D-Mannitol

Other names:	1,2,3,4,5,6-Hexanehexol CORDYCEPIC ACID D-(-)-Mannitol DIOSMOL Isotol MANNITOL Manicol Maniton-S Manna sugar Mannazucker Mannazucker (German) Mannidex Mannigen Mannistol Mannit Mannite Mannitol, D- Mannogem 2080 Marine Crystal NCI-C50362 Osmitrol Osmosal Partek M Pearlitol 25C Resectisol
Inchi:	InChI=1S/C6H14O6/c7-1-3(9)5(11)6(12)4(10)2-8/h3-12H,1-2H2/t3-,4-,5-,6-/m1/s1
InchiKey:	FBPFZTCFMRRESA-KVTDHHQDSA-N
Formula:	C6H14O6
SMILES:	OCC(O)C(O)C(O)C(O)CO
Mol. weight [g/mol]:	182.17
CAS:	69-65-8

Physical Properties

Property code	Value	Unit	Source
chs	-3045.70	kJ/mol	NIST Webbook
chs	-3025.00 ± 2.00	kJ/mol	NIST Webbook

chs	-3024.70 ± 1.80	kJ/mol	NIST Webbook
chs	-3053.00	kJ/mol	NIST Webbook
gf	-831.04	kJ/mol	Joback Method
hf	-1101.67	kJ/mol	Joback Method
hfs	-1337.20 ± 0.79	kJ/mol	NIST Webbook
hfs	-1337.50	kJ/mol	NIST Webbook
hfus	54.69	kJ/mol	Heat Capacities and Nonisothermal Thermal Decomposition Reaction Kinetics of d-Mannitol
hsub	202.00	kJ/mol	NIST Webbook
hvap	127.47	kJ/mol	Joback Method
log10ws	0.06		Estimated Solubility Method
logp	-3.585		Crippen Method
mcvol	130.620	ml/mol	McGowan Method
pc	6830.13	kPa	Joback Method
ss	238.50	J/mol×K	NIST Webbook
ss	253.10	J/mol×K	NIST Webbook
tb	888.00	K	Joback Method
tc	1092.90	K	Joback Method
tf	439.00 ± 1.00	K	NIST Webbook
tf	439.20 ± 0.20	K	NIST Webbook
tf	439.10 ± 0.10	K	NIST Webbook
tf	438.88	K	Cycling stability of D-mannitol when used as phase change material for thermal storage applications
tf	435.00	K	Nanocalorimetry measurements of metastable states
tf	439.13	K	KDB
tf	439.13 ± 0.20	K	NIST Webbook
tf	440.62	K	Heat capacities of some sugar alcohols as phase change materials for thermal energy storage applications
vc	0.462	m3/kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	446.82	J/mol×K	1024.60	Joback Method
cpg	451.78	J/mol×K	1058.75	Joback Method

cpg	423.48	J/mol×K	888.00	Joback Method
cpg	429.90	J/mol×K	922.15	Joback Method
cpg	435.91	J/mol×K	956.30	Joback Method
cpg	441.54	J/mol×K	990.45	Joback Method
cpg	456.45	J/mol×K	1092.90	Joback Method
cps	244.80	J/mol×K	303.00	NIST Webbook
cps	236.00	J/mol×K	294.10	NIST Webbook
cps	239.00	J/mol×K	298.15	NIST Webbook
dvisc	1.3716255e-08	Pa×s	817.05	Joback Method
dvisc	4.5232902e-09	Pa×s	888.00	Joback Method
dvisc	0.0005812	Pa×s	462.30	Joback Method
dvisc	0.0000222	Pa×s	533.25	Joback Method
dvisc	0.0000018	Pa×s	604.20	Joback Method
dvisc	0.0000003	Pa×s	675.15	Joback Method
dvisc	5.1362493e-08	Pa×s	746.10	Joback Method
hfust	54.69	kJ/mol	437.30	NIST Webbook
hfust	56.10	kJ/mol	439.10	NIST Webbook
hfust	56.10	kJ/mol	439.10	NIST Webbook
hfust	53.58	kJ/mol	433.20	NIST Webbook
hvapt	135.60 ± 1.10	kJ/mol	479.50	NIST Webbook
sfust	123.70	J/mol×K	433.20	NIST Webbook
sfust	127.80	J/mol×K	439.10	NIST Webbook

