

Vapour pressures and critical points of liquids: Halogenated C₃ and higher hydrocarbons

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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: HALOGENATED C₃ AND HIGHER HYDROCARBONS

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Compound tables are given on data sheets in the following order:

Formula	Name	Alternative Name(s)
HALOALKANES		
C ₃ H ₇ Cl	1-Chloropropane	Propyl chloride
	2-Chloropropane	Isopropyl chloride
C ₃ H ₇ Br	1-Bromopropane	Propyl bromide
	2-Bromopropane	Isopropyl bromide
C ₃ H ₆ Cl ₂	1,2-Dichloropropane	Propylene dichloride
C ₃ H ₆ Br ₂	1,2-Dibromopropane	Propylene dibromide
C ₃ H ₅ Br ₃	1,2,3-Tribromopropane	
C ₃ F ₈	Perfluoropropane	Octafluoropropane
C ₄ H ₉ Cl	1-Chlorobutane	Butyl chloride
	2-Chlorobutane	<i>sec</i> -Butyl chloride
	1-Chloro-2-methylpropane	Isobutyl chloride
	2-Chloro-2-methylpropane	<i>tert</i> -Butyl chloride
C ₄ H ₉ Br	1-Bromobutane	Butyl bromide
	2-Bromo-2-methylpropane	<i>tert</i> -Butyl bromide
C ₄ F ₁₀	Perfluorobutane	
	Perfluoro-2-methylpropane	Perfluoroisobutane

Formula	Name	Alternative Name(s)	
$C_5H_{11}Cl$ C_5F_{12}	1-Chloropentane Perfluoropentane Perfluoro-2-methylbutane	Pentyl chloride	<i>n</i> -Amyl chloride
$C_6H_{13}Cl$ C_6F_{14}	1-Chlorohexane Perfluorohexane Perfluoro-2-methylpentane Perfluoro-3-methylpentane Perfluoro-2,3-dimethylbutane	Hexyl chloride	
$C_7H_{15}Cl$ C_7F_{16}	1-Chloroheptane Perfluoroheptane	Heptyl chloride	
$C_8H_{17}Cl$ C_8F_{18}	1-Chlorooctane Perfluorooctane	Octyl chloride	
$C_9H_{19}Cl$ C_9F_{20}	1-Chlorononane Perfluorononane	Nonyl chloride	
$C_{10}H_{21}Cl$ $C_{10}F_{22}$	1-Chlorodecane Perfluorodecane	Decyl chloride	
$C_{11}H_{23}Cl$	1-Chloroundecane	Undecyl chloride	
$C_{12}H_{25}Cl$	1-Chlorododecane	Dodecyl chloride	
$C_{13}H_{27}Cl$	1-Chlorotridecane	Tridecyl chloride	
$C_{14}H_{29}Cl$	1-Chlorotetradecane	Tetradecyl chloride	
$C_{15}H_{31}Cl$	1-Chloropentadecane	Pentadecyl chloride	
$C_{16}H_{33}Cl$	1-Chlorohexadecane	Hexadecyl chloride	
HALOALKENES			
C_3H_5Cl	3-Chloropropylene	Allyl chloride	
C_3F_6	Perfluoropropylene	Hexafluoropropylene	
C_4F_8	Perfluorobut-1-ene	Octafluorobut-1-ene	
HALOALKADIENES			
C_4H_5Cl	2-Chlorobuta-1,3-diene	Chloroprene	
C_4Cl_6	Perchlorobuta-1,3-diene	Hexachlorobuta-1,3-diene	
HALOCYCLOALKANES			
C_4F_8	Perfluorocyclobutane	Octafluorocyclobutane	Refrigerant C318
C_6F_{12}	Perfluoro-1,2-dimethylcyclobutane		
C_5F_{10}	Perfluorocyclopentane		
C_6F_{12}	Perfluorocyclohexane		
C_7F_{14}	Perfluoromethylcyclohexane		
C_8F_{16}	Perfluoroethylcyclohexane		
	Perfluorodimethylcyclohexane		

This page Amendments A and C

VAPOUR PRESSURES AND CRITICAL POINTS OF LIQUIDS: HALOGENATED C₃ AND HIGHER HYDROCARBONS

1. INTRODUCTION

This Data Item presents saturated vapour pressures of halogenated hydrocarbons arranged in the order shown on the Contents page. Table 1 is the Compound Name Index which lists 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 Table.

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 Table. Using the critical temperature and the critical pressure given, the coefficients were derived by fitting the equation to the experimental and estimated 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 temperature.

In certain circumstances the user may need to allow for uncertainties in the tabulated values and estimates of these are provided in the Tables. For simplicity the uncertainties are rounded to 1, 2 or 5 times a power of 10.

The short table giving data at specified vapour pressures contains an assessment of the data quality, indicated by the letters 'X', 'A', 'B' or 'C' at these pressures. The estimated uncertainties in temperature and pressure which are dependent upon the data quality are shown underneath. This subject is 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 kelvin, (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. In general, pressures are given from just above the melting temperature 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 critical temperatures the tables are truncated at a convenient lower temperature.

Brackets enclose values above or below the range of supporting experimental data and values below 0.001 are given in exponent form. It is not feasible to assess uncertainties below 0.1 kPa.

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 Practical Temperature Scale (IPTS-68), which for practical purposes is interchangeable with thermodynamic temperature.

b_1, b_2, b_3, b_4	non-dimensional coefficients of the Wagner vapour-pressure equation	
p	vapour pressure	kPa
q	$(1 - T / T_c)$	
T	thermodynamic temperature	K
t	Celsius temperature ($T-273.15$)	°C

Subscripts

b	denotes value at the normal boiling point
c	denotes value at the critical point
m	denotes value at the 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 low pressure range direct measurements of vapour pressure have relatively large uncertainties because of the difficulty of making such measurements. In the high pressure range the uncertainties in measured values increase progressively with increasing temperature and the uncertainty in pressure may reach one or two per cent at the critical point.

For the majority of the compounds considered here the data are restricted to the medium pressure range and values outside this range were obtained by estimation.

4. EVALUATION AND CORRELATION

From well established data for a variety of compounds, Ambrose has shown, in References 3 and 4, that the differences in the shapes of the vapour pressure curves of different classes of chemical substances are characterised by different ranges of numerical values for not only various properties of the curves but also two simple functions involving the coefficients of their Wagner equations. In addition, Ambrose and Walton have shown, in Reference 5, that for a homologous series of compounds the coefficients of their equations fall into a gradually changing pattern reflecting the gradually changing shapes of the vapour pressure curves of successive members of the series.

Thus, for certain classes of compounds it is possible to establish criteria that vapour pressure curves based on less extensive or less reliable data should meet. For most of the compounds considered here these criteria were satisfied by fixing the ratio of the third coefficient to the second when fitting the Wagner equation.

Each particular group or series of compounds with related molecular structure, for example 1-chloroalkanes, was considered separately. Where necessary, critical temperatures and critical pressures were estimated by the methods of References 1 and 2 and the data for each compound fitted by the Wagner equation. Sometimes adjustments (usually to the selected critical pressure) were necessary to improve each fit or to ensure a smooth variation between compounds of each of the curve's parameters, for example, acentric factor.

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

5. DISCUSSION OF UNCERTAINTIES

For ease of interpolation, values are presented in the Tables according to a uniform pattern without regard to their estimated accuracy. The uncertainties in the values for each compound 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 giving data at specified vapour pressures the data quality at each pressure is denoted by one of the letters 'X', 'A', 'B' or 'C'. Brackets enclose the letters at those pressures which are outside the range of supporting experimental data. The uncertainties in temperature and pressure are not thought to be more than the values shown below each letter.

The data quality of vapour pressures derived from very high quality experimental data with uncertainties in temperature of about 0.001 K at the normal boiling point or about 0.01 K at the critical point is indicated by the letter 'X'. Such data are available for very few compounds. The majority of reliable data are considered of quality 'A' with uncertainties up to 10 times those of quality 'X'. 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.

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 and since the acentric factor, ω , is dependent upon the value of critical pressure selected, the uncertainty in ω for these compounds is 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. Use of the Antoine equation outside the quoted range of pressures will give vapour pressures that may be excessively low.

7. REFERENCES

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.

TABLE 1 COMPOUND NAME INDEX

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

<i>Name</i>		<i>Category</i>
Allyl chloride	see 3-Chloropropylene	HALOALKENES
<i>n</i> -Amyl chloride	see 1-Chloropentane	HALOALKANES
1-Bromobutane		HALOALKANES
2-Bromo-2-methylpropane		HALOALKANES
1-Bromopropane		HALOALKANES
2-Bromopropane		HALOALKANES
Butyl bromide	see 1-Bromobutane	HALOALKANES
<i>tert</i> -Butyl bromide	see 2-Bromo-2-methylpropane	HALOALKANES
Butyl chloride	see 1-Chlorobutane	HALOALKANES
<i>sec</i> -Butyl chloride	see 2-Chlorobutane	HALOALKANES
<i>tert</i> -Butyl chloride	see 2-Chloro-2-methylpropane	HALOALKANES
2-Chlorobuta-1,3-diene		HALOALKADIENES
1-Chlorobutane		HALOALKANES
2-Chlorobutane		HALOALKANES
1-Chlorodecane		HALOALKANES
1-Chlorododecane		HALOALKANES
1-Chloroheptane		HALOALKANES
1-Chlorohexadecane		HALOALKANES
1-Chlorohexane		HALOALKANES
1-Chloro-2-methylpropane		HALOALKANES
2-Chloro-2-methylpropane		HALOALKANES
1-Chlorononane		HALOALKANES
1-Chlorooctane		HALOALKANES
1-Chloropentadecane		HALOALKANES
1-Chloropentane		HALOALKANES
Chloroprene	see 2-Chlorobuta-1,3-diene	HALOALKADIENES
1-Chloropropane		HALOALKANES
2-Chloropropane		HALOALKANES
3-Chloropropylene		HALOALKENES
1-Chlorotetradecane		HALOALKANES
1-Chlorotridecane		HALOALKANES
1-Chloroundecane		HALOALKANES
Decyl chloride	see 1-Chlorodecane	HALOALKANES
1,2-Dibromopropane		HALOALKANES
1,2-Dichloropropane		HALOALKANES
Dodecyl chloride	see 1-Chlorododecane	HALOALKANES
Heptyl chloride	see 1-Chloroheptane	HALOALKANES
Hexachlorobuta-1,3-diene	see Perchlorobuta-1,3-diene	HALOALKADIENES
Hexadecyl chloride	see 1-Chlorohexadecane	HALOALKANES
Hexafluoropropylene	see Perfluoropropylene	HALOALKENES
Hexyl chloride	see 1-Chlorohexane	HALOALKANES
Isobutyl chloride	see 1-Chloro-2-methylpropane	HALOALKANES
Isopropyl bromide	see 2-Bromopropane	HALOALKANES

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TABLE 1 COMPOUND NAME INDEX

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

<i>Name</i>		<i>Category</i>
Isopropyl chloride	see 2-Chloropropane	HALOALKANES
Nonyl chloride	see 1-Chlorononane	HALOALKANES
Octafluorobut-1-ene	see Perfluorobut-1-ene	HALOALKENES
Octafluorocyclobutane	see Perfluorocyclobutane	HALOCYCLOALKANES
Octafluoropropane	see Perfluoropropane	HALOALKANES
Octyl chloride	see 1-Chlorooctane	HALOALKANES
Pentadecyl chloride	see 1-Chloropentadecane	HALOALKANES
Pentyl chloride	see 1-Chloropentane	HALOALKANES
Perchlorobuta-1,3-diene		HALOALKADIENES
Perfluorobutane		HALOALKANES
Perfluorobut-1-ene		HALOALKENES
Perfluorocyclobutane		HALOCYCLOALKANES
Perfluorocylohexane		HALOCYCLOALKANES
Perfluorocyclopentane		HALOCYCLOALKANES
Perfluorodecane		HALOALKANES
Perfluoro-2,3-dimethylbutane		HALOALKANES
Perfluoro-1,2-dimethylcyclobutane		HALOCYCLOALKANES
Perfluorodimethylcyclohexane		HALOCYCLOALKANES
Perfluoroethylcyclohexane		HALOCYCLOALKANES
Perfluoroheptane		HALOALKANES
Perfluorohexane		HALOALKANES
Perfluoroisobutane	see Perfluoro-2-methylpropane	HALOALKANES
Perfluoro-2-methylbutane		HALOALKANES
Perfluoromethylcyclohexane		HALOCYCLOALKANES
Perfluoro-2-methylpentane		HALOALKANES
Perfluoro-3-methylpentane		HALOALKANES
Perfluoro-2-methylpropane		HALOALKANES
Perfluorononane		HALOALKANES
Perfluorooctane		HALOALKANES
Perfluoropentane		HALOALKANES
Perfluoropropane		HALOALKANES
Perfluoropropylene		HALOALKENES
Propyl bromide	see 1-Bromopropane	HALOALKANES
Propyl chloride	see 1-Chloropropane	HALOALKANES
Propylene dibromide	see 1,2-Dibromopropane	HALOALKANES
Propylene dichloride	see 1,2-Dichloropropane	HALOALKANES
Refrigerant C318	see Perfluorocyclobutane	HALOCYCLOALKANES
Tetradecyl chloride	see 1-Chlorotetradecane	HALOALKANES
1,2,3-Tribromopropane		HALOALKANES
Tridecyl chloride	see 1-Chlorotridecane	HALOALKANES
Undecyl chloride	see 1-Chloroundecane	HALOALKANES

