1-Pentanamine

Other names:	1-AMINOPENTANE
	1-Pentylamine
	Amylamine
	Monoamylamine
	N-PENTANAMINE
	NORLEUCAMINE
	Pentylamine
	n--Amylamine
	n-C5H11NH2
	n-Pentylamine
	n-amylamine
Inchi:	InChI=1S/C5H13N/c1-2-3-4-5-6/h2-6H2,1H3
InchiKey:	DPBLXKKOBLCELK-UHFFFAOYSA-N
Formula:	C5H13N
SMILES:	CCCCCN
Mol. weight [g/mol]:	87.16
CAS:	110-58-7

Physical Properties

Property code	Value	Unit	Source
affp	923.50	kJ/mol	NIST Webbook
basg	889.50	kJ/mol	NIST Webbook
gf	57.67	kJ/mol	Joback Method
hf	-112.74	kJ/mol	Joback Method
hfus	13.90	kJ/mol	Joback Method
hvap	40.90	kJ/mol	NIST Webbook
hvap	40.15	kJ/mol	NIST Webbook
hvap	40.08 ± 0.06	kJ/mol	NIST Webbook
hvap	40.10 ± 0.10	kJ/mol	NIST Webbook
ie	9.30	eV	NIST Webbook
ie	8.70	eV	NIST Webbook
log10ws	-1.35		Crippen Method
logp	1.135		Crippen Method
mcvol	91.290	ml/mol	McGowan Method
nfpaf	%!d(float64=3)		KDB
nfpah	%!d(float64=3)		KDB
pc	3713.49	kPa	Joback Method

rinpol	731.00		NIST Webbook
rinpol	726.00		NIST Webbook
rinpol	729.00		NIST Webbook
rinpol	730.00		NIST Webbook
rinpol	726.00		NIST Webbook
rinpol	731.00		NIST Webbook
rinpol	730.00		NIST Webbook
rinpol	744.00		NIST Webbook
rinpol	726.00		NIST Webbook
rinpol	741.00		NIST Webbook
rinpol	725.00		NIST Webbook
rinpol	711.80		NIST Webbook
rinpol	731.00		NIST Webbook
rinpol	726.00		NIST Webbook
rinpol	714.00		NIST Webbook
rinpol	712.00		NIST Webbook
rinpol	742.00		NIST Webbook
rinpol	743.00		NIST Webbook
rinpol	741.00		NIST Webbook
rinpol	726.00		NIST Webbook
rinpol	741.00		NIST Webbook
rinpol	715.60		NIST Webbook
rinpol	733.70		NIST Webbook
rinpol	711.80		NIST Webbook
rinpol	712.00		NIST Webbook
rinpol	723.00		NIST Webbook
ripol	1009.00		NIST Webbook
ripol	1013.00		NIST Webbook
ripol	1015.00		NIST Webbook
ripol	1006.00		NIST Webbook
ripol	1010.00		NIST Webbook
ripol	1029.00		NIST Webbook
ripol	1018.00		NIST Webbook
ripol	1013.00		NIST Webbook
ripol	1010.00		NIST Webbook
ripol	1029.00		NIST Webbook
ripol	1020.00		NIST Webbook
tb	376.15 ± 0.80	K	NIST Webbook
tb	377.15 ± 1.00	K	NIST Webbook
tb	377.40	K	NIST Webbook
tb	377.00	K	NIST Webbook
tb	377.60	K	NIST Webbook
tb	376.15 ± 1.00	K	NIST Webbook
tb	377.15 ± 3.00	K	NIST Webbook

tb	375.65 ± 3.00	K	NIST Webbook
tb	377.00 ± 4.00	K	NIST Webbook
tb	376.15 ± 3.00	K	NIST Webbook
tb	368.15 ± 8.00	K	NIST Webbook
tb	368.15 ± 8.00	K	NIST Webbook
tb	366.15 ± 8.00	K	NIST Webbook
tb	376.20 ± 1.50	K	NIST Webbook
tb	377.93	K	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol
tc	567.29	K	Joback Method
tf	218.00 ± 1.00	K	NIST Webbook
tf	218.15 ± 0.60	K	NIST Webbook
tf	240.00 ± 1.00	K	NIST Webbook
vc	0.344	m3/kmol	Joback Method
volm	1.16e-04	m3/mol	Thermodynamic study of (heptane + amine) mixtures. II. Excess and partial molar volumes at 298.15 K

