IJETMR
International Journal of Engineering Technologies and Management Research
A Knowledge Repository

SYNTHESIS OF MIXED LIGAND METAL COMPLEX OF CU (II) WITH SCHIFF BASE AND THIOACETAMIDE

Pratibha Namdeo [*1], Arpan Bhardwaj [2], S.K. Verma [3]
[*1, 2] Government Madhav Science College, Ujjain (M.P.), India
[3] Government College, Sikar (Rajasthan), India

Abstract:
***Complex compounds were identified in the 19th century. The formation of hexammine cobalt (III) chloride [CO (NH3)6] Cl3 which is prepared from cobalt chloride and ammonia is the first compound, studied and real beginning of coordination Chemistry* [1]. *Alfred Werner first explained the nature of bonding and structure of these complexes and he was awarded Noble Prize in 1913* [2]. *He gave the concept of primary (ionisable) valency and secondary (unionsible) valencies of metal ion*.**

Keywords: *Synthesis; Thioacetamide; Schiff Base.*

Cite This Article: Pratibha Namdeo, Arpan Bhardwaj, and S.K. Verma. (2017). "SYNTHESIS OF MIXED LIGAND METAL COMPLEX OF CU (II) WITH SCHIFF BASE AND THIOACETAMIDE." *International Journal of Engineering Technologies and Management Research*, 4(12: SE), 24-26. DOI: 10.29121/ijetmr.v4.i12.2017.587.

1. Introduction

The elements of transition series exhibits various characteristic properties like metal conductance, variable oxidation state, catalytical properties etc. and also have a unique property that they form coordination compounds with Lewis-bases.

Organometallic chemistry in which metal carbon linkage is directly present in the complexes e.g. carbonyl complexes is also an entire sub discipline under coordination chemistry and also the field of bioinorganic chemistry is centered on coordination compounds present in the living system and conduct various biological activity [3-4].

2. Apparatus

The glass apparatus before each experiment were cleaned and rinsed with ethanol and dried. Then assembled protecting from atmosphere moisture using guard tube.

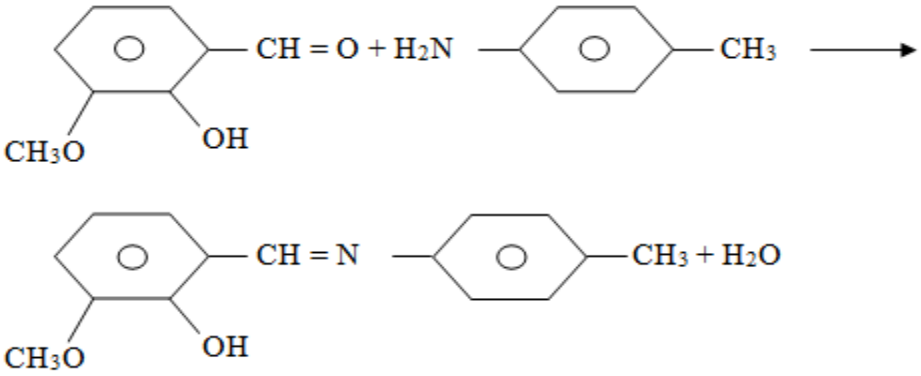
3. Materials

Solvent used were analytical grade, were purified and dried before use.

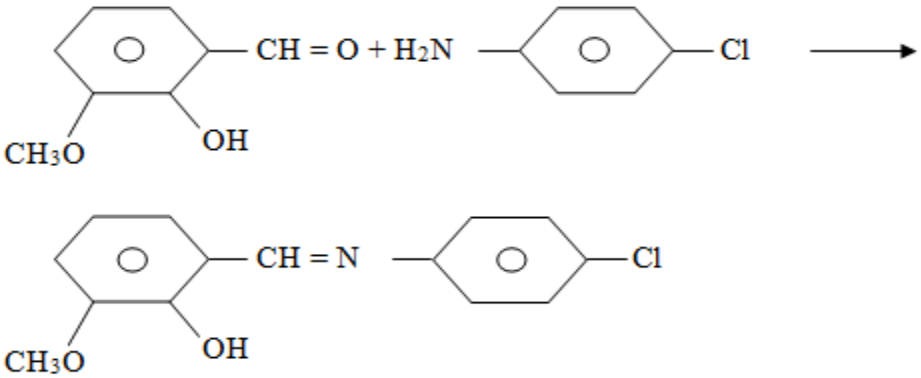
4. Synthesis of Schiff Bases (Ligands)

The following ligands were synthesized for complex formation.

