

# Tributylamine

<b>Other names:</b>	(n-C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> N 1-Butanamine, N,N-dibutyl- N,N-DIBUTYL-1-BUTANAMINE Tri-n-butylamine Tributilamina Tris[N-butylamine] UN 2542
<b>Inchi:</b>	InChI=1S/C12H27N/c1-4-7-10-13(11-8-5-2)12-9-6-3/h4-12H2,1-3H3
<b>InchiKey:</b>	IMFACGCPASFAPR-UHFFFAOYSA-N
<b>Formula:</b>	C <sub>12</sub> H <sub>27</sub> N
<b>SMILES:</b>	CCCCN(CCCC)CCCC
<b>Mol. weight [g/mol]:</b>	185.35
<b>CAS:</b>	102-82-9

## Physical Properties

Property code	Value	Unit	Source
affp	998.50	kJ/mol	NIST Webbook
basg	967.60	kJ/mol	NIST Webbook
chl	-8299.20 ± 1.10	kJ/mol	NIST Webbook
dm	0.80	debye	KDB
gf	160.94	kJ/mol	Joback Method
hf	-223.48	kJ/mol	Joback Method
hfl	-281.80 ± 1.10	kJ/mol	NIST Webbook
hfus	29.86	kJ/mol	Joback Method
hvap	62.70 ± 1.30	kJ/mol	NIST Webbook
ie	7.00 ± 0.10	eV	NIST Webbook
ie	7.86	eV	NIST Webbook
ie	7.40	eV	NIST Webbook
log10ws	-3.12		Aqueous Solubility Prediction Method
logp	3.689		Crippen Method
mvol	189.920	ml/mol	McGowan Method
nfpaf	%!d(float64=2)		KDB
nfpah	%!d(float64=2)		KDB
pc	1820.00	kPa	KDB
rinpol	1195.00		NIST Webbook
rinpol	1192.00		NIST Webbook

ripol	1189.00			NIST Webbook
ripol	1228.00			NIST Webbook
ripol	1228.00			NIST Webbook
ripol	1226.00			NIST Webbook
ripol	1166.00			NIST Webbook
ripol	1163.00			NIST Webbook
ripol	1192.00			NIST Webbook
ripol	1171.00			NIST Webbook
ripol	1215.00			NIST Webbook
ripol	1211.00			NIST Webbook
ripol	1220.00			NIST Webbook
ripol	1226.00			NIST Webbook
ripol	1220.00			NIST Webbook
ripol	1207.00			NIST Webbook
ripol	1225.00			NIST Webbook
ripol	1206.00			NIST Webbook
tb	486.60		K	KDB
tc	643.00		K	KDB
tf	257.47		K	Joback Method
vc	0.726		m <sup>3</sup> /kmol	Joback Method

## Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	441.92	J/molxK	486.40	Joback Method
cpg	476.04	J/molxK	539.67	Joback Method
cpg	492.09	J/molxK	566.31	Joback Method
cpg	507.50	J/molxK	592.94	Joback Method
cpg	522.28	J/molxK	619.58	Joback Method
cpg	536.45	J/molxK	646.21	Joback Method
cpg	459.32	J/molxK	513.04	Joback Method
dvisc	0.0009700	Paxs	313.15	Studies of viscosities of dilute solutions of alkylamine in non-electrolyte solvents. II. Haloalkanes and other polar solvents

dvisc	0.0011670	Paxs	303.15	Studies of viscosities of dilute solutions of alkylamine in non-electrolyte solvents. II. Haloalkanes and other polar solvents
hvapt	49.90	kJ/mol	460.00	NIST Webbook
hvapt	48.10	kJ/mol	410.00	NIST Webbook
hvapt	64.40	kJ/mol	317.50	NIST Webbook
hvapt	58.00	kJ/mol	298.00	Evaluation of the Vaporization Enthalpies and Liquid Vapor Pressures of (R)-Deprenyl, (S)-Benzphetamine, Alverine, and a Series of Aliphatic Tertiary Amines by Correlation Gas Chromatography at T/K = 298.15
hvapt	62.70	kJ/mol	298.00	Hypothetical Thermodynamic Properties. Subcooled Vaporization Enthalpies and Vapor Pressures of Polyaromatic Heterocycles and Related Compounds
rfi	1.42510		303.15	Density, Viscosity, Refractive Index, and Speed of Sound in the Binary Mixtures of 1,4-Dioxane + Ethanediol, + Hexane, + Tributylamine, or + Triethylamine at (298.15, 303.15, and 308.15) K

