

2.1.3 Saturated Monoesters, C₇

Butyl propanoate [590-01-2] C₇H₁₄O₂ MW = 130.19 31

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 2.1979 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.3039 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 273.15 to 383.85 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.15955 \cdot 10^3$
B	$-9.51999 \cdot 10^{-1}$
C	$-4.55571 \cdot 10^{-5}$

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

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
273.15	895.20 ± 1.50	-0.91	1886-gar ¹⁾	293.15	876.90 ± 0.50	0.35	1926-mat(Δ)
286.25	883.10 ± 0.60	-0.20	1886-gar(◆)	293.15	875.00 ± 0.60	-1.55	1948-vog-9 ¹⁾
296.95	873.10 ± 0.60	0.27	1886-gar(◆)	314.65	855.60 ± 0.60	0.11	1948-vog-9(×)
308.85	861.40 ± 0.60	0.23	1886-gar(◆)	334.15	837.00 ± 0.80	0.65	1948-vog-9(×)
322.75	847.50 ± 0.80	-0.04	1886-gar(◆)	358.55	813.20 ± 1.00	0.85	1948-vog-9(×)
338.25	832.40 ± 0.80	0.08	1886-gar(◆)	293.15	875.80 ± 0.80	-0.75	1949-eng/sch(×)
351.55	819.00 ± 0.80	-0.24	1886-gar(◆)	293.15	876.46 ± 0.20	-0.09	1958-hen(□)
370.45	799.80 ± 1.00	-0.83	1886-gar(◆)	298.15	871.54 ± 0.20	-0.12	1958-hen(□)
383.85	786.00 ± 1.00	-1.41	1886-gar(◆)	273.15	896.06 ± 0.20	-0.05	1959-tim/hen(○)
273.15	897.20 ± 0.60	1.09	1924-lie(∇)	288.15	881.33 ± 0.20	-0.11	1959-tim/hen(○)
288.15	881.80 ± 0.60	0.36	1924-lie(∇)	303.15	866.61 ± 0.20	-0.15	1959-tim/hen(○)

¹⁾ Not included in Fig. 1.

Further references: [1872-lin, 1934-gil/dex, 1935-sch-2].

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	899.18 ± 0.50	300.00	869.85 ± 0.50	350.00	820.76 ± 0.82
280.00	889.41 ± 0.48	310.00	860.05 ± 0.53	360.00	810.92 ± 0.97
290.00	879.63 ± 0.49	320.00	850.24 ± 0.57	370.00	801.07 ± 1.18
293.15	876.55 ± 0.49	330.00	840.42 ± 0.62	380.00	791.21 ± 1.44
298.15	871.66 ± 0.50	340.00	830.60 ± 0.70	390.00	781.34 ± 1.76

cont.

Butyl propanoate (cont.)

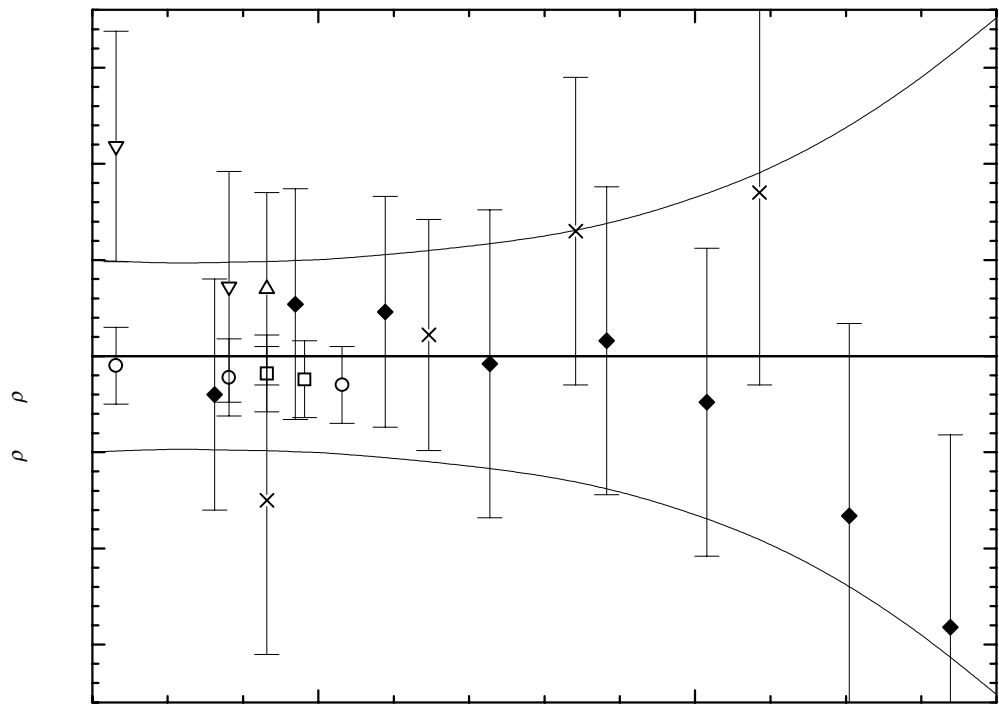


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

1,1-Dimethylethyl propanoate

[20487-40-5]

C₇H₁₄O₂

MW = 130.19

32

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	864.7 ± 1.0	1935-pal/sal

1,1-Dimethylpropyl ethanoate

[625-16-1]

C₇H₁₄O₂

MW = 130.19

33

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.
297.85	872.5 ± 0.4	1966-maz/lyn

1,2-Dimethylpropyl ethanoate [5343-96-4] C₇H₁₄O₂ MW = 130.19 34

Table 1. Fit with estimated *B* coefficient for 3 accepted points. Deviation $\sigma_w = 0.163$.

Coefficient	$\rho = A + BT$
<i>A</i>	1164.35
<i>B</i>	-1.000

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.
298.15	866.0 ± 0.7	-0.20	1998-ami/ban-1
303.15	861.2 ± 0.7	0.00	1998-ami/ban-1
308.15	856.4 ± 0.7	0.20	1998-ami/ban-1

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	874.3 ± 0.8
293.15	871.2 ± 0.8
298.15	866.2 ± 0.7
310.00	854.3 ± 0.7

(S)-1,2-Dimethylpropyl ethanoate [56640-64-3] C₇H₁₄O₂ MW = 130.19 35

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	860.0 ± 2.0	1933-ste

2,2-Dimethylpropyl ethanoate [926-41-0] C₇H₁₄O₂ MW = 130.19 36

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	853.9 ± 1.0	1956-sar/new

Ethyl 2,2-dimethylpropanoate [3938-95-2] C₇H₁₄O₂ MW = 130.19 37

Table 1. Fit with estimated *B* coefficient for 3 accepted points. Deviation $\sigma_w = 0.120$.

Coefficient	$\rho = A + BT$
<i>A</i>	1147.75
<i>B</i>	-1.000

cont.

