

2.2 Phenols, C₁₁ - C₂₃2-(1,1-Dimethylethyl)-4-methylphenol [2409-55-4] C₁₁H₁₆O MW = 164.25 37

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 3.6671 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.4243 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 328.15 to 433.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.18615 \cdot 10^3$
B	$-7.48205 \cdot 10^{-1}$

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)
353.15	922.00 ± 0.60	0.08	1944-par/wei(Δ)	348.15	926.00 ± 1.00	0.34	1953-sta/mue(\square)
393.15	892.00 ± 0.60	0.01	1944-par/wei(Δ)	373.15	907.00 ± 1.00	0.04	1953-sta/mue(\square)
433.15	862.00 ± 0.60	-0.07	1944-par/wei(Δ)	398.15	888.00 ± 1.00	-0.25	1953-sta/mue(\square)
348.15	924.70 ± 1.00	-0.96	1947-mck(\circ)	423.15	870.00 ± 1.00	0.45	1953-sta/mue(\square)
328.15	941.00 ± 1.00	0.37	1953-sta/mue(\square)				

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	946.73 ± 1.41	370.00	909.32 ± 0.75	420.00	871.91 ± 1.02
330.00	939.24 ± 1.22	380.00	901.83 ± 0.73	430.00	864.42 ± 1.18
340.00	931.76 ± 1.05	390.00	894.35 ± 0.75	440.00	856.94 ± 1.37
350.00	924.28 ± 0.92	400.00	886.87 ± 0.80		
360.00	916.80 ± 0.82	410.00	879.39 ± 0.90		

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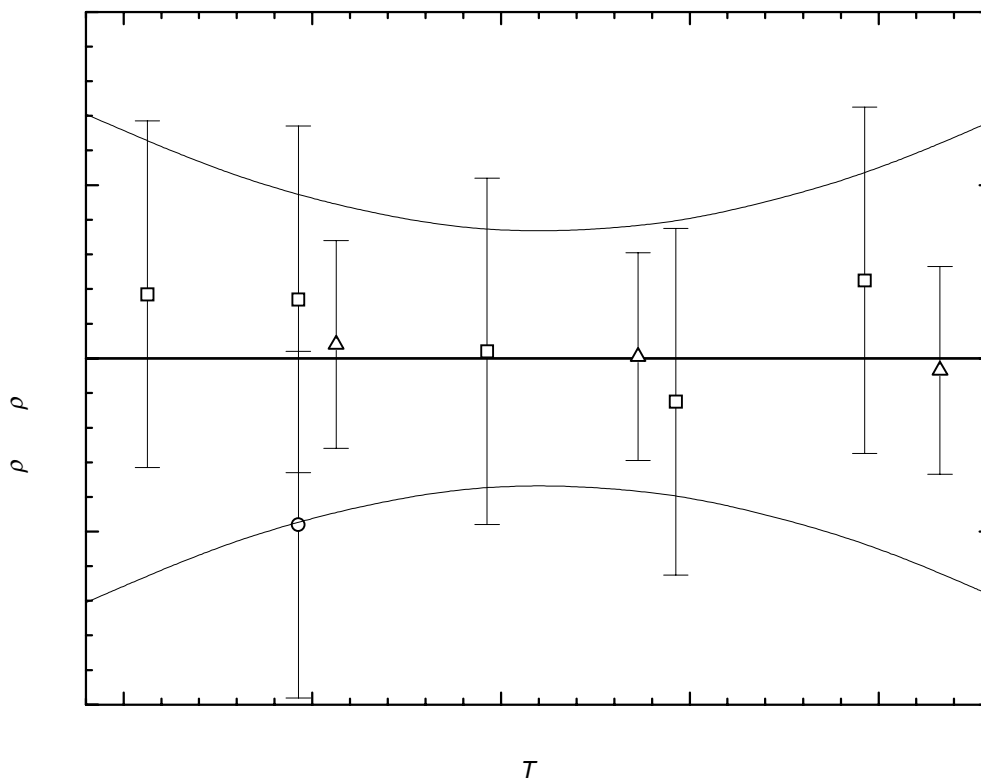
2-(1,1-Dimethylethyl)-4-methylphenol (cont.)

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-(1,1-Dimethylethyl)-5-methylphenol [88-60-8]C₁₁H₁₆O

MW = 164.25

38

Table 1. Fit with estimated *B* coefficient for 2 accepted points. Deviation $\sigma_w = 0.783$.

Coefficient	$\rho = A + BT$
<i>A</i>	1221.01
<i>B</i>	-0.850

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

<i>T</i> K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	$\rho_{\text{exp}} - \rho_{\text{calc}}$ kg · m ⁻³	Ref.
395.05	886.0 ± 1.0	0.78	1963-tho/mea
432.15	852.9 ± 1.0	-0.78	1963-tho/mea
293.15	987.6 ± 4.0	15.77	1964-kha/zav ¹⁾

¹⁾ Not included in calculation of linear coefficients.

cont.

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
390.00	889.5 \pm 1.5
400.00	881.0 \pm 1.2
410.00	872.5 \pm 1.0
420.00	864.0 \pm 1.0
430.00	855.5 \pm 1.3
440.00	847.0 \pm 1.6

2-(1,1-Dimethylethyl)-6-methylphenol [2219-82-1] C11H16O MW = 164.25 39

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	995.7 \pm 2.0	1957-bel/far

4-(1,1-Dimethylethyl)-2-methylphenol [98-27-1] C11H16O MW = 164.25 40

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{\text{c,w}} = 2.6427 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 1.1819 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 323.15 to 448.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.19170 \cdot 10^3$
B	$-7.45143 \cdot 10^{-1}$

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)
323.15	951.00 \pm 1.00	0.10	1953-sta/mue(□)	398.15	895.00 \pm 1.00	-0.02	1953-sta/mue(□)
348.15	932.00 \pm 1.00	-0.28	1953-sta/mue(□)	423.15	876.00 \pm 1.00	-0.39	1953-sta/mue(□)
373.15	914.00 \pm 1.00	0.35	1953-sta/mue(□)	448.15	858.00 \pm 1.00	0.24	1953-sta/mue(□)

Further references: [1957-bel/far].