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C₃H₇Cl 1-Chloropropane (Propyl chloride)**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 temperature on the International Practical Temperature Scale of 1968 (IPIS-68), p is the vapour pressure, T_c , p_c are the critical temperature and critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature	$T_c = 503.2 \text{ K}$	(= 230.05 °C	= 446.09 °F)
Critical Pressure	$p_c = 4580 \text{ kPa}$	(= 45.20 atm	= 664.3 psia)
	$b_1 = -7.25683$		
	$b_2 = 2.17705$		
	$b_3 = -3.0110$		
	$b_4 = -1.534$		
Acentric Factor	$\omega = 0.223$		
Normal Boiling Point	$= 319.573 \text{ K}$	(= 46.423 °C	= 115.562 °F)
dT/dp at N.B.P.	$= 0.290 \text{ K/kPa}$	(= 0.039 °C/mmHg	= 3.594 °F/psi)
Normal Melting Point	$= 150 \text{ K}$	(= -123 °C	= -190 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	100	1000	4580
T/K	164.492	180.902	201.492	228.294	265.008	319.188	408.454	503.200
(dp/dT)/(kPa/K)	2.E-4	0.001	0.010	0.074	0.527	3.417	19.552	66.051
Data Quality			(B)	(B)	B	B	B	B
Uncertainty in T (K)			0.5	0.2	0.1	0.1	0.5	1
Uncertainty in p (%)			5	2	1	0.5	1	2

Vapour Pressure of 1-Chloropropane

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	%
150	(8.E-5)			275	16.56	0.1	0.5	400	844.5	0.5	1
155	(2.E-4)			280	20.99	0.1	0.5	405	934.1	0.5	1
160	(5.E-4)			285	26.35	0.1	0.5	410	1031.	0.5	1
165	(0.001)			290	32.77	0.1	0.5	415	1134.	0.5	1
170	(0.002)			295	40.40	0.1	0.5	420	1245.	0.5	1
175	(0.005)			300	49.41	0.1	0.5	425	1364.	0.5	1
180	(0.009)			305	59.97	0.1	0.5	430	1491.	0.5	1
185	(0.017)			310	72.26	0.1	0.5	435	1626.	0.5	1
190	(0.030)			315	86.47	0.1	0.5	440	1770.	0.5	1
195	(0.051)			320	102.8	0.1	0.5	445	1923.	0.5	1
200	(0.086)			325	121.5	0.1	0.5	450	2086.	0.5	2
205	(0.141)	0.5	5	330	142.7	0.1	0.5	455	2259.	0.5	2
210	(0.223)	0.2	5	335	166.7	0.1	0.5	460	2442.	0.5	2
215	(0.346)	0.2	5	340	193.7	0.1	0.5	465	2637.	0.5	2
220	(0.525)	0.2	2	345	223.9	0.2	0.5	470	2843.	1	2
225	(0.779)	0.2	2	350	257.7	0.2	0.5	475	3062.	1	2
230	(1.134)	0.2	2	355	295.1	0.2	1	480	3294.	1	2
235	(1.621)	0.2	2	360	336.6	0.2	1	485	3540.	1	2
240	(2.277)	0.2	2	365	382.4	0.2	1	490	3801.	1	2
245	(3.148)	0.1	1	370	432.6	0.2	1	495	4080.	1	2
250	4.288	0.1	1	375	487.7	0.2	1	500	4377.	1	2
255	5.759	0.1	1	380	547.8	0.2	1				
260	7.634	0.1	1	385	613.3	0.2	1				
265	9.996	0.1	1	390	684.3	0.2	1				
270	12.94	0.1	1	395	761.3	0.2	1				

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Vapour Pressure of 1-Chloropropane continued

Units: atm or mmHg v. °C

T °C	p mmHg	T °C	p mmHg	T °C	p mmHg	T °C	p atm	T °C	p atm
-120	(0.001)	-50	(5.062)	25	344.3	100	4.606	175	19.98
-115	(0.003)	-45	(7.420)	30	419.1	105	5.181	180	21.65
-110	(0.006)	-40	(10.67)	35	506.3	110	5.807	185	23.42
-105	(0.013)	-35	(15.09)	40	607.4	115	6.488	190	25.30
		-30	(20.98)	45	723.8	120	7.225	195	27.29
-100	(0.027)	-25	28.73	50	857.2	125	8.023	200	29.41
-95	(0.053)	-20	38.79	55	1009.	130	8.884	205	31.65
-90	(0.099)	-15	51.66	60	1181.	135	9.811	210	34.02
-85	(0.180)	-10	67.95	65	1375.	140	10.81	215	36.54
-80	(0.315)	-5	88.32	70	1593.	145	11.87	220	39.23
-75	(0.535)	0	113.5	75	1836.	150	13.02	225	42.09
-70	(0.882)	5	144.4	80	2106.	155	14.24	230	45.17
-65	(1.416)	10	181.9	85	2406.	160	15.54		
-60	(2.215)	15	226.9	90	2737.	165	16.93		
-55	(3.385)	20	280.7	95	3101.	170	18.41		

Units: psia v. °F

T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia
-190	(1.E-5)	-50	(0.138)	100	10.84	250	108.7	400	461.3
-180	(3.E-5)	-40	(0.206)	110	13.21	260	122.0	410	500.0
-170	(8.E-5)	-30	(0.303)	120	15.97	270	136.5	420	541.3
-160	(2.E-4)	-20	(0.436)	130	19.17	280	152.2	430	585.6
		-10	0.615	140	22.84	290	169.1	440	633.2
-150	(4.E-4)	0	0.853	150	27.03	300	187.5		
-140	(9.E-4)	10	1.165	160	31.80	310	207.2		
-130	(0.002)	20	1.567	170	37.18	320	228.4		
-120	(0.004)	30	2.078	180	43.24	330	251.2		
-110	(0.007)	40	2.720	190	50.01	340	275.5		
-100	(0.012)	50	3.517	200	57.55	350	301.6		
-90	(0.021)	60	4.495	210	65.92	360	329.5		
-80	(0.035)	70	5.684	220	75.16	370	359.4		
-70	(0.057)	80	7.115	230	85.34	380	391.2		
-60	(0.090)	90	8.822	240	96.50	390	425.1		

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', high 'H' or critical 'C') of the data.

RICHARDSON, A.
 REX, A.
 HEIN, P.
BERTOUD, A.,
STULL, D. R.,
KEMME, R. H., KREPS, S. I.,

J.Chem.Soc., Vol.49, p.761, 1886.
 Z.Phys.Chem., Vol.55, p.355, 1906.
 Z.Phys.Chem., Vol.86, p.385, 1914.
J.Chim.Phys., Vol.15, p.3, 1917. H,C
 Ind.Eng.Chem., Vol.39, p.517, 1947.
J.Chem.Eng.Data, Vol.14, p.98, 1969. M

Coefficients of the Antoine equation $\ln p = A+B/(T+C)$ giving p in kPa when T is in kelvins and applicable between 2 and 200 kPa are: $A = 14.13399$ $B = -2653.531$ $C = -40.714$.

C₃H₇Cl 2-Chloropropane (Isopropyl chloride)**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 temperature on the International Practical Temperature Scale of 1968 (IPTS-68), p is the vapour pressure, T_c, p_c are the critical temperature and critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature	T _c = 488 K	(= 214.85 °C	= 418.73 °F)
Critical Pressure	p _c = 4400 kPa	(= 43.42 atm	= 638.2 psia)
	b ₁ = -7.01127		
	b ₂ = 1.73178		
	b ₃ = -2.0812		
	b ₄ = -2.248		
	= 0.195		
Acentric Factor			
Normal Boiling Point	= 308.250 K	(= 35.100 °C	= 95.180 °F)
dT/dp at N.B.P.	= 0.288 K/kPa	(= 0.038 °C/mmHg	= 3.570 °F/psi)
Normal Melting Point	= 156 K	(= -117 °C	= -179 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	100	1000	4400
T/K	156.579	172.341	192.220	218.269	254.257	307.867	396.651	488.000
(dp/dT)/(kPa/K)	2.E-4	0.001	0.010	0.076	0.536	3.441	19.675	63.217
Data Quality			(B)	(B)	(B)	B	(B)	(B)
Uncertainty in T (K)			0.5	0.2	0.1	0.1	0.5	1
Uncertainty in p (%)			5	2	1	0.5	1	2

Vapour Pressure of 2-Chloropropane

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	%
				275	27.58	0.1	0.5	400	(1068.)	0.5	1
				280	34.31	0.1	0.5	405	(1174.)	0.5	1
160	(0.002)			285	42.32	0.1	0.5	410	(1289.)	0.5	1
165	(0.004)			290	51.76	0.1	0.5	415	(1412.)	0.5	1
170	(0.007)			295	62.82	0.1	0.5	420	(1543.)	0.5	1
175	(0.014)			300	75.67	0.1	0.5	425	(1682.)	0.5	1
180	(0.026)			305	90.51	0.1	0.5	430	(1831.)	0.5	1
185	(0.046)			310	(107.6)	0.1	0.5	435	(1989.)	0.5	2
190	(0.079)			315	(127.0)	0.1	0.5	440	(2158.)	0.5	2
195	(0.132)	0.5	5	320	(149.1)	0.1	0.5	445	(2336.)	0.5	2
200	(0.214)	0.2	5	325	(174.1)	0.1	0.5	450	(2526.)	0.5	2
205	(0.337)	0.2	5	330	(202.1)	0.2	0.5	455	(2727.)	0.5	2
210	(0.517)	0.2	2	335	(233.5)	0.2	0.5	460	(2940.)	1	2
215	(0.776)	0.2	2	340	(268.5)	0.2	1	465	(3166.)	1	2
220	(1.140)	0.2	2	345	(307.4)	0.2	1	470	(3405.)	1	2
225	(1.642)	0.2	2	350	(350.4)	0.2	1	475	(3659.)	1	2
230	(2.322)	0.2	2	355	(397.7)	0.2	1	480	(3929.)	1	2
235	(3.229)	0.1	1	360	(449.7)	0.2	1	485	(4217.)	1	2
240	(4.420)	0.1	1	365	(506.7)	0.2	1				
245	(5.960)	0.1	1	370	(568.8)	0.2	1				
250	(7.926)	0.1	1	375	(636.5)	0.2	1				
255	(10.40)	0.1	1	380	(709.9)	0.2	1				
260	(13.49)	0.1	1	385	(789.4)	0.5	1				
265	(17.30)	0.1	0.5	390	(875.3)	0.5	1				
270	(21.95)	0.1	0.5	395	(967.9)	0.5	1				

