

Butanoic acid

Other names:	1-Butanoic acid
	1-Butyric acid
	1-Propanecarboxylic acid
	Butanic acid
	Buttersaeure
	Butyric acid
	Ethylacetic acid
	Kyselina maselna
	NSC 8415
	Propanecarboxylic acid
	Propylformic acid
	UN 2820
	n-Butanoic acid
	n-Butyric acid
	n-C3H7COOH
Inchi:	InChI=1S/C4H8O2/c1-2-3-4(5)6/h2-3H2,1H3,(H,5,6)
InchiKey:	FERIUCNNQQJTOY-UHFFFAOYSA-N
Formula:	C4H8O2
SMILES:	CCCC(=O)O
Mol. weight [g/mol]:	88.11
CAS:	107-92-6

Physical Properties

Property code	Value	Unit	Source
af	0.6830		KDB
aigt	723.15	K	KDB
chl	-2183.50 ± 0.59	kJ/mol	NIST Webbook
dm	1.50	debye	KDB
dvisc	0.0013960	Pa×s	Excess Molar Volumes and Viscosity Deviations of Binary Liquid Mixtures of 1,3-Dioxolane and 1,4-Dioxane with Butyl Acetate, Butyric Acid, Butylamine, and 2-Butanone at 298.15 K
fil	2.19	% in Air	KDB
flu	13.40	% in Air	KDB
fpc	347.59	K	KDB

fpo	344.26	K	KDB
gf	-282.94	kJ/mol	Joback Method
hf	-475.90 ± 4.00	kJ/mol	NIST Webbook
hf	-476.20	kJ/mol	KDB
hf	-475.90 ± 4.00	kJ/mol	NIST Webbook
hfl	-533.92 ± 0.59	kJ/mol	NIST Webbook
hfus	11.80	kJ/mol	Joback Method
hvap	47.92	kJ/mol	Joback Method
ie	10.22	eV	NIST Webbook
ie	10.38	eV	NIST Webbook
ie	10.24	eV	NIST Webbook
ie	10.24	eV	NIST Webbook
ie	10.17 ± 0.05	eV	NIST Webbook
ie	10.17 ± 0.05	eV	NIST Webbook
ie	10.16 ± 0.05	eV	NIST Webbook
ie	10.46	eV	NIST Webbook
log10ws	-0.19		Aqueous Solubility Prediction Method
logp	0.871		Crippen Method
mcvol	74.660	ml/mol	McGowan Method
nfpaf	%!d(float64=2)		KDB
nfpah	%!d(float64=2)		KDB
pc	4094.07 ± 90.00	kPa	NIST Webbook
pc	3950.00 ± 50.00	kPa	NIST Webbook
pc	4064.00 ± 60.00	kPa	NIST Webbook
pc	4030.00	kPa	KDB
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tb	436.67	K	Phase equilibria of liquid (water + butyric acid + oleyl alcohol) ternary system
tb	436.70	K	(Liquid + liquid) equilibria of (water + butyric acid + esters) ternary systems
tb	435.20	K	NIST Webbook
tb	436.55 ± 0.50	K	NIST Webbook
tb	436.70 ± 0.20	K	NIST Webbook
tc	631.77 ± 2.50	K	NIST Webbook
tc	624.00 ± 1.00	K	NIST Webbook
tc	615.20 ± 2.00	K	NIST Webbook
tc	624.00	K	KDB
tc	627.90 ± 6.00	K	NIST Webbook
tf	268.65	K	Differential scanning calorimetry determination of phase diagrams and water activities of aqueous carboxylic acid solutions
tf	266.68	K	Aqueous Solubility Prediction Method
tf	267.00 ± 1.50	K	NIST Webbook
tf	267.40	K	KDB
tf	267.80 ± 0.50	K	NIST Webbook
tf	267.60 ± 0.20	K	NIST Webbook
tf	267.95	K	NIST Webbook
tf	267.89 ± 0.05	K	NIST Webbook
tt	267.40 ± 0.20	K	NIST Webbook
tt	268.03	K	KDB
tt	267.97 ± 0.05	K	NIST Webbook
tt	268.03 ± 0.05	K	NIST Webbook
vc	0.290	m3/kmol	KDB
zc	0.2252590		KDB