O-Vanilline + P-toluidine ⟶ 2-[(4-Methyl phenyl imino) Methyl]-6-Methoxy phenol + H_2O



O-Vanilline + P-chloroaniline ⟶ 2-[(4-chloro phenyl imino) Methyl]-6-Methoxy phenol + H_2O



5. Procedure

In ethanolic medium the reaction between an aromatic compound containing aldehyde group and an aromatic primary amino compound or its derivative was carried out to prepare schiff bases.

The methodology for the preparation of schiff base is as follows-

O-vanilline (0.01 mol, 2.41 gm) dissolved in 50 ml of hot ethanol was added to 50 ml of ethanolic solution of p-toluidine (0.01 mol, 1.07 gm) in 250 ml of round bottom flask and refluxed on a water bath for about 2-3 hours [5]. The reaction was monitored by TLC. After heating on a water bath the solution was cooled to room temperature. The R B flask was placed in ice bath for 5 to 6 hours (in freezer) crystals of ligand was obtained [6-9] and was filtered under suction pump and washed with absolute alcohol and dried. The ligand was recrystalized from methanol before use and dried in a disiccator containing anhydrous calcium chloride. The purity of ligand was checked by TLC.

6. Synthesis of Metal Complex

The complex has been prepared from the reaction of copper nitrate (0.01 mol, 2.41 gm) dissolved in 50 ml of ethanol with thioacetamide (0.01 mol, 0.75gm) dissolved in 50 ml of ethanol and 2-[(4- methyl phenyl imino) methyl]-6-methoxy phenol (0.01 mol, 2.41 gm) in 250 ml of round bottom flask fitted with reflux condensor and was refluxed at 60-70^{0}C on water bath for 2-3 hours. The product was cooled at room temperature and kept overnight. Then filtered to get crystals. Washed with hot etanol. The complex is then recrystallized with methanol and dried to get purified compound [10-14]. The complex was stored in a desiccator over anhydrous calcium chloride.

Further investigation of the complex for its different properties is under process.

References

[1] J.E. Huhey, Inorganic Chemistry Principles of Structures and Reactivity 4th Ed. Haper & Row, New York, 1993.
[2] G.B. Dover, Classics in Coordination Chemistry, New York, 1968
[3] R.H. Crabtree, The Organometallic Chemistry of the Transition Metals 4th Ed. John Wiley & Sons
[4] Z. Lu, L. Yang, Journal of Inorganic Bio-Chemistry, 2003, 95(31)
[5] Brian S. Furniss, Antony J. Hannaford, Peter, W.G. Smith, Austin R, Tatchell, Text Book of Practical Organic Chemistry 5th Ed.
[6] N. Mahalaxmi, R. Ajavel, Asian Journal of Biochemical and Pharmaceutical Research, 2001, 1 (2), ISSN : 2231-2560
[7] S.R. Yaul, A.R. Yaul, G.B. Pathe, A.S. Aswar, American-Eurasian Journal of Scientific Research, 2009, 4 (4), 229-234, ISSN : 1818-6785
[8] A. Eman, H. Khaled, K. Safaa, H. Khalil, Australian Journal of Basic and Applied Sciences, 2008, 2 (2), 210-220
[9] S.A. Shanker, Y. Farina, A.A. Salleh, European Journal of Scientific Research 2009, 33 (4), 702-709
[10] I.A. Oswole, M. Peruzzini, International Journal of Inorganic Chemistry 2011, Article ID 650186, 7 Pages, , doi: 10, 1155/2011/650186
[11] M.S. Suresh, V. Prakash, International Journal of Current Research, 2001, 33 (2), 068-075, ISSN: 0975-833X.
[12] V. Uma, S. Joshi, V. Panwar, International Journal of Pharma and Bio Sciences, 2011, 2 (1), ISSN : 0975-6299
[13] R. Rajawel, S. Vedanayaki, D. Sandhanamalar, Research Journal of Pharmaceutical, Biological and Chemical Sciences, 2009, 2 (3), 994
[14] P.R. Singh, K.S. Dhakarey, Rasayan Journal of Chemistry, 2009, 2 (4), 869-874