

ABSTRACT

The thesis records the synthesis, structural elucidation and electrochemical studies of a range of new macrocyclic and encapsulation compounds. The research has been described in six chapters. In Chapter I, an outline has been traced on the advances of macrocyclic and encapsulation complexes.

In Chapter II, synthesis of a series of novel macrocyclic complexes of nickel(II), cobalt(II) and iron(II) derived from bis-(oxalodihydrazide) and bis-(malonodihydrazide) precursors using various cyclizing agents, viz. formaldehyde, acetaldehyde, cyclohexanone, vicinal diketones and the diester, diethyl oxalate has been described. Synthesis of novel trinuclear copper(II) complexes and dinuclear nickel(II) and cobalt(II) complexes derived from bis-(oxalodihydrazide)metal(II) and α,ω -dialdehydes is described in Chapter III. Chapter IV deals on a group of trinuclear nickel(II) macrocyclic complexes derived from bis-(dihydrazone)nickel(II) complexes and α,ω -diketones.

Chapter V has been divided into three sections. Sections A and B describe mononuclear and dinuclear fluoroboro-bridged metal(II) macrocyclic complexes respectively. Section C describes a series of alkoxyboro- and fluoroboro-capped iron(II) encapsulation compounds derived from oxalodihydroxamic acid. The complexes have been characterized by spectral studies.

Electrochemical redox behaviours have also been investigated, and the results have been discussed on the basis of thermodynamic considerations. The highlights of research work have been summarized in Chapter VI.

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