

3 Tabulated Data on Density - Unsaturated Halohydrocarbons

3.1 Haloalkenes

3.1.1 Bromoalkenes

1,2-Dibromoethene, (*cis+trans*) [540-49-8] $\text{C}_2\text{H}_2\text{Br}_2$ MW = 185.85 598

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	2256.00 ± 1.50	1891-gla

Bromoethene [593-60-2] $\text{C}_2\text{H}_3\text{Br}$ MW = 106.95 599

Table 1. Coefficients of the polynomial expansion equation. Standard deviations (see introduction): $\sigma_{\text{c,w}} = 9.3553 \cdot 10^{-1}$ (combined temperature ranges, weighted), $\sigma_{\text{c,uw}} = 2.5947 \cdot 10^{-1}$ (combined temperature ranges, unweighted).

Coefficient	$T = 237.65 \text{ to } 300.75 \text{ K}$ $\rho = A + BT + CT^2 + DT^3 + \dots$
A	$2.17639 \cdot 10^3$
B	-2.25346

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref. (Symbol in Fig. 1)	T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref. (Symbol in Fig. 1)
237.65	1642.20 ± 2.00	1.35	1937-guy/sch(□)	273.15	1561.60 ± 2.00	0.75	1937-guy/sch(□)
240.45	1634.00 ± 2.00	-0.54	1937-guy/sch(□)	273.85	1559.00 ± 2.00	-0.28	1937-guy/sch(□)
248.95	1615.70 ± 2.00	0.31	1937-guy/sch(□)	276.25	1554.50 ± 2.00	0.63	1937-guy/sch(□)
259.05	1592.00 ± 2.00	-0.63	1937-guy/sch(□)	279.25	1548.00 ± 2.00	0.89	1937-guy/sch(□)
260.45	1588.10 ± 2.00	-1.37	1937-guy/sch(□)	285.75	1533.80 ± 2.00	1.34	1937-guy/sch(□)
266.35	1576.00 ± 2.00	-0.18	1937-guy/sch(□)	296.15	1509.50 ± 2.00	0.48	1937-guy/sch(□)
268.65	1569.40 ± 2.00	-1.59	1937-guy/sch(□)	300.75	1497.50 ± 2.00	-1.16	1937-guy/sch(□)

Further references: [1883-ans, 1930-juv].

cont.

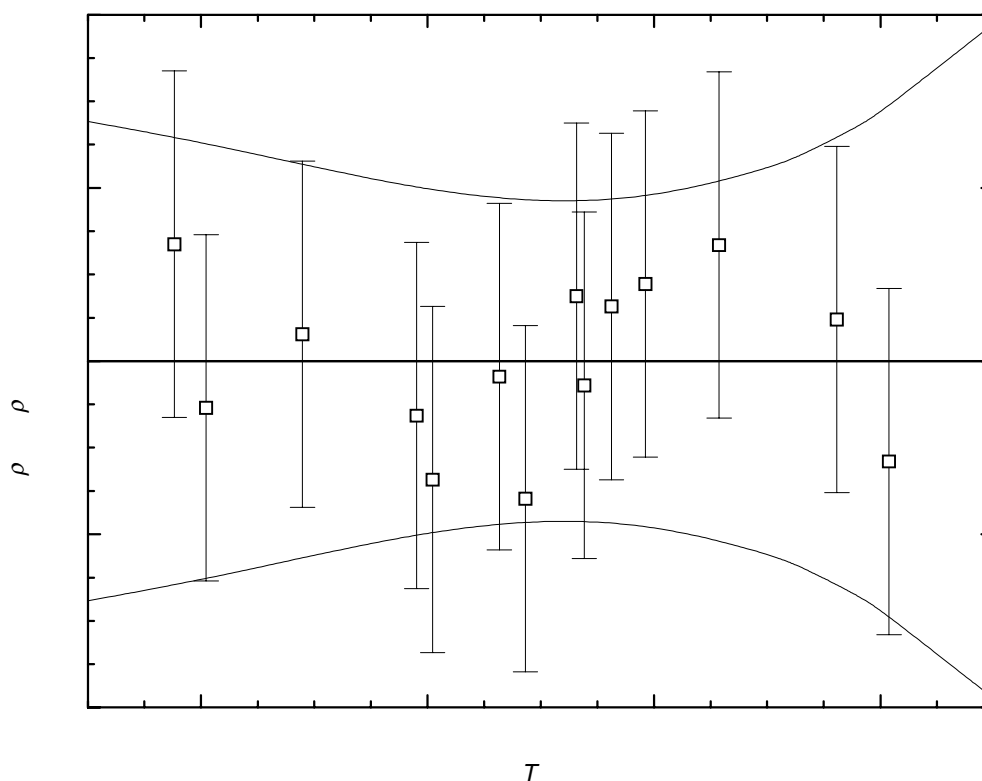
Bromoethene (cont.)