Vapour Pressure of 2-Chloropropane continued

Units: atm or mmHg v. °C

T °C	p mmHg	T °C	p mmHg	T °C	p mmHg	T °C	p atm	T °C	p atm
		-50	(10.78)	25	530.2	100	(6.028)	175	(24.22)
		-45	(15.35)	30	635.9	105	(6.731)	180	(26.16)
-115	(0.010)	-40	(21.48)	35	(757.4)	110	(7.493)	185	(28.22)
-110	(0.021)	-35	(29.57)	40	(896.4)	115	(8.317)	190	(30.40)
-105	(0.043)	-30	(40.09)	45	(1055.)	120	(9.207)	195	(32.71)
-100	(0.083)	-25	(53.58)	50	(1234.)	125	(10.16)	200	(35.17)
-95	(0.156)	-20	(70.67)	55	(1435.)	130	(11.19)	205	(37.77)
-90	(0.281)	-15	(92.06)	60	(1661.)	135	(12.29)	210	(40.54)
-85	(0.490)	-10	(118.5)	65	(1914.)	140	(13.47)		
-80	(0.824)	-5	(151.0)	70	(2194.)	145	(14.74)		
-75	(1.347)	0	190.3	75	(2505.)	150	(16.08)		
-70	(2.141)	5	237.6	80	(2848.)	155	(17.52)		
-65	(3.317)	10	294.0	85	(3225.)	160	(19.04)		
-60	(5.020)	15	360.7	90	(3638.)	165	(20.67)		
-55	(7.433)	20	439.0	95	(4089.)	170	(22.39)		

Units: psia v. °F

T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia
		-50	(0.286)	100	(16.10)	250	(138.3)	400	(550.7)
		-40	(0.415)	110	(19.33)	260	(154.3)	410	(595.8)
		-30	(0.592)	120	(23.05)	270	(171.5)		
-170	(3.E-4)	-20	(0.828)	130	(27.30)	280	(190.2)		
-160	(7.E-4)	-10	(1.138)	140	(32.13)	290	(210.2)		
-150	(0.001)	0	(1.539)	150	(37.58)	300	(231.8)		
-140	(0.003)	10	(2.051)	160	(43.71)	310	(255.0)		
-130	(0.005)	20	(2.696)	170	(50.58)	320	(279.9)		
-120	(0.010)	30	3.499	180	(58.22)	330	(306.5)		
-110	(0.018)	40	4.485	190	(66.70)	340	(334.9)		
-100	(0.030)	50	5.686	200	(76.08)	350	(365.3)		
-90	(0.050)	60	7.132	210	(86.40)	360	(397.7)		
-80	(0.081)	70	8.858	220	(97.73)	370	(432.3)		
-70	(0.126)	80	10.90	230	(110.1)	380	(469.2)		
-60	(0.192)	90	13.30	240	(123.6)	390	(508.6)		

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', high 'H' or critical 'C') of the data.

REX,A.
STULL,D.R.,

Z.Phys.Chem., Vol.55, p.355, 1906. M
Ind.Eng.Chem., Vol.39, p.517, 1947.

Coefficients of the Antoine equation $\ln p = A+B/(T+C)$ giving p in kPa when T is in kelvins and applicable between 2 and 200 kPa are: $A = 13.92464$ $B = -2522.448$ $C = -37.203$

C₃H₇Br 1-Bromopropane (Propyl bromide)

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 temperature on the International Practical Temperature Scale of 1968 (IPTS-68), p is the vapour pressure, T_c , p_c are the critical temperature and critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature	$T_c = 540 \text{ K}$	(= 266.85 °C	= 512.33 °F)
Critical Pressure	$p_c = 4470 \text{ kPa}$	(= 44.12 atm	= 648.3 psia)
	$b_1 = -7.15789$		
	$b_2 = 1.66063$		
	$b_3 = -2.0553$		
	$b_4 = -2.633$		
Acentric Factor	$z = 0.230$		
Normal Boiling Point	$= 344.115 \text{ K}$	(= 70.965 °C	= 159.737 °F)
dT/dp at N.B.P.	$= 0.315 \text{ K/kPa}$	(= 0.042 °C/mmHg	= 3.904 °F/psi)
Normal Melting Point	$= 163 \text{ K}$	(= -110 °C	= -166 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	100	1000	4470
T/K	177.003	194.478	216.479	245.250	284.892	343.696	440.270	540.000
$(dp/dT)/(\text{kPa/K})$	1.E-4	0.001	0.009	0.069	0.487	3.146	18.189	59.252
Data Quality			(B)	(B)	B	B	(B)	(B)
Uncertainty in T (K)			0.5	0.2	0.1	0.1	0.5	1
Uncertainty in p (%)			5	2	0.5	0.5	1	2

Vapour Pressure of 1-Bromopropane

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	19.99	0.1	0.5	425	(749.6)	0.2	1
				305	24.70	0.1	0.5	430	(825.7)	0.5	1
170	(3.E-4)			310	30.28	0.1	0.5	435	(907.5)	0.5	1
180	(0.002)			315	36.84	0.1	0.5	440	(995.1)	0.5	1
190	(0.006)			320	44.50	0.1	0.5	445	(1089.)	0.5	1
Interval change											
200	(0.019)			325	53.40	0.1	0.5	450	(1189.)	0.5	1
205	(0.032)			330	63.66	0.1	0.5	455	(1296.)	0.5	1
210	(0.054)			335	75.45	0.1	0.5	460	(1409.)	0.5	1
215	(0.087)			340	88.89	0.1	0.5	465	(1530.)	0.5	1
220	(0.138)	0.5	5	345	(104.2)	0.1	0.5	470	(1659.)	0.5	1
225	(0.212)	0.2	5	350	(121.4)	0.1	0.5	475	(1795.)	0.5	1
230	(0.321)	0.2	2	355	(140.9)	0.1	0.5	480	(1939.)	0.5	1
235	(0.475)	0.2	2	360	(162.6)	0.1	0.5	485	(2092.)	0.5	1
240	(0.689)	0.2	2	365	(186.9)	0.1	0.5	490	(2254.)	0.5	1
245	(0.983)	0.2	2	370	(214.0)	0.2	0.5	495	(2425.)	0.5	2
250	(1.379)	0.2	2	375	(243.9)	0.2	0.5	500	(2605.)	0.5	2
255	(1.905)	0.2	2	380	(276.9)	0.2	0.5	505	(2796.)	1	2
260	(2.593)	0.2	1	385	(313.3)	0.2	0.5	510	(2997.)	1	2
265	(3.483)	0.1	1	390	(353.2)	0.2	1	515	(3210.)	1	2
270	(4.619)	0.1	1	395	(396.8)	0.2	1	520	(3434.)	1	2
275	6.053	0.1	1	400	(444.4)	0.2	1	525	(3671.)	1	2
280	7.842	0.1	1	405	(496.2)	0.2	1	530	(3922.)	1	2
285	10.05	0.1	0.5	410	(552.3)	0.2	1	535	(4187.)	1	2
290	12.76	0.1	0.5	415	(613.1)	0.2	1	540	(4470.)	1	2
295	16.04	0.1	0.5	420	(678.8)	0.2	1				

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Vapour Pressure of 1-Bromopropane continued

Units: atm or mmHg v. °C

T °C	p mmHg	T °C	p mmHg	T °C	p mmHg	T °C	p atm	T °C	p atm
		-25	(9.142)	50	374.7	125	(4.207)	200	(17.21)
		-20	(12.70)	55	447.8	130	(4.703)	205	(18.60)
		-15	(17.38)	60	531.8	135	(5.241)	210	(20.08)
		-10	(23.46)	65	627.9	140	(5.824)	215	(21.64)
-110	(8.E-4)	-5	(31.26)	70	737.3	145	(6.454)	220	(23.30)
-100	(0.004)	0	41.13	75	(861.1)	150	(7.133)	225	(25.04)
-90	(0.018)	5	53.51	80	(1001.)	155	(7.865)	230	(26.89)
-80	(0.064)	10	68.86	85	(1157.)	160	(8.651)	235	(28.84)
-70	(0.199)	15	87.72	90	(1332.)	165	(9.494)	240	(30.89)
-60	(0.548)	20	110.7	95	(1527.)	170	(10.40)	245	(33.06)

Interval change

-50	(1.361)	25	138.3	100	(1744.)	175	(11.36)	250	(35.35)
-45	(2.071)	30	171.5	105	(1983.)	180	(12.39)	255	(37.77)
-40	(3.087)	35	210.8	110	(2246.)	185	(13.49)	260	(40.33)
-35	(4.512)	40	257.2	115	(2535.)	190	(14.65)	265	(43.06)
-30	(6.477)	45	311.5	120	(2852.)	195	(15.89)		

Units: psia v. °F

T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia
		-50	(0.038)	100	4.556	250	(56.58)	400	(271.0)
		-40	(0.060)	110	5.655	260	(64.19)	410	(295.1)
		-30	(0.091)	120	6.958	270	(72.54)	420	(320.7)
		-20	(0.135)	130	8.491	280	(81.69)	430	(347.9)
-160	(3.E-5)	-10	(0.198)	140	10.28	290	(91.68)	440	(376.9)
-150	(7.E-5)	0	(0.283)	150	12.36	300	(102.5)	450	(407.7)
-140	(2.E-4)	10	(0.398)	160	14.76	310	(114.4)	460	(440.3)
-130	(3.E-4)	20	(0.550)	170	(17.52)	320	(127.1)	470	(475.0)
-120	(7.E-4)	30	(0.749)	180	(20.65)	330	(141.0)	480	(511.9)
-110	(0.001)	40	1.006	190	(24.21)	340	(155.9)	490	(551.1)
-100	(0.003)	50	1.332	200	(28.23)	350	(171.9)	500	(592.8)
-90	(0.005)	60	1.741	210	(32.75)	360	(189.1)	510	(637.4)
-80	(0.009)	70	2.250	220	(37.80)	370	(207.6)		
-70	(0.015)	80	2.876	230	(43.43)	380	(227.3)		
-60	(0.024)	90	3.638	240	(49.68)	390	(248.5)		

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', high 'H' or critical 'C') of the data.

REX,A.
STULL,D.R.,

Z.Phys.Chem., Vol.55, p.355, 1906. **M**
Ind.Eng.Chem., Vol.39, p.517, 1947.

Coefficients of the Antoine equation $\ln p = A+B/(T+C)$ giving p in kPa when T is in kelvins and applicable between 2 and 200 kPa are: $A = 14.05527$ $B = -2836.945$ $C = -43.493$

C₃H₇Br 2-Bromopropane (Isopropyl bromide)

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 temperature on the International Practical Temperature Scale of 1968 (IPTS-68), p is the vapour pressure, T_c, p_c are the critical temperature and critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature	T _c = 525 K	(= 251.85 °C	= 485.33 °F)
Critical Pressure	p _c = 4530 kPa	(= 44.71 atm	= 657.0 psia)
	b ₁ = -7.07790		
	b ₂ = 1.63499		
	b ₃ = -1.9513		
	b ₄ = -2.529		
	= 0.214		
Acentric Factor			
Normal Boiling Point	= 332.553 K	(= 59.403 °C	= 138.925 °F)
dT/dp at N.B.P.	= 0.307 K/kPa	(= 0.041 °C/mmHg	= 3.805 °F/psi)
Normal Melting Point	= 184 K	(= -89 °C	= -128 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	100	1000	4530
T/K	187.045	208.390	236.333	274.880	332.144	426.377	525.000	
(dp/dT)/(kPa/K)	0.001	0.010	0.071	0.500	3.228	18.619	61.073	
Data Quality		(B)	(B)	B	B	(B)	(B)	
Uncertainty in T (K)		0.5	0.2	0.1	0.1	0.5	1	
Uncertainty in p (%)		5	2	1	0.5	1	2	

