

STUDY OF SCHIFF BASE COMPOUNDS AND ITS DERIVATIVES

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ABSTRACT:

The Schiff Base compounds are versatile compounds which is synthesized from the condensation of primary amines with carbonyl groups. It is also known as ketimines. The synthesized Schiff base were characterized by spectral technique like UV-Spectra and IR – Spectra. The transition metal complexes derived from the Schiff base legends have been widely studied in the present paper. The ketimines were also prepared from methyl-1-naphthyl ketone with Aniline, 2-chloro-aniline, 3-chloro aniline, 4-Chloro-aniline and 2-nitroaniline by using toluene solvent by using reflux method and it is confirmed by its colour and physical constant.

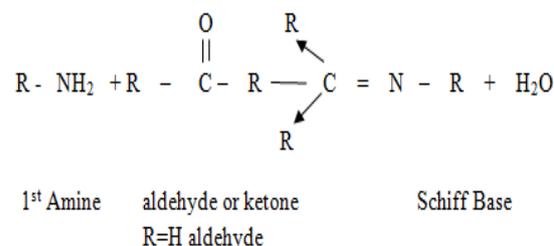
KEYWORDS: Ketimines, Schiff Base ligands, toluene solvent reflux method.

INTRODUCTION:

Organic compounds play important role in biological medical processes many drugs possess modified toxicological and pharmacological properties in the form of metal complex and also probably Schiff Base compound. The development of the field of Bioinorganic chemistry has increased the interest in Schiff base compounds. These Schiff bases are biologically as well as synthetically important nitrogen containing compounds having azomethane group. It is synthesized from an aromatic amines and carbonyl compounds by nucleophilic addition forming an imine or azomethine having of functional group $>C=N$ – And it is first

reported in 19th century by Hugo Schiff. The general formula of Schiff base are represented by $(R_1R_2)C=N-R_3$ where R_3 group is a alkyl or phenyl which makes the Schiff base a very stable imine. The formation of Schiff Base from an aldehydes or ketones is a reversible reaction. Schiff base that contain aryl substituent are substantially more stable and more readily synthesized while those which contain alkyl substituents are relatively unstable. Schiff base of aliphatic aldehydes are relatively unstable and readily polymerizable. While those of aromatic aldehydes having effective conjugation are known of more stable and more readily synthesized. While those which contain alkyl substituents are relatively unstable. Schiff base are relatively unstable and readily polymerizable. While those of aromatic aldehydes having effective conjugation are known of more stable.

REACTION SCHEME

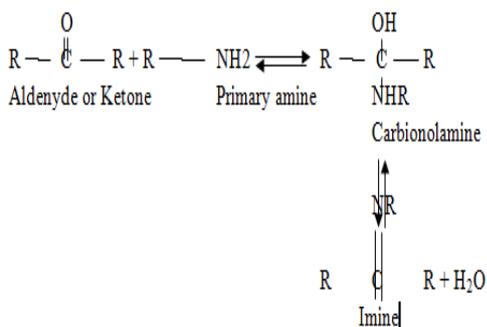


Where

R is the alkyl group.

MECHANISM

The formation of Schiff Base is an reversible reaction and it is conducted from aldehyde or ketones in the presence of acid or Base catalyst or upon heating. Many Schiff Base can be hydrolyzed back to their aldehydes or ketones and amines by aqueous acid or Base.



The dehydration of Carbinolamine is also catalyzed by base. The Schiff Base formation is really a sequence of two types of reaction i.e addition followed by elimination.

The mechanism of Schiff has formation is another variation on the theme of nucleophile addition to the carbonyl grp in this case the nucleophile is the amine. In the first part of the mechanism the amine reacts with aldehyde or ketone group to give an unstable addition compounds called carbinolamine the carbinolamine loses water by either acid or base catalyzed pathway. After that it undergoes acid catalyzed dehydration.

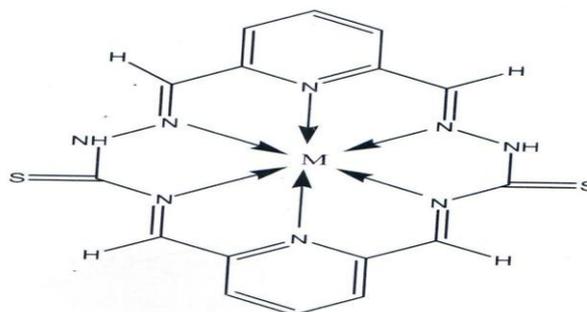
Iminium salt ($\text{R}_2\text{C} = \text{N}^+\text{R}_2$) at the other extremes are very rapidly hydrolyzed by water and have to be prepared under vigorously anhydrous condition. After that the iminium salt hydrolysis to use in the synthesis of secondary amines. From primary amines which involves conversion into the aldimine ($\text{R}_1\text{CH} = \text{NR}_2$) then by alkylation into the iminium Salt [$\text{R}_1\text{CH} = \text{NR}_2$ (R_3) XI] followed by hydrolysis to

given secondary amines (R_1NHR_3) because of the involvement of Schiff Base hydrolysis in a number of enzyme mediated processes.

