

6. Tabulated Data on Density - Amines

6.1 Saturated Amines

6.1.1 Saturated Primary Amines

Methanamine

[74-89-5]

CH5N

MW = 31.06

527

 $T_c = 430.70 \text{ K}$ [1974-kay/you-2] $\rho_c = 248.50 \text{ kg} \cdot \text{m}^{-3}$ [TRC-NH]**Table 1.** Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_1 = 7.2338 \cdot 10^{-1}$ (low temperature range), $\sigma_{c,w} = (8.1427 \cdot 10^{-1})$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 3.8402 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 190.57 \text{ to } 350.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 350.00 \text{ to } 430.70 \text{ K}$ $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$9.24674 \cdot 10^2$	3.98811
<i>B</i>	$-5.38653 \cdot 10^{-1}$	$-1.43853 \cdot 10^{-1}$
<i>C</i>	$-1.22540 \cdot 10^{-3}$	$1.93422 \cdot 10^{-3}$
<i>D</i>		$-8.87573 \cdot 10^{-6}$

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
190.57	777.85 ± 0.40	0.33	1929-fel/tho(□)	292.93	662.75 ± 0.40	1.01	1929-fel/tho(□)
198.96	769.01 ± 0.40	0.01	1929-fel/tho(□)	263.15	695.20 ± 0.50	-2.87	1947-lef/rus ¹⁾
208.90	758.48 ± 0.40	-0.19	1929-fel/tho(□)	273.15	683.90 ± 0.50	-2.21	1947-lef/rus(○)
217.63	749.29 ± 0.40	-0.12	1929-fel/tho(□)	286.75	667.60 ± 0.50	-1.86	1947-lef/rus(○)
228.84	737.17 ± 0.40	-0.07	1929-fel/tho(□)	298.15	653.90 ± 0.70	-1.24	1947-lef/rus(○)
236.78	728.82 ± 0.40	0.39	1929-fel/tho(□)	281.65	675.00 ± 2.00	-0.76	1966-isa/adz ¹⁾
252.21	711.22 ± 0.40	0.35	1929-fel/tho(□)	288.65	666.00 ± 2.00	-1.09	1966-isa/adz ¹⁾
259.55	702.71 ± 0.40	0.39	1929-fel/tho(□)	293.15	660.00 ± 2.00	-1.46	1966-isa/adz ¹⁾
262.15	699.00 ± 0.40	-0.25	1929-fel/tho(□)	313.15	636.00 ± 2.00	0.17	1966-isa/adz(Δ)
262.35	698.98 ± 0.40	-0.04	1929-fel/tho(□)	333.15	610.00 ± 2.00	0.78	1966-isa/adz(Δ)
266.85	694.21 ± 0.40	0.54	1929-fel/tho(□)	353.15	582.00 ± 2.00	0.83	1966-isa/adz(Δ)
275.01	684.45 ± 0.40	0.59	1929-fel/tho(□)	373.15	549.00 ± 2.00	4.62	1966-isa/adz(Δ)
284.14	673.33 ± 0.40	0.64	1929-fel/tho(□)	393.15	510.00 ± 2.50	-5.92	1966-isa/adz(Δ)
290.36	665.73 ± 0.40	0.77	1929-fel/tho(□)	413.15	466.00 ± 2.50	2.63	1966-isa/adz(Δ)

¹⁾ Not included in Fig. 1.**Further references:** [1889-hof].

cont.

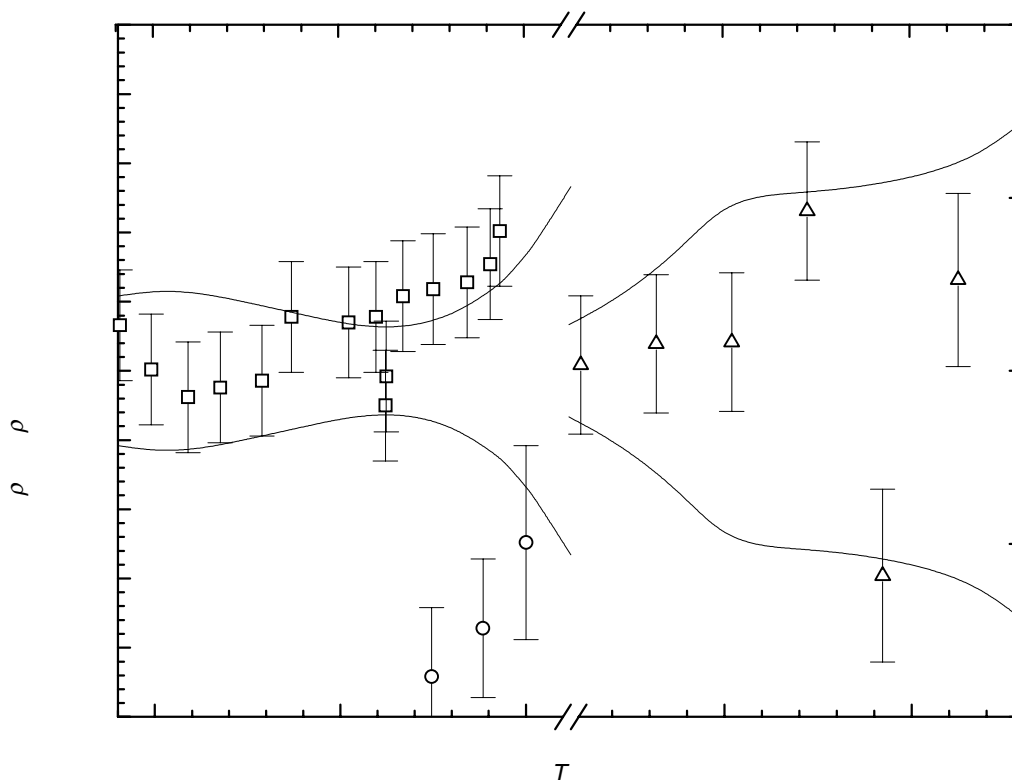
Methanamine (cont.)

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
190.00	778.09 ± 0.61	280.00	677.78 ± 0.42	350.00	586.03 ± 4.70
200.00	767.93 ± 0.58	290.00	665.41 ± 0.60	360.00	568.60 ± 5.06
210.00	757.52 ± 0.57	293.15	661.46 ± 0.68	370.00	549.77 ± 5.14
220.00	746.86 ± 0.52	298.15	655.14 ± 0.84	380.00	533.88 ± 5.23
230.00	735.96 ± 0.46	300.00	652.79 ± 0.90	390.00	520.37 ± 5.37
240.00	724.81 ± 0.40	310.00	639.93 ± 1.33	400.00	504.25 ± 5.57
250.00	713.42 ± 0.34	320.00	626.82 ± 1.91	410.00	476.51 ± 5.87
260.00	701.79 ± 0.31	330.00	613.47 ± 2.65	420.00	423.54 ± 6.34
270.00	689.91 ± 0.33	340.00	599.88 ± 3.58	430.00	303.22 ± 7.17

Ethanamine**[75-04-7]****C₂H₇N****MW = 45.08****528** $T_c = 456.35 \text{ K}$ [TRC-NH] $\rho_c = 250.50 \text{ kg} \cdot \text{m}^{-3}$ [TRC-NH]**Table 1.** Coefficients for the polynomial expansion equations. Standard deviations (see introduction): $\sigma_1 = 2.5094 \cdot 10^{-1}$ (low temperature range), $\sigma_{c,w} = (5.2980 \cdot 10^{-1})$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 2.3272 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 200.55 \text{ to } 340.00 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$	$T = 340.00 \text{ to } 456.35 \text{ K}$ $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)]$ $[\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$
<i>A</i>	$9.69787 \cdot 10^2$	1.10380
<i>B</i>	$-7.84028 \cdot 10^{-1}$	$-2.77111 \cdot 10^{-2}$
<i>C</i>	$-6.66161 \cdot 10^{-4}$	$2.89157 \cdot 10^{-4}$
<i>D</i>		$-1.02083 \cdot 10^{-6}$

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
		<i>crystal</i>		249.39	733.00 ± 0.40	0.17	1933-poh/meh(×)
192.15	898.0 ± 3.0		1933-poh/meh	262.44	718.60 ± 0.40	0.45	1933-poh/meh(×)
		<i>liquid</i>		273.20	705.90 ± 0.40	0.03	1933-poh/meh(×)
277.15	701.30 ± 0.30	-0.02	1889-per(∇)	283.30	694.90 ± 0.40	0.69	1933-poh/meh ¹⁾
283.15	694.40 ± 0.30	0.02	1889-per(∇)	292.60	683.70 ± 0.40	0.35	1933-poh/meh(×)
288.15	688.60 ± 0.30	0.04	1889-per(∇)	411.50	500.70 ± 0.80	-0.14	1933-poh/meh(×)
273.15	705.68 ± 0.20	-0.25	1910-tim(□)	420.40	481.60 ± 1.10	0.16	1933-poh/meh(×)
273.15	705.68 ± 0.20	-0.25	1912-tim-1(○)	273.15	705.63 ± 0.20	-0.30	1942-swi(Δ)
200.55	785.40 ± 0.40	-0.36	1933-poh/meh(×)	288.15	688.56 ± 0.20	0.00	1942-swi(Δ)
214.16	770.50 ± 0.40	-0.83	1933-poh/meh ¹⁾	298.15	676.85 ± 0.20	0.04	1942-swi(Δ)
223.65	761.00 ± 0.40	-0.12	1933-poh/meh(×)	308.15	664.79 ± 0.20	-0.14	1942-swi(Δ)
235.08	748.90 ± 0.40	0.24	1933-poh/meh(×)	298.15	676.90 ± 0.50	0.09	1950-bar/lef-1(◆)

¹⁾ Not included in Fig. 1.**Further references:** [1850-wur, 1850-wur-1, 1889-hof].**Table 3.** Recommended values (fit to the reliable experimental values according to the equations $\rho = A + BT + CT^2 + DT^3 + \dots$ or $\rho = [1 + 1.75(1 - T/T_c)^{1/3} + 0.75(1 - T/T_c)][\rho_c + A(T_c - T) + B(T_c - T)^2 + C(T_c - T)^3 + D(T_c - T)^4]$).