Ethyl 2,2-dimethylpropanoate (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	875.0 ± 1.5	0.40	1910-ric
293.15	854.6 ± 0.5	0.05	1947-how/mea
298.15	849.5 ± 0.5	-0.10	1947-how/mea

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	877.7 ± 1.2
280.00	867.7 ± 1.0
290.00	857.7 ± 0.8
293.15	854.6 ± 0.8
298.15	849.6 ± 0.8

Ethyl 2-methylbutyrate

[7452-79-1]

C₇H₁₄O₂

MW = 130.19

38

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	867.8 ± 2.0	1890-gar
299.15	860.0 ± 2.0	1935-ken/phi
293.15	873.7 ± 2.0	1963-sch

Ethyl 3-methylbutanoate

[108-64-5]

C₇H₁₄O₂

MW = 130.19

39

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{\text{c,w}} = 4.3497 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 1.3793 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 288.15 to 358.65 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.15494 \cdot 10^3$
B	$-9.86660 \cdot 10^{-1}$

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)
290.15	868.03 ± 1.00	-0.63	1891-sch/kos(Δ)	298.15	861.23 ± 0.60	0.46	1922-tro(□)
293.15	865.98 ± 0.60	0.28	1898-kah(∇)	293.15	865.20 ± 0.60	-0.50	1948-vog-9(○)
288.15	871.24 ± 0.60	0.61	1922-tro(□)	294.25	864.10 ± 0.60	-0.52	1948-vog-9(○)

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)
314.05	845.60 ± 0.80	0.52	1948-vog-9(O)	358.15	801.30 ± 1.00	-0.27	1948-vog-9(O)
314.55	845.10 ± 0.80	0.51	1948-vog-9(O)	358.65	800.80 ± 1.00	-0.27	1948-vog-9(O)

¹⁾ Not included in Fig. 1.

Further references: [1920-har/cla, 1926-mun].

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
280.00	878.68 ± 0.96	300.00	858.94 ± 0.68	340.00	819.48 ± 0.77
290.00	868.81 ± 0.82	310.00	849.08 ± 0.58	350.00	809.61 ± 1.05
293.15	865.70 ± 0.77	320.00	839.21 ± 0.55	360.00	799.74 ± 1.45
298.15	860.77 ± 0.70	330.00	829.34 ± 0.61	370.00	789.88 ± 2.02

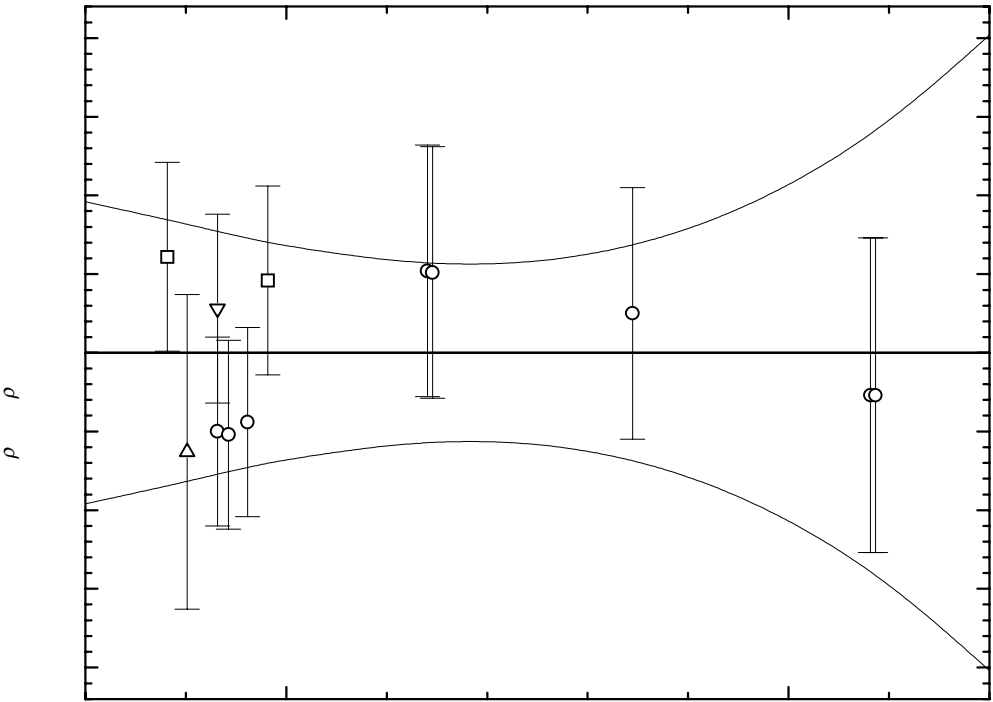


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Ethyl pentanoate

[539-82-2]

C₇H₁₄O₂

MW = 130.19

40

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 5.6632 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.6594 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 273.15 to 360.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.06602 \cdot 10^3$
B	$-4.02839 \cdot 10^{-1}$
C	$-8.59956 \cdot 10^{-4}$

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

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
293.15	874.40 ± 1.00	0.37	1890-gar(×)	314.65	854.20 ± 0.60	0.07	1948-vog-9(Δ)
352.15	815.50 ± 2.00	-2.02	1919-eyk(×)	314.95	853.90 ± 0.60	0.05	1948-vog-9(Δ)
273.15	893.00 ± 1.00	1.17	1924-lie(◆)	333.75	836.10 ± 0.60	0.31	1948-vog-9(Δ)
288.15	878.80 ± 0.50	0.26	1932-kao/ma -1(○)	359.75	809.70 ± 0.70	-0.11	1948-vog-9(Δ)
293.15	873.90 ± 0.50	-0.13	1932-kao/ma -1(○)	360.15	809.30 ± 0.70	-0.10	1948-vog-9(Δ)
298.15	869.00 ± 0.50	-0.47	1932-kao/ma -1(○)	293.15	875.00 ± 1.00	0.97	1950-mum/phi(V)
289.45	877.00 ± 0.50	-0.37	1948-vog-9(Δ)	298.15	870.30 ± 1.00	0.83	1950-mum/phi(V)
293.15	873.60 ± 0.50	-0.43	1948-vog-9(Δ)	293.15	874.31 ± 0.30	0.28	1951-ser/wis-1(□)
293.55	873.20 ± 0.50	-0.47	1948-vog-9(Δ)				

¹⁾ Not included in Fig. 1.

Further references: [1864-lan, 1872-lie/ros, 1883-els, 1884-sch-6, 1886-gar, 1934-gil/dex, 1970-ere, 1973-sad/akh].

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	894.57 ± 1.14	300.00	867.78 ± 0.64	340.00	829.65 ± 0.82
280.00	885.81 ± 0.87	310.00	858.50 ± 0.63	350.00	819.69 ± 0.98
290.00	876.88 ± 0.71	320.00	849.06 ± 0.67	360.00	809.55 ± 1.21
293.15	874.03 ± 0.67	330.00	839.44 ± 0.73	370.00	799.25 ± 1.53
298.15	869.47 ± 0.64				

cont.

