

Vapour pressures and critical points of liquids: Aliphatic and cyclic ketones

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THE PREPARATION OF THIS DATA ITEM

The work on this particular Data Item was monitored and guided by the Physical Data and Reaction Kinetics Committee, which first met in 1966 and now has the following membership:

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VAPOUR PRESSURES AND CRITICAL POINTS OF LIQUIDS
ALIPHATIC AND CYCLIC KETONES

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Sheet	Formula	Name	Alternative Names
C₃ and C₄ ALKANONES			
3.1	C ₃ H ₆ O	Acetone	Propanone Dimethyl ketone
4.1	C ₄ H ₈ O	Butanone	Butan-2-one Methyl ethyl ketone
C₅ ALKANONES			
5.1a	C ₅ H ₁₀ O	Pentan-2-one	Methyl propyl ketone
5.1b	C ₅ H ₁₀ O	Pentan-3-one	Diethyl ketone
5.2	C ₅ H ₁₀ O	3-Methylbutan-2-one	Methyl isopropyl ketone
C₆ ALKANONES			
6.1a	C ₆ H ₁₂ O	Hexan-2-one	Methyl butyl ketone
6.1b	C ₆ H ₁₂ O	Hexan-3-one	Ethyl propyl ketone
6.2a	C ₆ H ₁₂ O	3-Methylpentan-2-one	Methyl sec-butyl ketone
6.2b	C ₆ H ₁₂ O	4-Methylpentan-2-one	Methyl isobutyl ketone
6.3	C ₆ H ₁₂ O	2-Methylpentan-3-one	Ethyl isopropyl ketone
6.4	C ₆ H ₁₂ O	3,3-Dimethylbutan-2-one	Methyl tert-butyl ketone Pinacolone
C₇ ALKANONES			
7.1a	C ₇ H ₁₄ O	Heptan-2-one	Methyl pentyl ketone
7.1b	C ₇ H ₁₄ O	Heptan-3-one	Ethyl butyl ketone
7.1c	C ₇ H ₁₄ O	Heptan-4-one	Dipropyl ketone
7.2a	C ₇ H ₁₄ O	3-Methylhexan-2-one	Methyl sec-pentyl ketone
7.2b	C ₇ H ₁₄ O	4-Methylhexan-2-one	Methyl 2-methylbutyl ketone
7.2c	C ₇ H ₁₄ O	5-Methylhexan-2-one	Methyl isopentyl ketone
7.3a	C ₇ H ₁₄ O	2-Methylhexan-3-one	Propyl isopropyl ketone
7.3b	C ₇ H ₁₄ O	4-Methylhexan-3-one	Ethyl sec-butyl ketone
7.3c	C ₇ H ₁₄ O	5-Methylhexan-3-one	Ethyl isobutyl ketone
7.4a	C ₇ H ₁₄ O	3-Ethylpentan-2-one	Methyl 3-pentyl ketone
7.4b	C ₇ H ₁₄ O	3,3-Dimethylpentan-2-one	Methyl tert-pentyl ketone
7.4c	C ₇ H ₁₄ O	3,4-Dimethylpentan-2-one	Methyl 2-isopentyl ketone
7.4d	C ₇ H ₁₄ O	4,4-Dimethylpentan-2-one	Methyl neopentyl ketone
7.5a	C ₇ H ₁₄ O	2,2-Dimethylpentan-3-one	Ethyl tert-butyl ketone
7.5b	C ₇ H ₁₄ O	2,4-Dimethylpentan-3-one	Di-isopropyl ketone
C₈ ALKANONES			
8.1a	C ₈ H ₁₆ O	Octan-2-one	Methyl hexyl ketone
	C ₈ H ₁₆ O	2,2,4-Trimethylpentan-3-one	(not issued)
C₉ ALKANONES			
9.1a	C ₉ H ₁₈ O	Nonan-2-one	Methyl heptyl ketone
9.1d	C ₉ H ₁₈ O	Nonan-5-one	Dibutyl ketone
9.2	C ₉ H ₁₈ O	2,6-Dimethylheptan-4-one	Di-isobutyl ketone

NB. To allow for the future issue of omitted compounds sheet numbers are not always consecutive.

Continued on next page

CONTENTS continued

Sheet	Formula	Name	Alternative Names
C₁₀ to C₁₅ ALKANONES			
10.1a	C ₁₀ H ₂₀ O	Decan-2-one	Methyl octyl ketone
11.1a	C ₁₁ H ₂₂ O	Undecan-2-one	Methyl nonyl ketone
11.1e	C ₁₁ H ₂₂ O	Undecan-6-one	Dipentyl ketone
12.1a	C ₁₂ H ₂₄ O	Dodecan-2-one	Methyl decyl ketone
13.1a	C ₁₃ H ₂₆ O	Tridecan-2-one	Methyl undecyl ketone
13.1f	C ₁₃ H ₂₆ O	Tridecan-7-one	Dihexyl ketone
14.1a	C ₁₄ H ₂₈ O	Tetradecan-2-one	Methyl dodecyl ketone
15.1a	C ₁₅ H ₃₀ O	Pentadecan-2-one	Methyl tridecyl ketone
15.1g	C ₁₅ H ₃₀ O	Pentadecan-8-one	Diheptyl ketone

ALKENONES

106.1	C ₆ H ₁₀ O	4-Methylpent-3-en-2-one	Mesityl oxide
106.2	C ₆ H ₁₀ O	4-Methylpent-4-en-2-one	Isomesityl oxide

CYCLOALKANONES

404.1	C ₄ H ₆ O	Cyclobutanone
405.1	C ₅ H ₈ O	Cyclopentanone
406.1	C ₆ H ₁₀ O	Cyclohexanone
407.1	C ₇ H ₁₂ O	Cycloheptanone
408.1	C ₈ H ₁₄ O	Cyclooctanone

NB. To allow for the future issue of omitted compounds sheet numbers are not always consecutive.

VAPOUR PRESSURES AND CRITICAL POINTS OF LIQUIDS
ALIPHATIC AND CYCLIC KETONES

1. INTRODUCTION

This Data Item presents saturated vapour pressures of the aliphatic and cyclic ketones shown in the order of arrangement on the Contents page. The Compound Name Index lists the alternative names of the compounds with, in bold, the first name used for each compound on the Contents page and at the head of each Sheet.

The values of vapour pressure for each compound have been obtained by calculation from the Wagner vapour-pressure equation given at the top of each Sheet. Using the critical temperature and the critical pressure given, the coefficients were derived by fitting the equation to the data that had been selected and weighted in accordance with a critical assessment of all the data. Note that estimated values of critical temperature are normally rounded to the nearest kelvin and that values in other units are obtained by exact conversion. The Tables also give the acentric factor, the normal boiling point, the value of dT/dp at the normal boiling point and the approximate normal melting point. Brackets enclose data at those temperatures which are outside the range of supporting experimental data.

The table of Data at Specified Pressures for each compound gives, at each pressure, the temperature and the derivative of pressure with respect to temperature. In addition this table also gives an assessment of the data quality indicated, in decreasing order, by one of the letters 'A', 'B' or 'C'. At pressures of 1 kPa and above the estimated uncertainties in temperature and pressure which are dependent upon the data quality are shown below each letter rounded to 1, 2, or 5 times a power of 10. Uncertainties are discussed at greater length in Section 5.

Tabulated values of vapour pressure are presented in three sets of units, namely, (i) pressures in kPa at temperatures in kelvins, (ii) pressures in mmHg or atm at temperatures in degrees C, (iii) pressures in psia at temperatures in degrees F. The Table providing pressures in kPa also gives the uncertainties in pressure and temperature for pressure greater than 1 kPa. In general, pressures are given from just above the melting point to just below the critical point at intervals adjusted to make maximum use of the space available, a larger interval frequently being used at low temperatures. For compounds with very high estimated critical temperatures the tables are usually truncated at a convenient lower temperature.

The sources of information which give vapour pressure and/or critical point data for the compound considered are listed on the reverse side of each sheet. Those sources that were used to derive the critical properties and the coefficients of the vapour pressure equation are shown in bold type together with the pressure ranges of their data. These arbitrary pressure ranges are described in Section 3.

2. NOTATION AND UNITS

All temperatures are based on the International Temperature Scale (ITS-90). On ITS-90 kelvin temperatures are strictly called International Kelvin Temperatures, similarly Celsius temperatures are strictly called International Celsius Temperatures.

b_1, b_2, b_3, b_4	non-dimensional coefficients of the Wagner vapour-pressure equation
p	vapour pressure
q	$(1-T/T_c)$
T	kelvin temperature
t	Celsius temperature ($T-273.15$) or Fahrenheit temperature ($9T/5-459.67$)

Note. The UNITS of temperature and vapour pressure are shown in each table.

Subscripts

b	denotes value at normal boiling point
c	denotes value at critical point
m	denotes value at normal melting point

3. SOURCES OF DATA

Experimental vapour pressure data are, according to the apparatus and technique applied, usually reported for different pressure regions which may loosely be defined as:-

- low pressure, below say 1 kPa (approximately 7.5 mmHg),
- medium pressure, say 1 kPa to 200 kPa (approximately 2 atm),
- high pressure, say 200 kPa to the critical point,
- the critical point.

The experimental data reported for the low and high pressure ranges are usually less accurate than, and not always compatible with, data for the medium pressure range, which may be of a very high degree of precision, possibly with an uncertainty in pressure less than 0.01 per cent near the normal boiling point. In the high pressure range the uncertainties increase progressively with temperature up to the critical point where the uncertainty in pressure is seldom lower than 0.1 per cent and frequently higher than 1 per cent.

Of the compounds considered here very reliable medium pressure range measurements have been made on fifteen aliphatic and two alicyclic ketones. For two of these, acetone and butanone, reliable high pressure range measurements up to the critical point have also been made. The critical temperatures and critical pressures of six other aliphatic and the two alicyclic ketones have also been determined.

In Reference 1, Ambrose et al. proposed a correlating scheme for aliphatic ketones based on the data of fourteen of the above ketones. This scheme correlated vapour pressures with temperatures and the carbon number of the compound. Then using this scheme with a knowledge of the normal boiling points, vapour pressures for another fourteen ketones were estimated. In this Item critical temperatures and critical pressures have been estimated for those compounds for which they were not known and a correlating scheme using reduced temperatures and reduced pressures of the same fourteen compounds devised. This latter scheme was then used to derive vapour pressures for the other ketones.

4. EVALUATION AND CORRELATION

In References 5 and 6 Ambrose has examined the differences, in the high pressure range, between the shapes of well-established vapour pressure curves for a variety of compounds. He has shown

that for compounds in different classes of chemical substances these differences in shape are characterised by different ranges of numerical relationships between the coefficients of their Wagner equations. In Reference 7 Ambrose and Walton have demonstrated this phenomenon for the two homologous series of normal alkanes and alkanols. Thus, for certain classes of compounds it is possible to establish criteria that should be met by vapour-pressure curves based on less extensive or less reliable data.