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
200.00	786.34 ± 0.59	260.00	720.91 ± 0.32	300.00	674.62 ± 0.33
210.00	775.76 ± 0.52	270.00	709.54 ± 0.30	310.00	662.72 ± 0.38
220.00	765.06 ± 0.46	280.00	698.03 ± 0.29	320.00	650.68 ± 0.46
230.00	754.22 ± 0.41	290.00	686.40 ± 0.30	330.00	638.51 ± 0.58
240.00	743.25 ± 0.38	293.15	682.70 ± 0.30	340.00	626.21 ± 0.72
250.00	732.15 ± 0.34	298.15	676.81 ± 0.32	350.00	611.78 ± 0.90

cont.

Ethanamine (cont.)**Table 3.** (cont.)

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
360.00	594.68 ± 0.93	400.00	522.74 ± 1.14	440.00	420.72 ± 1.91
370.00	576.60 ± 0.96	410.00	503.85 ± 1.24	450.00	367.09 ± 2.47
380.00	558.48 ± 1.01	420.00	482.39 ± 1.38		
390.00	540.64 ± 1.07	430.00	455.97 ± 1.59		

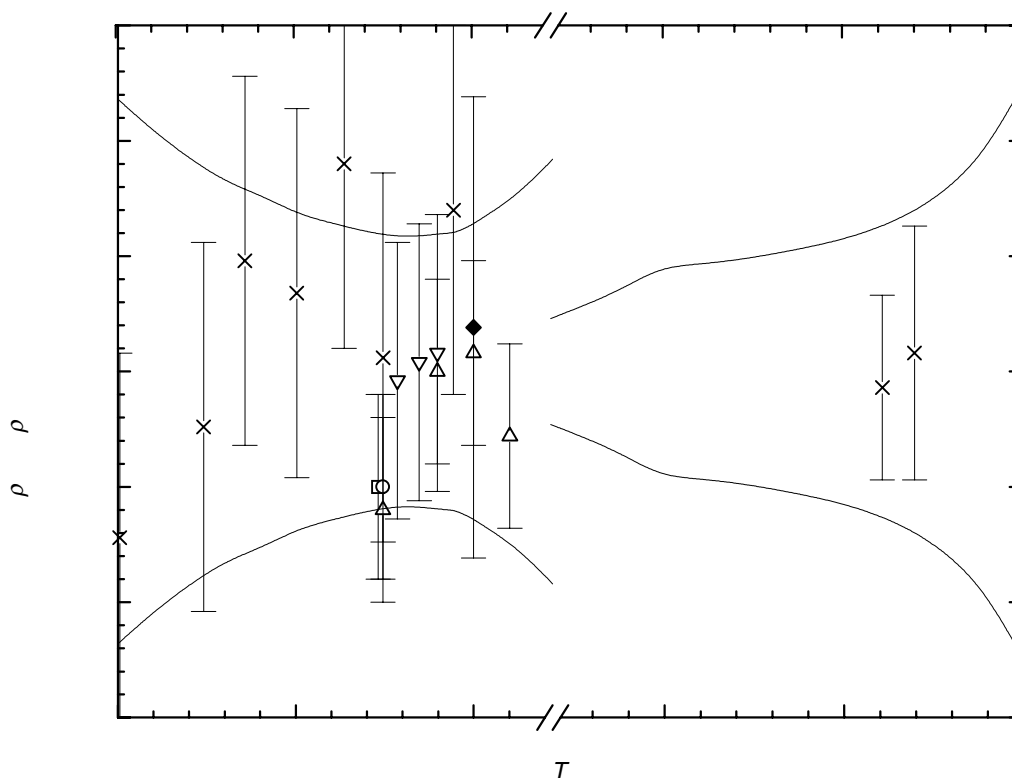


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

1-Propanamine**[107-10-8]****C₃H₉N****MW = 59.11****529**

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 7.7732 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.5448 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 213.15 to 393.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$9.70438 \cdot 10^2$
B	$-6.89122 \cdot 10^{-1}$
C	$-6.01943 \cdot 10^{-4}$

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)
277.15	733.00 ± 0.40	-0.21	1889-per(◆)	233.15	776.80 ± 0.50	-0.25	1959-cos/bow(×)
283.15	726.60 ± 0.40	-0.45	1889-per(◆)	253.15	756.70 ± 0.50	-0.71	1959-cos/bow(×)
288.15	721.60 ± 0.40	-0.29	1889-per(◆)	273.15	736.40 ± 0.50	-0.89	1959-cos/bow(×)
293.15	716.80 ± 0.40	0.11	1889-per(◆)	293.15	716.30 ± 0.50	-0.39	1959-cos/bow(×)
298.15	712.30 ± 0.40	0.83	1889-per(◆)	313.15	696.00 ± 0.50	0.39	1959-cos/bow(×)
289.75	720.90 ± 0.50	0.67	1895-bru-1(×)	333.15	675.20 ± 0.50	1.15	1959-cos/bow(×)
293.15	717.50 ± 0.50	0.81	1895-bru-1(×)	353.15	652.90 ± 0.50	0.90	1959-cos/bow(×)
289.05	719.90 ± 0.60	-1.06	1919-eyk(×)	373.15	629.60 ± 0.50	0.12	1959-cos/bow(×)
292.35	718.10 ± 0.60	0.57	1948-vog-4 ¹⁾	393.15	604.70 ± 0.50	-1.77	1959-cos/bow(×)
293.15	717.30 ± 0.60	0.61	1948-vog-4 ¹⁾	413.15	576.90 ± 0.50	-6.08	1959-cos/bow ¹⁾
299.55	710.60 ± 0.60	0.60	1948-vog-4(×)	293.15	716.40 ± 0.30	-0.29	1970-kri/kom(Δ)
311.15	698.40 ± 0.60	0.66	1948-vog-4(×)	298.15	710.86 ± 0.20	-0.61	1972-let(□)
313.95	695.50 ± 0.60	0.74	1948-vog-4(×)	298.15	711.02 ± 0.25	-0.45	1972-let-1(○)
314.75	694.70 ± 0.60	0.80	1948-vog-4(×)	293.15	715.50 ± 0.40	-1.19	1978-pat(∇)
213.15	797.00 ± 0.50	0.80	1959-cos/bow(×)				

¹⁾ Not included in Fig. 1.

Further references: [1869-sil, 1872-lin-3, 1886-sch, 1889-gla/per, 1891-gla, 1893-eyk-1, 1910-tur/mer, 1952-cow, 1956-ano-4, 1968-ano].

cont.

1-Propanamine (cont.)

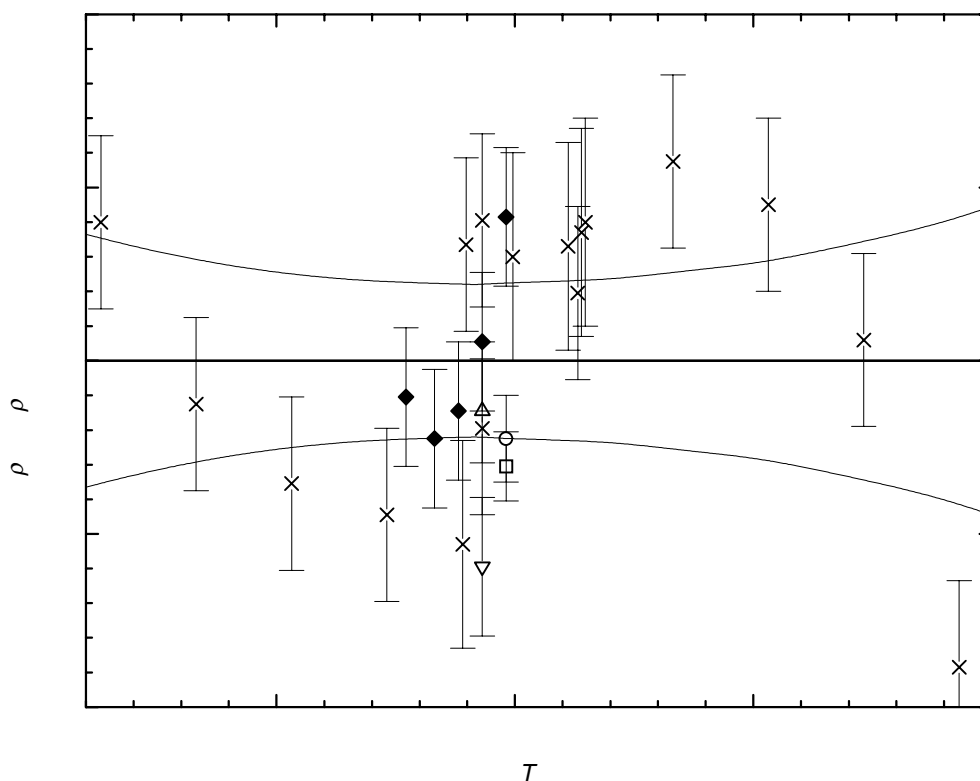


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
210.00	799.18 ± 0.73	290.00	719.97 ± 0.44	350.00	655.51 ± 0.56
220.00	789.70 ± 0.66	293.15	716.69 ± 0.44	360.00	644.34 ± 0.61
230.00	780.10 ± 0.60	298.15	711.47 ± 0.45	370.00	633.06 ± 0.67
240.00	770.38 ± 0.55	300.00	709.53 ± 0.45	380.00	621.65 ± 0.73
250.00	760.54 ± 0.51	310.00	698.96 ± 0.46	390.00	610.13 ± 0.80
260.00	750.58 ± 0.48	320.00	688.28 ± 0.47	400.00	598.48 ± 0.89
270.00	740.49 ± 0.46	330.00	677.48 ± 0.50		
280.00	730.29 ± 0.45	340.00	666.55 ± 0.53		

