

**SYNTHESIS AND CHARACTERIZATION OF SCHIFF BASE LIGAND  
DERIVED FROM *O*-PHENYLENEDIAMINE AND  
4-NITROBENZALDEHYDE AND ITS COMPLEXES**

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## ABSTRACT

### **SYNTHESIS AND CHARACTERIZATION OF SCHIFF BASE LIGAND DERIVED FROM *O*-PHENYLENEDIAMINE AND 4-NITROBENZALDEHYDE AND ITS METAL COMPLEXES**

The Schiff base ligand was prepared by a condensation reaction of *o*-phenylenediamine with 4-nitrobenzaldehyde. Metal complexes of a Schiff base were derived from condensation of *o*-phenylenediamine and 4-nitrobenzaldehyde in the presence of metal salt namely Ni(II) acetate tetrahydrate, Mn(II) nitrate tetrahydrate, Co(II) acetate, as well as Cu(II) chloride. The ligand and its metal complexes are reported and characterized based on elemental analysis, IR spectroscopy and molar conductance. All the metal complexes were non-electrolyte.

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

#### 1.1.1 Schiff bases

Schiff base (or azomethine) is any compound that contains carbon-nitrogen double bonds with the nitrogen atom connected to an aryl or alkyl group. Schiff bases are generally bidentate or tridentate ligands capable of forming very stable complexes with transition metals (Bukhari *et al.*, 2005).

Schiff bases are typically formed by the condensation of a primary amine and an aldehyde and also by primary amine and ketone. The resultant functional group is  $R'R''C=N-R'''$  and is called an imine that binds metal ions via the N atom lone pair. When it is used in combination with one or more donor atoms, it forms polydentate chelating ligand. The chemical equation of Schiff base synthesis is shown in Figure 1.1.

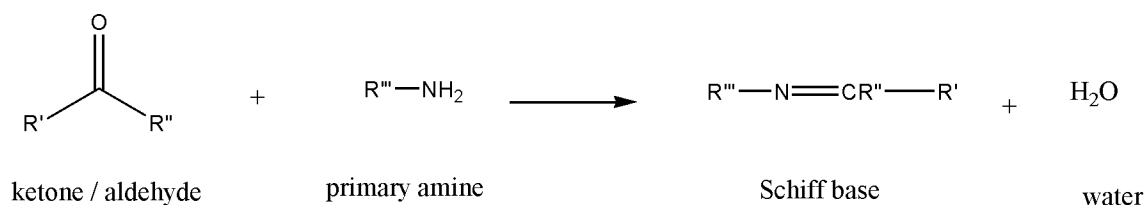


Figure 1.1: Formation of Schiff base