L-Glutamic acid

Other names:	(2S)-2-Aminopentanedioic acid
	(S)-(+)-Glutamic acid
	(S)-.alpha.-aminoglutaric acid
	(S)-2-Aminopentanedioic acid
	(S)-Glutamic acid
	.alpha.-glutamic acid
	1-Aminopropane-1,3-dicarboxylic acid
	2-Aminoglutaric acid
	2-Aminopentanedioic acid
	Aciglut
	D-Glutamiensuur
	Glusate
	Glutacid
	Glutamic acid
	Glutamic acid, L-
	Glutamicol
	Glutamidex
	Glutaminic acid
	Glutaminol
	Glutaton
	L (+)-glutamic acid, alpha-form
	L-(+)-Glutamic acid
	L-.alpha.-aminoglutaric acid
	L-2-aminoglutaric acid
	L-2-aminopentanedioic acid
	L-Glutaminic acid
	NSC 143503
	Pentanedioic acid, 2-amino-, (S)-
	«alpha»-Aminoglutaric acid
	«alpha»-Glutamic acid
	Â«alphaÂ»-Aminoglutaric acid
	Â«alphaÂ»-Glutamic acid
Inchi:	InChI=1S/C5H9NO4/c6-3(5(9)10)1-2-4(7)8/h3H,1-2,6H2,(H,7,8)(H,9,10)/t3-/m1/s1
InchiKey:	WHUUTDBJXJRKMK-GSVOUGTGSA-N
Formula:	C5H9NO4
SMILES:	NC(CCC(=O)O)C(=O)O
Mol. weight [g/mol]:	147.13
CAS:	56-86-0

Physical Properties

Property code	Value	Unit	Source
affp	913.00	kJ/mol	NIST Webbook
affp	981.80 ± 9.90	kJ/mol	NIST Webbook
basg	921.00 ± 11.00	kJ/mol	NIST Webbook
basg	879.10	kJ/mol	NIST Webbook
chs	-2250.47 ± 0.93	kJ/mol	NIST Webbook
chs	-2275.70	kJ/mol	NIST Webbook
chs	-2244.10 ± 0.75	kJ/mol	NIST Webbook
chs	-2248.50 ± 1.20	kJ/mol	NIST Webbook
chs	-2253.40	kJ/mol	NIST Webbook
ep	-95.00 ± 16.00	J/mol×K	NIST Webbook
gf	-476.25	kJ/mol	Joback Method
hf	-647.64	kJ/mol	Joback Method
hfs	-1003.30 ± 1.20	kJ/mol	NIST Webbook
hfs	-1005.20 ± 1.20	kJ/mol	NIST Webbook
hfus	21.75	kJ/mol	Joback Method
hvap	83.83	kJ/mol	Joback Method
log10ws	0.34		Crippen Method
logp	-0.737		Crippen Method
mcvol	106.170	ml/mol	McGowan Method
pc	5713.21	kPa	Joback Method
ss	188.20	J/mol×K	NIST Webbook
tb	677.99	K	Joback Method
tc	864.26	K	Joback Method
tf	435.87	K	Joback Method
vc	0.389	m3/kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	302.93	J/mol×K	802.17	Joback Method
cpg	307.87	J/mol×K	833.21	Joback Method
cpg	279.71	J/mol×K	677.99	Joback Method
cpg	286.05	J/mol×K	709.03	Joback Method
cpg	292.03	J/mol×K	740.08	Joback Method
cpg	297.65	J/mol×K	771.12	Joback Method
cpg	312.49	J/mol×K	864.26	Joback Method

cps	175.08	J/mol×K	298.00	NIST Webbook
cps	175.06	J/mol×K	298.15	NIST Webbook

Correlations

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/(T + C)
Coeff. A	3.70227e+01
Coeff. B	-1.26929e+04
Coeff. C	-1.48662e+02
Temperature range (K), min.	494.19
Temperature range (K), max.	548.93

