

4.1.3 Saturated Ketones, C₉ - C₁₁

2,2-Dimethyl-3-heptanone [19078-97-8] C₉H₁₈O MW = 142.24 210

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	816.8 ± 1.0	1960-pet/sok

2,2-Dimethyl-4-heptanone [1762-19-2] C₉H₁₈O MW = 142.24 211

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	809.0 ± 2.0	1957-luf-1

2,6-Dimethyl-3-heptanone [19549-83-8] C₉H₁₈O MW = 142.24 212

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	813.5 ± 1.0	1934-von/man

2,6-Dimethyl-4-heptanone [108-83-8] C₉H₁₈O MW = 142.24 213

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{\text{c,w}} = 5.0777 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 1.4129 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 293.15 to 358.55 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.04883 \cdot 10^3$
B	$-8.26444 \cdot 10^{-1}$

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)
293.15	805.30 ± 0.80	-1.26	1940-cow/jef ¹⁾	358.55	753.30 ± 1.00	0.79	1940-cow/jef(×)
334.45	772.60 ± 0.80	0.17	1940-cow/jef(×)	293.15	805.98 ± 0.60	-0.58	1947-str/gab(Δ)

¹⁾ Not included in Fig. 1.

cont.

2,6-Dimethyl-4-heptanone (cont.)

Table 2. (cont)

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
313.15	789.93 ± 0.60	-0.10	1947-str/gab(Δ)	293.15	806.00 ± 0.60	-0.56	1968-ano(∇)
333.15	773.77 ± 0.60	0.27	1947-str/gab(Δ)	293.15	806.90 ± 0.30	0.34	1970-sel(\square)
293.15	806.20 ± 0.70	-0.36	1955-ano-3(\times)	298.15	802.20 ± 0.30	-0.23	1970-sel(\square)
293.15	806.20 ± 0.60	-0.36	1958-ano-3(\blacklozenge)	293.15	807.18 ± 0.30	0.62	1972-bon/pik(\circ)

Further references: [1914-vav, 1942-ipa/hae, 1953-ano-5, 1954-doo, 1960-ter/kep].

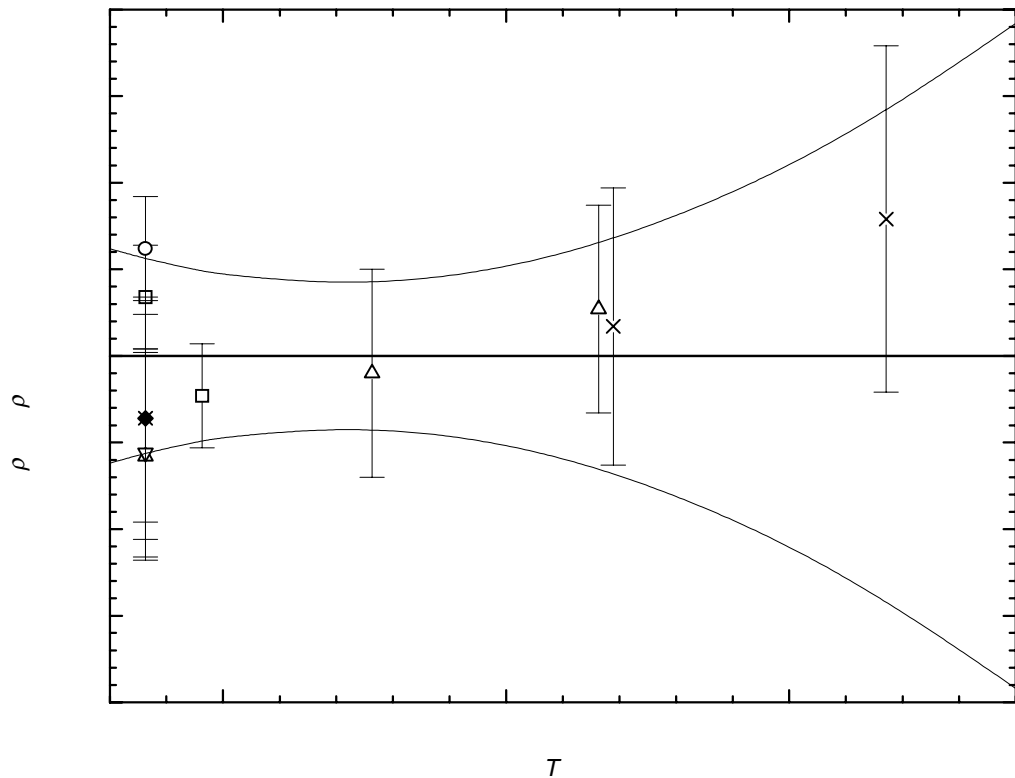


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

cont.

Table 3. Recommended values (fit to the reliable experimental values according to the equations $\rho = A + BT + CT^2 + DT^3 + \dots$ 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	809.16 ± 0.62	310.00	792.63 ± 0.41	350.00	759.58 ± 1.09
293.15	806.56 ± 0.56	320.00	784.37 ± 0.45	360.00	751.31 ± 1.47
298.15	802.43 ± 0.49	330.00	776.11 ± 0.58	370.00	743.05 ± 1.92
300.00	800.90 ± 0.47	340.00	767.84 ± 0.80		

3,5-Dimethyl-4-heptanone [19549-84-9] C₉H₁₈O MW = 142.24 214

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.
287.15	826.0 ± 2.0	1923-vav/iva

4,6-Dimethyl-2-heptanone [19549-80-5] C₉H₁₈O MW = 142.24 215

Table 1. Experimental and recommended values with uncertainties.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
273.15	902.4 ± 5.0	1909-gue ¹⁾
298.15	817.0 ± 2.0	1964-hin/dre
298.15	817.0 ± 2.0	Recommended

¹⁾ Not included in calculation of recommended value.

