IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 12, Issue 4, December 2021
Impact Factor: 5.731

A Review Study on Various Applications of Pd(II) Metal Complexes Derived from Schiff bases

Shikha Yadav[1], Suman Malik[1], Bharti Jain[2]
Department of Chemistry, Sadhu Vaswani Autonomous College, Bhopal, M.P. India[1,2]
Department of Chemistry, Government M. L. B. Girls Autonomous College, Bhopal, M.P. India[3]
drsumanmalik@gmail.com, shikha.yadav63@gmail.com

Abstract: *In the development of co-ordination chemistry, Schiff base plays an important role with transition metals. They can easily form stable complexes. The high affinity of Schiff bases for the chelation helps them in the direction of preparing solid complexes. Metals like Co,Pd, V, Zn, Cr, Fe plays vital roles in the synthesis of Schiff base metal complexes. This review describe properties and applications of Pd(II) metal complexes derived from different Schiff bases. These have various applications as therapeutic agents as antibacterial, antifungal, antidiabetic, antitumor, anticancer, and anti-inflammatory. Pd(II) complexes showed higher selectivity against cancer cell line. These complexes also show catalytic properties in many chemical reactions. Present review is an attempt to compile various applications of Pd(II) metal complexes with Schiff bases..*

Keywords: Schiff Bases, Metal Complexes, Pd (II) Metal Ion, Biological Activity

REFERENCES

[1]. A.W. Kleij, Nonsymmetrical salen ligands and their complexes: Synthesis and applications, Eur. J. Inorg. Chem., 193- 205, 2009.
[2]. P. Das, W. Linert, Schiff base-derived homogeneous and heterogeneous palladium catalysts for the Suzuki–Miyaura reaction, Coord. Chem. Rev., 311, 1-23, 2016.
[3]. S. A. Talouki, G. Grivani, P. Crochet, V. Cadierno, Half-sandwich ruthenium (II) complexes with water-soluble Schiff base ligands: Synthesis and catalytic activity in transfer hydrogenation of carbonyl compounds, Inorg. Chim. Acta, 456, 142-148, 2017.
[4]. A.A. Alshaheri, M. I. M. Tahir, M. B.A. Rahman, T. Begum, T. A. Saleh, Synthesis, characterisation and catalytic activity of dithiocarbazate Schiff base complexes in oxidation of cyclohexane, J. Mol. Liq., 240, 486-496, 2017.
[5]. S. Chandra and S.D. Sharma, Chromium(III), manganese(II), cobalt(II), nickel(II), copper(II) and palladium(II) complexes of a 12-membered tetraaza [N4] macrocyclic ligand, Trans. Met. Chem., 27:732-739, 2002.
[6]. S. Chandra andR. Kumar, Synthesis and spectroscopic characterization of transition metal complexes of a 12-membered tetraaza[N4] macrocyclic ligand and their biological activity,Trans. Met. Chem., 29, 2693-2704, 2004.
[7]. M.R. Malachowski , B. T. Dorsey, M.J. Parker, M. E. Adams and R.S. Kelly, Synthesis, characterization, and X-ray crystal structure of cobalt(III) complexes with a N2O2-donor Schiff base and ancillary ligands: Spectral, antibacterial activity, and electrochemical studies, Polyhedron, 17, 1289-1296, 1998.
[8]. S. Arulmurugan, H.P. Kavitha and B.R. Venkatraman, Biological activities of Schiff base and itscomplexes: a review, Rasayan J. Chem., 3(3):385-410, 2010.
[9]. D. Kumar,S. Chadda , J. Sharma and P. Surain, Syntheses, Spectral characterization, and antimicrobial studies on the coordination compounds of metal ions with schiff base containing both aliphatic and aromatic hydrazide moieties,Bioinorg. Chem. Appl., 10.1155, 2013.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 12, Issue 4, December 2021
Impact Factor: 5.731

[10]. M.J. Maclachlan, M.K. Park and L.K. Thompson, Coordination compounds of schiff-base ligands derived from diaminomaleonitrile (DMN): mononuclear, dinuclear, and macrocyclic derivatives, Inorg. Chem., 35(19), 5492-5499, 1996.

[11]. S. Malik , S. Ghosh and L. Mitu, Complexes of some 3d-metals with a schiff base derived From 5-acetamido-1,3,4-thiadiazole-2-sulphonamide and their biological activity,J. Serb. Chem. Soc.,76(10), 1387-1394, 2011.

[12]. M.A. Phaniband and S.D.Dhumwad, Synthesis, characterization and biological studies of Co(II), Ni(II), Cu(II) and Zn(II) complexes of schiff bases derived from 4-substituted carbostyrils[quinolin2(1H)-ones, Trans. Met. Chem.,32(8): 1117-1125, 2007.

[13]. S. Chandra , D. Jain , A.K. Sharma and P. Sharma, Coordination modes of a schiff base pentadentate derivative of 4-aminoantipyrine with cobalt(II), nickel(II) and copper(II) metalions: synthesis, spectroscopic and antimicrobial studies, Molecules. 14(1): 174-190, 2009.

[14]. H. Naeimi, J.Safari and A. Heidarnezhad, Synthesis of schiff base ligands derived from Condensation of salicylaldehyde derivatives and synthetic diamine, Dyes and Pigment.,73(2):251-253, 2007.

