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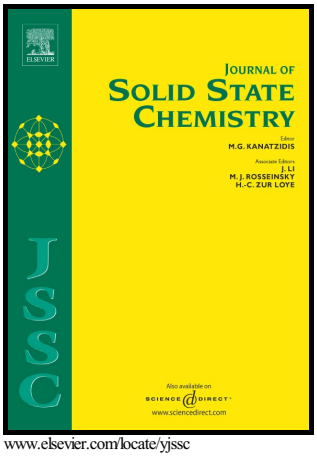

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Silica functionalized Cu(II) acetylacetonate Schiff base complex: An efficient catalyst for the oxidative condensation reaction of benzyl alcohol with amines

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Abstract:

Silica functionalized Cu(II) acetylacetonate Schiff base complex *via* the one pot reaction of silica functionalized 3-aminopropyltriethoxysilane with acetyl acetone and copper acetate has been reported. The synthesized material was well characterized by analytical techniques such as FT-IR, UV-DRS, XRD, SEM-EDX, HR-TEM, EPR, ICP-AES and BET analysis. The characterization results confirmed the grafting of Cu(II) Schiff base complex on the silica surface. The catalytic activity of synthesized silica functionalized Cu(II) acetylacetonate Schiff base complex was evaluated through the oxidative condensation reaction of benzyl alcohol to imine.

Keywords:

Silica; Cu(II) acetylacetonate Schiff base complex; 3-Aminopropyltriethoxysilane; Oxidative condensation.

1. Introduction

In recent years, functionalization of silica material with metal complexes are very active area of research in the fields of organic synthesis, catalysis, adsorption, separation and sensing [1-5]. Because, these heterogenized metal complexes of their easy separation from the reaction mixture and minimal product contamination caused by metal leaching [6-9], as well as the recyclability of catalyst [10], it is well known that Schiff base metal complexes have been widely employed as an efficient catalyst in a variety of oxidation reactions [11-14]. Due to their environmental issue arises from homogeneous catalyst and newer development in chemistry, which cannot be well suitable for large scale process, recent researchers are very much interested in the transformation of homogeneous catalytic reaction into heterogeneous process. Generally, heterogeneous catalyst has been prepared by anchoring homogeneous catalysts onto insoluble supports like, metal oxides [15], aluminophosphates [16], MCM-41 [17], silica [18], SBA-16 [19], SBA-15 [20], montmorillonite [21], Zeolite-X [22], and zeolite-Y [23].

Oxidation of alcohols to the corresponding carbonyl compounds is one of the most important transformations in organic synthesis [24-26]. In particular, the oxidation of benzyl