

Binuclear Tetrahedral Dimeric Mg(II) Complexes of Dibasic Tridentate Schiff Base Ligands and Their Microbial Studies

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ABSTRACT

Some Mg(II) complexes of dibasic tridentate Schiff base ligands derived from aldehydes and orthoaminophenol have been synthesized and characterized by some physico-chemical studies; elemental, spectral (IR, UV, NMR), magnetic and conductance analyses. Dimeric tetrahedral geometry for the prepared complexes has been proposed. The antibacterial activity of the prepared complexes was also studied against some gram positive and gram negative bacteria.

Keywords: Tridentate Schiff base, Orthoaminophenol, Mg(II) complexes, Antibacterial activity, Dimeric tetrahedral geometry

INTRODUCTION

A Schiff base named after Hugo Schiff, is a compound that contains azomethine group ($>C=N-$) connected to an aryl or alkyl group but not hydrogen. Schiff base ligands can be synthesized from an amine and a carbonyl compound by nucleophilic addition forming a hemi-aminal group followed by dehydration to generate an imine compound. Schiff base ligands are considered 'privileged ligands' because they are easily prepared by the condensation between aldehydes and amines. Schiff base ligands are able to coordinate with many metals to stabilize their various oxidation states. Schiff bases are generally monodentate, bidentate, tridentate, tetradentate etc. Ligands are capable of forming very stable complexes with transition metals. Most of the tridentate Schiff base ligands are formed by the condensation of β -diketones or o-hydroxyaldehydes or ketones with monoamines. These ligands with ONO donor atom set are well known to coordinate with various metal ions and this has attracted the interest of authors (Samanta, et al. 2007; Ghosh, et al. 2004; Salam, et al. 1997). Ligands with ONS donor atom set are also known to coordinate with metal ions (Chowdhury et al, 2010). Unsymmetrical Schiff bases functionalize as monobasic tridentate (NNO) ligands on complexation with some transition metal ions are reported (Jang, et al. 2005; Rabie, et al. 2008; Roberts, et al. 2010).

In contrast to the extensive converge of transition metal Schiff base complexes, there is a somewhat desultory presentation of magnesium complexes of these ligands. Sal-en complexes of magnesium have been first reported by Corazza