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**Research Article**

**Theme-** *New horizons in chemical sciences.*

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**A Study on the Synthesis and Anti-Microbial Activity of Some New Ethylenediamine Bis-Schiff Bases Ligands and Metal Complexes.**

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**ABSTRACT**

A number of transition metal complexes of Ni (II), Cu (II) And Zn (II) with bi-dentate ligand, Bis-(4-Hydroxy -3 Methoxy -5-Benzylidene ethylenediamine) were prepared in Methanol Separately in stoichiometric proportion 1:2 together; Mixture was reflux for 6 hours, Adjust the PH of solution 7-8 by using alcoholic ammonia solution. The metal Complexes has been characterized on the basis of elemental analysis, conductance .The ligand and metal complexes were screened for their Antimicrobial activities against Escherichia Coli, Staphylococcus Aureus, and Salmonella Typhi.

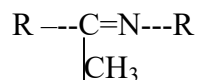
**KEYWORDS**

Schiff Bases, Ligands, Metal Complexes, Anti-microbial Activity.

## 1. INTRODUCTION

The Benzylidenes, Anils and Azomthines are referred as Schiff bases. [1] The Chemistry of Schiff bases [2] has been recognized for signification field of study. >C=N linkage of Schiff bases [3] Play an Important role in certain biological reactions.

The Schiff bases are represented as:-



An Interesting feature of Schiff bases is that they serve as starting material for synthesis of various heterocyclic compounds.[4] Like 4-thiazolidinones and 2-azetidiones[6] which are also very effective against most of diseases like cancer, HIV etc.

The Schiff base sand their metal complexes have great importance recently[1-5] because of their applications analytical, bio-chemical, biological, Clinical ,anti-microbial, anticancer, anti-tumor, analgesic, antipyretic, anti-fungal activity. They have been studied as a class of ligands[6-8] and are known to coordinate with metal ions. Ligands play important role in complex formation. Ligands act as breeding group to form stable metal complex. The metal complex depends on the affinity of metal ion reacts with ligands. The synthesis of transition metal complexes with Schiff are studied due to sensitivity, selectivity and flexibility towards metal[9]. In this paper we describe the behavior of the bi- dentate Schiff bases ligand with Ni (II), Cu(II) and Zn(II)..

## 2. MATERIALS AND METHODS

### *Synthesis of Schiff base ligands*

Compound containing an Azomethine group (-CH=N-) are known as Schiff bases. They are formed by Condensation of a Primary amine with Carbonyl compounds.

### *Preparation of Schiff base Ligands*

A series of Schiff base ligands were prepared by reacting the ethylenediamine with vanillin separately.

#### *1. Preparation of Bis (4-Hydroxy-3-Methoxy benzylidene) ethylenediamine*

To a Mixture of Vanillin (608mg, 4mmol) dissolved in methanol (25 ml) was added 2-3 drops of Glacial Acetic acid and mixture was refluxes for 3 hours. On cooling Solid was filtered washed with water and recrystallized from alcohol.

#### *2. Preparation Of Bis (4-Hydroxy-3-Methoxy benzylidene) ethylenediamine) NI (II) Complex*

Bis ((4-Hydroxy-3-Methoxy benzylidene) ethylenediamine (500mg 2mmol) and Nitrates of Nickel (250mg 1 mmol) separately. The mixture was refluxed for 6 hours pH of the solution is adjusted to 7-8 using alcoholic ammonia.

A Dark brown product was isolated after reduction of volume by evaporation. The solid was filtered of, washed with methanol and dried under vacuum.

**3. Preparation of Bis (4-Hydroxy-3-Methoxy benzylidene) ethylenediamine) Cu (II) Complex**

Bis ((4-Hydroxy-3-Methoxy benzylidene) ethylenediamine (500mg 2mmol) and Nitrates of copper (250mg 1 mmol) separately. The mixture was refluxed for 6 hours pH of the solution is adjusted to 7-8 using alcoholic ammonia.

A Dark Grey product was isolated after reduction of volume by evaporation. The solid was filtered of, washed with methanol and dried under vacuum.

**4. Preparation of Bis (4-Hydroxy-3-Methoxy benzylidene) ethylenediamine) Zn (II) Complex**

Bis ((4-Hydroxy-3-Methoxy benzylidene) ethylenediamine (500mg 2mmol) and Nitrates of Zinc (250mg 1 mmol) Separately. The mixture was refluxed for 6 hours pH of the solution is adjusted to 7-8 using alcoholic ammonia.

A Dark Brown product was isolated after reduction of volume by evaporation. The solid was filtered of, washed with methanol and dried under vacuum.

**Anti-Microbial Activity of Ligands and its Metal Complexes.**

The Anti -bacterial activity of bidetate Schiff base and their metal(II) complexes were Screened against micro-organism. The Microorganism in the present investigation included E.Coli, Staphylococcus Aureus and Salmonella Typhi. Minimum inhibitory concentration (MICS) Method was used to determine antibacterial activity of synthesized complex. The diffusion method is very simple, it requires commercial disk, medium used is Mueller Hinton agar with 2% of Glucose and diameter of inhibition zone is usually read at 24 hours after incubation at 37<sup>0</sup>C. The Antibacterial activity was estimated on the basis of size of inhibition zone around the paper disk on seeded agar plates. Streptomycin was used as Standard. The Results are prepared in table 1.

**Table 1.** Anti-Microbial Activity of Ligands and its Metal Complexes.

| Compound   | Pathogen         |                       |                  |
|--|------------------|-----------------------|------------------|
|  | Escherichia Coli | Staphylococcus aureus | Salmonella Typhi |
| Bis (4-Hydroxy-3-Methoxy benzylidene) ethylenediamine                  | -- --            | -- --                 | -- --            |
| Bis (4-Hydroxy-3-Methoxy benzylidene) ethylenediamine) NI (II) Complex | +++              | ++                    | ++               |

|  |     |     |     |
|--|-----|-----|-----|
| Bis (4-Hydroxy-3-Methoxy benzylidene) ethylenediamine) Cu (II) Complex.: | +++ | +++ | ++  |
| Bis (4-Hydroxy-3-Methoxy benzylidene) ethylenediamine) Zn (II) Complex.  | +++ | ++  | +++ |

### 3. RESULTS AND DISCUSSION

1. No inhibition Zone to the Schiff base i.e. Bis (4-Hydroxy-3-Methoxy benzylidene) ethylenediamine.
2. Bis (4-Hydroxy-3-Methoxy benzylidene) ethylenediamine) NI (II) Complex show highest antibacterial activity against E.Coli.
3. Bis (4-Hydroxy-3-Methoxy benzylidene) ethylenediamine) Cou (II) Complex show highest antibacterial activity against E.Coli and Staphylococcus aureus.
4. Bis (4-Hydroxy-3-Methoxy benzylidene) ethylenediamine) Zn (II) Complex show highest antibacterial activity against E.coli and Salmonella Typhi.

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