

Pentaethylene glycol

Other names:	2-[2-[2-[2-(2-Hydroxyethoxy)ethoxy]ethoxy]ethoxy]ethanol 3,6,9,12-tetraoxatetradecane-1,14-diol HO[CH ₂ CH ₂ O] ₅ H Pentaglycol
Inchi:	InChI=1S/C10H22O6/c11-1-3-13-5-7-15-9-10-16-8-6-14-4-2-12/h11-12H,1-10H2
InchiKey:	JLFNLZLINWHATN-UHFFFAOYSA-N
Formula:	C10H22O6
SMILES:	OCCOCCOCCOCCOCCO
Mol. weight [g/mol]:	238.28
CAS:	4792-15-8

Physical Properties

Property code	Value	Unit	Source
gf	-660.32	kJ/mol	Joback Method
hf	-1083.07	kJ/mol	Joback Method
hfus	34.58	kJ/mol	Joback Method
hvap	80.85	kJ/mol	Joback Method
log10ws	1.12		Crippen Method
logp	-0.963		Crippen Method
mcvol	186.980	ml/mol	McGowan Method
pc	2351.92	kPa	Joback Method
rinpol	1792.00		NIST Webbook
rinpol	1797.40		NIST Webbook
tb	702.24	K	Joback Method
tc	751.00 ± 20.00	K	NIST Webbook
tc	842.00	K	Critical temperatures and pressures of ethylene glycols
tf	264.45 ± 0.70	K	NIST Webbook
vc	0.706	m ³ /kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
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cpg	547.05	J/molxK	702.24	Joback Method
cpg	610.04	J/molxK	866.21	Joback Method
cpg	600.88	J/molxK	838.88	Joback Method
cpg	591.17	J/molxK	811.55	Joback Method
cpg	580.92	J/molxK	784.22	Joback Method
cpg	570.14	J/molxK	756.90	Joback Method
cpg	558.85	J/molxK	729.57	Joback Method
cpl	515.50	J/molxK	298.00	NIST Webbook
dvisc	0.0000061	Paxs	702.24	Joback Method
dvisc	0.0000106	Paxs	654.04	Joback Method
dvisc	0.0000199	Paxs	605.83	Joback Method
dvisc	0.0000416	Paxs	557.63	Joback Method
dvisc	0.0001001	Paxs	509.43	Joback Method
dvisc	0.0002898	Paxs	461.22	Joback Method
dvisc	0.0010746	Paxs	413.02	Joback Method

Datasets

Mass density, kg/m³

Temperature, K - Liquid	Pressure, kPa - Liquid	Mass density, kg/m ³ - Liquid
283.16	100.00	1133.5
283.16	1000.00	1134.0
283.16	2000.00	1134.5
283.16	5000.00	1135.8
283.16	7000.00	1136.7
283.16	10000.00	1137.9
283.16	12000.00	1138.9
283.16	16000.00	1140.7
283.16	20000.00	1142.5
283.16	25000.00	1144.6
283.16	30000.00	1146.6
283.16	35000.00	1148.6
283.16	40000.00	1150.5
283.16	45000.00	1152.4
283.16	50000.00	1154.4
283.16	55000.00	1156.2
283.16	60000.00	1158.2
283.16	65000.00	1160.1

283.16	70000.00	1161.8
283.16	75000.00	1163.6
283.16	80000.00	1165.3
283.16	85000.00	1167.0
283.16	90000.00	1168.6
283.16	95000.00	1170.3
293.16	100.00	1125.5
293.16	1000.00	1126.0
293.16	2000.00	1126.4
293.16	5000.00	1127.9
293.16	7000.00	1128.9
293.16	10000.00	1130.2
293.16	12000.00	1131.1
293.16	16000.00	1132.9
293.16	20000.00	1134.6
293.16	25000.00	1136.5
293.16	30000.00	1138.7
293.16	35000.00	1140.8
293.16	40000.00	1143.0
293.16	45000.00	1145.0
293.16	50000.00	1146.8
293.16	55000.00	1148.8
293.16	60000.00	1150.7
293.16	65000.00	1152.6
293.16	70000.00	1154.5
293.16	75000.00	1156.2
293.16	80000.00	1158.0
293.16	85000.00	1159.7
293.16	90000.00	1161.4
293.16	95000.00	1163.3
303.15	100.00	1117.0
303.15	1000.00	1117.5
303.15	2000.00	1118.0
303.15	5000.00	1119.8
303.15	7000.00	1120.8
303.15	10000.00	1122.1
303.15	12000.00	1123.1
303.15	16000.00	1125.0
303.15	20000.00	1126.8
303.15	25000.00	1128.3
303.15	30000.00	1131.0
303.15	35000.00	1133.2
303.15	40000.00	1135.4
303.15	45000.00	1137.4

303.15	50000.00	1139.5
303.15	55000.00	1141.4
303.15	60000.00	1143.2
303.15	65000.00	1145.1
303.15	70000.00	1147.1
303.15	75000.00	1148.9
303.15	80000.00	1150.8
303.15	85000.00	1152.8
303.15	90000.00	1154.6
303.15	95000.00	1156.4
313.16	100.00	1109.3
313.16	1000.00	1109.8
313.16	2000.00	1110.3
313.16	5000.00	1111.9
313.16	7000.00	1112.9
313.16	10000.00	1114.4
313.16	12000.00	1115.3
313.16	16000.00	1117.2
313.16	20000.00	1119.1
313.16	25000.00	1121.2
313.16	30000.00	1123.5
313.16	35000.00	1125.5
313.16	40000.00	1127.8
313.16	45000.00	1129.9
313.16	50000.00	1131.9
313.16	55000.00	1134.0
313.16	60000.00	1136.1
313.16	65000.00	1138.1
313.16	70000.00	1140.1
313.16	75000.00	1141.9
313.16	80000.00	1143.8
313.16	85000.00	1145.7
313.16	90000.00	1147.5
313.16	95000.00	1149.4
323.15	100.00	1101.1
323.15	1000.00	1101.5
323.15	2000.00	1102.1
323.15	5000.00	1103.7
323.15	7000.00	1104.7
323.15	10000.00	1106.2
323.15	12000.00	1107.2
323.15	16000.00	1109.1
323.15	20000.00	1111.1
323.15	25000.00	1113.6

