

PREFACE

I started the research work presented in this thesis entitled “**Ionic Liquid-Supported Schiff Bases and their Transition Metal Complexes: Synthesis, Physico-Chemical Characterization and Biological Activities**” in 2011 under the supervision of Dr. Biswajit Sinha, Professor, Department of Chemistry, University of North Bengal, India with an aim to synthesize the imidazolium based ionic liquid-supported Schiff bases and their transition metal complexes, their physico-chemical characterization and exploration of their biological activities, specially antibacterial and antimicrobial activities against naturally available bacteria.

It is well known that metal ions play vital roles in a number of biological processes. The metal ions with biologically active ligands are a subject of considerable interest; therefore much attention was paid due to their numerous applications as antitumor, antibacterial and antifungal agents. Schiff bases have been studied extensively over the years due to their selectivity and sensitivity towards various transition metal ions. They may act as polydentate ligands for the complexation with different transition metal ions like Mn(II), Co(II), Ni(II), Cu(II), Mn(III), Fe(III), Cr(III), *etc.*

Of late ionic liquids have drawn much interest in the context of green synthesis and catalysis, *etc.* Their merit lies in the ease with which their properties can be tuned by varying either the anion or the cation or the substitutions on the cation. The study of ionic liquids that are air and moisture stable has become a subject of extensive scientific investigations well documented in the literature. Catalytic utilization of the transition metal complexes prepared by these tunable ligands is very promising. Suitable changes of the steric or electronic environment about the metal complexes can have a dramatic influence on their physico-chemical properties. The functionalized ionic liquids (FILs) are favorite as ligands for the recovery of metal catalysts used in a series of chemical transformations such as olefin metathesis, hydrogenation, hydroformylation, Negishi cross-coupling reaction, Heck reaction, Suzuki and Stille coupling reactions, *etc.* Therefore studies on the ionic liquid (imidazolium based)-supported Schiff bases and their transition metal complexes would be quite interesting from the point of view: their stability, geometry, biological activity and potential applications in many fields.