4,6-Dimethyl-3-heptanone [40239-30-3] C₉H₁₈O MW = 142.24 216

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	820.8 ± 1.0	1944-pow/hag

5,6-Dimethyl-2-heptanone [2867-76-7] C₉H₁₈O MW = 142.24 217

Table 1. Experimental and recommended values with uncertainties.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	833.5 ± 3.0	1911-wal
293.15	824.0 ± 3.0	1911-wal
293.15	828.7 ± 4.5	Recommended

3-Ethyl-2-heptanone [6137-09-3] C₉H₁₈O MW = 142.24 218

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	824.6 ± 2.0	1941-ken/you

2-Methyl-3-octanone [923-28-4] C₉H₁₈O MW = 142.24 219

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.
286.15	824.1 ± 2.0	1912-pic/ken ¹⁾
293.15	821.2 ± 1.0	1914-low
293.15	821.2 ± 1.0	Recommended

¹⁾ Not included in calculation of recommended value.

2-Methyl-4-octanone [7492-38-8] C₉H₁₈O MW = 142.24 220

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	815.0 ± 2.0	1954-dub/luf

3-Methyl-2-octanone [6137-08-2] C₉H₁₈O MW = 142.24 221

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.
300.15	832.0 ± 2.0	1933-pow/mur

3-Methyl-4-octanone [20754-04-5] C₉H₁₈O MW = 142.24 222

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.
287.15	829.0 ± 2.0	1923-vav/iva

4-Methyl-3-octanone [6137-15-1] C₉H₁₈O MW = 142.24 223

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	820.0 ± 2.0	1954-dub/luf-1

6-Methyl-2-octanone [925-69-9] C₉H₁₈O MW = 142.24 224

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	822.0 ± 2.0	1953-sut

7-Methyl-4-octanone [20809-46-5] C₉H₁₈O MW = 142.24 225

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	823.9 ± 0.8	1944-pow/hag

2-Nonanone [821-55-6] C₉H₁₈O MW = 142.24 226

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{\text{c,w}} = 4.2193 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 1.6641 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 273.15 to 358.65 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.05146 \cdot 10^3$
B	$-7.83778 \cdot 10^{-1}$

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)
293.15	821.00 ± 2.00	-0.69	1901-von/hen(X)	293.15	822.70 ± 2.00	1.01	1939-nav(◆)
273.15	837.61 ± 0.50	0.24	1931-def(□)	293.15	820.80 ± 1.00	-0.89	1948-vog-7(V)
288.15	826.03 ± 0.50	0.42	1931-def(□)	313.65	805.90 ± 1.00	0.28	1948-vog-7(V)
303.15	814.38 ± 0.50	0.53	1931-def(□)	333.85	790.10 ± 1.00	0.31	1948-vog-7(V)
288.15	825.34 ± 0.50	-0.27	1936-ceu(O)	358.65	770.50 ± 1.00	0.15	1948-vog-7(V)
303.15	813.25 ± 0.50	-0.60	1936-ceu(O)	298.15	817.30 ± 0.50	-0.47	1988-gar/cob(Δ)

Further references: [1901-tho, 1902-pow/lee, 1906-van, 1952-coo].

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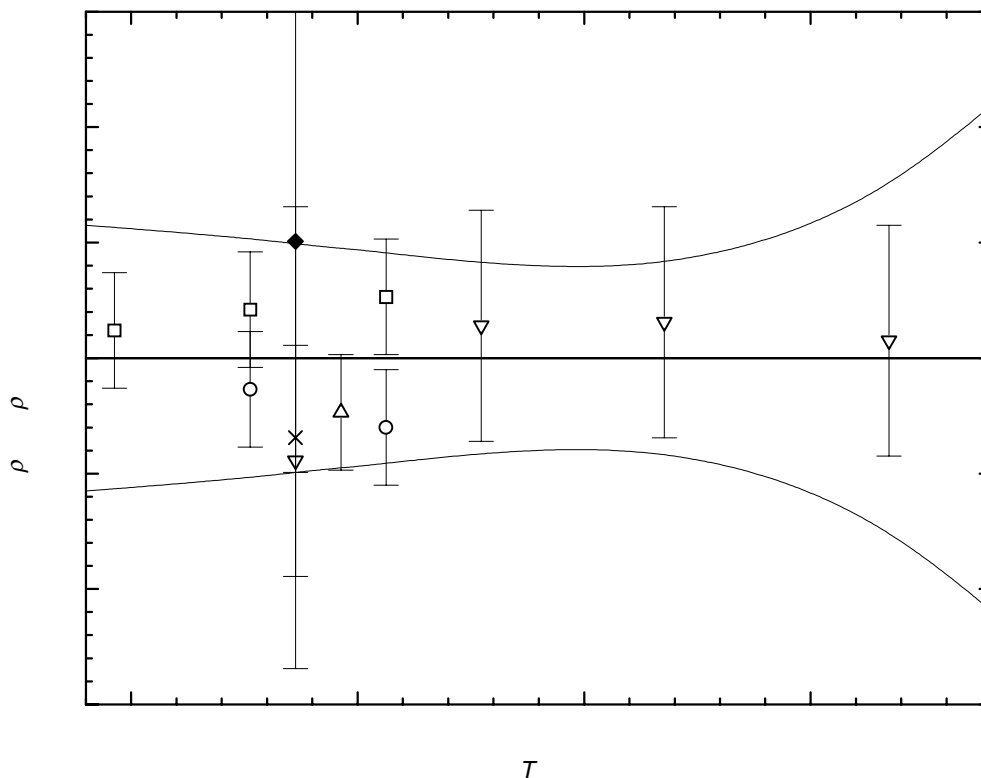
2-Nonanone (cont.)

