

5.1.3 Saturated Carboxylic Acids, C₁₃ - C₂₆

2-Butylnonanoic acid [19480-29-6] C₁₃H₂₆O₂ MW = 214.35 432

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	886.0 ± 1.0	1922-lev/tay-1

2,4-Dimethylundecanoic acid [92169-22-7] C₁₃H₂₆O₂ MW = 214.35 433

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	888.4 ± 2.0	1960-nik/ogi

3,3-Dimethylundecanoic acid [19758-01-1] C₁₃H₂₆O₂ MW = 214.35 434

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.
298.15	882.7 ± 1.0	1958-kim/tan

3,5-Dimethylundecanoic acid [93310-03-3] C₁₃H₂₆O₂ MW = 214.35 435

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	892.0 ± 2.0	1960-nik/ogi-1

2-Methyldodecanoic acid [2874-74-0] C₁₃H₂₆O₂ MW = 214.35 436

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.
298.15	884.0 ± 2.0	1929-lev/mik

Tridecanoic acid [638-53-9] C₁₃H₂₆O₂ MW = 214.35 437

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.150$.

Coefficient	$\rho = A + BT$
A	1149.66
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.
<i>crystal</i>			
293.15	1025.0 ± 5.0		1964-adr/dek
<i>liquid</i>			
353.15	845.8 ± 2.0	-0.15	1942-dor/mcc
343.15	854.7 ± 2.0	0.15	1958-met

Table 3. Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³
340.00	857.3 ± 2.0
350.00	848.7 ± 1.8
360.00	840.1 ± 2.2

2,4-Dimethyldodecanoic acid [32477-17-1] C₁₄H₂₈O₂ MW = 228.38 438

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	Ref.
293.15	886.9 ± 2.0	1960-nik/ogi

3,3-Dimethyldodecanoic acid [102944-03-6] C₁₄H₂₈O₂ MW = 228.38 439

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	Ref.
298.15	884.1 ± 2.0	1958-kim/tan

3,5-Dimethyldodecanoic acid [93761-42-3] C₁₄H₂₈O₂ MW = 228.38 440

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	891.0 ± 2.0	1960-nik/ogi-1

2,4-Dimethyl-6-ethyldecanoic acid [100962-87-6] C₁₄H₂₈O₂ MW = 228.38 441

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	891.4 ± 2.0	1960-nik/ogi

Tetradecanoic acid [544-63-8] C₁₄H₂₈O₂ MW = 228.38 442

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

$\sigma_{\text{c,w}} = 1.3995$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 2.1120 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 326.75 to 553.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.06360 \cdot 10^3$
B	$-5.46009 \cdot 10^{-1}$
C	$-2.10432 \cdot 10^{-4}$

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)
326.75	862.20 ± 2.00	-0.53	1882-kra-1(×)	393.15	815.60 ± 0.60	-0.81	1958-cos/bow-1(×)
333.15	858.40 ± 2.00	0.05	1899-sch-1(×)	413.15	801.50 ± 0.60	-0.60	1958-cos/bow-1(×)
343.15	852.80 ± 2.00	1.34	1915-dun(◆)	433.15	787.80 ± 0.60	0.18	1958-cos/bow-1(×)
363.15	839.40 ± 2.00	1.83	1915-dun(◆)	453.15	773.30 ± 0.80	0.33	1958-cos/bow-1(×)
353.15	843.90 ± 2.00	-0.64	1942-dor/mcc(×)	473.15	758.80 ± 0.80	0.65	1958-cos/bow-1(×)
348.15	848.10 ± 1.00	0.10	1952-gro/feu(Δ)	493.15	743.40 ± 0.80	0.24	1958-cos/bow-1(×)
353.15	843.90 ± 1.00	-0.64	1956-dag(∇)	513.15	728.10 ± 0.80	0.09	1958-cos/bow-1(×)
333.15	860.00 ± 1.00	1.65	1957-ham/lyd(□)	533.15	712.20 ± 0.80	-0.48	1958-cos/bow-1(×)
343.15	852.30 ± 1.00	0.84	1957-ham/lyd(□)	553.15	695.60 ± 1.00	-1.59	1958-cos/bow-1(×)
333.15	857.30 ± 0.60	-1.05	1958-cos/bow-1(×)	573.15	678.00 ± 2.00	-3.53	1958-cos/bow-1 ¹⁾
353.15	843.40 ± 0.60	-1.14	1958-cos/bow-1(×)	343.15	852.80 ± 1.00	1.34	1958-met(O)
373.15	829.40 ± 0.60	-1.16	1958-cos/bow-1(×)				

¹⁾ Not included in Fig. 1.

Further references: [1929-hun/maa].

cont.

