SUMMARY

This thesis is concerned with synthesis, structural aspects, magnetic properties, electrochemical studies, thermal decomposition kinetics and antimicrobial activities of some transition metal complexes. Thirty new complexes of substituted thiosemicarbazones with 3d transition metals have been prepared. These ligands derived from 2,6-diformyl-p-cresol and substituted thiosemicarbazides. The transition metals used are VO(IV), Mn(III) and Zn(II). All the complexes were characterized by elemental analysis, molar conductivity measurements, IR, $^1$H NMR, UV-Visible, ESR, FAB-mass spectroscopy, cryomagnetic studies and cyclic voltammetry. The ligands contain SNONS donor sequence possessing five potential coordinating sites and can bind two metal ions leading to oxobridged binuclear complex. Various molecular-orbital parameters have been calculated for VO(IV) complexes and the tentative structure has been assigned.

Based on the above studies, it is concluded that the VO(IV) complexes are monomeric, square-pyramidal, Mn(III) complexes are dimeric, octahedral and Zn(II) complexes are tetrahedral. Antimicrobial activities reveal that the zinc complexes are moderate to highly active against the species used.

Some new complexes of VO(IV) and Zn(II) metals with newly synthesized Schiff-base ligands and macrocycles, derived from 2,4-dihydroxy 5-acetyl acetophenone and substituted diamines. The ligands and their metal complexes were characterized by elemental analysis and various physico-chemical studies. Various ligand-field and molecular-orbital parameters have been calculated and the tentative structure has been assigned. Antibacterial and antifungal activities were carried out for the zinc complexes. From the data it is concluded that the ligands and their zinc complexes are more active against fungi's than bacteria.