Maleic anhydride

Other names:	(Z)-butenedioic acid anhydride
	2,5-Furanedione
	2,5-furandione
	Anhydrid kyseliny maleinove
	Dihydro-2,5-dioxofuran
	M 188
	Maleic acid anhydride
	Maleic anhydride, briquettes
	Maleinanhydrid
	NSC 137651
	Rcra waste number U147
	Toxilic anhydride
	UN 2215
	cis-butenedioic anhydride
Inchi:	InChI=1S/C4H2O3/c5-3-1-2-4(6)7-3/h1-2H
InchiKey:	FPYJFEHAWHCUMM-UHFFFAOYSA-N
Formula:	C4H2O3
SMILES:	O=C1C=CC(=O)O1
Mol. weight [g/mol]:	98.06
CAS:	108-31-6

Physical Properties

Property code	Value	Unit	Source
chs	-1389.50 ± 0.67	kJ/mol	NIST Webbook
chs	-1390.30 ± 0.71	kJ/mol	NIST Webbook
ea	1.44 ± 0.09	eV	NIST Webbook
ea	1.40 ± 0.20	eV	NIST Webbook
ea	1.44 ± 0.05	eV	NIST Webbook
gf	-274.28	kJ/mol	Joback Method
hf	-394.69	kJ/mol	Joback Method
hfs	-470.41 ± 0.71	kJ/mol	NIST Webbook
hfs	-469.60 ± 0.30	kJ/mol	NIST Webbook
hfus	7.20	kJ/mol	Joback Method
hsub	70.00	kJ/mol	NIST Webbook
hvap	38.36	kJ/mol	Joback Method
ie	11.45	eV	NIST Webbook
ie	11.10	eV	NIST Webbook

ie	11.11 ± 0.05	eV	NIST Webbook
ie	11.07	eV	NIST Webbook
log10ws	0.12		Crippen Method
logp	-0.374		Crippen Method
mcvol	61.070	ml/mol	McGowan Method
pc	5990.66	kPa	Joback Method
rinpol	833.00		NIST Webbook
rinpol	790.00		NIST Webbook
rinpol	791.00		NIST Webbook
rinpol	833.00		NIST Webbook
rinpol	830.00		NIST Webbook
rinpol	827.00		NIST Webbook
rinpol	827.00		NIST Webbook
tb	473.20	K	NIST Webbook
tc	719.14	K	Joback Method
tf	325.60	K	Isothermal (vapor + liquid) equilibria of maleic anhydride + di-isobutyl hexahydrophthalate and maleic anhydride + di-n-butyl phthalate systems at T= (413.2, 433.2 and 453.2) K
tf	325.95	K	Measurement and correlation of the solubility of maleic anhydride in different organic solvents
tf	325.60	K	Isobaric vapor liquid equilibria of the binary system: Maleic anhydride + di-n-butylsebacate at 2.67, 5.33 and 8.00 kPa
tf	325.60	K	Isobaric vapor-liquid equilibria of the binary system maleic anhydride and dimethyl phthalate at 2.67, 5.33 and 8.00 kPa
tf	325.80	K	Isobaric (vapor + liquid) equilibria of the binary system maleic anhydride and diethyl phthalate at p = (2.67, 5.33, and 8.00) kPa
tt	325.72 ± 0.02	K	NIST Webbook
vc	0.223	m3/kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source

cpg	154.11	J/mol×K	678.05	Joback Method
cpg	140.29	J/mol×K	595.88	Joback Method
cpg	132.91	J/mol×K	554.79	Joback Method
cpg	125.28	J/mol×K	513.71	Joback Method
cpg	117.47	J/mol×K	472.62	Joback Method
cpg	160.44	J/mol×K	719.14	Joback Method
cpg	147.37	J/mol×K	636.96	Joback Method
cps	67.40	J/mol×K	298.15	NIST Webbook
cps	119.90	J/mol×K	300.00	NIST Webbook
cps	123.20	J/mol×K	310.00	NIST Webbook
hfust	13.55	kJ/mol	325.72	NIST Webbook
hfust	13.65	kJ/mol	326.00	NIST Webbook
hfust	13.60	kJ/mol	325.30	NIST Webbook
hfust	12.26	kJ/mol	325.70	NIST Webbook
hfust	12.26	kJ/mol	325.70	NIST Webbook
hfust	12.93	kJ/mol	325.00	NIST Webbook
hfust	12.26	kJ/mol	325.64	NIST Webbook
hsubt	71.50 ± 5.00	kJ/mol	316.50	NIST Webbook
hsubt	68.80	kJ/mol	258.00	NIST Webbook
hsubt	85.40	kJ/mol	317.00	NIST Webbook
hvapt	54.80	kJ/mol	325.80	NIST Webbook
hvapt	49.10	kJ/mol	405.50	NIST Webbook
hvapt	54.80	kJ/mol	338.00	NIST Webbook
hvapt	56.70	kJ/mol	396.00	NIST Webbook
sfust	37.60	J/mol×K	325.64	NIST Webbook
sfust	39.80	J/mol×K	325.00	NIST Webbook
sfust	41.80	J/mol×K	325.30	NIST Webbook
sfust	41.60	J/mol×K	325.72	NIST Webbook

Sources

Isobaric vapor-liquid equilibria of the binary system maleic anhydride and dimethyl phthalate at 2.67, 5.33 and 8.00 kPa:	https://www.doi.org/10.1016/j.fluid.2006.06.013
Isobaric (vapor + liquid) equilibria of the binary system maleic anhydride and diethyl phthalate at p = (2.67, 5.33, and 8.00) kPa:	https://www.doi.org/10.1016/j.jct.2006.02.008
Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
Measurement and correlation of the solubility of maleic anhydride in different organic solvents:	https://www.doi.org/10.1016/j.fluid.2014.01.008
Crippen Method:	https://www.chemeo.com/doc/models/crippen_log10ws
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C108316&Units=SI
Joback Method:	https://en.wikipedia.org/wiki/Joback_method
Isobaric vapor liquid equilibria of the binary system maleic anhydride and di-isobutyl hexahydrophthalate at 2.67, 5.33 and 8.00 kPa:	https://www.doi.org/10.1016/j.fluid.2005.03.019
Isothermal (vapor + liquid) equilibria of maleic anhydride + di-isobutyl hexahydrophthalate and isobaric vapor liquid equilibria of the binary system: Maleic anhydride + di-n-butyl phthalate systems at T = (413.2, 433.2 and 453.2) K:	https://www.doi.org/10.1016/j.jct.2005.10.012
Isobaric vapor liquid equilibria of the binary system maleic anhydride + di-n-butyl adipate or di-n-butyl sebacate at 2.67, 5.33 and 8.00 kPa:	https://www.doi.org/10.1016/j.fluid.2008.08.001

McGowan Method: http://link.springer.com/article/10.1007/BF02311772

Legend

chs:	Standard solid enthalpy of combustion
cpg:	Ideal gas heat capacity
cps:	Solid phase heat capacity
ea:	Electron affinity
gf:	Standard Gibbs free energy of formation
hf:	Enthalpy of formation at standard conditions
hfs:	Solid phase enthalpy of formation at standard conditions
hfus:	Enthalpy of fusion at standard conditions
hfust:	Enthalpy of fusion at a given temperature
hsub:	Enthalpy of sublimation at standard conditions
hsubt:	Enthalpy of sublimation 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
rinpol:	Non-polar retention indices
sfust:	Entropy of fusion at a given temperature
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
tt:	Triple Point Temperature
vc:	Critical Volume