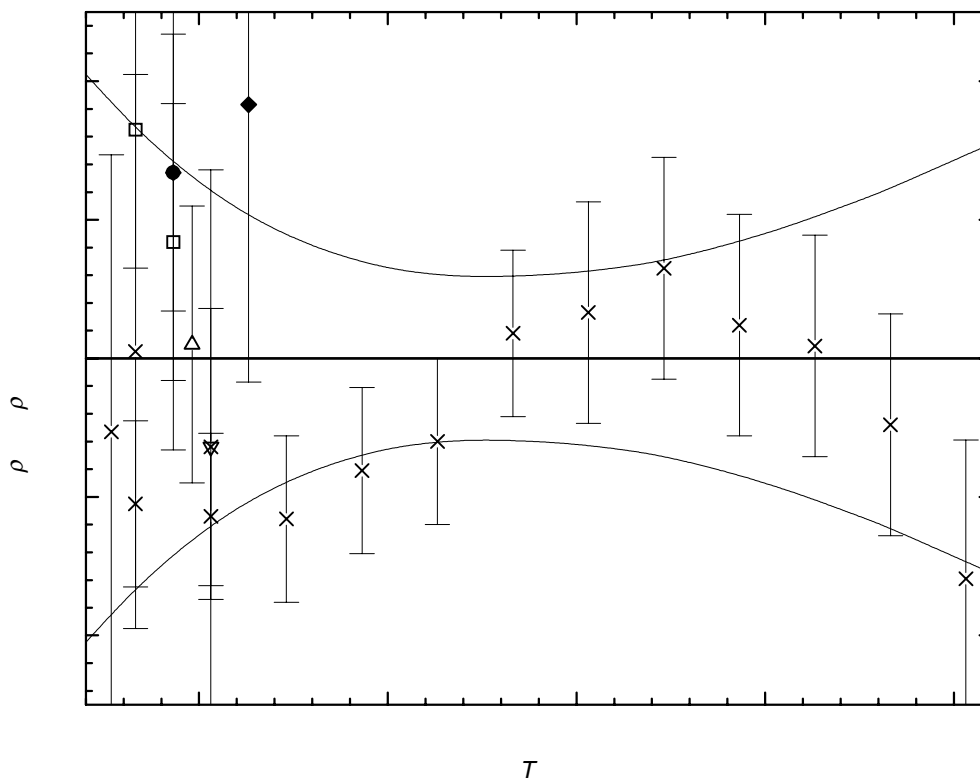
Tetradecanoic acid (cont.)

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
320.00	867.33 ± 2.05	410.00	804.37 ± 0.61	500.00	737.99 ± 0.90
330.00	860.51 ± 1.75	420.00	797.16 ± 0.59	510.00	730.41 ± 0.99
340.00	853.64 ± 1.49	430.00	789.91 ± 0.59	520.00	722.78 ± 1.09
350.00	846.72 ± 1.27	440.00	782.62 ± 0.60	530.00	715.11 ± 1.19
360.00	839.77 ± 1.08	450.00	775.29 ± 0.62	540.00	707.40 ± 1.31
370.00	832.77 ± 0.93	460.00	767.91 ± 0.65	550.00	699.64 ± 1.43
380.00	825.73 ± 0.81	470.00	760.50 ± 0.69	560.00	691.85 ± 1.55
390.00	818.65 ± 0.72	480.00	753.04 ± 0.75		
400.00	811.53 ± 0.65	490.00	745.53 ± 0.82		

2,4,5-Trimethylundecanoic acid [93761-45-6] C₁₄H₂₈O₂ MW = 228.38 443

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	893.2 ± 2.0	1960-nik/ogi

2-Butylundecanoic acid [66241-54-1] C₁₅H₃₀O₂ MW = 242.4 444

Table 1. Fit with estimated *B* coefficient for 2 accepted points. Deviation $\sigma_w = 0.250$.

Coefficient	$\rho = A + BT$
<i>A</i>	1092.42
<i>B</i>	-0.720

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	877.5 ± 1.0	-0.25	1959-lei/hag
343.15	845.6 ± 1.0	0.25	1959-lei/hag

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	883.6 ± 1.8
293.15	881.4 ± 1.7
298.15	877.8 ± 1.5
310.00	869.2 ± 1.1
320.00	862.0 ± 0.9
330.00	854.8 ± 1.0
340.00	847.6 ± 1.3
350.00	840.4 ± 1.7

2,4-Dimethyltridecanoic acid [73105-68-7] C₁₅H₃₀O₂ MW = 242.4 445

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	885.7 ± 2.0	1960-nik/ogi

3,3-Dimethyltridecanoic acid [81918-83-4] C₁₅H₃₀O₂ MW = 242.4 446

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.
298.15	889.2 ± 1.0	1958-kim/tan

3,5-Dimethyltridecanoic acid [20247-69-2] C₁₅H₃₀O₂ MW = 242.4 447

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	889.3 ± 2.0	1960-nik/ogi-1

4-Ethyl-2-pentyloctanoic acid [92862-33-4] C₁₅H₃₀O₂ MW = 242.4 448

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	886.6 ± 2.0	1961-nik/ogi

2-Ethyltridecanoic acid [500043-87-8] C₁₅H₃₀O₂ MW = 242.4 449

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

Coefficient	$\rho = A + BT$
<i>A</i>	1086.86
<i>B</i>	-0.700

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.
343.15	846.7 ± 1.0	0.05	1959-lei/hag
298.15	878.1 ± 1.0	-0.05	1959-lei/hag

Table 3. Recommended values.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	883.9 ± 1.8	310.00	869.9 ± 1.0	340.00	848.9 ± 1.3
293.15	881.7 ± 1.6	320.00	862.9 ± 0.9	350.00	841.9 ± 1.7
298.15	878.2 ± 1.4	330.00	855.9 ± 1.0		

2-Hexylnonanoic acid [37165-63-2] C₁₅H₃₀O₂ MW = 242.4 450**Table 1.** Fit with estimated *B* coefficient for 2 accepted points. Deviation $s_w = 0.075$.

