xylose

Other names:	(+)-xylose
	D-(+)-xylose
	D-xylose
	Wood sugar
	Xylo-Pfan
	xylose, D-
Inchi:	InChI=1S/C5H10O5/c6-1-3(8)5(10)4(9)2-7/h1,3-5,7-10H,2H2/t3-,4+,5+/m0/s1
InchiKey:	PYMYPHUHKUWMLA-VPENINKCSA-N
Formula:	C5H10O5
SMILES:	O=CC(O)C(O)C(O)CO
Mol. weight [g/mol]:	150.13
CAS:	25990-60-7

Physical Properties

Property code	Value	Unit	Source
hfus	16.78	kJ/mol	Joback Method
hvap	102.77	kJ/mol	Cheméo Relay (1.0)
log10ws	0.71		Cheméo Relay (1.0)
logp	-2.740		Crippen Method
mcvol	106.360	ml/mol	McGowan Method
tb	588.19	K	Cheméo Relay (1.0)
tf	380.91	K	Cheméo Relay (1.0)

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	303.13	J/mol×K	729.86	Joback Method
cpg	308.60	J/mol×K	758.32	Joback Method
cpg	313.78	J/mol×K	786.78	Joback Method
cpg	318.67	J/mol×K	815.24	Joback Method
cpg	323.29	J/mol×K	843.71	Joback Method
cpg	331.77	J/mol×K	900.63	Joback Method
cpg	327.65	J/mol×K	872.17	Joback Method

cps	2.55	J/mol×K	11.52	Thermochemistry of a-D-xylose(cr)
cps	128.07	J/mol×K	212.26	Thermochemistry of a-D-xylose(cr)
cps	6.47	J/mol×K	16.59	Thermochemistry of a-D-xylose(cr)
cps	8.19	J/mol×K	18.42	Thermochemistry of a-D-xylose(cr)
cps	9.97	J/mol×K	20.27	Thermochemistry of a-D-xylose(cr)
cps	12.06	J/mol×K	22.58	Thermochemistry of a-D-xylose(cr)
cps	14.39	J/mol×K	25.13	Thermochemistry of a-D-xylose(cr)
cps	16.85	J/mol×K	27.98	Thermochemistry of a-D-xylose(cr)
cps	19.42	J/mol×K	31.15	Thermochemistry of a-D-xylose(cr)
cps	22.14	J/mol×K	34.69	Thermochemistry of a-D-xylose(cr)
cps	25.09	J/mol×K	38.59	Thermochemistry of a-D-xylose(cr)
cps	8.79	J/mol×K	18.99	Thermochemistry of a-D-xylose(cr)
cps	31.18	J/mol×K	47.76	Thermochemistry of a-D-xylose(cr)
cps	34.56	J/mol×K	53.12	Thermochemistry of a-D-xylose(cr)
cps	38.30	J/mol×K	59.09	Thermochemistry of a-D-xylose(cr)
cps	42.39	J/mol×K	65.77	Thermochemistry of a-D-xylose(cr)
cps	46.67	J/mol×K	73.12	Thermochemistry of a-D-xylose(cr)
cps	51.82	J/mol×K	81.26	Thermochemistry of a-D-xylose(cr)
cps	57.70	J/mol×K	90.30	Thermochemistry of a-D-xylose(cr)
cps	63.68	J/mol×K	100.35	Thermochemistry of a-D-xylose(cr)
cps	69.55	J/mol×K	110.61	Thermochemistry of a-D-xylose(cr)
cps	75.36	J/mol×K	120.64	Thermochemistry of a-D-xylose(cr)
cps	81.56	J/mol×K	130.77	Thermochemistry of a-D-xylose(cr)
cps	87.47	J/mol×K	140.87	Thermochemistry of a-D-xylose(cr)
cps	93.15	J/mol×K	151.03	Thermochemistry of a-D-xylose(cr)
cps	99.11	J/mol×K	161.11	Thermochemistry of a-D-xylose(cr)