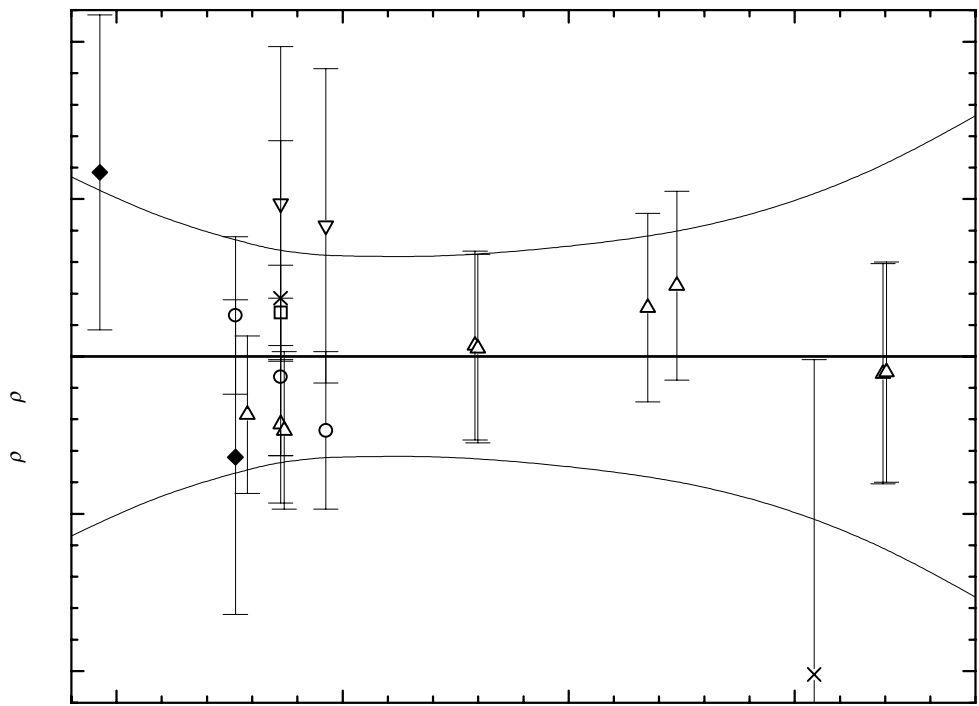


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

1-Ethyl-1-methylpropyl methanoate [500026-61-9] C₇H₁₄O₂ MW = 130.19 41

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	892.6 ± 0.8	1954-bar/naf

1-Ethylpropyl ethanoate [620-11-1] C₇H₁₄O₂ MW = 130.19 42

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	908.9 ± 2.0	1875-wag/say

Hexyl methanoate

[629-33-4]

C₇H₁₄O₂

MW = 130.19

43

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 6.1019 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 2.3123 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 292.55 to 384.35 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.07041 \cdot 10^3$
B	$-4.34323 \cdot 10^{-1}$
C	$-7.45871 \cdot 10^{-4}$

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

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
273.15	897.50 ± 0.00	1.37	1886-gar ¹⁾	371.05	806.50 ± 1.00	-0.07	1886-gar(○)
292.55	879.60 ± 0.60	0.08	1886-gar(○)	384.35	793.80 ± 1.00	0.50	1886-gar(○)
302.25	870.90 ± 0.60	-0.10	1886-gar(○)	293.15	878.90 ± 0.60	-0.09	1948-vog-9(□)
311.15	862.60 ± 0.80	-0.46	1886-gar(○)	314.65	860.90 ± 0.60	0.99	1948-vog-9(□)
321.35	853.00 ± 0.80	-0.82	1886-gar(○)	333.55	844.00 ± 0.80	1.44	1948-vog-9(□)
338.75	836.90 ± 0.80	-0.80	1886-gar(○)	359.65	821.80 ± 1.00	4.07	1948-vog-9 ¹⁾
351.95	824.50 ± 1.00	-0.66	1886-gar(○)				

¹⁾ Not included in Fig. 1.

Further references: [1883-fre, 35-bil/gis, 67-bar/fro, 75-nay/zor, 76-nay/zor].

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	881.73 ± 0.83	320.00	855.05 ± 0.76	360.00	817.39 ± 0.92
293.15	878.99 ± 0.80	330.00	845.86 ± 0.76	370.00	807.60 ± 1.12
298.15	874.62 ± 0.78	340.00	836.52 ± 0.77	380.00	797.67 ± 1.45
300.00	872.99 ± 0.77	350.00	827.03 ± 0.82	390.00	787.58 ± 1.90
310.00	864.10 ± 0.76				

cont.

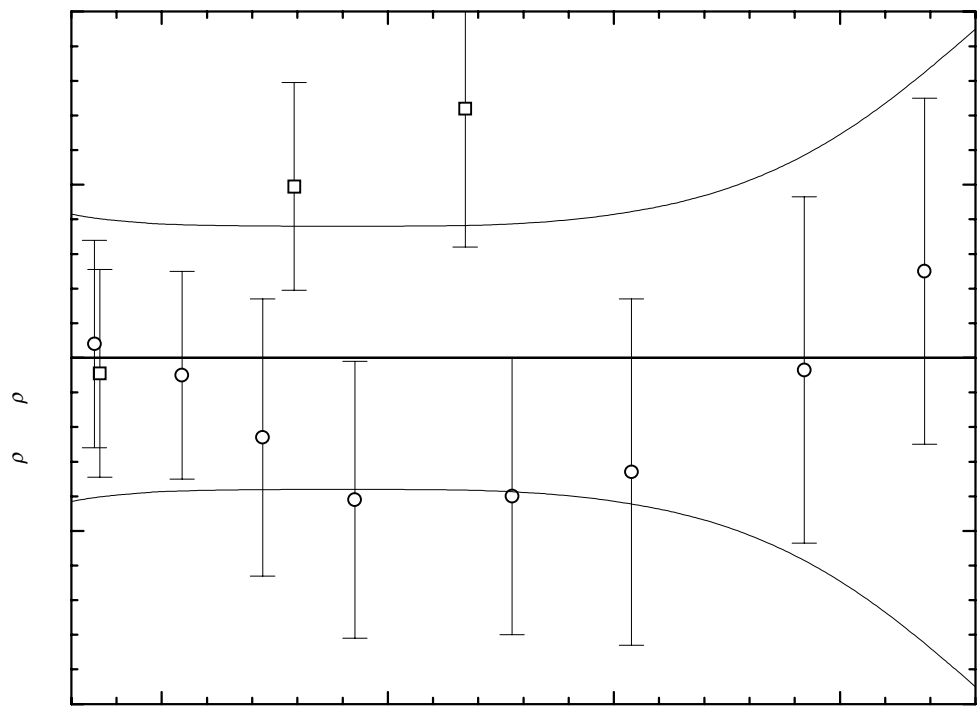


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Methyl 3,3-dimethylbutanoate [10250-48-3] C₇H₁₄O₂ MW = 130.19 44