Coefficient	$\rho = A + BT$
<i>A</i>	1095.12
<i>B</i>	-0.730

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.
298.15	877.4 ± 1.0	-0.07	1959-lei/hag
343.15	844.7 ± 1.0	0.08	1959-lei/hag

Table 3. Recommended values.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	883.4 ± 1.8
293.15	881.1 ± 1.6
298.15	877.5 ± 1.4
310.00	868.8 ± 1.0
320.00	861.5 ± 0.9
330.00	854.2 ± 1.0
340.00	846.9 ± 1.3
350.00	839.6 ± 1.7

2-Methyltetradecanoic acid [6683-71-2] C₁₅H₃₀O₂ MW = 242.4 451**Table 1.** Fit with estimated *B* coefficient for 2 accepted points. Deviation $\sigma_w = 0.150$.

Coefficient	$\rho = A + BT$
<i>A</i>	1087.36
<i>B</i>	-0.700

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.
298.15	878.5 ± 1.0	-0.15	1959-lei/hag
343.15	847.3 ± 1.0	0.15	1959-lei/hag

cont.

2-Methyltetradecanoic acid (cont.)**Table 3.** Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³
290.00	884.4 ± 1.8
293.15	882.2 ± 1.6
298.15	878.7 ± 1.4
310.00	870.4 ± 1.1
320.00	863.4 ± 0.9
330.00	856.4 ± 1.0
340.00	849.4 ± 1.3
350.00	842.4 ± 1.7

Pentadecanoic acid

[1002-84-2]

C₁₅H₃₀O₂

MW = 242.4

452

Table 1. Fit with estimated B coefficient for 3 accepted points. Deviation $\sigma_w = 0.759$.

Coefficient	$\rho = A + BT$
A	1118.02
B	-0.780

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.
353.15	842.3 ± 1.0	-0.27	1942-dor/mcc
343.15	851.4 ± 1.0	1.03	1958-met
343.15	849.6 ± 1.0	-0.77	1959-lei/hag

Table 3. Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³
340.00	852.8 ± 1.3
350.00	845.0 ± 1.2
360.00	837.2 ± 1.8

2-Pentyldecanoic acid

[60948-92-7]

C₁₅H₃₀O₂

MW = 242.4

453

Table 1. Fit with estimated B coefficient for 3 accepted points. Deviation $\sigma_w = 1.828$.

Coefficient	$\rho = A + BT$
A	1090.05
B	-0.710

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.
298.15	877.0 ± 1.0	-1.37	1959-lei/hag
343.15	845.2 ± 1.0	-1.22	1959-lei/hag
293.15	884.5 ± 1.0	2.58	1960-pet/nik-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	884.2 ± 2.3
293.15	881.9 ± 2.2
298.15	878.4 ± 2.1
310.00	870.0 ± 2.0
320.00	862.9 ± 2.1
330.00	855.8 ± 2.2
340.00	848.7 ± 2.5
350.00	841.6 ± 2.8

2-Propyldodecanoic acid

[101452-98-6]

C₁₅H₃₀O₂

MW = 242.4

454

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.175$.

Coefficient	$\rho = A + BT$
A	1095.42
B	-0.730

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	877.6 ± 1.0	-0.18	1959-lei/hag
343.15	845.1 ± 1.0	0.17	1959-lei/hag

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	883.7 ± 1.8	310.00	869.1 ± 1.1	340.00	847.2 ± 1.3
293.15	881.4 ± 1.6	320.00	861.8 ± 0.9	350.00	839.9 ± 1.7
298.15	877.8 ± 1.4	330.00	854.5 ± 1.0		

2-Butyldodecanoic acid [25354-95-4] C₁₆H₃₂O₂ MW = 256.43 455

Table 1. Fit with estimated *B* coefficient for 2 accepted points. Deviation $\sigma_w = 0.120$.

Coefficient	$\rho = A + BT$
<i>A</i>	1087.55
<i>B</i>	-0.700

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.
298.15	878.9 ± 1.0	0.06	1929-sta/jay
293.15	882.1 ± 2.0	-0.24	1961-nik/ogi

Table 3. Recommended values.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	884.5 ± 1.5
293.15	882.3 ± 1.4
298.15	878.8 ± 1.4

2,4-Dimethyltetraconoic acid [57859-34-4] C₁₆H₃₂O₂ MW = 256.43 456

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	884.3 ± 2.0	1960-nik/ogi

3,5-Dimethyltetraconoic acid [14779-94-3] C₁₆H₃₂O₂ MW = 256.43 457

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	885.9 ± 2.0	1960-nik/ogi

2-Ethyltetradecanoic acid [25354-93-2] C₁₆H₃₂O₂ MW = 256.43 458

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.
298.15	880.8 ± 1.0	1929-sta/jay

