1-Propanamine, N-propyl-

Other names:	(n-C3H7)2NH
	DIPROPYLAMINE
	Di-n-propylamine
	N-DIPROPYLAMINE
	N-Propyl-1-propanamine
	N-Propyl-propylamine
	Rcra waste number U110
	UN 2383
Inchi:	InChI=1S/C6H15N/c1-3-5-7-6-4-2/h7H,3-6H2,1-2H3
InchiKey:	WEHWNAOGRSTTBQ-UHFFFAOYSA-N
Formula:	C6H15N
SMILES:	CCCNCCC
Mol. weight [g/mol]:	101.19
CAS:	142-84-7

Physical Properties

Property code	Value	Unit	Source
af	0.4710		KDB
affp	962.30	kJ/mol	NIST Webbook
basg	929.30	kJ/mol	NIST Webbook
chl	-4348.68 ± 0.42	kJ/mol	NIST Webbook
chl	-4350.20 ± 1.30	kJ/mol	NIST Webbook
dm	1.00	debye	KDB
gf	89.03	kJ/mol	Joback Method
hf	-118.10	kJ/mol	NIST Webbook
hf	-116.50 ± 1.60	kJ/mol	NIST Webbook
hfl	-154.60 ± 1.50	kJ/mol	NIST Webbook
hfl	-156.20 ± 0.42	kJ/mol	NIST Webbook
hfus	16.39	kJ/mol	Joback Method
hvap	38.10	kJ/mol	NIST Webbook
hvap	40.10	kJ/mol	NIST Webbook
hvap	40.04 ± 0.06	kJ/mol	NIST Webbook
hvap	40.20 ± 0.30	kJ/mol	NIST Webbook
hvap	41.50	kJ/mol	NIST Webbook
hvap	40.00 ± 0.10	kJ/mol	NIST Webbook
ie	7.84 ± 0.02	eV	NIST Webbook
ie	7.80 ± 0.10	eV	NIST Webbook

ie	8.60 ± 0.30	eV	NIST Webbook
log10ws	-0.46		Aqueous Solubility Prediction Method
logp	1.396		Crippen Method
mcvol	105.380	ml/mol	McGowan Method
nfpaf	%!d(float64=3)		KDB
nfpah	%!d(float64=3)		KDB
pc	3630.00 ± 36.27	kPa	NIST Webbook
pc	3630.00	kPa	KDB
rinpol	748.00		NIST Webbook
rinpol	742.60		NIST Webbook
rinpol	742.60		NIST Webbook
rinpol	746.00		NIST Webbook
rinpol	744.00		NIST Webbook
rinpol	746.00		NIST Webbook
rinpol	746.00		NIST Webbook
rinpol	752.00		NIST Webbook
rinpol	748.00		NIST Webbook
rinpol	752.00		NIST Webbook
rinpol	750.00		NIST Webbook
rinpol	748.00		NIST Webbook
rinpol	745.00		NIST Webbook
ripol	904.00		NIST Webbook
ripol	900.00		NIST Webbook
ripol	910.00		NIST Webbook
ripol	894.00		NIST Webbook
ripol	905.00		NIST Webbook
ripol	901.00		NIST Webbook
tb	382.15 ± 3.00	K	NIST Webbook
tb	382.56 ± 0.30	K	NIST Webbook
tb	380.70	K	NIST Webbook
tb	382.70	K	NIST Webbook
tb	382.40	K	NIST Webbook
tb	381.55 ± 0.40	K	NIST Webbook
tb	382.45	K	NIST Webbook
tb	382.20 ± 1.50	K	NIST Webbook
tb	383.15 ± 2.00	K	NIST Webbook
tb	382.40	K	KDB
tb	383.15 ± 3.00	K	NIST Webbook
tb	382.15 ± 3.00	K	NIST Webbook
tb	383.85 ± 0.40	K	NIST Webbook
tb	382.35 ± 0.40	K	NIST Webbook
tb	383.05 ± 0.80	K	NIST Webbook
tc	555.80 ± 0.55	K	NIST Webbook
tc	555.80	K	KDB

tc	555.80	K	Gas-Liquid Critical Temperatures of Some Alkenes, Amines, and Cyclic Hydrocarbons
tf	210.15	K	NIST Webbook
tf	209.60 ± 0.60	K	NIST Webbook
tf	210.15 ± 0.50	K	NIST Webbook
tf	233.55 ± 0.50	K	NIST Webbook
tf	210.00	K	KDB
tf	215.90	K	Aqueous Solubility Prediction Method
vc	0.406	m3/kmol	Joback Method