Vapour Pressure of 2-Bromopropane**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	31.13	0.1	0.5	425	(974.6)	0.5	1
				305	38.03	0.1	0.5	430	(1069.)	0.5	1
185	(0.008)			310	46.12	0.1	0.5	435	(1170.)	0.5	1
190	(0.014)			315	55.53	0.1	0.5	440	(1278.)	0.5	1
195	(0.025)			320	66.42	0.1	0.5	445	(1394.)	0.5	1
200	(0.043)			325	78.94	0.1	0.5	450	(1516.)	0.5	1
205	(0.072)			330	93.26	0.1	0.5	455	(1647.)	0.5	1
210	(0.116)	0.5	5	335	(109.6)	0.1	0.5	460	(1786.)	0.5	1
215	(0.184)	0.2	5	340	(128.0)	0.1	0.5	465	(1933.)	0.5	1
220	(0.283)	0.2	5	345	(148.8)	0.1	0.5	470	(2089.)	0.5	1
225	(0.426)	0.2	2	350	(172.1)	0.1	0.5	475	(2254.)	0.5	1
230	(0.628)	0.2	2	355	(198.2)	0.2	0.5	480	(2429.)	0.5	2
235	(0.909)	0.2	2	360	(227.2)	0.2	0.5	485	(2614.)	0.5	2
240	(1.292)	0.2	2	365	(259.3)	0.2	0.5	490	(2809.)	0.5	2
245	(1.807)	0.2	2	370	(294.8)	0.2	0.5	495	(3016.)	1	2
250	(2.488)	0.2	1	375	(333.9)	0.2	1	500	(3234.)	1	2
255	(3.375)	0.1	1	380	(376.9)	0.2	1	505	(3464.)	1	2
260	(4.517)	0.1	1	385	(423.8)	0.2	1	510	(3708.)	1	2
265	(5.969)	0.1	1	390	(475.1)	0.2	1	515	(3965.)	1	2
270	(7.793)	0.1	1	395	(530.9)	0.2	1	520	(4238.)	1	2
275	10.06	0.1	0.5	400	(591.4)	0.2	1	525	(4530.)	1	2
280	12.85	0.1	0.5	405	(657.0)	0.2	1				
285	16.25	0.1	0.5	410	(727.9)	0.2	1				
290	20.36	0.1	0.5	415	(804.2)	0.5	1				
295	25.28	0.1	0.5	420	(886.4)	0.5	1				

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Vapour Pressure of 2-Bromopropane continued

Units: atm or mmHg v. °C

T °C	p mmHg	T °C	p mmHg	T °C	p mmHg	T °C	p atm	T °C	p atm
		-25	(16.61)	50	555.9	125	(5.610)	200	(21.63)
		-20	(22.65)	55	658.1	130	(6.239)	205	(23.32)
		-15	(30.46)	60	(774.7)	135	(6.918)	210	(25.11)
-85	(0.086)	-10	(40.44)	65	(906.9)	140	(7.652)	215	(27.00)
-80	(0.154)	-5	(53.03)	70	(1056.)	145	(8.441)	220	(29.00)
-75	(0.267)	0	68.74	75	(1224.)	150	(9.289)	225	(31.10)
-70	(0.449)	5	88.15	80	(1412.)	155	(10.20)	230	(33.33)
-65	(0.733)	10	111.9	85	(1621.)	160	(11.17)	235	(35.69)
-60	(1.167)	15	140.6	90	(1853.)	165	(12.21)	240	(38.18)
-55	(1.812)	20	175.2	95	(2110.)	170	(13.32)	245	(40.81)
-50	(2.751)	25	216.4	100	(2393.)	175	(14.51)	250	(43.62)
-45	(4.088)	30	265.1	105	(2704.)	180	(15.77)		
-40	(5.959)	35	322.4	110	(3045.)	185	(17.11)		
-35	(8.527)	40	389.2	115	(3417.)	190	(18.53)		
-30	(11.99)	45	466.6	120	(3823.)	195	(20.04)		

Units: psia v. °F

T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia
		0	(0.500)	150	(17.84)	300	(133.7)	450	(505.0)
		10	(0.691)	160	(21.11)	310	(148.4)	460	(544.5)
		20	(0.938)	170	(24.83)	320	(164.2)	470	(586.6)
-120	(0.002)	30	(1.256)	180	(29.04)	330	(181.3)	480	(631.6)
-110	(0.003)	40	1.659	190	(33.78)	340	(199.6)		
-100	(0.006)	50	2.163	200	(39.09)	350	(219.3)		
-90	(0.011)	60	2.788	210	(45.01)	360	(240.3)		
-80	(0.018)	70	3.553	220	(51.59)	370	(262.9)		
-70	(0.030)	80	4.482	230	(58.88)	380	(286.9)		
-60	(0.049)	90	5.598	240	(66.92)	390	(312.6)		
-50	(0.076)	100	6.928	250	(75.76)	400	(339.9)		
-40	(0.115)	110	8.500	260	(85.45)	410	(369.0)		
-30	(0.171)	120	10.34	270	(96.03)	420	(400.0)		
-20	(0.250)	130	12.49	280	(107.6)	430	(432.9)		
-10	(0.357)	140	(14.98)	290	(120.1)	440	(467.8)		

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', high 'H' or critical 'C') of the data.

REX, A.
STULL, D.R.,

Z. Phys. Chem., Vol. 55, p. 355, 1906. **M**
Ind. Eng. Chem., Vol. 39, p. 517, 1947.

Coefficients of the Antoine equation $\ln p = A + B/(T + C)$ giving p in kPa when T is in kelvins and applicable between 2 and 200 kPa are: $A = 14.01985$ $B = -2744.094$ $C = -40.675$

C₃H₆Cl₂ 1,2-Dichloropropane (Propylene dichloride)

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 temperature on the International Practical Temperature Scale of 1968 (IPTS-68),
 p is the vapour pressure, T_c , p_c are the critical temperature and critical pressure respectively
 and $q = 1 - T/T_c$.

Critical Temperature	$T_c = 574 \text{ K}$	(= 300.85 °C	= 573.53 °F)
Critical Pressure	$p_c = 4350 \text{ kPa}$	(= 42.93 atm	= 630.9 psia)
	$b_1 = -7.28427$		
	$b_2 = 1.68995$		
	$b_3 = -2.1855$		
	$b_4 = -2.817$		
	$= 0.255$		
Acentric Factor			
Normal Boiling Point	$= 369.363 \text{ K}$	(= 96.213 °C	= 205.184 °F)
dT/dp at N.B.P.	$= 0.334 \text{ K/kPa}$	(= 0.045 °C/mmHg	= 4.143 °F/psi)
Normal Melting Point	$= 173 \text{ K}$	(= -100 °C	= -148 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	100	1000	4350
T/K	191.446	210.118	233.598	264.265	306.456	368.919	471.185	574.000
(dp/dT)/(kPa/K)	1.E-4	0.001	0.009	0.065	0.458	2.965	17.213	55.204
Data Quality			(B)	(B)	B	B	(B)	(B)
Uncertainty in T (K)			0.5	0.2	0.1	0.1	0.5	1
Uncertainty in p (%)			5	2	0.5	0.5	1	2

Vapour Pressure of 1,2-Dichloropropane

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	%
				325	22.09	0.1	0.5	450	(682.0)	0.2	1
				330	26.86	0.1	0.5	455	(749.0)	0.2	1
				335	32.45	0.1	0.5	460	(820.8)	0.5	1
180	(2.E-4)			340	38.95	0.1	0.5	465	(897.7)	0.5	1
190	(8.E-4)			345	46.45	0.1	0.5	470	(979.7)	0.5	1
200	(0.003)			350	55.08	0.1	0.5	475	(1067.)	0.5	1
210	(0.010)			355	64.95	0.1	0.5	480	(1160.)	0.5	1
220	(0.028)			360	76.18	0.1	0.5	485	(1260.)	0.5	1
230	(0.073)			365	88.90	0.1	0.5	490	(1365.)	0.5	1
240	(0.171)	0.2	5	370	103.2	0.1	0.5	495	(1477.)	0.5	1
Interval change											
250	(0.372)	0.2	2	375	(119.4)	0.1	0.5	500	(1595.)	0.5	1
255	(0.534)	0.2	2	380	(137.4)	0.1	0.5	505	(1720.)	0.5	1
260	(0.754)	0.2	2	385	(157.4)	0.1	0.5	510	(1853.)	0.5	1
265	(1.049)	0.2	2	390	(179.7)	0.1	0.5	515	(1993.)	0.5	1
270	(1.438)	0.2	2	395	(204.4)	0.2	0.5	520	(2140.)	0.5	1
275	(1.945)	0.2	1	400	(231.6)	0.2	0.5	525	(2296.)	0.5	1
280	(2.598)	0.2	1	405	(261.5)	0.2	0.5	530	(2461.)	0.5	1
285	(3.428)	0.1	1	410	(294.3)	0.2	0.5	535	(2634.)	0.5	1
290	4.474	0.1	1	415	(330.1)	0.2	0.5	540	(2816.)	1	2
295	5.777	0.1	1	420	(369.2)	0.2	0.5	545	(3009.)	1	2
300	7.385	0.1	1	425	(411.7)	0.2	1	550	(3211.)	1	2
305	9.352	0.1	0.5	430	(457.7)	0.2	1	555	(3424.)	1	2
310	11.74	0.1	0.5	435	(507.6)	0.2	1	560	(3649.)	1	2
315	14.60	0.1	0.5	440	(561.5)	0.2	1	565	(3886.)	1	2
320	18.03	0.1	0.5	445	(619.5)	0.2	1	570	(4137.)	1	2

Vapour Pressure of 1,2-Dichloropropane 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	(5.E-4)	25	50.64	100	(1.117)	175	(6.497)	250	(22.08)
-90	(0.002)	30	64.34	105	(1.288)	180	(7.142)	255	(23.67)
-80	(0.009)	35	81.01	110	(1.478)	185	(7.833)	260	(25.35)
-70	(0.034)	40	101.1	115	(1.690)	190	(8.573)	265	(27.12)
-60	(0.104)	45	125.2	120	(1.924)	195	(9.364)	270	(28.98)
-50	(0.289)	50	153.8	125	(2.183)	200	(10.21)	275	(30.94)
-40	(0.721)	55	187.6	130	(2.468)	205	(11.11)	280	(33.00)
-30	(1.653)	60	227.1	135	(2.781)	210	(12.06)	285	(35.18)
-20	(3.511)	65	273.3	140	(3.123)	215	(13.08)	290	(37.47)
-10	(6.974)	70	326.7	145	(3.497)	220	(14.16)	295	(39.90)
Interval change									
0	(13.06)	75	388.2	150	(3.904)	225	(15.30)	300	(42.47)
5	(17.53)	80	458.6	155	(4.345)	230	(16.51)		
10	(23.24)	85	539.0	160	(4.823)	235	(17.79)		
15	30.45	90	630.2	165	(5.340)	240	(19.15)		
20	39.47	95	733.1	170	(5.897)	245	(20.58)		

Units: psia v. °F

T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia
		0	(0.080)	150	5.391	300	(56.00)	450	(250.9)
-140	(2.E-5)	10	(0.116)	160	6.567	310	(63.11)	460	(272.4)
-130	(4.E-5)	20	(0.167)	170	7.940	320	(70.88)	470	(295.2)
-120	(1.E-4)	30	(0.236)	180	9.535	330	(79.36)	480	(319.5)
-110	(2.E-4)	40	(0.328)	190	11.37	340	(88.57)	490	(345.3)
-100	(4.E-4)	50	(0.449)	200	13.49	350	(98.57)	500	(372.6)
-90	(8.E-4)	60	0.606	210	15.90	360	(109.4)	510	(401.5)
-80	(0.002)	70	0.807	220	(18.63)	370	(121.1)	520	(432.1)
-70	(0.003)	80	1.062	230	(21.72)	380	(133.6)	530	(464.6)
-60	(0.005)	90	1.380	240	(25.20)	390	(147.2)	540	(499.0)
-50	(0.008)	100	1.774	250	(29.09)	400	(161.7)	550	(535.5)
-40	(0.014)	110	2.257	260	(33.44)	410	(177.3)	560	(574.2)
-30	(0.022)	120	2.843	270	(38.27)	420	(193.9)	570	(615.6)
-20	(0.035)	130	3.549	280	(43.61)	430	(211.7)		
-10	(0.053)	140	4.392	290	(49.51)	440	(230.7)		

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', high 'H' or critical 'C') of the data.

NELSON, O.A., YOUNG, H.D.,

STULL, D.R.,

DREISBACH, R.R., SHRADER, S.A.,

J. Am. Chem. Soc., Vol. 55, p. 2429, 1933. M

Ind. Eng. Chem., Vol. 39, p. 517, 1947.