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

$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$	$\frac{T}{\text{K}}$	$\frac{\rho \pm \sigma_{\text{fit}}}{\text{kg} \cdot \text{m}^{-3}}$
230.00	1658.09 ± 2.77	270.00	1567.95 ± 1.82	298.15	1504.52 ± 2.72
240.00	1635.56 ± 2.53	280.00	1545.42 ± 1.88	300.00	1500.35 ± 2.87
250.00	1613.02 ± 2.24	290.00	1522.88 ± 2.22	310.00	1477.81 ± 3.90
260.00	1590.49 ± 1.97	293.15	1515.78 ± 2.38		

1-Bromo-1-propene**[590-14-7]****C₃H₅Br****MW = 120.98****600****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.
292.65	1428.00 ± 2.00	1878-reb
293.15	1415.50 ± 3.00	1933-bac

(E)-1-Bromo-1-propene

[590-15-8]

 $\text{C}_3\text{H}_5\text{Br}$

MW = 120.98

601

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

Coefficient	$\rho = A + BT$
A	1895.12
B	-1.640

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1416.90 ± 2.00	2.55	1927-kir ¹⁾
273.15	1447.10 ± 1.50	-0.05	1955-har/hat
298.15	1406.20 ± 1.50	0.05	1955-har/hat

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$
270.00	1452.3 ± 1.5
280.00	1435.9 ± 1.0
290.00	1419.5 ± 1.0
293.15	1414.4 ± 1.1
298.15	1406.2 ± 1.3

(Z)-1-Bromo-1-propene

[590-13-6]

 $\text{C}_3\text{H}_5\text{Br}$

MW = 120.98

602

Table 1. Fit with estimated B coefficient for 3 accepted points. Deviation $\sigma_w = 0.579$.

Coefficient	$\rho = A + BT$
A	1977.31
B	-1.880

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
288.90	1433.80 ± 3.00	-0.38	1914-cha ¹⁾
289.35	1433.30 ± 3.00	-0.04	1914-cha ¹⁾
298.15	1415.70 ± 2.00	-1.09	1947-rog
273.15	1464.10 ± 1.50	0.31	1955-har/hat
298.15	1417.10 ± 1.50	0.31	1955-har/hat

¹⁾ Not included in calculation of linear coefficients.

cont.

(Z)-1-Bromo-1-propene (cont.)**Table 3.** Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1469.7 \pm 1.8
280.00	1450.9 \pm 1.3
290.00	1432.1 \pm 1.1
293.15	1426.2 \pm 1.1
298.15	1416.8 \pm 1.3

2-Bromo-1-propene

[557-93-7]

 $\text{C}_3\text{H}_5\text{Br}$

MW = 120.98

603

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.
288.90	1396.50 \pm 3.00	1914-cha
293.15	1380.00 \pm 2.00	1935-far/bac
298.15	1380.30 \pm 2.00	1947-rog

3-Bromo-1-propene

[106-95-6]

 $\text{C}_3\text{H}_5\text{Br}$

MW = 120.98

604

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	1408.30 \pm 2.00	1930-juv

1,2-Dibromo-2-butene

[20629-39-4]

 $\text{C}_4\text{H}_6\text{Br}_2$

MW = 213.90

605

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	1880.00 \pm 10.00	1929-les/wie

2,3-Dibromo-1-butene

[52111-97-4]

 $\text{C}_4\text{H}_6\text{Br}_2$

MW = 213.90

606

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.
295.15	1869.80 \pm 2.00	1929-les/wie
293.15	1888.10 \pm 1.50	1931-hur/mei

3,4-Dibromo-1-butene**[10463-48-6]****MW = 213.90****607****Table 1.** Fit with estimated B coefficient for 3 accepted points. Deviation $\sigma_w = 1.179$.

