

Urea and Guanidine Hydrochloride Stock Solutions

Property	Urea	GuHCl
Mol wt	60.056	95.533
Solubility, 25°C	10.49M	8.54M
d/d_0^a	$1 + 0.2658W + 0.0330W^2$	$1 + 0.2710W + 0.0330W^2$
Molarity ^b	$117.66(\Delta N) + 29.753(\Delta N)^2 + 185.56(\Delta N)^3$	$57.147(\Delta N) + 38.68(\Delta N)^2 - 91.60(\Delta N)^3$
Grams of denaturant/ gram of water to prepare		
6M	0.495	1.009
8M	0.755	1.816
10M	1.103	—

^a W is the weight fraction of denaturant in the solution, d is the density of the solution and d_0 is the density of water (6).

^b ΔN is the difference in refractive index between the denaturant solution and water (or buffer) at the sodium D line. The equation for urea solutions is based on data from Warren and Gordon (7), and the equation for GuHCl solutions is from Nozaki (8).

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Summary of Data on Density and Index of Refraction of Guanidine·HCl

Weight fraction (W)	Molar concn.	Density (d/d_0)	\bar{V} (G · HCl)	$n_D^{22.5}$
0.0	0.0	—	0.700	1.3327
0.09866	1.060	1.02690	0.731	1.3507
0.18661	2.055	1.05186	0.743	1.3672
0.25649	2.878	1.07184	0.749	1.3809
0.36223	4.177	1.10173	0.754	1.4020
0.44181	5.208	1.12617	0.758	1.4188
0.52271	6.296	1.15074	0.760	1.4362

$d/d_0 = 1 + 0.2720 W + 0.0315 W^2$
where d_0 is the absolute density of water at 20.15°C.

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$d/d_0 = 1 + 0.2710 W + 0.0330 W^2$
where d_0 is the absolute density of water at 25°C.
Using d_0 for each appropriate temperature will give density to within 1 part per thousand for any temperature from 15 to 35°C.

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