

Liquid-liquid biphasic dimerisation of propene and 1-butene using acidic chloroaluminate ionic liquids

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Homogeneously catalyzed chemical reactions have several advantages compared to heterogeneous catalysis, usually milder reaction conditions and higher selectivities. The main disadvantage of a difficult catalyst recycling can be overcome by the application of biphasic liquid-liquid reaction system. Ionic liquids (ILs) have proven to be suitable catalyst phases for technical applications of transition metal catalysis mainly due to their tuneable solubility properties and often low nucleophilicity. The dimerisation of short-chain alkenes is of industrial interest, e.g. to produce intermediates for plasticizer alcohols.

Our poster presents detailed studies of the Ni-catalyzed dimerisation of propene and 1-butene in a slightly acidic system of BMIM[Cl]/AlCl₃ with heptane as second, organic extraction phase. The experiments were performed in a batch reactor. Several Ni-catalyst systems were screened under various conditions. Compared to the homogeneous reaction in toluene a significantly enhanced activity was found. In addition, the solubilities of all relevant reactants have been determined. Kinetic parameters for the reaction will be presented and for the system IL/organic solvent the Hatta-number has been determined.