

289ac Exploratory Studies on the Oxidation of Cyclohexane in the Presence of Heterogeneous Binuclear and Mononuclear Cu Complex Using Oxygen

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Binuclear bimetallic macrocyclic Cu Co complex, binuclear monometallic Cu Cu complex and Cu salen complex was prepared. The Cu Co complex starting with 2,6-diformyl-4-methyl-phenol and 1,3-diaminopropane, the CuCu complex prepared starting with 2,6-diformyl-4-methyl-phenol and 1,2-phenylenediamine and the Cu salen complex was prepared starting from salicylaldehyde and 1,2-phenylenediamine. These complexes were heterogenised by supporting them on zirconium pillared montmorillonite and modified carabamate silica gel. The elemental analysis was done using scanning electron microscopy. The Cu content in the CuCu complex was 22.62%, Cu content in the Cu salen complex was 24.01% and Cu and Co content (wt. %) in the CuCo complex was found to be 13.82% and 11.24% respectively. The catalysts developed were used to carry out oxidation of cyclohexane using oxygen as the oxidant in the absence of initiators and solvents. The reaction was conducted in a rocking type batch reactor and temperature was varied from 423K to 483 K. The products were analysed using GC and GC-Mass spectroscopy and cyclohexanol and cyclohexanone were found to be the major products. The metal complexes supported on both modified silica gel and modified montmorillonite were found to be free from leaching under the reaction conditions studied.