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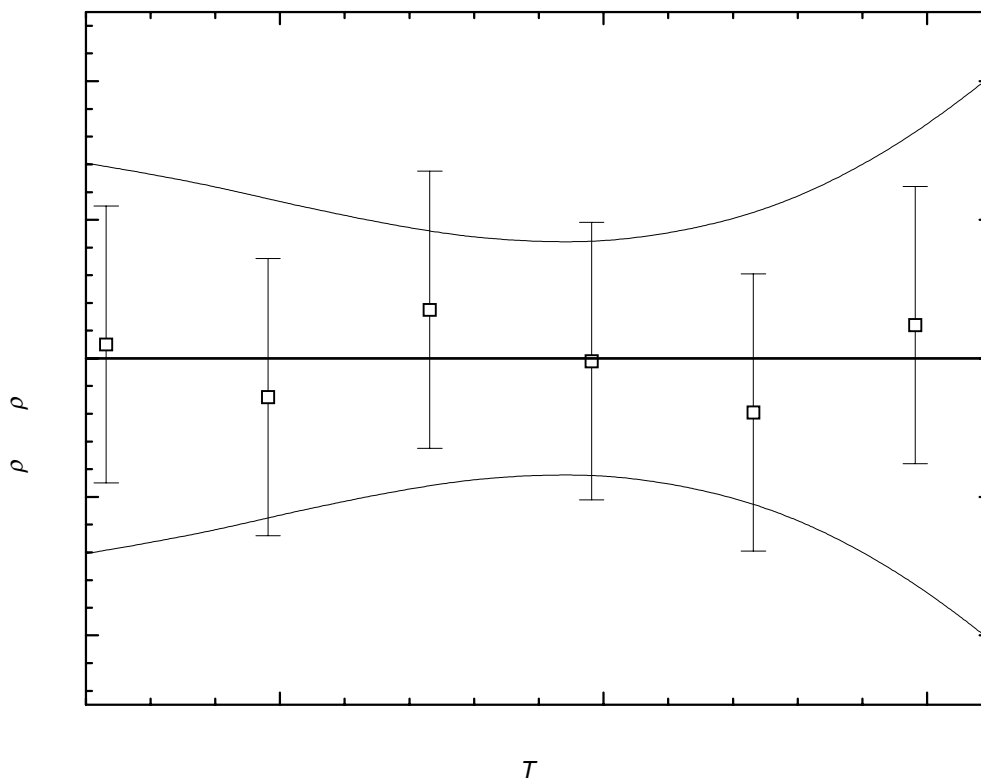
4-(1,1-Dimethylethyl)-2-methylphenol (cont.)

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	953.25 ± 1.41	370.00	915.99 ± 0.94	420.00	878.74 ± 1.00
330.00	945.80 ± 1.33	380.00	908.54 ± 0.87	430.00	871.29 ± 1.16
340.00	938.35 ± 1.24	390.00	901.09 ± 0.84	440.00	863.83 ± 1.39
350.00	930.90 ± 1.13	400.00	893.64 ± 0.84	450.00	856.38 ± 1.68
360.00	923.45 ± 1.03	410.00	886.19 ± 0.90	460.00	848.93 ± 2.04

4-(1,1-Dimethylethyl)-3-methylphenol [2219-72-9] C₁₁H₁₆O MW = 164.25 41

Table 1. Experimental value with uncertainty.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	977.2 ± 1.0	1957-bel/far

4-(1,1-Dimethylpropyl)phenol [80-46-6] C₁₁H₁₆O MW = 164.25 42

Table 1. Experimental value with uncertainty.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	962.0 ± 1.0	1953-sta/mue

2-(1-Methylbutyl)phenol [87-26-3] C₁₁H₁₆O MW = 164.25 43

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	966.5 ± 1.0	1937-tsu/naz

4-(3-Methylbutyl)phenol [1805-61-4] C₁₁H₁₆O MW = 164.25 44

Table 1. Experimental value with uncertainty.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	966.5 ± 2.0	1955-kak/lom

2-Methyl-4-(1-methylpropyl)phenol [42413-56-9] C₁₁H₁₆O MW = 164.25 45

Table 1. Experimental value with uncertainty.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	974.3 ± 2.0	1964-kha/zav

3-Methyl-6-(1-methylpropyl)phenol [500042-18-2] C₁₁H₁₆O MW = 164.25 46

Table 1. Experimental value with uncertainty.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	991.0 ± 1.0	1932-nie/nat

4-Methyl-2-(1-methylpropyl)phenol [51528-17-7] C₁₁H₁₆O MW = 164.25 47

Table 1. Experimental value with uncertainty.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	984.7 ± 2.0	1964-kha/zav

4-Methyl-2-(2-methylpropyl)phenol [500042-00-2] C₁₁H₁₆O MW = 164.25 48

Table 1. Experimental value with uncertainty.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	962.4 ± 1.0	1935-bar/mil

5-Methyl-2-(2-methylpropyl)phenol [147452-04-8] C₁₁H₁₆O MW = 164.25 49

Table 1. Experimental value with uncertainty.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	964.4 ± 1.0	1935-bar/mil

2-Pentylphenol [136-81-2] C₁₁H₁₆O MW = 164.25 50

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	963.5 ± 3.0	1930-san/gir ¹⁾
293.15	962.1 ± 1.0	1937-nie/nie
293.15	960.0 ± 2.0	1953-sta/mue
293.15	961.7 ± 1.3	Recommended

¹⁾ Not included in calculation of recommended value.

2,4-Bis(1-methylethyl)phenol [2934-05-6] C₁₂H₁₈O MW = 178.27 51

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	982.5 ± 3.0	1933-sow/hin ¹⁾
298.15	944.6 ± 2.0	1951-car/eas
298.15	944.6 ± 2.0	1957-kar
298.15	944.6 ± 2.0	Recommended

¹⁾ Not included in calculation of recommended value.

