## CONTENT

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>INTRODUCTION</td>
<td></td>
</tr>
<tr>
<td>1.A.</td>
<td>General</td>
<td>1</td>
</tr>
<tr>
<td>1.B.</td>
<td>Quadridentate chelating agents</td>
<td>3</td>
</tr>
<tr>
<td>1.C.</td>
<td>Metal complexes containing ONNO donor sequence</td>
<td>6</td>
</tr>
<tr>
<td>1.D.</td>
<td>Present work</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>REFERENCES</td>
<td>43</td>
</tr>
<tr>
<td>II.</td>
<td>SYNTHESIS OF SOME TETRADENTATE SCHIFF BASES DERIVED FROM 4-CARBOXALDEHYDE-1-PHENYL-3-METHYL-2-PYRAZOLIN-5-ONE, WITH SOME DIAMINES AND THEIR METAL CHELATES</td>
<td></td>
</tr>
<tr>
<td>2.A.</td>
<td>Present work</td>
<td>79</td>
</tr>
<tr>
<td>2.B.</td>
<td>Materials</td>
<td>86</td>
</tr>
<tr>
<td>2 C.</td>
<td>Synthesis of Ligands</td>
<td>86</td>
</tr>
<tr>
<td>2 D.</td>
<td>Synthesis of Chelates</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>REFERENCES</td>
<td>89</td>
</tr>
</tbody>
</table>
III. EXPERIMENTAL TECHNIQUES

3.A General 90
3.B. Elemental analysis 91
3.C. Electrical Conductivity measurements 91
3.D. Magnetic susceptibility measurements 92
3.E. Spectrophotometric measurements 94
3.F. Thermogravimetric analysis (TGA) 95

REFERENCES 96

IV RESULTS AND DISCUSSIONS

4.A. Present work 98
4.B. General 99
4.C. $^{13}$C NMR Spectral studies of Schiff bases ligands 100
4.D. Infrared Spectral studies 100
4.E. Electronic Spectral studies 107
   VO(II) Chelates
   Cr(III) Chelates
   Mn(II) Chelates
   Fe(II) Chelates
   Fe(III) Chelates
   Co(II) Chelates
   Ni(II) Chelates
   Cu(II) Chelates
4.F. Magnetic Properties 120
4.G. Thermogravimetric analysis (TGA) 121

REFERENCES 128
V ANTIMICROBIAL STUDIES

5.A. General 153
5.B. Studies on antimicrobial activities 156
5.C. Present work 159
5.D. Experimental 160
5.E. Results and discussion 165
5.E.1. Effect of Ligands and their Metal Chelates on the Growth of Bacterial Cultures 165
5.E.2. Effect of Ligands and their Metal Chelates on the Growth of Fungal Cultures 167
5.E.3. Effect of Ligands and their Metal Chelates on the Growth of Yeast Cultures 169

REFERENCES 172
SUMMARY 178
AUTHOR'S PUBLICATIONS 183