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STRUCTURE AND ANTIMICROBIAL ACTIVITY OF THE COPPER(II) COMPLEX WITH 8-FORMYLQUINOLINE 4-ETHYL-THIOSEMICARBAZONE

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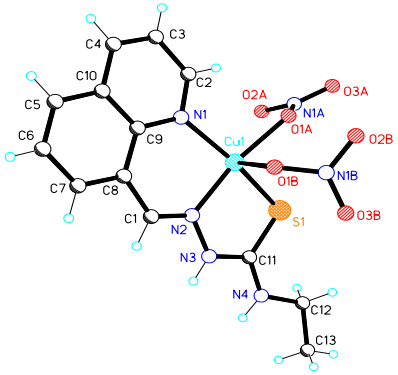
Thiosemicarbazones and their metal complexes are a wide class of biologically active compounds. In the present work, we report the synthesis, structure, and antibacterial property of copper(II) with 8-formilquinoline 4-etylthiosemicarbazone (4-Et-HQATSC).

Copper(II) nitrate and 4-Et-HQATSC were dissolved separately in ethanol, and mixed together in equimolar ratio. The final product has the composition Cu(4-Et-HQATSC)$(NO_3)_2$.

The structure of Cu(4-Et-HQATSC)$(NO_3)_2$ is molecular. It consists of discrete molecules in which the coordination sphere is formed by the neutral ligand 4-Et-HQATSC, and two monodentate ions NO_3^-, coordinated througth an oxygen atom.



Introduction of ethyl substituent at the nitrogen marginally atom in the thiosemicarbazidic fragment haven't change the coordination mode of the organic ligand [1]. The base of the tetragonal pyramid is formed by three atoms of the tridentate 4-Et-HQATSC ligand coordinated via NNS donor sites and by one oxygen atom of the nitrate anion. The second NO_3^- ion is situated in the apical position. The bond distance Cu-O = 1,994 Å for the ligand coordinated in the equatorial plane is smaller, than interatomic distance Cu-O = 2.431 Å in the apical position.

The antimicrobial activity against gram-negative and gram-positive bacteria has been determined for this compound. The results clearly demonstrate than the antibacterial activity of Cu(4-Et-HQATSC)$(NO_3)_2$ against *Pseudomonas aeruginosa* are more than 2 times higher, against *Escherichia coli* and *Enterococcus faecalis* 4 times higher, against *Proteus vulgaris* 64 times higher and against *Staphylococcus aureus* 12 times higher when compared to the activity of furaciline. The presence of ethyl-substituent in the thiosemicarbazide moiety gives rise to an increasing of the antibacterial activity.

References

[1] Revenko M.D., Bourosh P.N., Stratulat E.F., Gdaniec M., Lipkowski J.., Korzha I.D., Simonov, Yu.A. Synthesis and Structure of Copper(II) Coordination Compounds with 8-Quinolinecarboxaldehyde Thio- and 4-Phenylthiosemicarbazones. *Russian Journal of Inorganic Chemistry*, 2010, V. 55. N. 9. P. 1387-1397.