Hexafluoropropylene oxide

Other names:	(trifluoromethyl)trifluorooxirane
	1,2-Epoxyhexafluoropropane
	2,2,3-trifluoro-3-(trifluoromethyl)oxirane
	NA 1956
	Oxirane, 2,2,3-trifluoro-3-(trifluoromethyl)-
	hexafluoro-1,2-epoxypropane
	hexafluoroepoxypropane
	hexafluoropropene epoxide
	hexafluoropropene oxide
	hexafluoropropylene epoxide
	oxirane, trifluoro(trifluoromethyl)-
	perfluoro(methyloxirane)
	perfluoropropene oxide
	perfluoropropylene oxide
	propane, 1,2-epoxy-1,1,2,3,3,3-hexafluoro-
	propylene oxide hexafluoride
	trifluoro(trifluoromethyl)oxirane
Inchi:	InChI=1S/C3F6O/c4-1(2(5,6)7)3(8,9)10-1
InchiKey:	PGFXOWRDDHCDTE-UHFFFAOYSA-N
Formula:	C3F6O
SMILES:	FC(F)(F)C1(F)OC1(F)F
Mol. weight [g/mol]:	166.02
CAS:	428-59-1

Physical Properties

Property code	Value	Unit	Source
gf	-1235.70	kJ/mol	Joback Method
hf	-1339.72	kJ/mol	Joback Method
hfus	9.18	kJ/mol	Joback Method
hvap	17.89	kJ/mol	Joback Method
log10ws	-1.99		Crippen Method
logp	1.838		Crippen Method
mcvol	58.760	ml/mol	McGowan Method
pc	4010.84	kPa	Joback Method
tb	231.20	K	NIST Webbook
tb	246.00	K	NIST Webbook
tc	436.69	K	Joback Method

tf	217.60	K	Joback Method
vc	0.274	m3/kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	160.83	J/mol×K	436.69	Joback Method
cpg	155.04	J/mol×K	412.23	Joback Method
cpg	148.47	J/mol×K	387.77	Joback Method
cpg	141.05	J/mol×K	363.31	Joback Method
cpg	132.72	J/mol×K	338.85	Joback Method
cpg	123.40	J/mol×K	314.39	Joback Method
cpg	113.02	J/mol×K	289.93	Joback Method
pvap	580.80	kPa	293.15	Measurement of Vapor Liquid Equilibria for the Binary Mixture of Octafluoropropane and Hexafluoropropylene Oxide Containing Octafluorocyclobutane
pvap	1150.00	kPa	317.86	Experimental vapour liquid equilibrium data and modeling for binary mixtures of 1-butene with 1,1,2,3,3,3-hexafluoro-1-propene, 2,2,3-trifluoro-3-(trifluoromethyl)oxirane, or difluoromethane
pvap	1298.00	kPa	322.92	Experimental vapour liquid equilibrium data and modeling for binary mixtures of 1-butene with 1,1,2,3,3,3-hexafluoro-1-propene, 2,2,3-trifluoro-3-(trifluoromethyl)oxirane, or difluoromethane

pvap	1474.00	kPa	327.88	Experimental vapour liquid equilibrium data and modeling for binary mixtures of 1-butene with 1,1,2,3,3,3-hexafluoro-1-propene, 2,2,3-trifluoro-3-(trifluoromethyl)oxirane, or difluoromethane
pvap	1658.00	kPa	332.87	Experimental vapour liquid equilibrium data and modeling for binary mixtures of 1-butene with 1,1,2,3,3,3-hexafluoro-1-propene, 2,2,3-trifluoro-3-(trifluoromethyl)oxirane, or difluoromethane
pvap	1864.00	kPa	337.87	Experimental vapour liquid equilibrium data and modeling for binary mixtures of 1-butene with 1,1,2,3,3,3-hexafluoro-1-propene, 2,2,3-trifluoro-3-(trifluoromethyl)oxirane, or difluoromethane
pvap	2075.00	kPa	342.88	Experimental vapour liquid equilibrium data and modeling for binary mixtures of 1-butene with 1,1,2,3,3,3-hexafluoro-1-propene, 2,2,3-trifluoro-3-(trifluoromethyl)oxirane, or difluoromethane
pvap	2313.00	kPa	347.85	Experimental vapour liquid equilibrium data and modeling for binary mixtures of 1-butene with 1,1,2,3,3,3-hexafluoro-1-propene, 2,2,3-trifluoro-3-(trifluoromethyl)oxirane, or difluoromethane

