

A NEW Zn(II) COMPOUND WITH A MACROCYCLIC LIGAND *tpmc*. SYNTHESIS AND CHARACTERIZATION

Mirjana Antonijević-Nikolić¹, Sladana Tanasković², Branka Dražić²

¹Academy of Applied Studies Šabac, Department for Medical, Business and Technological Studies, Hajduk Veljkova 10, 15000 Šabac, Serbia,

²Faculty of Pharmacy, Vojvode Stepe 450, 11000 Belgrade, Serbia e-mail: mantonijevicnikolic@vmpts.edu.rs

Abstract

Zinc is an important transition metal in the biological intracellular environment of living organisms which plays critical roles in important physiological process [1]. Zinc complexes have kindled interest, as they are less toxic than complexes of non-essential metals and have been used as drugs for the treatment of Alzheimer's disease, showing bactericidal, antimicrobial and cytotoxic activity [2]. Zinc complexes can adopt diverse geometries with different ligands and coordination numbers. This paper reports the synthesis and characterization of new complex Zn(II) with N,N',N'',N'''-tetrakis(2-pyridilmethyl)-1,4,8,11-tetraazacyclotetradecane (*tpmc*).

The new complex was prepared in mixture acetonitrile/water in reaction $\text{Zn}(\text{CH}_3\text{COO})_2 \cdot 2\text{H}_2\text{O}$ and *tpmc* (mole ratio 2:1) with reflux and stirring for 2 h in a water bath (80 °C). Obtained complex is stable on the air

The complex was characterized by elemental analysis (C, H, N), FTIR spectroscopy, and molar conductivity determination. The analytical data show the formation of binuclear $[\text{Zn}_2(\text{OH})\text{tpmc}](\text{ClO}_4)_3 \cdot 3\text{H}_2\text{O}$ complex. The elemental analyses data correspond well to the proposed formula. The molar conductance measurements of the complex in acetonitrile correspond to 1:3 electrolyte [3].

FTIR spectrum of the complex is very much consistent with the proposed formula and with data obtained by other methods.

Comparing the FTIR spectrum of the new complex with the spectra of related *tpmc* hydroxo complexes and different central ions, it was concluded that the macrocyclic ligand is coordinated to metal ions through eight N atoms. Also, based on the comparison, it was concluded that OH^- connects two Zn(II) forming a bridge between them [4].

References

- [1] A. Dalla Cort, P. De Bernadin, G. Forte, F. Yafteh, Chem. Soc. Rev. 39 (2010) 3863.
- [2] S. Liu, W. Cao, L. Yu, W. Zheng, L. Li, C. Fan, T. Chen, Dalton Trans. 42 (2013) 5932
- [3] W.J. Geary, Coord. Chem. Rev. 7 (1971) 81
- [4] E. Asato, H. Toftlund, S. Kida, Inorganica Chimica Acta, 165 (1989) 207.