2,6-Bis(1-methylethyl)phenol

[2078-54-8]

C₁₂H₁₈O

MW = 178.27

52

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	955.0 ± 1.0	1957-kol/nap

2-(1,1-Dimethylethyl)-4,5-dimethylphenol

[1445-23-4]

C₁₂H₁₈O

MW = 178.27

53

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{\text{c,w}} = 4.2015 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 1.7153 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 323.15 to 433.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.17524 \cdot 10^3$
B	$-7.21827 \cdot 10^{-1}$

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)
<i>crystal</i>				433.15	863.00 ± 1.00	0.41	1944-par/wei(□)
299.85	973.0 ± 3.0		1944-par/wei	323.15	942.00 ± 1.00	0.01	1953-sta/mue(○)
299.85	973.0 ± 3.0		1953-sta/mue	348.15	924.00 ± 1.00	0.06	1953-sta/mue(○)
<i>liquid</i>				373.15	906.00 ± 1.00	0.11	1953-sta/mue(○)
353.15	920.00 ± 1.00	-0.33	1944-par/wei(□)	423.15	869.00 ± 1.00	-0.80	1953-sta/mue(○)
393.15	892.00 ± 1.00	0.54	1944-par/wei(□)				

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
320.00	944.26 ± 1.41	370.00	908.17 ± 0.88	420.00	872.08 ± 1.13
330.00	937.04 ± 1.33	380.00	900.95 ± 0.80	430.00	864.86 ± 1.42
340.00	929.82 ± 1.23	390.00	893.73 ± 0.78	440.00	857.64 ± 1.82
350.00	922.61 ± 1.11	400.00	886.51 ± 0.82		
360.00	915.39 ± 0.99	410.00	879.30 ± 0.94		

cont.

2-(1,1-Dimethylethyl)-4,5-dimethylphenol (cont.)

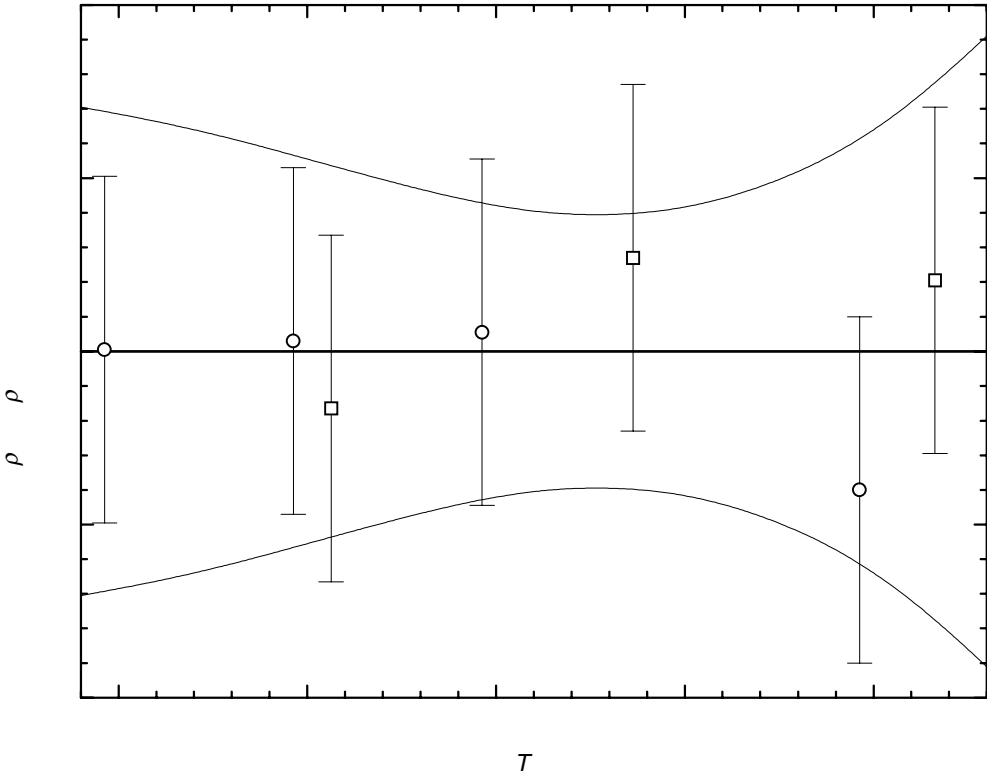


Fig. 1. The symbols show the deviation of the calculated from the experimental values from Table 2. The curves above and below the zero line indicate the calculated error region of the recommended values given in Table 3. The error bars represent the experimental errors. (Error bars smaller than the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

2-(1,1-Dimethylethyl)-4,6-dimethylphenol [1879-09-0] C₁₂H₁₈O MW = 178.27 54

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

Coefficient	$\rho = A + BT$
<i>A</i>	1175.00
<i>B</i>	-0.730

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

<i>T</i> K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³	$\rho_{\text{exp}} - \rho_{\text{calc}}$ kg · m ⁻³	Ref.
353.15	917.0 ± 2.0	-0.20	1944-par/wei
393.15	888.0 ± 2.0	0.00	1944-par/wei
433.15	859.0 ± 2.0	0.20	1944-par/wei

cont.

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	919.5 ± 2.8
360.00	912.2 ± 2.4
370.00	904.9 ± 2.1
380.00	897.6 ± 1.9
390.00	890.3 ± 1.8
400.00	883.0 ± 1.8
410.00	875.7 ± 2.0
420.00	868.4 ± 2.2
430.00	861.1 ± 2.6
440.00	853.8 ± 3.0

4-(1,1-Dimethylethyl)-2,5-dimethylphenol

[17696-37-6]

C₁₂H₁₈O

MW = 178.27

55

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

$\sigma_{\text{c,w}} = 2.1337 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 8.7108 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	T = 348.15 to 433.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.18730 \cdot 10^3$
B	$-7.02447 \cdot 10^{-1}$

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)
<i>crystal</i>				433.15	883.00 ± 1.00	-0.03	1944-par/wei(□)
299.85	1001.0 ± 3.0		1944-par/wei	348.15	943.00 ± 1.00	0.26	1953-sta/mue(○)
299.85	1001.0 ± 3.0		1953-sta/mue	373.15	925.00 ± 1.00	-0.18	1953-sta/mue(○)
<i>liquid</i>				398.15	908.00 ± 1.00	0.38	1953-sta/mue(○)
353.15	939.00 ± 1.00	-0.23	1944-par/wei(□)	423.15	890.00 ± 1.00	-0.06	1953-sta/mue(○)
393.15	911.00 ± 1.00	-0.13	1944-par/wei(□)				

cont.