MATERIALS AND METHOD

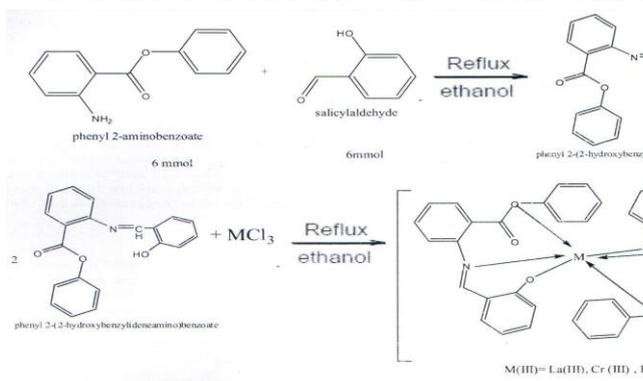
(1) EXPERIMENTAL WORK

The Schiff Base metal complexes of Cr (III), Co (II), Ni (II) and Cu (II) derived from 2,6 - pyridine dicarbonyl aldehyde - Thiosemicarbazone (PDCTC) by conventional as well as microwave method it is prepared by mixing of equal moles of metals salts dissolved in the methanol followed by addition of NaOAc in 1:1 ratio the precipitated complex was filtrate washed and recrystallized with ethanol and dried uncover the reduced pressure over anhydrous CaCl_2 in a desiccators.

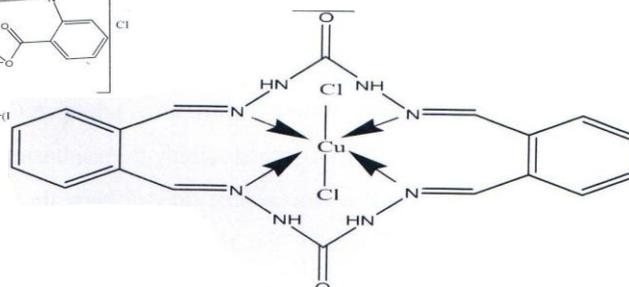


Metal complex obtained from 2,6 pyridine dicarbonyl aldehyde - Thiosemi - carbazone (PDCTC).

(2) Similarly the Cr (III), Fe (III) Co (III) complexes formed from tetradentate Schiff base ligands 1,4 - bis [3-2 - hydroxy- 1 - naphthaldimine) propyl] piperazine and 1, 8- bis [3-2 hydroxy- 1 - naphthaldimine) pmethane, show moderate antimicrobial activity.



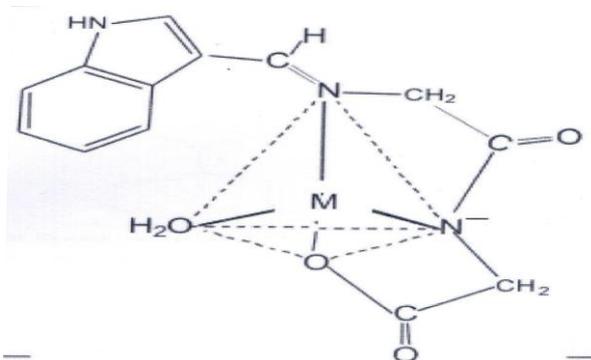
The next example is Tetraaza macrocyclic Cu (II) complexes of composition $[CuL_x 2]$ and $(x = Cl^-, NO_3^-)$. The biological activity of all the complexes against gram-positive and gram – negative bacteria.



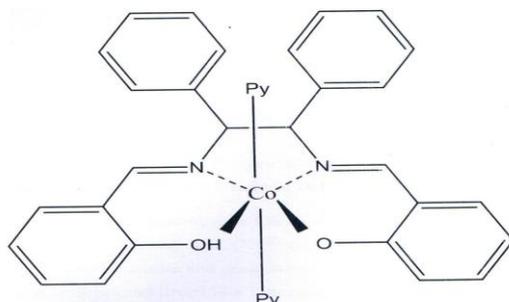
M (III) = La (III), Cr (III), Pr (III)

Schematic representation of HL ligands of its complex.

(3) The third metal complex with Schiff Base 2,5, thiophene Dicarboraldehyde – Thiasemi carbazone from 2, 5- thiophene dicarboraldehyde – Thiosemicarbazone (TDATC) by conventional as well as microwave method.

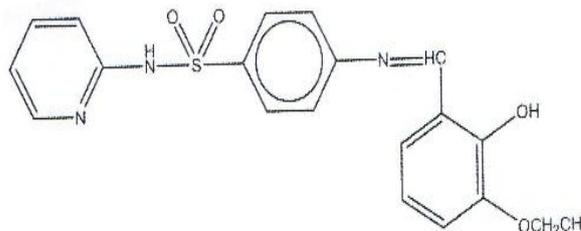


Schematic representation of Schiff base metal complex formed after condensation of glycine with indole – 3 carboraldehyde. The next Schiff base metal complexes from 2 – Hydroxy – 3 – methoxy – S-nitrobenzaldehyde also another metal complex with Schiff base derived from O phthalald ehyde (opa) and amino acids.



Cu (II) of Tetraaza macrocyclic ligand.

Another Schiff base derivatives derived from 3 ethoxy salicylaldehyde of sulpha pyridine the orange coloured solid mass formed during refluxing was cooled, filtered, washed and dried in a desiccators. The prepared Schiff base was characterized.



Schiff base ligand, 4 – (3-ethoxy-2-hydroxybenzylidene amino) N – pyridin-2-yl) benzenesulfonamide prepared from sulfapyridine and 3 – ethoxy – salicyl ddehyde.

CONCLUSION

The new Schiff base are synthesis from various aldehyde and amine under magnetic stirrer of microwave method Schiff base and their derivatives are the class of compounds with vast evidence from litreture evidence about pharmacological potential. Pf_6 given

paper it is also investigated that the derivatives of Schiff Base ligands are considered as privillage ligands because they are easily prepared by condensation of an aldehyde and primary amines.

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