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Polymer supported chemistry has been in the limelight for the last three decades because of its versatility and efficiency as reagents, substrates and catalysts. An advancement in this field is the tailor-made polymer supports with the desired combination of properties. Recently there has been observed a growing interest in the synthesis of polymer supported metal complexes as polymer supported schiff bases show great affinity for metal ions. Complexes of many transition metal ions are found to be good catalysts.

Hence it is worthwhile to synthesize and characterize polymer supported schiff base ligands and metal complexes out of them. Thus three schiff bases of amino methylated polystyrene with aldehydes such as p-hydroxy benzaldehyde, p-dimethyl amino benzaldehyde and 3-nitro benzaldehyde were synthesized. Subsequently three series of complexes of Cu[II], Ni[II], Co[II], Fe[III], Mn[II] and Zn[II] were prepared and all of them were characterized.

Polymer supported ligands are found to be efficient complexing agents and their high selectivity enables the removal and analysis of traces of heavy metal ions even in the presence of large amounts of sodium and potassium ions. Heavy metal ions are toxic to all the living organisms of land and sea. Therefore the metal ion removal studies were carried out to develop optimum conditions using the schiff bases of amino methylated polystyrene with p-hydroxy benzaldehyde and p-dimethyl amino benzaldehyde for the removal of Cu[II] and Fe[III] respectively.

Polymer supported membranes function as ion selective potentiometric sensors which allow the exchange of specific ions among other ions of the same charge. The complex of Cu(II) with the schiff base obtained by the condensation of amino methylated polystyrene with p-dimethyl amino
benzaldehyde is used as the ionophore for the fabrication of the copper sensor electrode.

**Chapter 1** gives an introduction to polymer supports, polymer supported complexes and a brief review on application of polymer supported complexes.

**Chapter 2** explains the materials and instruments used and the procedure adopted for the synthesis and characterization of schiff bases and complexes.

**Chapter 3** illustrates the results of characterization that led to the ascertainment of the structure of the synthesized schiff bases and complexes.

**Chapter 4** focuses on metal ion removal studies using the schiff base of amino methylated polystyrene with 4-hydroxy benzaldehyde and schiff base of amino methylated polystyrene with p-dimethyl amino benzaldehyde. The efficiency of the method and optimum conditions developed is described.

**Chapter 5** describes the fabrication of the Cu \(^{2+}\) ion selective sensor electrode, its selectivity, response behaviour and applicability.

**Chapter 6** Summary and conclusions.