Ind. Eng. Chem., Vol. 41, p. 2879, 1949. M

Coefficients of the Antoine equation $\ln p = A + B/(T + C)$ giving p in kPa when T is in kelvins and applicable between 2 and 200 kPa are: $A = 14.11589$ $B = -3048.551$ $C = -48.381$

$C_3H_6Br_2$ 1,2-Dibromopropane (Propylene dibromide)

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 temperature on the International Practical Temperature Scale of 1968 (IPTS-68), p is the vapour pressure, T_c , p_c are the critical temperature and critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature	$T_c = 650$ K	(= 376.85 °C	= 710.33 °F)
Critical Pressure	$p_c = 4850$ kPa	(= 47.87 atm	= 703.4 psia)
	$b_1 = -7.28805$		
	$b_2 = 1.69083$		
	$b_3 = -2.1902$		
	$b_4 = -2.823$		
	$= 0.255$		
Acentric Factor			
Normal Boiling Point	$= 414.242$ K	(= 141.092 °C	= 285.966 °F)
dT/dp at N.B.P.	$= 0.369$ K/kPa	(= 0.049 °C/mmHg	= 4.584 °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	100	1000	4850
T/K		236.944	263.228	297.483	344.472	413.750	526.570	650.000
(dp/dT)/(kPa/K)		1.E-3	0.008	0.058	0.412	2.680	15.636	54.381
Data Quality			(B)	(B)	B	B	(B)	(B)
Uncertainty in T (K)			0.5	0.2	0.1	0.1	0.5	1
Uncertainty in p (%)			5	2	0.5	0.5	1	2

Vapour Pressure of 1,2-Dibromopropane

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	%
				400	68.17	0.1	0.5	525	(975.7)	0.5	1
				405	78.63	0.1	0.5	530	(1055.)	0.5	1
220	(0.002)			410	90.34	0.1	0.5	535	(1138.)	0.5	1
230	(0.005)			415	(103.4)	0.1	0.5	540	(1227.)	0.5	1
240	(0.013)			420	(117.9)	0.1	0.5	545	(1321.)	0.5	1
250	(0.034)			425	(133.9)	0.1	0.5	550	(1419.)	0.5	1
260	(0.078)			430	(151.7)	0.1	0.5	555	(1523.)	0.5	1
270	(0.166)	0.2	5	435	(171.2)	0.1	0.5	560	(1633.)	0.5	1
280	(0.335)	0.2	2	440	(192.6)	0.1	0.5	565	(1749.)	0.5	1
290	(0.638)	0.2	2	445	(216.0)	0.2	0.5	570	(1870.)	0.5	1
300	(1.156)	0.2	2	450	(241.5)	0.2	0.5	575	(1998.)	0.5	1
310	(2.002)	0.2	1	455	(269.4)	0.2	0.5	580	(2132.)	0.5	1
320	3.330	0.1	1	460	(299.6)	0.2	0.5	585	(2272.)	0.5	1
330	5.342	0.1	1	465	(332.4)	0.2	0.5	590	(2420.)	0.5	1
340	8.294	0.1	0.5	470	(367.9)	0.2	0.5	595	(2575.)	0.5	1
Interval change											
350	12.50	0.1	0.5	475	(406.1)	0.2	0.5	600	(2737.)	0.5	1
355	15.20	0.1	0.5	480	(447.4)	0.2	0.5	605	(2907.)	0.5	1
360	18.35	0.1	0.5	485	(491.7)	0.2	0.5	610	(3084.)	1	1
365	22.03	0.1	0.5	490	(539.2)	0.2	0.5	615	(3271.)	1	1
370	26.29	0.1	0.5	495	(590.2)	0.2	1	620	(3465.)	1	1
375	31.20	0.1	0.5	500	(644.7)	0.2	1	625	(3670.)	1	1
380	36.83	0.1	0.5	505	(702.9)	0.2	1	630	(3883.)	1	1
385	43.26	0.1	0.5	510	(764.9)	0.2	1	635	(4107.)	1	2
390	50.57	0.1	0.5	515	(830.9)	0.5	1	640	(4342.)	1	2
395	58.84	0.1	0.5	520	(901.1)	0.5	1	645	(4589.)	1	2

Vapour Pressure of 1,2-Dibromopropane 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	(0.017)	75	87.11	150	(1.261)	225	(6.159)	300	(19.24)
-40	(0.051)	80	106.1	155	(1.430)	230	(6.720)	305	(20.54)
-30	(0.136)	85	128.5	160	(1.616)	235	(7.318)	310	(21.91)
-20	(0.331)	90	154.5	165	(1.820)	240	(7.955)	315	(23.34)
-10	(0.746)	95	184.8	170	(2.044)	245	(8.632)	320	(24.84)
0	(1.567)	100	219.8	175	(2.288)	250	(9.352)	325	(26.41)
10	(3.098)	105	260.0	180	(2.554)	255	(10.12)	330	(28.06)
20	(5.803)	110	305.9	185	(2.844)	260	(10.92)	335	(29.78)
30	(10.36)	115	358.2	190	(3.158)	265	(11.78)	340	(31.59)
40	17.70	120	417.5	195	(3.498)	270	(12.68)	345	(33.48)
Interval change									
50	29.09	125	484.5	200	(3.865)	275	(13.64)	350	(35.46)
55	36.81	130	559.7	205	(4.261)	280	(14.65)	355	(37.53)
60	46.18	135	644.0	210	(4.687)	285	(15.71)	360	(39.70)
65	57.48	140	738.1	215	(5.144)	290	(16.83)	365	(41.98)
70	71.01	145	(842.7)	220	(5.635)	295	(18.01)	370	(44.37)

Units: psia v. °F

T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia
		150	1.138	300	(18.02)	450	(102.6)	600	(345.4)
		160	1.438	310	(20.73)	460	(112.7)	610	(370.1)
-60	(3.E-4)	170	1.800	320	(23.75)	470	(123.5)	620	(396.1)
-40	(0.001)	180	2.236	330	(27.10)	480	(135.0)	630	(423.5)
-20	(0.003)	190	2.755	340	(30.80)	490	(147.4)	640	(452.3)
0	(0.008)	200	3.369	350	(34.89)	500	(160.5)	650	(482.6)
20	(0.019)	210	4.091	360	(39.39)	510	(174.6)	660	(514.5)
40	(0.041)	220	4.935	370	(44.31)	520	(189.5)	670	(548.1)
60	(0.085)	230	5.915	380	(49.70)	530	(205.3)	680	(583.5)
80	(0.166)	240	7.047	390	(55.57)	540	(222.1)	690	(620.8)
Interval change									
100	0.305	250	8.348	400	(61.95)	550	(239.9)	700	(660.1)
110	0.406	260	9.834	410	(68.88)	560	(258.8)	710	(702.0)
120	0.533	270	11.53	420	(76.38)	570	(278.7)		
130	0.694	280	13.44	430	(84.48)	580	(299.7)		
140	0.893	290	(15.60)	440	(93.20)	590	(321.9)		

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', high 'H' or critical 'C') of the data.

KAHLBAUM, G.W.A., ARNDT, K.,
STULL, D.R.,

Z.Phys.Chem., Vol.26, p.577, 1898. M
Ind.Eng.Chem., Vol.39, p.517, 1947.

Coefficients of the Antoine equation $\ln p = A + B/(T+C)$ giving p in kPa when T is in kelvins and applicable between 2 and 200 kPa are: $A = 14.23305$ $B = -3456.746$ $C = -54.715$

$C_3H_5Br_3$ 1,2,3-Tribromopropane

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 temperature on the International Practical Temperature Scale of 1968 (IPTS-68), p is the vapour pressure, T_c , p_c are the critical temperature and critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature	$T_c = 753 \text{ K}$	(= 479.85 °C	= 895.73 °F)
Critical Pressure	$p_c = 4250 \text{ kPa}$	(= 41.94 atm	= 616.4 psia)
	$b_1 = -7.67238$		
	$b_2 = 1.85672$		
	$b_3 = -2.7368$		
	$b_4 = -3.243$		
Acentric Factor	$\omega = 0.327$		
Normal Boiling Point	$= 495.240 \text{ K}$	(= 222.090 °C	= 431.761 °F)
dT/dp at N.B.P.	$= 0.430 \text{ K/kPa}$	(= 0.057 °C/mmHg	= 5.334 °F/psi)
Normal Melting Point	$= 285 \text{ K}$	(= 12 °C	= 53 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	100	1000	4250
T/K		287.734	318.686	358.905	413.894	494.667	625.550	753.000
(dp/dT)/(kPa/K)		8.E-4	0.007	0.050	0.353	2.303	13.529	43.304
Data Quality			(B)	(B)	B	B	(B)	(B)
Uncertainty in T (K)			0.5	0.2	0.1	0.1	0.5	1
Uncertainty in p (%)			5	1	0.5	0.2	1	2

Vapour Pressure of 1,2,3-Tribromopropane

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	(0.027)			475	62.18	0.1	0.5	600	(696.7)	0.2	0.5
310	(0.055)			480	70.47	0.1	0.5	605	(749.7)	0.2	1
320	(0.109)	0.5		485	79.62	0.1	0.5	610	(805.7)	0.5	1
330	(0.205)	0.2	2	490	89.70	0.1	0.5	615	(864.7)	0.5	1
340	(0.367)	0.2	2	495	100.8	0.1	0.2	620	(927.0)	0.5	1
350	(0.634)	0.2	2	500	(112.9)	0.1	0.5	625	(992.6)	0.5	1
360	(1.056)	0.2	1	505	(126.1)	0.1	0.5	630	(1062.)	0.5	1
370	(1.701)	0.2	1	510	(140.6)	0.1	0.5	635	(1134.)	0.5	1
380	(2.660)	0.1	1	515	(156.3)	0.1	0.5	640	(1210.)	0.5	1
390	(4.046)	0.1	1	520	(173.3)	0.1	0.5	645	(1290.)	0.5	1
Interval change											
400	(6.003)	0.1	0.5	525	(191.8)	0.1	0.5	650	(1374.)	0.5	1
405	7.248	0.1	0.5	530	(211.8)	0.2	0.5	655	(1462.)	0.5	1
410	8.704	0.1	0.5	535	(233.3)	0.2	0.5	660	(1554.)	0.5	1
415	10.40	0.1	0.5	540	(256.5)	0.2	0.5	665	(1650.)	0.5	1
420	12.36	0.1	0.5	545	(281.5)	0.2	0.5	670	(1751.)	0.5	1
425	14.61	0.1	0.5	550	(308.3)	0.2	0.5	675	(1857.)	0.5	1
430	17.20	0.1	0.5	555	(337.0)	0.2	0.5	680	(1967.)	0.5	1
435	20.16	0.1	0.5	560	(367.7)	0.2	0.5	685	(2082.)	0.5	1
440	23.52	0.1	0.5	565	(400.5)	0.2	0.5	690	(2202.)	0.5	1
445	27.33	0.1	0.5	570	(435.5)	0.2	0.5	695	(2327.)	0.5	1
450	31.63	0.1	0.5	575	(472.7)	0.2	0.5	700	(2458.)	0.5	1
455	36.46	0.1	0.5	580	(512.4)	0.2	0.5	705	(2595.)	0.5	1
460	41.89	0.1	0.5	585	(554.5)	0.2	0.5	710	(2737.)	1	1
465	47.94	0.1	0.5	590	(599.2)	0.2	0.5	715	(2885.)	1	1
470	54.69	0.1	0.5	595	(646.5)	0.2	0.5	720	(3040.)	1	1

Vapour Pressure of 1,2,3-Tribromopropane continued

Units: atm or mmHg v. °C

T °C	p mmHg	T °C	p mmHg	T °C	p mmHg	T °C	p atm	T °C	p atm
		Interval change							
		150	103.1	225	(812.2)	300	(4.527)	375	(13.25)
		155	121.5	230	(908.3)	305	(4.909)	380	(14.10)
20	(0.117)	160	142.6	235	(1013.)	310	(5.316)	385	(15.00)
30	(0.253)	165	166.7	240	(1128.)	315	(5.747)	390	(15.93)
40	(0.517)	170	194.0	245	(1252.)	320	(6.205)	395	(16.91)
50	(1.002)	175	224.8	250	(1386.)	325	(6.689)	400	(17.93)
60	(1.853)	180	259.6	255	(1532.)	330	(7.202)	405	(19.00)
70	(3.286)	185	298.6	260	(1689.)	335	(7.743)	410	(20.12)
80	(5.605)	190	342.2	265	(1858.)	340	(8.315)	415	(21.29)
90	(9.233)	195	390.9	270	(2041.)	345	(8.918)	420	(22.51)
100	(14.73)	200	444.9	275	(2236.)	350	(9.553)	425	(23.78)
110	(22.83)	205	504.8	280	(2446.)	355	(10.22)	430	(25.10)
120	(34.45)	210	571.0	285	(2671.)	360	(10.92)	435	(26.49)
130	50.74	215	644.0	290	(2911.)	365	(11.66)	440	(27.93)
140	73.06	220	724.2	295	(3167.)	370	(12.44)	445	(29.43)

