REVIEW OF RESEARCH

STUDIES ON SCHIFF BASE METAL COMPLEXES CONTAINING NITROGEN AND OXYGEN AS DONOR ATOM

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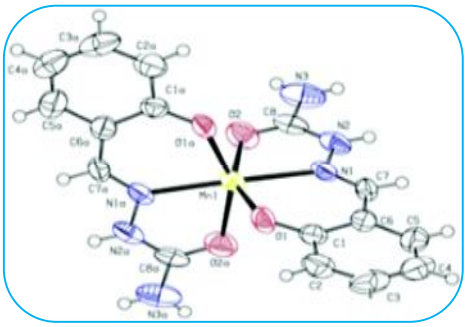
Anjani Kumar Choudhary

Assistant Professor (Guest) , Dept Of Chemistry , M.K.College, Darbhanga.



ABSTRACT:

The present study deals with transition metal complexes of Schiff base ligands derived from glutaraldehyde and amino acids such as L-Leucine (leu), L-Valine (val), L-Alanine (ala), L-Histidine (his) and L-Glutamine(gln). The present work was undertaken with a view to research the donor properties of Schiff base ligand and its use as antimicrobial agent.

KEYWORDS: *Schiff Base, Schiff base metal complexes, Antimicrobial activities, transition metal complexes.*

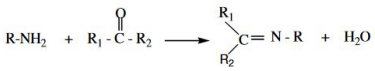
INTRODUCTION:-

Today , the field of research into the transitional metal components of Schiffbases has grown immensely and includes broad and diverse topics covering large areas of organometallic compounds and different aspects of bioinorganic chemistry.

This is because Schiff bases give an abuse for chiral induction, tuning the electronic factor of the metal centred factor and increasing the solubility and stability of the homogeneous or heterogeneous catalyst. Ship bases have unusual structural liability and are sensitive to molecular environment. Transition metals with oxygen and nitrogen donor bases.In order to perform particular psychological activities, the area around metal centre as organised geometry, the number of organised ligands and their donor groups. Furthermore it contributes to their biological activity if the donor atoms are present in the coordinating region. Studies on base metal complexes in the ship cover a broad range of areas ranging between general academic interests and a broader range of biological activities as well as practical usage in various areas such as medicine, agriculture, the detection of trace metal, pharmaceutical products and ion-selective electrodes.

SCHIFF BASES:

The 1864 condensation of a carbonyl compound with an amine leading to a Schiff basewas identified by Hugo Schiff, the German Chemist. In the field of amino acids and Biuret reagent he also worked. The base ship includes -CH = N-and is done in accordance with the Scheme1 The Azomethine Group

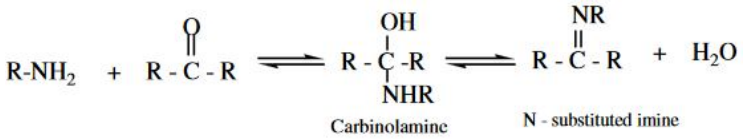


Scheme 1

R, R1 and R2 may be groups of alkyl and aryl. If an aldehyde is the reactant, the hydrogen is group R2. Sometimes they are called anils, imines or azomethines. In the sp2 hybridised orbital the presence of a single electron pair on the amino nitrogen atom gives the group of azomethines greater importance both chemically and biologically. The vessel bases are closer to amino nitrogen with additional donor atoms to form stable chelates with several metal ions.

The formation of an aldehyde or ketone-based Schiff base is reversible and normally under acid or base catalysis or heating

(scheme 2). (Scheme 2). Schiff base



Scheme 2

In general, the creation is guided to completion by the removal or separation of the substance. Many Schiff base may be hydrolysed by aqueous acid or base to its aldehydes or ketones and amines.

BIOLOGICAL IMPORTANCE OF SCHIFF BASES:

Schiff bases ligands, generally linked to aldehyde / ketone can coordinate metals by imine nitrogen and another group of metals. Many Schiff 's foundation studies and compounds have been carried out on the basis of their interesting and important properties such as their ability to bind oxygen reversibly, their catalytic hydrogenating activity, their photochromic characteristics and their complexing capability for certain toxic metals[6]. Complex Schiff bases applications in bioactivity and biological simulation have been shown to be promising.

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METHODS AND TECHNIQUES

- **Aldehyde:**Sigma Aldrich obtained and was used as got, glutaraldehyde (glu).
- **Amino acids:** L-Leucine (leu), L-Valine(val), L-Histidine(his), L-Alanine (ala) and
- **Metal Salts:** The nitrates and the perchloride used in the complex synthesis have been used without further purifications as the best grades of inorganic chemicals available commercially.
- **Solvents:** The standard technique described in the Weiss Berger series or qualitative analyses of Vogel was used to purify common solvents including methanol , ethanol and dimethyl sulphoxide (DMSO) used at different stages of work.

Experimental:

Synthesis of glutaraldehyde-amino acid Schiff bases

A 0.1 mmol glutaraldehyde and 0.2 mmol of suitable amino acids were synthesised in the Schiff bases in 150 ml absolute methanol. (1:2 molar relation). The mixture was refluxed for one hour in a steam bath between 90 and 95 ° C. TLC time to time before finishing examined the reaction. The strong yellow precipitate from the sSchiff bases hip base was filtered, cleaned, drained, recrystallized and eventually placed in a dryer.

Synthesis of glutaraldehyde-amino acid Schiff base metal complexes

Dropwise in 20 cm3 of methanol solution of the Schiff bases ligand methanol with continuous riveting was added salt metal (1,0 mmol) dissolved in 200 cm3 of methanol. For 8 hours, the resultant mixture was flushed and agitated. The solution volume was then reduced to 1/3 and the concentrate refluxed to 0oC. The shaped complex was filtered out, aqueous alcohol washed, purified water washed and vaccinated with the CaCl2 fused.