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	871.0 ± 0.8	1933-hom/whi
293.15	870.0 ± 1.0	1957-tra/bat
293.15	870.6 ± 0.9	Recommend

Methyl 2-ethylbutanoate [816-11-5] C₇H₁₄O₂ MW = 130.19 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.
293.15	879.7 ± 2.0	1890-gar

Methyl hexanoate

[106-70-7]

C₇H₁₄O₂

MW = 130.19

46

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 3.3713 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 7.9659 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	T = 273.15 to 405.25 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.11179 \cdot 10^3$
B	$-6.25821 \cdot 10^{-1}$
C	$-5.03986 \cdot 10^{-4}$

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
273.15	903.80 ± 0.60	0.56	1886-gar(○)	311.05	867.30 ± 1.00	-1.06	1948-bon/alt(Δ)
296.65	882.20 ± 0.60	0.41	1886-gar(○)	333.15	846.00 ± 1.00	-1.36	1948-bon/alt ¹⁾
304.45	875.00 ± 0.60	0.46	1886-gar(○)	372.05	808.90 ± 1.00	-0.29	1948-bon/alt(Δ)
314.45	865.60 ± 0.60	0.43	1886-gar(○)	287.65	890.20 ± 0.60	0.13	1948-vog-9(□)
324.05	856.30 ± 0.80	0.23	1886-gar(○)	291.25	886.80 ± 0.60	0.03	1948-vog-9(□)
338.15	842.90 ± 0.80	0.36	1886-gar(○)	293.15	885.00 ± 0.60	-0.02	1948-vog-9(□)
351.55	830.10 ± 0.80	0.61	1886-gar(○)	297.25	881.10 ± 0.60	-0.13	1948-vog-9(□)
370.25	811.40 ± 1.00	0.41	1886-gar(○)	314.05	865.60 ± 0.60	0.06	1948-vog-9(□)
383.65	797.80 ± 1.00	0.29	1886-gar(○)	316.15	863.60 ± 0.80	0.04	1948-vog-9(□)
405.25	775.10 ± 1.00	-0.31	1886-gar(○)	334.25	846.10 ± 0.80	-0.20	1948-vog-9(□)
273.15	903.24 ± 0.60	-0.00	1935-bil/gis(◆)	334.75	845.60 ± 0.80	-0.22	1948-vog-9(□)
288.15	889.29 ± 0.60	-0.32	1935-bil/gis(◆)	358.25	823.00 ± 1.00	0.10	1948-vog-9(□)
303.15	875.25 ± 0.60	-0.50	1935-bil/gis(◆)	360.05	821.30 ± 1.00	0.17	1948-vog-9(□)
293.15	884.40 ± 1.00	-0.62	1948-bon/alt(Δ)	293.15	884.40 ± 1.00	-0.62	1964-gou/vlu(∇)

¹⁾ Not included in Fig. 1.

Table 3. Recommended values (fit to the reliable experimental values according to the equations $\rho = A + BT + CT^2 + DT^3 + \dots$ 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	906.08 ± 0.77	310.00	869.35 ± 0.73	370.00	811.24 ± 1.00
280.00	897.05 ± 0.74	320.00	859.92 ± 0.74	380.00	801.20 ± 1.13
290.00	887.91 ± 0.73	330.00	850.38 ± 0.76	390.00	791.06 ± 1.31
293.15	885.02 ± 0.72	340.00	840.75 ± 0.79	400.00	780.82 ± 1.54
298.15	880.40 ± 0.72	350.00	831.01 ± 0.83	410.00	770.48 ± 1.81
300.00	878.68 ± 0.72	360.00	821.18 ± 0.90	420.00	760.04 ± 2.14

cont.

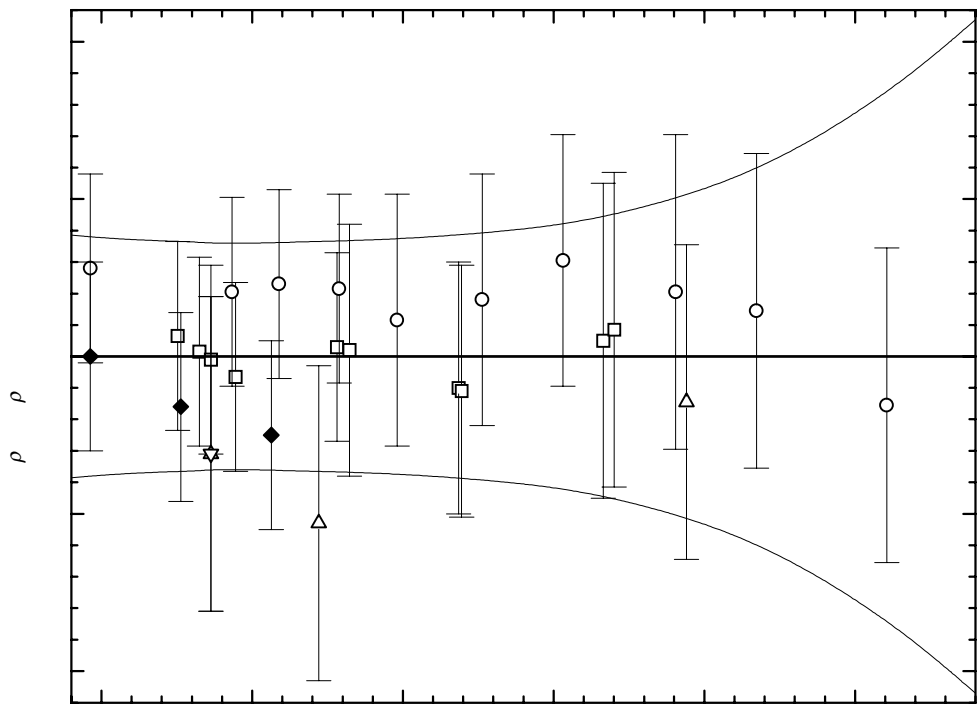


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

Methyl 2-methylpentanoate [2177-77-7] C₇H₁₄O₂ MW = 130.19 47

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	876.5 ± 2.0	1890-gar

(S)-Methyl 2-methylpentanoate [151409-53-9] C₇H₁₄O₂ MW = 130.19 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.
298.15	875.0 ± 2.0	1943-ste/gre

1-Methylbutyl ethanoate

[626-38-0]

C₇H₁₄O₂

MW = 130.19

49

Table 1. Fit with estimated *B* coefficient for 4 accepted points. Deviation $\sigma_w = 1.456$.