2-Heptylnonanoic acid [500043-43-6] C₁₆H₃₂O₂ MW = 256.43 459**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	877.1 ± 1.0	1929-sta/jay

Hexadecanoic acid [57-10-3] C₁₆H₃₂O₂ MW = 256.43 460**Table 1.** Coefficients of the polynomial expansion equation. Standard deviations (see introduction):

$\sigma_{\text{c,w}} = 9.7162 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 1.6341 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 335.15 to 553.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.04714 \cdot 10^3$
B	$-4.94242 \cdot 10^{-1}$
C	$-2.46090 \cdot 10^{-4}$

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
<i>crystal</i>				335.25	855.00 ± 2.00	1.21	1949-tsv/mar(×)
78.15	1087.0 ± 3.0		1930-bil/fis-1	336.05	853.32 ± 1.00	0.06	1952-war/sin(∇)
194.15	1053.0 ± 3.0		1930-bil/fis-1	341.24	849.62 ± 1.00	-0.21	1952-war/sin(∇)
290.15	1016.0 ± 3.0		1930-bil/fis-1	345.15	846.96 ± 1.00	-0.28	1952-war/sin(∇)
266.35	1008.4 ± 3.0		1952-war/sin	353.15	841.40 ± 1.00	-0.51	1952-war/sin(∇)
270.90	1007.3 ± 3.0		1952-war/sin	353.15	841.40 ± 1.00	-0.51	1956-dag(Δ)
279.03	1006.0 ± 3.0		1952-war/sin	353.15	841.40 ± 0.60	-0.51	1958-cos/bow-1(×)
285.15	1003.5 ± 3.0		1952-war/sin	373.15	827.80 ± 0.60	-0.65	1958-cos/bow-1(×)
290.56	1001.5 ± 3.0		1952-war/sin	393.15	814.10 ± 0.60	-0.69	1958-cos/bow-1(×)
<i>liquid</i>				413.15	800.20 ± 0.60	-0.74	1958-cos/bow-1(×)
335.15	852.70 ± 2.00	-1.15	1882-kra-1(×)	433.15	787.00 ± 0.60	0.11	1958-cos/bow-1(×)
348.95	846.50 ± 2.00	1.79	1893-eyk(×)	453.15	773.00 ± 0.80	0.36	1958-cos/bow-1(×)
338.05	853.40 ± 2.00	1.46	1912-rut(×)	473.15	759.00 ± 0.80	0.80	1958-cos/bow-1(×)
351.35	844.30 ± 2.00	1.19	1912-rut(×)	493.15	744.10 ± 0.80	0.54	1958-cos/bow-1(×)
352.75	843.30 ± 2.00	1.12	1912-rut(×)	513.15	729.00 ± 0.80	0.28	1958-cos/bow-1(×)
343.15	848.70 ± 2.00	0.14	1915-dun(×)	533.15	713.10 ± 0.80	-0.58	1958-cos/bow-1(×)
363.15	834.70 ± 2.00	-0.50	1915-dun(×)	553.15	697.20 ± 1.00	-1.25	1958-cos/bow-1(×)
348.15	845.70 ± 2.00	0.46	1919-wae/pes(×)	573.15	680.30 ± 2.00	-2.73	1958-cos/bow-1 ¹⁾
343.15	847.00 ± 2.00	-1.56	1925-hol/gen(◆)	343.15	848.70 ± 1.00	0.14	1958-met(○)
353.15	841.40 ± 1.00	-0.51	1942-dor/mcc(□)				

¹⁾ Not included in Fig. 1.

Further references: [1899-sch-1, 1919-eyk, 1929-hun/maa, 1930-bin/for].

cont.

Hexadecanoic acid (cont.)