2-Propanamine**[75-31-0]****C₃H₉N****MW = 59.11****530**

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 9.0077 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 2.0929 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 213.15 to 373.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$9.27211 \cdot 10^2$
B	$-5.15544 \cdot 10^{-1}$
C	$-1.01719 \cdot 10^{-3}$

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)
288.55	693.50 ± 0.50	-0.26	1895-bru-1(○)	293.15	690.00 ± 0.60	1.34	1956-shi(▽)
293.15	688.90 ± 0.50	0.24	1895-bru-1(○)	298.15	684.30 ± 0.60	1.22	1956-shi(▽)
288.15	694.00 ± 1.00	-0.20	1954-nor/hau(×)	213.15	771.30 ± 0.50	0.19	1959-cos/bow(□)
298.15	682.10 ± 0.60	-0.98	1954-tha/row(◆)	233.15	751.30 ± 0.50	-0.42	1959-cos/bow(□)
213.15	773.20 ± 0.60	2.09	1956-shi(▽)	253.15	731.20 ± 0.50	-0.31	1959-cos/bow(□)
223.15	763.00 ± 0.60	1.48	1956-shi(▽)	273.15	710.30 ± 0.50	-0.20	1959-cos/bow(□)
233.15	749.70 ± 0.60	-2.02	1956-shi(▽)	293.15	689.10 ± 0.50	0.44	1959-cos/bow(□)
243.15	740.10 ± 0.60	-1.62	1956-shi(▽)	313.15	666.50 ± 0.50	0.48	1959-cos/bow(□)
248.15	735.40 ± 0.60	-1.24	1956-shi(▽)	333.15	643.20 ± 0.50	0.64	1959-cos/bow(□)
253.15	730.80 ± 0.60	-0.71	1956-shi(▽)	353.15	618.40 ± 0.50	0.11	1959-cos/bow(□)
263.15	721.60 ± 0.60	0.49	1956-shi(▽)	373.15	592.40 ± 0.50	-0.80	1959-cos/bow(□)
273.15	709.80 ± 0.60	-0.70	1956-shi(▽)	298.15	682.30 ± 0.50	-0.78	1960-pad/sub(Δ)
283.15	701.20 ± 0.60	1.52	1956-shi(▽)				

Further references: [1868-sie, 1950-hou/mas-1, 1968-ano, 1969-kom/kri].

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

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
210.00	774.09 ± 0.68	280.00	703.11 ± 0.57	330.00	646.31 ± 0.57
220.00	764.56 ± 0.66	290.00	692.16 ± 0.56	340.00	634.34 ± 0.60
230.00	754.83 ± 0.64	293.15	688.66 ± 0.56	350.00	622.16 ± 0.65
240.00	744.89 ± 0.63	298.15	683.08 ± 0.55	360.00	609.79 ± 0.72
250.00	734.75 ± 0.61	300.00	681.00 ± 0.55	370.00	597.21 ± 0.81
260.00	724.41 ± 0.60	310.00	669.64 ± 0.55	380.00	584.42 ± 0.92
270.00	713.86 ± 0.58	320.00	658.08 ± 0.55		

cont.

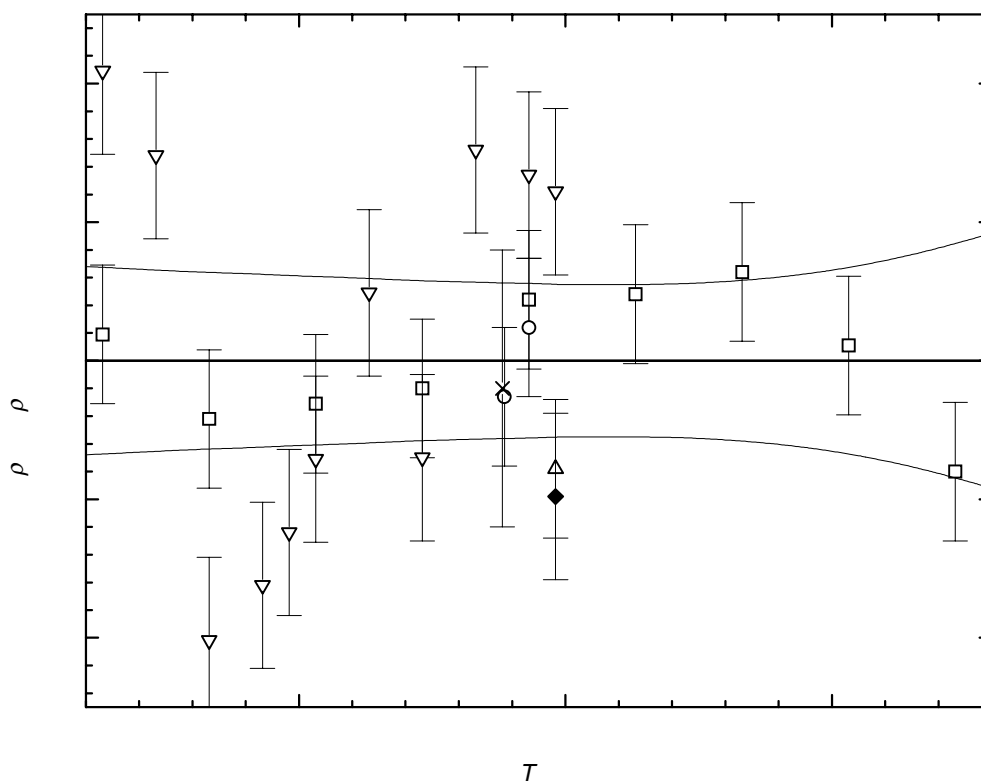
2-Propanamine (cont.)

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-Butanamine

[109-73-9]

 $\text{C}_4\text{H}_{11}\text{N}$

MW = 73.14

531

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 1.5085$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 3.3699 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 213.15 to 433.15 K
	$\rho = A + BT + CT^2 + DT^3 + \dots$
A	$9.46481 \cdot 10^2$
B	$-4.67815 \cdot 10^{-1}$
C	$-7.65944 \cdot 10^{-4}$

cont.

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref. (Symbol in Fig. 1)	T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref. (Symbol in Fig. 1)
293.15	741.40 ± 0.60	-2.12	1948-vog-4(◆)	373.15	667.10 ± 0.50	1.83	1959-cos/bow(▽)
315.25	722.20 ± 0.60	-0.68	1948-vog-4(◆)	393.15	646.50 ± 0.50	2.33	1959-cos/bow(▽)
335.15	702.00 ± 0.60	-1.66	1948-vog-4(◆)	413.15	623.20 ± 0.50	0.74	1959-cos/bow(▽)
213.15	814.40 ± 0.50	2.43	1959-cos/bow(▽)	433.15	597.10 ± 0.50	-3.04	1959-cos/bow(▽)
233.15	793.70 ± 0.50	-2.07	1959-cos/bow(▽)	293.15	743.90 ± 0.40	0.38	1977-rat/sal(□)
253.15	779.80 ± 0.50	0.83	1959-cos/bow(▽)	298.15	736.83 ± 0.40	-2.08	1979-sre/nai(Δ)
273.15	762.00 ± 0.50	0.45	1959-cos/bow(▽)	303.15	734.62 ± 0.40	0.35	1979-sre/nai(Δ)
293.15	744.00 ± 0.50	0.48	1959-cos/bow(▽)	313.15	725.28 ± 0.40	0.41	1979-sre/nai(Δ)
313.15	725.30 ± 0.50	0.43	1959-cos/bow(▽)	298.15	736.83 ± 0.40	-2.08	1979-sre/nai-1(○)
333.15	706.70 ± 0.50	1.08	1959-cos/bow(▽)	303.15	734.62 ± 0.40	0.35	1979-sre/nai-1(○)
353.15	687.00 ± 0.50	1.25	1959-cos/bow(▽)	313.15	725.28 ± 0.40	0.41	1979-sre/nai-1(○)

Further references: [1871-lie/ros-2, 1872-lin/von-2, 1919-eyk, 1944-fri/har-1, 1947-rog-1, 1949-few/smi, 1950-cur/est, 1952-cow, 1961-bel/shu-1, 1967-nak/shi, 1968-ano, 1970-nak/shi, 1971-let/bay, 1972-let, 1972-let-1, 1972-zhi/amp-1, 1974-dut/mat, 1977-rad/kac, 1978-pat, 1978-sre/nai, 1979-kri/sre, 1981-koh/atr, 1988-ace/pos-1, 1994-pap/pan-1, 1995-osw/pat, 1996-dom/rod].

