

Philadelphia Chemical Society meeting ... Symposium on Water (Chair Dor Ben-Amotz)

"Experimental studies of the solute effect in systems with single component liquid-liquid transitions"

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We have put forth the view that water, near its glass transition, T_g , is a strong liquid, much as are SiO_2 and BeF_2 near their respective T_g 's. Water itself is difficult to study near its T_g , both because of the difficulty of vitrifying it, and because of its early crystallization and indefinite glass transition during reheating after it has been vitrified. We revisit the conundrum associated with the glass transition of water as viewed from its known behavior in some of its many glassforming binary solutions with salts and other solutes. We report on specific studies of glassformer dynamics in these solutions as the glass-forming region boundary is approached, and link the findings to recent studies by others in which evidence has been given for separation of a pure vitreous ice phase from the aqueous LiCl solutions. We draw analogies with the behavior of related systems such as $\text{Li}_2\text{O} + \text{SiO}_2$ that have been much studied by electron microscopy, and then speculate on the possibility of seeing similar phenomena in the metallic binary system Ge-Li .