Coefficient	$\rho = A + BT$
<i>A</i>	2514.08
<i>B</i>	-2.300

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.
293.15	1839.00 ± 2.00	-0.83	1959-hat/gar
298.15	1830.00 ± 2.00	1.67	1959-hat/gar
303.15	1816.00 ± 2.00	-0.83	1959-hat/gar

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	1847.1 ± 2.3
293.15	1839.8 ± 2.2
298.15	1828.3 ± 2.1
310.00	1801.1 ± 2.4

(E)-1-Bromo-1-butene**[32620-08-9]****MW = 135.00****608****Table 1.** Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.095$.

Coefficient	$\rho = A + BT$
<i>A</i>	1739.46
<i>B</i>	-1.430

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.
288.15	1327.50 ± 2.00	0.10	1926-lep
295.15	1317.30 ± 2.00	-0.10	1926-lep

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
280.00	1339.1 ± 2.1
290.00	1324.8 ± 1.8
293.15	1320.3 ± 1.8
298.15	1313.1 ± 1.9

(Z)-1-Bromo-1-butene [31849-78-2] $\text{C}_4\text{H}_7\text{Br}$ MW = 135.00 609

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.
290.15	1210.00 ± 4.00	1926-kir-1

1-Bromo-2-butene [4784-77-4] $\text{C}_4\text{H}_7\text{Br}$ MW = 135.00 610

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.
273.15	1311.90 ± 20.00	1899-cha-2
293.15	1333.10 ± 2.00	1930-juv
294.15	1334.20 ± 2.00	1936-gan
273.15	1368.00 ± 5.00	1937-del
289.65	1348.00 ± 5.00	1937-del
293.15	1324.70 ± 3.00	1952-pet/che-2

2-Bromo-1-butene [23074-36-4] $\text{C}_4\text{H}_7\text{Br}$ MW = 135.00 611

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.
294.15	1282.00 ± 3.00	1891-reb
288.15	1320.90 ± 2.00	1926-lep
295.15	1310.00 ± 2.00	1926-lep

(E)-2-Bromo-2-butene [3017-71-8] $\text{C}_4\text{H}_7\text{Br}$ MW = 135.00 612

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.
299.15	1320.60 ± 3.00	1900-wis/sch
298.15	1317.40 ± 2.00	1959-goe/lar

(Z)-2-Bromo-2-butene [3017-68-3] $\text{C}_4\text{H}_7\text{Br}$ MW = 135.00 613

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.
299.15	1315.20 ± 3.00	1900-wis/sch
298.15	1332.00 ± 2.00	1959-goe/lar

3-Bromo-1-butene [22037-73-6] $\text{C}_4\text{H}_7\text{Br}$ MW = 135.00 614

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1333.00 ± 2.00	1922-bau

4-Bromo-1-butene [5162-44-7] $\text{C}_4\text{H}_7\text{Br}$ MW = 135.00 615

Table 1. Experimental and recommended values with uncertainties.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
290.15	1330.00 ± 3.00	1911-par ¹⁾
293.15	1323.00 ± 2.00	1930-juv
293.15	1324.00 ± 2.00	1951-lev/vik
293.15	1323.50 ± 2.00	Recommended

¹⁾ Not included in calculation of recommended value.

1-Bromo-2-methyl-1-propene [3017-69-4] $\text{C}_4\text{H}_7\text{Br}$ MW = 135.00 616

Table 1. Experimental values with uncertainties.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
273.15	1354.40 ± 2.00	1899-pog
289.65	1325.40 ± 2.00	1899-pog
293.15	1338.00 ± 2.00	1935-far/bac
291.15	1334.00 ± 2.00	1948-kir

3-Bromo-2-methyl-1-propene [1458-98-6] $\text{C}_4\text{H}_7\text{Br}$ MW = 135.00 617

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.955$.

Coefficient	$\rho = A + BT$
A	1605.55
B	-1.000

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
273.15	1331.40 ± 2.00	-0.96	1925-mer-1
293.15	1313.30 ± 2.00	0.95	1925-mer-1

cont.