Sources

McGowan Method:	http://link.springer.com/article/10.1007/BF02311772
Mutual diffusion coefficients of L-glutamic acid and monosodium L-glutamate in aqueous solutions at T = 298.15 K:	https://www.doi.org/10.1016/j.jct.2014.01.017
Measurement and Modeling of Solid-Liquid Equilibria of l-Glutamic Acid in Pure Solvents and Aqueous Binary Mixtures:	https://www.doi.org/10.1021/acs.jced.8b01084
Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
Influence of pH Value and Ionic Liquids on the Solubility of l-Alanine and l-Glutamic Acid in Aqueous Solutions at 30 °C:	https://www.doi.org/10.1021/acs.jced.6b00367
Solubility of alpha-form and beta-form of L-glutamic acid in different aqueous solvent mixtures:	https://www.doi.org/10.1016/j.fluid.2010.10.020
Modeling solubility and acid-base properties of some polar side chain amino acids in NaCl and (CH3)4NCl aqueous solutions at different ionic strengths and temperatures:	https://www.doi.org/10.1016/j.fluid.2017.11.030
The Yaws Handbook of Vapor Pressure:	https://www.sciencedirect.com/book/9780128029992/the-yaws-handbook-of-vapor-pressure
Solubility of the Proteinogenic a-Amino Acids in Water, Ethanol, and Ethanol-Water Mixtures:	https://www.doi.org/10.1021/acs.jced.7b00486
Viscosities of l-Phenylalanine, l-Leucine, l-Glutamic Acid, or l-Proline + 2.0 mol*dm-3 Aqueous NaCl or 2.0 mol*dm-3 Aqueous NaNO3 Solutions at T = (298.15 to 328.15) K:	https://www.doi.org/10.1021/je1000878
Ultrasonic Velocities and Densities of l-Phenylalanine, l-Leucine, l-Glutamic Acid, [illegible] + 2 mol*L-1 Aqueous NaCl and 2 mol*L-1 Aqueous NaNO3 Solutions from (298.15 to 328.15) K:	https://www.doi.org/10.1021/je900909s
Synthesis, heat capacity and enthalpy of formation of [illegible](H2O)8](ClO4)4*H2O:	https://www.doi.org/10.1016/j.tca.2005.11.021
Crippen Method:	https://www.chemeo.com/doc/models/crippen_log10ws
Ultrasonic Velocities and Densities of l-Histidine or l-Glutamic Acid or l-Tryptophan or Glycylglycine + 2 mol*L-1 Aqueous KCl or KNO3 Solutions from (298.15 to 323.15) K:	https://www.doi.org/10.1021/je900199j
Joback Method:	https://en.wikipedia.org/wiki/Joback_method
Thermodynamics of the first and second proton dissociations from aqueous L-aspartic acid and L-glutamic acid at temperatures from (278.15 to 393.15) K and at the pressure 0.35 MPa:	https://www.doi.org/10.1016/j.jct.2006.08.008
Volumetric and acoustic studies of L-tyrosine + L-glutamic acid + water at different temperatures:	https://www.doi.org/10.1016/j.tca.2014.03.004
Viscosities of L-Histidine/L-Glutamic Acid/L-Tryptophan/Glycylglycine+2 M Aqueous KCl/KNO3 Solutions at T =(298.15 to 323.15)K:	https://www.doi.org/10.1007/s10765-011-0996-9
Apparent molar heat capacities and apparent molar volumes of zwitterionic, protonated cationic, and deprotonated anionic forms at molalities from (0.002 to 1.0) mol Ae kg 1:	
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C56860&Units=SI

Legend

affp:	Proton affinity
basg:	Gas basicity
chs:	Standard solid enthalpy of combustion
cpg:	Ideal gas heat capacity
cps:	Solid phase heat capacity
ep:	Protonation entropy at 298K
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
hvap:	Enthalpy of vaporization at standard conditions
log10ws:	Log10 of Water solubility in mol/l
logp:	Octanol/Water partition coefficient
mcvol:	McGowan's characteristic volume
pc:	Critical Pressure
pvap:	Vapor pressure
ss:	Solid phase molar entropy at standard conditions
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
vc:	Critical Volume