Temperature Dependent Properties

Property code	Value	Unit	Temperature [K]	Source
cpg	176.47	J/mol×K	581.86	Joback Method
cpg	159.00	J/mol×K	494.93	Joback Method
cpg	165.07	J/mol×K	523.90	Joback Method

cpg	170.89	J/mol×K	552.88	Joback Method
cpg	181.81	J/mol×K	610.84	Joback Method
cpg	146.10	J/mol×K	436.97	Joback Method
cpg	152.68	J/mol×K	465.95	Joback Method
cpl	178.00	J/mol×K	298.15	NIST Webbook
cpl	177.70	J/mol×K	298.15	NIST Webbook
cpl	176.10	J/mol×K	298.00	NIST Webbook
cpl	176.10	J/mol×K	290.70	NIST Webbook
dvisc	0.0004536	Pa×s	405.07	Joback Method
dvisc	0.0318897	Pa×s	245.59	Joback Method
dvisc	0.0092130	Pa×s	277.49	Joback Method
dvisc	0.0002812	Pa×s	436.97	Joback Method
dvisc	0.0015427	Pa×s	341.28	Joback Method
dvisc	0.0007939	Pa×s	373.18	Joback Method
dvisc	0.0034383	Pa×s	309.38	Joback Method
hfust	11.07	kJ/mol	264.70	NIST Webbook
hfust	11.07	kJ/mol	264.70	NIST Webbook
hfust	11.07	kJ/mol	267.40	NIST Webbook
hfust	11.59	kJ/mol	268.00	NIST Webbook
hsubt	76.00 ± 1.50	kJ/mol	246.50	NIST Webbook
hvapt	50.30	kJ/mol	410.00	NIST Webbook
hvapt	52.00	kJ/mol	399.50	NIST Webbook
hvapt	47.70	kJ/mol	514.50	NIST Webbook
hvapt	51.10	kJ/mol	329.50	NIST Webbook
hvapt	53.20	kJ/mol	404.00	NIST Webbook
hvapt	58.50 ± 0.30	kJ/mol	293.00	NIST Webbook
hvapt	52.50	kJ/mol	409.50	NIST Webbook
pvap	90.07	kPa	432.61	Subatmospheric Vapor Pressure Curves for Propionic Acid, Butyric Acid, Isobutyric Acid, Valeric Acid, Isovaleric Acid, Hexanoic Acid, and Heptanoic Acid
pvap	1.14	kPa	333.15	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)

pvap	0.31	kPa	313.15	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	6.09	kPa	363.15	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	5.97	kPa	363.08	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	3.59	kPa	353.15	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	3.58	kPa	353.10	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	2.07	kPa	343.18	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	0.15	kPa	303.28	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)

pvap	1.15	kPa	333.18	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	0.15	kPa	303.15	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	0.11	kPa	298.25	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	0.11	kPa	298.15	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	0.07	kPa	293.29	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	0.07	kPa	293.15	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	0.03	kPa	283.15	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)

pvap	0.01	kPa	273.15	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	2.06	kPa	343.15	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	0.61	kPa	323.15	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	0.62	kPa	323.20	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)
pvap	9.38	kPa	373.10	Vapor-Liquid Equilibria on Four Binary Systems: 2-Phenylpropionaldehyde + Phenol, Propylene Glycol Monomethyl Ether + Nitroethane, Dimethyl Ether + Propylene, and N-Butyric Acid + Propionic Acid
pvap	100.04	kPa	436.05	Subatmospheric Vapor Pressure Curves for Propionic Acid, Butyric Acid, Isobutyric Acid, Valeric Acid, Isovaleric Acid, Hexanoic Acid, and Heptanoic Acid

pvap	95.10	kPa	434.51	Subatmospheric Vapor Pressure Curves for Propionic Acid, Butyric Acid, Isobutyric Acid, Valeric Acid, Isovaleric Acid, Hexanoic Acid, and Heptanoic Acid
pvap	45.85	kPa	413.15	Vapor-Liquid Equilibria on Four Binary Systems: 2-Phenylpropionaldehyde + Phenol, Propylene Glycol Monomethyl Ether + Nitroethane, Dimethyl Ether + Propylene, and N-Butyric Acid + Propionic Acid
pvap	14.56	kPa	383.55	Subatmospheric Vapor Pressure Curves for Propionic Acid, Butyric Acid, Isobutyric Acid, Valeric Acid, Isovaleric Acid, Hexanoic Acid, and Heptanoic Acid
pvap	19.58	kPa	390.87	Subatmospheric Vapor Pressure Curves for Propionic Acid, Butyric Acid, Isobutyric Acid, Valeric Acid, Isovaleric Acid, Hexanoic Acid, and Heptanoic Acid
pvap	29.65	kPa	401.32	Subatmospheric Vapor Pressure Curves for Propionic Acid, Butyric Acid, Isobutyric Acid, Valeric Acid, Isovaleric Acid, Hexanoic Acid, and Heptanoic Acid