Coefficient	$\rho = A + BT$
<i>A</i>	1179.11
<i>B</i>	-1.060

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.
291.15	869.2 ± 1.0	-1.29	1914-pic/ken-1
318.65	843.3 ± 1.0	1.96	1914-pic/ken-1
338.15	821.5 ± 1.0	0.83	1914-pic/ken-1
364.15	791.6 ± 1.0	-1.51	1914-pic/ken-1

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	871.7 ± 1.9	320.00	839.9 ± 1.7	350.00	808.1 ± 1.8
293.15	868.4 ± 1.8	330.00	829.3 ± 1.7	360.00	797.5 ± 1.8
298.15	863.1 ± 1.8	340.00	818.7 ± 1.7	370.00	786.9 ± 1.9
310.00	850.5 ± 1.7				

2-Methylbutyl ethanoate

[624-41-9]

C₇H₁₄O₂

MW = 130.19

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.
293.15	876.4 ± 2.0	1946-hou/ste
293.15	867.8 ± 0.6	1995-sen/say

3-Methylbutyl ethanoate

[123-92-2]

C₇H₁₄O₂

MW = 130.19

51

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 2.2569$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 2.8068 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 282.12 to 408.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$1.10737 \cdot 10^3$
<i>A</i>	$-6.63217 \cdot 10^{-1}$
<i>B</i>	$-4.81961 \cdot 10^{-4}$

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)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{cal}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
291.15	872.21 ± 0.80	-1.21	1891-sch/kos(◆)	332.45	834.90 ± 0.60	1.29	1943-fri/har(Δ)
293.15	872.03 ± 0.80	0.50	1891-sch/kos(◆)	374.05	792.50 ± 0.60	0.64	1943-fri/har(Δ)
288.65	874.60 ± 0.60	-1.17	1909-fal(O)	393.55	770.80 ± 0.80	-0.91	1943-fri/har(Δ)
298.75	864.80 ± 0.60	-1.41	1909-fal(O)	408.15	756.00 ± 0.80	-0.39	1943-fri/har(Δ)
308.15	855.90 ± 0.60	-1.33	1909-fal(O)	293.15	871.90 ± 0.60	0.37	1948-vog-9(∇)
316.65	847.50 ± 0.60	-1.53	1909-fal(O)	313.15	854.10 ± 0.60	1.68	1948-vog-9(∇)
325.85	834.80 ± 0.70	-5.28	1909-fal ¹⁾	333.65	834.50 ± 0.80	2.07	1948-vog-9(∇)
335.65	828.70 ± 0.70	-1.76	1909-fal(O)	358.65	809.60 ± 1.00	2.09	1948-vog-9(∇)
342.95	821.40 ± 0.70	-1.83	1909-fal(O)	300.15	866.00 ± 1.00	1.12	1952-mcg/cur(X)
293.15	870.82 ± 0.60	-0.71	1910-pol(□)	343.15	823.00 ± 1.00	-0.03	1952-mcg/cur(X)
282.12	882.55 ± 2.00	0.65	1924-mil(X)	297.15	867.00 ± 1.00	-0.73	1962-nar/red(X)
293.06	869.74 ± 2.00	-1.87	1924-mil ¹⁾	293.15	871.90 ± 0.80	0.37	1983-kor/tol-1(X)
285.65	880.80 ± 0.60	2.21	1943-fri/har(Δ)				

¹⁾ Not included in Fig. 1.

Further references: [1876-bal, 1884-sch-6, 1926-han, 1926-mun, 1935-sch-2, 1979-sub/rao].

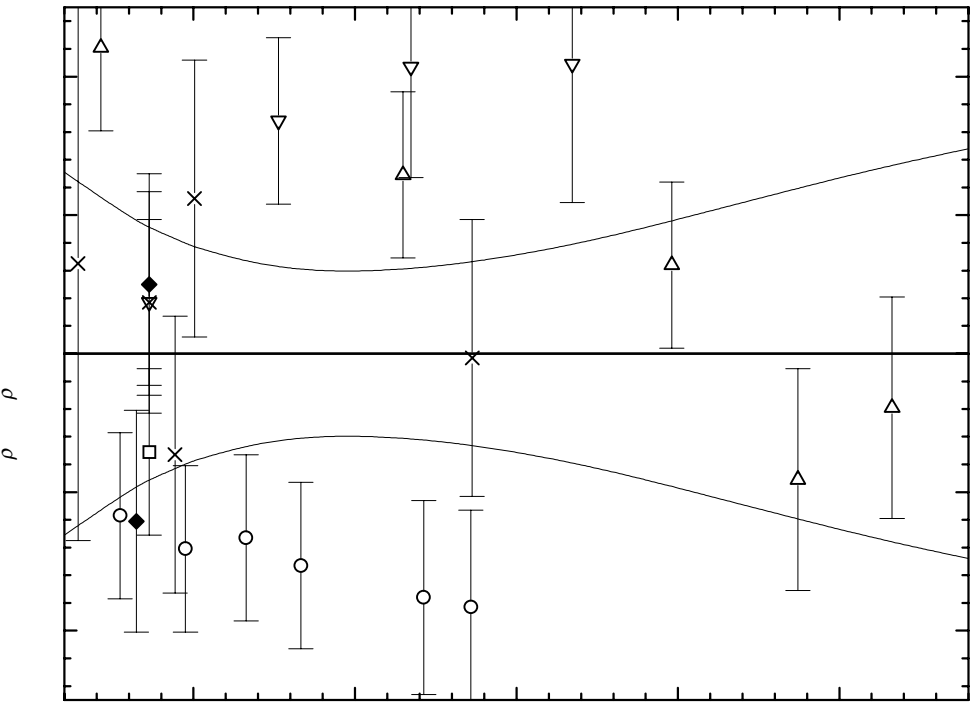


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

3-Methylbutyl ethanoate (cont.)

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
280.00	883.88 ± 1.31	320.00	845.78 ± 0.59	380.00	785.75 ± 1.03
290.00	874.50 ± 0.99	330.00	836.02 ± 0.60	390.00	775.40 ± 1.15
293.15	871.53 ± 0.91	340.00	826.16 ± 0.64	400.00	764.97 ± 1.27
298.15	866.78 ± 0.81	350.00	816.20 ± 0.71	410.00	754.43 ± 1.38
300.00	865.02 ± 0.77	360.00	806.15 ± 0.80	420.00	743.80 ± 1.48
310.00	855.45 ± 0.64	370.00	795.99 ± 0.91		

1-Methylethyl butanoate

[638-11-9]

C₇H₁₄O₂

MW = 130.19

52

Table 1. Fit with estimated *B* coefficient for 2 accepted points. Deviation $\sigma_w = 0.240$.