Pressure Dependent Properties

Property code	Value	Unit	Pressure [kPa]	Source
tbrp	568.20	K	0.50	NIST Webbook

Sources

Solubility of Rofecoxib in the Presence of Mannitol, Poly(vinylpyrrolidone) K30, Urea, Polyethylene Glycol 4000, and Polyethylene Glycol 6000 at (298.15, 303.15, and 308.15) K:	https://www.doi.org/10.1021/je049631p
Molar Volumes and Refractive Indexes of Hexane-1,2,3,4,5,6-hexol in Aqueous Solutions of 1-Propanol and 2-Propanol:	https://www.doi.org/10.1021/je900966r
KDB:	https://www.cheric.org/research/kdb/hcprop/showprop.php?cmpid=927
Volumetric and Viscometric Studies of Amino Acids in Mannitol Aqueous Solutions at T = (293.15 to 323.15) K:	https://www.doi.org/10.1021/je501178z
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C69658&Units=SI
Rheological and time domain 1H NMR relaxation studies of some polyhydroxy solutes in presence of L-glycine:	https://www.doi.org/10.1016/j.jct.2016.04.006
Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
Modulation in physico-chemical characteristics of some polyhydroxy solutes in presence of L-glycine: Volumetric and NMR spectroscopic approach:	https://www.doi.org/10.1016/j.fluid.2015.05.043

Enthalpies of Dilution, Volumetric Properties, and Refractive Indices of N,N′-Hexamethylenebisacetamide in Aqueous Xylitol or d-Mannitol Solutions at T = 298.15 K:	https://www.doi.org/10.1021/je300633e
Joback Method:	https://en.wikipedia.org/wiki/Joback_method
Heat capacities of some sugar alcohols as phase change materials for thermal energy storage applications:	https://www.doi.org/10.1016/j.jct.2017.08.004
Influence of NH4Br on Solvation Behavior of Polyhydroxy Solutes in Aqueous Solutions at Different Temperatures and Atmospheric Pressure:	https://www.doi.org/10.1021/je500886a
Cycling stability of D-mannitol when used as phase change material for thermal energy storage applications:	https://www.doi.org/10.1016/j.tca.2017.12.026
Properties of Sugar, Polyol, and Polysaccharide Water-Ethanol Solutions:	https://www.doi.org/10.1021/je700190m
Apparent Molar Volumes and Viscosity B-Coefficients of Carbohydrates in Aqueous Cetrimonium Bromide Solutions at (298.15, 308.15, and 318.15) K:	https://www.doi.org/10.1021/je100211s
Densities and Viscosities of Sugar Alcohol Aqueous Solutions:	https://www.doi.org/10.1021/je9010486
Densities and Viscosities of Erythritol, Xylitol, and Mannitol in l-ascorbic Acid Aqueous Solutions at T = (298.15 to 323.15) K:	https://www.doi.org/10.1021/je400395u
Ionic Liquids as Promising Solvents for Biomass Derived Mannitol and Xylitol:	https://www.doi.org/10.1021/je400279d
Viscosity and Density of the Nonelectrolyte System Mannitol + Sorbitol + Sucrose + H2O and Its Binary and Ternary Subsystems at 298.15 K:	https://www.doi.org/10.1021/je0503608
Estimated Solubility Method:	http://pubs.acs.org/doi/suppl/10.1021/ci034243x/suppl_file/ci034243xsi20040112_053635.txt
Nanocalorimetry measurements of metastable states:	https://www.doi.org/10.1016/j.tca.2014.06.017
Heat Capacities and Nonisothermal Thermal Decomposition Reaction Kinetics of d-Mannitol:	https://www.doi.org/10.1021/je900285w
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
dvisc:	Dynamic viscosity
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
hvap:	Enthalpy of vaporization at standard conditions
hvapt:	Enthalpy of vaporization at a given temperature
log10ws:	Log10 of Water solubility in mol/l
logp:	Octanol/Water partition coefficient
mcvol:	McGowan's characteristic volume
pc:	Critical Pressure
sfust:	Entropy of fusion at a given temperature
ss:	Solid phase molar entropy at standard conditions
tb:	Normal Boiling Point Temperature
tbrp:	Boiling point at reduced pressure
tc:	Critical Temperature
tf:	Normal melting (fusion) point
vc:	Critical Volume

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