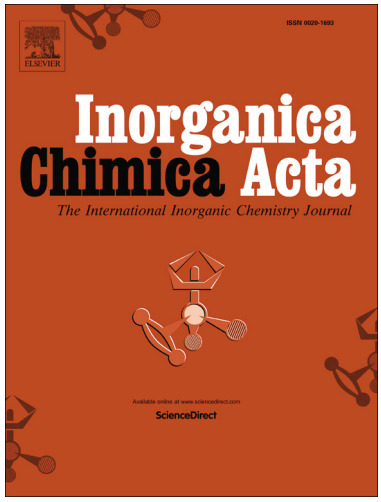

Research paper

Ethoxysilane appended M(II) complexes and their SiO_2/MCM-41 supported forms as catalysts for efficient oxidation of secondary alcohols

Rajendran Antony, Rajendiran Marimuthu, Pratap Vishnoi, Ramaswamy Murugavel

PII: S0020-1693(17)30891-5
DOI: http://dx.doi.org/10.1016/j.ica.2017.09.024
Reference: ICA 17880

To appear in: *Inorganica Chimica Acta*

Received Date: 7 June 2017
Revised Date: 12 August 2017
Accepted Date: 8 September 2017

Please cite this article as: R. Antony, R. Marimuthu, P. Vishnoi, R. Murugavel, Ethoxysilane appended M(II) complexes and their SiO_2/MCM-41 supported forms as catalysts for efficient oxidation of secondary alcohols, *Inorganica Chimica Acta* (2017), doi: http://dx.doi.org/10.1016/j.ica.2017.09.024

Ethoxysilane appended M(II) complexes and their SiO_2/MCM-41 supported forms as catalysts for efficient oxidation of secondary alcohols

Rajendran Antony, Rajendiran Marimuthu, Pratap Vishnoi and Ramaswamy Murugavel*
Organometallics and Materials Chemistry Lab, Department of Chemistry,
Indian Institute of Technology Bombay, Mumbai-400076, India
E-mail: rmv@chem.iitb.ac.in and muruks@iitb.ac.in

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