In Reference 4 Ambrose and Davies show how very low vapour pressures may be obtained from the difference between the ideal gas heat capacity and the liquid heat capacity. The procedure involves two integrations and rigorous treatment also requires the liquid molar volume and the second virial coefficient of the vapour. Low range vapour pressures obtained in this way were included in the data used to derive the vapour-pressure equations of nearly all of the alkanes in Reference 7 but, in general, were not available for the alkanols.

In Reference 8 Watson, reversing the procedure, derived the difference between the ideal gas and liquid heat capacities from the second differential of the Wagner vapour-pressure equation. He plotted this difference against reduced temperature from the melting point to the normal boiling point for all the alkanes and alkanols in Reference 7. Although only valid up to reduced temperatures of about 0.5 these were shown to be a well ordered, uniformly varying set of curves for both series.

Denoting the differences between the ideal gas and liquid heat capacities at reduced temperatures of 0.3 and 0.5 by, say, D_3 and D_5 respectively, it was noted that for the alkanes from propane to hexadecane, the variation of D_3/D_5 with D_5 could be represented by a straight line without significant error. For the compounds considered here the unconstrained extrapolations of the vapour pressure curves of the compounds with the most reliable data yielded values of D_3/D_5 which were not inconsistent with this line. Therefore in this Item the fit of the Wagner equation to the data for these compounds was adjusted by varying the ratio of the third and fourth coefficients until D_3/D_5 was the value given by the above straight line for the alkanes.

The equations of these compounds were then used to derive a correlation which was similar to that derived for the alkanes and which is described in Items 84022, 84028 and 85002. This correlation was then used to derive the vapour pressure equations of the remaining ketones for which the data were less extensive or less reliable.

For most of the compounds considered here saturated liquid density data were available, see Item 93010, and for some compounds the critical temperature and pressure were adjusted until they were optimum values for the correlation of both properties.

5. DISCUSSION OF UNCERTAINTIES

At any temperature, the estimated uncertainties in the tabulated values of temperature and pressure are dependent upon the reliability of the experimental and estimated data on which they are based. Except in the low pressure range values dependent on estimated data are much less certain than values dependent upon measured data.

The reliability of the experimental or estimated data may vary considerably over the entire liquid range of a compound. The term 'data quality' is used here to express the assessed reliability of the fitted data and hence also the reliability of the tabulated values. In the table of Data at Specified Pressures the data quality at each pressure is denoted by one of the letters 'A', 'B' or 'C'. The uncertainties in temperature and pressure are not thought to be more than the values shown below each letter.

The majority of reliable data are considered of quality 'A' with uncertainties of about 0.01 to 0.1 K at the normal boiling point or about 0.1 to 1 K at the critical point. Similarly

the letters 'B' and 'C' indicate that the vapour pressures are based on progressively less reliable data, the uncertainties increasing tenfold with each successive letter.

When the data quality is 'C' it will be appreciated that the uncertainties are necessarily rather speculative and that for some compounds they may be underestimated. Furthermore for those compounds for which the data quality at the critical pressure is denoted by 'C' the values of critical temperature and critical pressure given in the Tables should be regarded only as correlating parameters. Since the acentric factor, ω , is dependent upon the value of critical pressure selected, the uncertainty in ω for these compounds is high, possibly greater than 0.05.

6. ANTOINE EQUATION

Some users may find it more convenient to use an Antoine equation for certain applications confined to limited ranges of temperature or pressure. The coefficients of the Antoine equation given at the end of each sheet have been obtained by fitting this equation to values obtained from the Wagner equation between pressures of 2 and 200 kPa. The RMS deviation of each fit is usually between 0.05 and 0.1 per cent.

WARNING. Although, for most compounds, the Antoine equation may be used up to about 500 kPa without undue additional error, use at pressures outside the range 2 to 500 kPa will give vapour pressures that get progressively lower than the values given by the Wagner equation.

7. REFERENCES

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et al. Thermodynamic properties of organic oxygen compounds, XXXVIII. Vapour pressures of some aliphatic ketones. J.Chem.Thermodynamics, Vol.7, pp.453-472, 1975.
2. AMBROSE, D. Correlation and estimation of vapour-liquid critical properties: I. Critical temperatures of organic compounds. NPL Report Chem. 92, National Physical Laboratory, Teddington, Middlesex, UK, September 1978.
3. AMBROSE, D. Correlation and estimation of vapour-liquid critical properties: II. Critical pressures and critical volumes of organic compounds. NPL Report Chem. 98, National Physical Laboratory, Teddington, Middlesex, UK, May 1979.
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5. AMBROSE, D.
GHIASSEE, N.B. Vapour pressures and critical temperatures and critical pressures of some alkanolic acids: C1 to C10. J.Chem.Thermodynamics, Vol.19, pp.505-519, 1987.
6. AMBROSE, D.
GHIASSEE, N.B. Vapour pressures and critical temperatures and critical pressures of C5 and C6 cyclic alcohols and ketones. J.Chem.Thermodynamics, Vol.19, pp.903-909, 1987.
7. AMBROSE, D.
WALTON, J. Vapour pressures up to their critical temperatures of normal alkanes and alkan-1-ols. Pure & Appl.Chem., Vol.61, pp.1395-1403, 1989.
8. WATSON, J.T.R. Private Communication, 1990.

COMPOUND NAME INDEX

The first name given for each compound on the Contents page and at the head of each Table is in bold type

Name		Sheet No.
Acetone		3.1
Butan-2-one	see Butanone	4.1
Butanone		4.1
Cyclobutanone		404.1
Cycloheptanone		407.1
Cyclohexanone		406.1
Cyclooctanone		408.1
Cyclopentanone		405.1
Decan-2-one		10.1a
Dibutyl ketone	see Nonan-5-one	9.1d
Di-isobutyl ketone	see 2,6-Dimethylheptan-4-one	9.2
Diethyl ketone	see Pentan-3-one	5.1b
Diheptyl ketone	see Pentadecan-8-one	15.1g
Dihexyl ketone	see Tridecan-7-one	13.1f
Dimethyl ketone	see Acetone	3.1
3,3-Dimethylbutan-2-one		6.4
2,6-Dimethylheptan-4-one		9.2
3,3-Dimethylpentan-2-one		7.4b
3,4-Dimethylpentan-2-one		7.4c
4,4-Dimethylpentan-2-one		7.4d
2,2-Dimethylpentan-3-one		7.5a
2,4-Dimethylpentan-3-one		7.5b
Dipentyl ketone	see Undecan-6-one	11.1e
Dipropyl ketone	see Heptan-4-one	7.1c
Di-isopropyl ketone	see 2,4-Dimethylpentan-3-one	7.5b
Dodecan-2-one		12.1a
Ethyl butyl ketone	see Heptan-3-one	7.1b
Ethyl isobutyl ketone	see 5-Methylhexan-3-one	7.3c
Ethyl sec-butyl ketone	see 4-Methylhexan-3-one	7.3b
Ethyl tert-butyl ketone	see 2,2-Dimethylpentan-3-one	7.5a
Ethyl propyl ketone	see Hexan-3-one	6.1b
Ethyl isopropyl ketone	see 2-Methylpentan-3-one	6.3
3-Ethylpentan-2-one		7.4a
Heptan-2-one		7.1a
Heptan-3-one		7.1b
Heptan-4-one		7.1c
Hexan-2-one		6.1a
Hexan-3-one		6.1b
Isomesityl oxide	see 4-Methylpent-4-en-2-one	106.2
Mesityl oxide	see 4-Methylpent-3-en-2-one	106.1
Methyl butyl ketone	see Hexan-2-one	6.1a
Methyl isobutyl ketone	see 4-Methylpentan-2-one	6.2b
Methyl sec-butyl ketone	see 3-Methylpentan-2-one	6.2a
Methyl tert-butyl ketone	see 3,3-Dimethylbutan-2-one	6.4
Methyl decyl ketone	see Dodecan-2-one	12.1a
Methyl dodecyl ketone	see Tetradecan-2-one	14.1a
Methyl ethyl ketone	see Butanone	4.1
Methyl heptyl ketone	see Nonan-2-one	9.1a
Methyl hexyl ketone	see Octan-2-one	8.1a
Methyl 2-methylbutyl ketone	see 4-Methylhexan-2-one	7.2b

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COMPOUND NAME INDEX continued

Name		Sheet No.
Methyl nonyl ketone	see Undecan-2-one	11.1a
Methyl octyl ketone	see Decan-2-one	10.1a
Methyl pentyl ketone	see Heptan-2-one	7.1a
Methyl 3-pentyl ketone	see 3-Ethylpentan-2-one	7.4a
Methyl isopentyl ketone	see 5-Methylhexan-2-one	7.2c
Methyl 2-isopentyl ketone	see 3,4-Dimethylpentan-2-one	7.4c
Methyl neopentyl ketone	see 4,4-Dimethylpentan-2-one	7.4d
Methyl sec-pentyl ketone	see 3-Methylhexan-2-one	7.2a
Methyl tert-pentyl ketone	see 3,3-Dimethylpentan-2-one	7.4b
Methyl propyl ketone	see Pentan-2-one	5.1a
Methyl isopropyl ketone	see 3-Methylbutan-2-one	5.2
Methyl tridecyl ketone	see Pentadecan-2-one	15.1a
Methyl undecyl ketone	see Tridecan-2-one	13.1a
3-Methylbutan-2-one		5.2
3-Methylhexan-2-one		7.2a
4-Methylhexan-2-one		7.2b
5-Methylhexan-2-one		7.2c
2-Methylhexan-3-one		7.3a
4-Methylhexan-3-one		7.3b
5-Methylhexan-3-one		7.3c
3-Methylpentan-2-one		6.2a
4-Methylpentan-2-one		6.2b
2-Methylpentan-3-one		6.3
4-Methylpent-3-en-2-one		106.1
4-Methylpent-4-en-2-one		106.2
Nonan-2-one		9.1a
Nonan-5-one		9.1d
Octan-2-one		8.1a
Pentadecan-2-one		15.1a
Pentadecan-8-one		15.1g
Pentan-2-one		5.1a
Pentan-3-one		5.1b
Pinacolone	see 3,3-Dimethylbutan-2-one	6.4
Propanone	see Acetone	3.1
Propyl isopropyl ketone	see 2-Methylhexan-3-one	7.3a
Tetradecan-2-one		14.1a
Tridecan-2-one		13.1a
Tridecan-7-one		13.1f
Undecan-2-one		11.1a
Undecan-6-one		11.1e

C₃H₆O Acetone (Propanone, Dimethyl ketone)

CAS Reg. No. 67-64-1

Mol. Wt. 58.080

Vapour Pressure $\ln p = \ln p_c + (T_c/T)(b_1q + b_2q^{1.5} + b_3q^{2.5} + b_4q^5)$

where T is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90), p is the vapour pressure, T_c, p_c are the critical temperature and the critical pressure respectively and q = 1 - T/T_c.