cps	104.92	J/mol×K	171.25	Thermochemistry of a-D-xylose(cr)
cps	110.56	J/mol×K	181.48	Thermochemistry of a-D-xylose(cr)
cps	116.09	J/mol×K	191.69	Thermochemistry of a-D-xylose(cr)
cps	122.16	J/mol×K	201.94	Thermochemistry of a-D-xylose(cr)
cps	7.44	J/mol×K	17.61	Thermochemistry of a-D-xylose(cr)
cps	134.51	J/mol×K	222.61	Thermochemistry of a-D-xylose(cr)
cps	140.48	J/mol×K	232.87	Thermochemistry of a-D-xylose(cr)
cps	146.31	J/mol×K	243.02	Thermochemistry of a-D-xylose(cr)
cps	152.43	J/mol×K	253.18	Thermochemistry of a-D-xylose(cr)
cps	158.02	J/mol×K	263.22	Thermochemistry of a-D-xylose(cr)
cps	163.59	J/mol×K	273.41	Thermochemistry of a-D-xylose(cr)
cps	169.47	J/mol×K	283.51	Thermochemistry of a-D-xylose(cr)
cps	175.31	J/mol×K	293.61	Thermochemistry of a-D-xylose(cr)
cps	181.61	J/mol×K	303.66	Thermochemistry of a-D-xylose(cr)
cps	1.83	J/mol×K	10.35	Thermochemistry of a-D-xylose(cr)
cps	4.03	J/mol×K	13.56	Thermochemistry of a-D-xylose(cr)
cps	3.41	J/mol×K	12.72	Thermochemistry of a-D-xylose(cr)
cps	4.55	J/mol×K	14.25	Thermochemistry of a-D-xylose(cr)
cps	5.24	J/mol×K	15.07	Thermochemistry of a-D-xylose(cr)
cps	5.87	J/mol×K	15.84	Thermochemistry of a-D-xylose(cr)
cps	27.98	J/mol×K	42.93	Thermochemistry of a-D-xylose(cr)
cps	10.74	J/mol×K	21.17	Thermochemistry of a-D-xylose(cr)
cps	13.08	J/mol×K	23.64	Thermochemistry of a-D-xylose(cr)
cps	15.41	J/mol×K	26.29	Thermochemistry of a-D-xylose(cr)
cps	17.97	J/mol×K	29.32	Thermochemistry of a-D-xylose(cr)
cps	20.56	J/mol×K	32.68	Thermochemistry of a-D-xylose(cr)

cps	23.55	J/mol×K	36.33	Thermochemistry of a-D-xylose(cr)
cps	26.51	J/mol×K	40.53	Thermochemistry of a-D-xylose(cr)
cps	29.46	J/mol×K	45.13	Thermochemistry of a-D-xylose(cr)
cps	32.51	J/mol×K	50.20	Thermochemistry of a-D-xylose(cr)
cps	36.43	J/mol×K	55.82	Thermochemistry of a-D-xylose(cr)
cps	40.20	J/mol×K	62.21	Thermochemistry of a-D-xylose(cr)
cps	44.37	J/mol×K	69.15	Thermochemistry of a-D-xylose(cr)
cps	49.05	J/mol×K	76.88	Thermochemistry of a-D-xylose(cr)
cps	54.66	J/mol×K	85.51	Thermochemistry of a-D-xylose(cr)
cps	60.59	J/mol×K	95.15	Thermochemistry of a-D-xylose(cr)
cps	66.61	J/mol×K	105.25	Thermochemistry of a-D-xylose(cr)
cps	72.27	J/mol×K	115.43	Thermochemistry of a-D-xylose(cr)
cps	78.61	J/mol×K	125.54	Thermochemistry of a-D-xylose(cr)
cps	84.75	J/mol×K	135.74	Thermochemistry of a-D-xylose(cr)
cps	90.11	J/mol×K	145.76	Thermochemistry of a-D-xylose(cr)
cps	95.92	J/mol×K	155.98	Thermochemistry of a-D-xylose(cr)
cps	102.13	J/mol×K	166.15	Thermochemistry of a-D-xylose(cr)
cps	107.50	J/mol×K	176.34	Thermochemistry of a-D-xylose(cr)
cps	113.51	J/mol×K	186.59	Thermochemistry of a-D-xylose(cr)
cps	119.53	J/mol×K	196.81	Thermochemistry of a-D-xylose(cr)
cps	125.24	J/mol×K	207.17	Thermochemistry of a-D-xylose(cr)
cps	130.91	J/mol×K	217.50	Thermochemistry of a-D-xylose(cr)
cps	137.35	J/mol×K	227.74	Thermochemistry of a-D-xylose(cr)
cps	142.93	J/mol×K	237.95	Thermochemistry of a-D-xylose(cr)
cps	148.90	J/mol×K	248.07	Thermochemistry of a-D-xylose(cr)
cps	2.74	J/mol×K	12.19	Thermochemistry of a-D-xylose(cr)

