

Copper(II) and zinc(II) complexes based on azo Schiff base ligand: Synthesis, crystal structure and photoisomerization study

Siham Slassia*, Abdelkrim EL-Ghayouryb, Mohammed Aarjanea, Amina Aminea

¹*Equipe de recherche Chimie Moléculaire et Molécules Bioactives, Faculté des Sciences – Meknès, Université Moulay Ismail, Meknès, Maroc*

²*Laboratoire MOLTECH Anjou, Université d'Angers, UMR 6200, CNRS, 2 Bd. Lavoisier, 49045 Angers Cedex, France*

siham.slassi@gmail.com

Schiff base compounds have been recognized as privileged of organic molecules, because of their interesting and important properties, they are able to coordinate with various metals and stabilize them. It's an important special centre of attraction in many areas like biological, clinical, medicinal, analytical and pharmacological field [1]. They are also used in analytical medicinal and polymer chemistry. The azomethine (C=N) linkage in Schiff bases is significant in determining the mechanism of transamination and resamination reactions in biological systems[2], and it has been suggested that the azomethine group is responsible of the biological activities of Schiff bases molecules. Schiff bases ligands with chelating abilities have been recognized as privileged ligands to form stable complexes with a large variety of transition metals [3].

Herein, newly synthesized mononuclear copper(II) and zinc(II) complexes containing an azo Schiff base ligand (L), prepared by condensation of 2-hydroxy-5 (otolyldiazenyl)benzaldehyde and propylamine, were obtained and then characterized using infrared and NMR spectroscopies, mass spectrometry and X-ray diffraction. Ligand L behaves as a bidentate chelate by coordinating through deprotonated phenolic oxygen and azomethine nitrogen. The copper and zinc complexes crystallize in triclinic and orthorhombic systems, respectively, with space groups P-1 and Pca21. In these complexes, the Cu(II) ion is in a square planar geometry while the Zn(II) ion is in a distorted tetrahedral environment. The photochemical behaviors of ligand L, [Cu(L)2] and [Zn(L)2] were investigated.

[1] P. Przybylski, A. Huczynski, K. Pyta, B. Brzezinski, and F. Bartl, "Biological Properties of Schiff Bases and Azo Derivatives of Phenols," pp. 124–148, 2009.

[2] P. P. Dholakiya and M. N. Patel, "Synthesis and Reactivity in Inorganic and Metal- Organic Chemistry Metal Complexes : Preparation , Magnetic , Spectral , and Biocidal Studies of Some Mixed - Ligand Complexes with Schiff Bases Containing NO and NN Donor Atoms," no. April 2015, pp. 37–41, 2010.

[3] A. Corma, H. Garcia, F. X. Llabrés, and I. Xamena, "Engineering metal organic frameworks for heterogeneous catalysis," *Chemical Reviews*, vol. 110, p. 4606, 2010.

Keywords: Schiff base, Complexes, Crystal structure