Critical Temperature	T _c = 508.1 K	(t _c = 234.95 °C	= 454.91 °F)
Critical Pressure	p _c = 4703 kPa	(p _c = 46.42 atm	= 682.1 psi)
	b ₁ = -7.61531		
	b ₂ = 1.80247		
	b ₃ = -2.2594		
	b ₄ = -2.869		

Acentric Factor	= 0.307		
Normal Boiling Point	= 329.203 K	(= 56.053 °C	= 132.895 °F)
dT/dp at N.B.P.	= 0.289 K/kPa	(= 0.039 °C/mmHg	= 3.584 °F/psi)
Normal Melting Point	= 178 K	(= -95 °C	= -139 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	101.325	1000	4703
T/K		(189.295)	(210.160)	(237.303)	274.418	329.203	416.353	508.100
(dp/dT)/(kPa/K)		(0.001)	(0.010)	(0.074)	0.523	3.462	20.327	70.488
Data Quality				(B)	A	A	A	A
Uncert. in T (K)				(0.02)	0.01	0.01	0.05	0.1
Uncert. in p (kPa)				(0.002)	0.005	0.05	1	10
Uncert. in p (%)				(0.2)	0.05	0.05	0.1	0.2

Vapour Pressure of Acetone

Units: kPa v. K

Uncertainty in				Uncertainty in				Uncertainty in			
T	p	T	p	T	p	T	p	T	p	T	p
K	kPa	K	%	K	kPa	K	%	K	kPa	K	%
180	(0.003)	300	33.34	0.01	0.05	425	1188.	0.05	0.1		
185	(0.006)	305	41.05	0.01	0.05	430	1308.	0.05	0.1		
190	(0.011)	310	50.14	0.01	0.05	435	1437.	0.05	0.1		
195	(0.020)	315	60.80	0.01	0.05	440	1575.	0.05	0.1		
		320	73.22	0.01	0.05	445	1723.	0.05	0.1		
200	(0.035)	325	87.58	0.01	0.05	450	1882.	0.05	0.1		
205	(0.060)	330	104.1	0.01	0.05	455	2051.	0.1	0.1		
210	(0.098)	335	123.0	0.02	0.05	460	2232.	0.1	0.1		
215	(0.158)	340	144.6	0.02	0.05	465	2425.	0.1	0.1		
220	(0.249)	345	169.0	0.02	0.05	470	2630.	0.1	0.1		
225	(0.382)	350	196.5	0.02	0.05	475	2849.	0.1	0.2		
230	(0.573)	355	227.5	0.02	0.05	480	3082.	0.1	0.2		
235	(0.843)	360	262.1	0.02	0.05	485	3329.	0.1	0.2		
240	(1.216)	365	300.6	0.02	0.05	490	3593.	0.1	0.2		
245	(1.725)	370	343.4	0.02	0.05	495	3873.	0.1	0.2		
250	(2.407)	375	390.8	0.02	0.1	500	4172.	0.1	0.2		
255	(3.308)	380	443.0	0.02	0.1	505	4492.	0.1	0.2		
260	4.481	385	500.4	0.02	0.1						
265	5.989	390	563.3	0.05	0.1						
270	7.904	395	632.1	0.05	0.1						
275	10.31	400	707.0	0.05	0.1						
280	13.30	405	788.6	0.05	0.1						
285	16.97	410	877.0	0.05	0.1						
290	21.45	415	972.8	0.05	0.1						
295	26.86	420	1076.	0.05	0.1						

Vapour Pressure of Acetone continued

Units: atm or mmHg v. °C

$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{mmHg}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{mmHg}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$
		0	70.17	100	3.678	200	27.30		
-90	(0.034)	10	116.4	110	4.723	210	31.94		
-80	(0.120)	20	185.6	120	5.980	220	37.18		
-70	(0.368)	30	285.4	130	7.477	230	43.14		
-60	(1.000)	40	425.0	140	9.242				
-50	(2.450)	50	615.2	150	11.31				
-40	(5.491)	60	868.1	160	13.70				
-30	(11.39)	70	1197.	170	16.46				
-20	(22.10)	80	1617.	180	19.61				
-10	40.41	90	2144.	190	23.21				

Units: psia v. °F

$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$
		0	(0.491)	200	45.38	400	430.5		
		20	0.944	220	60.52	420	511.0		
		40	1.708	240	79.26	440	603.5		
		60	2.931	260	102.1				
-120	(0.001)	80	4.798	280	129.7				
-100	(0.005)	100	7.542	300	162.5				
-80	(0.016)	120	11.43	320	201.3				
-60	(0.043)	140	16.79	340	246.7				
-40	(0.106)	160	23.96	360	299.4				
-20	(0.238)	180	33.35	380	360.4				

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (*) indicates that the Source is not a primary source of experimental data for this compound.

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Antoine equation: $\ln(p/\text{kPa}) = 14.39576 - 2798.109/(T/\text{K} - 43.031)$ for $2 < p/\text{kPa} < 200$.

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C₄H₈O Butanone (Butan-2-one, Methyl ethyl ketone)

CAS Reg. No. 78-93-3

Mol. Wt. 72.107

Vapour Pressure $\ln p = \ln p_c + (T_c/T)(b_1q + b_2q^{1.5} + b_3q^{2.5} + b_4q^5)$

where T is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90), p is the vapour pressure, T_c , p_c are the critical temperature and the critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature	$T_c = 536.8 \text{ K}$	($t_c = 263.65 \text{ }^\circ\text{C}$	$= 506.57 \text{ }^\circ\text{F}$)
Critical Pressure	$p_c = 4200 \text{ kPa}$	($p_c = 41.45 \text{ atm}$	$= 609.2 \text{ psi}$)
	$b_1 = -7.71914$		
	$b_2 = 1.99001$		
	$b_3 = -2.6800$		
	$b_4 = -3.200$		

Acentric Factor	$= 0.321$		
Normal Boiling Point	$= 352.714 \text{ K}$	($= 79.564 \text{ }^\circ\text{C}$	$= 175.215 \text{ }^\circ\text{F}$)
dT/dp at N.B.P.	$= 0.309 \text{ K/kPa}$	($= 0.041 \text{ }^\circ\text{C/mmHg}$	$= 3.836 \text{ }^\circ\text{F/psi}$)
Normal Melting Point	$= 186 \text{ K}$	($= -87 \text{ }^\circ\text{C}$	$= -125 \text{ }^\circ\text{F}$)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	101.325	1000	4200
T/K	(186.308)	(203.949)	(226.065)	(254.845)	(294.268)	352.714	446.440	536.800
$(dp/dT)/(\text{kPa/K})$	(1.E-4)	(0.001)	(0.009)	(0.069)	(0.491)	3.235	18.827	60.396
Data Quality				(B)	(B)	A	A	A
Uncert. in T (K)				(0.05)	(0.02)	0.01	0.05	0.1
Uncert. in p (kPa)				(0.005)	(0.01)	0.02	1	10
Uncert. in p (%)				(0.5)	(0.1)	0.02	0.1	0.2

Vapour Pressure of Butanone

Units: kPa v. K

Uncertainty in				Uncertainty in				Uncertainty in			
T	p	T	p	T	p	T	p	T	p	T	p
K	kPa	K	$\%$	K	kPa	K	$\%$	K	kPa	K	$\%$
				300	(13.17)	0.02	0.1	425	653.6	0.05	0.1
				305	(16.57)	0.02	0.1	430	724.7	0.05	0.1
				310	(20.67)	0.02	0.05	435	801.5	0.05	0.1
190	(0.002)			315	(25.57)	0.01	0.05	440	884.2	0.05	0.1
195	(0.003)			320	31.38	0.01	0.05	445	973.2	0.05	0.1
200	(0.006)			325	38.23	0.01	0.05	450	1069.	0.05	0.1
205	(0.011)			330	46.24	0.01	0.05	455	1171.	0.05	0.1
210	(0.020)			335	55.55	0.01	0.05	460	1281.	0.05	0.1
215	(0.034)			340	66.32	0.01	0.05	465	1398.	0.05	0.1
220	(0.056)			345	78.69	0.01	0.02	470	1523.	0.05	0.1
225	(0.091)			350	92.84	0.01	0.02	475	1657.	0.05	0.1
230	(0.143)			355	108.9	0.01	0.02	480	1799.	0.1	0.1
235	(0.220)			360	127.2	0.01	0.02	485	1950.	0.1	0.1
240	(0.331)			365	147.7	0.01	0.05	490	2111.	0.1	0.1
245	(0.489)			370	170.8	0.01	0.05	495	2282.	0.1	0.1
250	(0.709)			375	196.6	0.02	0.05	500	2464.	0.1	0.1
255	(1.011)	0.05	0.5	380	225.3	0.02	0.05	505	2657.	0.1	0.2
260	(1.418)	0.05	0.5	385	257.1	0.02	0.05	510	2861.	0.1	0.2
265	(1.958)	0.05	0.2	390	292.4	0.02	0.05	515	3078.	0.1	0.2
270	(2.666)	0.05	0.2	395	331.2	0.02	0.05	520	3309.	0.1	0.2
275	(3.582)	0.05	0.2	400	373.9	0.02	0.05	525	3554.	0.1	0.2
280	(4.752)	0.02	0.2	405	420.6	0.02	0.05	530	3815.	0.1	0.2
285	(6.231)	0.02	0.1	410	471.7	0.02	0.05	535	4094.	0.1	0.2
290	(8.079)	0.02	0.1	415	527.4	0.02	0.05				
295	(10.36)	0.02	0.1	420	588.0	0.05	0.1				

Vapour Pressure of Butanone continued

Units: atm or mmHg v. °C

$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{mmHg}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{mmHg}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$
		0	(24.12)	100	1.842	200	15.85		
		10	(42.33)	110	2.418	210	18.69		
-80	(0.019)	20	(70.98)	120	3.123	220	21.89		
-70	(0.068)	30	(114.3)	130	3.976	230	25.50		
-60	(0.209)	40	(177.4)	140	4.997	240	29.57		
-50	(0.571)	50	266.8	150	6.205	250	34.16		
-40	(1.408)	60	389.6	160	7.623	260	39.36		
-30	(3.182)	70	554.4	170	9.272				
-20	(6.663)	80	770.6	180	11.18				
-10	(13.05)	90	1049.	190	13.36				

Units: psia v. °F

$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$
		0	(0.150)	200	22.38	400	250.9		
		20	(0.312)	220	30.61	420	300.1		
		40	(0.603)	240	41.03	440	356.4		
		60	(1.097)	260	53.99	460	420.7		
-120	(2.E-4)	80	(1.893)	280	69.87	480	494.1		
-100	(9.E-4)	100	(3.121)	300	89.07	500	578.4		
-80	(0.003)	120	4.937	320	112.0				
-60	(0.010)	140	7.534	340	139.2				
-40	(0.027)	160	11.13	360	171.0				
-20	(0.067)	180	15.99	380	208.1				

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (*) indicates that the Source is not a primary source of experimental data for this compound.

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Antoine equation: $\ln(p/\text{kPa}) = 14.33469 - 2953.329/(T/\text{K} - 48.764)$ for $2 < p/\text{kPa} < 200$.