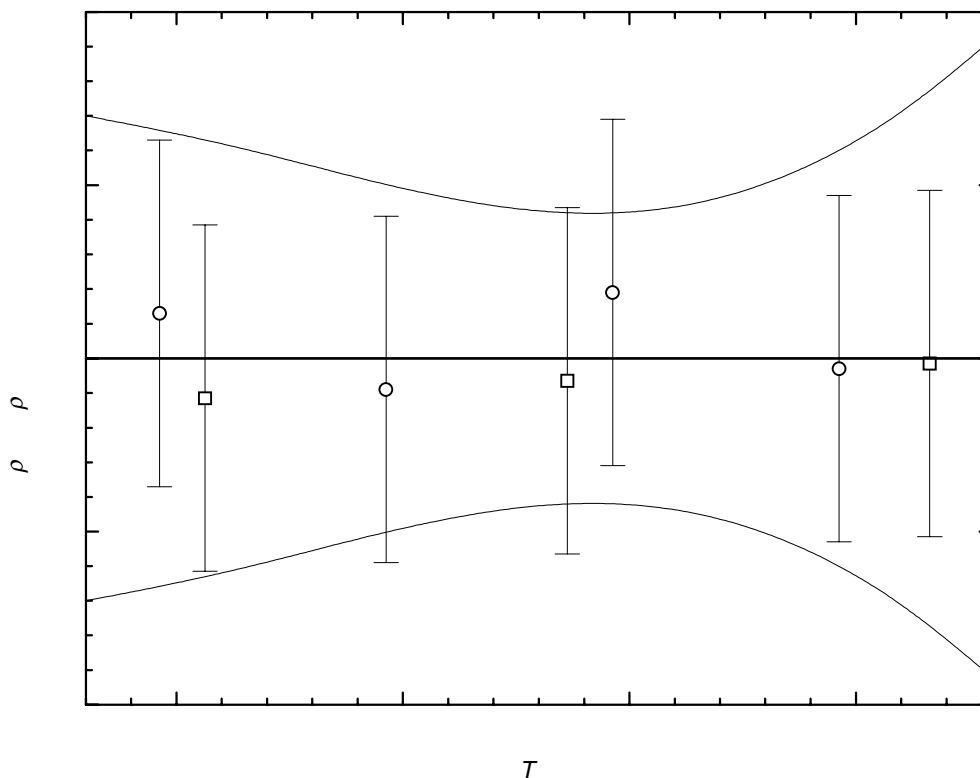
4-(1,1-Dimethylethyl)-2,5-dimethylphenol (cont.)

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	948.47 ± 1.40	380.00	920.37 ± 0.92	420.00	892.27 ± 1.10
350.00	941.44 ± 1.30	390.00	913.35 ± 0.84	430.00	885.25 ± 1.40
360.00	934.42 ± 1.18	400.00	906.32 ± 0.83	440.00	878.22 ± 1.84
370.00	927.39 ± 1.04	410.00	899.30 ± 0.91		

4-(1,1-Dimethylethyl)-2,6-dimethylphenol**[879-97-0]****C₁₂H₁₈O****MW = 178.27****56**

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 3.0173 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.2318 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 353.15 to 433.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.20001 \cdot 10^3$
B	$-8.06036 \cdot 10^{-1}$

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)
<i>crystal</i>				433.15	851.00 ± 1.00	0.12	1944-par/wei(□)
299.85	957.0 ± 3.0		1944-par/wei	353.15	916.00 ± 1.00	0.64	1953-sta/mue(○)
299.85	959.0 ± 3.0		1953-sta/mue	373.15	899.00 ± 1.00	-0.24	1953-sta/mue(○)
<i>liquid</i>				398.15	879.00 ± 1.00	-0.09	1953-sta/mue(○)
353.15	915.00 ± 1.00	-0.36	1944-par/wei(□)	423.15	859.00 ± 1.00	0.06	1953-sta/mue(○)
393.15	883.00 ± 1.00	-0.12	1944-par/wei(□)				

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

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
350.00	917.90 ± 1.32	390.00	885.66 ± 0.85	430.00	853.42 ± 1.38
360.00	909.84 ± 1.22	400.00	877.60 ± 0.82	440.00	845.36 ± 1.85
370.00	901.78 ± 1.08	410.00	869.54 ± 0.89		
380.00	893.72 ± 0.95	420.00	861.48 ± 1.07		

cont.

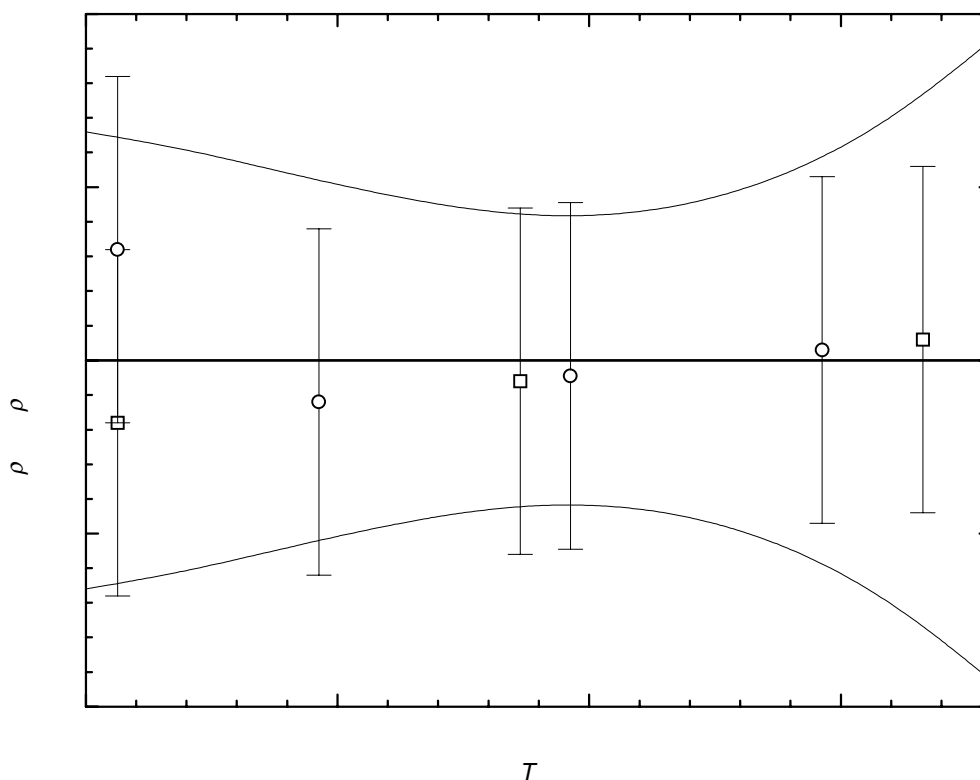
4-(1,1-Dimethylethyl)-2,6-dimethylphenol (cont.)

