Density of Aqueous Solutions of Organic Substances as Sugars and Alcohols

Changes in density of aqueous solutions with changes in concentration at 20°C. Density of some sugars, alcohols and other organic substances in water is plotted as function of wt%, mol/kg water and mol/l solution.

Be aware of the concentration units in the figures:

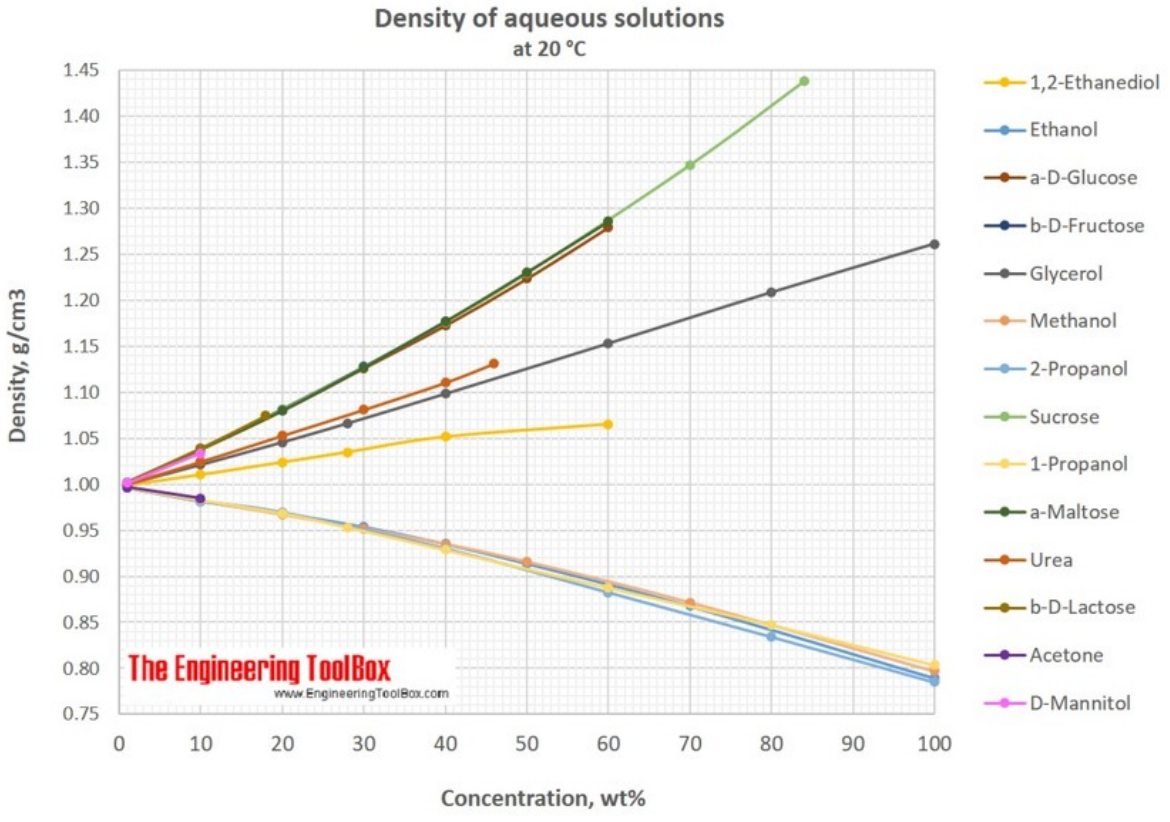
wt%: Mass of solute/total mass of solution*100%

