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Synthesis of Some Zinc and Copper Complexes of Benzimidazole

Rudhima Raj¹, Rajesh Kumar², L. K Mishra³ and Smriti Singh⁴*

PG Department of Chemistry^{1,2,3,4} Ranchi University, Ranchi, India

Abstract: Two complexes of Cu(II) and Zn(II) ions with Benzimidazole ligand have been prepared. The ligand and its metal complexes have been characterized by using NMR and FTIR techniques. Ligand L acts as a bidentate ligand. The antibacteriall property of the complexes has been verified. The outcome of the antibacterial screening demonstrated that the complexes possess good biological activity against different bacterial strains. The results therefore suggest that all the complexes are better antifungal agents than the free ligand.

Keywords: Benzimidazole ,Antibacterial , Metal Complexes Zinc Copper

REFERENCES

- Sivakumar R, Pradeepchandran R, Jayaveera KN, Kumarnallasivan P, Vijaianand PR and Venkatnarayanan R. Benzimidazole: An Attractive Pharmacophore in Medicinal Chemistry. International Journal of Pharmaceutical Research. 2011;3(3):19-31.
- [2]. Gaba M, Sing D, Singh S, Sharma V and Gaba P. Synthesis and pharmacological evaluation of novel 5substituted-1-(phenylsulfonyl)-2-methylbenzimidazole derivatives as anti-inflammatory and analgesic agents. European Journal of Medical Chemistry. 2010;45 2245.
- [3]. Singh Gurvinder, Kaur Manninderjith and Chandu Mohan. Benzimidazoles. The latest information on Biological Activities. International Research Journal of Pharmacy. 2013;4(1): 82-87.
- [4]. Ansari KF and Lal C. Synthesis and evaluation of some new benzimidazole derivatives as potential antimicrobial agents. European Journal of Medicinal Chemistry. 2009;44:2294-2299.
- **[5].** Mavrova AT, Anichina KK, Vuchev DI, Tsenov JA, Denkova PS, Magdalena SK and Micheva MK. Antihelminthic activity of some newly synthesized 5(6)-(un)substituted-1H-benzimidazol-2ylthioacetylpiperazine derivatives. European Journal of Medicinal Chemistry. 2006;41(12):1412-1420.
- [6]. Shobhit Srivastava, Pandeya SN, Meena K. Yadav and Singh BK. Synthesis and Analgesic Activity of Novel Derivatives of 1,2-Substituted Benzimidazoles. Journal of Chemistry. 2012;2013
- [7]. Cu (II) and Zn (II) Complexes of Benzimidazole Derived Schiff Base: A Study on their Antifungal Activity G. Kumaravel, P. PonyaUtthra and N. Raman COLLEGE SADHANA - Journal for Bloomers of Research, Vol. 10, No. 2, FEBRUARY 2018
- [8]. Palomino JC, Martin A, Camacho M , Guerra H, Swings J and Portaels F. American Society for Microbiology. 2002;46:2720-2722.
- [9]. PrakashaGavisiddegowda, DivyashreeNallurRajashekhar, Shiva Prasad Kollur, Revanasiddappa Hosakere Doddarevanna,* Biological Potency of New BenzimidazoleDerived Imine Based Ligand and its Co(III), Ni(II), Cu(II) and Pt(II) Complexes: Synthesis, Structure, Antimicrobial, Antioxidant and BSA Interaction Studies ,Volume 11, Issue 4, 2021, 11856 – 11890
- [10]. Carreira, M.; Calvo-Sanjuán, R.; Sanaú, M.; Zhao, X.; Magliozzo, R.S.; Marzo, I.; Contel, M. Cytotoxic hydrophilic iminophosphorane coordination compounds of d8 metals. Studies of their interactions with DNA and HSA. *Journal of Inorganic Biochemistry* 2012, *116*, 204-214, https://doi.org/10.1016/j.jinorgbio.2012.06.017.
- [11]. Panchsheela Ashok, U.; Prasad Kollur, S.; Prakash Arun, B.; Sanjay, C.; Shrikrishna Suresh, K.; Anil, N.; Vasant Baburao, H.; Markad, D.; Ortega Castro, J.; Frau, J.; Flores-Holguín, N.; Glossman-Mitnik, D. In

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vitro anticancer activity of 4(3H)-quinazolinone derived Schiff base and its Cu(II), Zn(II) and Cd(II) complexes: Preparation, X-ray structural, spectral characterization and theoretical investigations. *InorganicaChimicaActa***2020**, *511*, 1-32, https://doi.org/10.1016/j.ica.2020.119846.

- [12]. Skyrianou, K.C.; Psycharis, V.; Raptopoulou, C.P.; Kessissoglou, D.P.; Psomas, G. Nickel-quinolones interaction. Part 4 Structure and biological evaluation of nickel(II)-enrofloxacin complexes compared to zinc(II) analogues. *Journal of Inorganic Biochemistry* 2011, 105, 63-74, https://doi.org/10.1016/j.jinorgbio.2010.09.007.
- [13]. Jin, Y.; Lewis, M.A.; Gokhale, N.H.; Long, E.C.; Cowan, J.A. Influence of Stereochemistry and Redox Potentials on the Single- and Double-Strand DNA Cleavage Efficiency of Cu(II). and Ni(II) Lys-Gly-His-Derived ATCUN Metallopeptides. *Journal of the American Chemical Society* 2007, *129*, 8353-8361, https://doi.org/10.1021/ja0705083.
- [14]. Mahesh, S.V.; Manoj, N.B.; Sanjay, K.R.; Divya, J.J.; Prachi, T.A.; Dhaval, B.P.; Hitesh, D.P. Benzimidazole: A Milestone in the Field of Medicinal Chemistry. *Mini-Reviews in Medicinal Chemistry* 2020, 20, 532-565, https://doi.org/10.2174/1389557519666191122125453.
- [15]. Sunil, K.N.; Krishnamurthy, G.; Yadav, D.B.; Vikas, H.M.; Ravikumar, N.T.R.; Shivananda, K.; Prabhakar, B.T. Synthesis, characterization and tumor inhibitory activity of a novel Pd(II) complex derived from methanethiol-bridged(2-((1H-benzo[d]imidazol2-yl)methylthio)-1H-benzo[d]imidazol6-yl)(phenyl)methanone. *New J. Chem*2019, 43,790-806, https://doi.org/10.1039/c8nj03057j.
- [16]. Prasad, K.S.; Shruthi, G.; Shivamallu, C. Synthesis, characterization, in silico analysis and physicochemical properties of tin(II) and lead(II) coordination complexes prepared using 2-((3,5-dimethoxybenzylidene)amino)pyridin-3-ol and 1,10-phenanthroline. *Polyhedron* 2019, 157, 536-547, https://doi.org/10.1016/j.poly.2018.10.037