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	839.84 ± 1.15	300.00	816.32 ± 0.94	350.00	777.13 ± 1.14
280.00	832.00 ± 1.09	310.00	808.48 ± 0.85	360.00	769.30 ± 1.55
290.00	824.16 ± 1.02	320.00	800.65 ± 0.79	370.00	761.46 ± 2.19
293.15	821.69 ± 0.99	330.00	792.81 ± 0.79		
298.15	817.77 ± 0.95	340.00	784.97 ± 0.90		

3-Nonanone**[925-78-0]****C₉H₁₈O****MW = 142.24****227**

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 4.8156 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.7826 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 273.15 to 358.05 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.05876 \cdot 10^3$
B	$-7.99331 \cdot 10^{-1}$

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)
273.15	840.00 ± 2.00	-0.42	1891-wag(□)	313.85	808.40 ± 1.00	0.51	1948-vog-7(O)
293.15	825.00 ± 2.00	0.57	1891-wag(□)	333.25	792.10 ± 1.00	-0.28	1948-vog-7(O)
293.15	824.10 ± 1.00	-0.33	1948-vog-7(O)	358.05	772.50 ± 1.00	-0.05	1948-vog-7(O)

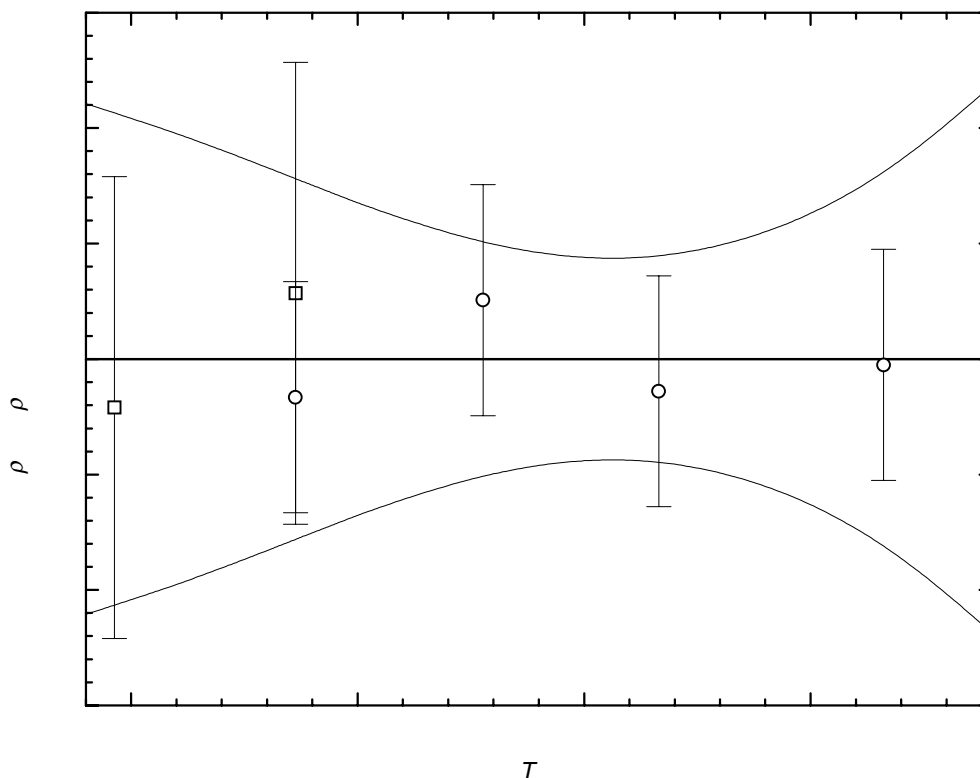


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

cont.

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	842.94 ± 2.21	300.00	818.96 ± 1.35	350.00	778.99 ± 1.23
280.00	834.94 ± 1.96	310.00	810.96 ± 1.08	360.00	771.00 ± 1.69
290.00	826.95 ± 1.66	320.00	802.97 ± 0.90	370.00	763.00 ± 2.37
293.15	824.43 ± 1.56	330.00	794.98 ± 0.85		
298.15	820.43 ± 1.41	340.00	786.98 ± 0.96		

4-Nonanone

[4485-09-0]

C₉H₁₈O

MW = 142.24

228

Table 1. Fit with estimated *B* coefficient for 4 accepted points. Deviation $\sigma_w = 1.063$.

