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ABSTRACT

Transition metal catalysts play an important role in modern organic chemistry promoting a number of fundamental reactions such as carbon-carbon, carbon-nitrogen, carbon-hydrogen, and carbon-oxygen bond formation. The immobilization of the catalytically active transition metal complexes onto suitably stable solid support is of great interest from the economic as well as the ecological point of view, since it allows efficient catalyst recovery and reuse, thereby minimizing both catalyst cost and contamination of the reaction products. The oxidation of primary and secondary alcohols into the corresponding carbonyl compounds plays a central role in organic synthesis. Selective oxidation of aliphatic alcohols to aldehydes with molecular oxygen is presumably the most demanding transformation. A great number of new catalysts have been suggested in recent years for the clean oxidation of alcohols with molecular oxygen.

The present work in this thesis was to prepare the catalysts based on polymer supported copper metal complex and use them for the oxidation of alcohols and olefins. The polymer used in my thesis is the cross linked polystyrene and bio polymer chitosan.

Four catalysts were prepared out of them two catalysts were prepared by anchoring copper on anion exchange resin through the ligands DMG and EDTA. While the remaining two Catalysts were prepared using polymer chitosan copper with ligands isatin and mercaptobenzothiazole respectively. All these catalysts were characterised by some physiochemical techniques. All these catalysts were found to be active for the oxidation of some alcoholic substrates and olefins

under mild conditions of temperature and pressure using molecular oxygen and hydrogen peroxide as the oxidant. The influence of concentration of the catalyst and the substrate and temperature on the rate of reaction was carried out. In the case of benzyl alcohol and cyclohexane as the substrate, the formation of benzaldehyde and cyclohexanone as the oxidation product was confirmed by GC – MS technique. This observation many be due to the influence of the ligand.