

ABSTRACT

Supramolecular chemistry based on molecular recognition is one of the most popular and fastest growing subjects and has added a new dimension to chemistry. The molecular recognition studies of carboxylic acids are of prime importance due to its versatile appearance in biologically active molecules. The binding of carboxylic acids by the designed receptor is of enormous interest to mimic the biological events in the field of molecular recognition research.

The design, fabrication of structurally defined architectures having nitrogen and oxygen containing heterocyclic frame works is one of the major goals of organic and inorganic chemistry. Among small organic molecules, nitrogen heterocycles especially azirine holds a special place due to its high reactivity.

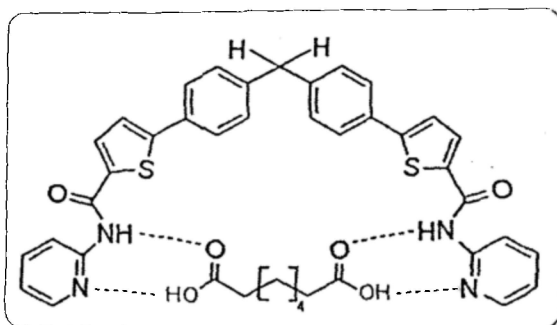
Many interesting results have been reported in recent years about colorimetric chemosensors for metal ions but there are still abundant aspects that need to be conveniently addressed in this field. Especially reports of highly selective chemosensor for target metal ions are still limited. The nitrogen containing Schiff's bases which show perceived color change is useful not only for the ratiometric method of detection but also for rapid visual sensing.

We have seen that macrocyclic *bis*-ethers and spirocyclic ethers are important from biological and medicinal point of view. Inspired by these beneficial effects of *bis*-ethers and spirocyclic compounds, we became interested to synthesize some macrocycles and spiro cyclic ethers.

The dissertation entitled "Design and Synthesis of Some Heteroatom Containing Supramolecules: Selective Recognition of Dicarboxylic Acids, Complexation with Metal Ions and Preparation of Some Spiro and Macrocyclic Compounds" has been organized in 4 chapters.

Chapter 1: *Molecular Recognition: Studies on the Synthesis of Methylene Pivotal Bis-Thiophene Carboxamide Derivatives as Ditopic Receptor for Suberic Acid*

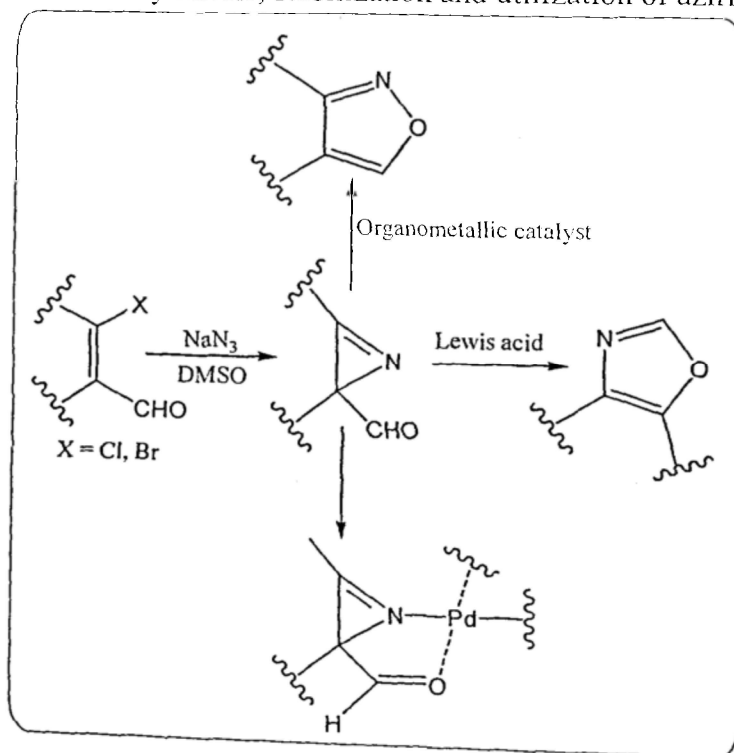
In this chapter selective recognition of dicarboxylic acids through multipoint hydrogen bonds of the different receptors have been reported. Consequently the association constant was also calculated by using both NMR and fluorescence titration experiment.



Chapter 2 (Part A): *A Simple Approach to Azirines Containing an Aldehyde Functionality and their Stabilization as Palladium(II) Complex*

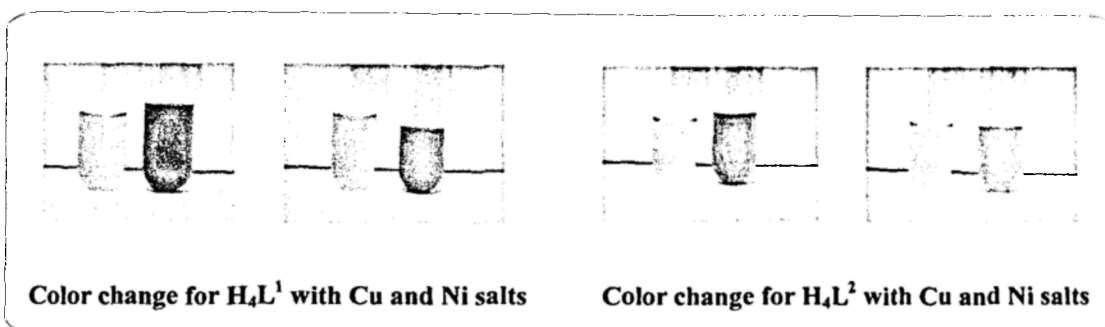
Chapter 2 (part B): *Utilization of Azirines as Synthetic Tools for Five Membered Oxazole and Isoxazole Rings*

This chapter describes the synthesis, stabilization and utilization of azirines.



Chapter 3: *Visible Colorimetric and Ratiometric Fluorescent Chemosensors for Cu(II) and Ni(II)*

In this chapter new fluorescent and colorimetric chemosensors for Copper(II) and Nickel(II) have been developed. Here fluorescent probe (H_4L^1 and H_4L^2) senses only Cu(II) and Ni(II) over other transition metal ions by means of a colorimetric method



Chapter 4: *Synthetic Approach Towards Macrocyclic Bis-ethers and in Sequence use of Barbier Reaction and RCM for Spirocyclic Ethers*

In this chapter some macrocyclic bis-ethers and a number of spirocyclic ethers have been synthesized by the combination of Barbier reaction and RCM.