C₅H₁₀O Pentan-2-one (Methyl propyl ketone)

CAS Reg. No. 107-87-9

Mol. Wt. 86.133

Vapour Pressure $\ln p = \ln p_c + (T_c/T)(b_1q + b_2q^{1.5} + b_3q^{2.5} + b_4q^5)$

where T is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90), p is the vapour pressure, T_c, p_c are the critical temperature and the critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature	T _c = 561.1 K	(t _c = 287.95 °C	= 550.31 °F)
Critical Pressure	p _c = 3695 kPa	(p _c = 36.47 atm	= 535.9 psi)
	b ₁ = -7.89184		
	b ₂ = 2.16269		
	b ₃ = -3.0491		
	b ₄ = -3.430		
Acentric Factor	= 0.347		
Normal Boiling Point	= 375.385 K	(= 102.235 °C	= 216.023 °F)
dT/dp at N.B.P.	= 0.328 K/kPa	(= 0.044 °C/mmHg	= 4.076 °F/psi)
Normal Melting Point	= 196 K	(= -77 °C	= -107 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	101.325	1000	3695
T/K	(199.255)	(217.895)	(241.260)	(271.676)	(313.387)	375.385	475.199	561.100
(dp/dT)/(kPa/K)	(1.E-4)	(0.001)	(0.009)	(0.066)	(0.464)	3.045	17.667	51.975
Data Quality				(B)	(A)	A	A	A
Uncert. in T (K)				(0.02)	(0.002)	0.002	0.1	0.1
Uncert. in p (kPa)				(0.001)	(0.001)	0.01	2	5
Uncert. in p (%)				(0.1)	(0.01)	0.01	0.2	0.2

Vapour Pressure of Pentan-2-one

Units: kPa v. K

Uncertainty in				Uncertainty in				Uncertainty in			
T	p	T	p	T	p	T	p	T	p	T	p
K	kPa	K	%	K	kPa	K	%	K	kPa	K	%
200	(0.001)			325	(16.74)	0.002	0.01	450	624.1	0.05	0.1
205	(0.002)			330	(20.63)	0.002	0.01	455	688.3	0.05	0.1
210	(0.004)			335	(25.22)	0.002	0.01	460	757.5	0.05	0.1
215	(0.007)			340	30.61	0.002	0.01	465	831.7	0.1	0.2
220	(0.013)			345	36.91	0.002	0.01	470	911.3	0.1	0.2
225	(0.021)			350	44.22	0.002	0.01	475	996.5	0.1	0.2
230	(0.035)			355	52.65	0.002	0.01	480	1088.	0.1	0.2
235	(0.057)			360	62.33	0.002	0.01	485	1185.	0.1	0.2
240	(0.090)			365	73.38	0.002	0.01	490	1289.	0.1	0.2
245	(0.138)			370	85.95	0.002	0.01	495	1399.	0.1	0.2
250	(0.208)			375	100.2	0.002	0.01	500	1516.	0.1	0.2
255	(0.307)			380	116.2	0.005	0.01	505	1641.	0.1	0.2
260	(0.446)			385	134.1	0.005	0.01	510	1774.	0.1	0.2
265	(0.637)			390	154.2	0.005	0.02	515	1915.	0.1	0.2
270	(0.895)			395	176.5	0.01	0.02	520	2064.	0.1	0.2
275	(1.240)	0.01	0.1	400	201.3	0.01	0.02	525	2222.	0.1	0.2
280	(1.693)	0.01	0.05	405	228.7	0.01	0.02	530	2390.	0.1	0.2
285	(2.281)	0.01	0.05	410	258.8	0.01	0.02	535	2568.	0.1	0.2
290	(3.036)	0.005	0.02	415	292.0	0.02	0.05	540	2757.	0.1	0.2
295	(3.994)	0.005	0.02	420	328.3	0.02	0.05	545	2957.	0.1	0.2
300	(5.196)	0.005	0.02	425	368.0	0.02	0.05	550	3170.	0.1	0.2
305	(6.690)	0.002	0.02	430	411.3	0.02	0.05	555	3396.	0.1	0.2
310	(8.529)	0.002	0.01	435	458.3	0.02	0.05	560	3639.	0.1	0.2
315	(10.77)	0.002	0.01	440	509.3	0.05	0.1				
320	(13.49)	0.002	0.01	445	564.5	0.05	0.1				

Vapour Pressure of Pentan-2-one continued

Units: atm or mmHg v. °C

t °C	p mmHg	t °C	p mmHg	t °C	p atm	t °C	p atm	t °C	p atm
		0	(8.257)	100	0.935	200	9.517		
		10	(15.34)	110	1.256	210	11.33		
		20	(27.10)	120	1.658	220	13.40		
-70	(0.013)	30	(45.75)	130	2.154	230	15.73		
-60	(0.044)	40	(74.19)	140	2.757	240	18.37		
-50	(0.132)	50	(116.0)	150	3.483	250	21.35		
-40	(0.359)	60	(175.7)	160	4.347	260	24.69		
-30	(0.883)	70	258.5	170	5.365	270	28.44		
-20	(1.997)	80	370.5	180	6.553	280	32.67		
-10	(4.195)	90	518.5	190	7.931				

Units: psia v. °F

t °F	p psia	t °F	p psia	t °F	p psia	t °F	p psia	t °F	p psia
-100	(2.E-4)	100	(1.293)	300	49.91	500	362.8		
-80	(6.E-4)	120	(2.139)	320	63.88	520	424.5		
-60	(0.002)	140	(3.398)	340	80.65	540	495.1		
-40	(0.007)	160	5.209	360	100.6				
-20	(0.019)	180	7.734	380	124.0				
0	(0.046)	200	11.16	400	151.3				
20	(0.102)	220	15.70	420	182.9				
40	(0.212)	240	21.58	440	219.3				
60	(0.409)	260	29.06	460	261.0				
80	(0.746)	280	38.40	480	308.6				

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (*) indicates that the Source is not a primary source of experimental data for this compound.

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C
M, H, C

Antoine equation: $\ln(p/\text{kPa}) = 14.20810 - 3057.405/(T/\text{K} - 56.566)$ for $2 < p/\text{kPa} < 200$.

C₅H₁₀O Pentan-3-one (Diethyl ketone)

CAS Reg. No. 96-22-0

Mol. Wt. 86.133

Vapour Pressure $\ln p = \ln p_c + (T_c/T)(b_1q + b_2q^{1.5} + b_3q^{2.5} + b_4q^5)$

where T is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90), p is the vapour pressure, T_c, p_c are the critical temperature and the critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature T_c = 561.5 K (t_c = 288.35 °C = 551.03 °F)
 Critical Pressure p_c = 3731 kPa (p_c = 36.82 atm = 541.1 psi)
 b₁ = -7.76572
 b₂ = 1.93875
 b₃ = -2.9534
 b₄ = -3.470

Acentric Factor = 0.343
 Normal Boiling Point = 375.084 K (= 101.934 °C = 215.481 °F)
 dT/dp at N.B.P. = 0.327 K/kPa (= 0.044 °C/mmHg = 4.059 °F/psi)
 Normal Melting Point = 234 K (= -39 °C = -38 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	101.325	1000	3731
T/K			(241.413)	(271.756)	(313.336)	375.084	474.536	561.500
(dp/dT)/(kPa/K)			(0.009)	(0.066)	(0.465)	3.058	17.697	51.609
Data Quality			(B)	(A)	(A)	A	A	A
Uncert. in T (K)			(0.02)	(0.002)	(0.002)	0.002	0.1	0.1
Uncert. in p (kPa)			(0.001)	(0.001)	(0.001)	0.01	2	5
Uncert. in p (%)			(0.1)	(0.01)	(0.01)	0.01	0.2	0.2

Vapour Pressure of Pentan-3-one

Units: kPa v. K

		Uncertainty in				Uncertainty in				Uncertainty in	
T	p	T	p	T	p	T	p	T	p	T	p
K	kPa	K	%	K	kPa	K	%	K	kPa	K	%
		350	44.52	0.002	0.01	475	1008.	0.1	0.2		
		355	53.04	0.002	0.01	480	1100.	0.1	0.2		
235	(0.056)	360	62.82	0.002	0.01	485	1198.	0.1	0.2		
240	(0.088)	365	73.99	0.002	0.01	490	1303.	0.1	0.2		
245	(0.136)	370	86.69	0.002	0.01	495	1414.	0.1	0.2		
		375	101.1	0.002	0.01	500	1533.	0.1	0.2		
250	(0.205)	380	117.3	0.005	0.01	505	1659.	0.1	0.2		
255	(0.304)	385	135.4	0.005	0.01	510	1792.	0.1	0.2		
260	(0.442)	390	155.7	0.005	0.02	515	1934.	0.1	0.2		
265	(0.633)	395	178.3	0.01	0.02	520	2084.	0.1	0.2		
270	(0.890)										
		400	203.4	0.01	0.02	525	2243.	0.1	0.2		
275	(1.234)	405	231.2	0.01	0.02	530	2411.	0.1	0.2		
280	(1.687)	410	261.7	0.01	0.05	535	2589.	0.1	0.2		
285	(2.275)	415	295.3	0.02	0.05	540	2778.	0.1	0.2		
290	(3.031)	420	332.1	0.02	0.05	545	2978.	0.1	0.2		
295	(3.991)										
		425	372.3	0.02	0.05	550	3190.	0.1	0.2		
300	(5.197)	430	416.1	0.02	0.05	555	3415.	0.1	0.2		
305	(6.697)	435	463.7	0.02	0.05	560	3655.	0.1	0.2		
310	(8.544)	440	515.4	0.05	0.1						
315	(10.80)	445	571.2	0.05	0.1						
320	(13.53)										
		450	631.6	0.05	0.1						
325	(16.81)	455	696.6	0.05	0.1						
330	(20.72)	460	766.5	0.1	0.1						
335	25.35	465	841.6	0.1	0.2						
340	30.79	470	922.1	0.1	0.2						
345	37.14										

Vapour Pressure of Pentan-3-one continued

Units: atm or mmHg v. °C

t °C	p mmHg	t °C	p mmHg	t °C	p atm	t °C	p atm	t °C	p atm
-40	(0.353)	50	(116.5)	150	3.523	250	21.54		
-30	(0.872)	60	176.6	160	4.398	260	24.89		
-20	(1.978)	70	260.1	170	5.429	270	28.65		
-10	(4.165)	80	373.1	180	6.632	280	32.86		
		90	522.7	190	8.026				
0	(8.216)	100	716.7	200	9.629				
10	(15.30)	110	963.6	210	11.46				
20	(27.07)	120	1273.	220	13.55				
30	(45.79)	130	1654.	230	15.90				
40	(74.36)	140	2119.	240	18.56				

Units: psia v. °F

t °F	p psia	t °F	p psia	t °F	p psia	t °F	p psia	t °F	p psia
		100	(1.295)	300	50.48	500	365.8		
		120	(2.146)	320	64.64	520	427.5		
		140	3.415	340	81.61	540	497.8		
-40	(0.007)	160	5.242	360	101.8				
-20	(0.019)	180	7.792	380	125.4				
0	(0.045)	200	11.25	400	153.0				
20	(0.102)	220	15.84	420	185.0				
40	(0.211)	240	21.79	440	221.7				
60	(0.409)	260	29.36	460	263.7				
80	(0.747)	280	38.83	480	311.5				

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (*) indicates that the Source is not a primary source of experimental data for this compound.