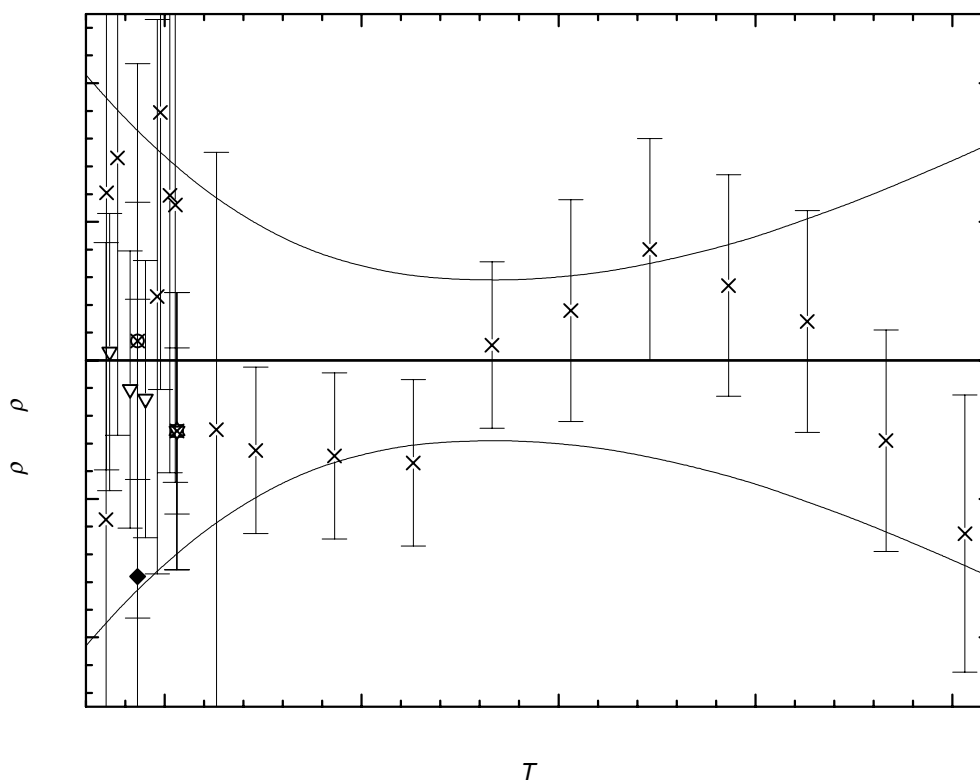


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
330.00	857.24 ± 2.06	410.00	803.13 ± 0.62	490.00	745.88 ± 0.81
340.00	850.65 ± 1.74	420.00	796.15 ± 0.59	500.00	738.50 ± 0.89
350.00	844.01 ± 1.47	430.00	789.11 ± 0.58	510.00	731.07 ± 0.99
360.00	837.32 ± 1.23	440.00	782.03 ± 0.58	520.00	723.59 ± 1.09
370.00	830.58 ± 1.04	450.00	774.90 ± 0.60	530.00	716.07 ± 1.20
380.00	823.79 ± 0.88	460.00	767.72 ± 0.63	540.00	708.49 ± 1.32
390.00	816.96 ± 0.76	470.00	760.49 ± 0.68	550.00	700.87 ± 1.44
400.00	810.07 ± 0.68	480.00	753.21 ± 0.74	560.00	693.19 ± 1.57

2-Hexyldecanoic acid [25354-97-6] C₁₆H₃₂O₂ MW = 256.43 461**Table 1.** Fit with estimated *B* coefficient for 2 accepted points. Deviation $\sigma_w = 0.280$.

Coefficient	$\rho = A + BT$
<i>A</i>	1127.39
<i>B</i>	-0.840

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.
298.15	876.8 ± 1.0	-0.14	1929-sta/jay
293.15	881.7 ± 2.0	0.56	1961-nik/ogi

Table 3. Recommended values.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	883.8 ± 1.5
293.15	881.1 ± 1.4
298.15	876.9 ± 1.4

2-Methylpentadecanoic acid [25354-92-1] C₁₆H₃₂O₂ MW = 256.43 462**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.
298.15	876.5 ± 1.0	1929-sta/jay

2-(2-Methylpropyl)dodecanoic acid [500043-41-4] C₁₆H₃₂O₂ MW = 256.43 463**Table 1.** Experimental value with uncertainty.

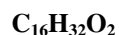
$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
298.15	876.3 ± 1.0	1929-sta/jay

2-Pentylundecanoic acid [500043-42-5] C₁₆H₃₂O₂ MW = 256.43 464**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.
298.15	888.7 ± 1.0	1929-sta/jay
293.15	880.9 ± 2.0	1961-nik/ogi

2-Propyltridecanoic acid

[25354-94-3]



MW = 256.43

465

Table 1. Fit with estimated *B* coefficient for 2 accepted points. Deviation $\sigma_w = 0.100$.

Coefficient	$\rho = A + BT$
<i>A</i>	1095.57
<i>B</i>	-0.720

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.
298.15	880.8 ± 1.0	-0.10	1929-sta/jay
343.15	848.6 ± 1.0	0.10	1959-lei/hag-4

Table 3. Recommended values.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
290.00	886.8 ± 3.2
293.15	884.5 ± 2.9
298.15	880.9 ± 2.4
310.00	872.4 ± 1.4
320.00	865.2 ± 0.9
330.00	858.0 ± 1.3
340.00	850.8 ± 2.1
350.00	843.6 ± 3.1

3,5-Dimethylpentadecanoic acid

[500043-86-7]



MW = 270.46

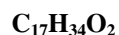
466

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	883.4 ± 2.0	1959-pet/nik
293.15	883.4 ± 2.0	1960-nik/ogi-1

Heptadecanoic acid

[506-12-7]