[15]. Alexander V. Design and synthesis of macrocyclic ligands and their complexes of lanthanides and actinides,Chem Rev, 95, 273-342, 1995.

[16]. A.G. Quiruga, C.N. Ranninger, Review contribution to the SAR field of metallated and coordination complexes: studies of the palladium and platinum derivatives with selected thiosemicarbazones as antitumoral drugs, Coord Chem Rev.,248, 119-33, 2004.

[17]. X.W. Douglas, E. Anthony, Thiosemicarbazone complexes of copper(II): structural and biological studies, CoordChem Rev, 123, 49-71, 1993.

[18]. W. Tuo, G. Zijian, Copper in medicine: homeostasis, chelation therapy and antitumor drug design, Curr Med Chem, 13, 525-37, 2006.

[19]. Meija, Juris, Atomic weights of the elements 2013 (IUPAC Technical Report) ,Pure and Applied Chemistry, (3), 265–91, 2016.

[20]. D. R. Lide, Magnetic susceptibility of the elements and inorganic compounds, CRC Handbook of Chemistry and Physics (PDF) (86th ed.), 20-8493, 0486, 5, 2005.

[21]. Weast, Robert, CRC, Handbook of Chemistry and Physics. Boca Raton, Florida: Chemical Rubber Company Publishing. E110, 0-8493-0464-4, 1984.

[22]. Jump,Hammond, C. R.,The Elements, Handbook of Chemistry and Physics (81st ed.), 0485-9, 2004.

[23]. B. Geeta, K. Shravankumar, Binuclear cobalt(II), nickel(II), copper(II) and palladium(II) complexes of a new Schiff-base as ligand: Synthesis, structural characterization, and antibacterial activity, Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 77, 4, 911-915, 2010.

[24]. J. R. Anacona, E. Bastardo and Camus. Manganese (II)And palladium(II) complexes containing a new macrocyclic Schiff base ligand: antibacterial properties, Transition Metal Chemistry, 24, 478-480, 1999.

[25]. T. Vadivel, M. Dhamodaran and K. Singaram,Antibacterial Activities of Palladium (II) Complexes Derived from Chitosan Biopolymer Schiff Base, Journal of Bacteriology and Mycology, 2015.

[26]. EmadYousif, Ahmed Majeed, Khulood Al-Sammarrae, Nadia Salih, JumatSalimon, Bashar Abdullah, Metal complexes of Schiff base: Preparation, characterization and antibacterial activity, Arabian Journal of Chemistry, 10, 2, 163, 2017.

[27]. Oshin Sebastian and AshwinThapa,Schiff base metal complexes of Ni, Pd and Cu, Journal of Chemical and Pharmaceutical Research, 7(10), 953-963, 2015.

[28]. Westcott, Palladium(II) Schiff base complexes derived from sulfanilamides and aminobenzothiazoles, Transition Metal Chemistry,30:411–418, 2005.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 12, Issue 4, December 2021
Impact Factor: 5.731

[29]. K. Yadav, S. Varshney and A.K. Varshney, Synthesis, Spectral and Antimicrobial Investigation of Some New Coordination compounds of Palladium (II) with Biologically Active Nitrogen donor Ligands, J.Appli.Chem., 1097- 1104, 72-78, 2016.

[30]. Mehmet Gulcan, Mehmet Sonmez, Ismet Berber, Synthesis, characterization, and antimicrobial activity of a new pyrimidine Schiff base and its Cu(II), Ni(II), Co(II), Pt(II), and Pd(II) complexes,Turk. J. Chem. 36, 189 – 200, 2012.

[31]. C.E. Satheesh, P. Raghavendra Kumar, P. Sharma, K. Lingaraju, B.S. Palakshamurthy, H. Raja Naika, Synthesis, characterisation and antimicrobial activity of new palladium and nickel complexes containing Schiff bases, InorganicaChimicaActa, 442,1-9, 2016.

[32]. M. Tumer,, H. Koksal., M.K. Sener, Antimicrobial activity studies of the binuclear metal complexes derived from tridentate Schiff base ligands, Transition Metal Chemistry ,24, 414–420, 1999.

[33]. N. Ahmad, E.H. Anouar, A.M. Tajuddin, K. Ramasamy, Synthesis, characterization, quantum chemical calculations and anticancer activity of a Schiff base NNOO chelate ligand and Pd(II) complex, journal.pone.,10.1371, 2020.

[34]. Elsayed, S.A., Butler, I.S., Claude, B.J. et al. Synthesis, characterization and anticancer activity of 3-formylchromone benzoylhydrazone metal complexes, Transition Met Chem, 40, 179–187, 2015.

[35]. Laila H. Abdel-Rahman, Mohamed Shaker S. Adam, Synthesis, theoretical investigations, biocidal screening, DNA binding, in vitro cytotoxicity and molecular docking of novel Cu (II), Pd (II) and Ag (I) complexes of chlorobenzylidene Schiff base: Promising antibiotic and anticancer agents, applied organometallic chemistry, 10,1002, 4527, 2018.

[36]. K.C. Gupta, Alekha Kumar Sutar, Catalytic activities of Schiff base transition metal complexes, Coordination Chemistry Reviews, 252, 12–14, 1420-1450, 2008.

[37]. Mustafa Kemal Yılmaza , Mustafa Keleşb, The catalytic activity of Palladium(II) complexes containing PN ligands in the Heck and Suzuki C-C coupling reactions, JOTCSA. 25(1), 133, 2018.