

Synthesis and Biological Screening Study of Novel Imines and Metal Complexes

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ABSTRACT

Two novel schiff bases (E)-6-(4-chloro benzylideneamino)-3,3-dimethyl-7-oxo-4-thia-1-aza-bicyclo heptane-2-carboxylic acid(L1) and (E)-6-(3-methoxy 4-hydroxy benzylideneamino)-3,3-dimethyl-7-oxo-4-thia-1-aza-bicyclo heptane-2-carboxylic acid (L2) and its metal complexes has been prepared. All the synthesized imines and metal complexes were well characterized and screened for antimicrobial activity.

Keywords: Imines, metal complexes, antimicrobial activity, etc.

INTRODUCTION

Schiff base ligands are considered "privileged ligands" because they are easily prepared by the condensation between aldehydes and amines. An incorporation of transition metals into these compounds leads to the enhancement of their biological activities and decrease in the cytotoxicity of both metal ion and schiff base ligand.¹⁻³ Schiff bases, characterized by the azomethine group ($-R-C=N-$), form a significant class of compounds in medicinal and pharmaceutical chemistry and are known to have biological applications due to their antitumor,⁴⁻⁵ antibacterial,⁶⁻⁷ and antifungal,⁷⁻¹⁰ activity.

Schiff bases with donors (N, O, S, etc.) have structural similarities with neutral biological systems. The presence of imino group is utilized in elucidating the mechanism of transformation of racemization reaction in biological system.¹¹⁻¹³

Coordination chemistry, a study of metal complexes is an important research area in inorganic chemistry. Detail reviews regarding Schiff base metal complexes and their applications have been published by several scientist in recent years, Kavita Rana et al.¹⁴ on analgesic, anti-inflammatory effect, S. Arulmurugan et al,¹⁵ and Neelima Mishra et al.¹⁶

on biological activities, Katarzyna Brodowska et al.¹⁷ in various fields of science.

In continuation of our work in Schiff bases and their complexes¹⁸⁻¹⁹, herein we synthesized some new Schiff bases and metal complexes.

EXPERIMENTAL PROCEDURE:

Materials and Methods

All the materials were of commercial grade reagents. Chemicals were purchased from S. D. Fine chemical companies in high purity and used without further purification. Melting points were determined in open capillaries using an Electrothermal Mk3 apparatus. Infrared (IR) spectra in KBr were recorded using a Perkin-Elmer FT-IR spectrometer 65. ¹H NMR spectra were recorded on 400 MHz FT-NMR spectrometer in CDCl₃ as a solvent and chemical shift values were recorded in δ (ppm) related to tetramethylsilane (Me₄Si) as an internal standard. The progress of the reactions was monitored on TLC (Thin Layer Chromatography). Elemental analyses were done on Elemental Varian Instrument. Mass spectra were scanned on Water-TQ Detector.

General Procedures For The Synthesis Of Schiff Bases

To an equimolar mixture of substituted benzaldehyde (1 mmol) and 6-amino-3, 3-