Coefficient	$\rho = A + BT$
<i>A</i>	1070.13
<i>B</i>	-0.840

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.
297.95	819.0 ± 1.0	-0.85	1942-owe/qua
308.00	810.8 ± 1.0	-0.61	1942-owe/qua
323.30	798.2 ± 1.0	-0.36	1942-owe/qua
293.15	825.7 ± 1.0	1.82	1957-shu/bel

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	826.5 ± 1.6
293.15	823.9 ± 1.5
298.15	819.7 ± 1.4
310.00	809.7 ± 1.4
320.00	801.3 ± 1.6
330.00	792.9 ± 1.8

5-Nonanone**[502-56-7]****C₉H₁₈O****MW = 142.24****229**

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 5.1692 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.8871 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 283.15 to 359.75 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.05366 \cdot 10^3$
B	$-7.91193 \cdot 10^{-1}$

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)
286.15	827.00 ± 1.00	-0.26	1912-pic/ken(∇)	323.30	796.60 ± 1.00	-1.27	1942-owe/qua(○)
283.15	829.60 ± 0.50	-0.03	1937-rin/say(□)	293.15	821.70 ± 1.00	-0.02	1948-vog-7(Δ)
303.15	814.80 ± 0.50	0.99	1937-rin/say(□)	313.85	805.60 ± 1.00	0.26	1948-vog-7(Δ)
323.15	798.10 ± 0.50	0.12	1937-rin/say(□)	333.75	789.50 ± 1.00	-0.10	1948-vog-7(Δ)
297.95	817.40 ± 1.00	-0.52	1942-owe/qua(○)	359.75	770.00 ± 1.00	0.97	1948-vog-7(Δ)
308.00	809.30 ± 1.00	-0.67	1942-owe/qua(○)	298.15	818.30 ± 0.50	0.54	1988-gar/cob(◆)

Further references: [1923-vav/iva].

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
280.00	832.12 ± 0.97	300.00	816.30 ± 0.83	340.00	784.65 ± 0.97
290.00	824.21 ± 0.90	310.00	808.39 ± 0.77	350.00	776.74 ± 1.21
293.15	821.72 ± 0.88	320.00	800.48 ± 0.77	360.00	768.83 ± 1.56
298.15	817.76 ± 0.84	330.00	792.57 ± 0.83	370.00	760.92 ± 2.05

cont.

5-Nonanone (cont.)

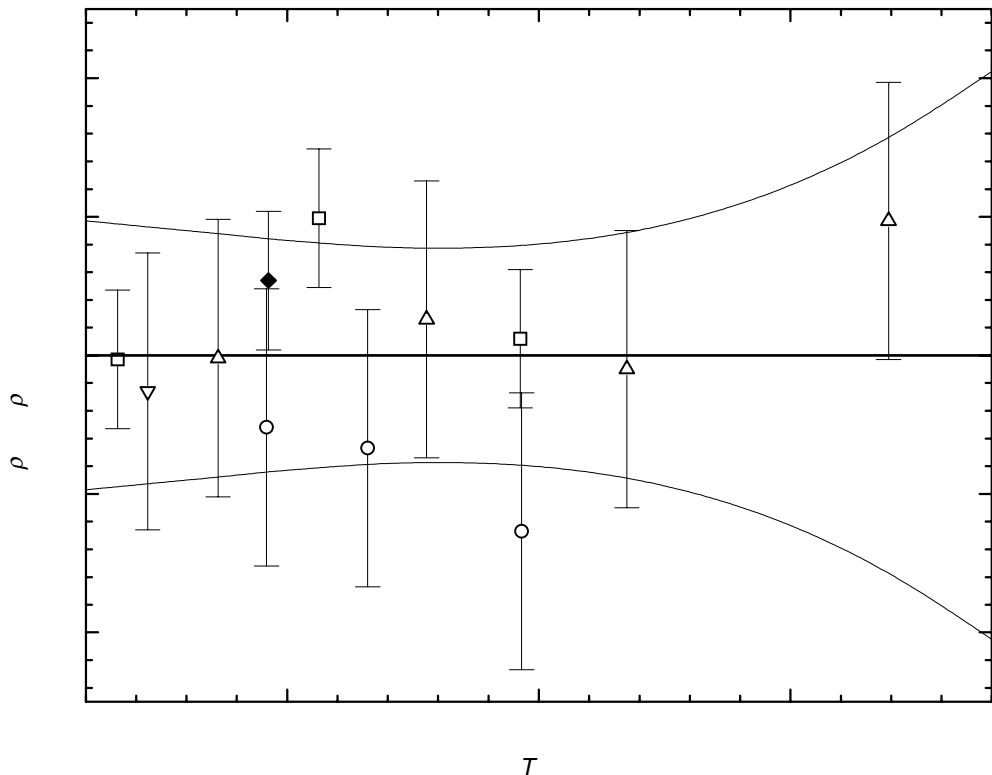


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

3-Propyl-2-hexanone [40239-27-8] C₉H₁₈O MW = 142.24 230

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	Ref.
293.15	874.9 ± 1.5	1890-gar

2,2,4,4-Tetramethyl-3-pentanone [815-24-7] C₉H₁₈O MW = 142.24 231

Table 1. Fit with estimated *B* coefficient for 6 accepted points. Deviation $\sigma_w = 0.706$.

