

Homogeneous And Heterogeneous Catalysts With Silane/Siloxane-Based Discrete Metal Complexes And Metal-Organic Frameworks

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New Cu(II) and Co(II) complexes with discrete structure based on Schiff base resulting from 1:2 condensation of 2,6-diformyl-4-methylphenol and trimethylsilyl-methyl-*p*-aminobenzoate have been prepared. The structures of the complexes were established by X-ray diffraction. The compounds act as homogeneous catalyst precursors for a number of single-pot reactions including: hydrocarboxylation of linear and cyclic alkanes, peroxidative oxidation of cyclohexane and microwave-assisted oxidation of 1-phenylethanol and cyclohexane. Co(II) complex was also tested as catalyst in electrochemical reduction of protons.

Another approach was to test the catalytic activity of Cu(II) and Co(II) metal-organic frameworks (MOFs) obtained from a siloxane dicarboxylate linker and two ancillary auxiliary co-ligands: 4,4'-bipyridine and 1,2-bis(4-pyridyl)ethylene. These MOFs acted as efficient catalysts in two processes occurring in aqueous media: alkaline decomposition of hydrogen peroxide with a conversion of 90% after 30 min and photodecomposition of Congo Red with a discoloration efficiency of ca. 80% after 80 min of exposure to sunlight.

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