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C
M, H, C

Antoine equation: $\ln(p/\text{kPa}) = 14.22830 - 3056.745/(T/\text{K} - 57.003)$ for $2 < p/\text{kPa} < 200$.

C₅H₁₀O 3-Methylbutan-2-one (Methyl isopropyl ketone)

CAS Reg. No. 563-80-4

Mol. Wt. 86.133

Vapour Pressure $\ln p = \ln p_c + (T_c/T)(b_1q + b_2q^{1.5} + b_3q^{2.5} + b_4q^5)$

where T is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90), p is the vapour pressure, T_c, p_c are the critical temperature and the critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature	T _c = 555 K	(t _c = 281.85 °C	= 539.33 °F)
Critical Pressure	p _c = 3780 kPa	(c = 37.31 atm	= 548.2 psi)
	b ₁ = -7.64289		
	b ₂ = 2.00024		
	b ₃ = -2.8864		
	b ₄ = -3.377		

Acentric Factor	= 0.312		
Normal Boiling Point	= 367.458 K	(= 94.308 °C	= 201.755 °F)
dT/dp at N.B.P.	= 0.325 K/kPa	(= 0.043 °C/mmHg	= 4.035 °F/psi)
Normal Melting Point	= 181 K	(= -92 °C	= -134 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	101.325	1000	3780
T/K	(194.124)	(212.394)	(235.315)	(265.190)	(306.239)	367.458	(466.724)	(555.000)
(dp/dT)/(kPa/K)	(1.E-4)	(0.001)	(0.009)	(0.067)	(0.471)	3.076	(17.665)	(52.063)
Data Quality				(B)	(A)	A	(A)	(B)
Uncert. in T (K)				(0.01)	(0.005)	0.002	(0.05)	(1)
Uncert. in p (kPa)				(0.001)	(0.002)	0.01	(1)	(50)
Uncert. in p (%)				(0.1)	(0.02)	0.01	(0.1)	(1)

Vapour Pressure of 3-Methylbutan-2-one

Units: kPa v. K

		Uncertainty in				Uncertainty in				Uncertainty in	
T	p	T	p	T	p	T	p	T	p	T	p
K	kPa	K	%	K	kPa	K	%	K	kPa	K	%
				300	(7.400)	0.005	0.02	425	(442.6)	0.02	0.05
180	(1.E-4)			305	(9.431)	0.005	0.02	430	(492.5)	0.02	0.05
185	(3.E-4)			310	(11.91)	0.005	0.02	435	(546.5)	0.02	0.05
190	(6.E-4)			315	(14.90)	0.005	0.02	440	(604.9)	0.02	0.05
195	(0.001)			320	(18.48)	0.005	0.02	445	(667.9)	0.02	0.05
200	(0.002)			325	(22.75)	0.005	0.02	450	(735.6)	0.05	0.05
205	(0.004)			330	27.79	0.005	0.01	455	(808.4)	0.05	0.1
210	(0.008)			335	33.70	0.005	0.01	460	(886.4)	0.05	0.1
215	(0.013)			340	40.59	0.005	0.01	465	(969.9)	0.05	0.1
220	(0.023)			345	48.58	0.005	0.01	470	(1059.)	0.05	0.1
225	(0.038)			350	57.78	0.005	0.01	475	(1154.)	0.1	0.1
230	(0.062)			355	68.32	0.002	0.01	480	(1256.)	0.1	0.2
235	(0.097)			360	80.34	0.002	0.01	485	(1364.)	0.1	0.2
240	(0.150)			365	93.98	0.002	0.01	490	(1479.)	0.1	0.2
245	(0.227)			370	109.4	0.005	0.01	495	(1601.)	0.2	0.2
250	(0.337)			375	126.7	0.005	0.01	500	(1730.)	0.2	0.2
255	(0.490)			380	(146.1)	0.005	0.01	505	(1868.)	0.2	0.2
260	(0.701)			385	(167.7)	0.005	0.02	510	(2013.)	0.2	0.5
265	(0.987)			390	(191.8)	0.005	0.02	515	(2167.)	0.2	0.5
270	(1.369)	0.01	0.1	395	(218.4)	0.01	0.02	520	(2330.)	0.5	0.5
275	(1.871)	0.01	0.05	400	(247.8)	0.01	0.02	525	(2503.)	0.5	0.5
280	(2.523)	0.01	0.05	405	(280.1)	0.01	0.02	530	(2686.)	0.5	0.5
285	(3.359)	0.01	0.05	410	(315.5)	0.01	0.02	535	(2879.)	0.5	1
290	(4.419)	0.005	0.05	415	(354.3)	0.02	0.05	540	(3084.)	0.5	1
295	(5.749)	0.005	0.02	420	(396.6)	0.02	0.05	545	(3301.)	1	1

Vapour Pressure of 3-Methylbutan-2-one continued

Units: atm or mmHg v. °C

$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{mmHg}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{mmHg}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$
		0	(12.52)	100	1.185	200	(11.04)		
-90	(0.001)	10	(22.69)	110	(1.574)	210	(13.06)		
-80	(0.007)	20	(39.17)	120	(2.055)	220	(15.35)		
-70	(0.025)	30	(64.74)	130	(2.643)	230	(17.92)		
-60	(0.082)	40	(102.9)	140	(3.351)	240	(20.82)		
-50	(0.237)	50	(158.2)	150	(4.195)	250	(24.06)		
-40	(0.617)	60	235.5	160	(5.192)	260	(27.70)		
-30	(1.466)	70	341.2	170	(6.356)	270	(31.77)		
-20	(3.207)	80	482.0	180	(7.706)	280	(36.38)		
-10	(6.538)	90	665.6	190	(9.261)				

Units: psia v. °F

$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$
		0	(0.073)	200	14.27	400	(175.0)		
		20	(0.158)	220	(19.80)	420	(210.1)		
		40	(0.317)	240	(26.88)	440	(250.3)		
		60	(0.598)	260	(35.77)	460	(296.0)		
-120	(7.E-5)	80	(1.064)	280	(46.77)	480	(348.0)		
-100	(3.E-4)	100	(1.801)	300	(60.17)	500	(407.0)		
-80	(0.001)	120	(2.920)	320	(76.29)	520	(474.0)		
-60	(0.004)	140	4.555	340	(95.48)				
-40	(0.012)	160	6.864	360	(118.1)				
-20	(0.031)	180	10.03	380	(144.4)				

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (*) indicates that the Source is not a primary source of experimental data for this compound.

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- 10 TRC Thermodynamic Tables, Texas A & M Univ., Loose leaf data sheets extant 1992.*

The following Sources were used to estimate data for this compound.

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AMBROSE, D., NPL Report Chem 98, Nat. Phys. Lab., Teddington, Middlesex, UK, 1979.* **C**

Antoine equation: $\ln(p/\text{kPa}) = 14.10213 - 2959.304/(T/\text{K} - 55.420)$ for $2 < p/\text{kPa} < 200$.

C₆H₁₂O Hexan-2-one (Methyl butyl ketone)

CAS Reg. No. 591-78-6

Mol. Wt. 100.160

Vapour Pressure $\ln p = \ln p_c + (T_c/T)(b_1q + b_2q^{1.5} + b_3q^{2.5} + b_4q^5)$

where T is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90), p is the vapour pressure, T_c, p_c are the critical temperature and the critical pressure respectively and q = 1 - T/T_c.

Critical Temperature T_c = 587.0 K (t_c = 313.85 °C = 596.93 °F)
 Critical Pressure p_c = 3270 kPa (p_c = 32.27 atm = 474.3 psi)
 b₁ = -8.09961
 b₂ = 2.25153
 b₃ = -3.3795
 b₄ = -3.650

Acentric Factor = 0.387
 Normal Boiling Point = 400.700 K (= 127.550 °C = 261.590 °F)
 dT/dp at N.B.P. = 0.348 K/kPa (= 0.046 °C/mmHg = 4.318 °F/psi)
 Normal Melting Point = 217 K (= -56 °C = -69 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	101.325	1000	3270
T/K		(233.852)	(258.624)	(290.853)	335.034	400.700	506.349	587.000
(dp/dT)/(kPa/K)		(0.001)	(0.008)	(0.062)	0.438	2.874	16.726	45.122
Data Quality				(A)	A	A	A	A
Uncert. in T (K)				(0.01)	0.005	0.005	0.1	0.5
Uncert. in p (kPa)				(0.0005)	0.002	0.01	2	20
Uncert. in p (%)				(0.05)	0.02	0.01	0.2	0.5

Vapour Pressure of Hexan-2-one

Units: kPa v. K

Uncertainty in				Uncertainty in				Uncertainty in			
T	p	T	p	T	p	T	p	T	p	T	p
K	kPa	K	%	K	kPa	K	%	K	kPa	K	%
225	(0.004)			350	18.61	0.005	0.02	475	570.8	0.05	0.1
230	(0.007)			355	22.59	0.005	0.02	480	627.5	0.05	0.1
235	(0.011)			360	27.23	0.005	0.02	485	688.4	0.05	0.1
240	(0.019)			365	32.62	0.005	0.01	490	753.6	0.1	0.1
245	(0.030)			370	38.85	0.005	0.01	495	823.4	0.1	0.2
250	(0.048)			375	46.00	0.005	0.01	500	898.0	0.1	0.2
255	(0.074)			380	54.19	0.005	0.01	505	977.6	0.1	0.2
260	(0.112)			385	63.50	0.005	0.01	510	1062.	0.1	0.2
265	(0.166)			390	74.05	0.005	0.01	515	1153.	0.1	0.2
270	(0.243)			395	85.96	0.005	0.01	520	1249.	0.2	0.2
275	(0.350)			400	99.33	0.005	0.01	525	1351.	0.2	0.2
280	(0.495)			405	114.3	0.005	0.01	530	1460.	0.2	0.2
285	(0.690)			410	131.0	0.005	0.01	535	1575.	0.2	0.2
290	(0.948)			415	149.5	0.005	0.02	540	1697.	0.2	0.2
295	(1.287)	0.01	0.05	420	170.0	0.01	0.02	545	1826.	0.2	0.5
300	(1.725)	0.005	0.05	425	192.7	0.01	0.02	550	1963.	0.2	0.5
305	(2.285)	0.005	0.05	430	217.7	0.01	0.02	555	2108.	0.2	0.5
310	2.994	0.005	0.02	435	245.0	0.01	0.02	560	2261.	0.2	0.5
315	3.882	0.005	0.02	440	275.0	0.02	0.05	565	2424.	0.5	0.5
320	4.983	0.005	0.02	445	307.7	0.02	0.05	570	2596.	0.5	0.5
325	6.337	0.005	0.02	450	343.3	0.02	0.05	575	2779.	0.5	0.5
330	7.989	0.005	0.02	455	381.9	0.02	0.05	580	2974.	0.5	0.5
335	9.985	0.005	0.02	460	423.9	0.02	0.05	585	3182.	0.5	0.5
340	12.38	0.005	0.02	465	469.2	0.05	0.05				
345	15.24	0.005	0.02	470	518.1	0.05	0.1				