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.)

4,5-Dimethyl-2-(2-methylpropyl)phenol [55329-19-6] C₁₂H₁₈O MW = 178.27 57

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	966.4 ± 1.0	1935-bar/mil

6-(1,1-Dimethylpropyl)-3-methylphenol [32751-55-6] C₁₂H₁₈O MW = 178.27 58

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	963.2 ± 2.0	1961-sal/vik

2,4-Dipropylphenol [23167-99-9] C₁₂H₁₈O MW = 178.27 59

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.
288.15	934.2 ± 2.0	1957-kar

2-(1-Ethylbutyl)phenol [91763-74-5] C₁₂H₁₈O MW = 178.27 60

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	953.1 ± 2.0	1939-smi/ung

2-Hexylphenol [3226-32-2] C₁₂H₁₈O MW = 178.27 61

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.
296.15	952.4 ± 2.0	1930-san/gir

3-Methyl-4-(1-methylbutyl)phenol [500042-01-3] C₁₂H₁₈O MW = 178.27 62

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	961.4 ± 2.0	1961-sal/vik

3-Methyl-6-(1-methylbutyl)phenol [14705-04-5] C₁₂H₁₈O MW = 178.27 63

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	990.0 ± 2.0	1932-nie/nat
293.15	959.5 ± 2.0	1961-sal/vik

2,4-Bis(1-methylethyl)-5-methylphenol [40625-96-5] C₁₃H₂₀O MW = 192.3 64

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.
353.15	876.3 ± 3.0	1919-eyk ¹⁾
298.15	944.5 ± 2.0	1933-sow/hin
298.15	944.5 ± 2.0	Recommended

¹⁾ Not included in calculation of recommended value.

2,6-Bis(1-methylethyl)-4-methylphenol [20766-99-8] C₁₃H₂₀O MW = 192.3 65

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	966.1 ± 2.0	1933-sow/hin

4,6-Bis(1-methylethyl)-2-methylphenol [106593-24-2] C₁₃H₂₀O MW = 192.3 66

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	947.7 ± 2.0	1933-sow/hin

4-(1-Ethylpentyl)phenol [6465-74-3] C₁₃H₂₀O MW = 192.3 67

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	950.4 ± 2.0	1963-dor/kri

2-Heptylphenol [5284-22-0] C₁₃H₂₀O MW = 192.3 68

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.
296.15	943.2 ± 1.0	1930-san/gir

4-Heptylphenol [1987-50-4] C₁₃H₂₀O MW = 192.3 69

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	958.3 ± 1.0	1937-nie/nie

2-Methyl-4-(1-methylpentyl)phenol [500042-03-5] C₁₃H₂₀O MW = 192.3 70

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	948.7 ± 1.0	1964-rom/kar

2,6-Bis(1,1-dimethylethyl)phenol [128-39-2] C₁₄H₂₂O MW = 206.33 71

Table 1. Fit with estimated *B* coefficient for 2 accepted points. Deviation $\sigma_w = 0.030$.

Coefficient	$\rho = A + BT$
<i>A</i>	1209.42
<i>B</i>	-0.880

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.
394.15	862.6 ± 1.0	0.03	1963-tho/mea
432.15	829.1 ± 1.0	-0.03	1963-tho/mea

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
390.00	866.2 ± 1.5
400.00	857.4 ± 1.1
410.00	848.6 ± 0.9
420.00	839.8 ± 1.0
430.00	831.0 ± 1.2
440.00	822.2 ± 1.6

2,6-Bis(2-methylpropyl)phenol [52348-51-3] C₁₄H₂₂O MW = 206.33 72

Table 1. Experimental value with uncertainty.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	956.4 ± 1.0	1935-bar/mil

4-(1,1-Diethylbutyl)phenol [63264-81-3] C₁₄H₂₂O MW = 206.33 73

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	954.5 ± 1.0	1948-hus/lan
293.15	954.4 ± 1.0	1953-sta/mue
293.15	954.5 ± 1.0	Recommended

4-(1,1-Dimethyl-2-ethylbutyl)phenol [500042-05-7] C₁₄H₂₂O MW = 206.33 74

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	966.8 ± 2.0	1939-hus/gui

4-[(1,2-Dimethyl-1-ethyl)butyl]phenol [59048-99-6] C₁₄H₂₂O MW = 206.33 75

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	971.7 ± 1.0	1948-hus/lan
293.15	971.7 ± 1.0	1953-sta/mue
293.15	971.7 ± 1.0	Recommended

4-[(1,3-Dimethyl-1-ethyl)butyl]phenol [500061-01-8] C₁₄H₂₂O MW = 206.33 76

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	953.0 ± 1.0	1948-hus/lan
293.15	953.0 ± 1.0	1953-sta/mue
293.15	953.0 ± 1.0	Recommended

4-(1,1-Dimethylhexyl)phenol [30784-29-3] C₁₄H₂₂O MW = 206.33 77

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	948.9 ± 2.0	1939-hus/gui

4-(1-Ethyl-1-methylpentyl)phenol [1988-35-8] C₁₄H₂₂O MW = 206.33 78

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	956.9 ± 2.0	1958-tri ¹⁾
293.15	951.6 ± 1.0	1948-hus/lan
293.15	951.6 ± 1.0	1953-sta/mue
293.15	951.6 ± 1.0	Recommended

¹⁾ Not included in calculation of recommended value.