rfi	1.42260	308.15	Density, Viscosity, Refractive Index, and Speed of Sound in the Binary Mixtures of 1,4-Dioxane + Ethenediol, + Hexane, + Tributylamine, or + Triethylamine at (298.15, 303.15, and 308.15) K
rfi	1.42280	308.15	Density, Viscosity, Refractive Index, and Speed of Sound in the Binary Mixtures of Tri-n-butylamine + Triethylamine, + Tetrahydrofuran, + Tetradecane, + Tetrachloroethylene, + Pyridine, or + Trichloroethylene at (298.15, 303.15, and 308.15) K
rfi	1.42540	303.15	Density, Viscosity, Refractive Index, and Speed of Sound in the Binary Mixtures of Tri-n-butylamine + Triethylamine, + Tetrahydrofuran, + Tetradecane, + Tetrachloroethylene, + Pyridine, or + Trichloroethylene at (298.15, 303.15, and 308.15) K
rfi	1.42740	298.15	Density, Viscosity, Refractive Index, and Speed of Sound in the Binary Mixtures of 1,4-Dioxane + Ethenediol, + Hexane, + Tributylamine, or + Triethylamine at (298.15, 303.15, and 308.15) K

rfi	1.42590	293.15	Volumetric properties of binary mixtures of tributylamine with benzene derivatives and comparison with ERAS model results at temperatures from (293.15 to 333.15) K
rfi	1.41880	318.15	Densities and Refractive Indices of Binary Mixtures of Benzene with Triethylamine and Tributylamine at Different Temperatures
rfi	1.42100	313.15	Densities and Refractive Indices of Binary Mixtures of Benzene with Triethylamine and Tributylamine at Different Temperatures
rfi	1.42310	308.15	Densities and Refractive Indices of Binary Mixtures of Benzene with Triethylamine and Tributylamine at Different Temperatures
rfi	1.42590	303.15	Densities and Refractive Indices of Binary Mixtures of Benzene with Triethylamine and Tributylamine at Different Temperatures

rfi	1.42550		303.15	Density, Viscosity, Refractive Index, and Speed of Sound in the Binary Mixtures of Tri-n-butylamine + Triethylamine, + Tetrahydrofuran, + Tetradecane, + Tetrachloroethylene, + Pyridine, or + Trichloroethylene at (298.15, 303.15, and 308.15) K
rfi	1.42760		298.15	Density, Viscosity, Refractive Index, and Speed of Sound in the Binary Mixtures of Tri-n-butylamine + Triethylamine, + Tetrahydrofuran, + Tetradecane, + Tetrachloroethylene, + Pyridine, or + Trichloroethylene at (298.15, 303.15, and 308.15) K
rfi	1.42740		298.15	Densities and Refractive Indices of Binary Mixtures of Benzene with Triethylamine and Tributylamine at Different Temperatures
rhol	765.81	kg/m3	308.15	Volumetric and FT-IR Studies of the Binary Liquid Mixtures of Tributylamine and Alkyl Ester (C1-C5)
rhol	762.06	kg/m3	313.15	Volumetric and FT-IR Studies of the Binary Liquid Mixtures of Tributylamine and Alkyl Ester (C1-C5)

rho1	773.28	kg/m3	298.15	Volumetric and FT-IR Studies of the Binary Liquid Mixtures of Tributylamine and Alkyl Ester (C1-C5)
rho1	779.00	kg/m3	293.00	KDB
rho1	782.30	kg/m3	293.20	Modeling extraction equilibria of butyric acid distributed between water and tri-n-butyl amine/diluent or tri-n-butyl phosphate/diluent system: Extension of the LSER approach
rho1	773.56	kg/m3	298.15	Volumetric, acoustic, viscometric, and spectroscopic properties for binary mixtures of alkoxypropanol with mono, di-, and tri-alkylamines at a temperature of 298.15K
rho1	773.30	kg/m3	298.15	Partial molar volume of tertiary amines in methanol at T = 298.15 K. Solvation, shape and specific interactions
rho1	770.21	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
rho1	763.11	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