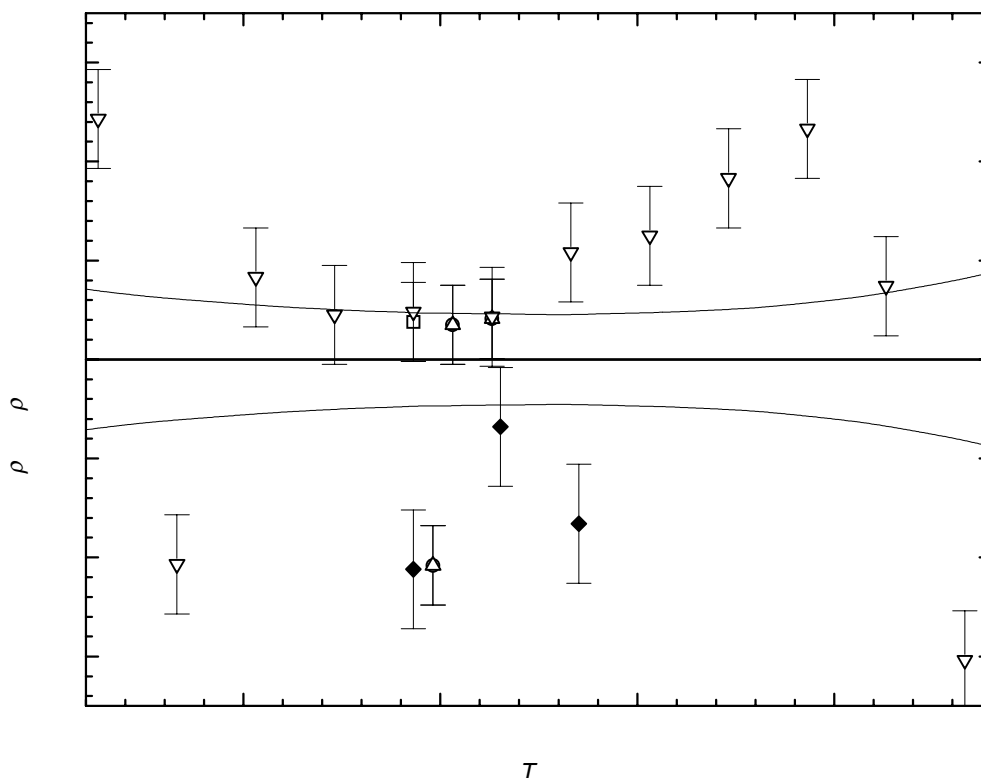


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
210.00	814.46 ± 0.71	293.15	743.52 ± 0.47	370.00	668.53 ± 0.50
220.00	806.49 ± 0.66	298.15	738.91 ± 0.47	380.00	658.11 ± 0.52
230.00	798.37 ± 0.62	300.00	737.20 ± 0.47	390.00	647.53 ± 0.56
240.00	790.09 ± 0.59	310.00	727.85 ± 0.46	400.00	636.80 ± 0.60
250.00	781.66 ± 0.56	320.00	718.35 ± 0.46	410.00	625.92 ± 0.65
260.00	773.07 ± 0.53	330.00	708.69 ± 0.45	420.00	614.89 ± 0.72
270.00	764.33 ± 0.51	340.00	698.88 ± 0.46	430.00	603.70 ± 0.79
280.00	755.44 ± 0.49	350.00	688.92 ± 0.47	440.00	592.36 ± 0.88
290.00	746.40 ± 0.48	360.00	678.80 ± 0.48		

2-Butanamine

[13952-84-6]

 $\text{C}_4\text{H}_{11}\text{N}$

MW = 73.14

532

Table 1. Fit with estimated B coefficient for 7 accepted points. Deviation $\sigma_w = 0.701$.

Coefficient	$\rho = A + BT$
A	1006.46
B	-0.960

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.
289.85	727.1 ± 1.0	-1.10	1895-bru-1	293.15	724.6 ± 0.6	-0.43	1948-vog-4
293.15	723.8 ± 1.0	-1.23	1895-bru-1	314.15	705.1 ± 0.6	0.23	1948-vog-4
293.15	725.0 ± 1.0	-0.03	1903-tho	293.15	722.5 ± 2.0	-2.53	1954-nor/hau ¹⁾
286.65	733.3 ± 2.0	2.03	1919-eyk ¹⁾	293.15	725.3 ± 1.0	0.27	1978-pat
288.15	730.8 ± 0.6	0.97	1930-nat-1				

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
280.00	737.7 ± 1.9
290.00	728.1 ± 1.1
293.15	725.0 ± 1.0
298.15	720.2 ± 0.9
310.00	708.9 ± 1.6
320.00	699.3 ± 2.5

2-Methyl-1-propanamine**[78-81-9]****C₄H₁₁N****MW = 73.14****533**

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 8.6235 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.7881 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 213.15 to 433.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$9.25054 \cdot 10^2$
B	$-3.60951 \cdot 10^{-1}$
C	$-9.93331 \cdot 10^{-4}$

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)
340.85	686.50 ± 0.60	-0.12	1886-sch(Δ)	213.15	804.20 ± 0.50	1.21	1959-cos/bow(\square)
290.15	735.90 ± 0.50	-0.80	1895-bru-1(∇)	233.15	787.20 ± 0.50	0.30	1959-cos/bow(\square)
290.15	735.90 ± 0.50	-0.80	1895-bru-1(∇)	253.15	769.40 ± 0.50	-0.62	1959-cos/bow(\square)
293.15	732.90 ± 0.50	-0.98	1895-bru-1(∇)	273.15	751.30 ± 0.50	-1.05	1959-cos/bow(\square)
293.15	732.90 ± 0.50	-0.98	1895-bru-1(∇)	293.15	733.00 ± 0.50	-0.88	1959-cos/bow(\square)
292.85	734.90 ± 0.60	0.74	1948-vog-4(\circ)	313.15	713.60 ± 0.50	-1.01	1959-cos/bow(\square)
293.15	734.60 ± 0.60	0.72	1948-vog-4(\circ)	333.15	694.20 ± 0.50	-0.35	1959-cos/bow(\square)
297.65	730.20 ± 0.60	0.59	1948-vog-4(\circ)	353.15	674.30 ± 0.50	0.60	1959-cos/bow(\square)
298.65	729.00 ± 0.60	0.34	1948-vog-4(\circ)	373.15	653.50 ± 0.50	1.45	1959-cos/bow(\square)
313.85	714.30 ± 0.60	0.38	1948-vog-4(\circ)	393.15	630.80 ± 0.50	1.19	1959-cos/bow(\square)
314.55	713.60 ± 0.60	0.36	1948-vog-4(\circ)	413.15	606.40 ± 0.50	0.03	1959-cos/bow(\square)
333.25	695.20 ± 0.60	0.75	1948-vog-4(\circ)	433.15	580.50 ± 0.50	-1.84	1959-cos/bow(\square)
334.35	694.10 ± 0.60	0.77	1948-vog-4(\circ)				

Further references: [1889-gla/per, 1889-per, 1919-eyk, 1970-goo/moo, 1977-rad/kac, 1978-pat].

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

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
210.00	805.45 ± 0.69	293.15	733.88 ± 0.55	370.00	655.52 ± 0.54
220.00	797.57 ± 0.67	298.15	729.14 ± 0.54	380.00	644.46 ± 0.56
230.00	789.49 ± 0.64	300.00	727.37 ± 0.54	390.00	633.20 ± 0.59
240.00	781.21 ± 0.62	310.00	717.70 ± 0.53	400.00	621.74 ± 0.62
250.00	772.73 ± 0.61	320.00	707.83 ± 0.53	410.00	610.09 ± 0.67
260.00	764.06 ± 0.59	330.00	697.77 ± 0.52	420.00	598.23 ± 0.72
270.00	755.18 ± 0.58	340.00	687.50 ± 0.52	430.00	586.18 ± 0.79
280.00	746.11 ± 0.56	350.00	677.04 ± 0.52	440.00	573.93 ± 0.87
290.00	736.84 ± 0.55	360.00	666.38 ± 0.53		

cont.

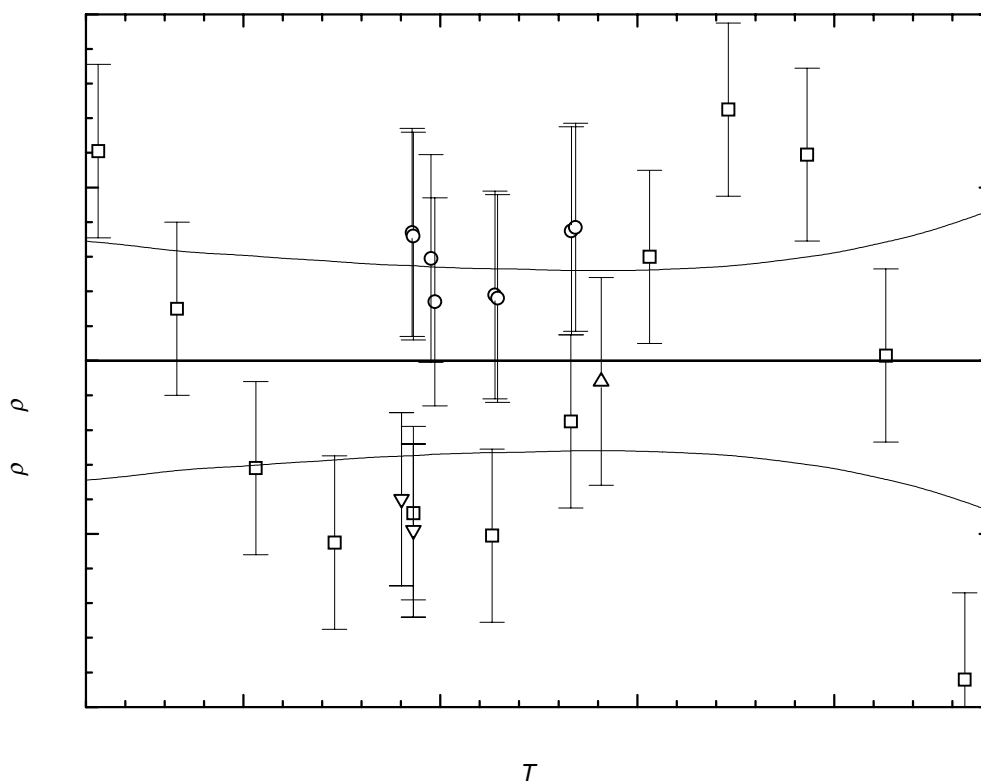
2-Methyl-1-propanamine (cont.)