4-(1-Methylheptyl)phenol [1818-08-2] C₁₄H₂₂O MW = 206.33 79

Table 1. Experimental value with uncertainty.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
293.15	947.4 ± 2.0	1963-dor/kri

5-Methyl-2-(1-methylethyl)-6-(2-methylpropyl)phenol [500042-10-4] C₁₄H₂₂O MW = 206.33 80

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	934.4 ± 1.0	1935-bar/mil

2-Methyl-4-(1-methylhexyl)phenol [42433-61-4] C₁₄H₂₂O MW = 206.33 81

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	949.9 ± 1.0	1964 -rom/kar

2-Octylphenol [949-13-3] C₁₄H₂₂O MW = 206.33 82

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.
296.15	936.2 ± 1.0	1930-san/gir

4-(1,1,2-Trimethylpentyl)phenol [500042-06-8] C₁₄H₂₂O MW = 206.33 83

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	966.7 ± 2.0	1939-hus/gui

4-(1,1,3-Trimethylpentyl)phenol [500042-07-9] C₁₄H₂₂O MW = 206.33 84

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	952.6 ± 2.0	1939-hus/gui

4-(1,1,4-Trimethylpentyl)phenol [46376-57-2] C₁₄H₂₂O MW = 206.33 85

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	950.2 ± 2.0	1939-hus/gui

2,4-Bis(1,1-dimethylethyl)-5-methylphenol [497-39-2] C₁₅H₂₄O MW = 220.35 86

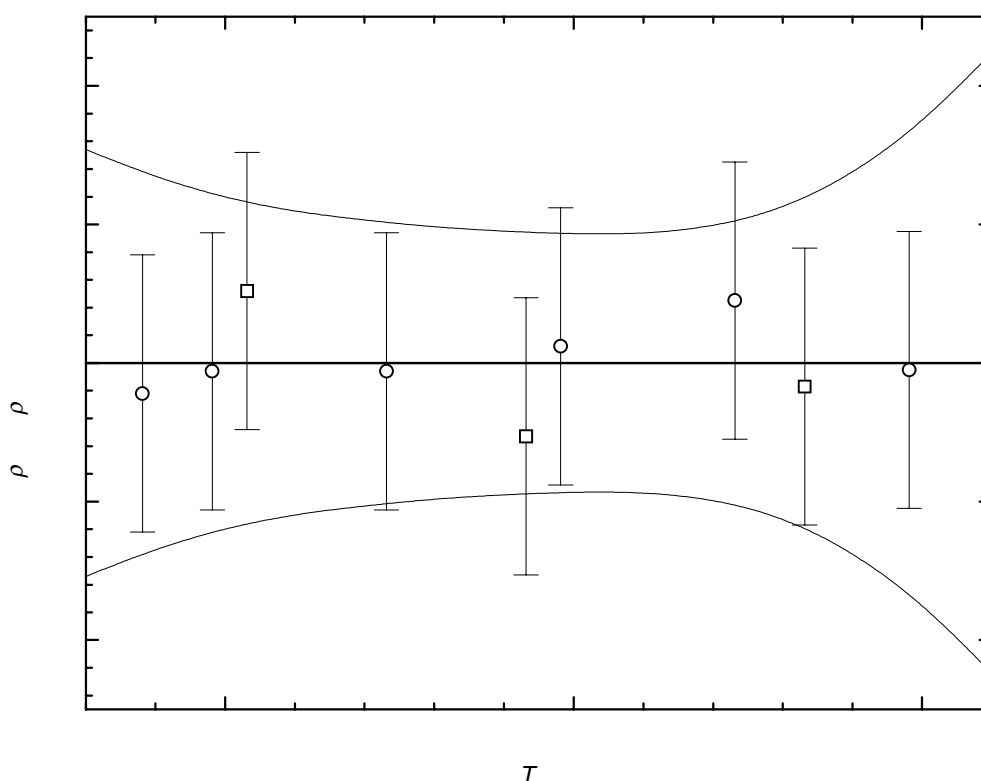
Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{\text{c,w}} = 3.0947 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 1.1697 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 338.15 to 448.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.14892 \cdot 10^3$
B	$-6.26297 \cdot 10^{-1}$
C	$-1.30421 \cdot 10^{-4}$

cont.

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

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)	$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{\rho_{\text{exp}} - \rho_{\text{calc}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref. (Symbol in Fig. 1)
353.15	912.00 ± 1.00	0.52	1944-par/wei(□)	373.15	897.00 ± 1.00	-0.06	1953-sta/mue(○)
393.15	882.00 ± 1.00	-0.53	1944-par/wei(□)	398.15	879.00 ± 1.00	0.12	1953-sta/mue(○)
433.15	853.00 ± 1.00	-0.17	1944-par/wei(□)	423.15	861.00 ± 1.00	0.45	1953-sta/mue(○)
338.15	922.00 ± 1.00	-0.22	1953-sta/mue(○)	448.15	842.00 ± 1.00	-0.05	1953-sta/mue(○)
348.15	915.00 ± 1.00	-0.06	1953-sta/mue(○)				

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

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
330.00	928.04 ± 1.54	380.00	892.09 ± 0.98	430.00	855.50 ± 1.11
340.00	920.90 ± 1.34	390.00	884.83 ± 0.95	440.00	848.10 ± 1.36
350.00	913.74 ± 1.19	400.00	877.53 ± 0.93	450.00	840.67 ± 1.73
360.00	906.55 ± 1.09	410.00	870.21 ± 0.93	460.00	833.22 ± 2.24
370.00	899.33 ± 1.03	420.00	862.87 ± 0.98		

2,4-Bis(1,1-dimethylethyl)-6-methylphenol**[616-55-7]****C₁₅H₂₄O****MW = 220.35****87**

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 2.8205 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 9.9718 \cdot 10^{-2}$ (combined temperature ranges, unweighted).