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	199.23	J/mol×K	386.85	Joback Method
cpg	210.62	J/mol×K	415.16	Joback Method
cpg	221.60	J/mol×K	443.48	Joback Method
cpg	232.16	J/mol×K	471.79	Joback Method
cpg	242.32	J/mol×K	500.10	Joback Method
cpg	252.08	J/mol×K	528.41	Joback Method
cpg	261.47	J/mol×K	556.73	Joback Method
dvisc	0.0005120	Pa×s	303.15	Studies of viscosities of dilute solutions of alkylamine in non-electrolyte solvents. II. Haloalkanes and other polar solvents
dvisc	0.0004230	Pa×s	313.15	Studies of viscosities of dilute solutions of alkylamine in non-electrolyte solvents. II. Haloalkanes and other polar solvents
hvapt	39.80	kJ/mol	362.00	NIST Webbook
hvapt	40.00	kJ/mol	351.50	NIST Webbook
hvapt	33.47	kJ/mol	382.40	NIST Webbook
hvapt	41.00	kJ/mol	291.00	NIST Webbook

pvap	3.60	kPa	298.15	Thermodynamics of mixtures with strongly negative deviations from Raoult s law Part 9. Vapor liquid equilibria for the system 1-propanol + di-n-propylamine at six temperatures between 293.15 and 318.15K	
pvap	2.72	kPa	293.15	Thermodynamics of mixtures with strongly negative deviations from Raoult s law Part 9. Vapor liquid equilibria for the system 1-propanol + di-n-propylamine at six temperatures between 293.15 and 318.15K	
pvap	7.80	kPa	313.15	Thermodynamics of mixtures with strongly negative deviations from Raoult s law Part 9. Vapor liquid equilibria for the system 1-propanol + di-n-propylamine at six temperatures between 293.15 and 318.15K	
pvap	6.12	kPa	308.15	Thermodynamics of mixtures with strongly negative deviations from Raoult s law Part 9. Vapor liquid equilibria for the system 1-propanol + di-n-propylamine at six temperatures between 293.15 and 318.15K	

pvap	9.89	kPa	318.15	Thermodynamics of mixtures with strongly negative deviations from Raoult s law Part 9. Vapor liquid equilibria for the system 1-propanol + di-n-propylamine at six temperatures between 293.15 and 318.15K
pvap	4.71	kPa	303.15	Thermodynamics of mixtures with strongly negative deviations from Raoult s law Part 9. Vapor liquid equilibria for the system 1-propanol + di-n-propylamine at six temperatures between 293.15 and 318.15K
rhol	731.21	kg/m3	303.15	Studies of partial molar volumes of alkylamine in non-electrolyte solvents I. Alkylamines in hydrocarbons at 303.15 and 313.15K
rhol	738.19	kg/m3	293.15	Thermodynamics of amide + amine mixtures. 1. Volumetric, speed of sound, and refractive index data for N,Ndimethylformamide + N-propylpropan-1-amine, + N-butylbutan-1-amine, + butan-1-amine, or + hexan-1-amine systems at several temperatures

rhol	733.62	kg/m3	298.15	Thermodynamics of amide + amine mixtures. 1. Volumetric, speed of sound, and refractive index data for N,Ndimethylformamide + N-propylpropan-1-amine, + N-butylbutan-1-amine, + butan-1-amine, or + hexan-1-amine systems at several temperatures
rhol	729.10	kg/m3	303.15	Thermodynamics of amide + amine mixtures. 1. Volumetric, speed of sound, and refractive index data for N,Ndimethylformamide + N-propylpropan-1-amine, + N-butylbutan-1-amine, + butan-1-amine, or + hexan-1-amine systems at several temperatures
rhol	738.47	kg/m3	291.15	Density and Relative Permittivity of 2-Methoxyethanol + Dipropylamine Mixtures at Various Temperatures
rhol	726.15	kg/m3	313.15	Studies of partial molar volumes of alkylamine in non-electrolyte solvents I. Alkylamines in hydrocarbons at 303.15 and 313.15K
rhol	732.56	kg/m3	298.15	Density and Relative Permittivity of 2-Methoxyethanol + Dipropylamine Mixtures at Various Temperatures