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-Methyl-2-propanamine

[75-64-9]

 $\text{C}_4\text{H}_{11}\text{N}$

MW = 73.14

534

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 5.3402 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.7644 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 273.15 to 303.15 K
	$\rho = A + BT + CT^2 + DT^3 + \dots$
A	$6.22509 \cdot 10^2$
B	1.57779
C	$-4.53190 \cdot 10^{-3}$

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)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
291.15	697.80 ± 0.60	0.08	1897-bru(▽)	303.15	684.31 ± 0.40	-0.03	1973-oti/gra(□)
293.15	695.80 ± 0.60	0.22	1897-bru(▽)	293.15	695.20 ± 0.40	-0.38	1978-pat(◆)
293.15	695.10 ± 0.60	-0.48	1946-bro/jon(○)	273.15	715.50 ± 0.60	0.15	1978-whi/cyv(Δ)
293.15	696.49 ± 0.40	0.91	1973-oti/gra(□)	288.15	700.40 ± 0.60	-0.46	1978-whi/cyv(Δ)

Further references: [1949-few/smi, 1961-ano-7, 1965-kri/man, 1977-rad/kac].

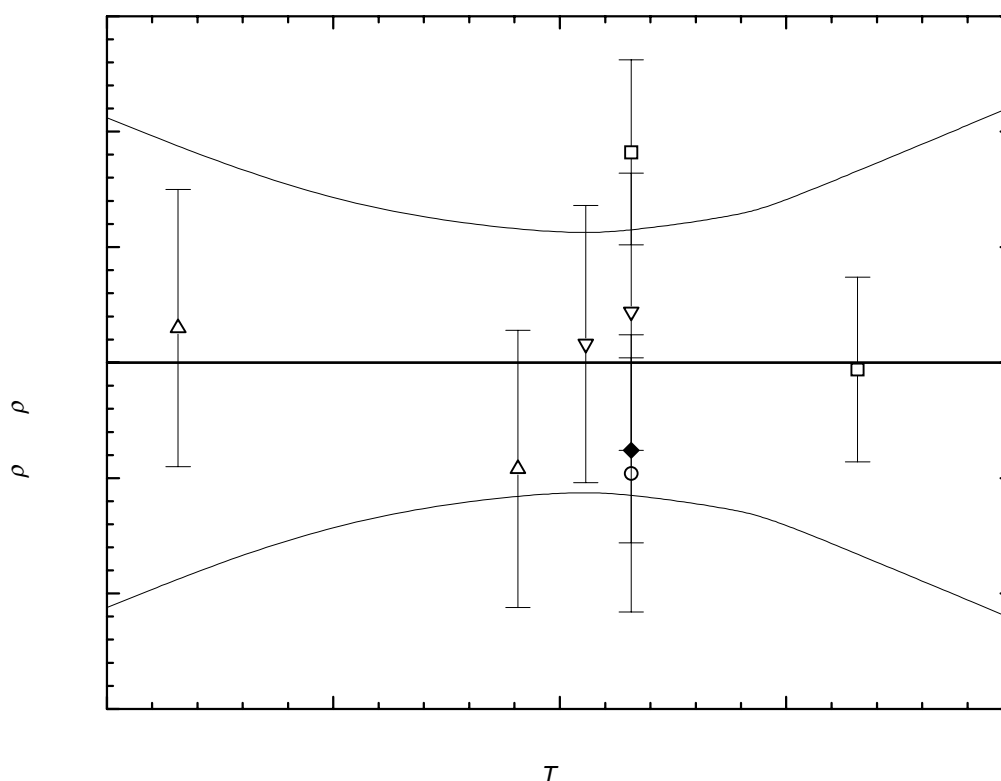


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the 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	718.14 ± 1.06	293.15	695.58 ± 0.57	310.00	676.11 ± 1.11
280.00	708.99 ± 0.67	298.15	690.07 ± 0.64		
290.00	698.94 ± 0.55	300.00	687.98 ± 0.70		

2-Methyl-1-butanamine [96-15-1] $\text{C}_5\text{H}_{13}\text{N}$ MW = 87.16 535

Table 1. Fit with estimated B coefficient for 3 accepted points. Deviation $\sigma_w = 0.309$.

Coefficient	$\rho = A + BT$
A	992.38
B	-0.820

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	767.8 ± 1.0	-0.60	1881-pli	290.65	754.2 ± 0.6	0.15	1907-ehr
295.69	750.1 ± 1.0	0.18	1881-pli	291.15	755.0 ± 2.0	1.36	1908-har/sik ¹⁾
298.15	750.5 ± 2.0	2.60	1904-mar-1 ¹⁾	358.15	692.6 ± 2.0	-6.10	1908-har/sik 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	771.0 ± 1.9
280.00	762.8 ± 0.9
290.00	754.6 ± 0.5
293.15	752.0 ± 0.7
298.15	747.9 ± 1.1

(R)-2-Methyl-1-butanamine [36272-22-7] $\text{C}_5\text{H}_{13}\text{N}$ MW = 87.16 536

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	787.8 ± 1.0	1881-pli

3-Methyl-1-butanamine [107-85-7] $\text{C}_5\text{H}_{13}\text{N}$ MW = 87.16 537

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

$\sigma_{c,w} = 6.6967 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.7454 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 291.05 \text{ to } 359.95 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$9.61011 \cdot 10^2$
B	$-5.65192 \cdot 10^{-1}$
C	$-5.31789 \cdot 10^{-4}$

cont.

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref. (Symbol in Fig. 1)	T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref. (Symbol in Fig. 1)
291.05	751.40 ± 0.50	-0.06	1895-bru-1(○)	298.45	744.50 ± 0.60	-0.46	1948-vog-4(Δ)
293.15	749.30 ± 0.50	-0.32	1895-bru-1(○)	302.55	740.30 ± 0.60	-1.03	1948-vog-4(Δ)
298.15	744.30 ± 0.50	-0.93	1895-bru-1(○)	314.05	731.50 ± 0.60	0.44	1948-vog-4(Δ)
293.15	750.50 ± 0.40	0.88	1910-tur/mer(□)	316.25	729.60 ± 0.60	0.52	1948-vog-4(Δ)
303.15	741.70 ± 0.40	0.90	1910-tur/mer(□)	334.55	712.90 ± 0.60	0.49	1948-vog-4(Δ)
318.15	727.70 ± 0.40	0.33	1910-tur/mer(□)	335.15	712.20 ± 0.60	0.35	1948-vog-4(Δ)
333.15	712.80 ± 0.40	-0.89	1910-tur/mer(□)	359.95	689.00 ± 0.60	0.33	1948-vog-4(Δ)
293.15	749.10 ± 0.60	-0.52	1948-vog-4(Δ)				

Further references: [1867-wur-1].

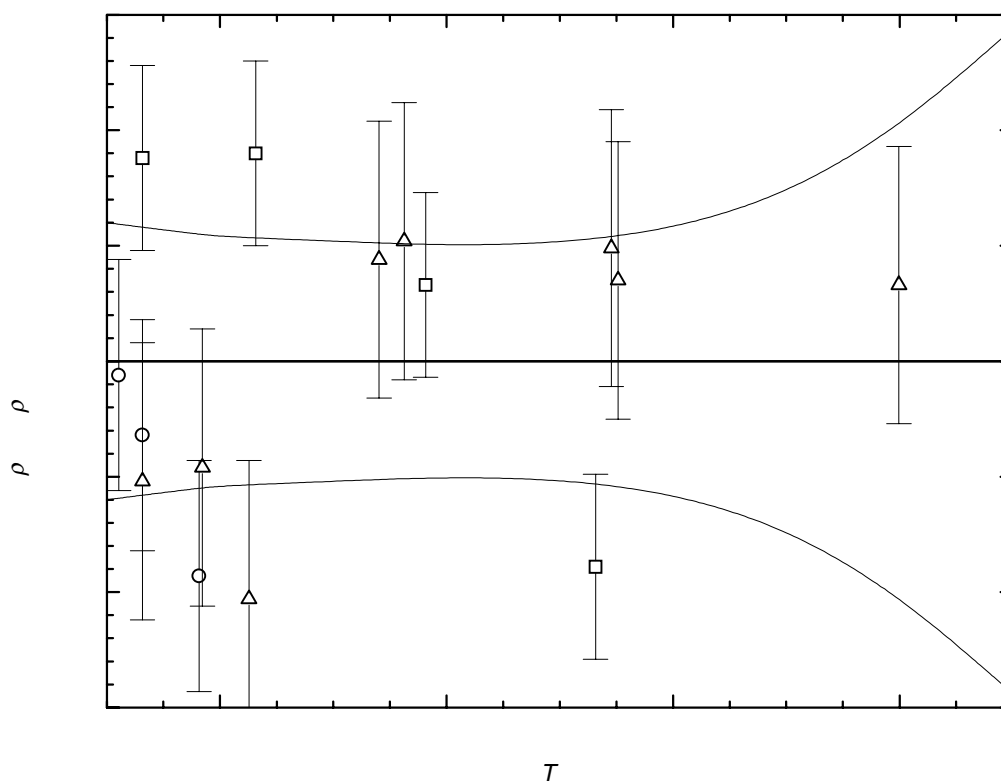


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

cont.