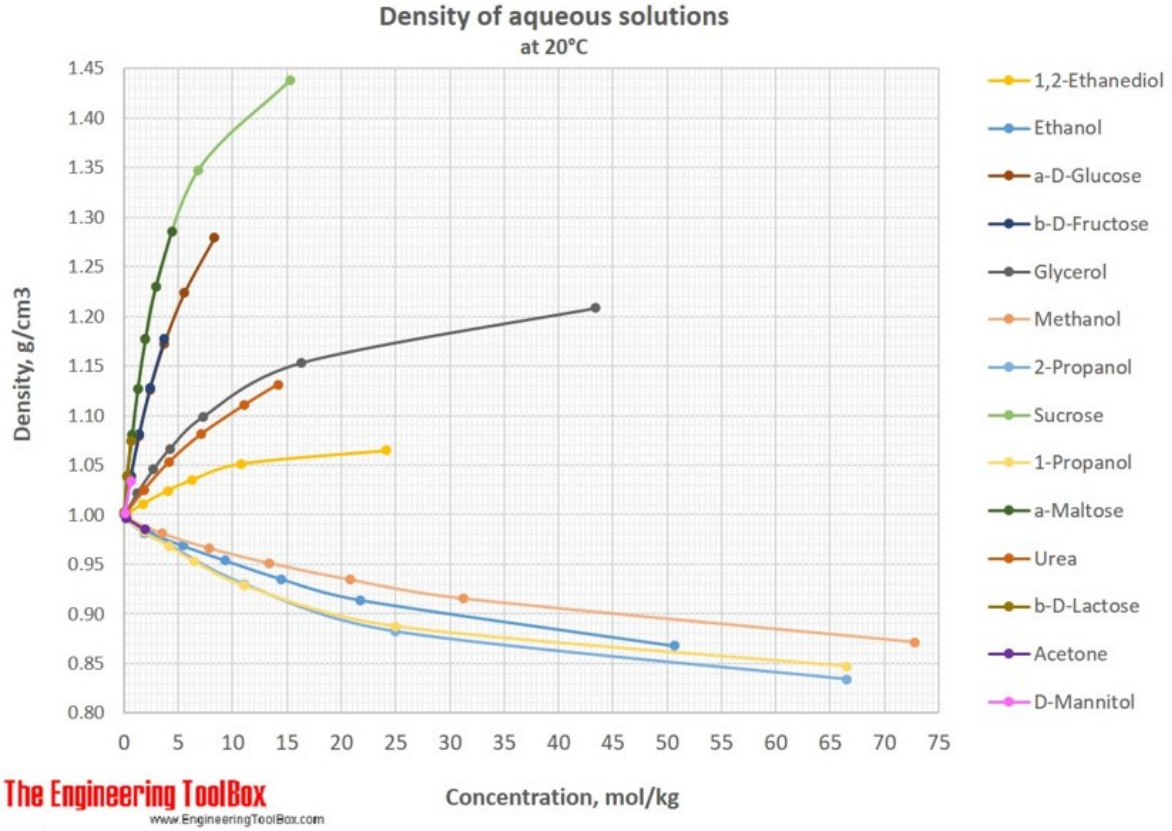
mol/kg: Molality = moles of solute/kg of *water*

mol/liter: Molarity = moles of solute/liter of *solution*

Values are tabulated below the figures.

See also density of aqueous solutions of organic acids , inorganic chlorides , inorganic sodium salts , inorganic potassium salts and some other inorganic substances




