IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, March 2022
Impact Factor: 6.252

Synthesis, Characterization and Biological Activity of Some Mixed Ligand Transitionmetal Complexes

S. R. Bhagvat[1], Y. A. Gaikwad[1], G. C. Wadhawa[1], R. D. Mohite[1], V. S. Shivankar[2]*
Department of Chemistry, Karmaveer Bhaurao Patil College, Vashi, Navi Mumbai, Maharashtra, India[1]
Rayat Shikshan Sanstha's, Chhatrapati Shivaji College, Satara, Maharashtra, India[2]

Abstract: *The Schiff bases derived from Salicylaldehyde with substituted amines and alpha benzoin oxime as a primary ligand are prepared by mixed with Cobalt (II), Nickel(II) and Copper (II). Structure have been proposed from elemental examination, like IR, NMR, thermal examination and magnetic susceptibility, Spectroscopic studies suggests that coordination occurs through azomethine nitrogen, hydroxyl group and oxime of the ligand to the metal ions. Elemental analysis of Schiff bases, alpha benzoin oxime and metal complexes are confirmed to stoichiometry of the type ML_1L_2 where Metals are Cobalt (II) and Nickel (II) L_1 are Schiff bases and L_2 are alpha benzoin oxime. The mixed ligand Co(II) complexes were synthesize by using α-benzoin oxime as a primary ligand and Schiff base prepared from salicylaldehyde and chloroanilines with hydroxyanilines as a secondary ligand. The metal complexes have been characterized different elemental analyses and various chemical techniques such as molar conductance, magnetic susceptibility, infrared, NMR, spectral studies and thermal analysis. The elemental analysis data is consistent with their general formulation as mixed ligand complexes MLL'.xH_2O. The bondings and structures of the complexes are discussed in detail on the basis of the results of various chemical studies. All of these metal complexes and ligands have been screened for their biological activities against selected pathogenic microbial strains. The Ditch Plate Method has been used to study the antibacterial activity against E. coli, S. typhi, S. aureusandS. pyogenes.*

Keywords: Schiff base, Benzoin Derivative, Metal complexes, biological activity

REFERENCES

[1]. Rovira-Bru, M., Giralt, F. and Cohen, Y., 2001 "Protein adsorption onto zirconia modified with terminally grafted polyvinylpyrrolidone" Journal of colloid and interface science 235(1) 70- 79.
[2]. Huckel, M., Wirth, H.J. and Hearn, M.T., 1996 "Porous zirconia: a new support material for enzyme immobilization" Journal of biochemical and biophysical methods 31(3-4) 165-179.
[3]. Witucki, G.L., 1993 "A silane primer: chemistry and applications of alkoxy silanes" Journal of coatings technology 65 57-57.
[4]. Simon, A., Cohen-Bouhacina, T., Porté, M.C., Aimé, J.P. and Baquey, C., 2002 "Study of two grafting methods for obtaining a 3-aminopropyltriethoxysilane monolayer on silica surface." Journal of colloid and interface science 251(2) 278-283.
[5]. Malakooti, R., Bardajee, G.R., Hadizadeh, S., Atashin, H. and Khanjari, H., 2014 "An iron Schiff base complex loaded mesoporous silica nanoreactor as a catalyst for the synthesis of pyrazine-based heterocycles" Transition Metal Chemistry 39(1) 47-54.
[6]. Murphy, E.F., Ferri, D., Baiker, A., Van Doorslaer, S. and Schweiger, A., 2003 "Novel routes to Cu (salicylaldimine) covalently bound to silica: combined pulse EPR and in situ attenuated total reflection-IR studies of the immobilization" Inorganic chemistry 42(8) 2559- 2571.
[7]. Fayad, N.K., Al-Noor, T.H., Mahmood, A.A. and Malih, I.K., 2013 "Synthesis, Characterization, and Antibacterial Studies of Mn (II), Fe (II), Co (II), Ni (II), Cu (II) and Cd (II) Mixed-Ligand Complexes Containing Amino Acid (L-Valine) And (1, 10- phenanthroline)" Synthesis 3(5)

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 3, March 2022
Impact Factor: 6.252

[8]. W. J. Shi L Mao , Y. Yang and H. L. Zhu, "Synthesis, Characterisationand biological activity of a Schiff base Zn(II) complex", J. ofCoordin Chem., 2009, 62(21), 3471-3477.

[9]. M. Mousavi and H. Seyfi, "Preparation of α-Hydroxy Ketones fromAromatic Aldehydes", J. Org. Chem, 2011, 1, 17-23.

[10]. M.S. El-Shahawi , M.S. Al-Jahdali, A.S. Bashammakh, A.A. Al-Sibaaiand H.M. Nassef, "Spectroscopic and electrochemicalcharacterization of some Schiff base metal complexes containing benzoin moiety", Spectrochimica Acta Part A: Molecu. and Biomolec. Spect. 2013, 113 , 459–465.