Coefficient	$\rho = A + BT$
<i>A</i>	1152.07
<i>B</i>	-1.000

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	884.3 ± 3.0	5.37	1883-els ¹⁾
407.95	744.6 ± 2.0	0.48	1884-sch-7
293.15	858.8 ± 1.0	-0.12	1935-sch-2

¹⁾ Not included in calculation of linear coefficients.

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	862.1 ± 1.2	330.00	822.1 ± 1.0	380.00	772.1 ± 2.1
293.15	858.9 ± 1.2	340.00	812.1 ± 1.2	390.00	762.1 ± 2.4
298.15	853.9 ± 1.1	350.00	802.1 ± 1.4	400.00	752.1 ± 2.7
310.00	842.1 ± 0.8	360.00	792.1 ± 1.6	410.00	742.1 ± 3.0
320.00	832.1 ± 0.9	370.00	782.1 ± 1.9		

1-Methylethyl 2-methylpropanoate

[617-50-5]

C₇H₁₄O₂

MW = 130.19

53

Table 1. Fit with estimated *B* coefficient for 2 accepted points. Deviation $\sigma_w = 0.307$.

Coefficient	$\rho = A + BT$
<i>A</i>	1153.02
<i>B</i>	-1.040

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	868.6 ± 1.0	-0.31	1950-tim
294.50	847.0 ± 1.0	0.31	1950-tim
293.15	850.5 ± 2.0	2.35	1963-sch 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	872.2 ± 0.9
280.00	861.8 ± 0.7
290.00	851.4 ± 0.7
293.15	848.1 ± 0.8
298.15	842.9 ± 0.9

1-Methylpropyl propanoate [591-34-4] C₇H₁₄O₂ MW = 0.19 54

Table 1. Fit with estimated *B* coefficient for 4 accepted points. Deviation σ_w = 0.148.

Coefficient	$\rho = A + BT$
<i>A</i>	1177.29
<i>B</i>	-1.060

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.
290.15	869.9 ± 0.6	0.17	1914-pic/ken-1
326.15	831.4 ± 0.6	-0.17	1914-pic/ken-1
359.15	796.5 ± 0.6	-0.09	1914-pic/ken-1
398.15	755.4 ± 0.8	0.15	1914-pic/ken-1

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	869.9 ± 2.0	330.00	827.5 ± 0.7	370.00	785.1 ± 1.5
293.15	866.5 ± 1.8	340.00	816.9 ± 0.6	380.00	774.5 ± 1.8
298.15	861.2 ± 1.7	350.00	806.3 ± 0.8	390.00	763.9 ± 2.2
310.00	848.7 ± 1.2	360.00	795.7 ± 1.1	400.00	753.3 ± 2.6
320.00	838.1 ± 0.9				

2-Methylpropyl propanoate

[540-42-1]

C₇H₁₄O₂

MW = 130.19

55

Table 1. Fit with estimated *B* coefficient for 5 accepted points. Deviation $\sigma_w = 1.476$.

Coefficient	$\rho = A + BT$
<i>A</i>	1183.56
<i>B</i>	-1.060

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	892.6 ± 1.0	-1.42	1872-pie/puc	389.65	769.8 ± 1.0	-0.73	1872-pie/puc
322.35	843.7 ± 1.0	1.83	1872-pie/puc	410.15	747.4 ± 1.0	-1.40	1884-sch-6
373.30	789.6 ± 1.0	1.73	1872-pie/puc	298.15	864.0 ± 2.0	-3.52	1926-mun ¹⁾

¹⁾ Not included in calculation of linear coefficients.

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	897.4 ± 3.7	320.00	844.4 ± 2.1	380.00	780.8 ± 2.0
280.00	886.8 ± 3.4	330.00	833.8 ± 1.9	390.00	770.2 ± 2.2
290.00	876.2 ± 3.0	340.00	823.2 ± 1.7	400.00	759.6 ± 2.5
293.15	872.8 ± 2.9	350.00	812.6 ± 1.7	410.00	749.0 ± 2.8
298.15	867.5 ± 2.8	360.00	802.0 ± 1.7	420.00	738.4 ± 3.1
310.00	855.0 ± 2.4	370.00	791.4 ± 1.8		

Pentyl ethanoate

[628-63-7]

C₇H₁₄O₂

MW = 130.19

56

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 1.3469$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 2.3833 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 273.15 to 448.11 K $\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	1.08006 · 10 ³
<i>B</i>	-4.60463 · 10 ⁻¹
<i>C</i>	-7.99634 · 10 ⁻⁴

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
273.15	894.60 ± 0.60	-0.02	1886-gar(×)	338.65	832.40 ± 0.80	-0.02	1886-gar(×)
286.65	882.20 ± 0.60	-0.16	1886-gar(×)	351.65	819.60 ± 0.80	0.34	1886-gar(×)
297.15	872.50 ± 0.60	-0.13	1886-gar ¹⁾	370.95	800.70 ± 0.80	1.48	1886-gar(×)
308.95	861.50 ± 0.60	0.03	1886-gar(×)	384.35	786.70 ± 1.00	1.75	1886-gar(×)
318.65	852.10 ± 0.60	-0.04	1886-gar(×)	292.45	874.80 ± 1.00	-2.21	1905-bol/guy 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)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
297.35	870.00 ± 1.00	-2.44	1905-bol/guy ¹⁾	293.15	875.30 ± 0.50	-1.06	1950-mum/phi(×)
301.95	865.20 ± 1.00	-2.92	1905-bol/guy ¹⁾	298.15	870.70 ± 0.50	-0.99	1950-mum/phi(×)
312.75	854.50 ± 1.00	-3.34	1905-bol/guy ¹⁾	273.15	896.12 ± 0.40	1.50	1955-tim/hen(∇)
328.15	839.20 ± 1.00	-3.65	1905-bol/guy(×)	288.15	881.87 ± 0.40	0.89	1955-tim/hen(∇)
353.95	813.40 ± 1.00	-3.50	1905-bol/guy(×)	303.15	867.37 ± 0.40	0.39	1955-tim/hen(∇)
381.65	784.50 ± 1.00	-3.35	1905-bol/guy(×)	293.15	877.00 ± 0.50	0.64	1964-tur/den(×)
273.15	896.20 ± 0.50	1.58	1924-lie(×)	293.15	875.70 ± 0.50	-0.66	1970-ere(×)
288.15	881.00 ± 0.50	0.02	1924-lie(×)	293.15	875.50 ± 0.50	-0.86	1971-shl-1(×)
288.45	880.50 ± 0.50	-0.21	1943-fri/har(×)	298.15	872.23 ± 0.30	0.54	1988-fer/lap(○)
315.65	854.40 ± 0.50	-0.64	1943-fri/har(×)	293.15	877.76 ± 0.40	1.40	1992-qin/hof-2(Δ)
336.15	835.00 ± 0.50	0.08	1943-fri/har(×)	298.15	870.73 ± 0.20	-0.96	1996-elb(□)
354.85	816.50 ± 0.50	0.52	1943-fri/har(×)	323.14	846.50 ± 0.42	-1.27	1996-ste/chi(◆)
373.50	797.50 ± 0.50	0.97	1943-fri/har(×)	348.13	822.30 ± 0.45	-0.55	1996-ste/chi(◆)
392.55	778.30 ± 0.50	2.22	1943-fri/har(×)	373.12	797.20 ± 0.47	0.27	1996-ste/chi(◆)
408.15	761.90 ± 0.50	2.99	1943-fri/har(×)	398.12	769.80 ± 0.50	-0.20	1996-ste/chi(◆)
293.15	874.50 ± 0.60	-1.86	1948-vog-9 ¹⁾	423.11	740.70 ± 0.52	-1.38	1996-ste/chi(◆)
314.85	856.00 ± 0.60	0.19	1948-vog-9(×)	448.11	711.00 ± 0.55	-2.15	1996-ste/chi(◆)
335.05	837.90 ± 0.80	1.88	1948-vog-9(×)	473.11	679.50 ± 0.57	-3.73	1996-ste/chi ¹⁾
359.85	812.80 ± 0.80	1.98	1948-vog-9(×)				