Coefficient	T = 328.15 to 448.15 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.14787 \cdot 10^3$
B	$-7.26876 \cdot 10^{-1}$

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)
		<i>crystal</i>		328.15	909.00 ± 1.00	-0.35	1953-sta/mue(O)
299.85	940.0 ± 4.0		1944-par/wei	348.15	895.00 ± 1.00	0.19	1953-sta/mue(O)
299.85	940.0 ± 4.0		1953-sta/mue	373.15	877.00 ± 1.00	0.36	1953-sta/mue(O)
		<i>liquid</i>		398.15	859.00 ± 1.00	0.53	1953-sta/mue(O)
353.15	891.00 ± 1.00	-0.18	1944-par/wei(□)	423.15	840.00 ± 1.00	-0.30	1953-sta/mue(O)
393.15	862.00 ± 1.00	-0.10	1944-par/wei(□)	448.15	822.00 ± 1.00	-0.12	1953-sta/mue(O)
433.15	833.00 ± 1.00	-0.03	1944-par/wei(□)				

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

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
320.00	915.27 ± 1.39	370.00	878.93 ± 0.97	420.00	842.59 ± 0.98
330.00	908.00 ± 1.33	380.00	871.66 ± 0.89	430.00	835.32 ± 1.13
340.00	900.74 ± 1.24	390.00	864.39 ± 0.85	440.00	828.05 ± 1.34
350.00	893.47 ± 1.15	400.00	857.12 ± 0.84	450.00	820.78 ± 1.62
360.00	886.20 ± 1.05	410.00	849.85 ± 0.89	460.00	813.51 ± 1.98

cont.

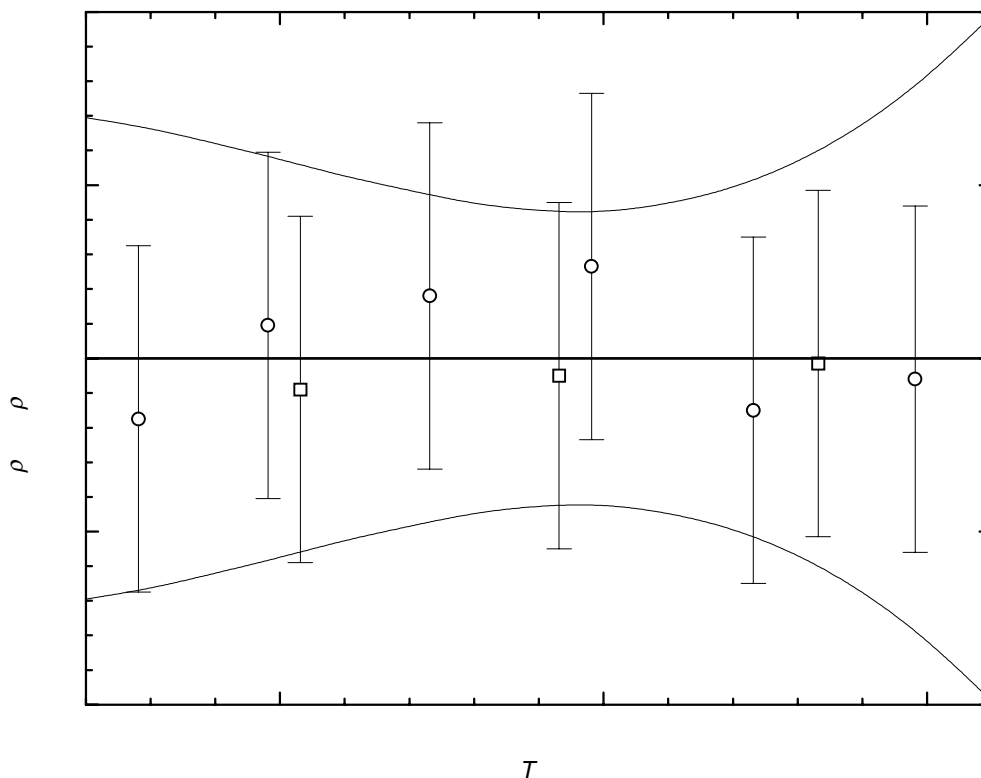
2,4-Bis(1,1-dimethylethyl)-6-methylphenol (cont.)

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.)

2,6-Bis(1,1-dimethylethyl)-4-methylphenol

[128-37-0]

C₁₅H₂₄O

MW = 220.35

88

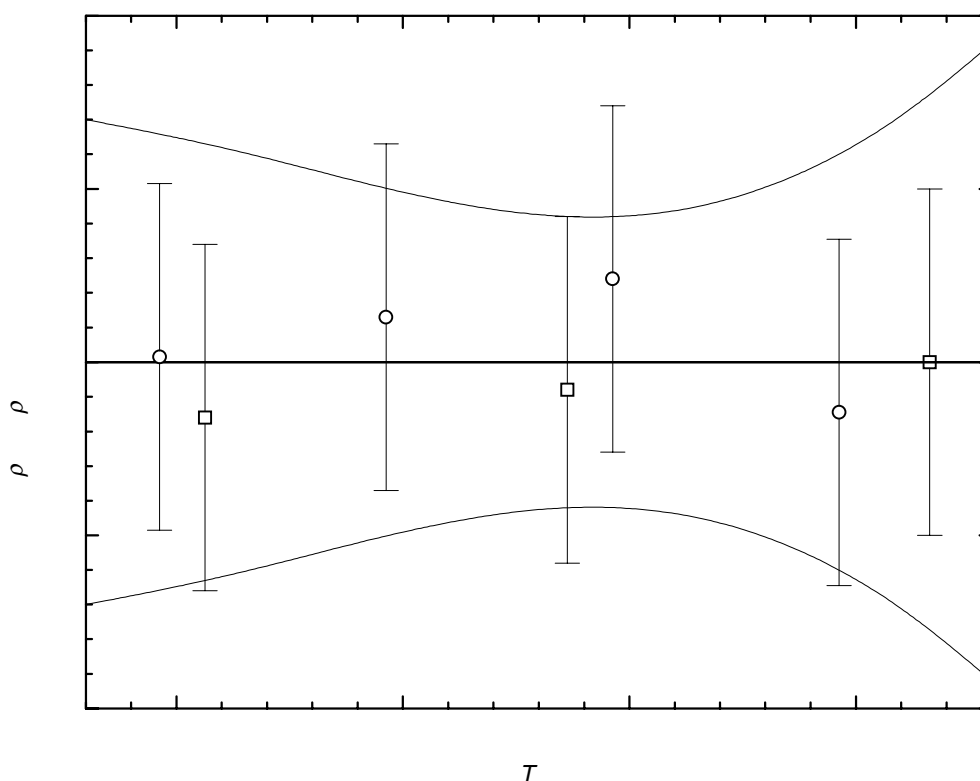
Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{c,w} = 2.7154 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.1085 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 348.15 to 433.15 K
	$\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.15678 \cdot 10^3$
B	$-7.29032 \cdot 10^{-1}$

cont.