3-Bromo-2-methyl-1-propene (cont.)**Table 3.** Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$
270.00	1335.5 ± 2.4
280.00	1325.5 ± 2.1
290.00	1315.5 ± 2.1
293.15	1312.4 ± 2.3
298.15	1307.4 ± 2.5

2,3-Dibromo-2-pentene (*cis and trans*) [500025-34-3] $\text{C}_5\text{H}_8\text{Br}_2$ MW = 227.93 618**Table 1.** Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
291.15	1706.80 ± 2.00	1914-van-1

1-Bromo-2-methyl-1-butene [10379-48-3] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 619**Table 1.** Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.050$.

Coefficient	$\rho = A + BT$
A	1599.99
B	-1.220

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1242.30 ± 2.00	-0.05	1899-vas
273.15	1266.80 ± 2.00	0.05	1899-vas

Table 3. Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$
270.00	1270.6 ± 2.2
280.00	1258.4 ± 1.8
290.00	1246.2 ± 1.9
293.15	1242.3 ± 2.0
298.15	1236.2 ± 2.3

1-Bromo-2-methyl-2-butene [41178-84-1] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 620

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
291.15	1259.00 ± 2.00	1951-lau/sch

1-Bromo-3-methyl-1-butene [85738-96-1] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 621

Table 1. Experimental values with uncertainties.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
292.15	1248.00 ± 3.00	1927-kir
292.15	1248.00 ± 3.00	1929-kir
293.15	1225.00 ± 3.00	1935-far/bac

2-Bromo-3-methyl-1-butene [31844-96-9] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 622

Table 1. Experimental values with uncertainties.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1232.00 ± 2.00	1913-kuc
292.15	1236.00 ± 2.00	1935-gre-3

2-Bromo-3-methyl-2-butene [3017-70-7] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 623

Table 1. Experimental values with uncertainties.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
294.15	1282.00 ± 2.00	1932-bou/pia
293.15	1287.00 ± 2.00	1935-far/bac

4-Bromo-2-methyl-2-butene [870-63-3] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 624

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1284.00 ± 2.00	1961-fed/pet

(E)-1-Bromo-1-pentene [31849-76-0] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 625

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	1254.00 ± 4.00	1926-kir-1

(Z)-1-Bromo-1-pentene [31849-75-9] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 626

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.
294.15	1246.00 ± 2.00	1962-sli/mai

1-Bromo-2-pentene [20599-27-3] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 627

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	1254.50 ± 2.00	1937-del

(E)-1-Bromo-2-pentene [7348-71-2] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 628

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	1254.50 ± 2.00	1928-bou

2-Bromo-1-pentene [31844-95-8] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 629

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.
273.15	1277.00 ± 5.00	1920-les/bou
293.15	1228.00 ± 2.00	1921-les
273.15	1257.00 ± 2.00	1921-les

2-Bromo-2-pentene [80204-19-9] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 630

Table 1. Experimental value with uncertainty.

T	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$	Ref.
K	$\text{kg} \cdot \text{m}^{-3}$	
293.15	1275.00 ± 2.00	1935-far/bac

3-Bromo-2-pentene [500028-02-4] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 631

Table 1. Experimental value with uncertainty.

T	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$	Ref.
K	$\text{kg} \cdot \text{m}^{-3}$	
293.15	1271.00 ± 2.00	1935-far/bac

4-Bromo-1-pentene [31950-56-8] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 632

Table 1. Experimental values with uncertainties.

T	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$	Ref.
K	$\text{kg} \cdot \text{m}^{-3}$	
273.15	1265.70 ± 2.00	1950-kam/cha
293.15	1241.70 ± 1.00	1952-pet/che-2

4-Bromo-2-pentene [1809-26-3] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 633

Table 1. Experimental value with uncertainty.

T	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$	Ref.
K	$\text{kg} \cdot \text{m}^{-3}$	
293.15	1272.10 ± 1.00	1955-pud/sha

5-Bromo-1-pentene [1119-51-3] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 634

Table 1. Experimental values with uncertainties.