pvap	588.00	kPa	293.00	Experimental Measurements and Thermodynamic Modeling of the Dissociation Conditions of Clathrate Hydrates for (Refrigerant + NaCl + Water) Systems	
pvap	505.00	kPa	288.00	Experimental Measurements and Thermodynamic Modeling of the Dissociation Conditions of Clathrate Hydrates for (Refrigerant + NaCl + Water) Systems	
pvap	431.00	kPa	283.00	Experimental Measurements and Thermodynamic Modeling of the Dissociation Conditions of Clathrate Hydrates for (Refrigerant + NaCl + Water) Systems	
pvap	366.00	kPa	278.00	Experimental Measurements and Thermodynamic Modeling of the Dissociation Conditions of Clathrate Hydrates for (Refrigerant + NaCl + Water) Systems	
pvap	309.00	kPa	273.00	Experimental Measurements and Thermodynamic Modeling of the Dissociation Conditions of Clathrate Hydrates for (Refrigerant + NaCl + Water) Systems	

pvap	215.10	kPa	263.15	Measurement of Vapor Liquid Equilibria for the Binary Mixture of Octafluoropropane and Hexafluoropropylene Oxide Containing Octafluorocyclobutane
pvap	309.40	kPa	273.15	Measurement of Vapor Liquid Equilibria for the Binary Mixture of Octafluoropropane and Hexafluoropropylene Oxide Containing Octafluorocyclobutane
pvap	430.10	kPa	283.15	Measurement of Vapor Liquid Equilibria for the Binary Mixture of Octafluoropropane and Hexafluoropropylene Oxide Containing Octafluorocyclobutane
pvap	1015.00	kPa	312.93	Experimental vapour liquid equilibrium data and modeling for binary mixtures of 1-butene with 1,1,2,3,3,3-hexafluoro-1-propene, 2,2,3-trifluoro-3-(trifluoromethyl)oxirane, or difluoromethane
pvap	771.20	kPa	303.15	Measurement of Vapor Liquid Equilibria for the Binary Mixture of Octafluoropropane and Hexafluoropropylene Oxide Containing Octafluorocyclobutane
pvap	258.47	kPa	268.13	Isothermal Vapor Liquid Equilibrium Data for the Binary System 1,1,2,3,3,3-Hexafluoro-1-propene (R1216) + 2,2,3-Trifluoro-3-(trifluoromethyl)oxirane from (268.13 to 308.19) K

pvap	365.66	kPa	278.13	Isothermal Vapor Liquid Equilibrium Data for the Binary System 1,1,2,3,3,3-Hexafluoro-1-propene (R1216) + 2,2,3-Trifluoro-3-(trifluoromethyl)oxirane from (268.13 to 308.19) K
pvap	503.71	kPa	288.15	Isothermal Vapor Liquid Equilibrium Data for the Binary System 1,1,2,3,3,3-Hexafluoro-1-propene (R1216) + 2,2,3-Trifluoro-3-(trifluoromethyl)oxirane from (268.13 to 308.19) K
pvap	678.24	kPa	298.17	Isothermal Vapor Liquid Equilibrium Data for the Binary System 1,1,2,3,3,3-Hexafluoro-1-propene (R1216) + 2,2,3-Trifluoro-3-(trifluoromethyl)oxirane from (268.13 to 308.19) K
pvap	894.42	kPa	308.20	Isothermal Vapor Liquid Equilibrium Data for the Binary System 1,1,2,3,3,3-Hexafluoro-1-propene (R1216) + 2,2,3-Trifluoro-3-(trifluoromethyl)oxirane from (268.13 to 308.19) K
pvap	1160.25	kPa	318.21	Isothermal Vapor Liquid Equilibrium Data for the Binary System 1,1,2,3,3,3-Hexafluoro-1-propene (R1216) + 2,2,3-Trifluoro-3-(trifluoromethyl)oxirane from (268.13 to 308.19) K
pvap	302.20	kPa	271.88	Pure Component and Binary Vapor-Liquid Equilibrium + Modeling for Hexafluoropropylene and Hexafluoropropylene Oxide with Toluene and Hexafluoroethane

pvap	649.90	kPa	295.53	Pure Component and Binary Vapor-Liquid Equilibrium + Modeling for Hexafluoropropylene and Hexafluoropropylene Oxide with Toluene and Hexafluoroethane
pvap	745.60	kPa	300.47	Pure Component and Binary Vapor-Liquid Equilibrium + Modeling for Hexafluoropropylene and Hexafluoropropylene Oxide with Toluene and Hexafluoroethane
pvap	798.50	kPa	303.11	Pure Component and Binary Vapor-Liquid Equilibrium + Modeling for Hexafluoropropylene and Hexafluoropropylene Oxide with Toluene and Hexafluoroethane
pvap	874.70	kPa	306.50	Pure Component and Binary Vapor-Liquid Equilibrium + Modeling for Hexafluoropropylene and Hexafluoropropylene Oxide with Toluene and Hexafluoroethane
pvap	970.10	kPa	310.48	Pure Component and Binary Vapor-Liquid Equilibrium + Modeling for Hexafluoropropylene and Hexafluoropropylene Oxide with Toluene and Hexafluoroethane

