

**SYNTHESIS AND CHARACTERIZATION OF NEW SCHIFF BASES DERIVED
FROM BENZALDEHYDE WITH
O-PHENYLENEDIAMINE AND 1,3-DIAMINOPROPANE
AND THEIR Ni(II), Cu(II), Zn(II) AND Co(II) COMPLEXES.**

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ABSTRACT

SYNTHESIS AND CHARACTERIZATION OF NEW SCHIFF BASE DERIVED FROM BENZALDEHYDE WITH *O*-PHENYLENEDIAMINE AND 1,3-DIAMINOPROPANE AND THEIR Ni(II), Cu(II), Zn(II) AND Co(II) COMPLEXES.

Two new Schiff base ligands are prepared by condensation reaction of benzaldehyde with *o*-phenylenediamine and 1,3-diaminopropane in the ratio of 2:1. The complexes of two Schiff bases, bis(benzaldehyde)*o*-phenylenediamine (baOPD) and bis(benzaldehyde)1,3-diaminopropane (baprop) with Ni(II), Cu(II), Zn(II) and Co(II) have been successfully prepared. The metal complexes are prepared by the direct method in the ratio of 1:1 (baOPD/baprop : metal) and the template method in the ratio 2:1:1 (benzaldehyde : OPD/1,3-diaminopropane : metal). Elemental analysis data, and magnetic susceptibility values have been obtained, IR and ¹H NMR spectral studies have been carried out to suggest tentative structures for the characterization of the complexes and ligands. The results suggest that the direct method is better than template method for complexation and the Schiff bases are bidentate ligands (NN) coordinating through the azomethine nitrogens.

CHAPTER 1

INTRODUCTION

1.1 What is Schiff base?

A Schiff base (or azomethine), named after a German chemist, Hugo Schiff (1834-1915), contains a carbon-nitrogen double bond ($\text{CH}=\text{N}$) functional group with the nitrogen atom connected to an aryl or alkyl group (R) but not hydrogen, ($\text{R}-\text{C}=\text{N}$). Schiff bases can be synthesized from primary amine and a carbonyl compound by nucleophilic addition forming a hemiaminal, followed by a dehydration to generate an imine.

The chemistry Schiff base ligands warrants in-depth study because they can be formed from umpteen number of combinations of starting materials containing $\text{C}=\text{O}$ and amine precursors. The Schiff bases derived from aldehydes form an interesting series of ligands whose properties can be greatly modified by introducing organic substitutions thereby inducing different stereochemistry in the resultant metal complexes (Tarafder et al., 2002). The number of ligands synthesized continues to increase because of the intriguing observation that different ligands show different biological properties, although they may differ only slightly in their molecular structures. The synthesis of Schiff base complexes continues to be of interest in order to evaluate their coordination chemistry and