Water-mediated Supersaturation of Sugars in Ionic Liquids

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The low solubility of sugars in organic solvents is a major problem in synthesizing sugar esters through enzyme reactions. To increase the dissolved concentration of sugars, supersaturated sugar solutions in ionic liquids were prepared by a water-mediated method. The supersaturated glucose solutions in [Emim][TfO] and [Bmim][TfO] had concentrations of 19 and 10 times higher than their solubilities, respectively. In the lipase-catalyzed esterification of glucose with vinyl laurate, the conversion for the reaction with supersaturated solution in [Bmim][TfO] was 12 times higher than that with saturated solution in the presence of glucose crystal.