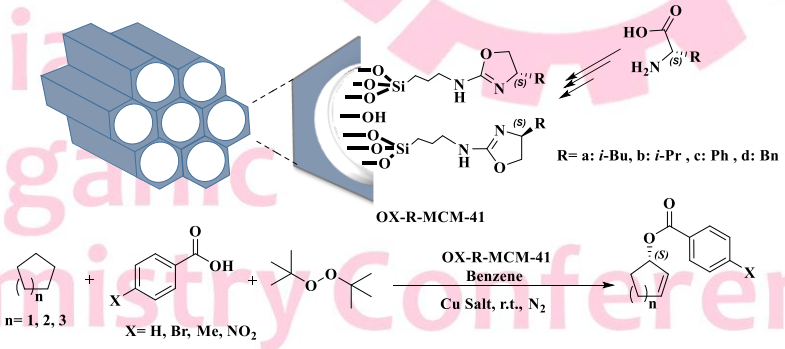
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Simultaneous dehydrogenation and allylic oxidation of cycloalkane in the presence of chiral heterogeneous oxazoline-based catalysts for the synthesis of chiral allylic esters

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Dehydrogenation of alkanes and allylic oxidation of alkenes are both known reactions separately, but the combination of them in a single reaction is rare [1]. There is also no report about the use of chiral catalysts in this type of reaction in order to the synthesis of chiral allylic esters. There are many ways to access enantioenriched compounds which one of them is using chiral catalysts. Using heterogeneous chiral catalysts has drawn a lot of attention because of some advantages such as easy separation and reuse as well as the possibility of giving a product with high enantioselectivity [2]. Immobilization of an efficient chiral ligand on an inorganic substrate such as MCM-41 is a way to access these catalysts. Chiral oxazoline-based ligands are considered as selective and efficient catalysts in recent years [2, 3]. In this study, first, MCM-41 mesoporous silica was prepared and then functionalized with 3-chloropropyl trimethoxysilane. Next, the chiral amino oxazoline ligands, synthesized from chiral amino alcohols and cyanogen bromide, were immobilized on it. In continue and for the first time, the copper complexes of synthesized heterogeneous oxazoline ligands were used in simultaneous dehydrogenation reaction and allylic oxidation of cycloalkanes in the presence of benzoic acid derivatives and di-tert-butyl peroxide (DTBP) (Scheme 1). The resulting chiral allylic esters, were obtained in high yields and good to excellent enantioselectivities.



Scheme 1: Synthesis of chiral allylic esters from cycloalkane using chiral heterogeneous oxazoline-based catalysts

Keywords: Chiral heterogeneous oxazoline-based catalysts, Dehydrogenation, Allylic oxidation, Chiral allylic ester.

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