Vapour Pressure of Hexan-2-one continued

Units: atm or mmHg v. °C

t °C	p mmHg	t °C	p mmHg	t °C	p atm	t °C	p atm	t °C	p atm
-50	(0.023)	50	43.54	150	1.817	250	12.95		
-40	(0.070)	60	69.03	160	2.315	260	15.11		
-30	(0.190)	70	105.9	170	2.914	270	17.54		
-20	(0.472)	80	157.8	180	3.625	280	20.26		
-10	(1.080)	90	229.0	190	4.461	290	23.32		
0	(2.298)	100	324.3	200	5.437	300	26.75		
10	(4.583)	110	449.4	210	6.567	310	30.63		
20	(8.635)	120	610.5	220	7.866				
30	(15.47)	130	814.3	230	9.352				
40	26.48	140	1068.	240	11.04				

Units: psia v. °F

t °F	p psia	t °F	p psia	t °F	p psia	t °F	p psia	t °F	p psia
		100	0.456	300	25.97	500	222.1		
		120	0.798	320	34.03	520	262.0		
-60	(4.E-4)	140	1.335	340	43.90	540	307.3		
-40	(0.001)	160	2.144	360	55.83	560	358.8		
-20	(0.004)	180	3.323	380	70.10	580	417.6		
0	(0.011)	200	4.986	400	86.98				
20	(0.027)	220	7.269	420	106.8				
40	(0.061)	240	10.33	440	129.8				
60	(0.127)	260	14.33	460	156.5				
80	(0.248)	280	19.47	480	187.1				

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (*) indicates that the Source is not a primary source of experimental data for this compound.

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- 15 AMBROSE,D., NPL Report Chem 107, Nat.Phys.Lab., Teddington, Middlesex, UK, 1980.*
- 16 TRC Thermodynamic Tables, Texas A & M Univ., Loose leaf data sheets extant 1992.*

C
M,H,C

Antoine equation: $\ln(p/\text{kPa}) = 14.20578 - 3236.991/(T/\text{K} - 63.072)$ for $2 < p/\text{kPa} < 200$.

C₆H₁₂O Hexan-3-one (Ethyl propyl ketone)

CAS Reg. No. 589-38-8

Mol. Wt. 100.160

Vapour Pressure $\ln p = \ln p_c + (T_c/T)(b_1q + b_2q^{1.5} + b_3q^{2.5} + b_4q^5)$

where T is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90), p is the vapour pressure, T_c, p_c are the critical temperature and the critical pressure respectively and q = 1 - T/T_c.

Critical Temperature	T _c = 582.8 K	(t _c = 309.65 °C	= 589.37 °F)
Critical Pressure	p _c = 3319 kPa	(p _c = 32.76 atm	= 481.4 psi)
	b ₁ = -8.07996		
	b ₂ = 2.30111		
	b ₃ = -3.4104		
	b ₄ = -3.649		

Acentric Factor	= 0.379		
Normal Boiling Point	= 396.625 K	(= 123.475 °C	= 254.256 °F)
dT/dp at N.B.P.	= 0.345 K/kPa	(= 0.046 °C/mmHg	= 4.281 °F/psi)
Normal Melting Point	= 218 K	(= -55 °C	= -67 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	101.325	1000	3319
T/K		(231.412)	(255.922)	(287.816)	(331.557)	396.625	501.495	582.800
(dp/dT)/(kPa/K)		(0.001)	(0.008)	(0.063)	(0.442)	2.899	16.833	46.017
Data Quality				(B)	(A)	A	A	A
Uncert. in T (K)				(0.02)	(0.002)	0.002	0.1	0.2
Uncert. in p (kPa)				(0.001)	(0.001)	0.01	2	10
Uncert. in p (%)				(0.1)	(0.01)	0.01	0.2	0.2

Vapour Pressure of Hexan-3-one

Units: kPa v. K

Uncertainty in				Uncertainty in				Uncertainty in			
T	p	T	p	T	p	T	p	T	p	T	p
K	kPa	K	%	K	kPa	K	%	K	kPa	K	%
225	(0.005)			350	21.46	0.002	0.01	475	623.8	0.05	0.1
230	(0.009)			355	25.95	0.002	0.01	480	684.8	0.05	0.1
235	(0.015)			360	31.19	0.002	0.01	485	750.2	0.1	0.1
240	(0.024)			365	37.26	0.002	0.01	490	820.2	0.1	0.2
245	(0.038)			370	44.26	0.002	0.01	495	895.1	0.1	0.2
250	(0.060)			375	52.27	0.002	0.01	500	975.1	0.1	0.2
255	(0.093)			380	61.41	0.002	0.01	505	1060.	0.1	0.2
260	(0.139)			385	71.78	0.002	0.01	510	1151.	0.1	0.2
265	(0.206)			390	83.51	0.002	0.01	515	1248.	0.1	0.2
270	(0.300)			395	96.70	0.002	0.01	520	1350.	0.1	0.2
275	(0.429)			400	111.5	0.005	0.01	525	1460.	0.1	0.2
280	(0.603)			405	128.0	0.005	0.01	530	1575.	0.1	0.2
285	(0.837)			410	146.4	0.005	0.02	535	1698.	0.2	0.2
290	(1.145)	0.01	0.1	415	166.7	0.01	0.02	540	1828.	0.2	0.2
295	(1.546)	0.01	0.05	420	189.3	0.01	0.02	545	1966.	0.2	0.2
300	(2.063)	0.01	0.05	425	214.1	0.01	0.02	550	2112.	0.2	0.2
305	(2.722)	0.005	0.05	430	241.3	0.01	0.02	555	2267.	0.2	0.2
310	(3.551)	0.005	0.02	435	271.2	0.02	0.05	560	2431.	0.2	0.2
315	(4.585)	0.005	0.02	440	303.8	0.02	0.05	565	2604.	0.2	0.2
320	(5.864)	0.005	0.02	445	339.3	0.02	0.05	570	2789.	0.2	0.2
325	(7.429)	0.002	0.01	450	377.9	0.02	0.05	575	2985.	0.2	0.2
330	(9.331)	0.002	0.01	455	419.8	0.02	0.05	580	3194.	0.2	0.2
335	(11.62)	0.002	0.01	460	465.2	0.05	0.05				
340	(14.36)	0.002	0.01	465	514.2	0.05	0.1				
345	(17.62)	0.002	0.01	470	566.9	0.05	0.1				

Vapour Pressure of Hexan-3-one continued

Units: atm or mmHg v. °C

$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{mmHg}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{mmHg}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$
-50	(0.030)	50	(51.11)	150	2.019	250	14.00		
-40	(0.090)	60	(80.45)	160	2.564	260	16.30		
-30	(0.242)	70	(122.6)	170	3.215	270	18.89		
-20	(0.594)	80	181.6	180	3.987	280	21.80		
-10	(1.342)	90	261.9	190	4.891	290	25.06		
0	(2.821)	100	368.9	200	5.944	300	28.73		
10	(5.569)	110	508.5	210	7.160				
20	(10.39)	120	687.3	220	8.555				
30	(18.45)	130	912.7	230	10.15				
40	(31.33)	140	1192.	240	11.95				

Units: psia v. °F

$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$
		100	(0.540)	300	28.88	500	239.6		
		120	(0.938)	320	37.68	520	282.1		
-60	(5.E-4)	140	(1.556)	340	48.42	540	330.5		
-40	(0.002)	160	(2.480)	360	61.36	560	385.5		
-20	(0.005)	180	3.817	380	76.78	580	448.4		
0	(0.014)	200	5.691	400	94.98				
20	(0.033)	220	8.247	420	116.3				
40	(0.074)	240	11.65	440	141.0				
60	(0.153)	260	16.09	460	169.5				
80	(0.296)	280	21.76	480	202.2				

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (*) indicates that the Source is not a primary source of experimental data for this compound.

- 1 COWAN,D.M., JEFFERY,G.H., VOGEL,A.I., J.Chem.Soc., p.171, 1940.
- 2 GINNINGS,P.M., PLONK,D., CARTER,E., J.Am.Chem.Soc., Vol.62, p.1923, 1940.
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- 14 TRC Thermodynamic Tables, Texas A & M Univ., Loose leaf data sheets extant 1992.*

C
M,H,C

Antoine equation: $\ln(p/\text{kPa}) = 14.17301 - 3187.804/(T/\text{K} - 62.987)$ for $2 < p/\text{kPa} < 200$.

C₆H₁₂O 3-Methylpentan-2-one (Methyl sec-butyl ketone)

CAS Reg. No. 565-61-7

Mol. Wt. 100.160

Vapour Pressure $\ln p = \ln p_c + (T_c/T)(b_1q + b_2q^{1.5} + b_3q^{2.5} + b_4q^5)$

where T is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90), p is the vapour pressure, T_c, p_c are the critical temperature and the critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature	T _c = 579 K	(t _c = 305.85 °C	= 582.53 °F)
Critical Pressure	p _c = 3350 kPa	(c = 33.06 atm	= 485.9 psi)
	b ₁ = -7.82156		
	b ₂ = 2.07067		
	b ₃ = -3.0701		
	b ₄ = -3.551		
Acentric Factor	= 0.344		
Normal Boiling Point	= 390.550 K	(= 117.400 °C	= 243.320 °F)
dT/dp at N.B.P.	= 0.345 K/kPa	(= 0.046 °C/mmHg	= 4.282 °F/psi)
Normal Melting Point	= -	-	-

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	101.325	1000	3350
T/K	(206.832)	(226.175)	(250.446)	(282.092)	(325.603)	390.550	(495.810)	(579.000)
(dp/dT)/(kPa/K)	(1.E-4)	(0.001)	(0.008)	(0.063)	(0.444)	2.899	(16.697)	(45.257)
Data Quality				(C)	(C)	C	(C)	(C)
Uncert. in T (K)				(2)	(1)	0.5	(2)	(5)
Uncert. in p (kPa)				(0.1)	(0.5)	2	(50)	(200)
Uncert. in p (%)				(10)	(5)	2	(5)	(10)