Antimicrobial activity

Many of the drugs used in administrating metal compounds have enhanced biological activity. The definition and chelation theory of Overtone can be used to describe this causing or enhancing metal complexes. The lipid membrane surrounding your cell favours the passage of only the lip soluble materials, since lip solubility is an important factor regulating antimicrobial activity, as defined in Overtone's definition of cell permeability. On Chelation, the polarity of the metal ion is more diminished

because the ligand is overlapped and the positive load of the metal ion is partly shared between donor groups.

RESULTS AND DISCUSSION

IR Spectra of glu-glnSchiff base complexes:

It is necessary to know the groups coordinated to the metal, comparing the infrared spectra of the glu-gln base ligand and the infrasound spectrum of the respective Cu(II), Ni(II) and Co(II) complexes. At 1655 cm-1 in the ligand the heavy absorbing band in the complexes moved to 1598-1650 cm-1. This suggests the azomethine group's existence and is also due to the azomethine group's participation in the complex formation. The new 430-450 cm-1 and 506-544 cm-1 bands are assigned to the (M-N)and (M-O) stretches in the low-frequency region of the Schiff's IR spectra. The symmetric vibration of the coordinated carboxylate group can be attributed to the strip in the 1346-1369 cm-1 region. The big band 2940-3500 cm-1 in the area further confirms the existence on site of the water molecules. Figures 1 , 2 and 3 demonstrate representative IR spectrums of the same complexes.

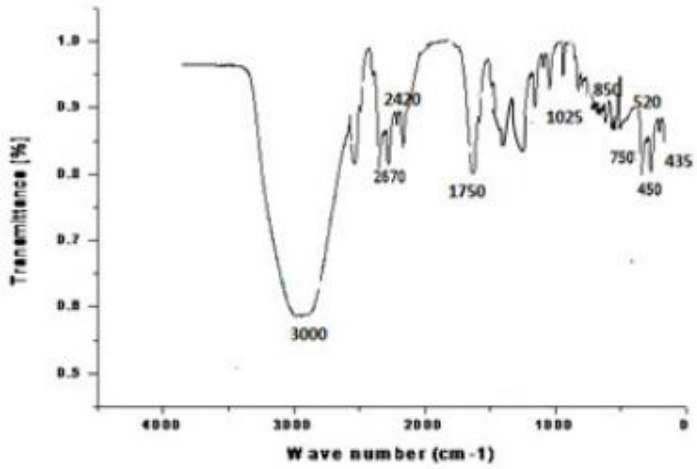

Figure 1: IR Spectrum of [Cu(glu)(gln).2H2O] complex

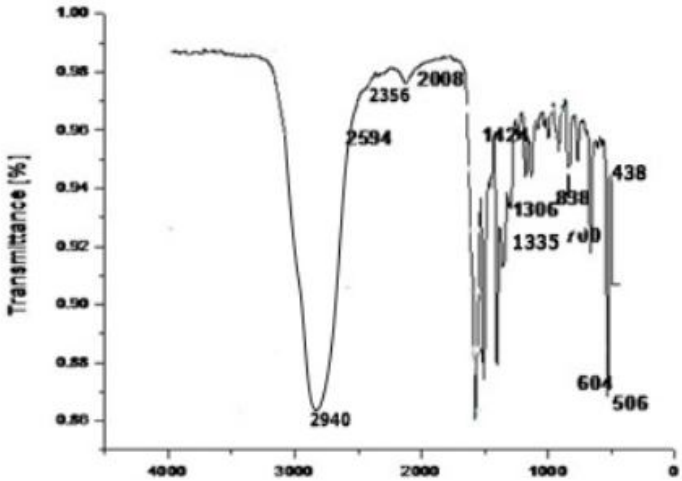

Figure 2: IR Spectrum of [Ni(glu)(gln).2H2O] complex

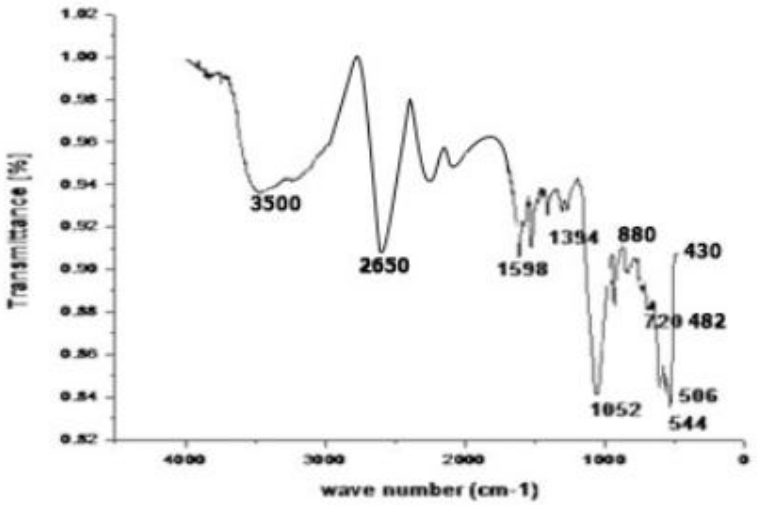

Figure 3: IR Spectrum of [Co (glu)(gln).2H2O] complex

CONCLUSION:

The significance of the Schiff bases and its metal transition complexes has been well established in biological processes. A thorough analysis was made of Schiff's donor actions in relation to metal ions.

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