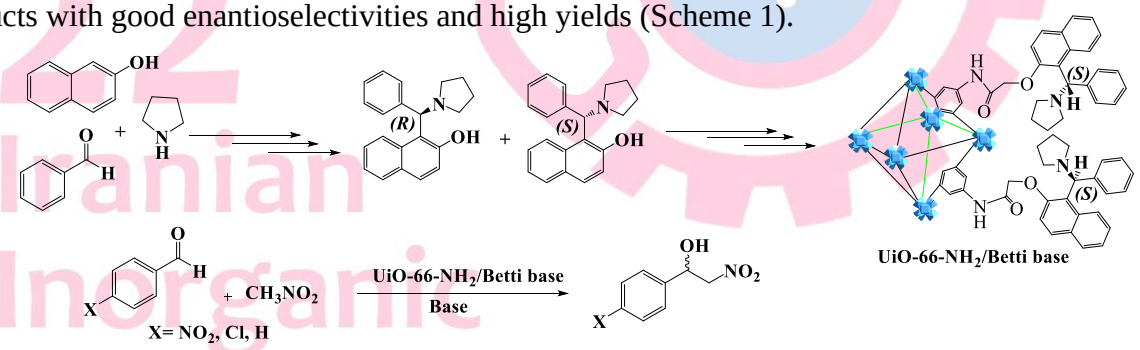
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Asymmetric Henry reaction catalyzed by chiral heterogeneous Betti base ligands

Bahareh Rostami Tabesh, Yunes Naghdi, Shiva Majidian and Saadi Samadi *

*Laboratory of asymmetric synthesis, Department of Chemistry, Faculty of Science, University of Kurdistan, Sanandaj, Iran.*E-mail: s.samadi@uok.ac.ir*

Henry reaction is one of the most famous methods for the formation of carbon-carbon bonds, which is carried out through the addition of nitroalkane compounds to carbonyl-containing compounds such as aldehyde or ketone in the presence of a base and finally produces β-Nitroalcohol compounds, which are valuable raw materials are in organic synthesis [1,2]. The immobilization of chiral ligands on an inorganic substrate such as UiO-66-NH_2, in order to prepare a heterogeneous chiral catalyst, has attracted much attention due to different advantages of heterogeneous catalysts [3]. Chiral Betti bases can be used as ligands in various reactions to induce chirality [4]. In this work, racemic Betti bases were first synthesized by a multicomponent reaction between 2-naphthol, benzaldehyde and pyrrolidine, and then the resulting enantiomers were separated by diastereomeric crystallization method using L-tartaric acid in acetone. Next, the UiO-66-NH_2 metal-organic framework was synthesized by solvothermal method and after functionalization of it using 2-chloroacetyl chloride, the synthesized chiral Betti ligand was immobilized on it. Finally, this heterogeneous chiral ligand was used in the asymmetric Henry reaction in order to chirality induction, which resulted in the synthesis of chiral β-Nitroalcohol products with good enantioselectivities and high yields (Scheme 1).



Scheme 1: Synthesis of chiral heterogeneous Betti base ligands and using in enantioselective Henry reaction

Keywords: Chiral Betti base, Heterogeneous catalyst, Henry reaction, Chiral β-nitroalcohol

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