Density of aqueous solutions
at 20°C
Density, g/cm3
Concentration, mol/kg
1,2-Ethanediol
Ethanol
a-D-Glucose
b-D-Fructose
Glycerol
Methanol
2-Propanol
Sucrose
1-Propanol
a-Maltose
Urea
b-D-Lactose
Acetone
D-Mannitol
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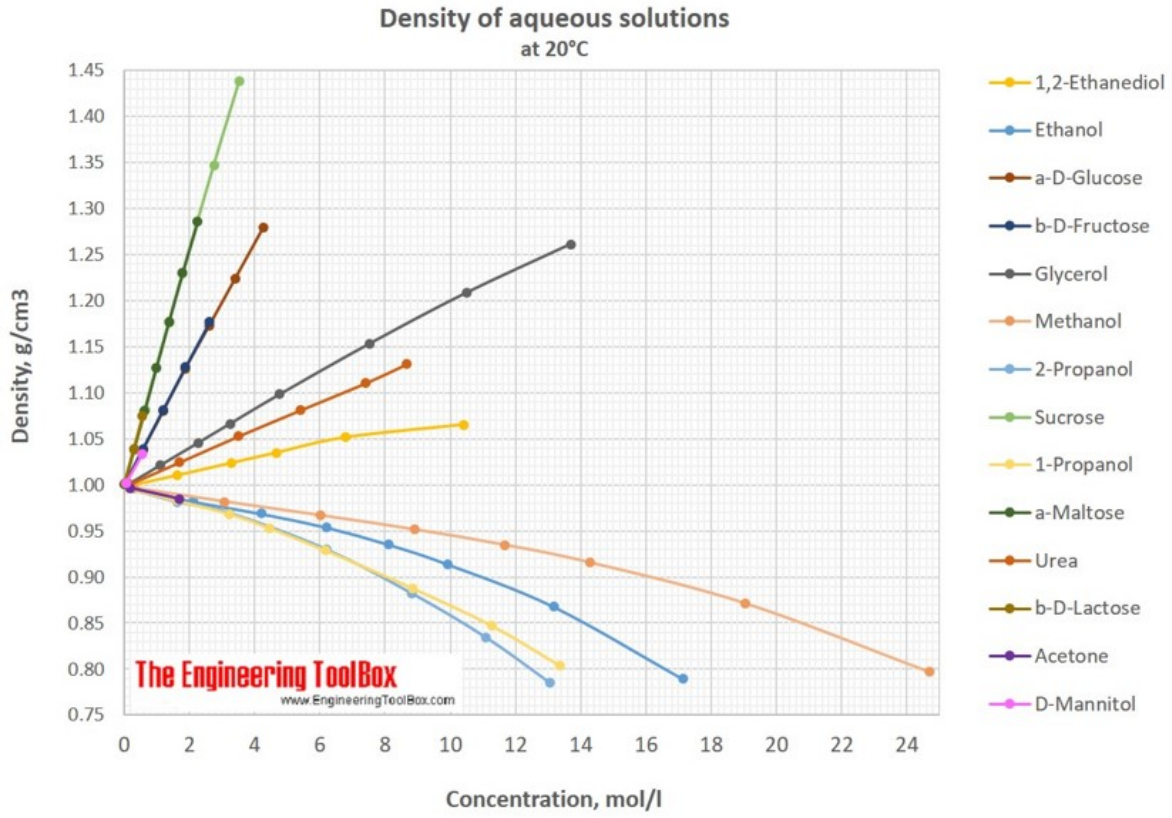
Density of aqueous solutions
at 20°C
Density, g/cm3
Concentration, mol/l
1,2-Ethanediol
Ethanol
a-D-Glucose
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Glycerol
Methanol
2-Propanol
Sucrose
1-Propanol
a-Maltose
Urea
b-D-Lactose
Acetone
D-Mannitol
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Density of aqueous solutions at 20°C, given as g/cm^3:

For full table with Glycerol, b-D-Lactose, a-Maltose, D-Mannitol, Methanol, 1-propanol, 2-propanol, Sucrose and Urea - **rotate the screen!**

Mass%	Acetone	1,2-Ethanediol	Ethanol	b-D-Fructose	a-D-Glucose
1	0.9968	0.9995	0.9963	1.0021	1.0020
5	0.9912	1.0044	0.9893	1.0181	1.0175
10	0.9849	1.0108	0.9819	1.0385	1.0375
20		1.0241	0.9687	1.0816	1.0797
30			0.9539	1.1276	1.1260
40		1.0514	0.9352	1.1769	1.1724
50		1.0650	0.9139		1.2235
60					1.2793
70			0.8676		
80					
100			0.7893		
Density of aqueous solutions at 20°C, given as wt%					

Conversion of the concentration from mass% to mol/kg (moles of solute/kg of water = molality):

For full table with Glycerol, b-D-Lactose, a-Maltose, D-Mannitol, Methanol, 1-propanol, 2-propanol, Sucrose and Urea - **rotate the screen!**

Mass%	Acetone	1,2-Ethanediol	Ethanol	b-D-Fructose	a-D-Glucose
1	0.170	0.163	0.219	0.056	0.056
5	0.876	0.848	1.142	0.292	0.292
10	1.913	1.790	2.412	0.617	0.617
20		4.028	5.427	1.388	1.388
30			9.303	2.379	2.379
40		10.741	14.471	3.700	3.700
50			21.706		5.551
60		24.166			8.326
70			50.648		
80					
Mol/kg solution at 20°C					

