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Innovative Approaches for Catalyst Removal and Recycling in Organocatalysis

A significant disadvantage of organocatalysis so far is the use of high catalyst loadings between 1 and 30 mol% to obtain high selectivities and productivities. To overcome this drawback this project aimed at the development of efficient catalyst recycling concepts. For this purpose, three innovative strategies for catalyst recycling were designed, investigated and evaluated. Within the first stage, organic solvent nanofiltration was used for recovery and reuse of an organocatalyst. The embedding of organocatalysts in IL-based hydrogels as a second possibility for catalyst and product separation is an interesting novel immobilization method. Switchable solvent systems, which are already established for transition metal catalysts, were investigated as the third separation method to optimize the organocatalytic reaction.