Coefficient	$\rho = A + BT$
<i>A</i>	1082.68
<i>B</i>	-0.880

cont.

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
298.15	819.9 ± 1.0	-0.41	1913-hal/bau	298.15	820.2 ± 1.0	-0.06	1947-how/mea
291.15	824.0 ± 1.0	-2.47	1923-vav/iva	293.15	826.9 ± 2.0	2.19	1960-pet/kao ¹⁾
298.15	808.3 ± 4.0	-12.00	1931-pfe/adk ¹⁾	293.15	825.2 ± 0.4	0.49	1970-sel
293.15	830.6 ± 3.0	5.89	1938-whi ¹⁾	298.15	820.4 ± 0.4	0.09	1970-sel
293.15	824.1 ± 1.0	-0.64	1947-how/mea				

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	827.5 ± 0.9
293.15	824.7 ± 0.9
298.15	820.3 ± 0.9

2,2,5-Trimethyl-3-hexanone

[14705-50-1]

C₉H₁₈O

MW = 142.24

232

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.
296.15	812.0 ± 2.0	1954-col/gre ¹⁾
293.15	818.2 ± 1.0	1960-pet/sok
293.15	818.2 ± 1.0	Recommended

¹⁾ Not included in calculation of recommended value.**4,5,5-Trimethyl-2-hexanone**

[65995-71-3]

C₉H₁₈O

MW = 142.24

233

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.
298.15	829.5 ± 2.5	1935-ste-1 ¹⁾
293.15	835.0 ± 1.5	1960-lev/kos
293.15	835.0 ± 1.5	Recommended

¹⁾ Not included in calculation of recommended value.

2-Decanone**[693-54-9]****C₁₀H₂₀O****MW = 156.27****234****Table 1.** Fit with estimated *B* coefficient for 6 accepted points. Deviation $\sigma_w = 0.600$.

Coefficient	$\rho = A + BT$
<i>A</i>	1088.20
<i>B</i>	-0.900

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

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
290.85	828.3 ± 3.0	1.86	1880-jou ¹⁾	293.15	830.2 ± 3.0	5.83	1932-stp ¹⁾
276.65	837.9 ± 3.0	-1.32	1882-kra ¹⁾	288.15	827.6 ± 0.6	-1.24	1936-ceu
293.15	824.7 ± 1.0	0.33	1882-kra	303.15	815.8 ± 0.6	0.40	1936-ceu
295.15	823.0 ± 1.0	0.43	1926-ruz/bru	298.15	820.1 ± 0.4	0.22	1995-com/fra-2
293.15	824.5 ± 1.0	0.13	1932-stp				

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

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
280.00	836.2 ± 1.1
290.00	827.2 ± 0.8
293.15	824.4 ± 0.8
298.15	819.9 ± 0.8
310.00	809.2 ± 1.0

3-Decanone**[928-80-3]****C₁₀H₂₀O****MW = 156.27****235****Table 1.** Fit with estimated *B* coefficient for 4 accepted points. Deviation $\sigma_w = 0.369$.

Coefficient	$\rho = A + BT$
<i>A</i>	1048.51
<i>B</i>	-0.760

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

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	825.1 ± 1.0	-0.62	1948-vog-7
312.75	810.9 ± 1.0	0.08	1948-vog-7
333.75	795.1 ± 1.0	0.24	1948-vog-7
358.85	776.1 ± 1.0	0.31	1948-vog-7

cont.

Table 3. Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³
290.00	828.1 ± 2.0
293.15	825.7 ± 1.8
298.15	821.9 ± 1.6
310.00	812.9 ± 1.2
320.00	805.3 ± 1.0
330.00	797.7 ± 1.0
340.00	790.1 ± 1.2
350.00	782.5 ± 1.6
360.00	774.9 ± 2.0

4-Decanone

[624-16-8]

C₁₀H₂₀O

MW = 156.27

236

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.315$.

Coefficient	$\rho = A + BT$
A	1074.22
B	-0.860

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	$\rho_{\text{exp}} - \rho_{\text{calc}}$ kg · m ⁻³	Ref.
273.15	839.0 ± 2.0	-0.31	1891-wag
293.65	822.0 ± 2.0	0.32	1891-wag

Table 3. Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³
270.00	842.0 ± 1.9
280.00	833.4 ± 1.8
290.00	824.8 ± 1.8
293.15	822.1 ± 1.9
298.15	817.8 ± 2.0

5-Decanone

[820-29-1]

C₁₀H₂₀O

MW = 156.27

237

Table 1. Fit with estimated B coefficient for 3 accepted points. Deviation $\sigma_w = 0.322$.

Coefficient	$\rho = A + BT$
A	1065.03
B	-0.820

cont.

5-Decanone (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.
297.95	820.3 ± 1.0	-0.41	1942-owe/qua
308.00	812.5 ± 1.0	0.03	1942-owe/qua
323.30	800.3 ± 1.0	0.38	1942-owe/qua

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	827.2 ± 1.4
293.15	824.6 ± 1.3
298.15	820.5 ± 1.1
310.00	810.8 ± 1.0
320.00	802.6 ± 1.1
330.00	794.4 ± 1.4

2,2-Dimethyl-4-ethyl-3-hexanone [40239-63-2] C₁₀H₂₀O MW = 156.27 238

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	825.2 ± 1.0	1913-hal/bau

2,2-Dimethyl-3-octanone [5340-64-7] C₁₀H₂₀O MW = 156.27 239

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	832.0 ± 2.0	1954-col/gre ¹⁾
293.15	820.2 ± 1.0	1960-pet/sok
293.15	820.2 ± 1.0	Recommended

¹⁾ Not included in calculation of recommended value.