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	228.56	J/mol×K	567.29	Joback Method
cpg	220.33	J/mol×K	537.13	Joback Method
cpg	211.74	J/mol×K	506.97	Joback Method
cpg	202.79	J/mol×K	476.81	Joback Method
cpg	193.46	J/mol×K	446.65	Joback Method
cpg	183.74	J/mol×K	416.49	Joback Method
cpg	173.63	J/mol×K	386.33	Joback Method
cpl	218.00	J/mol×K	198.15	NIST Webbook
hvapt	39.00	kJ/mol	357.50	NIST Webbook
hvapt	34.01	kJ/mol	377.40	NIST Webbook
pvap	30.85	kPa	343.16	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol

pvap	27.99	kPa	340.66	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol
pvap	53.38	kPa	358.15	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol
pvap	63.27	kPa	363.14	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol
pvap	80.72	kPa	370.62	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol
pvap	101.33	kPa	377.93	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol
pvap	25.25	kPa	338.07	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol
pvap	20.65	kPa	333.14	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol
pvap	16.87	kPa	328.37	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol
pvap	13.08	kPa	322.61	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol

pvap	37.22	kPa	348.11	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol
pvap	33.81	kPa	345.56	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol
pvap	44.75	kPa	353.15	Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and 1-Pentanamine + 1-Methoxy-2-propanol

Correlations

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/(T + C)
Coeff. A	1.51720e+01
Coeff. B	-3.49313e+03
Coeff. C	-4.40120e+01
Temperature range (K), min.	278.70
Temperature range (K), max.	398.27

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/T + C*ln(T) + D*T^2
Coeff. A	7.55354e+01
Coeff. B	-7.12672e+03
Coeff. C	-8.90798e+00
Coeff. D	5.71490e-06
Temperature range (K), min.	218.15
Temperature range (K), max.	555.00

Datasets

Viscosity, Pa*s

Pressure, kPa - Liquid	Temperature, K - Liquid	Viscosity, Pa*s - Liquid
100.00	293.15	0.0006610
100.00	313.15	0.0005010
100.00	333.15	0.0003870
100.00	353.15	0.0003160
20000.00	293.15	0.0007800
20000.00	313.15	0.0005770
20000.00	333.15	0.0004580
20000.00	353.15	0.0003780
40000.00	293.15	0.0009110
40000.00	313.15	0.0006780
40000.00	333.15	0.0005310
40000.00	353.15	0.0004370
60000.00	293.15	0.0010540
60000.00	313.15	0.0007790
60000.00	333.15	0.0006120
60000.00	353.15	0.0005000
80000.00	293.15	0.0012030
80000.00	313.15	0.0008790
80000.00	333.15	0.0006990
80000.00	353.15	0.0005650
100000.00	293.15	0.0013620
100000.00	313.15	0.0009740
100000.00	333.15	0.0007890
100000.00	353.15	0.0006300

Reference *https://www.doi.org/10.1016/j.jct.2008.08.006*

Mass density, kg/m3

Temperature, K - Liquid	Pressure, kPa - Liquid	Mass density, kg/m3 - Liquid
293.15	100.00	754.1
293.15	10000.00	760.9

293.15	20000.00	767.4
293.15	30000.00	773.4
293.15	40000.00	778.9
293.15	50000.00	784.2
293.15	60000.00	789.3
293.15	70000.00	794.0
293.15	80000.00	798.5
293.15	90000.00	802.8
293.15	100000.00	806.9
293.15	110000.00	810.8
293.15	120000.00	814.7
293.15	130000.00	818.4
293.15	140000.00	822.0
303.15	100.00	744.7
303.15	10000.00	752.6
303.15	20000.00	759.6
303.15	30000.00	765.9
303.15	40000.00	772.0
303.15	50000.00	777.4
303.15	60000.00	782.7
303.15	70000.00	787.4
303.15	80000.00	792.1
303.15	90000.00	796.5
303.15	100000.00	800.8
303.15	110000.00	805.0
303.15	120000.00	808.8
303.15	130000.00	812.5
303.15	140000.00	816.1
313.15	100.00	735.6
313.15	10000.00	743.8
313.15	20000.00	751.1
313.15	30000.00	757.9
313.15	40000.00	764.1
313.15	50000.00	769.8
313.15	60000.00	775.2
313.15	70000.00	780.3
313.15	80000.00	785.1
313.15	90000.00	789.7
313.15	100000.00	794.1
313.15	110000.00	798.4
313.15	120000.00	802.4
313.15	130000.00	806.4
313.15	140000.00	810.1
323.15	100.00	726.4