pvap	39.72	kPa	409.00	Subatmospheric Vapor Pressure Curves for Propionic Acid, Butyric Acid, Isobutyric Acid, Valeric Acid, Isovaleric Acid, Hexanoic Acid, and Heptanoic Acid
pvap	49.79	kPa	415.00	Subatmospheric Vapor Pressure Curves for Propionic Acid, Butyric Acid, Isobutyric Acid, Valeric Acid, Isovaleric Acid, Hexanoic Acid, and Heptanoic Acid
pvap	59.86	kPa	420.22	Subatmospheric Vapor Pressure Curves for Propionic Acid, Butyric Acid, Isobutyric Acid, Valeric Acid, Isovaleric Acid, Hexanoic Acid, and Heptanoic Acid
pvap	69.92	kPa	424.81	Subatmospheric Vapor Pressure Curves for Propionic Acid, Butyric Acid, Isobutyric Acid, Valeric Acid, Isovaleric Acid, Hexanoic Acid, and Heptanoic Acid
pvap	79.99	kPa	428.96	Subatmospheric Vapor Pressure Curves for Propionic Acid, Butyric Acid, Isobutyric Acid, Valeric Acid, Isovaleric Acid, Hexanoic Acid, and Heptanoic Acid
pvap	0.32	kPa	313.22	Isothermal Vapor-Liquid Equilibria and Excess Enthalpy Data for the Binary System (Butyric Acid + Toluene)

rfi	1.39599	298.15	Refractive Index, Surface Tension, and Density of Aqueous Mixtures of Carboxylic Acids at 298.15 K
rfi	1.39600	298.15	Liquid-Liquid Equilibria for Ternary Mixtures of gamma-Valerolactone + n-Tetradecane + (Butanoic Acid or Hexanoic Acid or Methyl Myristate) at 298.15 K
rfi	1.39740	293.15	Liquid Liquid Equilibrium Data of Water + Butyric Acid + {Butanal or n-Butanol} Ternary Systems at 293.15, 308.15, and 323.15 K
rfi	1.39394	303.15	Liquid-liquid equilibria for ternary mixtures of 1-alkyl-3-methyl imidazolium bis{(trifluoromethyl)sulfonyl}imides, n-hexane and organic compounds at 303.15 K and 0.1 MPa
rfi	1.39770	298.20	Tie line data for the (water + butyric acid + n-butyl alcohol or amyl alcohol) at T = (298.2, 308.2, and 318.2) K and (water + butyric acid + isoamyl alcohol) at T = 298.2 K
rfi	1.39760	298.20	Ternary liquid liquid equilibrium data for the (water + butyric acid + n-hexane or n-hexanol) systems at T = (298.2, 308.2, and 318.2) K

rfi	1.39760	298.20	(Liquid + liquid) equilibria of aqueous solutions of butyric acid with n-heptane and toluene at T = (298.2, 308.2, and 318.2) K
rfi	1.39750	293.15	(Liquid + liquid) equilibria of (water + butyric acid + dibasic esters) ternary systems
rfi	1.39750	298.20	(Liquid + liquid) equilibria of the (water + butyric acid + dodecanol) ternary system
rfi	1.39770	293.20	Experimental and Correlational Study of Phase Equilibria in Aqueous Solutions of Formic and Butyric Acids with Isoamyl Acetate and Methyl Isoamyl Ketone at T = 298.15 K
rfi	1.39820	293.15	(Liquid + liquid) equilibria of (water + butyric acid + cyclohexyl acetate) ternary system
rfi	1.39470	303.15	Phase equilibria measurements of ternary mixtures (sulfolane + a carboxylic acid + pentane) at 303.15 K
rfi	1.39470	303.15	Liquid liquid equilibria measurements of ternary systems (acetonitrile + a carboxylic acid + dodecane) at 303.15 K
rfi	1.39770	298.20	Solubility and tie line data for the aqueous solutions of butyric acid with 1-octanol and 2-ethyl-1-hexanol at various temperatures

