PREFACE

Transition metal complexes with Schiff bases as ligands have been amongst the widely studied coordination compounds and find remarkable applications in different fields. The chelating characters of Schiff bases towards transition metals are very interesting. Schiff bases coordinate to the metal ion through nitrogen atom of azomethine group. The presence of functional group with replaceable hydrogen atom near enough to >C=N renders extra stability to metal complexes through chelation.

In the present course of studies the complexation of four new Schiff bases furoin-2-aminothiophenol (FATP), furoin-2-aminophenol (FAP), furoin thiosemicarbazone (FTSC) and furoin semicarbazone (FSC) have been studied extensively. Co(II), Ni(II), Cu(II) and Zn(II) metal ions are used for complexation. Characterisation of metal complexes has been done based on the physicochemical studies. These results are presented in Part I.

Thermal studies of selected Schiff base complexes are carried out using Thermogravimetry. Order of reaction, activation energy and entropy of activation are evaluated using the Coats–Redfern equation. The results of these studies are given in Part II
Based on the X-ray powder diffraction pattern the crystal lattice and cell dimensions of eight newly synthesised Schiff base complexes are determined and reported in Part III.

Part IV explores the application of newly synthesised Schiff bases as corrosion inhibitors on mild steel in hydrochloric acid media.

Another potential application of the synthesised ligands and complexes as semiconductor materials is envisaged by studying the solid state D.C electrical conductivity and their temperature dependence. The results are summarised in Part V.

Detailed lists of references have been arranged in serial order and are given at the end of each part. The thesis concludes with a brief summary.

The research work presented in this thesis has partly been published/under publication as indicated


2. Synthesis and characterisation of Co(II), Ni(II), Cu(II) and Zn(II) complexes of Schiff bases furoin-2-aminothiophenol, furoin-2-amino
phenol, furoin thiosemicarbazone and furoin semicarbazone. (To be communicated to Transition Metal Chemistry)

3. Thermal decomposition and kinetic studies of transition metal complexes derived from Schiff bases furoin-2-aminothiophenol, furoin-2-aminophenol, furoin thiosemicarbazone and furoin semicarbazone. (To be communicated to Thermochemica Acta)

4. Powder X-ray diffraction studies of transition metal complexes of furoin based Schiff bases. (To be communicated to Bulletin of Material Science)

5. Corrosion inhibition studies of four new Schiff bases on mild steel in 1M HCl. (To be communicated to Electrochemica Acta)

6. Electrical conductivity of metal complexes derived from furoin based Schiff base ligands. (To be communicated to Material Chemistry and Physics).