

Ethene, trifluoro-

Other names:

C2HF3
Ethylene trifluoride
Ethylene, trifluoro-
R-1123
TRIFLUOROETHENE
Trifluoroethylene

Inchi:

InChI=1S/C2HF3/c3-1-2(4)5/h1H

InchiKey:

MIZLGWKEZAPEFJ-UHFFFAOYSA-N

Formula:

C2HF3

SMILES:

FC=C(F)F

Mol. weight [g/mol]:

82.02

CAS:

359-11-5

Physical Properties

Property code	Value	Unit	Source
af	0.2380		KDB
affp	699.40	kJ/mol	NIST Webbook
basg	666.90	kJ/mol	NIST Webbook
chg	-976.50 ± 8.40	kJ/mol	NIST Webbook
gf	-546.80	kJ/mol	Joback Method
hf	-474.00 ± 8.40	kJ/mol	NIST Webbook
hfus	9.07	kJ/mol	Joback Method
hvap	17.63	kJ/mol	Joback Method
ie	10.14	eV	NIST Webbook
ie	10.62 ± 0.02	eV	NIST Webbook
ie	10.14	eV	NIST Webbook
ie	10.14	eV	NIST Webbook
ie	10.14 ± 0.02	eV	NIST Webbook
ie	10.54 ± 0.02	eV	NIST Webbook
ie	10.53	eV	NIST Webbook
log10ws	-1.56		Crippen Method
logp	1.694		Crippen Method
mcvol	40.050	ml/mol	McGowan Method
pc	4520.00	kPa	KDB
rinpol	254.00		NIST Webbook
rinpol	254.00		NIST Webbook
tb	222.00	K	NIST Webbook

tb	221.00	K	KDB
tc	347.20	K	KDB
tf	95.00	K	KDB
vc	0.182	m3/kmol	KDB
zc	0.2857490		KDB

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	54.74	J/mol×K	247.01	Joback Method
cpg	58.29	J/mol×K	270.52	Joback Method
cpg	61.66	J/mol×K	294.03	Joback Method
cpg	64.87	J/mol×K	317.54	Joback Method
cpg	67.92	J/mol×K	341.05	Joback Method
cpg	70.81	J/mol×K	364.55	Joback Method
cpg	73.55	J/mol×K	388.06	Joback Method
pvap	1727.40	kPa	289.99	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	1231.00	kPa	277.67	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	1312.50	kPa	279.97	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	1313.70	kPa	279.98	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	1476.60	kPa	284.12	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)

pvap	1476.80	kPa	284.12	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	1477.70	kPa	284.15	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	1516.10	kPa	285.10	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	1517.00	kPa	285.12	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	1727.20	kPa	289.99	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	1230.30	kPa	277.67	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	1963.10	kPa	294.97	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	1963.00	kPa	294.97	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	2222.10	kPa	300.00	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)

pvap	2388.20	kPa	303.00	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	2504.70	kPa	305.00	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	2687.80	kPa	308.00	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	2815.30	kPa	310.00	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	3015.40	kPa	313.00	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	3155.00	kPa	315.00	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	3373.30	kPa	318.00	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	3525.70	kPa	320.00	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)

pvap	3764.50	kPa	323.00	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	3931.30	kPa	325.00	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	4194.20	kPa	328.00	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	4377.70	kPa	330.00	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)
pvap	4543.40	kPa	331.73	Measurements of Saturation Pressures for Trifluoroethene (R1123) and 3,3,3-Trifluoropropene (R1243zf)

Correlations

Information	Value
Property code	pvap
Equation	$\ln(P_{vp}) = A + B/(T + C)$
Coeff. A	1.78527e+01
Coeff. B	-4.23849e+03
Coeff. C	9.82630e+01
Temperature range (K), min.	143.04
Temperature range (K), max.	239.70

Information	Value
Property code	pvap
Equation	$\ln(P_{vp}) = A + B/T + C*\ln(T) + D*T^2$

Coeff. A	8.65399e+01
Coeff. B	-3.90796e+03
Coeff. C	-1.21425e+01
Coeff. D	2.67399e-05
Temperature range (K), min.	180.15
Temperature range (K), max.	244.15

Sources

KDB Vapor Pressure Data:	https://www.cheric.org/research/kdb/hcprop/showprop.php?cmpid=1721
Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C359115&Units=SI
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
Joback Method:	https://en.wikipedia.org/wiki/Joback_method
KDB:	https://www.cheric.org/files/research/kdb/mol/mol1721.mol
Measurements of Saturation Pressures for Trifluoroethene (R1123) and 1,1,1,3,3,3-hexafluoroethane (R1243zf):	https://www.doi.org/10.1021/acs.jced.7b00818
McGowan Method:	http://link.springer.com/article/10.1007/BF02311772

Legend

af:	Acentric Factor
affp:	Proton affinity
basg:	Gas basicity
chg:	Standard gas enthalpy of combustion
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
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
rinpol:	Non-polar retention indices
tb:	Normal Boiling Point Temperature

tc:	Critical Temperature
tf:	Normal melting (fusion) point
vc:	Critical Volume
zc:	Critical Compressibility

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