



Multi-Step Solvent Factory

A functional solvents system serves as integrated reactor-separator for the 3-step flow cascade to (1R,3S)-1-(3-chlorophenyl)butane-1,3-diol. The ethoxylated ionic liquid Ammoeng 110TM acts as phase separator for the biocatalyst alcohol dehydrogenase, increasing also its activity and stability. The system water/acetophenone/Ammoeng 110TM gives up to 5 metastable phases which turn with time to fewer phases.

The large diversity of ILs ($>10 \times 10^6$) and conventional solvents (> 7000) opens up possibility for solvent modelling via the COSMO-RS method. We identified 2-hydrazinoethanol as best conventional solvent and also some IL candidates. Cost/LCA assessment and experimental screening will then guide to the final solvents of our "Multi-Step-Solvent-Factory".