T	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$	Ref.
K	$\text{kg} \cdot \text{m}^{-3}$	
293.15	1258.10 ± 2.00	1930-juv
293.15	1258.50 ± 2.00	1951-lev/vik
293.15	1258.30 ± 2.00	Recommended

5-Bromo-2-pentene [51952-42-2] $\text{C}_5\text{H}_9\text{Br}$ MW = 149.03 635

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1271.50 ± 1.00	1948-goe/cri

3,4-Dibromo-3-hexene [89580-53-0] $\text{C}_6\text{H}_{10}\text{Br}_2$ MW = 241.95 636

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1612.80 ± 1.00	1929-les/wie

1-Bromo-1-hexene (*cis,trans* mixture) [57855-22-8] $\text{C}_6\text{H}_{11}\text{Br}$ MW = 163.06 637

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1188.80 ± 3.00	1933-bac

1-Bromo-2-hexene [34686-76-5] $\text{C}_6\text{H}_{11}\text{Br}$ MW = 163.06 638

Table 1. Experimental values with uncertainties.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
289.15	1211.90 ± 2.00	1928-bou
289.15	1211.90 ± 2.00	1936-gre/van

1-Bromo-3-hexene [84254-20-6] $\text{C}_6\text{H}_{11}\text{Br}$ MW = 163.06 639

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
288.15	1212.00 ± 2.00	1948-nor

2-Bromo-1-hexene [3017-66-1] $\text{C}_6\text{H}_{11}\text{Br}$ MW = 163.06 640

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1196.00 ± 0.60	1936-you/vog

3-Bromo-3-hexene [21971-89-1] $\text{C}_6\text{H}_{11}\text{Br}$ MW = 163.06 641

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.
294.15	1197.00 ± 2.00	1929-les/wie

4-Bromo-2-hexene [21964-21-6] $\text{C}_6\text{H}_{11}\text{Br}$ MW = 163.06 642

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	1207.70 ± 2.00	1952-lev/fai

5-Bromo-1-hexene [4558-27-4] $\text{C}_6\text{H}_{11}\text{Br}$ MW = 163.06 643

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	1200.00 ± 2.00	1952-gol-1

6-Bromo-1-hexene [2695-47-8] $\text{C}_6\text{H}_{11}\text{Br}$ MW = 163.06 644

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	1216.90 ± 2.00	1952-gol-1

6-Bromo-2-hexene [36851-77-1] $\text{C}_6\text{H}_{11}\text{Br}$ MW = 163.06 645

Table 1. Experimental value with uncertainty.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
291.15	1215.00 ± 2.00	1956-gla/gau

2-Bromo-4-methyl-1-pentene

[31844-97-0]

 $\text{C}_6\text{H}_{11}\text{Br}$

MW = 163.06

646

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.
291.15	1207.00 ± 2.00	1921-les
291.15	1207.00 ± 2.00	1933-van-1

3-Bromo-2-methyl-2-pentene

[203251-07-4]

 $\text{C}_6\text{H}_{11}\text{Br}$

MW = 163.06

647

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.043$.

Coefficient	$\rho = A + BT$
A	1579.65
B	-1.210

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.
273.15	1249.10 ± 3.00	-0.04	1895-ipa
291.65	1226.80 ± 3.00	0.04	1895-ipa

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1253.0 ± 3.0
280.00	1240.9 ± 2.7
290.00	1228.8 ± 2.8
293.15	1224.9 ± 2.9
298.15	1218.9 ± 3.1

5-Bromo-2-methyl-2-pentene

[2270-59-9]

 $\text{C}_6\text{H}_{11}\text{Br}$

MW = 163.06

648

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	1220.00 ± 2.00	1932-ruz/lig

3-Bromo-2,4-dimethyl-2-pentene**[23074-38-6]****C₇H₁₃Br****MW = 177.08****649****Table 1.** Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.037$.

