Synthesis Of Transition Metal Complexes With Biologicaly Active Schiff Bases

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Abstract :

Some novel transition metal [Co(II), Cu(II), Ni(II) and Zn(II)] complexes of substituted pyridine Schiff-bases have been prepared and characterized by physical, spectral and analytical data. The synthesized Schiff-bases act as deprotonated tridentate for the complexation reaction with Co(II), Ni(II) and Zn(II) ions. The new compounds, possessing the general formula [M(L)2] where [M=Co(II), Cu(II), Ni(II) and Zn(II) and HL=HL1, HL2, HL3 and HL4] show an octahedral geometry. In order to evaluate the effect of metal ions upon chelation, the Schiff bases and their complexes have been screened for antibacterial activity against the strains such as Escherichia coli,Staphylococcus aureus, and Pseudomonas aeruginosa. The complexed Schiff bases have shown to be more antibacterial against one more bacterial species as compared to uncomplexed Schiff-bases. The study in complexation behavior of such base ligand having a various substituents with 0-N, 0-S, 0-N-S as a donor sites have been reported.

Various studies have show that the azomethine group (>C=N-)in a Schiff base metal complexes. Consider biological significance1 and found to responsible for biological activtiy such as fungicidal and insecticidal2 and anticarcinogenic properties. Catalytical activity and anticancer drug3, antitumor4-5, DNA binding6-7 and DNA cleaning.

Keywords *– XRD, NMR, IR, UV-Visible Spectroscopy*

I. Introduction :

The transition metal complex with Schiff bases found huge application in different field such as pharamaceutical, agriculture, drug, dyes, metallurgy, photography, enviromental science, toxicology and analytical chemistry.

The role of transition metal complexes in living system as catalyst for metabolic process. It is also act as promotors for storage and transport of metal ion of donor molecule and as a agent of transmission of energy is well established.

The coordination complexes which are present in minerals, plants and animals one of great importance because they play important functions were they present. Beside its valuable biological activities, unique properties and application created interest amoung the researcher.

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II. Methodology :

Prepration and characterication of transition metal complexes with synthesised newly schiff bases by using various physico- chemical tenchniques such as NMRC nuclear magnatic spectroscopy ,IR(Infra red spectroscopy) ,uv (ltra vioet ,visible spectrograyhy)spectral studies thurmal and x-ray analysis ,magnetic susceptibility ,elemental analysis and conductivity . and biologically activity can be studied against various stains

Chemicals used were of analytical grade and purchased from commercial sources. All ligand synthesis reactions were carried out in solvents that were purified and dried before use, using standard literature methods. The redistilled and deionized water was used in all experiments. Gallenkamp apparatus was used to determine melting points of synthesized ligands and decomposition temperature of the metal complexes. Infrared spectra of solids (in a KBr matrix) were recorded in the 3700–370 cm−1 region on a Nicolet FT-IR Impact 400D infrared spectrometer. 1H and 13CNMR spectra were run on a Bruker Advance 300 MHz instrument. Mass spectrometry work was carried out by Ms. B. Woods N.U.I. Maynooth using an Agilent Technologies 6`210 Time-of-Flight LC/MS. UV spectra were obtained on a Hitachi UV-3200 spectrophotometer. Microanalysis (C, H, and N%) of the synthesized compounds was carried out using a CHN Analyzer on Perkin Elmer 2400 series II. Molar conductances of the transition metal complexes were measured in 0.01 M in DMF solution using an Inolab Cond 720 Conductivity Bridge at room temperature. A Stanton SM12/S Gouy balance was used to measure the magnetic susceptibility of the metal complexes at room temperature by using mercury acetate as a standard. Different aldehydes such as 5-methyl furfural, 2-anisaldehyde, and 2-hydroxybenzaldehyde in methanol (20 mL) were added to a refluxed solution of ethylene-1,2-diamine in same solvent in an equimolar ratio for 10 minutes followed by 2-3 drops of acetic acid. Then

the reaction mixture was refluxed for 6 h by monitoring through TLC. When the reaction was completed, it was cooled to room temperature, filtered, and volume reduced to about one-third using rotary evaporator. The solid product thus obtained was filtered, washed with methanol, and dried. It was recrystallized in hot methanol/ether (2 : 1).

III. Results and discussion

Schiff base are important class at ligand in coordination chemistry. Schiff base can be syntheised by condensing carbonyl compounds and amines in various conditons and in different solvent with elimination of water molecules.

Synthesis of Schiff bases derived from Dehydroacetic acid with various subtituted aniline. Synthesised complexes of 4-hydroxy-6- methyl -3 [3- dimethyacryoyl] - 2H- pyran-2-one

Dehydroacetic acid based Schff's Bases and their metal complexes. Dehydroacetic acid based Hydrazone Schiff base metal complexes of first transition series : synthesis and biological evaluation study.

- Transition metal form stable complex with Schiff base ligand the research scientist working in the field due to its anique properties and applications. It is playing increasingly singificant roles in the development of coordination chemistry.
- Schiff base and their metal complexes possesing novel structural features, interesting spectral and mangnetic proerties have been subjected to intensive research due to their importane in medical, agriculture, biological and Industrial freld.
- Lot of number of Shciff bases are known to be medicinally important and used to desing medicinal compounds12-13
- **They are active catalyst.**

Conclusion :

During last few year a significant amount of investigation related to the characterisation of Schiff bases derived from anilines , diammines, amino acids hydrazines, semicabozides, thiosemicarbazides, benzoxazole, benzothiazole, hydrazone, benzimidazole, orthohydraoxy acetophenone, dehydroacetic acid and primary aromatic amines and their metal complexes.

Synthesis of dchiff bases and their characterisation by various techniques. Study of transition metalcomplexes with synthesised newly schiff bases. Study of biological activities of schiff bases and metal complexes.

References

1) Dej k. J. sic and Res, 33 (1974) 76
2) Lean katz Pat U. S. chem. Abstr, 50 (1956) 6519
3) A. D. Burrow, science progress, 85 (3) (2002) 199
4) Ainscough EW, Bordie, Dobbs AJ , Ranford JD, Waters JM Inorg chim Acta 27-38 (1998) 267
5) Rajenadran G, Amritha Cs , Anto RJ, cheriyan VT J serb chem . Soc 749-761 (2010) 75
6 Patel M, chhasatia M, Bhatt B. Med chem res 220-230 (2011)20
7) Chan S, wong WT Coord chem Rev 196-219 (1995) 138
8) Sigman DS, Mazumder A, Perrin DM. chem Rev 2295-2316 (1993)-93
9) Bharti SK, Patel SK , Nath G, Tilak R, singh SK Transition met chem 917-925 (2010) 35
10) Ganjali MR, Norouzi P, Alizadeh T, Salavati NM. Bull korean chem soc 1(2007) 28
11) Iqbas M.S, Khan A.H, Loother B.A, Bukhari I. H. Medicinal chemisry research 18 (2009)31
12) Dao V.T, Dowd M.K, Martin M.T, Aaspard c, Mayer M, Michelot R. J, European Journal of medicinal chemistry 39 (2004) 619.