2,6-Bis(1,1-dimethylethyl)-4-methylphenol (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)
<i>crystal</i>				433.15	841.00 \pm 1.00	-0.00	1944-par/wei(\square)
293.15	1048.0 \pm 4.0		1944-par/wei	348.15	903.00 \pm 1.00	0.03	1953-sta/mue(\circ)
293.15	1048.0 \pm 4.0		1953-sta/mue	373.15	885.00 \pm 1.00	0.26	1953-sta/mue(\circ)
<i>liquid</i>				398.15	867.00 \pm 1.00	0.48	1953-sta/mue(\circ)
353.15	899.00 \pm 1.00	-0.32	1944-par/wei(\square)	423.15	848.00 \pm 1.00	-0.29	1953-sta/mue(\circ)
393.15	870.00 \pm 1.00	-0.16	1944-par/wei(\square)				

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

$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{K}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
340.00	908.91 \pm 1.40	380.00	879.75 \pm 0.92	420.00	850.59 \pm 1.10
350.00	901.62 \pm 1.30	390.00	872.46 \pm 0.84	430.00	843.30 \pm 1.40
360.00	894.33 \pm 1.18	400.00	865.17 \pm 0.83	440.00	836.01 \pm 1.84
370.00	887.04 \pm 1.04	410.00	857.88 \pm 0.91		

2,6-Bis(2-methylpropyl)-4-methylphenol [2364-74-1] C₁₅H₂₄O MW = 220.35 89

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	913.5 \pm 1.0	1935-bar/mil

2,6-Bis(2-methylpropyl)-5-methylphenol [500042-14-8] C₁₅H₂₄O MW = 220.35 90

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	922.4 \pm 1.0	1935-bar/mil

2-(1,1-Dimethylethyl)-6-(1,1-dimethylpropyl)phenol [500042-12-6] C₁₅H₂₄O MW = 220.35 91

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	935.4 \pm 1.0	1962-ers/vol

4-(1-Methyloctyl)phenol [17404-66-9] C₁₅H₂₄O MW = 220.35 92

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	933.4 \pm 2.0	1963-dor/kri

3-Methyl-4-(1,1,3,3-tetramethylbutyl)phenol

[500061-17-6]

C₁₅H₂₄O

MW = 220.35

93

Table 1. Fit with estimated B coefficient for 3 accepted points. Deviation $\sigma_w = 0.340$.

Coefficient	$\rho = A + BT$
A	1158.73
B	-0.720

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	904.0 ± 2.0	-0.47	1944-par/wei
393.15	876.0 ± 2.0	0.33	1944-par/wei
433.15	847.0 ± 2.0	0.13	1944-par/wei

Table 3. Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ kg · m ⁻³
350.00	906.7 ± 2.8
360.00	899.5 ± 2.5
370.00	892.3 ± 2.2
380.00	885.1 ± 1.9
390.00	877.9 ± 1.8
400.00	870.7 ± 1.9
410.00	863.5 ± 2.0
420.00	856.3 ± 2.3
430.00	849.1 ± 2.6
440.00	841.9 ± 3.0

4-Methyl-2-(1,1,3,3-tetramethylbutyl)phenol

[4979-46-8]

C₁₅H₂₄O

MW = 220.35

94

Table 1. Fit with estimated B coefficient for 3 accepted points. Deviation $\sigma_w = 0.340$.

Coefficient	$\rho = A + BT$
A	1158.73
B	-0.720

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.
<i>crystal</i>			
299.85	930.0 ± 4.0		1944-par/wei
<i>liquid</i>			
353.15	904.0 ± 2.0	-0.47	1944-par/wei
393.15	876.0 ± 2.0	0.33	1944-par/wei
433.15	847.0 ± 2.0	0.13	1944-par/wei

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	906.7 ± 2.8
360.00	899.5 ± 2.5
370.00	892.3 ± 2.2
380.00	885.1 ± 1.9
390.00	877.9 ± 1.8
400.00	870.7 ± 1.9
410.00	863.5 ± 2.0
420.00	856.3 ± 2.3
430.00	849.1 ± 2.6
440.00	841.9 ± 3.0

2-Nonylphenol

[136-83-4]

C₁₅H₂₄O

MW = 220.35

95

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.
296.15	930.9 ± 1.0	1930-san/gir

2,4,6-Tris(1-methylethyl)phenol

[2934-07-8]

C₁₅H₂₄O

MW = 220.35

96

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	949.7 ± 2.0	1933-sow/hin

2,6-Bis(1,1-dimethylpropyl)phenol [3279-20-7] C₁₆H₂₆O MW = 234.38 97

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	935.0 ± 1.0	1962-ers/vol

2,6-Bis(1,1-dimethylpropyl)-4-methylphenol [56103-67-4] C₁₇H₂₈O MW = 248.41 98

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	938.6 ± 3.0	1961-dyu/nik ¹⁾
298.15	931.0 ± 1.0	1944-par/wei
298.15	931.0 ± 1.0	1953-sta/mue
298.15	931.0 ± 1.0	Recommended

¹⁾ Not included in calculation of recommended value.

2,4,6-Tris(1,1-dimethylethyl)phenol [732-26-3] C₁₈H₃₀O MW = 262.44 99

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.
299.85	864.0 ± 2.0	1944-par/wei
299.85	864.0 ± 2.0	1953-sta/mue
299.85	864.0 ± 2.0	Recommended

4-(1,1,3,3,5,5-Hexamethylhexyl)phenol [500042-16-0] C₁₈H₃₀O MW = 262.44 100

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	964.4 ± 1.0	1957-bel/far

2,6-Bis(1,1-dimethylhexyl)-4-methylphenol [13698-57-2] C₂₃H₄₀O MW = 332.57 101

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	919.0 ± 3.0	1961-dyu/nik