

GLYCEROL : DENSITY, REFRACTIVE INDEX, FREEZING POINT DEPRESSION, AND VISCOSITY OF AQUEOUS SOLUTIONS

This table gives properties of aqueous solutions of 45 common substances as a function of concentration. All data refer to a temperature of concentration; All data refer to temperature of 20°C.

The properties are:

Mass %	Mass of solute divided by total mass of solution, expressed as percent.
m	Molality (moles of solute per kg of water).
c	Molarity (moles of solute per liter of solution).
ρ	Density of solution in g/cm ³ .
n	Index of refraction, relative to air, at a wavelength of 589 nm (sodium D line); the index of pure water at 20°C is 1.3330.
Δ	Freezing point depression relative to pure water.
η	Absolute (dynamic) viscosity in mPa s (equal to centipoise, cP); the viscosity of pure water at 20°C is 1.002 mPa s.

Density data over a wider range of temperatures and pressures (and for other compounds) may be found in Reference 2.

REFERENCES

1. Wolf, A. V., Aqueous Solutions and Body Fluids, Hoeber, 1966.
2. Söhnel, O., and Novotny, F., Densities of Aqueous Solutions of Inorganic Substances, Elsevier, Amsterdam, 1985.

Mass %	m/mol kg-1	c/mol L-1	ρ /g cm-3	n	Δ /°C	η /mPa s
0.5	0.055	0.054	0.9994	1.3336	0.07	1.048
1.0	0.110	0.109	1.0005	1.3342	0.18	1.022
2.0	0.222	0.218	1.0028	1.3353	0.41	1.048
3.0	0.336	0.327	1.0051	1.3365	0.63	1.074
4.0	0.452	0.438	1.0074	1.3376	0.85	1.100
5.0	0.572	0.548	1.0097	1.3388	1.08	1.127
6.0	0.693	0.659	1.0120	1.3400	1.32	1.157
7.0	0.817	0.771	1.0144	1.3412	1.56	1.188
8.0	0.944	0.883	1.0167	1.3424	1.81	1.220
9.0	1.074	0.996	1.0191	1.3436	2.06	1.256
10.0	1.207	1.109	1.0215	1.3448	2.32	1.291
12.0	1.481	1.337	1.0262	1.3472	2.88	1.365
14.0	1.768	1.568	1.0311	1.3496	3.47	1.445
16.0	2.068	1.800	1.0360	1.3521	4.09	1.533
18.0	2.384	2.035	1.0409	1.3547	4.76	1.630
20.0	2.715	2.271	1.0459	1.3572	5.46	1.737
24.0	3.429	2.752	1.0561	1.3624	7.01	1.988
28.0	4.223	3.242	1.0664	1.3676	8.77	2.279
32.0	5.110	3.742	1.0770	1.3730	10.74	2.637
36.0	6.108	4.252	1.0876	1.3785	12.96	3.088
40.0	7.239	4.771	1.0984	1.3841	15.50	3.653
44.0	8.532	5.300	1.1092	1.3897		4.443
48.0	10.024	5.838	1.1200	1.3954		5.413
52.0	11.764	6.385	1.1308	1.4011		6.666
56.0	13.820	6.944	1.1419	1.4069		8.349
60.0	16.288	7.512	1.1530	1.4129		10.681
64.0	19.305	8.092	1.1643	1.4189		13.657
68.0	23.075	8.680	1.1755	1.4249		18.457
72.0	27.923	9.277	1.1866	1.4310		27.625
76.0	34.387	9.884	1.1976	1.4370		40.57
80.0	43.436	10.498	1.2085	1.4431		59.9
84.0	57.009	11.121	1.2192	1.4492		84.3
88.0	79.632	11.753	1.2299	1.4553		147.5
92.0	124.878	12.392	1.2404	1.4613		384
96.0	260.615	13.039	1.2508	1.4674		780
100.0		13.694	1.2611	1.4735		