Conversion of the concentration from mass% to mol/liter (moles of solute/liter of solution = molarity):

For full table with Glycerol, b-D-Lactose, a-Maltose, D-Mannitol, Methanol, 1-propanol, 2-propanol, Sucrose and Urea - **rotate the screen!**

Mass%	Acetone	1,2-Ethanediol	Ethanol	b-D-Fructose	a-D-Glucose
1	0.172	0.161	0.216	0.056	0.056
5	0.837	0.809	1.074	0.283	0.282
10	1.696	1.628	2.131	0.576	0.576
20		3.300	4.205	1.201	1.199
30			6.212	1.878	1.873
40		6.776	8.120	2.613	2.603
50			9.919		3.396
60		10.406			4.261
70			13.183		
80					
100			17.133		
Mol/liter solution at 20°C					

Related Topics

- **Material Properties** - Material properties of gases, fluids and solids - densities, specific heats, viscosities and more.
- **Densities** - Densities of solids, liquids and gases. Definitions and convertion calculators.

Related Documents

- **Alcohols and Carboxylic Acids - Physical Data** - Molweight, melting and boiling point, density, pKa-values, as well as number of carbon and hydrogen atoms in molecules are given for 150 different alcohols and acids.
- **API Gravity** - API expresses the gravity or density of liquid petroleum products. Online API to Specific Gravity calculator.
- **Concentration Units Converter** - Calculator and formulas for conversion between different units of concentration: Molarity, molality, mole fraction, weight percent of solute and grams of solute per liter of solution - descriptive terms for solubility.
- **Crude Oil - Density vs. Temperature** - Variations in crude oil density are shown as function of temperatur, together with volume correction factors.
- **Densities of Aqueous Solutions of Inorganic Chlorides** - Changes in density of aqueous solutions with changes in concentration at 20°C. Density of inorganic chlorides in water is plotted as function of wt%, mol/kg water and mol/l solution.
- **Densities of Aqueous Solutions of Inorganic Potassium Salts** - Changes in density of aqueous solutions with changes in concentration at 20°C. Density of potassium salts in water is plotted as function of wt%, mol/kg water and mol/l solution.
- **Densities of Aqueous Solutions of Inorganic Sodium Salts** - Changes in density of aqueous solutions with changes in concentration at 20°C. Density of inorganic sodium salts in water is plotted as function of wt%, mol/kg water and mol/l solution.
- **Densities of Aqueous Solutions of Organic Acids** - Changes in density of aqueous solutions with changes in concentration at 20°C. Density of acetic acid, citric acid, formic acid, D-lactic acid, oxalic acid and trichloroacetic acid in water is plotted as function of wt%, mol/kg water and mol/l solution.
- **Density of Aqueous Solutions of some Inorganic Substances** - Changes in density of aqueous solutions with changes in concentration at 20°C. Density of inorganic substances in water is plotted as function of wt%, mol/kg water and mol/l solution.
- **Density vs. Specific Weight and Specific Gravity** - An introduction to density, specific weight and specific gravity.
- **Elements of the Periodic System** - The elements of the periodic system with names, symbols, atomic numbers and weights, melting and boiling points, density, electronegativity and electron affinity, and electron configuration.
- **Ethanol - Dynamic and Kinematic Viscosity vs. Temperature and Pressure** - Online calculator, figures and tables showing dynamic and kinematic viscosity of ethanol, C_2H_5OH, at varying temperature and pressure - Imperial and SI Units.
- **Ethanol Water Mixtures - Densities vs. Temperature** - Density of Ethyl Alcohol aqueous solutions.
- **Fuel Oils - Densities vs. Temperature** - Variations in fuel oils density as function of temperatur, together with volume correction factors.
- **Hydrocarbons - Physical Data** - Molweight, melting and boiling point, density, flash point and autoignition temperature, as well as number of carbon and hydrogen atoms in each molecule for 200 different hydrocarbons.
- **Hydrocarbons - Autoignition Temperatures and Flash Points** - Autoignition temperatures and flash points (°C and °F) of different types of hydrocarbons with varying carbon numbers up to C12.
- **Hydrocarbons, Alcohols and Acids - Boiling points** - Boiling temperatures (°C and °F) with varying carbon numbers up to C33.
- **Hydrocarbons, Linear Alcohols and Acids - Densities** - Density of hydrocarbons like alcohols and acids as function of carbon number at 20°C / 68°.
- **Jet Fuel - Density vs. Temperature** - Variations in jet fuel density as function of temperatur, together with volume correction factors.
- **Liquid-Liquid Solution - Shrinkage and Estimation of Density** - It is possible to estimate the density of a liquid-liquid solution from the density of the solute and the solvent. However, due to shrinkage, the estimate will be a bit too low.
- **Liquids - Densities** - Densities of common liquids like acetone, beer, oil, water and more.
- **Liquids - Densities vs. Pressure and Temperature Change** - Densities and specific volume of liquids vs. pressure and temperature change.
- **Liquids - Specific Gravities** - Specific gravities of liquids like alcohol, oils, benzene, water and many more.
- **Lubricating Oil - Densities vs. Temperature** - Variations in lubricating oil density as function of temperatur, together with volume correction factors.
- **Naming of Organic Compounds** - Nomenclature rules for different groups of organic compounds and functional groups, together with examples of use of the rules.
- **Organic Sulfur Compounds - Densities** - Liquid density of different kinds of organic sulfur compounds with varying carbon number (20°C/68°F). Comparison of thiols, sulfides, disulfides and thiophenes.
- **Propane Butane Mixture - Evaporation Pressure** - Evaporation pressure of propane butane mixture vs. temperature.
- **Solids - Densities** - Densities of selected solids.
- **Solutions, Molarity and Dilution** - Definitions and examples of how to calculate wt%, molarity and how to prepare dilutions.
- **Water - Specific Volume vs. Temperature** - Online calculator, figures and tables showing Specific Volume of water at temperatures ranging from 0-370 °C and 32 - 700 °F - Imperial and IS Units.

