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Synthesis and Characterization of Some of Cupper (II) and Nickel (II) Complexes of Schiff-Base

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Abstract

A Schiff-base ligand derived from meta-phenelyenediamine and β-naphtholaldehyde and its transition metal complexes with Cu (II) and Ni (II) have been synthesized. The prepared Schiff-bases were characterized by IR, UV-Visible and CHN. The electrical properties of the prepared Schiff-bases were studied and the maximum value of the conductivity was $1.37*10^{-4}ohm^{-1}.cm^{-1}$ after doping with I_2.

Keywords: Schiff-base, transition metal complexes

Introduction

The condensation of an amine and an aldehyde to give an imine is well known reversible; removal of water to derive this reaction to completion is often essential to obtain a good yield. The condensation has been used by many research to form both small and large macrocycles, usually template with transition metals [1,2]. Schiff-base complexes are important for designing metal complexes related to synthetic and natural oxygen carriers. The complexes make these compounds effective and stereo specific catalyst for oxidation, reduction and hydrolysis and they show a biological activity and other transformations of organic and inorganic chemistry [3]. It is well known that some drugs have a higher activity when administered as metal complexes than as free ligand [4]. During the past two decades, considerable attention has been paid to the chemistry of the metal complexes of Schiff-bases containing nitrogen and other donors [5]. This may be attributed to their stability, biological activity [6] and potential applications in many fields such as oxidation catalysis [7], electrochemistry [8]. The present study has prepared two types of Schiff-bases complexes Cu (II) and Ni (II).

Experimental

A-Chemicals

β-naptholaldehyde (BDH), meta-phenylenediamine (1,3-diamino benzene) (Fluka), Lithium hydroxide mono hydrate (Fluka), Ethanol absolute (BDH), Cupper acetate monohydrate (Fluka), Nickel acetate Dihdrate (Fluka) and water distillation.

B- Instruments

1. IR-Infrared photometer (U-1500) made by (HITACH) in the range (4000-500) cm^{-1} from the College of Education - Department of Chemistry - Basrah University.
2. UV-Visible spectrophotometer made (Lab Med.Inc), U.S.A the range (300-800)nm from the College of Education - Department of Chemistry - Basrah University.
3. Elemental analysis (CHN) from the College of Science -Cairo University.
4. Electrical conductivity (Voltmeter, Power Supply, Resistance, Temperature recorded and Measured Sample Cell) was used under vacuum in the College of Education-Department of Chemistry-Basrah University.