2,2-Dimethyl-4-octanone [22319-52-4] C₁₀H₂₀O MW = 156.27 240

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	814.3 ± 1.0	1938-whi/pop-1

2,7-Dimethyl-4-octanone [59387-92-7] C₁₀H₂₀O MW = 156.27 241

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	830.5 ± 1.0	1944-pow/hag

3,4-Dimethyl-2-octanone [7079-06-3] C₁₀H₂₀O MW = 156.27 242

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.
284.15	839.0 ± 2.0	1935-col-1

1-5-(1-Methylethyl)-2-heptanone [500036-75-9] C₁₀H₂₀O MW = 156.27 243

Table 2. 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	830.8 ± 1.0	1944-smi/cha

2-Methyl-3-nonanone [5445-31-8] C₁₀H₂₀O MW = 156.27 244

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.
290.15	823.4 ± 2.0	1912-pic/ken ¹⁾
293.15	822.6 ± 1.0	1914-low
293.15	822.6 ± 1.0	Recommended

¹⁾ Not included in calculation of recommended value.

2-Methyl-4-nonanone [6627-76-5] C₁₀H₂₀O MW = 156.27 245

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	818.5 ± 3.0	1914-low ¹⁾
298.15	818.0 ± 2.0	1954-dub/luf
298.15	818.0 ± 2.0	Recommended

¹⁾ Not included in calculation of recommended value.

2-Methyl-5-nonanone [22287-02-1] C₁₀H₂₀O MW = 156.27 246

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	Ref.
293.15	821.3 ± 1.0	1944-pow/hag

6-Methyl-2-nonanone [104092-42-4] C₁₀H₂₀O MW = 156.27 247

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	Ref.
293.15	838.4 ± 1.0	1961-shv/pet

2,2,5,5-Tetramethyl-3-hexanone [868-91-7] C₁₀H₂₀O MW = 156.27 248

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

Coefficient	$\rho = A + BT$
A	1073.31
B	-0.860

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	$\rho_{\text{exp}} - \rho_{\text{calc}}$ kg · m ⁻³	Ref.
273.15	827.0 ± 3.0	-11.40	1906-bou/loc-1 ¹⁾
293.15	811.2 ± 3.0	-10.00	1941-whi/whi ¹⁾
293.15	821.2 ± 0.4	0.00	1970-sel
298.15	816.9 ± 0.4	0.00	1970-sel

¹⁾ Not included in calculation of linear coefficients.

Table 3. Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³
290.00	823.9 ± 0.3
293.15	821.2 ± 0.2
298.15	816.9 ± 0.2

3,3,5,5-Tetramethyl-2-hexanone [129583-17-1] C₁₀H₂₀O MW = 156.27 249

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	842.7 ± 1.0	1954-hic/hya-1

4,6,6-Trimethyl-2-heptanone [40239-01-8] C₁₀H₂₀O MW = 156.27 250

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.
288.65	825.2 ± 2.0	1946-dou-1

4,6-Dimethyl-4-ethyl-3-heptanone [500023-84-7] C₁₁H₂₂O MW = 170.3 251

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	842.0 ± 1.0	1955-str/tho

2,2-Dimethyl-3-nonanone [22921-92-2] C₁₁H₂₂O MW = 170.3 252

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	823.7 ± 1.0	1960-pet/sok

2,2-Dimethyl-4-nonanone [41696-78-0] C₁₁H₂₂O MW = 170.3 253

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	818.4 ± 1.0	1938-whi/pop-1

2-Methyl-5-decanone [54410-89-8] C₁₁H₂₂O MW = 170.3 254

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	823.5 ± 1.0	1944-pow/hag

3-Methyl-2-decanone [1534-13-0] C₁₁H₂₂O MW = 170.3 255

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	823.0 ± 2.0	1933-pow/mur

4-Methyl-3-decanone [6137-22-0] C₁₁H₂₂O MW = 170.3 256

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	826.0 ± 2.0	1954-dub/luf-1

3-Propyl-2-octanone [500036-90-8] C₁₁H₂₂O MW = 170.3 257

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	840.5 ± 1.0	1912-gue-2

5-Propyl-4-octanone [500044-29-1] C₁₁H₂₂O MW = 170.3 258

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	830.9 ± 1.0	1949-naz/zar

4,4,5,5-Tetramethyl-2-heptanone [100533-99-1] C₁₁H₂₂O MW = 170.3 259

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	896.9 ± 2.0	1957-pet/sus

2-Undecanone**[112-12-9]****C₁₁H₂₂O****MW = 170.3****260**

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 3.6004 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 5.8555 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	T = 273.15 to 433.00 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.01801 \cdot 10^3$
B	$-5.67147 \cdot 10^{-1}$
C	$-3.01331 \cdot 10^{-4}$