pvap	1024.90	kPa	312.64	Pure Component and Binary Vapor-Liquid Equilibrium + Modeling for Hexafluoropropylene and Hexafluoropropylene Oxide with Toluene and Hexafluoroethane
pvap	1175.30	kPa	318.16	Pure Component and Binary Vapor-Liquid Equilibrium + Modeling for Hexafluoropropylene and Hexafluoropropylene Oxide with Toluene and Hexafluoroethane
pvap	896.00	kPa	307.93	Experimental vapour liquid equilibrium data and modeling for binary mixtures of 1-butene with 1,1,2,3,3,3-hexafluoro-1-propene, 2,2,3-trifluoro-3-(trifluoromethyl)oxirane, or difluoromethane
pvap	786.00	kPa	302.95	Experimental vapour liquid equilibrium data and modeling for binary mixtures of 1-butene with 1,1,2,3,3,3-hexafluoro-1-propene, 2,2,3-trifluoro-3-(trifluoromethyl)oxirane, or difluoromethane
pvap	310.00	kPa	273.18	Phase equilibrium data for binary mixtures of carbon dioxide with {1,1,2,3,3,3-hexafluoro-1-propene or 2,2,3-trifluoro-3-(trifluoromethyl)oxirane} at temperatures between (233 and 273) K

pvap	216.00	kPa	263.24	Phase equilibrium data for binary mixtures of carbon dioxide with {1,1,2,3,3,3-hexafluoro-1-propene or 2,2,3-trifluoro-3-(trifluoromethyl)oxirane} at temperatures between (233 and 273) K
pvap	145.00	kPa	253.22	Phase equilibrium data for binary mixtures of carbon dioxide with {1,1,2,3,3,3-hexafluoro-1-propene or 2,2,3-trifluoro-3-(trifluoromethyl)oxirane} at temperatures between (233 and 273) K
pvap	95.00	kPa	243.24	Phase equilibrium data for binary mixtures of carbon dioxide with {1,1,2,3,3,3-hexafluoro-1-propene or 2,2,3-trifluoro-3-(trifluoromethyl)oxirane} at temperatures between (233 and 273) K
pvap	58.00	kPa	233.17	Phase equilibrium data for binary mixtures of carbon dioxide with {1,1,2,3,3,3-hexafluoro-1-propene or 2,2,3-trifluoro-3-(trifluoromethyl)oxirane} at temperatures between (233 and 273) K

Datasets

Speed of sound, m/s

Pressure, kPa - Liquid	Temperature, K - Liquid	Speed of sound, m/s - Liquid
2500.00	283.15	449.4
2500.00	313.15	326.6
2510.00	253.15	571.2
9990.00	283.15	517.5
10010.00	313.15	420.6
10010.00	373.15	255.0
10040.00	253.15	623.9
10040.00	343.15	332.6
20010.00	403.15	322.5
24970.00	373.15	413.4
25000.00	283.15	617.4
25020.00	253.15	708.0
25020.00	403.15	367.5
25030.00	313.15	538.8
25050.00	343.15	471.3
49990.00	283.15	737.8
50010.00	313.15	670.9
50020.00	403.15	525.9
50030.00	253.15	816.7
50030.00	343.15	614.1
50060.00	373.15	565.5
74990.00	283.15	831.4
75000.00	373.15	673.0
75010.00	253.15	903.6
75030.00	343.15	718.0
75040.00	313.15	769.9
75050.00	403.15	636.7
100040.00	253.15	977.8
100040.00	373.15	760.0
100040.00	403.15	725.7
100050.00	283.15	910.0
100050.00	313.15	852.0
100050.00	343.15	803.0
125010.00	403.15	801.5
125030.00	343.15	875.8
125040.00	253.15	1043.1
125040.00	313.15	922.8
125040.00	373.15	834.6
125050.00	283.15	978.4