rhol	728.20	kg/m3	303.15	Density and Relative Permittivity of 2-Methoxyethanol + Dipropylamine Mixtures at Various Temperatures
rhol	723.64	kg/m3	308.15	Density and Relative Permittivity of 2-Methoxyethanol + Dipropylamine Mixtures at Various Temperatures
rhol	738.00	kg/m3	293.00	KDB
rhol	733.72	kg/m3	298.15	Thermodynamics of ketone + amine mixtures. Part IX. Excess molar enthalpies at 298.15K for dipropylamine, or dibutylamine + 2-alkanone systems and modeling of linear or aromatic amine + 2-alkanone mixtures in terms of DISQUAC and ERAS
rhol	733.37	kg/m3	298.15	Thermodynamics of amide + amine mixtures. 5. Excess molar enthalpies of N,N-dimethylformamide or N,N-dimethylacetamide + N-propylpropan-1-amine, + N-butylbutan-1-amine, + butan-1-amine, or + hexan-1-amine systems at 298.15 K. Application of the ERAS model
rhol	738.18	kg/m3	293.15	Volumetric properties of binary mixtures of (acetonitrile + amines) at several temperatures with application of the ERAS model

rhol	733.64	kg/m3	298.15	Volumetric properties of binary mixtures of (acetonitrile + amines) at several temperatures with application of the ERAS model
rhol	731.21	kg/m3	303.15	Studies of viscosities of dilute solutions of alkylamines in non-electrolyte solvents III. Alkylamines in butanols 303.15K
rhol	729.07	kg/m3	303.15	Volumetric properties of binary mixtures of (acetonitrile + amines) at several temperatures with application of the ERAS model
rhol	724.48	kg/m3	308.15	Volumetric properties of binary mixtures of (acetonitrile + amines) at several temperatures with application of the ERAS model
rhol	737.20	kg/m3	293.15	Density and Relative Permittivity of 2-Methoxyethanol + Dipropylamine Mixtures at Various Temperatures
speedsl	1170.43	m/s	303.15	Mixing Properties for Binary Liquid Mixtures of Methyl tert-Butyl Ether with Propylamine and Dipropylamine at Temperatures from (288.15 to 308.15) K

speedsl	1149.03	m/s	308.15	Mixing Properties for Binary Liquid Mixtures of Methyl tert-Butyl Ether with Propylamine and Dipropylamine at Temperatures from (288.15 to 308.15) K	
speedsl	1191.86	m/s	298.15	Mixing Properties for Binary Liquid Mixtures of Methyl tert-Butyl Ether with Propylamine and Dipropylamine at Temperatures from (288.15 to 308.15) K	
speedsl	1213.41	m/s	293.15	Mixing Properties for Binary Liquid Mixtures of Methyl tert-Butyl Ether with Propylamine and Dipropylamine at Temperatures from (288.15 to 308.15) K	
speedsl	1235.06	m/s	288.15	Mixing Properties for Binary Liquid Mixtures of Methyl tert-Butyl Ether with Propylamine and Dipropylamine at Temperatures from (288.15 to 308.15) K	
speedsl	1187.70	m/s	298.15	Thermodynamics of ketone + amine mixtures Part IV. Volumetric and speed of sound data at (293.15; 298.15 and 303.15 K) for 2-butanone +dipropylamine, +dibutylamine or +triethylamine systems	

speedsl	1209.20	m/s	293.15	Thermodynamics of ketone + amine mixtures Part IV. Volumetric and speed of sound data at (293.15; 298.15 and 303.15 K) for 2-butanone +dipropylamine, +dibutylamine or +triethylamine systems	
speedsl	1167.57	m/s	303.15	Thermodynamics of (ketone + amine) mixtures. Part VI. Volumetric and speed of sound data at (293.15, 298.15, and 303.15) K for (2-heptanone + dipropylamine, +dibutylamine, or +triethylamine) systems	
speedsl	1188.00	m/s	298.15	Thermodynamics of (ketone + amine) mixtures. Part VI. Volumetric and speed of sound data at (293.15, 298.15, and 303.15) K for (2-heptanone + dipropylamine, +dibutylamine, or +triethylamine) systems	
speedsl	1209.38	m/s	293.15	Thermodynamics of (ketone + amine) mixtures. Part VI. Volumetric and speed of sound data at (293.15, 298.15, and 303.15) K for (2-heptanone + dipropylamine, +dibutylamine, or +triethylamine) systems	

speedsl	1167.10	m/s	303.15	Thermodynamics of ketone + amine mixtures Part IV. Volumetric and speed of sound data at (293.15; 298.15 and 303.15 K) for 2-butanone +dipropylamine, +dibutylamine or +triethylamine systems

