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A Short Review on Preparation and Biological Activity of Some Metal Complexes

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Abstract: *Schiff bases possess structural similarities with naturally occuring biological substances. This enhances their use in determining the mechanism of reaction processes in biological systems .Schiff bases have imine group containing N and O which binds with the metals and can form co-ordinate bond and results in stable cyclic structure with enhanced biological activity.*

Keywords: Metal Complexes.

I. INTRODUCTION

Anju Malik and et al(1) Schiff base ligand prepared by the condensation of o-vanillin with 2-aminopyridine and its metal complexes and characterised by different spectroscopic methods. All the tellurium(IV) complexes are colored, crystalline solids, stable at room temperature and non-hygroscopic in nature. They are insoluble in non polar and less polar organic solvents, but are soluble in polar donor solvents like DMF, DMSO Tthe biological activities was carried by "Broth Dilution Method"and the standard drugs such as ampicillin and chloramphenicol used for antibacterial, nystatin and greseofulvin for antifungal activitie and found that complexes organyltellurium(IV) exhibited more antibacterial activity than antifungal activity as compared to free ligand..

Shailendra Pande and Co-workers(2) Srivastava reported the series of schiff base of 2-aminopyridine with different aldehydes and ketones and cyclic ketones which shows better Anticonvulsant Agents.

Abdullahio. Sobola et all(3) reported the preparation of schiff bases of salicylaldehyde and *o*-vanillin with 2- and 3-amino- and (aminomethyl)pyridine, respectively and its Cupper metal complexes charactersied by different spectral techinique.The *o*-vanillin based ligands were significantly potent against the *C. albicans*.it shows higher antifungal activity than the commercially available anti-fungal drug, ketoconazole and also reported antimicrobial activity of the Cu(II) complexes was similar or slightly higher than the free ligands.

Shaibu, Rafiu and Watkins, Gareth M(4) Reported the prepration of substituted hydroxybenzaldimines with salicylaldehyde, o-vanillin, p-vanillin or vanillin with 2-aminomethyl pyridine and different Spectroscopic methods used for characterisation .The study of electronic effects of the variously substituted hydroxybenzaldehydes were examined in methanol and dimethylformamide and obesrved that the electronic effects of the substituents and solvents influenced the intramolecular hydrogen bonding via the conjugation of the heterocyclic ring or by modifying the capacity of the nitrogen atom from entering into hydrogen bonding.

Aida L. El-Ansary et al(5)

Schiff bases synthesized from the condensation of 5,7-dihydroxy-6-formyl-2-methylbenzopyran-4-one with 2-aminopyridine , p-phenylenediamine and o-phenylenediamine and their complexes with metals namely lanthanum (III), neodymium (III), and erbium (III) and characterized by different spectral analysis and three differenr methods of chelations observed from the data.as mono-negative (OO) bidentate ligand,,monobasic(NO) bidentate ligand and dinegative N2O2 tetradentate ligands. Excitation study shows that the neodymium and erbium complexes exhibited characteristic flfluorescence

Mehmet Gulcan and Mehmet Sonmez(6) reported thesynthesis of Monobasic tridentate Schiff base ligand having ONS donor by condensing N-aminopyrimidine-2-thione with o-vanillin and their metal complexes with Cu(II), Ni(II), Co(II),

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Mn(II), and Cd(II) etc. Schiff base and its comlpexes were characterised by different spectral analysis. From data Cu(II) Ni(II) Co(II), complexes are octahedral paramagnetic and Cd(II) complex is dimagnetic.

Malik A, Goyat G (7) and co-workers synthesized the new schiff bases from o-vanillin with 3-aminopyridine and its organyltellurium(IV) complexes were screened in *vitro* antimicrobial potential against Gram +ve bacteria Gram -ve bacteria strain; fungal strains *C.* albicans MTCC 227, A. niger MTCC 282 and **A. clavatus** MTCC 1323 by "Broth Dilution Method"and results shows that some complexes exhibit higher antibacterial activity than Schiff base itself.