Coefficient	$\rho = A + BT$
A	1483.73
B	-1.070

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.
273.15	1191.50 ± 2.00	0.04	1913-mer-1
294.95	1168.10 ± 2.00	-0.04	1913-mer-1

Table 3. Recommended values.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1194.8 ± 2.3
280.00	1184.1 ± 1.8
290.00	1173.4 ± 1.9
293.15	1170.1 ± 2.0
298.15	1164.7 ± 2.3

4-Bromo-2,4-dimethyl-1-pentene**[500003-52-1]****C₇H₁₃Br****MW = 177.08****650****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	1145.00 ± 1.00	1955-che/che

1-Bromo-1-heptene**[89942-12-1]****C₇H₁₃Br****MW = 177.08****651****Table 1.** Experimental values with uncertainties.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
294.15	1158.10 ± 3.00	1929-kir
293.15	1153.20 ± 3.00	1933-bac

1-Bromo-2-heptene [34686-77-6] $\text{C}_7\text{H}_{13}\text{Br}$ MW = 177.08 652

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.
290.15	1168.20 ± 2.00	1937-del
273.15	1191.00 ± 2.00	1943-del/hub

1-Bromo-3-heptene [42976-85-2] $\text{C}_7\text{H}_{13}\text{Br}$ MW = 177.08 653

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.
289.15	1176.00 ± 2.00	1948-nor

4-Bromo-3-heptene [21971-90-4] $\text{C}_7\text{H}_{13}\text{Br}$ MW = 177.08 654

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.
295.15	1174.20 ± 1.00	1929-les/wie

6-Bromo-2-heptene [500045-96-5] $\text{C}_7\text{H}_{13}\text{Br}$ MW = 177.08 655

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.
293.15	1156.50 ± 2.00	1938-del-1

7-Bromo-2-heptene [90321-84-9] $\text{C}_7\text{H}_{13}\text{Br}$ MW = 177.08 656

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.
290.15	1173.00 ± 2.00	1956-gla/gau

7-Bromo-3-heptene [36851-78-2] $\text{C}_7\text{H}_{13}\text{Br}$ MW = 177.08 657

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.
290.15	1177.00 ± 2.00	1956-gla/gau

3-Bromo-2-methyl-2-hexene

[500045-98-7]

 $\text{C}_7\text{H}_{13}\text{Br}$

MW = 177.08

658

Table 1. Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.036$.

Coefficient	$\rho = A + BT$
A	1486.47
B	-1.080

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
273.15	1191.50 ± 2.00	0.04	1913-mer-1
294.75	1168.10 ± 2.00	-0.04	1913-mer-1

Table 3. Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$
270.00	1194.9 ± 2.3
280.00	1184.1 ± 1.8
290.00	1173.3 ± 1.9
293.15	1169.9 ± 2.0
298.15	1164.5 ± 2.3

5-Bromo-5-methyl-1-hexene

[90601-72-2]

 $\text{C}_7\text{H}_{13}\text{Br}$

MW = 177.08

659

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1166.40 ± 1.00	1955-che/che

6-Bromo-6-methyl-1-heptene

[15424-05-2]

 $\text{C}_8\text{H}_{15}\text{Br}$

MW = 191.11

660

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1116.30 ± 1.00	1955-che/che

1-Bromo-1-octene [1119-88-6] $\text{C}_8\text{H}_{15}\text{Br}$ MW = 191.11 661

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1132.10 ± 3.00	1933-bac

1-Bromo-2-octene [25466-54-0] $\text{C}_8\text{H}_{15}\text{Br}$ MW = 191.11 662

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

Coefficient	$\rho = A + BT$
A	1435.81
B	-1.050

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

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	$\rho_{\text{exp}} - \rho_{\text{calc}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
273.15	1149.00 ± 2.00	0.00	1937-del
293.15	1128.00 ± 2.00	0.00	1937-del

Table 3. Recommended values.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$
270.00	1152.3 ± 2.2
280.00	1141.8 ± 1.8
290.00	1131.3 ± 1.9
293.15	1128.0 ± 2.0
298.15	1122.7 ± 2.3

1-Bromo-3-octene [90201-93-7] $\text{C}_8\text{H}_{15}\text{Br}$ MW = 191.11 663

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
289.15	1139.00 ± 2.00	1948-nor

2-Bromo-1-octene [13249-60-0] $\text{C}_8\text{H}_{15}\text{Br}$ MW = 191.11 664

Table 1. Experimental value with uncertainty.