MW = 270.46

467

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

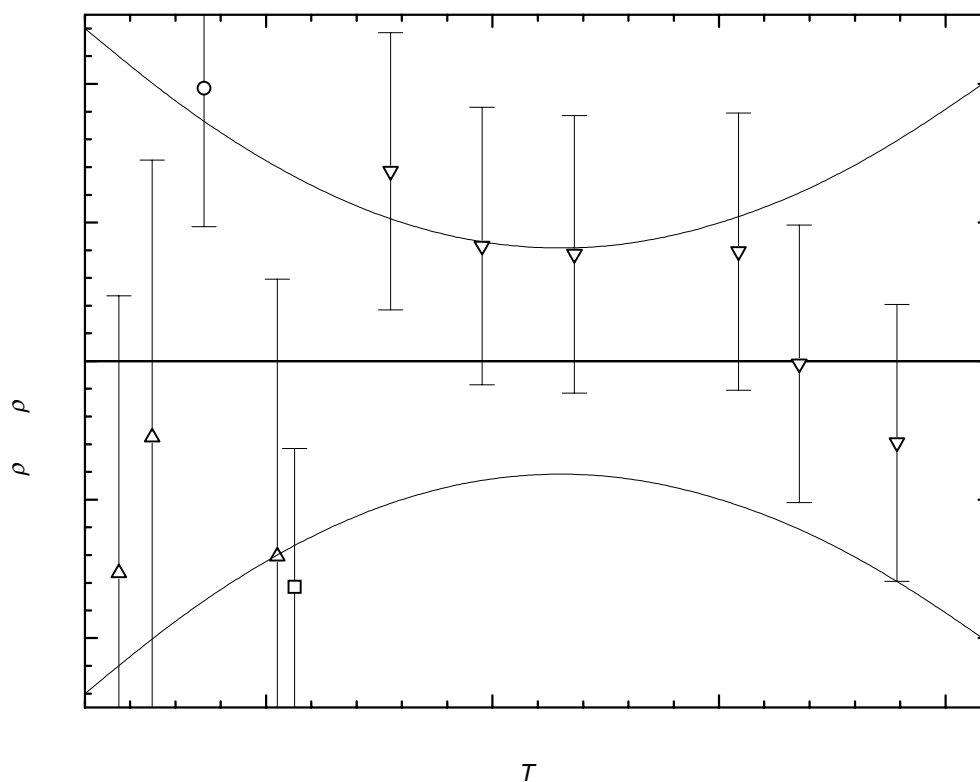
$\sigma_{c,w} = 1.5772$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 3.7261 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 333.75 \text{ to } 419.65 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
<i>A</i>	$1.07779 \cdot 10^3$
<i>B</i>	$-6.69838 \cdot 10^{-1}$

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)
333.75	852.70 ± 2.00	-1.53	1912-rut(Δ)	402.15	809.20 ± 1.00	0.79	1929-hun/maa(∇)
337.45	851.20 ± 2.00	-0.55	1912-rut(Δ)	408.85	803.90 ± 1.00	-0.02	1929-hun/maa(∇)
351.25	841.10 ± 2.00	-1.41	1912-rut(Δ)	419.65	796.10 ± 1.00	-0.59	1929-hun/maa(∇)
363.75	835.50 ± 1.00	1.37	1929-hun/maa(∇)	353.15	839.60 ± 1.00	-1.63	1942-dor/mcc(\square)
373.85	828.20 ± 1.00	0.83	1929-hun/maa(∇)	343.15	849.90 ± 1.00	1.97	1958-met(\circ)
384.05	821.30 ± 1.00	0.77	1929-hun/maa(∇)				

**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.

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
330.00	856.74 ± 2.40	370.00	829.95 ± 0.89	410.00	803.15 ± 1.23
340.00	850.04 ± 1.86	380.00	823.25 ± 0.80	420.00	796.45 ± 1.59
350.00	843.34 ± 1.43	390.00	816.55 ± 0.83	430.00	789.76 ± 2.04
360.00	836.64 ± 1.10	400.00	809.85 ± 0.98		

2-Pentyltridecanoic acid

[84426-34-6]

C₁₇H₃₄O₂

MW = 270.46

468

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	878.9 ± 2.0	1961-nik/ogi

2-Propyltridecanoic acid

[53705-91-2]

C₁₇H₃₄O₂

MW = 270.46

469

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.
343.15	846.6 ± 1.0	1959-lei/hag-4

3-Propyltridecanoic acid

[109470-62-4]

C₁₇H₃₄O₂

MW = 270.46

470

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.
343.15	848.5 ± 1.0	1959-lei/hag-4

2-Butyltridecanoic acid

[22890-20-6]

C₁₈H₃₆O₂

MW = 284.48

471

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	874.3 ± 1.0	1929-sta/jay

4-Ethyl-2-(2-ethylhexyl)octanoic acid [24251-97-6] C₁₈H₃₆O₂ MW = 284.48 472

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	882.2 ± 2.0	1960-nik/ogi-1
293.15	882.2 ± 2.0	1960-pet/nik-2

2-Ethylhexadecanoic acid [54240-85-6] C₁₈H₃₆O₂ MW = 284.48 473

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	876.7 ± 1.0	1929-sta/jay

7-Ethyl-2-pentylundecanoic acid [94307-26-3] C₁₈H₃₆O₂ MW = 284.48 474

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	881.8 ± 2.0	1961-nik/ogi

2-Heptylundecanoic acid [22890-21-7] C₁₈H₃₆O₂ MW = 284.48 475

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	874.7 ± 1.0	1929-sta/jay

2-Hexyldodecanoic acid [69848-19-7] C₁₈H₃₆O₂ MW = 284.48 476

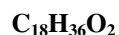
Table 1. Experimental value with uncertainty.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
298.15	874.1 ± 1.0	1929-sta/jay