Units: psia v. °F

T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia
		Interval change							
		300	1.920	450	(18.44)	600	(85.19)	750	(260.2)
		310	2.308	460	(20.80)	610	(92.73)	760	(277.5)
		320	2.758	470	(23.38)	620	(100.8)	770	(295.7)
60	(0.002)	330	3.279	480	(26.21)	630	(109.3)	780	(314.8)
80	(0.004)	340	3.878	490	(29.29)	640	(118.4)	790	(334.8)
100	(0.009)	350	4.563	500	(32.66)	650	(128.0)	800	(355.8)
120	(0.018)	360	5.344	510	(36.31)	660	(138.3)	810	(377.8)
140	(0.036)	370	6.231	520	(40.28)	670	(149.1)	820	(400.9)
160	(0.068)	380	7.233	530	(44.56)	680	(160.5)	830	(425.1)
180	(0.121)	390	8.361	540	(49.19)	690	(172.6)	840	(450.4)
200	(0.209)	400	9.627	550	(54.19)	700	(185.4)	850	(476.9)
220	(0.347)	410	11.04	560	(59.56)	710	(198.8)	860	(504.7)
240	(0.557)	420	12.62	570	(65.32)	720	(213.0)	870	(533.9)
260	(0.865)	430	14.37	580	(71.50)	730	(228.0)	880	(564.6)
280	1.305	440	(16.31)	590	(78.12)	740	(243.7)	890	(597.0)

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', high 'H' or critical 'C') of the data.

STULL, D.R.,
DREISBACH, R.R., SHRADER, S.A.,

Ind. Eng. Chem., Vol. 39, p. 517, 1947.
Ind. Eng. Chem., Vol. 41, p. 2879, 1949. **M**

Coefficients of the Antoine equation $\ln p = A + B/(T + C)$ giving p in kPa when T is in kelvins and applicable between 2 and 200 kPa are: $A = 14.33422$ $B = -4107.331$ $C = -72.496$

C₃F₈ Perfluoropropane (Octafluoropropane)

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 temperature on the International Practical Temperature Scale of 1968 (IPTS-68), p is the vapour pressure, T_c , p_c are the critical temperature and critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature	$T_c = 345.04 \text{ K}$	(= 71.89 °C	= 161.40 °F)
Critical Pressure	$p_c = 2670 \text{ kPa}$	(= 26.35 atm	= 387.3 psia)
	$b_1 = -7.57490$		
	$b_2 = 1.71950$		
	$b_3 = -2.7038$		
	$b_4 = -3.063$		
	$= 0.322$		
Acentric Factor			
Normal Boiling Point	$= 236.391 \text{ K}$	(= -36.759 °C	= -34.167 °F)
dT/dp at N.B.P.	$= 0.217 \text{ K/kPa}$	(= 0.029 °C/mmHg	= 2.695 °F/psi)
Normal Melting Point	$= -$	$= -$	$= -$

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	100	1000	2670
T/K	122.323	134.166	149.089	168.643	195.693	236.102	303.064	345.040
(dp/dT)/(kPa/K)	2.E-4	0.002	0.014	0.102	0.712	4.558	26.224	58.617
Data Quality			(B)	(B)	B	B	B	B
Uncertainty in T (K)			0.5	0.2	0.1	0.1	0.5	1
Uncertainty in p (%)			10	2	1	0.5	2	2

Vapour Pressure of Perfluoropropane

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	%
100	(2.E-6)			220	45.04	0.1	1	345	2668.	1	2
105	(1.E-5)			225	58.54	0.1	1				
110	(5.E-5)			230	75.07	0.1	0.5				
115	(2.E-4)			235	95.08	0.1	0.5				
120	(6.E-4)			240	119.0	0.1	0.5				
125	(0.002)			245	147.5	0.1	1				
130	(0.005)			250	180.9	0.2	1				
135	(0.012)			255	219.9	0.2	1				
140	(0.026)			260	265.0	0.2	1				
145	(0.056)			265	316.8	0.2	1				
150	(0.113)	0.5	10	270	375.9	0.2	1				
155	(0.216)	0.2	5	275	443.0	0.2	1				
160	(0.392)	0.2	5	280	518.7	0.2	1				
165	(0.684)	0.2	5	285	603.8	0.5	2				
170	(1.146)	0.2	2	290	698.9	0.5	2				
175	(1.855)	0.2	2	295	804.7	0.5	2				
180	(2.909)	0.1	2	300	922.0	0.5	2				
185	(4.430)	0.1	2	305	1052.	0.5	2				
190	(6.572)	0.1	1	310	1195.	0.5	2				
195	9.517	0.1	1	315	1352.	0.5	2				
200	13.48	0.1	1	320	1524.	0.5	2				
205	18.71	0.1	1	325	1713.	0.5	2				
210	25.50	0.1	1	330	1920.	1	2				
215	34.16	0.1	1	335	2146.	1	2				
				340	2394.	1	2				

Amendment A May 1990

Vapour Pressure of Perfluoropropane 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
-175	(9.E-6)	-100	(11.69)	-25	1.657	50	16.20		
-170	(5.E-5)	-95	(18.54)	-20	2.021	55	18.17		
-165	(2.E-4)	-90	(28.53)	-15	2.443	60	20.33		
-160	(9.E-4)	-85	(42.73)	-10	2.929	65	22.69		
-155	(0.003)	-80	(62.41)	-5	3.485	70	25.29		
-150	(0.009)	-75	89.11	0	4.118				
-145	(0.025)	-70	124.6	5	4.833				
-140	(0.063)	-65	170.9	10	5.637				
-135	(0.147)	-60	230.4	15	6.538				
-130	(0.321)	-55	305.5	20	7.542				
-125	(0.659)	-50	399.1	25	8.657				
-120	(1.282)	-45	514.3	30	9.891				
-115	(2.372)	-40	654.3	35	11.25				
-110	(4.197)	-35	822.7	40	12.75				
-105	(7.133)	-30	1023.	45	14.39				

Units: psia v. °F

T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia
		-150	(0.203)	0	32.34	150	337.5		
		-140	(0.341)	10	39.75	160	380.7		
		-130	(0.552)	20	48.37				
-270	(2.E-6)	-120	(0.863)	30	58.34				
-260	(9.E-6)	-110	1.309	40	69.79				
-250	(4.E-5)	-100	1.931	50	82.84				
-240	(1.E-4)	-90	2.779	60	97.65				
-230	(4.E-4)	-80	3.909	70	114.3				
-220	(0.001)	-70	5.386	80	133.1				
-210	(0.003)	-60	7.282	90	154.0				
-200	(0.007)	-50	9.675	100	177.3				
-190	(0.016)	-40	12.65	110	203.2				
-180	(0.033)	-30	16.31	120	231.9				
-170	(0.063)	-20	20.74	130	263.7				
-160	(0.116)	-10	26.05	140	298.7				

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', high 'H' or critical 'C') of the data.

BROWN, J.A.,	J.Chem.Eng.Data, Vol.8, p.106, 1963.	C
PACE, E.L., PLAUSH, A.C.,	J.Chem.Phys., Vol.47, p.38, 1967.	M
MOUSA, A.H.N., KAY, W.B., KREGLEWSKI, A.,	J.Chem.Thermodynamics, Vol.4, p.301, 1972.	C
MOUSA, A.H.N.,	Can.J.Chem.Eng., Vol.56, p.128, 1978.	C

Coefficients of the Antoine equation $\ln p = A + B/(T + C)$ giving p in kPa when T is in kelvins and applicable between 2 and 200 kPa are: $A = 13.84752$ $B = -1872.899$ $C = -33.459$

C₄H₉Cl 1-Chlorobutane (Butyl chloride)

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 temperature on the International Practical Temperature Scale of 1968 (IPTS-68), p is the vapour pressure, T_c, p_c are the critical temperature and critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature	T _c = 538 K	(= 264.85 °C	= 508.73 °F)
Critical Pressure	p _c = 3825 kPa	(= 37.75 atm	= 554.8 psia)
	b ₁ = -7.38755		
	b ₂ = 1.81709		
	b ₃ = -2.4362		
	b ₄ = -2.729		
Acentric Factor	= 0.268		
Normal Boiling Point	= 351.688 K	(= 78.538 °C	= 173.369 °F)
dT/dp at N.B.P.	= 0.320 K/kPa	(= 0.043 °C/mmHg	= 3.969 °F/psi)
Normal Melting Point	□ 150 K	(= -123 °C	= -190 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	100	1000	3825
T/K	181.933	199.700	222.052	251.268	291.518	351.262	449.513	538.000
(dp/dT)/(kPa/K)	1.E-4	0.001	0.009	0.068	0.480	3.094	17.886	52.523
Data Quality			(B)	(B)	B	B	(B)	(B)
Uncertainty in T (K)			0.5	0.2	0.1	0.1	0.5	1
Uncertainty in p (%)			5	2	0.5	0.5	1	2

Vapour Pressure of 1-Chlorobutane

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	%
150	(3.E-6)			300	14.82	0.1	0.5	425	(628.1)	0.2	1
160	(3.E-5)			305	18.46	0.1	0.5	430	(693.8)	0.2	1
170	(2.E-4)			310	22.80	0.1	0.5	435	(764.4)	0.5	1
180	(8.E-4)			315	27.95	0.1	0.5	440	(840.3)	0.5	1
190	(0.003)			320	34.00	0.1	0.5	445	(921.7)	0.5	1
Interval change				325	41.07	0.1	0.5	450	(1009.)	0.5	1
200	(0.010)			330	49.28	0.1	0.5	455	(1102.)	0.5	1
205	(0.018)			335	58.75	0.1	0.5	460	(1201.)	0.5	1
210	(0.031)			340	69.63	0.1	0.5	465	(1307.)	0.5	1
215	(0.051)			345	82.05	0.1	0.5	470	(1419.)	0.5	1
220	(0.083)										
225	(0.130)	0.5	5	350	96.15	0.1	0.5	475	(1539.)	0.5	1
230	(0.200)	0.2	5	355	(112.1)	0.1	0.5	480	(1666.)	0.5	1
235	(0.301)	0.2	2	360	(130.1)	0.1	0.5	485	(1801.)	0.5	1
240	(0.445)	0.2	2	365	(150.2)	0.1	0.5	490	(1944.)	0.5	1
245	(0.644)	0.2	2	370	(172.6)	0.1	0.5	495	(2095.)	0.5	2
250	(0.917)	0.2	2	375	(197.6)	0.2	0.5	500	(2255.)	0.5	2
255	(1.284)	0.2	2	380	(225.3)	0.2	0.5	505	(2425.)	0.5	2
260	1.771	0.2	2	385	(255.9)	0.2	0.5	510	(2604.)	1	2
265	2.408	0.2	1	390	(289.5)	0.2	0.5	515	(2794.)	1	2
270	3.230	0.1	1	395	(326.4)	0.2	0.5	520	(2995.)	1	2
275	4.279	0.1	1	400	(366.8)	0.2	1	525	(3207.)	1	2
280	5.603	0.1	1	405	(410.9)	0.2	1	530	(3433.)	1	2
285	7.254	0.1	1	410	(458.8)	0.2	1	535	(3673.)	1	2
290	9.294	0.1	0.5	415	(510.9)	0.2	1				
295	11.79	0.1	0.5	420	(567.2)	0.2	1				

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Vapour Pressure of 1-Chlorobutane continued

