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REVIEW ARTICLE

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A Study on Transition Metal Complexes of Copper

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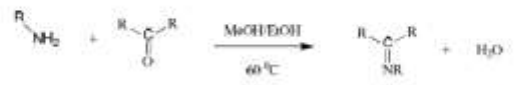
INTRODUCTION

Schiff Bases are such type ligand which formed as a product of the reaction between any amine moiety and derivatives aldehyde (aromatic or aliphatic) or ketone derivatives under the condensation method. It contain at least one amide group which when nitrogen atom of moieties hydrogen atom is replaced by the Kenton or aldehyde groups. Many kind of Schiff bases are widely used as organic compounds.

In this reaction R is represented an alkyl or aryl group. Using of this general method much different type of such ligand moieties has been synthesized.



MECHANISM

It is a neucleophilic addition reaction. In this reaction CHO or C=O group reacts with amine moiety's carbinolamine is formed as a production as seen as **scheme 2**. The carbinolamine group loses the water molecule due to the some pathways like acid or base catalyzed manner.

Nitrogen atom of amine moiety behaves like nucleophilic is attack on carbonyl carbon. Unstable carbinolamine is resultant as intermediate. This reaction may be reverse reaction and azomethine

(C=N) bond is formed which is known as imine moiety and molecules of water is released. This type of reaction is called condensation reaction. Many factors such as pH, steric, electromaric effect of these compounds effects of such type reactions.

In the development of coordination compound these ligand have a very important role because they can make most stable metal complexes with the almost d-block metals in various oxidation states as well as these Schiff bases and their complexes have significantly values i.e. stereochemistry, spectroscopy isomerism, knowing the structure their magnetic properties, reaction mechanism reaction with coordinated ligand, agriculture all fields of sciences such as photography, elctro-optical devices, dyes and pigments etc.

The metal complexes of such type ligands are coordinated to various modes like octahedral, tetrahedral and so on. This is very important because it is clear that which groups more useful.

This metal numerous. the passion shown within the coordination chemistry of atomic number 42 metallic element metal follows class of metal in a very number of chemical reaction enzymes like organic compound enzyme, sulphite enzyme, organic compound enzyme, nitrate enzyme and enzyme, the last 2 enzymes being concerned within the organic process of plants.

Schiff base ligands are considered privileged ligands, because they are easily prepared by a simple one-pot condensation of active carbonyl groups and primary amines in an alcohol solvent.

The coordination chemistry of transition metal complexes of asymmetrical Schiff base ligands has attracted much attention in recent years due the fact that the ligands around central metal ions in natural systems are asymmetrical. Asymmetric Schiff-base ligands have many advantages over their symmetrical counterparts in the composition and geometry of transition metal complexes and properties. Asymmetric Schiff base compounds have been widely studied in connection with catalysis of many reactions due to the versatility of their steric and electronic properties and are promising materials for optoelectronic applications and models of relevance for biologically important species and their industrial applications.

There is a continuing interest in metal complexes of Schiff bases. Because of the presence of both hard nitrogen or oxygen and soft sulphur donor atoms in the backbones of these ligands.

They readily coordinate with a wide range of transition metal ions yielding stable and intensely coloured metal complexes, some of which have been shown to exhibit interesting physical and chemical properties and potentially useful biological activities. Many reports are available for the preparation and properties of model copper complexes which mimic copper-containing metalloproteins such as hemocyanine and tyrosinase. Two noticeable properties of copper proteins are an intense absorption band near 600 nm and relatively high copper(II)/copper(I) reduction potentials. Attention was particularly focused on their correlation with the active site of metalloenzymes and metalloproteins containing dinuclear metallocenters in order to elucidate the factors that determine the reversible binding and activation of O2 in various natural oxygen transport systems and mono- and dioxygenases and to mimic their activity.

Schiff bases were still regarded as one of the most potential group of chelators for facile preparations of metallo-organic hybrid materials. In the past two decades, the properties of Schiff base metal complexes stimulated much interest for their noteworthy contributions to single molecule-based magnetism, material science, catalysis of many reactions like carbonylation, hydroformylation, oxidation, reduction and epoxidation, their industrial applications, complexing ability towards some toxic metals. The interest in Schiff base compounds as analytical reagents is increasing since they enable simple and unexpensive determinations of different organic and inorganic substances. The high affinity for the chelation of the Schiff bases towards the transition metal ions is utilized in preparing their solid complexes.

Schiff bases derived from condensation of various aldehydes with 4-aminoantipyrine or 2-aminophenol were reported.