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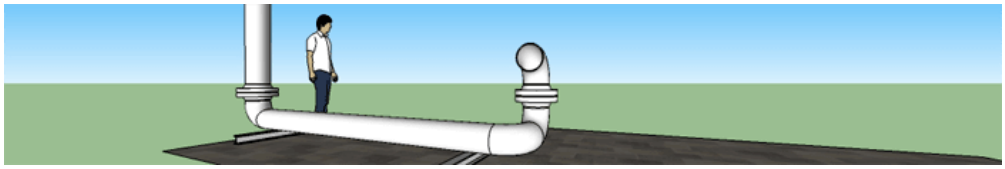

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Modify access date.

- **Statics**
- **Steam and Condensate**
- **Thermodynamics**
- **Water Systems**

Unit Converter

Temperature

0.0

- ◉ °C
- ○ °F

Convert!

Length

1.0

- ◉ *m*
- ○ *km*
- ○ *in*
- ○ *ft*
- ○ *yards*
- ○ *miles*
- ○ *naut miles*

Convert!

Area

1.0

- ◉ m^2
- ○ km^2
- ○ in^2
- ○ ft^2
- ○ $miles^2$
- ○ *acres*

Convert!

Volume

1.0

- ◉ m^3
- ○ *liters*
- ○ in^3
- ○ ft^3
- ○ *us gal*

Convert!

Weight

1.0

- kg_f
- N
- lb_f

Convert!

Velocity

1.0

- m/s
- km/h
- ft/min
- ft/s
- mph
- $knots$

Convert!

Pressure

1.0

- $Pa\ (N/m^2)$
- bar
- $mm\ H_2O$
- kg/cm^2
- psi
- $inches\ H_2O$

Convert!

Flow

1.0

- m^3/s
- m^3/h
- $US\ gpm$
- cfm

Convert!

Scientific Online Calculator

4 7

Make Shortcut to Home Screen?