Units: atm or mmHg v. °C

T °C	p mmHg	T °C	p mmHg	T °C	p mmHg	T °C	p atm	T °C	p atm
		-25	(6.046)	50	287.5	125	(3.469)	200	(14.74)
		-20	(8.517)	55	345.8	130	(3.890)	205	(15.97)
		-15	11.81	60	413.2	135	(4.349)	210	(17.27)
-120	(5.E-5)	-10	16.14	65	490.8	140	(4.847)	215	(18.65)
-110	(4.E-4)	-5	21.76	70	579.5	145	(5.387)	220	(20.12)
-100	(0.002)	0	28.97	75	680.5	150	(5.971)	225	(21.66)
-90	(0.009)	5	38.09	80	(794.9)	155	(6.602)	230	(23.30)
-80	(0.034)	10	49.51	85	(923.8)	160	(7.281)	235	(25.04)
-70	(0.111)	15	63.68	90	(1069.)	165	(8.010)	240	(26.87)
-60	(0.321)	20	81.07	95	(1230.)	170	(8.793)	245	(28.81)
Interval change									
-50	(0.828)	25	102.2	100	(1411.)	175	(9.631)	250	(30.86)
-45	(1.284)	30	127.8	105	(1611.)	180	(10.53)	255	(33.04)
-40	(1.948)	35	158.3	110	(1832.)	185	(11.48)	260	(35.35)
-35	(2.895)	40	194.6	115	(2075.)	190	(12.50)		
-30	(4.221)	45	237.4	120	(2343.)	195	(13.59)		

Units: psia v. °F

T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia
		-50	(0.024)	100	3.436	250	(46.52)	400	(232.7)
-190	(5.E-7)	-40	(0.038)	110	4.299	260	(52.98)	410	(253.8)
-180	(1.E-6)	-30	(0.058)	120	5.331	270	(60.09)	420	(276.5)
-170	(4.E-6)	-20	(0.089)	130	6.553	280	(67.90)	430	(300.6)
-160	(1.E-5)	-10	(0.131)	140	7.991	290	(76.45)	440	(326.2)
-150	(3.E-5)	0	(0.191)	150	9.670	300	(85.79)	450	(353.6)
-140	(8.E-5)	10	0.272	160	11.62	310	(95.96)	460	(382.7)
-130	(2.E-4)	20	0.382	170	13.87	320	(107.0)	470	(413.7)
-120	(4.E-4)	30	0.526	180	(16.44)	330	(119.0)	480	(446.7)
-110	(8.E-4)	40	0.715	190	(19.38)	340	(131.9)	490	(481.9)
-100	(0.001)	50	0.957	200	(22.71)	350	(145.8)	500	(519.5)
-90	(0.003)	60	1.265	210	(26.47)	360	(160.8)		
-80	(0.005)	70	1.652	220	(30.70)	370	(177.0)		
-70	(0.009)	80	2.131	230	(35.42)	380	(194.3)		
-60	(0.014)	90	2.720	240	(40.68)	390	(212.8)		

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', high 'H' or critical 'C') of the data.

RAMSAY, W., YOUNG, S.

LENTH, C. W.,

STULL, D. R.,

KEMME, R. H., KREPS, S. I.,

J. Chem. Soc., Vol. 47, p. 42, 1885.

J. Am. Chem. Soc., Vol. 55, p. 3283, 1933.

Ind. Eng. Chem., Vol. 39, p. 517, 1947.

J. Chem. Eng. Data, Vol. 14, p. 98, 1969. **M**

Coefficients of the Antoine equation $\ln p = A + B/(T + C)$ giving p in kPa when T is in kelvins and applicable between 2 and 200 kPa are: $A = 14.03152$ $B = -2869.37$ $C = -46.864$

C₄H₉Cl 2-Chlorobutane (sec-Butyl chloride)

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 temperature on the International Practical Temperature Scale of 1968 (IPTS-68),
p is the vapour pressure, T_c, p_c are the critical temperature and critical pressure respectively
and $q = 1 - T/T_c$.

Critical Temperature	T _c = 529 K	(= 255.85 °C	= 492.53 °F)
Critical Pressure	p _c = 3850 kPa	(= 38.00 atm	= 558.4 psia)
	b ₁ = -7.17072		
	b ₂ = 1.79268		
	b ₃ = -2.2833		
	b ₄ = -2.399		
Acentric Factor	= 0.225		
Normal Boiling Point	= 341.465 K	(= 68.315 °C	= 154.967 °F)
dT/dp at N.B.P.	= 0.318 K/kPa	(= 0.042 °C/mmHg	= 3.945 °F/psi)
Normal Melting Point	= 133 K	(= -140 °C	= -220 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	100	1000	3850
T/K	174.160	191.535	213.445	242.157	281.845	341.042	439.206	529.000
(dp/dT)/(kPa/K)	1.E-4	0.001	0.009	0.069	0.485	3.114	17.805	52.188
Data Quality			(B)	(B)	B	B	(B)	(B)
Uncertainty in T (K)			0.5	0.2	0.1	0.1	0.5	1
Uncertainty in p (%)			5	2	0.5	0.5	1	2

Vapour Pressure of 2-Chlorobutane

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	22.69	0.1	0.5	425	(769.7)	0.5	1
				305	27.87	0.1	0.5	430	(845.7)	0.5	1
				310	33.97	0.1	0.5	435	(927.1)	0.5	1
				315	41.11	0.1	0.5	440	(1014.)	0.5	1
140	(2.E-6)			320	49.40	0.1	0.5	445	(1107.)	0.5	1
150	(1.E-5)			325	58.97	0.1	0.5	450	(1206.)	0.5	1
160	(1.E-4)			330	69.97	0.1	0.5	455	(1312.)	0.5	1
170	(5.E-4)			335	82.53	0.1	0.5	460	(1424.)	0.5	1
180	(0.002)			340	96.80	0.1	0.5	465	(1543.)	0.5	1
190	(0.008)			345	(112.9)	0.1	0.5	470	(1669.)	0.5	1
200	(0.026)			350	(131.1)	0.1	0.5	475	(1803.)	0.5	1
210	(0.072)			355	(151.4)	0.1	0.5	480	(1945.)	0.5	1
220	(0.180)	0.2	5	360	(174.2)	0.1	0.5	485	(2095.)	0.5	2
230	(0.409)	0.2	2	365	(199.4)	0.2	0.5	490	(2253.)	0.5	2
240	(0.860)	0.2	2	370	(227.4)	0.2	0.5	495	(2421.)	0.5	2
Interval change											
250	(1.687)	0.2	2	375	(258.2)	0.2	0.5	500	(2598.)	1	2
255	(2.310)	0.2	1	380	(292.2)	0.2	0.5	505	(2785.)	1	2
260	(3.117)	0.1	1	385	(329.4)	0.2	1	510	(2983.)	1	2
265	(4.152)	0.1	1	390	(370.2)	0.2	1	515	(3192.)	1	2
270	(5.463)	0.1	1	395	(414.6)	0.2	1	520	(3414.)	1	2
275	7.104	0.1	1	400	(462.8)	0.2	1	525	(3650.)	1	2
280	9.137	0.1	1	405	(515.2)	0.2	1				
285	11.63	0.1	0.5	410	(571.8)	0.2	1				
290	14.66	0.1	0.5	415	(633.0)	0.2	1				
295	18.32	0.1	0.5	420	(698.9)	0.2	1				

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Vapour Pressure of 2-Chlorobutane continued

Units: atm or mmHg v. °C

T °C	p mmHg	T °C	p mmHg	T °C	p mmHg	T °C	p atm	T °C	p atm
-140		-25	(11.23)	50	414.6	125	(4.387)	200	(17.30)
-130	(3.E-5)	-20	(15.45)	55	493.0	130	(4.888)	205	(18.67)
-120	(2.E-4)	-15	(20.96)	60	582.7	135	(5.432)	210	(20.12)
-110	(0.001)	-10	(28.05)	65	684.9	140	(6.019)	215	(21.65)
		-5	(37.07)	70	800.6	145	(6.651)	220	(23.27)
-100	(0.006)	0	48.41	75	(931.0)	150	(7.332)	225	(24.98)
-90	(0.026)	5	62.51	80	(1077.)	155	(8.063)	230	(26.79)
-80	(0.091)	10	79.88	85	(1241.)	160	(8.847)	235	(28.71)
-70	(0.273)	15	101.1	90	(1423.)	165	(9.685)	240	(30.73)
-60	(0.730)	20	126.7	95	(1625.)	170	(10.58)	245	(32.87)

Interval change

-50	(1.764)	25	157.4	100	(1849.)	175	(11.54)	250	(35.14)
-45	(2.653)	30	193.9	105	(2095.)	180	(12.55)	255	(37.56)
-40	(3.909)	35	237.0	110	(2365.)	185	(13.63)		
-35	(5.653)	40	287.6	115	(2660.)	190	(14.78)		
-30	(8.032)	45	346.4	120	(2983.)	195	(16.00)		

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	(0.004)	50	1.545	200	(30.08)	350	(174.4)
		-90	(0.007)	60	2.005	210	(34.75)	360	(191.4)
		-80	(0.011)	70	2.572	220	(39.95)	370	(209.6)
-220		-70	(0.019)	80	3.265	230	(45.73)	380	(229.1)
-210	(2.E-7)	-60	(0.031)	90	4.103	240	(52.11)	390	(249.9)
-200	(6.E-7)	-50	(0.049)	100	5.107	250	(59.14)	400	(272.0)
-190	(2.E-6)	-40	(0.076)	110	6.300	260	(66.86)	410	(295.6)
-180	(6.E-6)	-30	(0.114)	120	7.707	270	(75.31)	420	(320.7)
-170	(2.E-5)	-20	(0.168)	130	9.354	280	(84.53)	430	(347.5)
-160	(4.E-5)	-10	(0.242)	140	11.27	290	(94.57)	440	(375.9)
-150	(1.E-4)	0	(0.343)	150	13.48	300	(105.5)	450	(406.1)
-140	(2.E-4)	10	(0.477)	160	(16.02)	310	(117.3)	460	(438.2)
-130	(5.E-4)	20	(0.654)	170	(18.91)	320	(130.0)	470	(472.4)
-120	(0.001)	30	(0.883)	180	(22.20)	330	(143.7)	480	(508.8)
-110	(0.002)	40	1.176	190	(25.91)	340	(158.5)	490	(548.0)

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', high 'H' or critical 'C') of the data.

ROLAND, M.
TIMMERMAN, J., MARTIN, F.,
STULL, D.R.,

Bull.Soc.Chim.Belg., Vol.37, p.117, 1928. M
J.Chim.Phys., Vol.25, p.411, 1928. M
Ind.Eng.Chem., Vol.39, p.517, 1947.

Coefficients of the Antoine equation $\ln p = A+B/(T+C)$ giving p in kPa when T is in kelvins and applicable between 2 and 200 kPa are: $A = 13.89361$ $B = -2768.563$ $C = -42.977$

C₄H₉Cl 1-Chloro-2-methylpropane (Isobutyl chloride)

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 temperature on the International Practical Temperature Scale of 1968 (IPTS-68),
p is the vapour pressure, T_c, p_c are the critical temperature and critical pressure respectively
and $q = 1 - T/T_c$.