¹⁾ Not included in Fig. 1.

Further references: [1864-lan, 1871-lie/ros-1, 1871-lie/ros-3, 1883-sch-3, 1892-lan/jah, 1903-hom/guy, 1910-tho, 1914-kre/mei, 1917-jae-1, 1926-han, 1926-sch, 1934-gil/dex, 1937-bue/gar, 1955-usa/bil, 1956-usa/bil-1, 1964-bre/ulu, 1964-kul/zil, 1976-dus/pie, 1976-nay/zor, 1977-toj/arc, 1989-khi/zhu, 1989-sol/mar, 1992-qin/hof-1].

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	897.44 ± 0.55	330.00	841.03 ± 0.60	400.00	767.93 ± 0.72
280.00	888.44 ± 0.54	340.00	831.06 ± 0.61	410.00	756.85 ± 0.74
290.00	879.28 ± 0.53	350.00	820.94 ± 0.63	420.00	745.61 ± 0.77
293.15	876.36 ± 0.52	360.00	810.66 ± 0.65	430.00	734.21 ± 0.80
298.15	871.69 ± 0.53	370.00	800.22 ± 0.67	440.00	722.65 ± 0.84
300.00	869.95 ± 0.54	380.00	789.62 ± 0.68	450.00	710.93 ± 0.89
310.00	860.47 ± 0.56	390.00	778.85 ± 0.70	460.00	699.04 ± 0.95
320.00	850.83 ± 0.58				

cont.

Pentyl ethanoate (cont.)

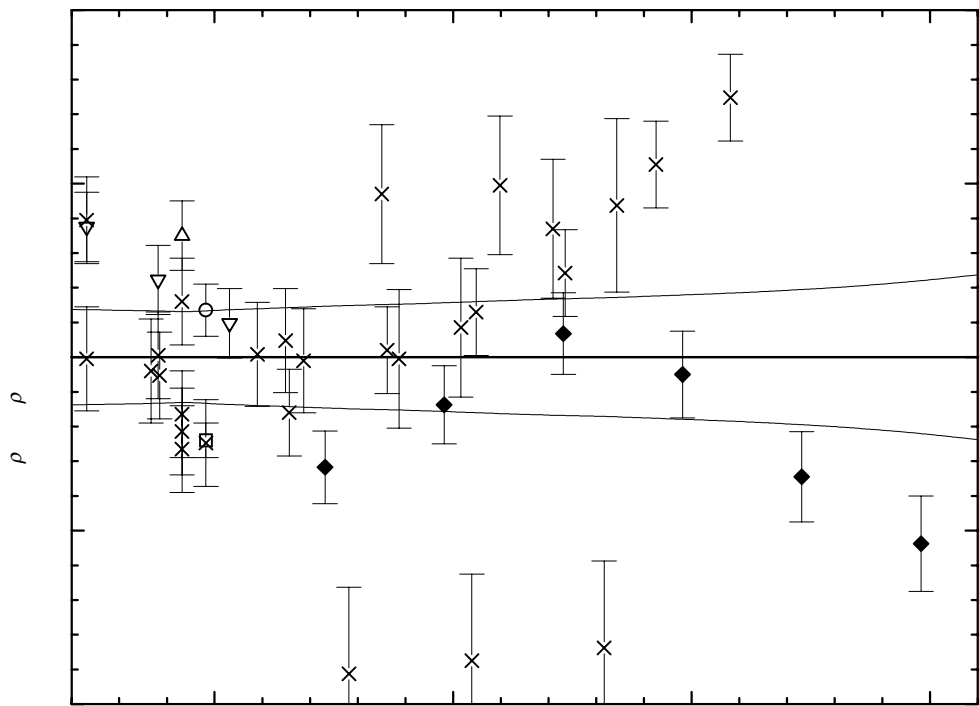


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

Propyl butanoate [105-66-8] C₇H₁₄O₂ MW = 130.19 57

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 7.9614 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 2.7852 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 273.15 to 421.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.16334 \cdot 10^3$
B	$-9.89814 \cdot 10^{-1}$

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

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
288.15	878.90 ± 2.00	0.77	1872-lin/von(X)	293.15	871.60 ± 1.00	-1.58	1890-gar(X)
273.15	892.99 ± 1.00	0.02	1883-els(X)	287.85	877.42 ± 0.80	-1.00	1919-eyk(X)

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)
298.15	871.00 ± 2.00	2.77	1926-mun(×)	278.15	887.76 ± 0.40	-0.27	1989-khi/zhu(□)
293.15	873.00 ± 0.60	-0.18	1935-sch-2(∇)	333.15	833.37 ± 0.40	-0.22	1989-khi/zhu(□)
293.15	872.20 ± 0.60	-0.98	1948-vog-9(◆)	298.15	869.97 ± 1.00	1.74	1990-lor/leg(×)
313.85	852.60 ± 0.60	-0.09	1948-vog-9(◆)	298.15	867.97 ± 0.40	-0.26	1991-lor/jim-5(○)
334.25	832.10 ± 0.80	-0.40	1948-vog-9(◆)				

¹⁾ Not included in Fig. 1.

Further references: [1872-lin, 1872-pie/puc, 1884-sch-6, 1911-dob, 1931-von/wun, 1934-gil/dex, 1944-fri/har-2, 1947-fre, 1963-voi].

