PREFACE

The azo derivatives of pyrazolones and β-diketones find significance in the academic and research fields. Their main application in the industrial field is still the dyeing property. The metal complexes of these azo dyes due to their stability also find a host of applications viz., in the analytical field.

The donor behaviour of multidentate ligands has always captivated the attention of the researchers. Hence, it was found appropriate to investigate the ligational properties of the above mentioned compounds. The emphasis is set on the structural aspects of the ligands and metal complexes with the help of many of the modern instrumental facilities. A possible application of europium complex of the ligand is also envisaged.

The present investigation encompasses the synthesis and characterization of four ligands, phenylazo dimedone (AD), 1-phthalazinyl 3-methyl-2-pyrazolin-5-one (HyPy), phenylazo dehydroacetic acid (ADAA) and antipyrinylazodimedone (DAAP). Five metal complexes in each category have also been synthesised and characterized.

The thesis has been divided into two parts for the sake of convenience. Part I comprises the synthesis and characterization of the ligands and metal complexes. Part II deals with the photophysical studies.
Part I is arranged in six chapters.

Chapter I consists of three sections: Section A unfolds a retrospection of the previous works on azoderivatives of various \( \beta \)-diketones and pyrazolones. A collection of the implementation of the different aspects of the azoderivatives is included in Section B. The objective and scope of the present work is highlighted in Section C.

Chapter II mentions the materials used and the methods adopted for the investigation.

Chapters III, IV, V and VI describes the synthesis, characterization and structural aspects of the four ligands AD, HyPy, ADAA and DAAP, respectively and their metal complexes using various physico-chemical and spectral methods.

Part II consists of two chapters and deals with the possible utility of one of the ligands, AD when complexed with europium in light emitting devices (LED). There has been plenty of published work on polymers impregnated with europium-chelates during the later half of twentieth century. LED technology is undergoing constant refinement as it is environment friendly and economical. The synthesis and characterization of two europium complexes with phenylazo dimedone (AD) in one and dimedone in the other and their incorporation into four different polymers and the basic
absorption/PL studies have been included in Chapter II of Part II. The work has been undertaken keeping in mind the choice of active material in OLED on the premise that similar results were obtained in other published works.

The references are cited in serial order at the end of each chapter in Part I and the references for Part II are appended at the end of the thesis.