rfi	1.39820		293.15	Vapour-liquid equilibrium of carboxylic acid alcohol binary systems:2-Propanol + butyric acid, 2-butanol + butyric acid and 2-methyl-1-propanol + butyric acid
rhoI	952.80	kg/m3	298.20	Investigation of Ternary Phase Diagrams of (Water + Butyric Acid + Phenyl Acetate) at Different Temperatures
rhoI	952.68	kg/m3	298.15	Liquid Phase Equilibria of Aqueous Mixtures of Carboxylic Acids (C1-C4) with Ethylbenzene: Thermodynamic and Mathematical Modeling
rhoI	952.10	kg/m3	298.15	Tie-Line Data for Aqueous Mixtures of Butyric Acid with Diisopropyl Ether at Various Temperatures
rhoI	938.05	kg/m3	313.15	Influence of alkyl group and temperature on thermophysical properties of carboxylic acid and their binary mixtures
rhoI	942.92	kg/m3	308.15	Influence of alkyl group and temperature on thermophysical properties of carboxylic acid and their binary mixtures
rhoI	947.94	kg/m3	303.15	Influence of alkyl group and temperature on thermophysical properties of carboxylic acid and their binary mixtures

rhoI	952.81	kg/m3	298.15	Influence of alkyl group and temperature on thermophysical properties of carboxylic acid and their binary mixtures
rhoI	957.78	kg/m3	293.15	Influence of alkyl group and temperature on thermophysical properties of carboxylic acid and their binary mixtures
rhoI	953.05	kg/m3	298.15	Liquid-liquid equilibria and density data for pseudoternary systems of refined soybean oil + (hexanal, or heptanal, or butyric acid, or valeric acid, or caproic acid, or caprylic acid) + dimethyl sulfoxide at 298.15 K
rhoI	938.10	kg/m3	313.15	Effect of temperature on density, sound velocity, refractive index and their derived properties for the binary systems (heptanoic acid + propanoic or butanoic acids)
rhoI	942.90	kg/m3	308.15	Effect of temperature on density, sound velocity, refractive index and their derived properties for the binary systems (heptanoic acid + propanoic or butanoic acids)
rhoI	947.90	kg/m3	303.15	Effect of temperature on density, sound velocity, refractive index and their derived properties for the binary systems (heptanoic acid + propanoic or butanoic acids)

rhoI	952.80	kg/m3	298.15	Effect of temperature on density, sound velocity, refractive index and their derived properties for the binary systems (heptanoic acid + propanoic or butanoic acids)
rhoI	957.80	kg/m3	293.15	Effect of temperature on density, sound velocity, refractive index and their derived properties for the binary systems (heptanoic acid + propanoic or butanoic acids)
rhoI	957.80	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
rhoI	958.00	kg/m3	293.00	KDB
rhoI	947.84	kg/m3	303.15	Density, speed of sound, and refractive index measurements for the binary systems (butanoic acid + propanoic acid, or 2-methyl-propanoic acid) at T = (293.15 to 313.15) K
rhoI	952.81	kg/m3	298.15	Density, speed of sound, and refractive index measurements for the binary systems (butanoic acid + propanoic acid, or 2-methyl-propanoic acid) at T = (293.15 to 313.15) K

rhoI	957.78	kg/m3	293.15	Density, speed of sound, and refractive index measurements for the binary systems (butanoic acid + propanoic acid, or 2-methyl-propanoic acid) at T = (293.15 to 313.15) K
rhoI	952.10	kg/m3	298.20	Phase equilibria of (water + propionic acid or butyric acid + 2-methoxy-2-methylpropane) ternary systems at 298.2 K and 323.2 K
rhoI	937.91	kg/m3	313.15	Density, speed of sound, and refractive index measurements for the binary systems (butanoic acid + propanoic acid, or 2-methyl-propanoic acid) at T = (293.15 to 313.15) K
rhoI	952.81	kg/m3	298.20	Phase equilibria of (water + butyric acid + butyl acetate) ternary systems at different temperatures
rhoI	942.87	kg/m3	308.15	Density, speed of sound, and refractive index measurements for the binary systems (butanoic acid + propanoic acid, or 2-methyl-propanoic acid) at T = (293.15 to 313.15) K
sfust	41.40	J/mol×K	267.40	NIST Webbook
srf	0.03	N/m	308.15	Apparent Molar Volume and Surface Tension of Dilute Aqueous Solutions of Carboxylic Acids

srf	0.03	N/m	303.15	Apparent Molar Volume and Surface Tension of Dilute Aqueous Solutions of Carboxylic Acids
srf	0.03	N/m	298.15	Apparent Molar Volume and Surface Tension of Dilute Aqueous Solutions of Carboxylic Acids
srf	0.03	N/m	293.15	Apparent Molar Volume and Surface Tension of Dilute Aqueous Solutions of Carboxylic Acids

Correlations

Information	Value
Property code	pvap
Equation	$\ln(P_{vp}) = A + B/(T + C)$
Coeff. A	1.57477e+01
Coeff. B	-4.11288e+03
Coeff. C	-6.64480e+01
Temperature range (K), min.	332.48
Temperature range (K), max.	460.54

