dl-Serine

Other names:	(.+-.)-serine
	2-amino-3-hydroxypropanoic acid
	DL-HOCH2CH(NH2)COOH
	Serine DL-form
	Serine, dl-
	propanoic acid, 2-amino-3-hydroxy-
Inchi:	InChI=1S/C3H7NO3/c4-2(1-5)3(6)7/h2,5H,1,4H2,(H,6,7)
InchiKey:	MTCFGRXMJLQNBG-UHFFFAOYSA-N
Formula:	C3H7NO3
SMILES:	NC(CO)C(=O)O
Mol. weight [g/mol]:	105.09
CAS:	302-84-1

Physical Properties

Property code	Value	Unit	Source
chs	-1441.90 ± 1.90	kJ/mol	NIST Webbook
gf	-364.17	kJ/mol	Joback Method
hf	-493.78	kJ/mol	Joback Method
hfus	14.97	kJ/mol	Joback Method
hvap	72.63	kJ/mol	Joback Method
ie	8.70	eV	NIST Webbook
ie	10.00	eV	NIST Webbook
log10ws	1.01		Crippen Method
logp	-1.609		Crippen Method
mcvol	76.420	ml/mol	McGowan Method
pc	7014.41	kPa	Joback Method
tb	578.36	K	Joback Method
tc	760.22	K	Joback Method
tf	363.40	K	Joback Method
vc	0.271	m3/kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source

cpg	184.80	J/mol×K	578.36	Joback Method
cpg	190.08	J/mol×K	608.67	Joback Method
cpg	195.08	J/mol×K	638.98	Joback Method
cpg	199.83	J/mol×K	669.29	Joback Method
cpg	204.33	J/mol×K	699.60	Joback Method
cpg	208.59	J/mol×K	729.91	Joback Method
cpg	212.60	J/mol×K	760.22	Joback Method
cps	132.40	J/mol×K	298.15	NIST Webbook

Sources

Thermodynamics of proton dissociations from aqueous serine at temperatures from (278.15 to 393.15) K, molalities from (0.01 up to 1.0) mol Ae kg-1, and at the pressure 0.35 MPa:	https://www.doi.org/10.1016/j.jct.2005.07.019
Solubility and Thermodynamics of Solute-Solvent Interactions of Some Amino Acids in Aqueous Sodium Bromide and Potassium Bromide Solutions:	https://www.doi.org/10.1021/acs.jced.7b00647
Solubility and Chemical Thermodynamics of d,l-Alanine and d,l-Serine in Aqueous NaCl and KCl Solutions:	https://www.doi.org/10.1021/acs.jced.5b00351
Apparent molar heat capacities and apparent molar volumes of serine, serinium chloride, and sodium serinate:	
Joback Method:	https://en.wikipedia.org/wiki/Joback_method
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C302841&Units=SI
Partial molar volumes of L-alanine, DL-serine, DL-threonine, L-histidine, glycine, and glycylglycine in water, NaCl, and DMSO aqueous solutions at T = 298.15 K:	https://www.doi.org/10.1016/j.jct.2005.03.015
Crippen Method:	https://www.chemeo.com/doc/models/crippen_log10ws
Effects of hydroxyl groups on binary diffusion coefficients of -amino acids in dilute aqueous solutions:	https://www.doi.org/10.1016/j.fluid.2007.10.013
A thermochemical study of serine stereoisomers:	https://www.doi.org/10.1016/j.tca.2014.08.032
Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
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
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
tb:	Normal Boiling Point Temperature

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