Vapour Pressure of 3-Methylpentan-2-one

Units: kPa v. K

Uncertainty in				Uncertainty in				Uncertainty in			
T	p	T	p	T	p	T	p	T	p	T	p
K	kPa	K	%	K	kPa	K	%	K	kPa	K	%
200	(4.E-4)			300	(2.847)	1	5	400	(131.8)	1	2
205	(8.E-4)			305	(3.713)	1	5	405	(150.5)	1	2
210	(0.002)			310	(4.793)	1	5	410	(171.3)	1	2
215	(0.003)			315	(6.126)	1	5	415	(194.3)	1	2
220	(0.005)			320	(7.757)	1	5	420	(219.6)	1	2
225	(0.009)			325	(9.735)	1	5	425	(247.3)	1	2
230	(0.015)			330	(12.12)	1	5	430	(277.6)	1	2
235	(0.025)			335	(14.96)	1	5	435	(310.7)	1	2
240	(0.040)			340	(18.34)	1	5	440	(346.7)	2	2
245	(0.063)			345	(22.31)	1	5	445	(385.8)	2	2
250	(0.096)			350	(26.97)	1	2	450	(428.2)	2	5
255	(0.145)			355	(32.39)	1	2	455	(474.1)	2	5
260	(0.215)			360	(38.65)	1	2	460	(523.5)	2	5
265	(0.313)			365	(45.86)	1	2	465	(576.7)	2	5
270	(0.448)			370	(54.12)	1	2	470	(633.9)	2	5
275	(0.631)			375	(63.52)	1	2	475	(695.3)	2	5
280	(0.876)			380	(74.18)	0.5	2	480	(761.1)	2	5
285	(1.198)	2	10	385	(86.21)	0.5	2	485	(831.4)	2	5
290	(1.618)	1	10	390	99.74	0.5	2	490	(906.5)	2	5
295	(2.159)	1	10	395	(114.9)	1	2	495	(986.5)	2	5

Vapour Pressure of 3-Methylpentan-2-one continued

Units: atm or mmHg v. °C

t °C	p mmHg	t °C	p mmHg	t °C	p atm	t °C	p atm	t °C	p atm
-100	(3.E-5)	0	(4.177)	100	(0.591)	200	(6.633)	300	(30.59)
-90	(2.E-4)	10	(8.015)	110	(0.805)	210	(7.943)		
-80	(0.001)	20	(14.58)	120	(1.077)	220	(9.438)		
-70	(0.005)	30	(25.28)	130	(1.415)	230	(11.14)		
-60	(0.017)	40	(42.01)	140	(1.831)	240	(13.05)		
-50	(0.054)	50	(67.20)	150	(2.336)	250	(15.21)		
-40	(0.154)	60	(103.9)	160	(2.942)	260	(17.64)		
-30	(0.398)	70	(155.8)	170	(3.661)	270	(20.35)		
-20	(0.938)	80	(227.2)	180	(4.507)	280	(23.38)		
-10	(2.049)	90	(323.1)	190	(5.493)	290	(26.78)		

Units: psia v. °F

t °F	p psia	t °F	p psia	t °F	p psia	t °F	p psia	t °F	p psia
-100	(6.E-5)	100	(0.728)	300	(33.44)	500	(259.2)		
-80	(2.E-4)	120	(1.235)	320	(43.24)	520	(303.8)		
-60	(9.E-4)	140	(2.009)	340	(55.09)	540	(354.2)		
-40	(0.003)	160	(3.145)	360	(69.27)	560	(411.4)		
-20	(0.008)	180	(4.761)	380	(86.05)	580	(476.8)		
0	(0.022)	200	(6.991)	400	(105.7)				
20	(0.051)	220	(9.991)	420	(128.6)				
40	(0.109)	240	(13.94)	440	(155.0)				
60	(0.217)	260	(19.02)	460	(185.3)				
80	(0.409)	280	(25.44)	480	(219.9)				

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (*) indicates that the Source is not a primary source of experimental data for this compound.

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- 18 TRC Thermodynamic Tables, Texas A & M Univ., Loose leaf data sheets extant 1992.* N

The following Sources were used to estimate data for this compound.

- AMBROSE, D., NPL Report Chem 92, Nat. Phys. Lab., Teddington, Middlesex, UK, 1978.* C
 AMBROSE, D., NPL Report Chem 98, Nat. Phys. Lab., Teddington, Middlesex, UK, 1979.* C

Antoine equation: $\ln(p/\text{kPa}) = 14.08351 - 3128.244/(T/K - 60.050)$ for $2 < p/\text{kPa} < 200$.

C₆H₁₂O 4-Methylpentan-2-one (Methyl isobutyl ketone)

CAS Reg. No. 108-10-1

Mol. Wt. 100.160

Vapour Pressure $\ln p = \ln p_c + (T_c/T)(b_1q + b_2q^{1.5} + b_3q^{2.5} + b_4q^5)$

where T is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90), p is the vapour pressure, T_c, p_c are the critical temperature and the critical pressure respectively and q = 1 - T/T_c.

Critical Temperature	T _c = 574.6 K	(t _c = 301.45 °C	= 574.61 °F)
Critical Pressure	p _c = 3270 kPa	(p _c = 32.27 atm	= 474.3 psi)
	b ₁ = -7.78930		
	b ₂ = 1.94732		
	b ₃ = -3.0921		
	b ₄ = -3.573		

Acentric Factor	= 0.351		
Normal Boiling Point	= 389.124 K	(= 115.974 °C	= 240.753 °F)
dT/dp at N.B.P.	= 0.342 K/kPa	(= 0.046 °C/mmHg	= 4.250 °F/psi)
Normal Melting Point	= 189 K	(= -84 °C	= -119 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	101.325	1000	3270
T/K	(206.540)	(225.796)	(249.944)	281.412	324.645	389.124	493.633	574.600
(dp/dT)/(kPa/K)	(1.E-4)	(0.001)	(0.008)	0.063	0.447	2.920	16.801	44.332
Data Quality				A	A	A	A	A
Uncert. in T (K)				0.01	0.01	0.02	0.1	0.5
Uncert. in p (kPa)				0.0005	0.005	0.05	2	20
Uncert. in p (%)				0.05	0.05	0.05	0.2	0.5

Vapour Pressure of 4-Methylpentan-2-one

Units: kPa v. K

		Uncertainty in				Uncertainty in				Uncertainty in	
T	p	T	p	T	p	T	p	T	p	T	p
K	kPa	K	%	K	kPa	K	%	K	kPa	K	%
				300	2.972	0.01	0.05	425	257.3	0.05	0.1
				305	3.876	0.01	0.05	430	288.8	0.05	0.1
				310	5.003	0.01	0.05	435	323.1	0.05	0.1
190	(9.E-5)			315	6.394	0.01	0.05	440	360.5	0.05	0.1
195	(2.E-4)			320	8.095	0.01	0.05	445	401.1	0.05	0.1
200	(4.E-4)			325	10.16	0.01	0.05	450	445.1	0.05	0.1
205	(8.E-4)			330	12.64	0.01	0.05	455	492.6	0.05	0.1
210	(0.002)			335	15.61	0.01	0.05	460	543.8	0.05	0.1
215	(0.003)			340	19.13	0.01	0.05	465	599.0	0.1	0.1
220	(0.005)			345	23.28	0.01	0.05	470	658.3	0.1	0.2
225	(0.009)			350	28.13	0.01	0.05	475	721.8	0.1	0.2
230	(0.016)			355	33.78	0.01	0.05	480	789.9	0.1	0.2
235	(0.026)			360	40.31	0.01	0.05	485	862.7	0.1	0.2
240	(0.041)			365	47.82	0.02	0.05	490	940.4	0.1	0.2
245	(0.065)			370	56.42	0.02	0.05	495	1023.	0.1	0.2
250	(0.100)			375	66.21	0.02	0.05	500	1111.	0.1	0.2
255	(0.152)			380	77.31	0.02	0.05	505	1205.	0.1	0.2
260	(0.225)			385	89.83	0.02	0.05	510	1305.	0.2	0.2
265	(0.327)			390	103.9	0.02	0.05	515	1410.	0.2	0.2
270	(0.468)			395	119.7	0.02	0.05	520	1523.	0.2	0.2
275	0.659			400	137.2	0.02	0.05	525	1641.	0.2	0.2
280	0.914			405	156.8	0.02	0.05	530	1767.	0.2	0.5
285	1.251	0.01	0.05	410	178.4	0.02	0.05	535	1900.	0.2	0.5
290	1.689	0.01	0.05	415	202.2	0.02	0.1	540	2041.	0.2	0.5
295	2.254	0.01	0.05	420	228.5	0.02	0.1	545	2190.	0.2	0.5

Vapour Pressure of 4-Methylpentan-2-one continued

Units: atm or mmHg v. °C

t °C	p mmHg	t °C	p mmHg	t °C	p atm	t °C	p atm	t °C	p atm
		0	4.360	100	0.616	200	6.887	300	31.65
		10	8.366	110	0.839	210	8.243		
-80	(0.001)	20	15.22	120	1.121	220	9.789		
-70	(0.005)	30	26.39	130	1.473	230	11.54		
-60	(0.017)	40	43.85	140	1.906	240	13.53		
-50	(0.056)	50	70.13	150	2.431	250	15.76		
-40	(0.161)	60	108.4	160	3.060	260	18.26		
-30	(0.415)	70	162.5	170	3.807	270	21.06		
-20	(0.979)	80	236.9	180	4.684	280	24.19		
-10	(2.138)	90	336.9	190	5.706	290	27.69		

Units: psia v. °F

t °F	p psia	t °F	p psia	t °F	p psia	t °F	p psia	t °F	p psia
-100	(6.E-5)	100	0.760	300	34.79	500	268.3		
-80	(3.E-4)	120	1.289	320	44.97	520	314.3		
-60	(0.001)	140	2.096	340	57.27	540	366.4		
-40	(0.003)	160	3.281	360	71.98	560	425.6		
-20	(0.009)	180	4.965	380	89.36				
0	(0.023)	200	7.288	400	109.7				
20	(0.053)	220	10.41	420	133.4				
40	0.113	240	14.52	440	160.7				
60	0.227	260	19.81	460	192.0				
80	0.427	280	26.49	480	227.7				

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (*) indicates that the Source is not a primary source of experimental data for this compound.

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Antoine equation: $\ln(p/\text{kPa}) = 14.08483 - 3106.585/(T/K - 60.958)$ for $2 < p/\text{kPa} < 200$.

C₆H₁₂O 2-Methylpentan-3-one (Ethyl isopropyl ketone)

CAS Reg. No. 565-69-5

Mol. Wt. 100.160

Vapour Pressure $\ln p = \ln p_c + (T_c/T)(b_1q + b_2q^{1.5} + b_3q^{2.5} + b_4q^5)$

where T is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90), p is the vapour pressure, T_c, p_c are the critical temperature and the critical pressure respectively and q = 1 - T/T_c.