150010.00	253.15	1101.9
150010.00	283.15	1039.3
150030.00	343.15	940.5
150040.00	373.15	900.3
150040.00	403.15	868.4
150070.00	313.15	986.2
175000.00	373.15	959.8
175010.00	343.15	999.1
175020.00	313.15	1043.4
175030.00	253.15	1155.8
175040.00	403.15	928.7
175090.00	283.15	1095.2
200020.00	313.15	1095.8
200030.00	253.15	1205.6
200050.00	403.15	983.8
200060.00	343.15	1052.9
200070.00	373.15	1014.2
200080.00	283.15	1146.8
249990.00	373.15	1111.6
250010.00	283.15	1239.4
250020.00	313.15	1190.7
250040.00	403.15	1082.6
250050.00	343.15	1149.1
250060.00	253.15	1295.5
299960.00	343.15	1234.4
299980.00	403.15	1169.6
300010.00	313.15	1274.7
300020.00	283.15	1321.5
300030.00	373.15	1198.0
300100.00	253.15	1376.5
350000.00	253.15	1449.2
350020.00	283.15	1396.5
350030.00	313.15	1350.5
350040.00	373.15	1275.4
350040.00	403.15	1247.9
350090.00	343.15	1311.5
399990.00	403.15	1319.9
400010.00	373.15	1346.4
400040.00	343.15	1382.2
400060.00	313.15	1420.2
400120.00	253.15	1516.7
400120.00	283.15	1465.2

Reference *https://www.doi.org/10.1021/je300652k*

Sources

Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
Phase equilibrium data for binary mixtures of carbon dioxide with (1,1,2,3,3,3-hexafluoro-1-propene or 2,2,3-trifluoro-3-(trifluoromethyl)oxirane) at temperatures between (253 and 273) K:	https://www.doi.org/10.1016/j.fluid.2016.05.004
Joback Method:	https://en.wikipedia.org/wiki/Joback_method
Experimental Measurements and Thermodynamic Modeling of the Dissociation Conditions of Clathrate Hydrates for (Refrigerant + NaCl + Water) Systems:	https://www.doi.org/10.1021/je400919u
McGowan Method:	http://link.springer.com/article/10.1007/BF02311772
Speeds of Sound in Liquid and Supercritical Hexafluoropropylene (HFP) and Hexafluoropropylene Oxide (HFPO) at Pressures up to 400 MPa :	https://www.doi.org/10.1021/je300652k
Crippen Method:	https://www.chemeo.com/doc/models/crippen_log10ws
Pure Component and Binary Vapor-Liquid Equilibrium + Modeling for Hexafluoropropylene and Hexafluoropropylene Oxide with Toluene and Hexafluoroethane:	https://www.doi.org/10.1021/je900400v
Vapor-Liquid Equilibrium Data for Binary Systems Consisting of Either Hexafluoropropylene (HFP) or 2,2,3-Trifluoro-3-(trifluoromethyl)oxirane (HFPO) with Carbon Dioxide (R-744) or 2,2-Dichloro-1,1,1-trifluoroethane (R-123):	https://www.doi.org/10.1021/je100841y
Experimental vapour liquid equilibrium data and modeling for binary mixtures [illegible]	https://www.doi.org/10.1016/j.jct.2013.01.017
Isothermal phase (vapour + liquid) equilibrium data for binary mixtures of [illegible] 2,2,3-trifluoro-3-(trifluoromethyl)oxirane, 1,1,2,3,3,3-hexafluoro-1-propene (R1216) or [illegible] in the temperature range of (279 to 318) K:	https://www.doi.org/10.1016/j.jct.2015.06.017
Isothermal vapor-liquid equilibrium data for the ethene + 2,2,3-trifluoro-3-(trifluoromethyl)oxirane binary system between 258 and 308 K at pressures up to 4.8 MPa:	https://www.doi.org/10.1016/j.fluid.2015.03.006
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C428591&Units=SI
Measurement of Vapor-Liquid Equilibria for the Binary Mixture of Octafluoropropane and Hexafluoropropylene Oxide Containing Octafluorocyclobutane:	https://www.doi.org/10.1021/je401123k
Isothermal Vapor-Liquid Equilibrium Data for the Binary System 1,1,2,3,3,3-Hexafluoro-1-propene (R1216) + 2,2,3-Trifluoro-3-(trifluoromethyl)oxirane from (268.13 to 308.19) K:	https://www.doi.org/10.1021/je5006938

Legend

cpg:	Ideal gas heat capacity
gf:	Standard Gibbs free energy of formation
hf:	Enthalpy of formation at standard conditions
hfus:	Enthalpy of fusion at standard conditions
hvap:	Enthalpy of vaporization at standard conditions
log10ws:	Log10 of Water solubility in mol/l
logp:	Octanol/Water partition coefficient
mcvol:	McGowan's characteristic volume
pc:	Critical Pressure
pvap:	Vapor pressure
speedsl:	Speed of sound in fluid
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
vc:	Critical Volume

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