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)
288.15	829.50 ± 0.70	-0.06	1902-hou(X)	333.30	795.40 ± 0.50	-0.10	1966-mey/wag(X)
293.15	826.30 ± 0.70	0.45	1902-hou(X)	343.15	787.80 ± 0.50	-0.11	1966-mey/wag(X)
293.65	825.40 ± 0.80	-0.08	1902-pow/lee(X)	353.23	780.00 ± 0.50	-0.08	1966-mey/wag(X)
288.15	829.43 ± 0.70	-0.13	1936-ceu(X)	363.60	772.00 ± 0.50	0.04	1966-mey/wag(X)
303.15	817.99 ± 0.70	-0.39	1936-ceu(X)	373.35	764.20 ± 0.60	-0.06	1966-mey/wag(X)
293.15	825.00 ± 0.70	-0.85	1948-vog-7(X)	383.35	756.50 ± 0.60	0.19	1966-mey/wag(X)
314.65	809.80 ± 0.70	0.08	1948-vog-7(X)	392.93	748.70 ± 0.60	0.06	1966-mey/wag(X)
333.75	795.50 ± 0.70	0.34	1948-vog-7(X)	402.35	741.00 ± 0.60	-0.04	1966-mey/wag(X)
358.95	777.00 ± 0.70	1.39	1948-vog-7 ¹⁾	413.00	732.50 ± 0.60	0.12	1966-mey/wag(X)
273.15	840.50 ± 0.40	-0.11	1960-wri(V)	423.95	723.50 ± 0.60	0.09	1966-mey/wag(X)
273.15	840.50 ± 0.60	-0.11	1961-wri(X)	433.00	715.90 ± 0.60	-0.04	1966-mey/wag(X)
298.14	822.20 ± 0.40	0.07	1966-mey/wag(X)	298.15	821.70 ± 0.40	-0.43	1993-com/fra(□)
299.84	820.90 ± 0.40	0.04	1966-mey/wag(X)	298.15	822.31 ± 0.40	0.18	1995-com/fra(○)
304.32	817.50 ± 0.40	-0.01	1966-mey/wag(X)	298.15	822.19 ± 0.40	0.06	1995-com/fra-2(Δ)
313.46	810.50 ± 0.40	-0.12	1966-mey/wag(X)	298.15	823.25 ± 0.40	1.12	1995-com/fra-4(◆)
323.46	802.90 ± 0.40	-0.13	1966-mey/wag(X)				

¹⁾ Not included in Fig. 1.

Further references: [1870-gie, 1901-tho, 1910-eis, 1917-sal, 1939-nav].

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

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	842.91 ± 0.65	298.15	822.13 ± 0.56	330.00	798.03 ± 0.51
280.00	835.58 ± 0.61	300.00	820.74 ± 0.55	340.00	790.34 ± 0.50
290.00	828.19 ± 0.58	320.00	805.66 ± 0.52	350.00	782.59 ± 0.50
293.15	825.85 ± 0.57	310.00	813.23 ± 0.54	360.00	774.78 ± 0.50

cont.

2-Undecanone (cont.)

Table 3. (cont.)

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
370.00	766.91 ± 0.51	400.00	742.94 ± 0.62	430.00	718.42 ± 0.89
380.00	758.98 ± 0.53	410.00	734.82 ± 0.69	440.00	710.13 ± 1.03
390.00	750.99 ± 0.57	420.00	726.65 ± 0.78		

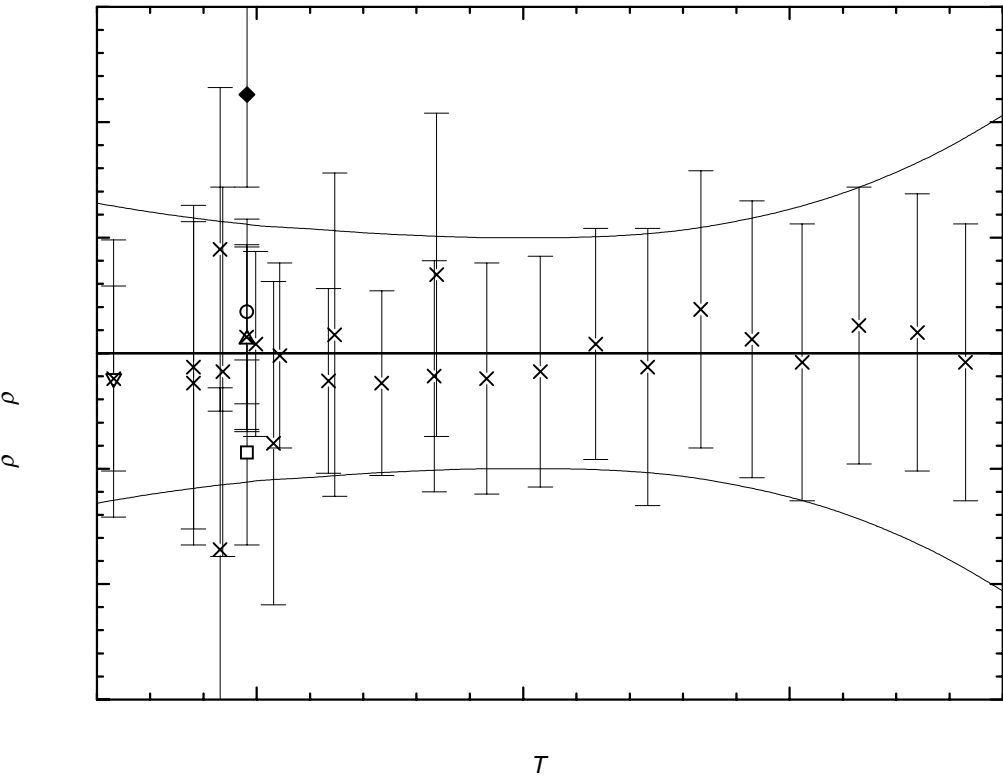


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

3-Undecanone

[2216-87-7]

