

6.2 Unsaturated Amines

2-Propene-1-amine
[107-11-9]
C₃H₇N
MW = 57.1
650

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

$\sigma_{c,w} = 5.8367 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{c,uw} = 1.9007 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	T = 277.15 to 314.45 K $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$1.07466 \cdot 10^3$
B	-1.06411

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)
278.35	778.70 ± 1.50	0.23	1889-gla/per(V)	298.15	756.10 ± 0.60	-1.30	1889-per(□)
277.15	779.90 ± 0.60	0.16	1889-per(□)	293.15	763.10 ± 0.80	0.38	1895-bru-1(Δ)
283.15	773.70 ± 0.60	0.34	1889-per(□)	294.95	761.30 ± 0.80	0.50	1895-bru-1(Δ)
288.15	768.10 ± 0.60	0.06	1889-per(□)	293.15	762.10 ± 0.60	-0.62	1948-vog-4(○)
293.15	762.30 ± 0.60	-0.42	1889-per(□)	314.45	740.70 ± 0.60	0.65	1948-vog-4(○)

Further references: [1884-gla].

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	787.35 ± 1.44	293.15	762.72 ± 0.62	310.00	744.79 ± 0.80
280.00	776.71 ± 0.95	298.15	757.40 ± 0.61	320.00	734.15 ± 1.17
290.00	766.07 ± 0.67	300.00	755.43 ± 0.62		

cont.

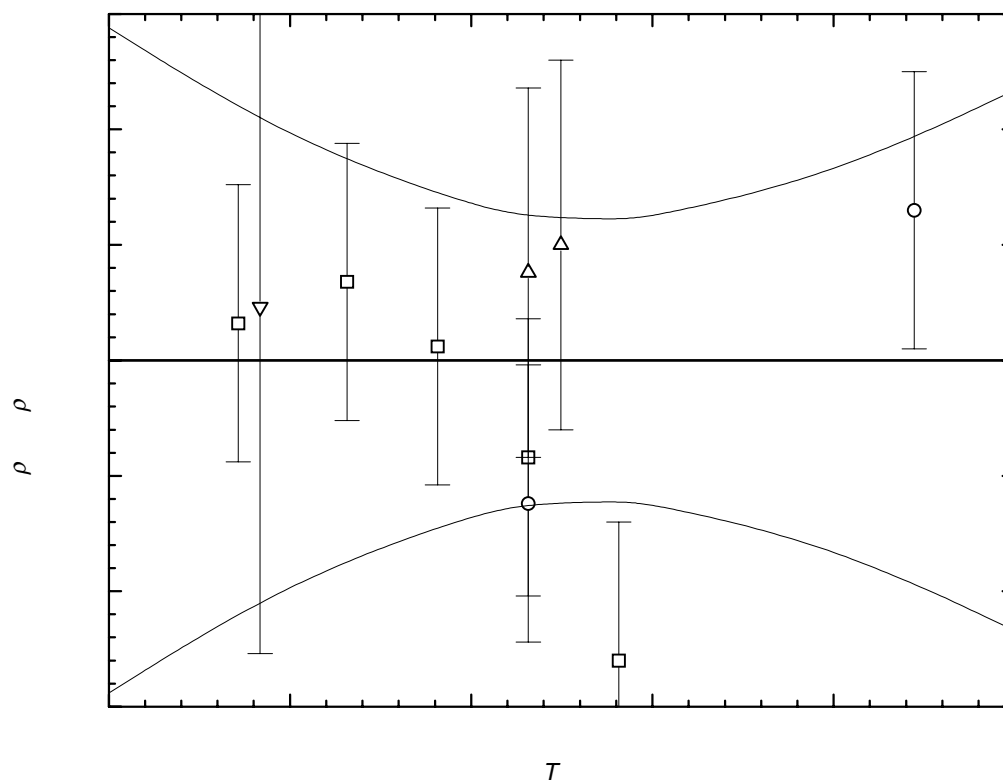
2-Propene-1-amine (cont.)

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

1-Methyl-4-pentene-1-amine

[500015-35-0]

 $\text{C}_6\text{H}_{13}\text{N}$

MW = 99.18

651

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.
285.75	785.2 ± 0.5	1892-eyk

N-(2-Propenyl)-1,1,3,3-tetramethylbutylamine

[500044-77-9]

 $\text{C}_{11}\text{H}_{23}\text{N}$

MW = 169.31

652

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	799.4 ± 1.0	1956-bor/lus

***N*-(5,5-Dimethyl-2-hexenyl)-1,1,3,3-tetramethylbutylamine** [500044-78-0] C₁₆H₃₃N MW = 239.44 653

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	803.6 ± 1.0	1956-bor/lus

***N,N*-Dimethyl-4-pentene-1-amine** [500015-36-1] C₇H₁₅N MW = 113.2 654

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.
288.05	763.4 ± 0.5	1892-eyk

***N,N*-Dimethyl-5-hexene-1-amine** [500015-37-2] C₈H₁₇N MW = 127.23 655

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.
285.25	773.0 ± 0.6	1892-eyk

***N,N*-Diethyl-1-heptene-3-amine** [500003-44-1] C₁₁H₂₃N MW = 169.31 656

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.
289.15	797.0 ± 2.0	1956-gla/gau

***N,N*-Diethyl-4-heptene-1-amine** [500003-46-3] C₁₁H₂₃N MW = 169.31 657

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.
289.85	788.0 ± 2.0	1956-gla/gau

***N,N*-Diethyl-5-heptene-1-amine** [500003-45-2] C₁₁H₂₃N MW = 169.31 658

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.
289.15	791.0 ± 2.0	1956-gla/gau