Various polar tripeptides as asymmetric organocatalyst in direct aldol reactions in aqueous media

ABSTRACT

A series of tripeptide organocatalysts containing a secondary amine group and two amino acids with polar side chain units were developed and evaluated in the direct asymmetric intermolecular aldol reaction of 4-nitrobenzaldehyde and cyclohexanone. The effectiveness of short polar peptides as asymmetric catalysts in aldol reactions to attain high yields of enantio- and diastereoselective isomers were investigated. In a comparison, glutamic acid and histidine produced higher % ee and yields when they were applied as the second amino acid in short trimeric peptides. These short polar peptides were found to be efficient organocatalysts for the asymmetric aldol addition reaction in aqueous media. Chirality 25:726-734, 2013.

Keyword: Aldol reaction asymmetric; Organocatalyst; Short polar peptide.