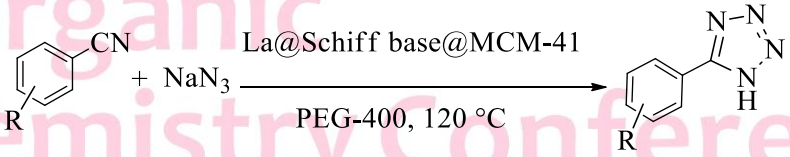
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A La-Schiff base complex on MCM-41 as a recyclable nanocatalyst in the homoselective synthesis of tetrazoles

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Recyclable and high efficient catalysts are one of the principles of green chemistry [1]. Therefore difficult recovering of the homogeneous catalysts and low catalytic activity of the heterogeneous catalysts are main challenges chemists [2]. To overcome on these problems, the nanostructure catalysts emerged as ideal catalysts because nanocatalysts have a heterogeneous nature with high surface area [3]. Therefore, nanocatalysts exist as a border between heterogeneous and homogeneous catalysts because they have advantages from both, such as efficiency, selectivity and reusability [3,4]. Therefore, various nanoparticle have been employed in catalysis applications. Amongst them, mesoporous nanomaterials especially MCM-41 were widely used as a support for immobilization of various catalysts [5]. Because MCM-41 has unique properties e.g. excellent stability, high surface area, easy surface modification, homogeneous hexagonal channel structure, large pore volumes, and easy separation from the reaction mixture [6]. Therefore, we investigated a new lanthanum-Schiff-base complex on MCM-41 (La@Schiff base@MCM-41) as an efficient, stable and reusable nanocatalyst in the homoselective synthesis of 5-substituted 1H-tetrazoles. La@Schiff base@MCM-41 was characterized by ICP, CHN, XRD, TGA, BET, FT-IR, SEM, EDS and WDX techniques. This catalyst has good stability and heterogeneity nature which can easily recovered and reused for several times without significant loss in catalytic activity. The recovered La@Schiff base@MCM-41 catalyst was characterized by FT-IR, SEM and AAS techniques.

Keywords: Mesoporous MCM-41, tetrazoles, lanthanum, selective catalyst, Schiff-base complex



Scheme 1. Synthesis of 5-substituted 1H-tetrazoles in the presence of La@Schiff base@MCM-41.

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