

PREFACE

Organic compounds represents important reagents for the quantification of trace metal ions in environmental, biological and alloys etc. Different classes of Organic compounds are employed as analytical reagents like carboxyl, sulphonic, oximic, nitro, phenolic, thiophenolic, acid imide and derivatives of ammonia like $-\text{NH}_2$, $-\text{NHR}$, $-\text{NR}'\text{R}''$ etc. Among the above class oximes and Hydrazones are potential analytical reagents for the determination of metal ions by Spectrophotometry.

The important class of organic reagents is derived from Carbonyl compounds reaction with amino compounds. The compounds containing the azomethine group ($>\text{C}=\text{N}-$) possess basic properties. They accept a proton from a bronsted-lowry acid to form the conjugate cation. They react with hydroxylic compounds to yield hydrogen bonded complexes in aprotic solvents. The most characteristic feature relating to this basic character of the compounds lies in the formation of complexes with metals. Therefore it is essential that, another functional group with a replaceable hydrogen atom, preferably a hydroxyl group shall be present in the molecule of the Schiff base near enough to $>\text{C}=\text{N}$ -group to permit the formation of five membered or six membered ring by chelation with the metal ion. The coordination complexes formed with divalent metal ion and also on the nature of the substituent on the nitrogen atom, the substituent if any on the aromatic ring.

Besides the utility of azomethines as complex formers in the analytical field, they are used widely in agriculture and medicine as fungicides and drugs respectively. Among the azomethines, hydrazones and semicarbazones are found useful as anti-convulsants. These semicarbazones are also found to possess anti-tuberculous, anti-leprotic, anti-rheumatic activities. These activities are related to their complex forming abilities with the metal ions.

In the view of the great complex forming abilities of the azomethines and their metal complexes being used as drugs, the author has synthesized 3,5-Dimethoxy-4-hydroxybenzaldehyde isonicotinoylhydrazone (DMHBIH) and diacetylmonoxime-3-amino-4-hydroxybenzoylhydrazone (DMAHBH) and studied their spectrophotometric behaviour under different pH conditions.

A comprehensive summary of work entitled “**Spectrophotometric determination of metal ions using organic reagents**” has been incorporated in this thesis. The whole thesis is divided into seven chapters.

Chapter 1 deals with the general introduction to Organic reagents.

Chapter 2 comprises literature survey of Hydrazones and other Organic reagents used for the determination of Lead (II), Cadmium (II), Vanadium (V) and Copper (II) by using Spectrophotometer.

In Chapter 3 Theoretical analysis of present research work was described.

Chapter 4 explains the experimental investigations of present study. It includes the synthesis and characterization of analytical organic reagents- DMAHBH, DMHBIH. Direct and derivative spectrophotometric determination of Cd(II), Pb(II), V (V) and Cu (II) using DMAHBH and Cd(II), Pb(II) with DMHBIH reagent is also included.

Chapter 5 deals with the Experimental Results & Discussion

Chapter 6 deals with the summary, conclusion and recommendations of the present research work.