Correlations

Information	Value
Property code	pvap
Equation	ln(Pvp) = A + B/T + C*ln(T) + D*T^2
Coeff. A	1.45365e+02
Coeff. B	-1.01337e+04
Coeff. C	-1.95845e+01
Coeff. D	1.57470e-05
Temperature range (K), min.	210.15
Temperature range (K), max.	555.80

Datasets

Viscosity, Pa*s

Temperature, K - Liquid	Pressure, kPa - Liquid	Viscosity, Pa*s - Liquid
303.15	101.33	0.0005118

Reference *https://www.doi.org/10.1016/j.tca.2009.07.008*

Sources

Thermodynamic study of heptane + amine mixtures. V. Excess and	https://www.doi.org/10.1016/j.fluid.2014.12.017
Studies of viscosities of dilute solutions of alkylamines in non electrolyte solvents. IV.	https://www.doi.org/10.1016/j.tca.2009.07.008
Thermodynamics of ketone + amine mixtures. Part IV. Volumetric and speed	https://www.doi.org/10.1016/j.tca.2010.09.004
Studies of viscosities of dilute alkylamines in 1,4-dioxane and oxolane	https://www.doi.org/10.1016/j.tca.2009.02.005
Thermodynamics of amide + amine solutions of alkylamines in	https://www.doi.org/10.1016/j.fluid.2019.112283
Thermodynamic study of (heptane + amine) mixtures. III. Excess and partial	https://www.doi.org/10.1016/j.jct.2011.04.017
Studies of viscosities of dilute solutions of alkylamines in	https://www.doi.org/10.1016/j.tca.2004.08.013
Joback method	https://en.wikipedia.org/wiki/Joback_method
KDB Vapor Pressure Data:	https://www.cheric.org/research/kdb/hcprop/showprop.php?cmpid=1270
Thermodynamics of ketone + amine mixtures. Part IX. Excess molar	https://www.doi.org/10.1016/j.fluid.2013.01.011
Thermodynamics of mixtures with strongly negative deviations from	https://www.doi.org/10.1016/j.fluid.2005.01.013
UNIFAC-Lyngby-Vapor-Liquid-Equilibrium	http://link.springer.com/article/10.1007/BF02311772
Thermodynamics of ketone + amine mixtures. Part V. Volumetric and speed	https://www.doi.org/10.1016/j.jct.2011.05.003
Some Alkoxy Alkanes and Cyclic Ethers with Alkanes, Cycloalkanes, and	https://www.doi.org/10.1021/je0341357
Studies of partial molar volumes of alkylamine in non-electrolyte solvents I.	https://www.doi.org/10.1016/j.tca.2005.08.012
Alkylamines in Hydrocarbons at 303.15	https://www.doi.org/10.1016/j.jct.2015.09.002
Density and Relative Permittivity of	https://www.doi.org/10.1021/je040006u
Mixtures at Various Temperatures:	https://www.doi.org/10.1021/acs.jced.5b00802
KDB:	https://www.cheric.org/files/research/kdb/mol/mol1270.mol
NIST Webbook:	http://webbook.nist.gov/cgi/cbook.cgi?ID=C142847&Units=SI
KDB Pure (Korean Thermophysical Properties Databank):	https://www.cheric.org/research/kdb/hcprop/showprop.php?cmpid=1270
Aqueous Solubility Prediction Method:	http://onschallenge.wikispaces.com/file/view/AqueousDataset002.xlsx/351826032/AqueousDa
Mixing Properties for Binary Liquid Mixtures of Methyl tert-Butyl Ether with	https://www.doi.org/10.1021/je900597n
Crippen Method:	http://pubs.acs.org/doi/abs/10.1021/ci990307l

Legend

af:	Acentric Factor
affp:	Proton affinity
basg:	Gas basicity
chl:	Standard liquid enthalpy of combustion
cpg:	Ideal gas heat capacity
dm:	Dipole Moment
dvisc:	Dynamic viscosity
gf:	Standard Gibbs free energy of formation
hf:	Enthalpy of formation at standard conditions
hfl:	Liquid phase 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
speedsl:	Speed of sound in fluid
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
vc:	Critical Volume