323.15	10000.00	735.1
323.15	20000.00	742.8
323.15	30000.00	749.8
323.15	40000.00	756.3
323.15	50000.00	762.3
323.15	60000.00	768.0
323.15	70000.00	773.2
323.15	80000.00	778.2
323.15	90000.00	783.0
323.15	100000.00	787.6
323.15	110000.00	792.1
323.15	120000.00	796.2
323.15	130000.00	800.3
323.15	140000.00	804.2
333.15	100.00	716.9
333.15	10000.00	726.1
333.15	20000.00	734.3
333.15	30000.00	741.7
333.15	40000.00	748.5
333.15	50000.00	754.8
333.15	60000.00	760.7
333.15	70000.00	766.3
333.15	80000.00	771.5
333.15	90000.00	776.5
333.15	100000.00	781.1
333.15	110000.00	785.6
333.15	120000.00	790.0
333.15	130000.00	794.2
333.15	140000.00	798.0
343.15	100.00	707.5
343.15	10000.00	717.8
343.15	20000.00	726.5
343.15	30000.00	734.4
343.15	40000.00	741.6
343.15	50000.00	748.2
343.15	60000.00	754.3
343.15	70000.00	760.0
343.15	80000.00	765.4
343.15	90000.00	770.6
343.15	100000.00	775.4
343.15	110000.00	780.1
343.15	120000.00	784.4
343.15	130000.00	788.7
343.15	140000.00	792.8

353.15	100.00	698.0
353.15	10000.00	708.7
353.15	20000.00	718.0
353.15	30000.00	726.3
353.15	40000.00	733.9
353.15	50000.00	740.8
353.15	60000.00	747.4
353.15	70000.00	753.3
353.15	80000.00	759.1
353.15	90000.00	764.2
353.15	100000.00	769.3
353.15	110000.00	774.1
353.15	120000.00	778.6
353.15	130000.00	782.9
353.15	140000.00	787.2

Reference *https://www.doi.org/10.1016/j.jct.2008.01.006*

Temperature, K	Pressure, kPa	Mass density, kg/m3
293.15	100.00	754.0
293.15	10000.00	760.8
293.15	20000.00	767.2
293.15	30000.00	773.3
293.15	40000.00	779.0
293.15	50000.00	784.3
293.15	60000.00	789.3
293.15	70000.00	794.0
293.15	80000.00	798.5
293.15	90000.00	802.9
293.15	100000.00	806.9
293.15	110000.00	810.9
293.15	120000.00	814.6
293.15	130000.00	818.2
293.15	140000.00	821.8
353.15	100.00	698.5
353.15	10000.00	709.4
353.15	20000.00	718.5
353.15	30000.00	726.8
353.15	40000.00	734.3
353.15	50000.00	741.2
353.15	60000.00	747.6
353.15	70000.00	753.6
353.15	80000.00	759.3

