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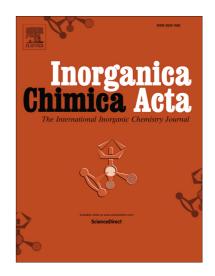
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Ethoxysilane appended M(II) complexes and their SiO₂/MCM-41 supported forms as catalysts for efficient oxidation of secondary alcohols

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ABSTRACT

Divalent transition metal complexes ML_2 (M = Mn 1; Co 2; Cu 3; Zn 4), possessing an ethoxysilane group as a part of the bidentate Schiff base ((*E*)-1-((3-(triethoxysilyl)propylimino)methyl)naphthalen-2-ol (*L*)), have been synthesized. While the copper complex 3 has been isolated in an analytically pure form and characterized by spectroscopic and single crystal XRD studies, the formation of complexes 1, 2, and 4 in solution has been verified by ESI mass spectroscopy and subsequently used for further catalyst preparation without their isolation. Treatment of the in situ formed 1-4 with pre-activated silica in boiling toluene produces the catalysts 5-8, respectively. The copper complex 3 was also treated with MCM-41 in boiling toluene to obtain $CuL_2@MCM-41$ (9). Elemental analysis (CHN), ESI MS, IR, UV-vis., $^{13}C & ^{29}Si NMR$, EPR, P-XRD, TGA, BET, SEM and TEM have been used to characterize the compounds. Compounds 3 (homogeneous) and 5-9 (heterogeneous) have been utilized as catalysts in the oxidation of secondary alcohols to corresponding carbonyls in the presence of H_2O_2 , t-BuOOH, and $C_6H_5C(CH_3)_2OOH$. 3 and 9 have shown better catalytic activity than the rest of the catalysts investigated. Combination of 9 with H_2O_2 is the best catalytic system due to its efficiency and reusability besides being environment friendly.

KEYWORDS: Schiff base, coordination, spectroscopy, heterogeneous catalysis, oxidation, green chemistry

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