Devidas U. Thombal etall (8) reported synthesis of new schiff bases from aldehyde (1 mmol) and 6-amino-3, 3-dimethyl-7-oxo-4-thia-1-aza-bicyclo [3.2.0] heptane-2-carboxylic acid and its metal complexes with first transition series elements. Antimicrobial activity tested against bacteria

Escherichia coli, Pseudomonas aeruginosa and Staphylococcus aureus etcSome of schiff bases shows excellent antimicrobial activity also.Aromatic ring in a compound enhances the activity as compared to open chain compounds.

Zahid H. Chohan (9) reported the Synthesis, characterization and biological studies of Schiff base-derived sulfonamides and their Co (II), Cu (II), Ni (II) and Zn (II) complexes. In-vitro antimicrobial activity against Gram positive and Gram negative bacteria shows that all compounds showed moderate to significant antibacterial activity, however, the zinc (II) complexes were found to be more active and also some compound shows antifungal against various fungal strains .

Ajeet Kumar Maurya (10) and co-workers reported the two mixed-ligand copper(II) and zinc(II) complexes with pyridine-2,5-dicarboxylic acid and 1,3,5- benzenetricarboxylic acid .and charactrised by different analyatical technique. From data both complexes shows binuclear in nature.as well as coordination mode is similar in both the complexes.

Dragoslav R. Ilić (11) et al reported synthesis of pd(II) complxes with different bidentate ligands and tested for their in vitro antimicrobial activity against different species of bacteria and fungi. Palladiun complxes rather them others exhibited significantly higher activity then corresponding ligandsnearly all complxes shows moderate antimicrobial activity.

E. Ogbonda-Chukw(12) and coworkers prepared Schiff bases from 2-aminopyridine and 4- ethoxybenzaldehyde and the reaction of 4-ethoxyaniline and 2-pyridinecarboxaldehyde using the reflux method in ethanol respectively and their Zn and Cr complexes prepared same method as above. In biological activity, metal complexes are active against some pathogens or show a broad spectrum .activity.Results shows that complexation with chromium metal increases biological activity. From study only the chromium complex of the 4-ethoxyaniline-2-pyridinecarboxaldehyde shows activity against S. cerevisiae.

T. I. Uzoigwe etall(13) synthesized schiff base from ciprofloxacin and 2-aminopyridine and its complexes with cobalt(II) and zinc(II) Metals. Different analyatical methods used for their characterisation in vitro biological screening carried out by taking two o Gram positive bacterial strain, two Gram negative bacterial strains and two fungal strains and shown that the biological activity greater then tested microbes than the parent.

Taghreed H AL-Noor(14)and co-workers synthesized four metal complexes mixed ligand of 2-aminophenol and tributylphosphine were produced in aqueous ethanol and characterised by different spectral methods and from data all complexes are octahedral geometry and also ligands and their complexes shows good antibacterial activities.

Festus et. al. (15) synthesized transition metal complexes of Mn(II), Co(II), Ni(II), and Cu(II) using Schiff base ligand 2-(4,6-dimethylpyrimidin-2-ylamino)naphthalene- 1,4-dione.and studies of antibacterial, antifungal and

radical scavenging properties. Biological activity carried out by using bacteria like B. cereus, S. aureus, K. oxytoca, E. coli, P. mirabilis, and P. aeruginosa microbes for antibacterial studies for Schiff base ligand and synthesized complexes. They further studied the in vitro antifungal properties for all synthesized complexes against A.niger, A. flevus, and R. Stolonifer using standard drug like diflucan. They found the better antimicrobial results for complexes. They also found the good results for radical scavenging ability.

II. CONCLUSION

In present study prepration of new schiff bases and therir metal complexes and their biological activities were taken into consideration metals of first series transition elements shows excellent biological activities.

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