Schiff bases derived from the salicylaldehydes are known as polydentate ligands, coordinating in deprotonated or neutral forms. Schiff base ligands have significant importance in chemistry; especially in the development of Schiff base complexes, because Schiff base ligands are potentially capable of forming stable complexes with metal ions.

Many Schiff base complexes show excellent catalytic activity in various reactions at high temperature (>100 0C) and in the presence of moisture. Over the past few years, there have been many reports on their applications in homogeneous and heterogeneous catalysis, hence the need for a review article highlighting the catalytic activity of Schiff base complexes realized.

LITERATURE REVIEW

Waldemar et al. showed catalyses the uneven reaction of silyl ketone acetals in high enantioselectivity [66]. In 1986 many research appliance of chiral Schiff base complexes in enantioselective compound oxidations. Exploitation tetradentate Schiff base-oxovanadium(IV) as catalyst, they might come through associate degree enantio-selectivity of forty second within the reaction of methylphenyl compound to the corresponding sulfoxide.

The oxovanadium(V) advanced having associate degree amino acid derived tridentate -O-N-Otype Schiff base as matter was according to change state the uneven reaction of sulphoxide. The chemical action behaviour of the complexes fashioned unchanged from Schiff base derivatives of salicylaldehyde and aminophenol and vanadyl acetylacetonate is outstanding for the reaction of sulphides.

Vetter and Berkessel according the enantio-selectivities related to the sulfoxidations of metal catalysts derived from Schiff-base ligands. Katsuki and coworkers extended this study exploitation as matter and metal because the transition metal ions have highly application.

Since the invention of its biological activity within the early 2005 , toxicity that ends up in undesirable facet don't seem to be sensitive to atomic number 78 agents 1, 2- diaminoethane backbone. It's been shown that acceptable substituents on the aromatic rings might increase the toxicity of the complexes. These fascinating results elicited America to synthesize platinum(II) complexes bearing Schiff base ligands. The medication condensation of aldehyde derivative was found to extend on chelation with transition metal ions were additionally activity compared to the free Schiff bases.

Many mono and bi nucleate phenylaminoaceto hydrazide and dibenzoylmethane area unit tougher bactericides and fungicides than the ligand . Sharma and Piwnica-Worms according Schiff base complexes that focus on hemozoin aggregation just like the antiprotozoal drug, antimalarial drug.

The primary preparation of imines was according within the nineteenth century by Schiff . Since then a spread of strategies for the synthesis of imines are delineated. The classical synthesis according by Schiff involves the condensation of a carbonyl compound with associate degree alkane beneath azeotropic distillation .

Molecular sieves area unit then won't to fully take away water fashioned within the system. Within the Nineties associate degree in place technique those strategies relies Examples synthesis of Schiff bases embody ZnCl2, TiCl4, MgSO4-PPTS, Ti(OR)4, alumina, H2SO4, NaHCO3, MgSO4, Mg(ClO4)2, H3CCOOH, Er(OTf)3, P2O5/Al2O3, HCl. Schiff bases are enjoying a crucial role within the extensively thanks to their engaging chemical and physical properties and their wide selection of applications in varied scientific areas. These forms of complexes are

smartly explored in recent years and such studies are the topic of the many papers and reviews.

OBJECTIVE OF THE WORK

1. We have a tendency to synthesized polydentate ligands containing nitrogennitrogen-oxygen and oxygen-nitrogen-oxygen donor teams like Schiff base ligands derived from aldehydes, ketones, primaryamines, etc.

2. Prepared between metal salts and the above synthesized NMR, 13C NMR, Mass, electronic, magnetic and spectral measurements.

3. Antifungal and medicine studies of those complexes were additionally done against staphylococci species and candida and staphylococci cereviscae fungous species.

FURTHER SCOPE

In continuation to the work, there's scope of any studies on the subsequent lines:

· Vasoconstrictive magnetic condition measurements on the complexes that show existence of high spin and low equilibrium or temperature concerned reversible stereochemical conversions.

· To synthesize the complexes of 4d and 5d transition metal ions.

· Studies on crystal structure of compounds

· Cyclic voltametric studies of the complexes.

· Stabilization of surprising chemical reaction states of transition metal ions.

· They'll be employed in optical and chemistry sensors, additionally as numerous natural action ways, to change detection of increased electivity and sensitivity.

· Physical and analytical chemical needed to hold out meaty physics and kinetic example effect studies

· Fluoroscence and chemiluminescence's characters of those compounds may be studied.

· To review their biological additionally as chemical process properties

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