3-Methyl-1-butanamine (cont.)**Table 3.** Recommended values (fit to the reliable experimental values according to the equations

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	752.38 \pm 0.60	310.00	734.70 \pm 0.52	350.00	698.05 \pm 0.72
293.15	749.62 \pm 0.58	320.00	725.69 \pm 0.50	360.00	688.62 \pm 1.01
298.15	745.23 \pm 0.55	330.00	716.59 \pm 0.51	370.00	679.09 \pm 1.44
300.00	743.59 \pm 0.54	340.00	707.37 \pm 0.57		

1-Pentanamine**[110-58-7]****C₅H₁₃N****MW = 87.16****538****Table 1.** Coefficients of the polynomial expansion equation. Standard deviations (see introduction):

$\sigma_{c,w} = 7.4048 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.7295 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 213.15 to 433.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$9.68225 \cdot 10^2$
B	$-5.87016 \cdot 10^{-1}$
C	$-4.79919 \cdot 10^{-4}$

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)
298.15	750.50 \pm 0.60	-0.04	1904-mar-1(Δ)	253.15	788.80 \pm 0.50	-0.07	1959-cos/bow(\square)
293.15	754.40 \pm 0.60	-0.50	1948-vog-4(\circ)	273.15	771.70 \pm 0.50	-0.37	1959-cos/bow(\square)
293.25	754.30 \pm 0.60	-0.51	1948-vog-4(\circ)	293.15	754.70 \pm 0.50	-0.20	1959-cos/bow(\square)
295.55	752.40 \pm 0.60	-0.41	1948-vog-4(\circ)	313.15	737.40 \pm 0.50	0.06	1959-cos/bow(\square)
315.15	734.30 \pm 0.60	-1.26	1948-vog-4(\circ)	333.15	719.90 \pm 0.50	0.51	1959-cos/bow(\square)
315.25	734.20 \pm 0.60	-1.27	1948-vog-4(\circ)	353.15	701.80 \pm 0.50	0.73	1959-cos/bow(\square)
335.45	717.00 \pm 0.60	-0.31	1948-vog-4(\circ)	373.15	683.20 \pm 0.50	0.84	1959-cos/bow(\square)
336.65	715.90 \pm 0.60	-0.31	1948-vog-4(\circ)	393.15	664.30 \pm 0.50	1.04	1959-cos/bow(\square)
359.15	696.60 \pm 0.60	1.11	1948-vog-4(\circ)	413.15	644.20 \pm 0.50	0.42	1959-cos/bow(\square)
360.25	695.60 \pm 0.60	1.13	1948-vog-4(\circ)	433.15	622.20 \pm 0.50	-1.72	1959-cos/bow(\square)
213.15	822.00 \pm 0.50	0.70	1959-cos/bow(\square)	453.15	598.30 \pm 0.50	-5.37	1959-cos/bow ¹⁾
233.15	805.70 \pm 0.50	0.43	1959-cos/bow(\square)				

¹⁾ Not included in Fig. 1.**Further references:** [1850-wur, 1867-sil-1, 1886-sch, 1972-zhi/amp].

cont.

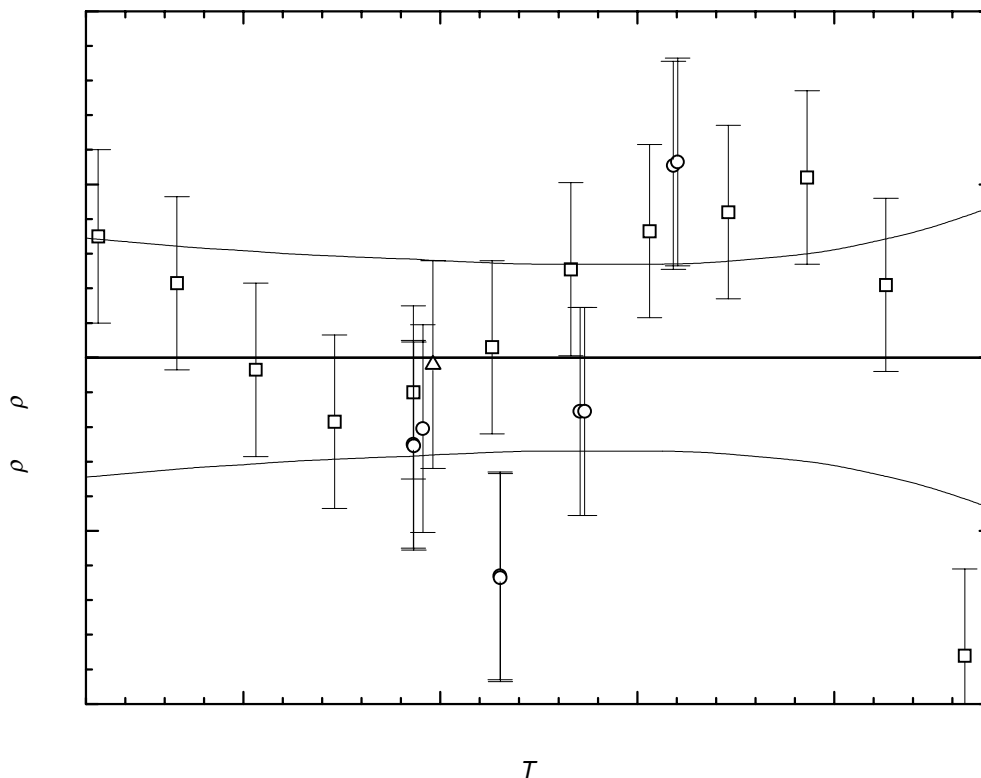


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
210.00	823.79 ± 0.69	293.15	754.90 ± 0.57	370.00	685.33 ± 0.55
220.00	815.85 ± 0.67	298.15	750.54 ± 0.56	380.00	675.86 ± 0.57
230.00	807.82 ± 0.65	300.00	748.93 ± 0.56	390.00	666.29 ± 0.59
240.00	799.70 ± 0.63	310.00	740.13 ± 0.55	400.00	656.63 ± 0.62
250.00	791.48 ± 0.62	320.00	731.24 ± 0.54	410.00	646.87 ± 0.67
260.00	783.16 ± 0.60	330.00	722.25 ± 0.54	420.00	637.02 ± 0.72
270.00	774.74 ± 0.59	340.00	713.16 ± 0.54	430.00	627.07 ± 0.79
280.00	766.23 ± 0.58	350.00	703.98 ± 0.54	440.00	617.03 ± 0.87
290.00	757.63 ± 0.57	360.00	694.70 ± 0.54		

3-Pentylamine

[616-24-0]



MW = 87.16

539

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.
291.35	711.3 ± 0.5	1919-eyk

1-Hexanamine

[111-26-2]



MW = 101.19

540

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

$\sigma_{\text{c,w}} = 8.8645 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 2.0774 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 253.15 \text{ to } 493.15 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$9.34157 \cdot 10^2$
B	$-3.54735 \cdot 10^{-1}$
C	$-7.53116 \cdot 10^{-4}$

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)
293.15	766.00 ± 0.60	0.55	1948-vog-4(×)	373.15	696.40 ± 0.50	-0.52	1959-cos/bow(○)
314.45	748.10 ± 0.60	-0.04	1948-vog-4(×)	393.15	678.40 ± 0.50	0.11	1959-cos/bow(○)
333.75	732.20 ± 0.60	0.32	1948-vog-4(×)	413.15	659.60 ± 0.50	0.55	1959-cos/bow(○)
358.75	710.60 ± 0.60	0.63	1948-vog-4(×)	433.15	640.40 ± 0.50	1.20	1959-cos/bow(○)
293.15	764.30 ± 0.60	-1.15	1955-ano-3(Δ)	453.15	620.00 ± 0.50	1.24	1959-cos/bow(○)
253.15	797.00 ± 0.50	0.91	1959-cos/bow(○)	473.15	598.00 ± 0.50	0.29	1959-cos/bow(○)
273.15	781.00 ± 0.50	-0.07	1959-cos/bow(○)	493.15	574.20 ± 0.50	-1.86	1959-cos/bow(○)
293.15	764.90 ± 0.50	-0.55	1959-cos/bow(○)	293.15	766.00 ± 0.60	0.55	1968-ano(◆)
313.15	748.10 ± 0.50	-1.12	1959-cos/bow(○)	298.15	762.99 ± 0.60	1.54	1977-bel/bub(∇)
333.15	731.00 ± 0.50	-1.39	1959-cos/bow(○)	298.15	761.20 ± 0.40	-0.25	1995-osw/pat(□)
353.15	714.00 ± 0.50	-0.96	1959-cos/bow(○)				

Further references: [1917-jae].**Table 3.** Recommended values (fit to the reliable experimental values according to the equations

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
250.00	798.40 ± 0.66	290.00	767.95 ± 0.59	310.00	751.81 ± 0.56
260.00	791.02 ± 0.64	293.15	765.45 ± 0.58	320.00	743.52 ± 0.55
270.00	783.48 ± 0.62	298.15	761.45 ± 0.58	330.00	735.08 ± 0.54
280.00	775.79 ± 0.60	300.00	759.96 ± 0.57	340.00	726.49 ± 0.53

cont.

Table 3. (cont.)