C₁₁H₂₂O

MW = 170.3

261

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	827.2 ± 3.0	1929-von/teu

4-Undecanone [14476-37-0] C₁₁H₂₂O MW = 170.3 262

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	827.4 ± 3.0	1929-von/kro

5-Undecanone [33083-83-9] C₁₁H₂₂O MW = 170.3 263

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.
292.15	827.8 ± 3.0	1929-von/kro

6-Undecanone [927-49-1] C₁₁H₂₂O MW = 170.3 264

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{\text{c,w}} = 6.8297 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 2.4012 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 288.15 to 359.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$9.75284 \cdot 10^2$
B	$-3.26315 \cdot 10^{-1}$
C	$-6.36006 \cdot 10^{-4}$

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	824.70 ± 2.00	-0.27	1877-lie/jan(Δ)	323.30	803.50 ± 0.70	0.19	1942-owe/qua(∇)
313.15	809.60 ± 2.00	-1.13	1877-lie/jan(Δ)	293.15	824.50 ± 0.70	-0.47	1948-vog-7(○)
288.15	828.60 ± 0.70	0.15	1929-sim(□)	314.65	809.70 ± 0.70	0.06	1948-vog-7(○)
303.15	816.88 ± 0.70	-1.03	1929-sim(□)	333.65	795.60 ± 0.70	-0.01	1948-vog-7(○)
297.95	823.10 ± 0.70	1.50	1942-owe/qua(∇)	359.15	776.20 ± 0.70	0.15	1948-vog-7(○)
308.00	815.30 ± 0.70	0.85	1942-owe/qua(∇)				

Further references: [1914-low, 1929-von/kro].

cont.

6-Undecanone (cont.)

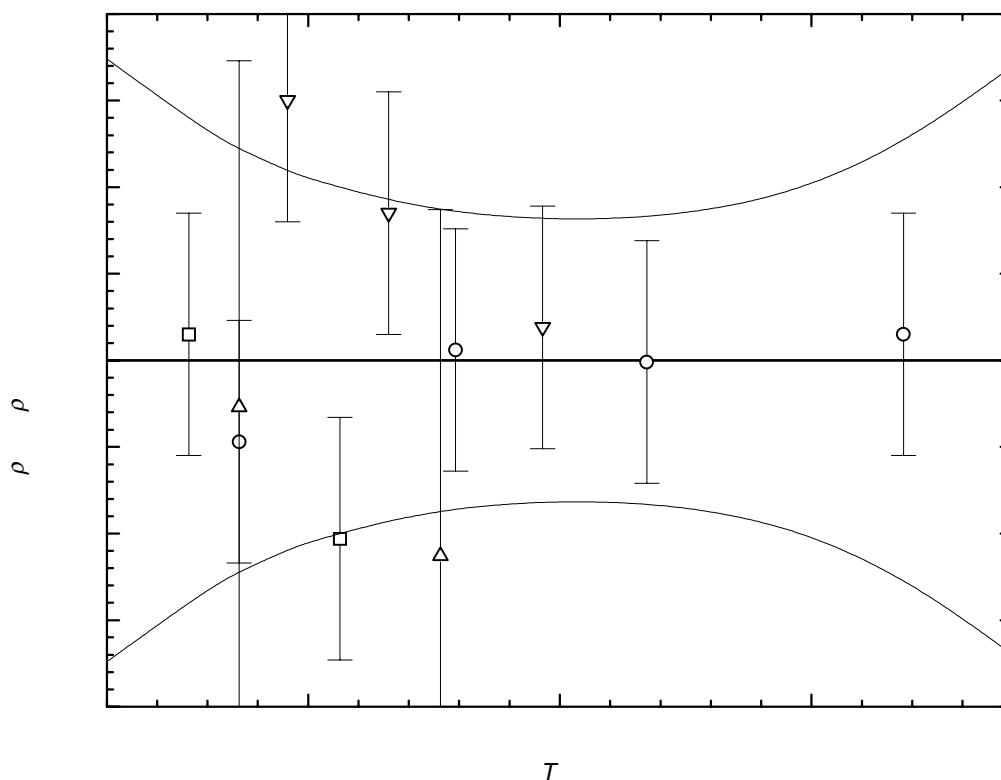


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{fit}}{kg \cdot m^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{fit}}{kg \cdot m^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{fit}}{kg \cdot m^{-3}}$
280.00	834.05 ± 1.74	300.00	820.15 ± 1.05	340.00	790.81 ± 0.86
290.00	827.16 ± 1.32	310.00	813.01 ± 0.89	350.00	783.16 ± 1.00
293.15	824.97 ± 1.22	320.00	805.74 ± 0.82	360.00	775.38 ± 1.28
298.15	821.46 ± 1.09	330.00	798.34 ± 0.81	370.00	767.48 ± 1.70