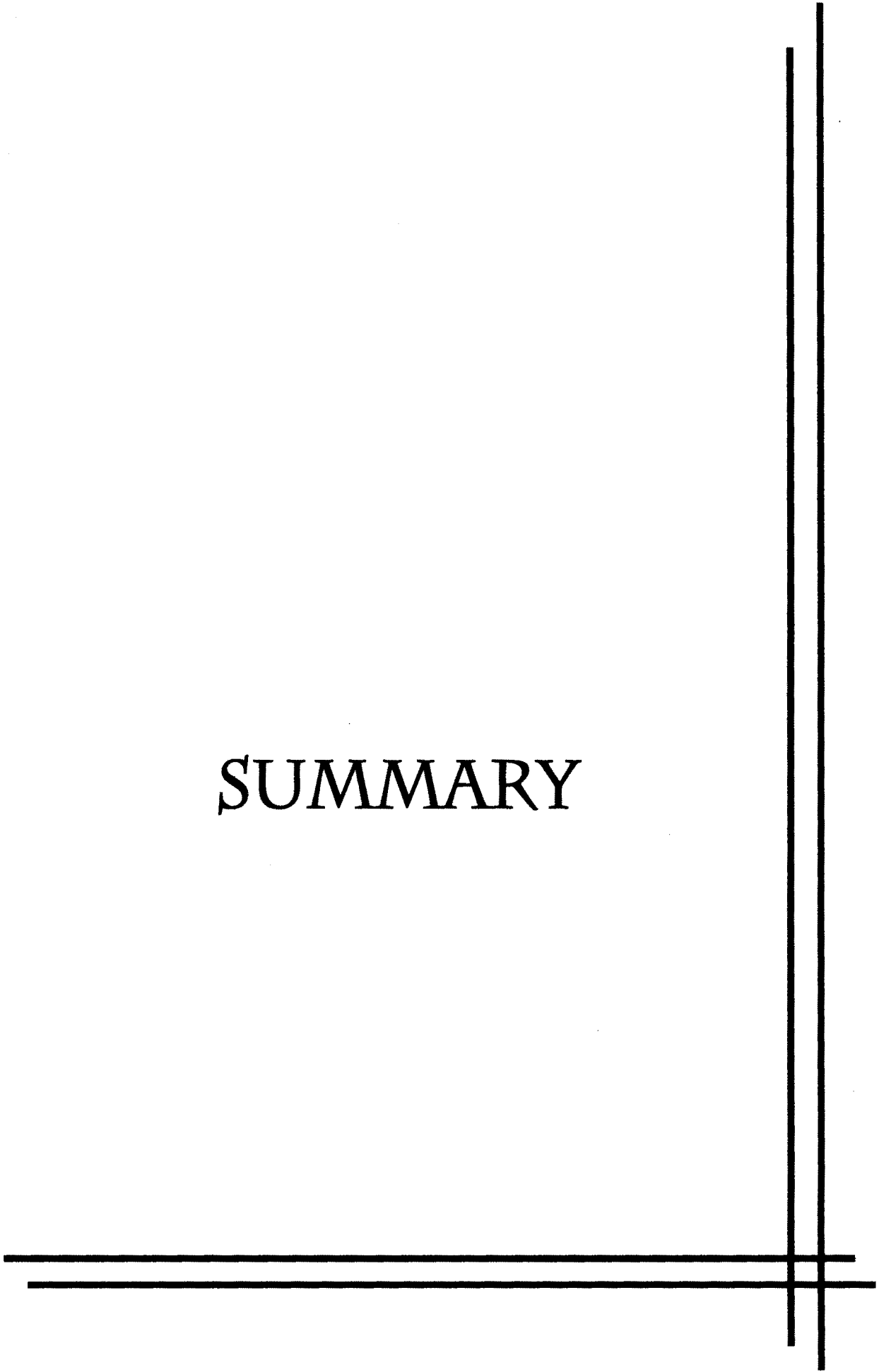


SUMMARY



Chapter I give a general introduction to transition metal chelates of some quadridentate Schiff bases with respect to their structural properties. It also includes a brief review of the investigations on metal chelates of H₂BPPz-en, H₂BPPz-mph, H₂BPPz-pph, H₂BPPz-benz ligand. The survey of literature showed that different quadridentate systems have been extensively studied but no systematic work seems to have been done on quadridentate Schiff base of 4-Benzoyl-3-methyl-1-[4'-nitrophenyl]-2-pyrazolin-5-ones. i.e. 4-Benzoyl -3- methyl-1-[4'-nitrophenyl]-2-pyrazolin-5-one as ligands having ONNO donor sequence. It was therefore, thought worthwhile, to study structure and properties of various metal chelates of a group of related quadridentate ligands.