rho	770.21	kg/m <sup>3</sup>	303.15	Studies of viscosities of dilute solutions of alkylamines in non-electrolyte solvents III. Alkylamines in butanols 303.15K
rho	777.01	kg/m <sup>3</sup>	293.15	Volumetric and FT-IR Studies of the Binary Liquid Mixtures of Tributylamine and Alkyl Ester (C1-C5)
rho	773.28	kg/m <sup>3</sup>	298.15	Volumetric and FT-IR Studies of the Binary Liquid Mixtures of Tributylamine and Alkyl Ester (C1-C5)
rho	769.55	kg/m <sup>3</sup>	303.15	Volumetric and FT-IR Studies of the Binary Liquid Mixtures of Tributylamine and Alkyl Ester (C1-C5)
rho	777.01	kg/m <sup>3</sup>	293.15	Volumetric and FT-IR Studies of the Binary Liquid Mixtures of Tributylamine and Alkyl Ester (C1-C5)
rho	762.06	kg/m <sup>3</sup>	313.15	Volumetric and FT-IR Studies of the Binary Liquid Mixtures of Tributylamine and Alkyl Ester (C1-C5)
rho	769.55	kg/m <sup>3</sup>	303.15	Volumetric and FT-IR Studies of the Binary Liquid Mixtures of Tributylamine and Alkyl Ester (C1-C5)
rho	765.81	kg/m <sup>3</sup>	308.15	Volumetric and FT-IR Studies of the Binary Liquid Mixtures of Tributylamine and Alkyl Ester (C1-C5)



speedsl	1210.42	m/s	308.15	Densities, Excess Molar Volumes, Speeds of Sound, and Isothermal Compressibilities for 2-(2-Hexyloxyethoxy)ethanol + n-Alkylamine at Temperatures Between 288.15 K and 308.15 K
speedsl	1228.98	m/s	303.15	Densities, Excess Molar Volumes, Speeds of Sound, and Isothermal Compressibilities for 2-(2-Hexyloxyethoxy)ethanol + n-Alkylamine at Temperatures Between 288.15 K and 308.15 K
speedsl	1247.64	m/s	298.15	Densities, Excess Molar Volumes, Speeds of Sound, and Isothermal Compressibilities for 2-(2-Hexyloxyethoxy)ethanol + n-Alkylamine at Temperatures Between 288.15 K and 308.15 K
speedsl	1266.37	m/s	293.15	Densities, Excess Molar Volumes, Speeds of Sound, and Isothermal Compressibilities for 2-(2-Hexyloxyethoxy)ethanol + n-Alkylamine at Temperatures Between 288.15 K and 308.15 K
speedsl	1210.42	m/s	308.15	Volumetric and Acoustic Properties for Binary Mixtures of Dipropylene Glycol Monopropyl Ether with Alkylamines at Temperatures Between 288.15 K and 308.15 K

speedsl	1228.98	m/s	303.15	Volumetric and Acoustic Properties for Binary Mixtures of Dipropylene Glycol Monopropyl Ether with Alkylamines at Temperatures Between 288.15 K and 308.15 K
speedsl	1247.64	m/s	298.15	Volumetric and Acoustic Properties for Binary Mixtures of Dipropylene Glycol Monopropyl Ether with Alkylamines at Temperatures Between 288.15 K and 308.15 K
speedsl	1266.37	m/s	293.15	Volumetric and Acoustic Properties for Binary Mixtures of Dipropylene Glycol Monopropyl Ether with Alkylamines at Temperatures Between 288.15 K and 308.15 K
speedsl	1285.04	m/s	288.15	Volumetric and Acoustic Properties for Binary Mixtures of Dipropylene Glycol Monopropyl Ether with Alkylamines at Temperatures Between 288.15 K and 308.15 K
speedsl	1285.04	m/s	288.15	Densities, Excess Molar Volumes, Speeds of Sound, and Isothermal Compressibilities for 2-(2-Hexyloxyethoxy)ethanol + n-Alkylamine at Temperatures Between 288.15 K and 308.15 K

# Pressure Dependent Properties

Property code	Value	Unit	Pressure [kPa]	Source
tbrp	364.70	K	1.00	NIST Webbook

## Correlations

Information	Value
Property code	pvap
Equation	$\ln(P_{vp}) = A + B/(T + C)$
Coeff. A	1.64228e+01
Coeff. B	-4.76217e+03
Coeff. C	-7.65780e+01
Temperature range (K), min.	371.72
Temperature range (K), max.	505.17

Information	Value
Property code	pvap
Equation	$\ln(P_{vp}) = A + B/T + C*\ln(T) + D*T^2$
Coeff. A	1.39611e+02
Coeff. B	-1.26026e+04
Coeff. C	-1.79458e+01
Coeff. D	8.32364e-06
Temperature range (K), min.	203.00
Temperature range (K), max.	644.00

## Datasets

### Viscosity, Pa\*s

Temperature, K - Liquid	Pressure, kPa - Liquid	Viscosity, Pa*s - Liquid
303.15	101.33	0.0011670