Critical Temperature	T _c = 572 K	(t _c = 298.85 °C	= 569.93 °F)
Critical Pressure	p _c = 3200 kPa	(p _c = 31.58 atm	= 464.1 psi)
	b ₁ = -7.83638		
	b ₂ = 2.08059		
	b ₃ = -3.0958		
	b ₄ = -3.559		
Acentric Factor	= 0.346		
Normal Boiling Point	= 387.650 K	(= 114.500 °C	= 238.100 °F)
dT/dp at N.B.P.	= 0.344 K/kPa	(= 0.046 °C/mmHg	= 4.268 °F/psi)
Normal Melting Point	= -		

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	101.325	1000	3200
T/K	(204.963)	(224.158)	(248.254)	(279.695)	322.966	387.650	(492.662)	(572.000)
(dp/dT)/(kPa/K)	(1.E-4)	(0.001)	(0.008)	(0.063)	0.446	2.908	(16.733)	(43.841)
Data Quality				(C)	C	C	(C)	(C)
Uncert. in T (K)				(1)	1	2	(5)	(10)
Uncert. in p (kPa)				(0.05)	0.5	5	(100)	(500)
Uncert. in p (%)				(5)	5	5	(10)	(10)

Vapour Pressure of 2-Methylpentan-3-one

Units: kPa v. K

Uncertainty in				Uncertainty in				Uncertainty in			
T	p	T	p	T	p	T	p	T	p	T	p
K	kPa	K	%	K	kPa	K	%	K	kPa	K	%
200	(5.E-4)			300	3.259	1	5	400	(142.6)	2	5
205	(0.001)			305	4.234	1	5	405	(162.6)	2	5
210	(0.002)			310	5.444	1	5	410	(184.7)	2	5
215	(0.004)			315	6.933	1	5	415	(209.1)	2	5
220	(0.006)			320	8.748	1	5	420	(235.8)	2	5
225	(0.011)			325	10.94	1	5	425	(265.2)	2	5
230	(0.018)			330	13.58	1	5	430	(297.2)	2	5
235	(0.030)			335	16.71	1	5	435	(332.2)	2	5
240	(0.048)			340	20.42	1	5	440	(370.1)	2	5
245	(0.076)			345	24.78	1	5	445	(411.3)	5	10
250	(0.116)			350	29.86	1	5	450	(455.9)	5	10
255	(0.174)			355	35.76	1	5	455	(504.0)	5	10
260	(0.256)			360	42.57	1	5	460	(555.8)	5	10
265	(0.370)			365	50.39	2	5	465	(611.6)	5	10
270	(0.527)			370	59.31	2	5	470	(671.5)	5	10
275	(0.738)			375	69.45	2	5	475	(735.7)	5	10
280	(1.019)	1	5	380	80.92	2	5	480	(804.4)	5	10
285	(1.389)	1	5	385	93.85	2	5	485	(877.9)	5	10
290	(1.868)	1	5	390	(108.3)	2	5	490	(956.2)	5	10
295	2.481	1	5	395	(124.5)	2	5	495	(1040.)	5	10

Vapour Pressure of 2-Methylpentan-3-one continued

Units: atm or mmHg v. °C

$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{mmHg}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{mmHg}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$
-100	(4.E-5)	0	(4.895)	100	0.647	200	(7.021)		
-90	(3.E-4)	10	(9.306)	110	0.877	210	(8.390)		
-80	(0.001)	20	16.78	120	(1.168)	220	(9.950)		
-70	(0.006)	30	28.86	130	(1.529)	230	(11.72)		
-60	(0.021)	40	47.60	140	(1.972)	240	(13.72)		
-50	(0.067)	50	75.63	150	(2.507)	250	(15.96)		
-40	(0.189)	60	116.2	160	(3.147)	260	(18.49)		
-30	(0.482)	70	173.1	170	(3.905)	270	(21.31)		
-20	(1.124)	80	251.1	180	(4.794)	280	(24.48)		
-10	(2.426)	90	355.3	190	(5.828)	290	(28.03)		

Units: psia v. °F

$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$
-100	(7.E-5)	100	0.826	300	(35.89)	500	(271.7)		
-80	(3.E-4)	120	1.391	320	(46.25)	520	(318.1)		
-60	(0.001)	140	2.246	340	(58.74)	540	(370.8)		
-40	(0.004)	160	3.494	360	(73.64)	560	(430.9)		
-20	(0.010)	180	5.256	380	(91.22)				
0	(0.026)	200	7.674	400	(111.8)				
20	(0.060)	220	10.91	420	(135.7)				
40	(0.127)	240	(15.15)	440	(163.2)				
60	(0.251)	260	(20.58)	460	(194.8)				
80	0.468	280	(27.42)	480	(230.8)				

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (*) indicates that the Source is not a primary source of experimental data for this compound.

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- 15 TRC Thermodynamic Tables, Texas A & M Univ., Loose leaf data sheets extant 1992.*

The following Sources were used to estimate data for this compound.

- AMBROSE, D., NPL Report Chem 92, Nat. Phys. Lab., Teddington, Middlesex, UK, 1978.* C**
AMBROSE, D., NPL Report Chem 98, Nat. Phys. Lab., Teddington, Middlesex, UK, 1979.* C

Antoine equation: $\ln(p/\text{kPa}) = 14.02650 - 3081.799/(T/\text{K} - 60.084)$ for $2 < p/\text{kPa} < 200$.

C₆H₁₂O 3,3-Dimethylbutan-2-one (Methyl tert-butyl ketone, Pinacolone)

CAS Reg. No. 75-97-8

Mol. Wt. 100.160

Vapour Pressure $\ln p = \ln p_c + (T_c/T)(b_1q + b_2q^{1.5} + b_3q^{2.5} + b_4q^5)$

where T is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90), p is the vapour pressure, T_c, p_c are the critical temperature and the critical pressure respectively and q = 1 - T/T_c.

Critical Temperature T_c = 567 K (t_c = 293.85 °C = 560.93 °F)
 Critical Pressure p_c = 3430 kPa (p_c = 33.85 atm = 497.5 psi)
 b₁ = -7.68493
 b₂ = 2.04736
 b₃ = -2.9678
 b₄ = -3.428

Acentric Factor = 0.318
 Normal Boiling Point = 379.236 K (= 106.086 °C = 222.955 °F)
 dT/dp at N.B.P. = 0.338 K/kPa (= 0.045 °C/mmHg = 4.200 °F/psi)
 Normal Melting Point = 221 K (= -52 °C = -62 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	101.325	1000	3430
T/K			(242.262)	(273.128)	315.632	379.236	(482.800)	(567.000)
(dp/dT)/(kPa/K)			(0.009)	(0.065)	0.454	2.955	(16.916)	(46.493)
Data Quality			(A)	(A)	A	A	(A)	(B)
Uncert. in T (K)			(0.01)	(0.01)	0.005	0.005	(0.1)	(2)
Uncert. in p (kPa)			(0.0005)	(0.0005)	0.002	0.02	(2)	(100)
Uncert. in p (%)			(0.05)	(0.05)	0.02	0.02	(0.2)	(2)

Vapour Pressure of 3,3-Dimethylbutan-2-one

Units: kPa v. K

		Uncertainty in				Uncertainty in				Uncertainty in	
T	p	T	p	T	p	T	p	T	p	T	p
K	kPa	K	%	K	kPa	K	%	K	kPa	K	%
				350	39.63	0.005	0.02	475	(874.4)	0.1	0.1
				355	47.15	0.005	0.02	480	(953.5)	0.1	0.1
				360	55.78	0.005	0.02	485	(1038.)	0.1	0.2
240	(0.082)			365	65.61	0.005	0.02	490	(1127.)	0.1	0.2
245	(0.126)			370	76.78	0.005	0.02	495	(1223.)	0.1	0.2
250	(0.190)			375	89.40	0.005	0.02	500	(1324.)	0.2	0.2
255	(0.281)			380	103.6	0.005	0.02	505	(1432.)	0.2	0.2
260	(0.407)			385	119.5	0.01	0.02	510	(1546.)	0.2	0.5
265	(0.580)			390	137.3	0.01	0.02	515	(1667.)	0.2	0.5
270	(0.815)			395	157.0	0.01	0.02	520	(1795.)	0.5	0.5
275	(1.127)	0.01	0.05	400	178.9	0.01	0.02	525	(1930.)	0.5	0.5
280	(1.538)	0.005	0.05	405	(203.1)	0.01	0.05	530	(2073.)	0.5	1
285	(2.070)	0.005	0.05	410	(229.7)	0.02	0.05	535	(2225.)	0.5	1
290	2.752	0.005	0.02	415	(258.9)	0.02	0.05	540	(2385.)	1	1
295	3.616	0.005	0.02	420	(290.9)	0.02	0.05	545	(2554.)	1	1
300	4.700	0.005	0.02	425	(325.8)	0.02	0.05	550	(2733.)	1	2
305	6.046	0.005	0.02	430	(363.8)	0.02	0.05	555	(2923.)	1	2
310	7.700	0.005	0.02	435	(405.0)	0.02	0.05	560	(3125.)	2	2
315	9.717	0.005	0.02	440	(449.7)	0.05	0.05	565	(3339.)	2	2
320	12.15	0.005	0.02	445	(498.0)	0.05	0.1				
325	15.08	0.005	0.02	450	(550.1)	0.05	0.1				
330	18.55	0.005	0.02	455	(606.2)	0.05	0.1				
335	22.66	0.005	0.02	460	(666.5)	0.05	0.1				
340	27.49	0.005	0.02	465	(731.1)	0.05	0.1				
345	33.11	0.005	0.02	470	(800.4)	0.05	0.1				

Vapour Pressure of 3,3-Dimethylbutan-2-one continued

Units: atm or mmHg v. °C

$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{mmHg}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{mmHg}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$	$\frac{t}{^{\circ}\text{C}}$	$\frac{p}{\text{atm}}$
-50	(0.122)	50	104.5	150	(3.084)	250	(18.55)		
-40	(0.330)	60	158.0	160	(3.843)	260	(21.39)		
-30	(0.809)	70	232.0	170	(4.734)	270	(24.58)		
-20	(1.826)	80	331.9	180	(5.773)	280	(28.14)		
-10	(3.825)	90	463.7	190	(6.975)	290	(32.16)		
0	(7.511)	100	634.2	200	(8.354)				
10	(13.93)	110	850.7	210	(9.928)				
20	24.55	120	1121.	220	(11.71)				
30	41.36	130	1454.	230	(13.73)				
40	66.94	140	(1859.)	240	(16.00)				

Units: psia v. °F

$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$	$\frac{t}{^{\circ}\text{F}}$	$\frac{p}{\text{psia}}$
		100	1.167	300	(44.20)	500	(314.4)		
		120	1.926	320	(56.47)	520	(366.7)		
-60	(0.002)	140	3.055	340	(71.16)	540	(426.1)		
-40	(0.006)	160	4.674	360	(88.55)	560	(494.0)		
-20	(0.017)	180	6.926	380	(109.0)				
0	(0.042)	200	9.976	400	(132.7)				
20	(0.093)	220	14.01	420	(160.1)				
40	(0.192)	240	19.22	440	(191.5)				
60	(0.371)	260	25.83	460	(227.4)				
80	0.675	280	(34.07)	480	(268.2)				

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (*) indicates that the Source is not a primary source of experimental data for this compound.

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The following Sources were used to estimate data for this compound.

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Antoine equation: $\ln(p/\text{kPa}) = 13.99547 - 3012.459/(T/\text{K} - 57.981)$ for $2 < p/\text{kPa} < 200$.