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
350.00	717.74 ± 0.52	410.00	662.12 ± 0.49	470.00	601.07 ± 0.65
360.00	708.85 ± 0.51	420.00	652.32 ± 0.49	480.00	590.37 ± 0.71
370.00	699.80 ± 0.50	430.00	642.37 ± 0.51	490.00	579.51 ± 0.79
380.00	690.61 ± 0.49	440.00	632.27 ± 0.53	500.00	568.51 ± 0.88
390.00	681.26 ± 0.49	450.00	622.02 ± 0.56		
400.00	671.76 ± 0.48	460.00	611.62 ± 0.60		

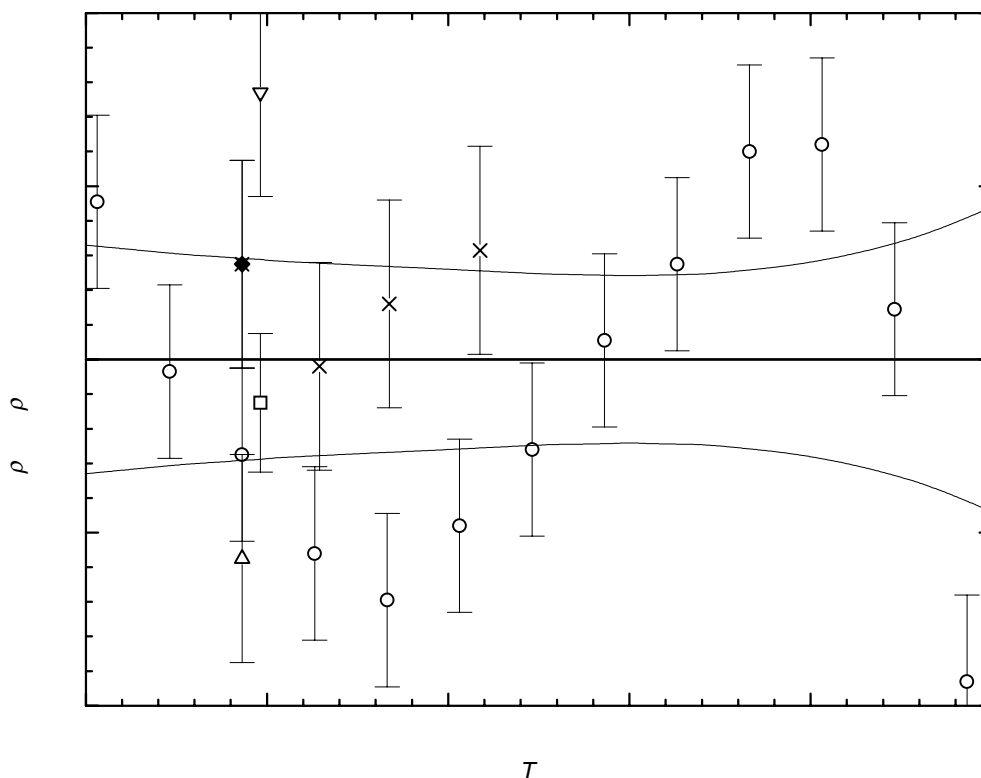


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

d*-3-Methylpentylamine*[500044-60-0]****C₆H₁₅N****MW = 101.19****541****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	767.0 ± 2.0	1931-lev/mar-5

4-Methyl-2-pentanamine [108-09-8] $\text{C}_6\text{H}_{15}\text{N}$ MW = 101.19 542

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	748.2 ± 0.4	1954-ano-12

2,2-Dimethyl-3-pentanamine [500041-20-3] $\text{C}_7\text{H}_{17}\text{N}$ MW = 115.22 543

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
298.15	761.5 ± 0.8	1953-mos/cox

2,4-Dimethyl-2-pentanamine [64379-30-2] $\text{C}_7\text{H}_{17}\text{N}$ MW = 115.22 544

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

Coefficient	$\rho = A + BT$
A	1018.10
B	-0.840

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.
293.15	771.9 ± 2.0	0.05	1909-kho
273.15	788.6 ± 2.0	-0.05	1909-kho

Table 3. Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$
270.00	791.3 ± 2.2
280.00	782.9 ± 1.8
290.00	774.5 ± 1.9
293.15	771.9 ± 2.0
298.15	767.7 ± 2.3

2,4-Dimethyl-3-pentanamine [4083-57-2] $\text{C}_7\text{H}_{17}\text{N}$ MW = 115.22 545

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	788.2 ± 1.0	1955-bal/vas

1-Heptanamine**[111-68-2]****C₇H₁₇N****MW = 115.22****546**

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 4.9550 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.7518 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 293.15 to 357.85 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.00498 \cdot 10^3$
B	$-7.83738 \cdot 10^{-1}$

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)
299.65	768.90 ± 0.60	-1.24	1893-eyk-1(□)	332.65	744.30 ± 0.60	0.03	1948-vog-4(○)
293.15	775.40 ± 0.60	0.17	1948-vog-4(○)	357.85	724.40 ± 0.60	-0.12	1948-vog-4(○)
293.15	775.40 ± 0.60	0.17	1948-vog-4(○)	357.85	724.40 ± 0.60	-0.12	1948-vog-4(×)
313.15	760.10 ± 0.60	0.54	1948-vog-4(○)				

Further references: [1919-eyk].

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	777.70 ± 0.77	310.00	762.02 ± 0.60	350.00	730.68 ± 0.66
293.15	775.23 ± 0.75	320.00	754.19 ± 0.52	360.00	722.84 ± 0.90
298.15	771.31 ± 0.71	330.00	746.35 ± 0.49	370.00	715.00 ± 1.27
300.00	769.86 ± 0.69	340.00	738.51 ± 0.53		

cont.

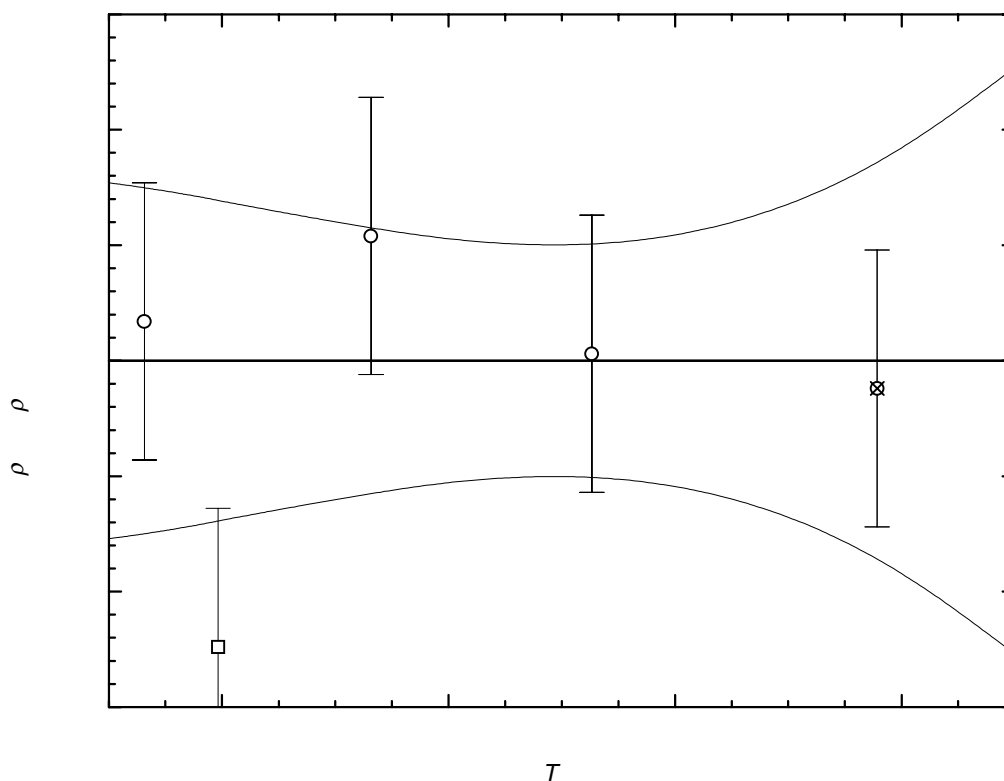
1-Heptanamine (cont.)

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-Heptanamine

[123-82-0]

 $C_7H_{17}N$

MW = 115.22

547

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	762.9 ± 1.0	1954-nor/hau

***l*-3-Methyl-1-hexanamine**

[500044-61-1]

 $C_7H_{17}N$

MW = 115.22

548

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.
299.15	772.0 ± 2.0	1931-lev/mar-5

***l*-3-Methyl-1-heptanamine** [500044-62-2] C₈H₁₉N MW = 129.25 549

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.
297.15	782.0 ± 2.0	1931-lev/mar-5

1-Octanamine [111-86-4] C₈H₁₉N MW = 129.25 550

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.
299.95	776.9 ± 1.0	1893-eyk-1 ¹⁾
293.15	781.9 ± 0.6	1948-vog-4 ¹⁾
298.15	796.2 ± 3.0	1996-ste/chi-2 ¹⁾
630.60	358.0 ± 3.0	1996-ste/chi-2 ¹⁾
640.30	282.5 ± 5.0	1996-ste/chi-2 ¹⁾
298.15	779.3 ± 0.4	1995-osw/pat
298.15	779.3 ± 0.4	Recommended

¹⁾ Not included in calculation of recommended value.

2,6-Dimethyl-4-heptanamine [500044-70-2] C₉H₂₁N MW = 143.27 551

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	771.9 ± 2.0	1954-nor/hau

***l*-3-Methyl-1-octanamine** [500044-63-3] C₉H₂₁N MW = 143.27 552

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.
297.15	788.0 ± 2.0	1931-lev/mar-5

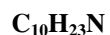
2-Propyl-1-hexanamine [500003-36-1] C₉H₂₁N MW = 143.27 553

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	789.2 ± 0.5	1934-wal/mce

1-Decanamine

[2016-57-1]



MW = 157.3

554

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	789.0 ± 0.4	1977-bel/bub

1-Dodecanamine

[124-22-1]



MW = 185.35

555

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

$\sigma_{\text{c,w}} = 2.2687 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 6.9273 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	$T = 298.15 \text{ to } 573.15 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$9.67871 \cdot 10^2$
B	$-4.80752 \cdot 10^{-1}$
C	$-3.38826 \cdot 10^{-4}$

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)
313.15	784.10 ± 0.50	0.00	1959-cos/bow(□)	473.15	664.80 ± 0.50	0.25	1959-cos/bow(□)
333.15	769.90 ± 0.50	-0.20	1959-cos/bow(□)	493.15	648.20 ± 0.50	-0.19	1959-cos/bow(□)
353.15	755.40 ± 0.50	-0.44	1959-cos/bow(□)	513.15	632.20 ± 0.50	0.25	1959-cos/bow(□)
373.15	741.30 ± 0.50	-0.00	1959-cos/bow(□)	533.15	615.60 ± 0.50	0.35	1959-cos/bow(□)
393.15	726.50 ± 0.50	0.01	1959-cos/bow(□)	553.15	598.50 ± 0.50	0.23	1959-cos/bow(□)
413.15	711.50 ± 0.50	0.09	1959-cos/bow(□)	573.15	580.50 ± 0.50	-0.52	1959-cos/bow(□)
433.15	696.00 ± 0.50	-0.06	1959-cos/bow(□)	298.15	794.70 ± 0.40	0.28	1995-osw/pat(O)
453.15	680.40 ± 0.50	-0.04	1959-cos/bow(□)				

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	799.96 ± 0.60	350.00	758.10 ± 0.55	430.00	698.50 ± 0.48
293.15	797.82 ± 0.60	360.00	750.89 ± 0.54	440.00	690.74 ± 0.48
298.15	794.42 ± 0.59	370.00	743.61 ± 0.53	450.00	682.92 ± 0.47
300.00	793.15 ± 0.59	380.00	736.26 ± 0.53	460.00	675.03 ± 0.47
310.00	786.28 ± 0.58	390.00	728.84 ± 0.52	470.00	667.07 ± 0.47
320.00	779.34 ± 0.57	400.00	721.36 ± 0.51	480.00	659.05 ± 0.47
330.00	772.33 ± 0.56	410.00	713.81 ± 0.50	490.00	650.95 ± 0.47
340.00	765.25 ± 0.56	420.00	706.19 ± 0.49	500.00	642.79 ± 0.48

cont.