6-Methyl-2-pentylundecanoic acid [94307-16-1] C₁₈H₃₆O₂ MW = 284.48 477

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	877.40 ± 2.00	1961-nik/ogi

Octadecanoic acid**[57-11-4]****MW = 284.48****478****Table 1.** Coefficients of the polynomial expansion equation. Standard deviations (see introduction):
 $\sigma_{c,w} = 2.1163$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 3.7542 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 342.35 to 573.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.08632 \cdot 10^3$
B	$-6.68677 \cdot 10^{-1}$
C	$-7.53889 \cdot 10^{-5}$

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)
<i>crystal</i>				371.65	829.20 ± 2.00	1.81	1929-hun/maa(∇)
78.15	1081.0 ± 3.0		1930-bil/fis-1	383.65	821.00 ± 2.00	2.31	1929-hun/maa(∇)
194.15	1041.0 ± 3.0		1930-bil/fis-1	392.15	815.30 ± 2.00	2.79	1929-hun/maa(∇)
290.15	1017.0 ± 3.0		1930-bil/fis-1	404.65	806.60 ± 2.00	3.20	1929-hun/maa(∇)
78.15	1098.0 ± 3.0		1930-bil/fis-1	414.65	799.50 ± 2.00	3.41	1929-hun/maa(∇)
290.15	1036.0 ± 3.0		1930-bil/fis-1	418.15	797.50 ± 2.00	3.97	1929-hun/maa(∇)
78.15	1095.0 ± 3.0		1930-bil/fis-1	403.15	799.00 ± 2.00	-5.49	1950-boe/ned ¹⁾
290.15	1035.0 ± 3.0		1930-bil/fis-1	453.15	765.00 ± 2.00	-2.83	1950-boe/ned(◆)
78.15	1083.0 ± 3.0		1930-bil/fis-1	513.15	722.00 ± 2.00	-1.34	1950-boe/ned(◆)
290.15	1023.0 ± 5.0		1930-bil/fis-1	573.15	674.00 ± 2.00	-4.30	1950-boe/ned(◆)
<i>liquid</i>				348.15	843.10 ± 1.00	-1.28	1952-gro/feu(○)
342.35	845.40 ± 2.00	-3.16	1882-kra-1(×)	353.15	839.00 ± 1.00	-1.78	1956-dag(□)
352.75	842.80 ± 2.00	1.74	1893-eyk ¹⁾	343.15	849.00 ± 1.00	1.01	1958-met(Δ)
378.95	825.00 ± 2.00	2.90	1893-eyk(×)	351.80	840.40 ± 0.50	-1.35	1981-ber/ber(×)
351.15	841.80 ± 2.00	-0.42	1912-rut(×)	352.70	839.70 ± 0.50	-1.40	1981-ber/ber(×)
354.25	839.90 ± 2.00	-0.08	1912-rut(×)	368.70	828.60 ± 0.50	-0.93	1981-ber/ber(×)
372.65	827.60 ± 2.00	0.93	1912-rut(×)	380.90	820.20 ± 0.50	-0.48	1981-ber/ber(×)
343.15	849.00 ± 2.00	1.01	1915-dun(×)	383.40	818.40 ± 0.50	-0.47	1981-ber/ber(×)
348.15	843.60 ± 2.00	-0.78	1919-wae/pes(×)	393.90	810.20 ± 0.50	-1.03	1981-ber/ber(×)
343.15	848.00 ± 2.00	0.01	1929-hun/maa(∇)	406.10	801.10 ± 0.50	-1.24	1981-ber/ber(×)
351.45	843.00 ± 2.00	1.00	1929-hun/maa ¹⁾	433.20	782.60 ± 0.50	0.10	1981-ber/ber(×)
361.15	835.50 ± 2.00	0.50	1929-hun/maa(∇)	461.10	760.90 ± 0.50	-1.07	1981-ber/ber(×)

¹⁾ Not included in Fig. 1.**Further references:** [1899-sch-1, 1919-eyk, 1925-hol/gen, 1942-dor/mcc, 1958-cos/bow-1].

cont.

