

The role of neutral anions in ionic liquid as solvent media for the reactivity and stereoselectivity towards asymmetric Michael addition reaction of n-pentanal with β -nitrostyrene catalyzed by L-Proline

ABSTRACT

Michael addition reactions of n-pentanal with β -nitrostyrene in achiral and chiral ionic liquids catalyzed by l-proline were studied. Results indicate anion plays an important role as weak coordination properties in the reactivity and stereoselectivity towards Michael product. 1-Butyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide ([Bmim][NTf₂]) ionic liquid was found to be the best solvent media with a high yield (up to 90%) and a high diastereomeric ratio (syn/anti: 91/9), with moderate enantioselectivity (38% ee) among ten ionic liquids tested. The ionic liquid has been reusable over five numbers of cycles.

Keyword : Anion; Cation; Chiral; Enantioselective; Ionic liquid; l-proline; Michael addition