Table 3. (cont.)

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
510.00	634.56 ± 0.50	540.00	609.46 ± 0.60	570.00	583.76 ± 0.78
520.00	626.26 ± 0.53	550.00	600.96 ± 0.65	580.00	575.05 ± 0.86
530.00	617.90 ± 0.56	560.00	592.39 ± 0.71		

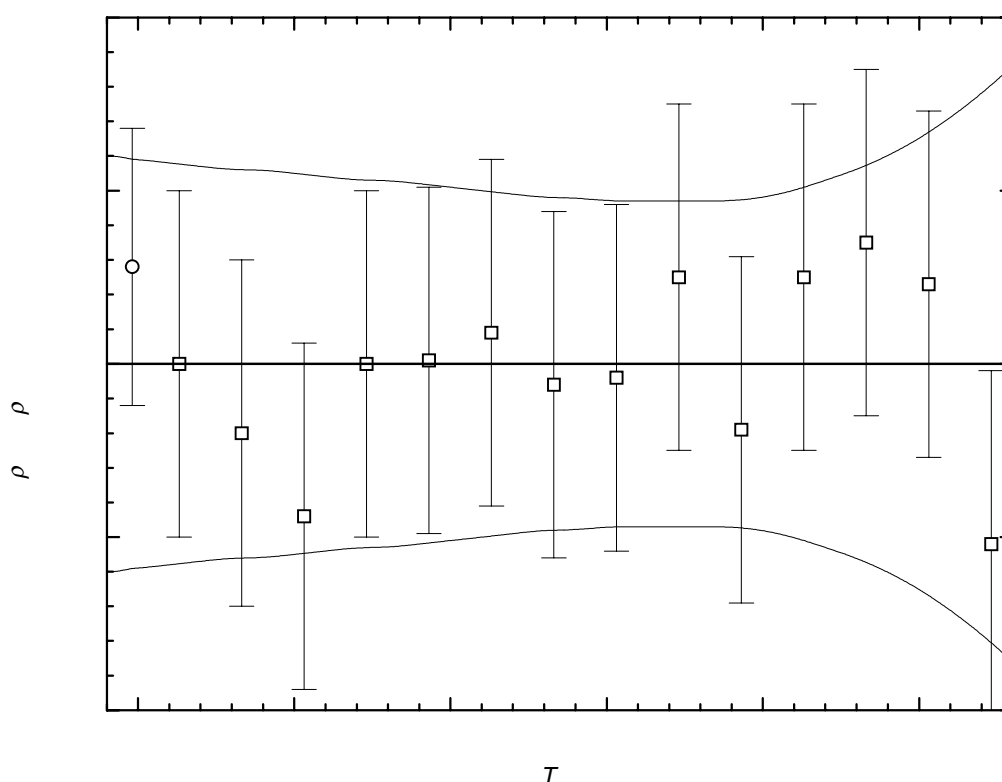


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

2-Butyl-2-propyl-1-hexanamine**[500003-37-2]****C₁₃H₂₉N****MW = 199.38****556****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	816.9 ± 0.5	1934-wal/mce

1-Tridecanamine [2869-34-3] $C_{13}H_{29}N$ MW = 199.38 557

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
298.15	818.0 ± 0.6	1963-sud/phr

1-Hexadecanamine [143-27-1] $C_{16}H_{35}N$ MW = 241.46 558

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

$\sigma_{\text{c,w}} = 4.2708 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 1.3935 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 333.15 \text{ to } 553.15 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$9.78618 \cdot 10^2$
B	$-5.20713 \cdot 10^{-1}$
C	$-2.12224 \cdot 10^{-4}$

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref. (Symbol in Fig. 1)	T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref. (Symbol in Fig. 1)
333.15	782.10 ± 0.50	0.51	1959-cos/bow(□)	473.15	685.10 ± 0.50	0.37	1959-cos/bow(□)
353.15	768.40 ± 0.50	0.14	1959-cos/bow(□)	493.15	671.00 ± 0.50	0.78	1959-cos/bow(□)
373.15	754.40 ± 0.50	-0.36	1959-cos/bow(□)	513.15	656.00 ± 0.50	0.47	1959-cos/bow(□)
393.15	740.70 ± 0.50	-0.40	1959-cos/bow(□)	533.15	640.50 ± 0.50	-0.17	1959-cos/bow(□)
413.15	726.90 ± 0.50	-0.36	1959-cos/bow(□)	553.15	624.90 ± 0.60	-0.75	1959-cos/bow(□)
433.15	713.00 ± 0.50	-0.25	1959-cos/bow(□)	573.15	607.50 ± 0.60	-2.96	1959-cos/bow ¹⁾
453.15	699.10 ± 0.50	0.02	1959-cos/bow(□)				

¹⁾ Not included in Fig. 1.

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

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

T K	$\rho \pm \sigma_{\text{fit}}$ $\text{kg} \cdot \text{m}^{-3}$	T K	$\rho \pm \sigma_{\text{fit}}$ $\text{kg} \cdot \text{m}^{-3}$	T K	$\rho \pm \sigma_{\text{fit}}$ $\text{kg} \cdot \text{m}^{-3}$
330.00	783.67 ± 0.70	410.00	729.45 ± 0.51	490.00	672.51 ± 0.48
340.00	777.04 ± 0.67	420.00	722.48 ± 0.50	500.00	665.20 ± 0.50
350.00	770.37 ± 0.64	430.00	715.47 ± 0.48	510.00	657.85 ± 0.54
360.00	763.66 ± 0.61	440.00	708.42 ± 0.47	520.00	650.46 ± 0.60
370.00	756.90 ± 0.59	450.00	701.32 ± 0.46	530.00	643.03 ± 0.67
380.00	750.10 ± 0.56	460.00	694.18 ± 0.46	540.00	635.55 ± 0.76
390.00	743.26 ± 0.54	470.00	687.00 ± 0.45	550.00	628.03 ± 0.87
400.00	736.38 ± 0.53	480.00	679.78 ± 0.46	560.00	620.46 ± 0.99

cont.

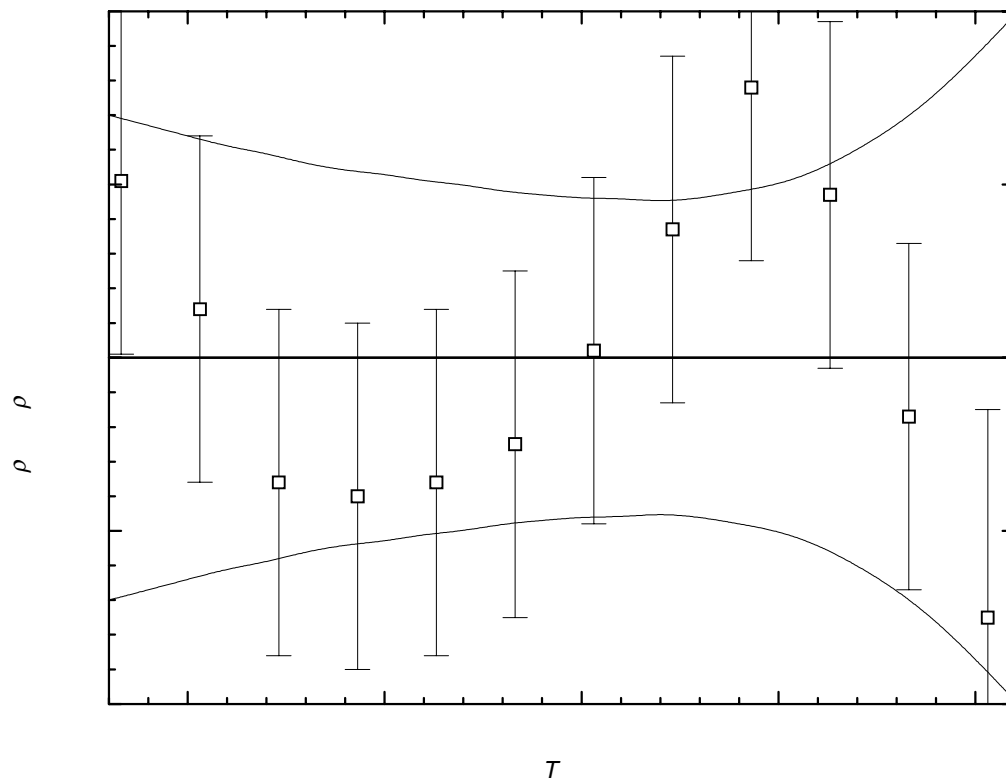


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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