323.15	30000.00	1115.7
323.15	35000.00	1118.1
323.15	40000.00	1120.4
323.15	45000.00	1122.7
323.15	50000.00	1124.9
323.15	55000.00	1126.6
323.15	60000.00	1128.6
323.15	65000.00	1130.8
323.15	70000.00	1132.7
323.15	75000.00	1134.5
323.15	80000.00	1136.5
323.15	85000.00	1138.6
323.15	90000.00	1140.4
323.15	95000.00	1142.4
333.15	100.00	1092.9
333.15	1000.00	1093.5
333.15	2000.00	1094.0
333.15	5000.00	1095.7
333.15	7000.00	1096.8
333.15	10000.00	1098.3
333.15	12000.00	1099.3
333.15	16000.00	1101.4
333.15	20000.00	1103.3
333.15	25000.00	1105.8
333.15	30000.00	1108.1
333.15	35000.00	1110.4
333.15	40000.00	1112.8
333.15	45000.00	1115.1
333.15	50000.00	1117.1
333.15	55000.00	1119.4
333.15	60000.00	1121.3
333.15	65000.00	1123.4
333.15	70000.00	1125.6
333.15	75000.00	1127.7
333.15	80000.00	1129.8
333.15	85000.00	1131.8
333.15	90000.00	1133.6
333.15	95000.00	1135.6
343.16	100.00	1084.9
343.16	1000.00	1085.4
343.16	2000.00	1086.3
343.16	5000.00	1087.8
343.16	7000.00	1088.8
343.16	10000.00	1090.6

343.16	12000.00	1091.6
343.16	16000.00	1093.7
343.16	20000.00	1095.8
343.16	25000.00	1097.9
343.16	30000.00	1100.4
343.16	35000.00	1102.5
343.16	40000.00	1104.8
343.16	45000.00	1107.0
343.16	50000.00	1109.8
343.16	55000.00	1112.2
343.16	60000.00	1114.4
343.16	65000.00	1116.7
343.16	70000.00	1118.3
343.16	75000.00	1120.9
343.16	80000.00	1122.9
343.16	85000.00	1124.9
343.16	90000.00	1126.9
343.16	95000.00	1129.0
353.16	100.00	1076.7
353.16	1000.00	1077.3
353.16	2000.00	1077.9
353.16	5000.00	1079.7
353.16	7000.00	1080.8
353.16	10000.00	1082.6
353.16	12000.00	1083.6
353.16	16000.00	1085.8
353.16	20000.00	1088.0
353.16	25000.00	1090.6
353.16	30000.00	1093.2
353.16	35000.00	1095.8
353.16	40000.00	1098.1
353.16	45000.00	1100.5
353.16	50000.00	1102.5
353.16	55000.00	1104.8
353.16	60000.00	1107.2
353.16	65000.00	1109.6
353.16	70000.00	1111.6
353.16	75000.00	1113.8
353.16	80000.00	1115.9
353.16	85000.00	1118.2
353.16	90000.00	1119.9
353.16	95000.00	1122.1
363.16	100.00	1068.6
363.16	1000.00	1069.2

363.16	2000.00	1069.9
363.16	5000.00	1071.6
363.16	7000.00	1072.9
363.16	10000.00	1074.5
363.16	12000.00	1075.7
363.16	16000.00	1077.9
363.16	20000.00	1080.2
363.16	25000.00	1082.9
363.16	30000.00	1085.6
363.16	35000.00	1088.0
363.16	40000.00	1090.5
363.16	45000.00	1092.9
363.16	50000.00	1095.4
363.16	55000.00	1097.7
363.16	60000.00	1100.3
363.16	65000.00	1102.5
363.16	70000.00	1104.7
363.16	75000.00	1106.8
363.16	80000.00	1109.0
363.16	85000.00	1111.2
363.16	90000.00	1113.2
363.16	95000.00	1115.3

Reference

<https://www.doi.org/10.1016/j.fluid.2017.01.003>

Sources

Joback Method:	https://en.wikipedia.org/wiki/Joback_method
McGowan Method:	http://link.springer.com/article/10.1007/BF02311772
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C4792158&Units=SI
Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
Crippen Method:	https://www.chemeo.com/doc/models/crippen_log10ws
New measurements and modeling of high pressure thermodynamic properties of glycols:	https://www.doi.org/10.1016/j.fluid.2017.01.003
Critical temperatures and pressures of ethylene glycols:	https://www.doi.org/10.1016/j.fluid.2018.05.011

Legend

cpg:	Ideal gas heat capacity
cpl:	Liquid phase heat capacity

dvisc:	Dynamic viscosity
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
log10ws:	Log10 of Water solubility in mol/l
logp:	Octanol/Water partition coefficient
mcpvol:	McGowan's characteristic volume
pc:	Critical Pressure
rho:	Liquid Density
rinpol:	Non-polar retention indices
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
vc:	Critical Volume

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