cps	2.21	J/mol×K	10.97	Thermochemistry of a-D-xylose(cr)
cps	154.94	J/mol×K	258.24	Thermochemistry of a-D-xylose(cr)
cps	160.56	J/mol×K	268.36	Thermochemistry of a-D-xylose(cr)
cps	166.47	J/mol×K	278.46	Thermochemistry of a-D-xylose(cr)
cps	172.37	J/mol×K	288.47	Thermochemistry of a-D-xylose(cr)
cps	177.87	J/mol×K	298.67	Thermochemistry of a-D-xylose(cr)
dvisc	0.0157042	Pa×s	386.39	Joback Method
dvisc	0.0010983	Pa×s	443.64	Joback Method
dvisc	0.0001411	Pa×s	500.88	Joback Method
dvisc	0.0000276	Pa×s	558.12	Joback Method
dvisc	0.0000073	Pa×s	615.37	Joback Method
dvisc	0.0000024	Pa×s	672.62	Joback Method
dvisc	0.0000010	Pa×s	729.86	Joback Method

Sources

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Solubility of glucose, xylose, fructose and galactose in ionic liquids: Experimental and theoretical studies using a continuum solvation model:	https://www.doi.org/10.1016/j.fluid.2015.03.020
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Cheméo Relay (1.0):	
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NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C25990607&Units=SI
Saturation molalities and standard molar enthalpies of solution of a-D-xylose(cr) in H2O(l); standard molar enthalpies of solution of 1,4-b-D-xylobiose(am), and 1,4-b-D-xylotriose(am) in H2O(l):	https://www.doi.org/10.1016/j.jct.2011.07.004
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Density and Viscosity in Ternary d-Xylose + Ionic Liquid (1-Alkyl-3-methylimidazolium Bromide) + Water Solutions at 298.15 K:	https://www.doi.org/10.1021/je2013022
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Exploration of solute-solvent interactions in aqueous mixtures of monosaccharides and triammonium citrate (TAC) at different temperatures: Volumetric and acoustic approach:	https://www.doi.org/10.1016/j.jct.2019.105877
Densities and Viscosities of Polyhydroxy Solutes in Aqueous Tetraethylammonium Bromide Solutions at Different Temperatures:	https://www.doi.org/10.1021/acs.jced.5b00940

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McGowan Method:	http://link.springer.com/article/10.1007/BF02311772
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Studies on volumetric properties of some saccharides in aqueous potassium chloride solutions over temperature range (288.15 to 318.15) K:	https://www.doi.org/10.1016/j.jct.2008.11.009
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Vapor-liquid equilibrium in the ternary systems acetic acid + water + (xylose or glucose):	https://www.doi.org/10.1016/j.fluid.2018.06.011
Measurement and Modeling of Phase Equilibria in Systems Containing Water, Xylose, Furfural, and Acetic Acid:	https://www.doi.org/10.1021/acs.jced.9b00095
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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
Volumetric, viscometric and 1H NMR spectroscopic studies in (polyhydroxy solute + CTAB + H2O) ternary solutions:	https://www.doi.org/10.1016/j.jct.2017.04.001
Salting-out effect of carbohydrates on the surface active ionic liquid 1-decyl-3-methylimidazolium bromide in aqueous solutions:	https://www.doi.org/10.1016/j.jct.2017.08.027
Effect of sodium acetate on the volumetric behaviour of some mono-, di-, and tri-saccharides in aqueous solutions over temperature range (288.15 to 318.15) K:	https://www.doi.org/10.1016/j.jct.2009.07.015
Crippen Method:	https://www.chemeo.com/doc/models/crippen_log10ws

Legend

cpg:	Ideal gas heat capacity
cps:	Solid phase heat capacity
dvisc:	Dynamic viscosity
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
tb:	Normal Boiling Point Temperature
tf:	Normal melting (fusion) point

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