T K	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$ $\text{kg} \cdot \text{m}^{-3}$	Ref.
293.15	1158.00 ± 2.00	1925-les

1-Bromo-2-nonene**[76853-14-0]****C₉H₁₇Br****MW = 205.14****665****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.
273.15	1110.00 \pm 2.00	1937-del
294.65	1094.00 \pm 2.00	1937-del

1-Bromo-4-nonene**[4676-76-0]****C₉H₁₇Br****MW = 205.14****666****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.
283.15	1112.00 \pm 4.00	1947-pau/rio
289.15	1122.00 \pm 2.00	1949-rio

1-Bromo-2-decene**[14304-30-4]****C₁₀H₁₉Br****MW = 219.16****667****Table 1.** Fit with estimated B coefficient for 4 accepted points. Deviation $\sigma_w = 0.938$.

Coefficient	$\rho = A + BT$
A	1439.50
B	-1.250

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.
273.15	1099.00 \pm 2.00	0.94	1936-del
291.65	1074.00 \pm 2.00	-0.94	1936-del
273.15	1099.00 \pm 2.00	0.94	1937-del
291.65	1074.00 \pm 2.00	-0.94	1937-del

Table 3. Recommended values.

$\frac{T}{\text{K}}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1102.0 \pm 2.4
280.00	1089.5 \pm 2.0
290.00	1077.0 \pm 2.2
293.15	1073.1 \pm 2.3
298.15	1066.8 \pm 2.6

2-Bromo-1-decene

[3017-67-2]

C₁₀H₁₉Br**MW = 219.16****668****Table 1.** Fit with estimated B coefficient for 2 accepted points. Deviation $\sigma_w = 0.000$.

Coefficient	$\rho = A + BT$
A	1399.20
B	-1.080

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.
273.15	1104.20 ± 1.00	0.00	1926-joh/mce
293.15	1082.60 ± 1.00	0.00	1926-joh/mce

Table 3. Recommended values.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$
270.00	1107.6 ± 1.1
280.00	1096.8 ± 0.9
290.00	1086.0 ± 1.0
293.15	1082.6 ± 1.0
298.15	1077.2 ± 1.2

1-Bromo-2-dodecene

[65560-54-5]

C₁₂H₂₃Br**MW = 247.22****669****Table 1.** Experimental values with uncertainties.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
273.15	1072.00 ± 2.00	1936-del
289.15	1061.00 ± 2.00	1936-del
273.15	1072.00 ± 2.00	1937-del

1-Bromo-2-pentadecene

[92857-87-9]

C₁₅H₂₉Br**MW = 289.3****670****Table 1.** Experimental values with uncertainties.

$\frac{T}{K}$	$\frac{\rho_{\text{exp}} \pm 2\sigma_{\text{est}}}{\text{kg} \cdot \text{m}^{-3}}$	Ref.
273.15	1025.00 ± 2.00	1937-del
292.15	1011.00 ± 2.00	1937-del

(E)-1-Bromo-9-octadecene [13044-38-7] $\text{C}_{18}\text{H}_{35}\text{Br}$ MW = 331.38 671

Table 1. Experimental value with uncertainty.

T	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$	Ref.
K	$\text{kg} \cdot \text{m}^{-3}$	
291.15	994.40 ± 1.00	1926-boe/bel

(Z)-1-Bromo-9-octadecene [6110-53-8] $\text{C}_{18}\text{H}_{35}\text{Br}$ MW = 331.38 672

Table 1. Experimental value with uncertainty.

T	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$	Ref.
K	$\text{kg} \cdot \text{m}^{-3}$	
290.15	1019.30 ± 1.00	1926-boe/bel

2-Bromo-1-nonadecene [500047-58-5] $\text{C}_{19}\text{H}_{37}\text{Br}$ MW = 345.41 673

Table 1. Experimental value with uncertainty.

T	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$	Ref.
K	$\text{kg} \cdot \text{m}^{-3}$	
293.15	978.10 ± 2.00	1933-cof/tsa

1-Bromo-13-docosene [500047-56-3] $\text{C}_{22}\text{H}_{43}\text{Br}$ MW = 387.49 674

Table 1. Experimental value with uncertainty.

T	$\rho_{\text{exp}} \pm 2\sigma_{\text{est}}$	Ref.
K	$\text{kg} \cdot \text{m}^{-3}$	
293.15	974.60 ± 2.00	1939-mul/bin