

Nature-based deep eutectic solvents : a new generation of designer solvents for reactions and separations

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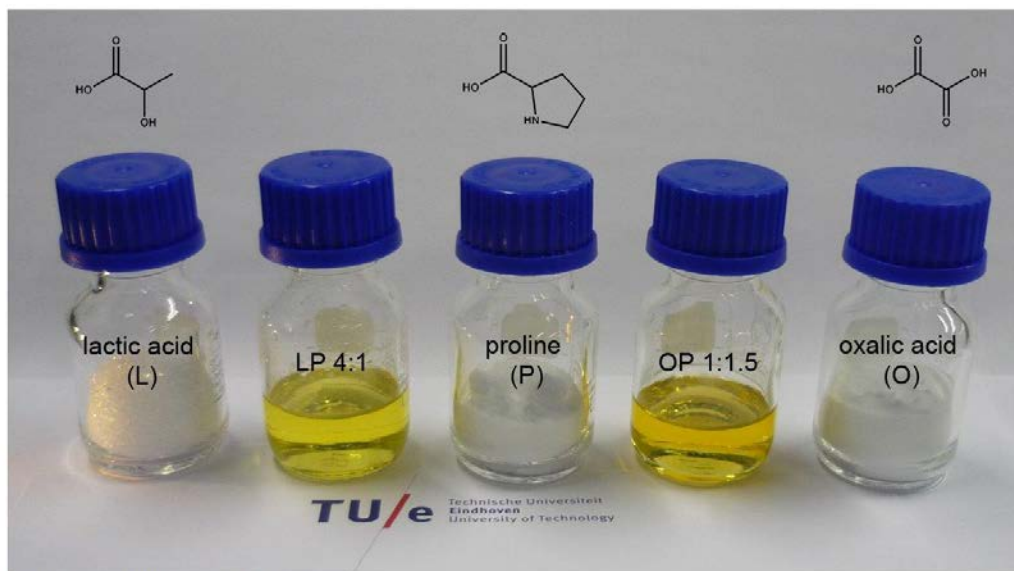
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Abstract title NATURE-BASED DEEP EUTECTIC SOLVENTS: A NEW GENERATION OF DESIGNER SOLVENTS FOR REACTIONS AND SEPARATIONS

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Deep eutectic solvents are mixtures of two or three nature-based compounds that have melting points above 100 °C and are solid at room temperature. However, when you mix these compounds in certain ratios, they form a liquid phase at room temperature with very low volatility. The first deep eutectic solvent (choline chloride : urea = 1 : 2) was discovered in 2003 by Abbott *et al.* Since this discovery, around 150 journal papers on deep eutectic solvents have appeared (half of them in the last year), mainly involving mixtures of choline chloride with urea or alcohols (glycerol, phenol). This year, I discovered 24 new nature-based and food-grade deep eutectic solvents, consisting of sugar, natural acids, amino acids and/or salts. Still, we have only begun to scratch the surface of this new family of solvents. Many new deep eutectic solvents have yet to be discovered. Their properties and applications are largely unknown. I expect that deep eutectic solvents will attract much interest as green solvents for various applications in the short future. In this talk, I will focus on the interesting characteristics and possible future applications of this new type of solvents, including their use in biomass processing, carbon capture, production of pharmaceuticals, enzymatic reactions and as entrainer in extractive distillations.



Natural deep eutectic solvents formed by mixing organic acids and amino acids