Critical Temperature	T _c = 525 K	(= 251.85 °C	■ 485.33 °F)
Critical Pressure	p _c = 3830 kPa	(■ 37.80 atm	■ 555.5 psia)
	b ₁ = -7.30705		
	b ₂ = 1.84138		
	b ₃ = -2.4510		
	b ₄ = -2.536		
Acentric Factor	= 0.251		
Normal Boiling Point	= 341.550 K	(= 68.400 °C	■ 155.120 °F)
dT/dp at N.B.P.	= 0.313 K/kPa	(= 0.042 °C/mmHg	= 3.887 °F/psi)
Normal Melting Point	= 142 K	(= -131 °C	= -204 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	100	1000	3830
T/K	175.800	193.108	214.897	243.397	282.698	341.133	437.607	525.000
(dp/dT)/(kPa/K)	1.E-4	0.001	0.009	0.070	0.491	3.160	18.164	53.307
Data Quality			(B)	(B)	(B)	B	(B)	(B)
Uncertainty in T (K)			0.5	0.2	0.1	0.1	0.5	1
Uncertainty in p (%)			5	2	0.5	0.5	1	2

Vapour Pressure of 1-Chloro-2-methylpropane

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	%
150	(1.E-5)			300	22.08	0.1	0.5	425	(789.7)	0.5	1
160	(7.E-5)			305	27.22	0.1	0.5	430	(868.7)	0.5	1
170	(4.E-4)			310	33.29	0.1	0.5	435	(953.5)	0.5	1
180	(0.002)			315	40.41	0.1	0.5	440	(1044.)	0.5	1
190	(0.007)			320	48.70	0.1	0.5	445	(1141.)	0.5	1
Interval change											
200	(0.022)			325	58.31	0.1	0.5	450	(1245.)	0.5	1
205	(0.038)			330	69.38	0.1	0.5	455	(1355.)	0.5	1
210	(0.063)			335	82.05	0.1	0.5	460	(1472.)	0.5	1
215	(0.101)	0.5	5	340	96.47	0.1	0.5	465	(1597.)	0.5	1
220	(0.159)	0.2	5	345	(112.8)	0.1	0.5	470	(1729.)	0.5	1
225	(0.245)	0.2	5	350	(131.3)	0.1	0.5	475	(1870.)	0.5	1
230	(0.368)	0.2	2	355	(152.0)	0.1	0.5	480	(2019.)	0.5	2
235	(0.543)	0.2	2	360	(175.1)	0.1	0.5	485	(2177.)	0.5	2
240	(0.786)	0.2	2	365	(200.9)	0.2	0.5	490	(2344.)	0.5	2
245	(1.117)	0.2	2	370	(229.5)	0.2	0.5	495	(2521.)	1	2
250	(1.563)	0.2	2	375	(261.1)	0.2	0.5	500	(2708.)	1	2
255	(2.153)	0.2	1	380	(296.0)	0.2	0.5	505	(2907.)	1	2
260	(2.923)	0.1	1	385	(334.3)	0.2	1	510	(3117.)	1	2
265	(3.916)	0.1	1	390	(376.2)	0.2	1	515	(3339.)	1	2
270	(5.179)	0.1	1	395	(421.9)	0.2	1	520	(3576.)	1	2
275	(6.768)	0.1	1	400	(471.7)	0.2	1	525	(3830.)	1	2
280	(8.747)	0.1	1	405	(525.8)	0.2	1				
285	(11.18)	0.1	0.5	410	(584.5)	0.2	1				
290	(14.16)	0.1	0.5	415	(647.8)	0.2	1				
295	17.76	0.1	0.5	420	(716.2)	0.2	1				

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Vapour Pressure of 1-Chloro-2-methylpropane continued

Units: atm or mmHg v. °C

T °C	p mmHg	T °C	p mmHg	T °C	p mmHg	T °C	p atm	T °C	p atm
-130	(2.E-5)	-25	(10.37)	50	409.5	125	(4.469)	200	(17.93)
-120	(1.E-4)	-20	(14.37)	55	488.3	130	(4.987)	205	(19.37)
-110	(0.001)	-15	(19.61)	60	578.8	135	(5.549)	210	(20.90)
		-10	(26.40)	65	681.9	140	(6.157)	215	(22.51)
		-5	(35.08)	70	(799.1)	145	(6.813)	220	(24.22)
-100	(0.005)	0	(46.04)	75	(931.4)	150	(7.519)	225	(26.03)
-90	(0.021)	5	(59.74)	80	(1080.)	155	(8.279)	230	(27.95)
-80	(0.075)	10	(76.69)	85	(1247.)	160	(9.094)	235	(29.98)
-70	(0.233)	15	(97.44)	90	(1433.)	165	(9.967)	240	(32.13)
-60	(0.636)	20	122.6	95	(1639.)	170	(10.90)	245	(34.41)
Interval change									
-50	(1.568)	25	152.9	100	(1868.)	175	(11.90)	250	(36.85)
-45	(2.379)	30	189.1	105	(2120.)	180	(12.96)		
-40	(3.535)	35	231.9	110	(2398.)	185	(14.09)		
-35	(5.151)	40	282.3	115	(2702.)	190	(15.30)		
-30	(7.372)	45	341.2	120	(3034.)	195	(16.57)		

Units: psia v. °F

T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia	T °F	p psia
-200	(4.E-7)	-50	(0.044)	100	5.007	250	(60.18)	400	(282.3)
-190	(1.E-6)	-40	(0.068)	110	6.199	260	(68.14)	410	(307.1)
-180	(4.E-6)	-30	(0.104)	120	7.608	270	(76.88)	420	(333.6)
-170	(1.E-5)	-20	(0.154)	130	9.263	280	(86.42)	430	(361.8)
-160	(3.E-5)	-10	(0.224)	140	11.19	290	(96.82)	440	(391.8)
-150	(8.E-5)	0	(0.320)	150	13.42	300	(108.1)	450	(423.8)
-140	(2.E-4)	10	(0.448)	160	(15.99)	310	(120.4)	460	(457.9)
-130	(4.E-4)	20	(0.618)	170	(18.93)	320	(133.6)	470	(494.3)
-120	(8.E-4)	30	(0.839)	180	(22.28)	330	(148.0)	480	(533.4)
-110	(0.002)	40	(1.123)	190	(26.06)	340	(163.4)		
-100	(0.003)	50	(1.483)	200	(30.32)	350	(179.9)		
-90	(0.006)	60	(1.934)	210	(35.10)	360	(197.7)		
-80	(0.010)	70	2.492	220	(40.44)	370	(216.8)		
-70	(0.017)	80	3.177	230	(46.37)	380	(237.2)		
-60	(0.028)	90	4.008	240	(52.93)	390	(259.0)		

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', high 'H' or critical 'C') of the data.

TIMMERMANS, J., MARTIN, F.,
HIRSHBERG, Y.
STULL, D. R.,
MUMFORD, S. A., PHILLIPS, J. W. C.,

J. Chim. Phys., Vol. 23, p. 733, 1926.
Bull. Soc. Chim. Belg., Vol. 41, p. 163, 1932.
Ind. Eng. Chem., Vol. 39, p. 517, 1947.
J. Chem. Soc., p. 75, 1950. **M**

Coefficients of the Antoine equation $\ln p = A + B/(T + C)$ giving p in kPa when T is in kelvins and applicable between 2 and 200 kPa are: $A = 13.96879$ $B = -2772.981$ $C = -44.989$

C₄H₉Cl 2-Chloro-2-methylpropane (tert-Butyl chloride)

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 temperature on the International Practical Temperature Scale of 1968 (IPTS-68), p is the vapour pressure, T_c, p_c are the critical temperature and critical pressure respectively and $q = 1 - T/T_c$.

Critical Temperature	T _c = 507 K	(= 233.85 °C	= 452.93 °F)
Critical Pressure	p _c = 3850 kPa	(= 38.00 atm	= 558.4 psia)
	b ₁ = -7.00473		
	b ₂ = 1.73017		
	b ₃ = -2.0728		
	b ₄ = -2.242		
Acentric Factor	= 0.194		
Normal Boiling Point	= 324.223 K	(= 51.073 °C	= 123.931 °F)
dT/dp at N.B.P.	= 0.308 K/kPa	(= 0.041 °C/mmHg	= 3.820 °F/psi)
Normal Melting Point	= 247 K	(= -26 °C	■ -15 °F)

Data at Specified Pressures

p/kPa	0.001	0.01	0.1	1	10	100	1000	3850
T/K					266.625	323.813	419.197	507.000
(dp/dT)/(kPa/K)					0.504	3.215	18.264	53.192
Data Quality					(B)	B	(B)	(B)
Uncertainty in T (K)					0.1	0.1	0.5	1
Uncertainty in p (%)					1	0.5	1	2

Vapour Pressure of 2-Chloro-2-methylpropane**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	%
250	(4.056)	0.1	1	375	(403.6)	0.2	1	500	(3500.)	1	2
255	(5.397)	0.1	1	380	(452.3)	0.2	1	505	(3746.)	1	2
260	(7.092)	0.1	1	385	(505.3)	0.2	1				
265	(9.209)	0.1	1	390	(562.8)	0.2	1				
270	(11.82)	0.1	0.5	395	(625.0)	0.2	1				
275	(15.02)	0.1	0.5	400	(692.1)	0.2	1				
280	(18.90)	0.1	0.5	405	(764.4)	0.5	1				
285	(23.55)	0.1	0.5	410	(842.1)	0.5	1				
290	(29.10)	0.1	0.5	415	(925.5)	0.5	1				
295	(35.66)	0.1	0.5	420	(1015.)	0.5	1				
300	43.35	0.1	0.5	425	(1110.)	0.5	1				
305	52.31	0.1	0.5	430	(1212.)	0.5	1				
310	62.69	0.1	0.5	435	(1321.)	0.5	1				
315	74.64	0.1	0.5	440	(1436.)	0.5	1				
320	88.31	0.1	0.5	445	(1559.)	0.5	1				
325	103.9	0.1	0.5	450	(1689.)	0.5	1				
330	(121.5)	0.1	0.5	455	(1828.)	0.5	1				
335	(141.3)	0.1	0.5	460	(1974.)	0.5	2				
340	(163.6)	0.1	0.5	465	(2130.)	0.5	2				
345	(188.5)	0.1	0.5	470	(2294.)	0.5	2				
350	(216.2)	0.2	0.5	475	(2468.)	1	2				
355	(246.9)	0.2	0.5	480	(2651.)	1	2				
360	(280.7)	0.2	0.5	485	(2846.)	1	2				
365	(318.0)	0.2	1	490	(3051.)	1	2				
370	(358.9)	0.2	1	495	(3269.)	1	2				

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Vapour Pressure of 2-Chloro-2-methylpropane continued

Units: atm or mmHg v. °C

T °C	p mmHg	T °C	p atm	T °C	p atm	T °C	p atm	T °C	p atm
-25	(27.27)	50	0.966	125	(6.580)	200	(23.71)		
-20	(36.48)	55	(1.132)	130	(7.274)	205	(25.48)		
-15	(48.15)	60	(1.320)	135	(8.021)	210	(27.36)		
-10	(62.79)	65	(1.531)	140	(8.823)	215	(29.35)		
-5	(80.95)	70	(1.766)	145	(9.682)	220	(31.45)		
0	(103.2)	75	(2.029)	150	(10.60)	225	(33.68)		
5	(130.4)	80	(2.321)	155	(11.58)	230	(36.05)		
10	(163.0)	85	(2.643)	160	(12.63)				
15	(202.0)	90	(2.998)	165	(13.74)				
20	(248.3)	95	(3.388)	170	(14.93)				
25	302.7	100	(3.815)	175	(16.19)				
30	366.3	105	(4.281)	180	(17.52)				
35	440.1	110	(4.788)	185	(18.94)				
40	525.3	115	(5.339)	190	(20.44)				
45	622.9	120	(5.935)	195	(22.03)				

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	9.397	250	(89.27)	400	(371.5)		
		110	11.39	260	(100.0)	410	(402.1)		
		120	13.69	270	(111.7)	420	(434.7)		
		130	(16.35)	280	(124.3)	430	(469.4)		
-10	(0.582)	140	(19.40)	290	(138.0)	440	(506.4)		
0	(0.799)	150	(22.86)	300	(152.7)	450	(546.1)		
10	(1.081)	160	(26.78)	310	(168.6)				
20	(1.440)	170	(31.20)	320	(185.6)				
30	(1.893)	180	(36.15)	330	(203.9)				
40	(2.457)	190	(41.68)	340	(223.4)				
50	(3.152)	200	(47.82)	350	(244.3)				
60	(3.999)	210	(54.63)	360	(266.6)				
70	(5.021)	220	(62.13)	370	(290.4)				
80	6.243	230	(70.37)	380	(315.8)				
90	7.692	240	(79.40)	390	(342.8)				

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', high 'H' or critical 'C') of the data.

COFFIN, C.C., SUTHERLAND, H.S., MAASS, O., Can. J. Research, Vol. 2, p. 267, 1930.
 STULL, D.R., Ind. Eng. Chem., Vol. 39, p. 517, 1947.
 KUSHNER, L.M., CROWE, R.W., SMYTH, C.P., J. Am. Chem. Soc., Vol. 72, p. 1901, 1950.
 CALERO, G.C., et al., Rev. Acad. Cienc. Ex. Fis. Quim. Nat. Zarag., Vol. 24, p. 137, 1969. **M**

Coefficients of the Antoine equation $\ln p = A + B/(T + C)$ giving p in kPa when T is in kelvins and applicable between 2 and 200 kPa are: $A = 13.78105$ $B = -2616.581$ $C = -38.655$