Chapter II describes the experimental methods used for the syntheses of 4-Benzoyl -3- methyl-1-[4'-nitrophenyl]-2-pyrazolin-5-one and their Schiff base with ethylenediamine, m-phenylenediamine, p-phenylenediamine and benzidine. It also describes the general procedure used for the synthesis of VO(II), Cr(III), Mn(II), Fe(II), Fe(III), Co(II), Ni(II),Cu(II) and Zn(II) chelates with the above Schiff bases.

Chapter III gives an outline of the different physico-chemical methods used in the present study. The following physico-chemical methods have been used:

1. Color
2. Metal,carbon,hydrogen and nitrogen analysis
3. Conductivity measurements.
4. ¹³C NMR Spectral studies (ligands)
5. FT-IR spectral studies
6. Electronic spectral studies (300-1300 nm)
7. Magnetic studies
8. Thermogravimetric analysis

Chapter IV describes in detail, the information obtained by different physico-chemical methods and its interpretation with respect to the structure of metal chelates.

The conductivity, magnetic, electronic spectral and thermogravimetric data suggest six coordinate octahedral stereochemistry for all the metal chelates. The IR spectral data suggest quadridentate nature of the ligand and show coordination to the metal ions through the nitrogen atoms of the azomethine groups and the enolic oxygen of the 5-OH groups. The rest of the coordination positions have been occupied by either the water molecules or by acetate (CH_3COO^-) and water molecule.

Chapter V describes the studies on antimicrobial activities of the Schiff bases ligands and their metal chelates.

All the ligands and their metal chelates prepared during the present investigations are tested for their antibacterial, antifungal and antiyeasts activity against *Escherichia coli*, *Bacillus subtilis* and *Aspergillus nigar*, *Trichoderma longibrachiatum* and *Rhodotorula minuta*, *Pichiastipitis* respectively using standard literature procedures. It was observed that all the synthesized ligands and their metal chelates affect the growth of microorganisms and resulted into inhibitory effect. The antimicrobial activity of the metal chelates was found higher than that of the corresponding ligands.

TABLE

METAL ION	GENERAL FORMULA OF THE CHELATE	LIGAND	COORDINATING ATOMS OF THE THIOSEMICARBAZONE LIGAND	GEOMETRY OF THE CHELATE
VO(II)	[ML(H ₂ O)]	H ₂ BPPz-en	ONNO	Octahedral
		H ₂ BPPz-mph		
		H ₂ BPPz-pph		
		H ₂ BPPz-benz		
Cr(III)	[ML(H ₂ O)OAc]	H ₂ BPPz-en	ONNO	Octahedral
		H ₂ BPPz-mph		
		H ₂ BPPz-pph		
		H ₂ BPPz-benz		
Mn(II)	[ML(H ₂ O) ₂]	H ₂ BPPz-en	ONNO	Octahedral
		H ₂ BPPz-mph		
		H ₂ BPPz-pph		
		H ₂ BPPz-benz		
Fe(II)	[ML(H ₂ O) ₂]	H ₂ BPPz-en	ONNO	Octahedral
		H ₂ BPPz-mph		
		H ₂ BPPz-pph		
		H ₂ BPPz-benz		
Fe(III)	[ML(H ₂ O)OAc]	H ₂ BPPz-en	ONNO	Octahedral
		H ₂ BPPz-mph		
		H ₂ BPPz-pph		
		H ₂ BPPz-benz		

METAL ION	GENERAL FORMULA OF THE CHELATE	LIGAND	COORDINATING ATOMS OF THE THIOSEMICARBAZONE LIGAND	GEOMETRY OF THE CHELATE
Co(II)	[ML(H ₂ O) ₂]	H ₂ BPPz-en	ONNO	Octahedral
		H ₂ BPPz-mph		
		H ₂ BPPz-pph		
		H ₂ BPPz-benz		
Ni(II)	[ML(H ₂ O) ₂]	H ₂ BPPz-en	ONNO	Octahedral
		H ₂ BPPz-mph		
		H ₂ BPPz-pph		
		H ₂ BPPz-benz		
Cu(II)	[ML(H ₂ O) ₂]	H ₂ BPPz-en	ONNO	Octahedral
		H ₂ BPPz-mph		
		H ₂ BPPz-pph		
		H ₂ BPPz-benz		
Zn(II)	[ML(H ₂ O) ₂]	H ₂ BPPz-en	ONNO	Octahedral
		H ₂ BPPz-mph		
		H ₂ BPPz-pph		
		H ₂ BPPz-benz		