Ethane, 2,2-dichloro-1,1,1-trifluoro-

Other names:	1,1,1-TRIFLUORO-2,2-DICHLOROETHANE
	1,1,1-trifluorodichloroethane
	1,1-Dichloro-2,2,2-trifluoroethane
	2,2-Dichloro-1,1,1-trifluoroethane
	CF3CHCl2
	CFC-123
	Dichlorotrifluoroethane
	Dichlorotrifluoromethylmethane
	FC-123
	Fluorocarbon 123
	Freon 123
	Genetron 123
	HCFC-123
	HFA 123
	R 123
	R-123
	REFRIGERANT-123
	Solkane 123
	ethane, 1,1-dichloro-2,2,2-trifluoro-
Inchi:	InChI=1S/C2HCl2F3/c3-1(4)2(5,6)7/h1H
InchiKey:	OHMHBGPWCHTMQE-UHFFFAOYSA-N
Formula:	C2HCl2F3
SMILES:	FC(F)(F)C(Cl)Cl
Mol. weight [g/mol]:	152.93
CAS:	306-83-2

Physical Properties

Property code	Value	Unit	Source
gf	-641.93	kJ/mol	Joback Method
hf	-718.45	kJ/mol	Joback Method
hfus	7.63	kJ/mol	Joback Method
hvap	26.60 ± 0.30	kJ/mol	NIST Webbook
ie	11.50	eV	NIST Webbook
ie	12.00	eV	NIST Webbook
log10ws	-2.24		Crippen Method
logp	2.352		Crippen Method
mcvol	68.830	ml/mol	McGowan Method

pc	3675.00 ± 8.00	kPa	NIST Webbook
pc	3672.00 ± 5.00	kPa	NIST Webbook
pc	3665.50 ± 4.00	kPa	NIST Webbook
rhoc	553.61 ± 4.59	kg/m3	NIST Webbook
rhoc	555.14 ± 7.65	kg/m3	NIST Webbook
rhoc	556.67 ± 4.59	kg/m3	NIST Webbook
tb	300.20	K	NIST Webbook
tc	456.86 ± 0.05	K	NIST Webbook
tc	456.94 ± 0.10	K	NIST Webbook
tc	456.90 ± 0.10	K	NIST Webbook
tc	456.87 ± 0.06	K	NIST Webbook
tc	456.96 ± 0.10	K	NIST Webbook
tf	161.33	K	Joback Method
vc	0.282	m3/kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	127.90	J/mol×K	453.46	Joback Method
cpg	105.76	J/mol×K	314.16	Joback Method
cpg	110.87	J/mol×K	342.02	Joback Method
cpg	115.62	J/mol×K	369.88	Joback Method
cpg	120.03	J/mol×K	397.74	Joback Method
cpg	124.12	J/mol×K	425.60	Joback Method
cpg	131.39	J/mol×K	481.32	Joback Method
hfust	5.51	kJ/mol	145.70	NIST Webbook
hvapt	28.70	kJ/mol	345.50	NIST Webbook

Correlations

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/(T + C)
Coeff. A	1.43494e+01
Coeff. B	-2.57652e+03
Coeff. C	-3.61980e+01
Temperature range (K), min.	219.43
Temperature range (K), max.	456.83

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/T + C*ln(T) + D*T^2
Coeff. A	4.16921e+01
Coeff. B	-4.31555e+03
Coeff. C	-4.03308e+00
Coeff. D	3.08579e-06
Temperature range (K), min.	244.15
Temperature range (K), max.	456.15

Sources

Crippen Method:	https://www.chemeo.com/doc/models/crippen_log10ws
Vapor-Liquid Equilibrium Data for Binary Systems Consisting of Either Hexafluoropropene (HFP) or 2,3,3-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
Hydrogen substitution effect on the solubility of perhalogenated compounds in ionic liquid [bmim][PF6]:	https://www.doi.org/10.1016/j.fluid.2007.07.035
KDB:	https://www.cheric.org/files/research/kdb/mol/mol1550.mol
McGowan Method:	http://link.springer.com/article/10.1007/BF02311772
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C306832&Units=SI
KDB Pure (Korean Thermophysical Properties Databank):	https://www.cheric.org/research/kdb/hcprop/showprop.php?cmpid=1550
Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
The Yaws Handbook of Vapor Pressure:	https://www.sciencedirect.com/book/9780128029992/the-yaws-handbook-of-vapor-pressure
KDB Vapor Pressure Data:	https://www.cheric.org/research/kdb/hcprop/showprop.php?cmpid=1550
Joback Method:	https://en.wikipedia.org/wiki/Joback_method
Vapor liquid equilibria of the carbon dioxide (CO2) + 2,2-dichloro-1,1,1-trifluoroethane (R123) system and carbon dioxide (CO2) + 1-chloro-1,2,2,2-tetrafluoroethane (R124) system:	https://www.doi.org/10.1016/j.fluid.2006.10.021
Solubility Differences of Halocarbon Isomers in Ionic Liquid [emim][Tf2N]:	https://www.doi.org/10.1021/je700295e

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
hfust:	Enthalpy of fusion at a given temperature
hvap:	Enthalpy of vaporization at standard conditions
hvapt:	Enthalpy of vaporization at a given temperature
ie:	Ionization energy

log10ws:	Log10 of Water solubility in mol/l
logp:	Octanol/Water partition coefficient
mcvol:	McGowan's characteristic volume
pc:	Critical Pressure
pvap:	Vapor pressure
rhoc:	Critical density
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
vc:	Critical Volume