## Sources

Hypothetical Thermodynamic Properties, Subcooled Vaporization Enthalpies, Excess Molar Volumes, Partial Molar Heat Capacities, and Related Computed Indices for 2-(2-Hexyloxyethoxy)ethanol + *n*-Alkylamine at Temperatures Between 288.15 K and 308.15 K: Aqueous Solubility Prediction Method:

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<http://onschallenge.wikispaces.com/file/view/AqueousDataset002.xlsx/351826032/AqueousDataset002.xlsx>

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<https://www.thermo.com/research/kdb/hcprop/showprop.php?cmpid=1282>

<https://www.doi.org/10.1016/j.jct.2011.10.027>

<https://www.doi.org/10.1021/je030107c>

<https://www.doi.org/10.1016/j.tca.2005.08.012>

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<http://webbook.nist.gov/cgi/cbook.cgi?ID=C102829&Units=SI>

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<https://www.doi.org/10.1016/j.fluid.2014.10.043>

<https://www.doi.org/10.1016/j.jct.2012.07.012>

<https://www.doi.org/10.1016/j.jct.2005.12.007>

<https://www.doi.org/10.1021/je500358r>

Studies of viscosities of dilute solutions of alkylamines in non-fluorinated solvents. I. Alkylamines in 1,4-dioxane and oxolane at 303.15 K. Volumetric properties of binary mixtures of tributylamine with benzene and diethyl ether. I. Diffusion coefficients and speeds of sound in the binary mixtures of tributylamine with diethyl ether, + alkylamine in non-polar electrolyte solvents I. The thermodynamic properties of binary and ternary mixtures. III: Excess and partial molar volumes in mixtures with secondary, tertiary, and cyclic amines

Volumetric and Acoustic Properties for Binary Mixtures of Dipropylene Glycol Monopropyl Ether with Alkylamines at Temperatures Between 288.15 K and 308.15 K. Vapor Pressure: Studies of viscosities of dilute solutions of alkylamine in non-fluorinated solvents. II. Haloalkanes and other polar solvents: Studies of viscosities of dilute solutions of alkylamines in non-fluorinated solvents. I. Densities and Refractive Indices of Binary Mixtures of Benzene with Tributylamine and Triethylamine. Excess molar enthalpies, excess molar heat capacities, and excess molar volumes of binary and ternary mixtures of tributylamine and triethylamine containing 1-propanol, methanol, or ethanol. Experimental data, correlation and prediction of density, viscosity, and speed of sound in the binary mixtures of tributylamine and diethyl ether at 303.15 K. Experimental data, correlation and prediction of density, viscosity, and speed of sound in the binary mixtures of tributylamine and diethyl ether at 303.15 K. Experimental data, correlation and prediction of density, viscosity, and speed of sound in the binary mixtures of tributylamine and diethyl ether at 303.15 K. Experimental data, correlation and prediction of density, viscosity, and spectroscopic properties for binary mixtures of the vaporization enthalpies and liquid vapor pressures of *n*-butylamine, *n*-pentylamine, and a series of aliphatic tertiary amines by correlation gas chromatography at T/K = 298.15:

## Legend

affp:	Proton affinity
basg:	Gas basicity
chl:	Standard liquid enthalpy of combustion

<b>cpg:</b>	Ideal gas heat capacity
<b>dm:</b>	Dipole Moment
<b>dvisc:</b>	Dynamic viscosity
<b>gf:</b>	Standard Gibbs free energy of formation
<b>hf:</b>	Enthalpy of formation at standard conditions
<b>hfl:</b>	Liquid phase enthalpy of formation at standard conditions
<b>hfus:</b>	Enthalpy of fusion at standard conditions
<b>hvap:</b>	Enthalpy of vaporization at standard conditions
<b>hvapt:</b>	Enthalpy of vaporization at a given temperature
<b>ie:</b>	Ionization energy
<b>log10ws:</b>	Log10 of Water solubility in mol/l
<b>logp:</b>	Octanol/Water partition coefficient
<b>mcvol:</b>	McGowan's characteristic volume
<b>nfpaf:</b>	NFPA Fire Rating
<b>nfpah:</b>	NFPA Health Rating
<b>pc:</b>	Critical Pressure
<b>pvap:</b>	Vapor pressure
<b>rfi:</b>	Refractive Index
<b>rhol:</b>	Liquid Density
<b>rinpol:</b>	Non-polar retention indices
<b>ripol:</b>	Polar retention indices
<b>speedsl:</b>	Speed of sound in fluid
<b>tb:</b>	Normal Boiling Point Temperature
<b>tbrp:</b>	Boiling point at reduced pressure
<b>tc:</b>	Critical Temperature
<b>tf:</b>	Normal melting (fusion) point
<b>vc:</b>	Critical Volume

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