

INVESTIGATION OF SOME HYDROSOLUBLE BINUCLEAR COMPLEXES OF COPPER(II) BASED ON BIS-ISOTHIOSEMICARBAZONES

Tudor Jovmir^{a,*}, Sergiu Shova^{a,b}, Lucian Lupascu^a, Greta Balan^c, Olga Burduniuc^c, Ion Geru^d,
Nicolae Gaiu^c, Aurelian Gulea^c, Vasile Lozan^a

^aInstitute of Chemistry, Moldova State University, 3, Academiei str., Chisinau MD-2028, Republic of Moldova

^b"Petru Poni" Institute of Macromolecular Chemistry, Department of Inorganic Polymers, 41A, Aleea Grigore Ghika Voda,
RO-700487 Iasi, Romania

^cMoldova State University, 60 Mateevici str., Chisinau MD-2009, Republic of Moldova

^dAcademy of Sciences of Moldova, 1, Stefan cel Mare Blvd. Chisinau MD-2001, Republic of Moldova
*e-mail: tjovmir@gmail.com, (+373) 68 271 304; fax: (+373) 22 73 99 54

Abstract. Four new coordination compounds of copper(II) containing binucleating Schiff base have been synthesized starting from the known hydrosoluble binuclear copper(II) $[\text{Cu}_2(\text{H}_2\text{Q})-\mu\text{-Cl}]\text{Cl}_2\cdot\text{H}_2\text{O}$ based on 2,6-diformyl-4-methylphenol bis(*S*-methylisothiosemicarbazone) (H_3Q). The complexes were characterized by elemental analysis, IR spectroscopy and XRD analysis. In the structure of $[\text{Cu}_2\text{H}_2\text{Q}-\mu\text{-Cl}-\mu\text{-(ZnCl}_4)]\cdot\text{H}_2\text{O}$ both chloride anions coordinated in *cis*-apical fashion to copper dimer, being part of a new formed tetrachlorozincate anion which function as additional triatomic bridge between copper centers: Cu-Cl-Zn-Cl-Cu. The EPR spectra of the former compound recorded at 300 K revealed seven lines of hyperfine structure with $g = 2.008 \pm 0.003$ of the central component and the constant of hyperfine interaction $A = (126 \pm 13) \cdot 10^{-4} \text{ cm}^{-1}$. It was found that it manifests a pronounced selective antibacterial activity in aqueous solutions against pathogen Gram(+) bacteria (MMC= 1-2 $\mu\text{g/mL}$), as well as against fungal strains (MMC= 4-8 $\mu\text{g/mL}$), while the free ligand H_3Q does not reveal significant antimicrobial activity.

Keywords: copper, binuclear, isothiosemicarbazone, X-ray study, electron paramagnetic resonance spectroscopy, antimicrobial activity.