353.15	90000.00	764.7
353.15	100000.00	769.8
353.15	110000.00	774.5
353.15	120000.00	779.0
353.15	130000.00	783.5
353.15	140000.00	787.7
363.15	100.00	688.6
363.15	10000.00	700.1
363.15	20000.00	710.0
363.15	30000.00	718.7
363.15	40000.00	726.6
363.15	50000.00	733.9
363.15	60000.00	740.6
363.15	70000.00	746.9
363.15	80000.00	752.8
363.15	90000.00	758.5
363.15	100000.00	763.7
363.15	110000.00	768.7
363.15	120000.00	773.4
363.15	130000.00	777.9
363.15	140000.00	782.1
373.15	100.00	679.0
373.15	10000.00	691.5
373.15	20000.00	702.0
373.15	30000.00	711.3
373.15	40000.00	719.6
373.15	50000.00	727.1
373.15	60000.00	734.1
373.15	70000.00	740.5
373.15	80000.00	746.7
373.15	90000.00	752.3
373.15	100000.00	757.6
373.15	110000.00	762.7
373.15	120000.00	767.6
373.15	130000.00	772.2
373.15	140000.00	776.6
383.15	10000.00	682.6
383.15	20000.00	693.8
383.15	30000.00	703.7
383.15	40000.00	712.3
383.15	50000.00	720.3
383.15	60000.00	727.5
383.15	70000.00	734.3
383.15	80000.00	740.6

383.15	90000.00	746.5
383.15	100000.00	752.0
383.15	110000.00	757.2
383.15	120000.00	762.2
383.15	130000.00	766.8
383.15	140000.00	771.4
393.15	10000.00	673.1
393.15	20000.00	685.2
393.15	30000.00	695.5
393.15	40000.00	704.7
393.15	50000.00	713.2
393.15	60000.00	720.8
393.15	70000.00	727.9
393.15	80000.00	734.4
393.15	90000.00	740.3
393.15	100000.00	746.0
393.15	110000.00	751.4
393.15	120000.00	756.5
393.15	130000.00	761.4
393.15	140000.00	766.0
403.15	10000.00	664.1
403.15	20000.00	677.0
403.15	30000.00	687.8
403.15	40000.00	697.3
403.15	50000.00	705.9
403.15	60000.00	713.9
403.15	70000.00	721.0
403.15	80000.00	727.8
403.15	90000.00	734.0
403.15	100000.00	739.9
403.15	110000.00	745.4
403.15	120000.00	750.7
403.15	130000.00	755.7
403.15	140000.00	760.5

Reference *https://www.doi.org/10.1016/j.jct.2012.09.016*

Sources

High-pressure (up to 140 MPa) density and derivative properties of some (perfluoroalkyl + alkyl) alkanes between (293.15 and 393.15) K	https://www.doi.org/10.1016/j.jct.2008.01.006
Thermodynamic study of heptane + amine mixtures. V. Excess and solvation Gibbs energies.	https://www.doi.org/10.1016/j.fluid.2014.12.017
The Yaws Handbook of Vapor Pressure:	https://www.sciencedirect.com/book/9780128029992/the-yaws-handbook-of-vapor-pressure

Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l
KDB:	https://www.cheric.org/files/research/kdb/mol/mol1267.mol
McGowan Method:	http://link.springer.com/article/10.1007/BF02311772
KDB Vapor Pressure Data:	https://www.cheric.org/research/kdb/hcprop/showprop.php?cmpid=1267
Influence of the chain length on the dynamic viscosity at high pressure of some amines: Measurements and	https://www.doi.org/10.1016/j.jct.2008.08.006
Thermodynamic study of (heptane + amine) mixtures. II. Excess and partial	https://www.doi.org/10.1016/j.jct.2010.12.025
Crippen Method:	https://www.chemeo.com/doc/models/crippen_log10ws
Vapor-Liquid Equilibrium for Acetonitrile + Propanenitrile and	https://www.doi.org/10.1021/je025660t
Heat capacity of 1-pentylamine and 1-hexylamine: Experimental	https://www.doi.org/10.1016/j.jct.2012.09.016
Nist Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C110587&Units=SI
Joback Method:	https://en.wikipedia.org/wiki/Joback_method

Legend

affp:	Proton affinity
basg:	Gas basicity
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
hvapt:	Enthalpy of vaporization at a given temperature
ie:	Ionization energy
log10ws:	Log10 of Water solubility in mol/l
logp:	Octanol/Water partition coefficient
mcvol:	McGowan's characteristic volume
nfpaf:	NFPA Fire Rating
nfpah:	NFPA Health Rating
pc:	Critical Pressure
pvap:	Vapor pressure
rhol:	Liquid Density
rinpol:	Non-polar retention indices
ripol:	Polar retention indices
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
vc:	Critical Volume
volm:	Molar Volume