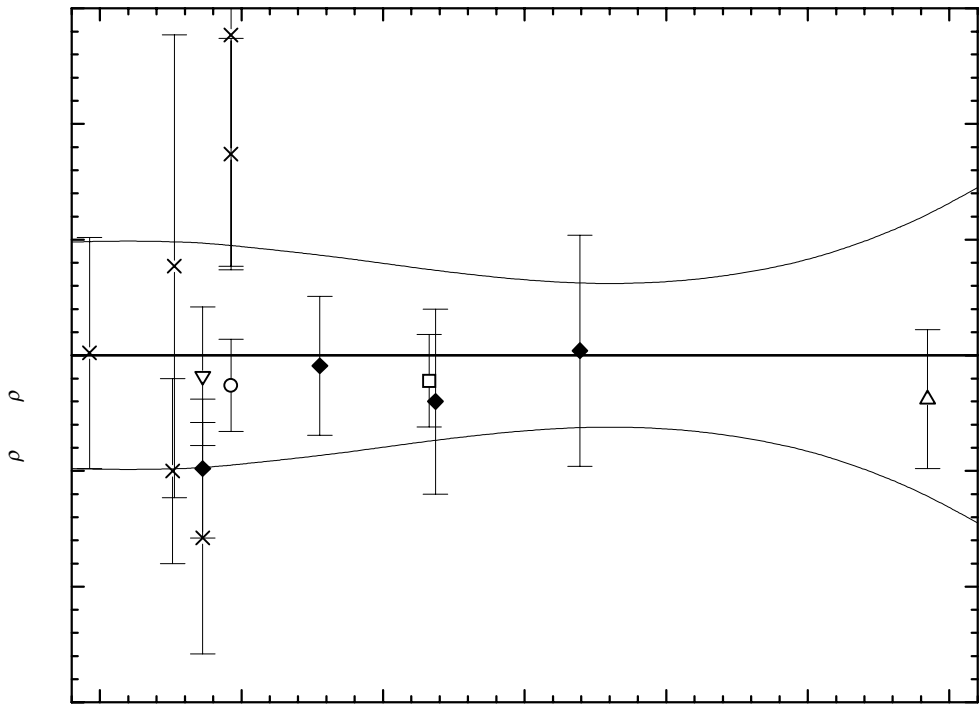


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

cont.

Propyl butanoate (cont.)

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	896.09 ± 0.98	320.00	846.60 ± 0.83	380.00	787.21 ± 0.65
280.00	886.19 ± 0.99	330.00	836.70 ± 0.76	390.00	777.31 ± 0.72
290.00	876.30 ± 0.98	340.00	826.81 ± 0.70	400.00	767.42 ± 0.82
293.15	873.18 ± 0.97	350.00	816.91 ± 0.65	410.00	757.52 ± 0.98
298.15	868.23 ± 0.95	360.00	807.01 ± 0.62	420.00	747.62 ± 1.18
300.00	866.40 ± 0.94	370.00	797.11 ± 0.62	430.00	737.72 ± 1.45
310.00	856.50 ± 0.89				

Propyl 2-methylpropanoate

[644-49-5]

C₇H₁₄O₂

MW = 130.19

58

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{\text{c,w}} = 1.9902 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 7.9678 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	T = 288.45 to 407.95 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.08272 \cdot 10^3$
B	$-5.32995 \cdot 10^{-1}$
C	$-7.23830 \cdot 10^{-4}$

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)
407.95	744.60 ± 1.50	-0.23	1884-sch-6(○)	314.65	843.00 ± 0.80	-0.35	1948-vog-9(Δ)
293.15	864.00 ± 1.00	-0.27	1890-gar(□)	334.55	823.60 ± 0.80	0.20	1948-vog-9(Δ)
288.45	869.00 ± 0.60	0.24	1948-vog-9(Δ)	334.65	823.50 ± 0.80	0.21	1948-vog-9(Δ)
292.25	865.20 ± 0.60	0.07	1948-vog-9(Δ)	360.05	797.20 ± 1.00	0.22	1948-vog-9(Δ)
293.15	864.30 ± 0.60	0.03	1948-vog-9(Δ)	360.55	796.70 ± 1.00	0.24	1948-vog-9(Δ)
314.45	843.20 ± 0.80	-0.35	1948-vog-9(Δ)				

¹⁾ Not included in Fig. 1.

cont.

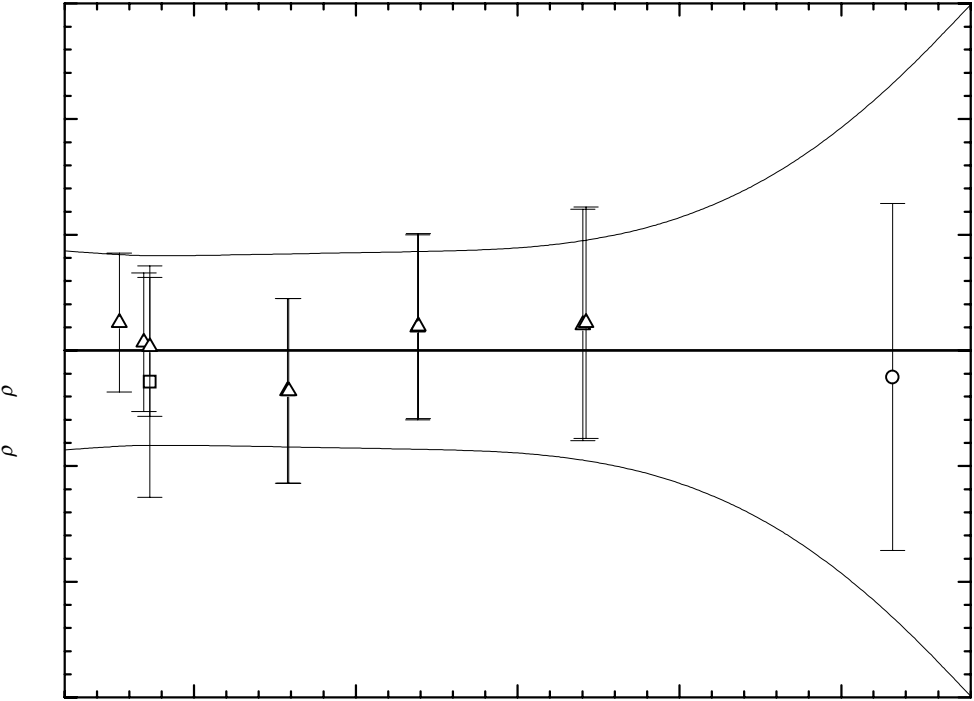


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
280.00	876.74 ± 0.86	320.00	838.05 ± 0.84	380.00	775.66 ± 1.24
290.00	867.28 ± 0.82	330.00	828.01 ± 0.85	390.00	764.76 ± 1.52
293.15	864.27 ± 0.82	340.00	817.83 ± 0.86	400.00	753.71 ± 1.91
298.15	859.47 ± 0.82	350.00	807.51 ± 0.88	410.00	742.52 ± 2.40
300.00	857.68 ± 0.82	360.00	797.04 ± 0.94	420.00	731.18 ± 2.99
310.00	847.94 ± 0.83	370.00	786.42 ± 1.05		

