L-Methionine

Other names:	(S)-(+)-methionine (S)-2-Amino-4-(methylthio)butanoic acid (S)-2-amino-4-(methylthio)-butanoic acid, , .gamma.-methylthio-.alpha.-aminobutyric acid 2-Amino-4-(methylthio)butyric acid 2-Amino-4-methylthiobutanoic acid 2-Amino-4-methylthiobutanoic acid (S)- Acimethin Butanoic acid, 2-amino-4-(methylthio)-, (S)- Butyric acid, 2-amino-4-(methylthio)- Cymethion L(-)-Amino-«gamma»-methylthiobutyric acid L(-)-Amino-Â«gammaÂ»-methylthiobutyric acid L-(-)-Methionine L-.alpha.-amino-.gamma.-methylthiobutyric acid L-2-Amino-4-(methylthio)butyric acid L-Homocysteine, S-methyl- L-«alpha»-Amino-«gamma»-methylmercaptobutyric acid L-«gamma»-Methylthio-«alpha»-aminobutyric acid L-Â«alphaÂ»-Amino-Â«gammaÂ»-methylmercaptobutyric acid L-Â«gammaÂ»-Methylthio-Â«alphaÂ»-aminobutyric acid Liquimeth Met Methionine Methionine, L- NSC 22946 S-Methionine h-Met-oh «gamma»-Methylthio-«alpha»-aminobutyric acid Â«gammaÂ»-Methylthio-Â«alphaÂ»-aminobutyric acid
Inchi:	InChI=1S/C5H11NO2S/c1-9-3-2-4(6)5(7)8/h4H,2-3,6H2,1H3,(H,7,8)/t4-/m1/s1
InchiKey:	FFEARJCKVFRZRR-SCSAIBSYSA-N
Formula:	C5H11NO2S
SMILES:	CSCCC(N)C(=O)O
Mol. weight [g/mol]:	149.21
CAS:	63-68-3

Physical Properties

Property code	Value	Unit	Source
affp	935.40	kJ/mol	NIST Webbook
basg	901.50	kJ/mol	NIST Webbook
chs	-3564.11 ± 0.61	kJ/mol	NIST Webbook
chs	-3176.00 ± 0.80	kJ/mol	NIST Webbook
gf	-177.39	kJ/mol	Joback Method
hf	-413.50 ± 4.10	kJ/mol	NIST Webbook
hfs	-577.50 ± 0.70	kJ/mol	NIST Webbook
hfus	20.20	kJ/mol	Joback Method
hsub	164.00 ± 4.00	kJ/mol	NIST Webbook
hsub	164.00 ± 4.00	kJ/mol	NIST Webbook
hvap	67.22	kJ/mol	Joback Method
ie	8.30	eV	NIST Webbook
ie	8.63 ± 0.10	eV	NIST Webbook
ie	9.00	eV	NIST Webbook
ie	8.65	eV	NIST Webbook
log10ws	-0.44		Crippen Method
logp	0.151		Crippen Method
mcvol	115.080	ml/mol	McGowan Method
pc	4684.89	kPa	Joback Method
tb	600.72	K	Joback Method
tc	805.14	K	Joback Method
tf	359.52	K	Joback Method
vc	0.417	m3/kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	313.51	J/mol×K	771.07	Joback Method
cpg	274.83	J/mol×K	600.72	Joback Method
cpg	283.51	J/mol×K	634.79	Joback Method
cpg	291.70	J/mol×K	668.86	Joback Method
cpg	299.43	J/mol×K	702.93	Joback Method
cpg	306.70	J/mol×K	737.00	Joback Method
cpg	319.87	J/mol×K	805.14	Joback Method
hsubt	125.00	kJ/mol	474.00	NIST Webbook
hsubt	125.00 ± 0.80	kJ/mol	455.00	NIST Webbook

hvapt	139.00	kJ/mol	437.00	Enthalpies of sublimation of L-methionine and DL-methionine: Knudsen's effusion mass spectrometric study

Correlations

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/(T + C)
Coeff. A	2.71590e+01
Coeff. B	-1.50359e+04
Temperature range (K), min.	559.55
Temperature range (K), max.	688.22

Sources

Surface Tension of Aqueous Solutions of Small-Chain Amino and Organic Acids:	https://www.doi.org/10.1021/acs.jced.9b00026
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C63683&Units=SI
Crippen Method:	https://www.chemeo.com/doc/models/crippen_log10ws
Surface tension and UV-visible investigations of aggregation and adsorption behavior of NaC and NaDC in water-amino acid mixtures:	https://www.doi.org/10.1016/j.fluid.2015.03.012
Volumetric, compressibility and viscometric studies on sodium cholate/sodium deoxycholate amino acid interactions in aqueous medium:	https://www.doi.org/10.1016/j.tca.2015.02.014
Study of solute solute and solute solvent interactions of L-methionine in aqueous sucrose solutions at different temperatures:	https://www.doi.org/10.1016/j.jct.2012.11.001
Solubility and Metastable Zone Width of the Methionine Enantiomers and Their Mixtures in Water:	https://www.doi.org/10.1021/je9001834
APPARENT MOLAR VOLUME, COMPRESSIBILITY AND VISCOMETRIC STUDIES OF SODIUM DODECYL BENZENE SULFONATE (SDBS) AND DODECYLTRIMETHYLAMMONIUM BROMIDE (DTAB) IN AQUEOUS AMINO ACID SOLUTIONS: A THERMO-ACOUSTIC APPROACH:	https://www.doi.org/10.1016/j.tca.2013.12.021
Thermodynamics of proton dissociations from aqueous L-methionine at temperatures from (278.15 to 393.15) K, molalities from (0.01 to 1.0) mol Ae kg 1, and at the pressure 0.35 MPa: Apparent molar heat capacities and apparent molar volumes of L-methionine, methioninium chloride, and sodium methioninate:	https://www.doi.org/10.1016/j.jct.2006.07.018
Joback Method:	https://en.wikipedia.org/wiki/Joback_method
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
Study of the interactions of PAMAM-NH2 G4 dendrimer with selected natural amino acids in aqueous solutions:	https://www.doi.org/10.1016/j.jct.2013.10.022
McGowan Method:	http://link.springer.com/article/10.1007/BF02311772
Effect of temperature and additives on the critical micelle concentration and thermodynamics of micelle formation of sodium dodecyl benzene sulfonate and dodecyltrimethylammonium bromide in aqueous solution: A conductometric study:	https://www.doi.org/10.1016/j.jct.2013.12.019
Enthalpies of sublimation of L-methionine and DL-methionine: Knudsen's effusion mass spectrometric study:	https://www.doi.org/10.1016/j.jct.2019.04.006
Solubility of the Proteinogenic a-Amino Acids in Water, Ethanol, and Ethanol-Water Mixtures:	https://www.doi.org/10.1021/acs.jced.7b00486
Determination and correlation of solubility and thermodynamic properties of L-methionine in binary solvents of water + (methanol, ethanol, acetone):	https://www.doi.org/10.1016/j.jct.2015.12.022
Conductivity and fluorescence studies on the micellization properties of sodium cholate and sodium deoxycholate in aqueous medium at different temperatures: Effect of selected amino acids:	https://www.doi.org/10.1016/j.jct.2014.10.014

Legend

affp:	Proton affinity
basg:	Gas basicity
chs:	Standard solid enthalpy of combustion
cpg:	Ideal gas heat capacity
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
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
pvap:	Vapor pressure
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
vc:	Critical Volume