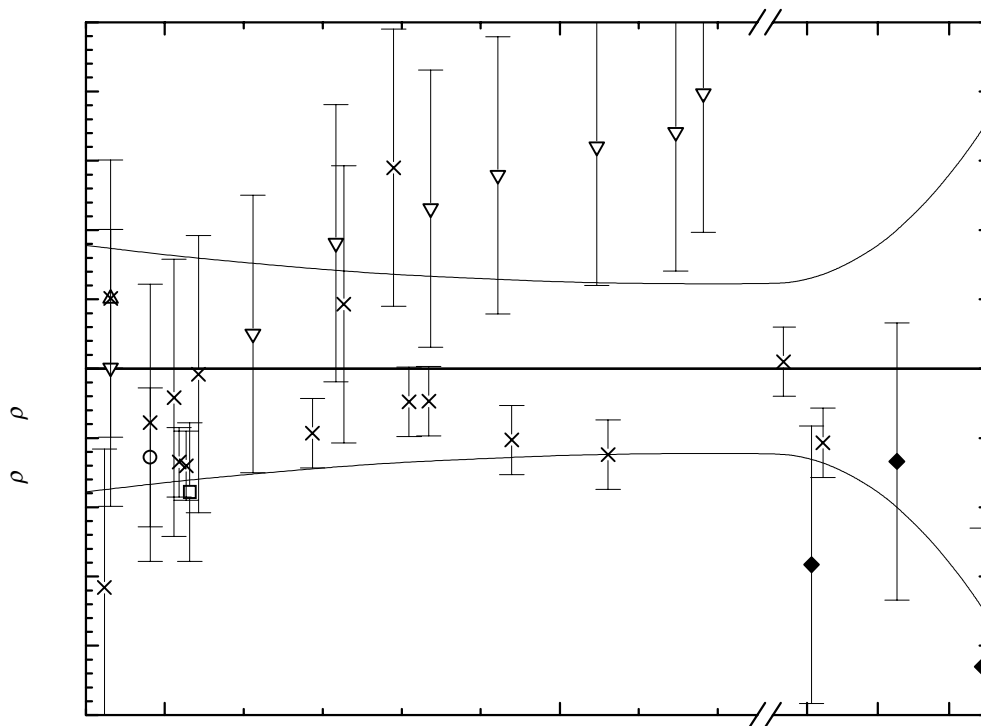


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
340.00	850.26 ± 1.78	430.00	784.85 ± 1.23	520.00	718.22 ± 2.13
350.00	843.05 ± 1.64	440.00	777.51 ± 1.25	530.00	710.75 ± 2.33
360.00	835.83 ± 1.53	450.00	770.15 ± 1.29	540.00	703.25 ± 2.55
370.00	828.59 ± 1.43	460.00	762.78 ± 1.35	550.00	695.74 ± 2.80
380.00	821.34 ± 1.35	470.00	755.39 ± 1.43	560.00	688.22 ± 3.06
390.00	814.07 ± 1.30	480.00	747.99 ± 1.53	570.00	680.68 ± 3.35
400.00	806.79 ± 1.25	490.00	740.57 ± 1.65	580.00	673.13 ± 3.66
410.00	799.49 ± 1.23	500.00	733.14 ± 1.78		
420.00	792.18 ± 1.22	510.00	725.69 ± 1.94		

2-Pentyltridecanoic acid [500043-44-7] C₁₈H₃₆O₂ MW = 284.48 479

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	882.9 ± 1.0	1929-sta/jay

2-Propylpentadecanoic acid [32815-53-5] C₁₈H₃₆O₂ MW = 284.48 480

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.
343.15	846.8 ± 1.0	1959-lei/hag-4

3-Propylpentadecanoic acid [109554-32-7] C₁₈H₃₆O₂ MW = 284.48 481

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.
343.15	849.3 ± 1.0	1959-lei/hag-4

17-Methyloctadecanoic acid [500024-93-1] C₁₉H₃₈O₂ MW = 298.51 482

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.
343.15	842.0 ± 1.0	1942-cas

Nonadecanoic acid [646-30-0] C₁₉H₃₈O₂ MW = 298.51 483

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.
343.15	846.8 ± 1.0	1958-met

3-Propylhexadecanoic acid [109936-07-4] C₁₉H₃₈O₂ MW = 298.51 484

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.
343.15	843.0 ± 1.0	1959-lei/hag-4

4-Propylhexadecanoic acid [109936-08-5] C₁₉H₃₈O₂ MW = 298.51 485

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.
343.15	843.5 ± 1.0	1959-lei/hag-4

Eicosanoic acid [506-30-9] C₂₀H₄₀O₂ MW = 312.54 486

Table 1. Fit with estimated *B* coefficient for 4 accepted points. Deviation $\sigma_w = 0.000$.

Coefficient	$\rho = A + BT$
<i>A</i>	1078.14
<i>B</i>	-0.680

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.
373.15	824.0 ± 2.0	-0.40	1931-ble/ulr ¹⁾
353.15	838.0 ± 1.0	-0.00	1956-dag
358.15	834.6 ± 1.0	-0.00	1956-dag
363.15	831.2 ± 1.0	0.00	1956-dag
368.15	827.8 ± 1.0	-0.00	1956-dag

¹⁾ Not included in calculation of linear coefficients.

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
350.00	840.1 ± 1.3
360.00	833.3 ± 0.7
370.00	826.5 ± 1.2

2-(2-Ethylhexyl)dodecanoic acid [94677-29-9] C₂₀H₄₀O₂ MW = 312.54 487

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	876.7 ± 2.0	1960-nik/ogi-1
293.15	876.7 ± 2.0	1960-pet/nik-2

Docosanoic acid [112-85-6] C₂₂H₄₄O₂ MW = 340.59 488

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.
373.15	822.1 ± 2.0	1931-ble/ulr

Tricosanoic acid [2433-96-7] C₂₃H₄₆O₂ MW = 354.62 489

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.
342.15	803.6 ± 1.5	1882-kra-1
343.85	802.4 ± 1.5	1882-kra-1

Tetracosanoic acid [557-59-5] C₂₄H₄₈O₂ MW = 368.64 490

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.
373.15	820.7 ± 2.0	1931-ble/ulr

Hexacosanoic acid [506-46-7] C₂₆H₅₂O₂ MW = 396.7 491

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.
352.15	835.9 ± 2.0	1893-eyk