1,1,1,2,3,3-Hexafluoropropane

Other names:	HFC 236ea
	Propane, 1,1,1,2,3,3-hexafluoro-
	R 236ea
	R-236ea
Inchi:	InChI=1S/C3H2F6/c4-1(2(5)6)3(7,8)9/h1-2H
InchiKey:	FYIRUPZTYPILDH-UHFFFAOYSA-N
Formula:	C3H2F6
SMILES:	FC(F)C(F)C(F)(F)F
Mol. weight [g/mol]:	152.04
CAS:	431-63-0

Physical Properties

Property code	Value	Unit	Source
gf	-1196.52	kJ/mol	Joback Method
hf	-1301.22	kJ/mol	Joback Method
hfus	7.55	kJ/mol	Joback Method
hvap	15.30	kJ/mol	Joback Method
log10ws	-2.02		Crippen Method
logp	2.152		Crippen Method
mcvol	63.750	ml/mol	McGowan Method
pc	3416.00	kPa	Critical Properties of Four HFE + HFC Binary Systems: Trifluoromethoxymethane (HFE-143m) + Pentafluoroethane (HFC-125), + 1,1,1,2-Tetrafluoroethane (HFC-134a), + 1,1,1,2,3,3,3-Heptafluoropropane (HFC-227ea), and + 1,1,1,2,3,3-Hexafluoropropane (HFC-236ea)

pc	3416.00	kPa	Critical Parameters Measurements of Four HFE + HFC Binary Systems: Pentafluoromethoxyethane (HFE-245Mc) + Pentafluoroethane (HFC-125), + 1,1,1,2-Tetrafluoroethane (HFC-134a), + 1,1,1,2,3,3,3-Heptafluoropropane (HFC-227ea), and + 1,1,1,2,3,3-Hexafluoropropane (HFC-236ea)
rhoc	568.62 ± 1.52	kg/m3	NIST Webbook
tb	279.00	K	NIST Webbook
tb	279.70 ± 0.50	K	NIST Webbook
tc	412.37 ± 0.03	K	NIST Webbook
vc	0.288	m3/kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	145.86	J/mol×K	384.44	Joback Method
cpg	140.86	J/mol×K	363.63	Joback Method
cpg	135.63	J/mol×K	342.81	Joback Method
cpg	130.14	J/mol×K	322.00	Joback Method
cpg	124.41	J/mol×K	301.18	Joback Method
cpg	118.41	J/mol×K	280.37	Joback Method
cpg	112.15	J/mol×K	259.55	Joback Method
pvap	1570.90	kPa	373.15	Thermodynamic Properties of HFC-236ea
pvap	455.20	kPa	323.15	Thermodynamic Properties of HFC-236ea
pvap	602.00	kPa	333.15	Thermodynamic Properties of HFC-236ea
pvap	602.50	kPa	333.15	Thermodynamic Properties of HFC-236ea
pvap	783.20	kPa	343.16	Thermodynamic Properties of HFC-236ea
pvap	932.00	kPa	350.15	Thermodynamic Properties of HFC-236ea

pvap	1000.80	kPa	353.15	Thermodynamic Properties of HFC-236ea
pvap	999.60	kPa	353.15	Thermodynamic Properties of HFC-236ea
pvap	1263.50	kPa	363.15	Thermodynamic Properties of HFC-236ea
pvap	1262.70	kPa	363.15	Thermodynamic Properties of HFC-236ea
pvap	1537.20	kPa	372.15	Thermodynamic Properties of HFC-236ea
pvap	1569.70	kPa	373.15	Thermodynamic Properties of HFC-236ea
pvap	392.60	kPa	318.15	Thermodynamic Properties of HFC-236ea
pvap	1860.20	kPa	381.15	Thermodynamic Properties of HFC-236ea
pvap	1935.90	kPa	383.15	Thermodynamic Properties of HFC-236ea
pvap	2274.80	kPa	391.15	Thermodynamic Properties of HFC-236ea
pvap	2362.00	kPa	393.15	Thermodynamic Properties of HFC-236ea
pvap	2364.90	kPa	393.15	Thermodynamic Properties of HFC-236ea
pvap	2605.20	kPa	398.15	Thermodynamic Properties of HFC-236ea
pvap	2874.50	kPa	403.15	Thermodynamic Properties of HFC-236ea
pvap	2871.50	kPa	403.15	Thermodynamic Properties of HFC-236ea
pvap	3145.80	kPa	408.15	Thermodynamic Properties of HFC-236ea
pvap	3197.60	kPa	408.75	Thermodynamic Properties of HFC-236ea
pvap	3336.00	kPa	411.08	Thermodynamic Properties of HFC-236ea
pvap	3397.20	kPa	412.15	Thermodynamic Properties of HFC-236ea

pvap	337.50	kPa	313.15	Thermodynamic Properties of HFC-236ea
pvap	337.20	kPa	313.15	Thermodynamic Properties of HFC-236ea
pvap	288.00	kPa	308.15	Thermodynamic Properties of HFC-236ea
pvap	244.20	kPa	303.15	Thermodynamic Properties of HFC-236ea
pvap	206.00	kPa	298.15	Thermodynamic Properties of HFC-236ea
pvap	178.00	kPa	294.08	Thermodynamic Properties of HFC-236ea
pvap	172.40	kPa	293.15	Thermodynamic Properties of HFC-236ea

Correlations

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/(T + C)
Coeff. A	1.66773e+01
Coeff. B	-3.14132e+03
Coeff. C	-1.88230e+01
Temperature range (K), min.	210.49
Temperature range (K), max.	412.44

Sources

Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
Critical Parameters Measurements of Four HFE + HFC Binary Systems: Pentafluoroethoxymethane (HFE-245Mc) + Pentafluoroethane (HFC-125), + 1,1,1,2-Tetrafluoroethane (HFC-134a), + 1,1,1,2,3,3,3-Heptafluoropropane (HFC-227ea), and + 1,1,1,2,3,3-Hexafluoropropane (HFC-236ea):	https://www.doi.org/10.1021/je0499420
The Yaws Handbook of Vapor Pressure	https://www.sciencedirect.com/book/9780128029992/the-yaws-handbook-of-vapor-pressure
Crippen Method:	https://www.chemeo.com/doc/models/crippen_log10ws
Critical Properties of Four HFE + HFC Binary Systems: Pentafluoroethoxymethane (HFE-143m) + Pentafluoroethane (HFC-125), + 1,1,1,2-Tetrafluoroethane (HFC-134a), + 1,1,1,2,3,3,3-Heptafluoropropane (HFC-227ea), and + 1,1,1,2,3,3-Hexafluoropropane (HFC-236ea):	https://www.doi.org/10.1021/je0499723
Joback Method:	https://en.wikipedia.org/wiki/Joback_method
Thermodynamic Properties of 1,1,1,2,3,3,3-Heptafluoropropane and 1,1,1,2,3,3-Hexafluoropropane:	https://www.doi.org/10.1007/s10765-007-0369-6
McGowan Method:	http://link.springer.com/article/10.1007/BF02311772

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
rhoc:	Critical density
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
vc:	Critical Volume