Information	Value
Property code	pvap
Equation	$\ln(P_{vp}) = A + B/T + C \cdot \ln(T) + D \cdot T^2$
Coeff. A	9.87911e+01
Coeff. B	-9.90286e+03
Coeff. C	-1.19698e+01
Coeff. D	6.22559e-06
Temperature range (K), min.	267.95
Temperature range (K), max.	628.00

Sources

Experiment and correlation of osmotic coefficient for aqueous solution of carboxylic acids using NRTL nonrandom factor model:
(Liquid + liquid) equilibria of aqueous solutions of butyric acid with n-heptane and n-octane at pressure (298.2, 308.2, and 318.2) K:
 Density, speed of sound, and refractive index measurements for the binary systems **Viscosity and Surface Tension Measurements of Binary Systems**
Equilibrium Solubility Data of Butyric Acid in n-Heptane and n-Octane
 Equilibrium solubility measurements for ternary systems (sulfolane + dicarboxylic acid + n-heptane) at $T = 303.15\text{ K}$ and at 0.1 MPa.
 Webbook:

[illegible]

Excess Molar Volumes and Viscosity Deviations of Binary Liquid Mixtures of 1,3-Dioxolane and Acetonitrile, Ethylacetate + butyric acid + cyclohexylacetate) binary liquid equilibria 2-Butanol-Water 298.15 putyric acid + oleyl alcohol) ternary system + liquid) equilibria of (water + butyric acid + dibasic esters) ternary systems liquid liquid equilibria measurements of ternary systems (acetonitrile + a carbonyl compound) and a carbonyl compound of dilute Aqueous Solutions of Carboxylic Acids :

Extraction of Butyric Acid by Phosphonium Decanoate Ionic Liquid: Crippen Method:

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Phase equilibria of (water + carboxylic acid + diethyl maleate) ternary liquid systems at 101.3 kPa
 Subcooled vapor pressure curves for Propionic Acid, Butyric Acid, and Valeric Acid, and their mixtures with water, hexanol, and butyl acetate
 Vapor pressure diagrams of binary mixtures of butyric acid with several solvents: experimental and correlated pressure
 Modeling extraction equilibria of butyric acid distributed between water and diethyl ether
 Determination and correlation of liquid-liquid equilibria in the water system: extension of the ternary phase diagram of the water + propionic acid + diethyl ether
 Ternary liquid-liquid phase equilibria of (water-carboxylic acid-1-undecanol) ternary liquid-liquid equilibrium data for the (water + butyric acid + n-hexane) tie-line data for Aqueous Mixtures of Butyric Acid with Diisopropyl Ether at Various Temperatures
 Vapor pressure of (water + butyric acid + diethyl succinate or diethyl succinate + diethyl succinate) mixtures of n-butyl-3-methyl-3-oxobutanoate
 Liquid-liquid equilibria of the (water + butyric acid + 1-undecanol) ternary systems and binary systems of carboxylic acid-alcohol binary systems: 2-Propanol + butyric acid and 2-butanol + butyric acid
 Phase equilibria in aqueous butyric acid solutions: temperature and density
 Phase equilibria of (water + butyric acid + butyl acetate) ternary systems at 101.3 kPa
 Solubility of Naphthalene in Isobutyl Acetate, n-Butyric Acid, Ethyl Acetate, N-Methyl Pyrrolidone, N,N-Dimethylformamide, and Tetrahydrofuran:

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Legend

af:	Acentric Factor
agt:	Autoignition Temperature
chl:	Standard liquid enthalpy of combustion
cpg:	Ideal gas heat capacity
cpl:	Liquid phase heat capacity
dm:	Dipole Moment
dvisc:	Dynamic viscosity
fl:	Lower Flammability Limit
flu:	Upper Flammability Limit
fpc:	Flash Point (Closed Cup Method)
fpo:	Flash Point (Open Cup Method)
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
hfust:	Enthalpy of fusion at a given temperature

hsubt:	Enthalpy of sublimation at a given temperature
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
rfi:	Refractive Index
rhof:	Liquid Density
rinpol:	Non-polar retention indices
ripol:	Polar retention indices
sfust:	Entropy of fusion at a given temperature
sg:	Molar entropy at standard conditions
sl:	Liquid phase molar entropy at standard conditions
srf:	Surface Tension
tb:	Normal Boiling Point Temperature
tc:	Critical Temperature
tf:	Normal melting (fusion) point
tt:	Triple Point Temperature
vc:	Critical Volume
zc:	Critical Compressibility

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