[11]. H. Molina and R.A. Mederos, in: A.B.P. Lever (Ed.), ComprehensiveCoordination

[12]. Chemistry II, vol. I, Elsevier-Pergamon Press, Amsterdam-Oxford-New York, 2003, 411–446.

[13]. E. K.Kareem, S. M. Lateef and A. A-Ali Drea, "Study of Preparationand Identification of some metals complexes of New Schiff BaseLigand type(NNO) Derived from Isatin", J.ofMultifunc mater. andPhotosci., 2015, 6 (1), 1-10.

[14]. Kirby W.A., Bauer A.W., Sherris J., and Turk M. "Antibioticsusceptibility testing by standardized single disk method". American.J. Clin.Pathol. 1966, 45, 493-496,.

[15]. V. Niranjan, and A. Malini, "Antimicrobial resistance pattern inEscherichia coli causing urinary tract infection among inpatients". J.Med. Res., Indian, 2014, 139,

[16]. A. Cotton and G. Wilkinson , " Basic Inorganic Chemistry", Wiley ,NewYork, 1977.

[17]. E. M. Larsen , " Transitional Elements", , Menlo park , Galf.,Benjamin, 1965.

[18]. L. E. Orgel, " An Introduction to Transtion – Metal Chemistry",Methuen , London , 2nd Ed, 1966.

[19]. N. Gayathri, M .S.Suresh and V. Prakash, "Synthesis, Characterizationand Antibacterial Studies of Oxovanadium (IV) and Copper(II)Schiff Base Complexes Derived from Benzoin and Anthranilic Acid-A Tridentate Ligand", Der Pharma Chemica, 2017, 9(7), 128-132..

[20]. G.Valramathy and R. S. ALAkshmi, "Synthesis, SpectralCharacterization of Biologically Active Novel Schiff Basecomplexes Derived from 2-Sulphanil amido pyrimidine", Int JPharm Bio Sci Apr; 2013, 4(2), 1019 – 1029

[21]. S. F. Mohammed and F. H. Musa, "Synthesis and characterization ofCo(II), Ni(II), Cu(II), Cd (II) and Hg(II) complexes with newderivative of L-ascorbic acid". 2nd Ed. Scientif. Confer. of the College of Scie., Univ. of Baghdad, 2014, 42-48,.

[22]. J.J. Li, Ed. Heterocyclic Chemistry in Drug Discovery, John Wiley &Sons: Hoboken, **2013**. [Google Scholar], [Publisher]

[23]. D.D. Patil, D.K. Mhaske, G.C. Wadhawa, *J. Adv. Pharm. Educ. Res.*, 2011, *2*, 104-112. [Google Scholar], [Publisher]

[24]. W.A. Denny, G.W. Rewcastle, B.C. Baguley, *J. Med. Chem.*, **1990**, *33*, 814–819. [Crossref], [Google Scholar], [Publisher]

[25]. N.A. Mirgane, V.S. Shivankar, S.B. Kotwal, G.C. Wadhawa, M.C. Sonawale, *Mater. Today: Proceedings*, **2021**, *37*, 849-853. [Crossref], [Google Scholar], [Publisher]

[26]. S.S. Nayak, N.A. Mirgane, V.S. Shivankar, K.B. Pathade, G.C. Wadhawa, *Mater. Today: Proc.*, **2021**, *37*, 2302-2305. [Crossref], [Google Scholar], [Publisher]

[27]. N.A. Mirgane, V.S. Shivankar, S.B. Kotwal, G.C. Wadhawa, M.C. Sonawale, *Mater. Today: Proc.*, **2021**, *37*, 886-889. [Crossref], [Google Scholar], [Publisher]

[28]. N.A. Mirgane, A. Chandore, V. Shivankar, Y. Gaikwad, G.C. Wadhawa, *Res. J. Pharm. Technol.*, **2021**, *14*, 2686-2690. [Crossref], [Google Scholar], [Publisher]

[29]. S.S. Nayak, N.A. Mirgane, K.B. Pathade, V.S. Shivankar, G.C Wadhawa, *Plant Sci. Today*, **2021**, *8*, 425-428. [Crossref], [Google Scholar], [Publisher]

[30]. A.K. Valvi, S.S. Nayak, V.S. Shivankar, G.C. Wadhawa, *Mater. Today: Proc.*, **2021**. [Crossref], [Google Scholar], [Publisher]

[31]. D. Davey, P.W. Erhadt, W.C. Lumma Jr., J. Wiggins, M. Sullivan, D. Pang, E. Cantor, *J. Med. Chem.,* **1987**, *30*, 1337–1342. [Crossref], [Google Scholar], [Publisher]

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 3, March 2022
Impact Factor: 6.252

[32]. B.E. Tomczuk, C.R. Taylor Jr., L.M. Moses, D.B. Sutherland, Y.S. Lo, D.N., Johnson, W.B. Kinnier, B.F. Kilpatrick, *J. Med. Chem.*, **1991**, *34*, 2993–3006. [Crossref], [Google Scholar], [Publisher]