nonane, eicosafluoro-

Other names: Perfluorononane
eicosafluorononane
Inchi: InChI=1S/C9F20/c10-1(11,2(12,13)4(16,17)6(20,21)8(24,25)26)3(14,15)5(18,19)7(22,23)
InchiKey: UVWPNDVAQBNQBG-UHFFFAOYSA-N
Formula: C9F20
SMILES: FC(F)(F)C(F)(F)C(F)(F)C(F)(F)C(F)(F)C(F)(F)C(F)(F)C(F)(F)C(F)(F)C(F)(F)F
Mol. weight [g/mol]: 488.06
CAS: 375-96-2

Physical Properties

Property code	Value	Unit	Source
gf	-3845.74	kJ/mol	Joback Method
hf	-4230.04	kJ/mol	Joback Method
hfus	13.94	kJ/mol	Joback Method
hvap	45.30 ± 0.20	kJ/mol	NIST Webbook
log10ws	-7.11		Crippen Method
logp	6.558		Crippen Method
mcvol	173.070	ml/mol	McGowan Method
pc	1560.00	kPa	KDB
tb	398.50	K	KDB
tc	524.00 ± 0.50	K	NIST Webbook
tc	524.00	K	KDB
tf	224.77	K	Joback Method
vc	0.800	m3/kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	501.38	J/mol×K	448.28	Joback Method
cpg	477.58	J/mol×K	413.63	Joback Method
cpg	464.54	J/mol×K	396.30	Joback Method
cpg	450.71	J/mol×K	378.98	Joback Method
cpg	436.06	J/mol×K	361.65	Joback Method
cpg	512.19	J/mol×K	465.61	Joback Method

cpg	489.85	J/mol×K	430.96	Joback Method
hvapt	32.80	kJ/mol	455.50	NIST Webbook
kvisc	0.0000010	m2/s	298.15	Viscosities of Liquid Fluorocompounds
kvisc	0.0000009	m2/s	303.15	Viscosities of Liquid Fluorocompounds
kvisc	0.0000008	m2/s	308.15	Viscosities of Liquid Fluorocompounds
kvisc	0.0000008	m2/s	313.15	Viscosities of Liquid Fluorocompounds
kvisc	0.0000007	m2/s	318.15	Viscosities of Liquid Fluorocompounds
pvap	0.94	kPa	293.18	Densities and Vapor Pressures of Highly Fluorinated Compounds
pvap	1.29	kPa	298.11	Densities and Vapor Pressures of Highly Fluorinated Compounds
pvap	1.71	kPa	303.10	Densities and Vapor Pressures of Highly Fluorinated Compounds
pvap	2.32	kPa	308.19	Densities and Vapor Pressures of Highly Fluorinated Compounds
pvap	3.06	kPa	313.17	Densities and Vapor Pressures of Highly Fluorinated Compounds
pvap	3.99	kPa	318.22	Densities and Vapor Pressures of Highly Fluorinated Compounds
pvap	5.14	kPa	323.15	Densities and Vapor Pressures of Highly Fluorinated Compounds
pvap	6.59	kPa	328.15	Densities and Vapor Pressures of Highly Fluorinated Compounds

pvap	0.68	kPa	288.18	Densities and Vapor Pressures of Highly Fluorinated Compounds
pvap	8.42	kPa	333.15	Densities and Vapor Pressures of Highly Fluorinated Compounds
rhol	1798.00	kg/m3	293.15	Binary vapour-liquid equilibrium data for C7 and C9 straight-chain perfluorocarbons with ethylene
srf	0.01	N/m	319.15	Surface Tension of Liquid Fluorocompounds
srf	0.01	N/m	308.75	Surface Tension of Liquid Fluorocompounds
srf	0.01	N/m	303.45	Surface Tension of Liquid Fluorocompounds
srf	0.02	N/m	298.25	Surface Tension of Liquid Fluorocompounds
srf	0.02	N/m	292.75	Surface Tension of Liquid Fluorocompounds
srf	0.02	N/m	287.15	Surface Tension of Liquid Fluorocompounds
srf	0.01	N/m	313.85	Surface Tension of Liquid Fluorocompounds

Correlations

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/(T + C)
Coeff. A	1.53201e+01
Coeff. B	-3.71064e+03
Coeff. C	-5.19190e+01
Temperature range (K), min.	298.76
Temperature range (K), max.	422.66

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/T + C*ln(T) + D*T^2
Coeff. A	-2.42081e+01
Coeff. B	-1.89818e+03
Coeff. C	5.70483e+00
Coeff. D	-1.95990e-06
Temperature range (K), min.	387.15
Temperature range (K), max.	523.15

Sources

Densities and Vapor Pressures of Highly Fluorinated Compounds:	https://www.doi.org/10.1021/je050056e
KDB Vapor Pressure Data:	https://www.cheric.org/research/kdb/hcprop/showprop.php?cmpid=1647
Viscosities of Liquid Fluorocompounds:	https://www.doi.org/10.1021/je700632z
Crippen Method:	https://www.chemeo.com/doc/models/crippen_log10ws
KDB:	https://www.cheric.org/files/research/kdb/mol/mol1647.mol
Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
Perfluoroalkanes and perfluoroalkylalkane surfactants in solution: Partial molar volumes in	https://www.doi.org/10.1016/j.fluid.2011.02.020
Liquid-liquid equilibrium of (1H,1H,7H-perfluoroheptan-1-ol + n-octane and hetero-SAFT-VR modelling:	https://www.doi.org/10.1016/j.fluid.2006.10.025
Binary vapour–liquid equilibrium data for C7 and C9 straight-chain perfluorocarbons with ethylene:	https://www.doi.org/10.1016/j.fluid.2016.08.015
The Yaws Handbook of Vapor Pressure:	https://www.sciencedirect.com/book/9780128029992/the-yaws-handbook-of-vapor-pressure
Joback Method:	https://en.wikipedia.org/wiki/Joback_method
Surface Tension of Liquid Fluorocompounds:	https://www.doi.org/10.1021/je060199g
McGowan Method:	http://link.springer.com/article/10.1007/BF02311772
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C375962&Units=SI

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
hvapt:	Enthalpy of vaporization at a given temperature
kvisc:	Kinematic viscosity
log10ws:	Log10 of Water solubility in mol/l
logp:	Octanol/Water partition coefficient

mcvol:	McGowan's characteristic volume
pc:	Critical Pressure
pvap:	Vapor pressure
rhol:	Liquid Density
srf:	Surface Tension
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
vc:	Critical Volume