



**SYNTHESIS, STRUCTURE AND ANTIMICROBIAL ACTIVITY OF SALICYLALDEHYDE  
4-(DIMETHYLPHENYL) THIOSEMICARBAZONES AND BIOMETAL  
COORDINATION COMPOUNDS WITH THESE LIGANDS**

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The aim of this work is the synthesis of salicylaldehyde 4-(dimethylphenyl)thiosemicarbazones (H<sub>2</sub>L) and cobalt, nickel, copper, and zinc coordination compounds with these ligands, determination of their composition, structure and antimicrobial activity.

First, the thiocarbamides were obtained by the reaction of dimethylanilines with DTMT. Then thiosemicarbazides were obtained by a one or two step process. Finally, thiosemicarbazones H<sub>2</sub>L were synthesized by the condensation of corresponding thiosemicarbazide with salicylaldehyde.

The purity of all organic substances was proved by NMR (<sup>1</sup>H and <sup>13</sup>C) spectroscopy. The single crystals of some substances were obtained and their structures were determined by X rays diffraction analysis. These molecules represent almost planar structures. The ethanol solutions of chlorides of stated above metals react with thiosemicarbazones H<sub>2</sub>L in 1:1 or 1:2 molar ratio forming coordination compounds M(HL)Cl (M = Cu, Zn), Ni(HL)<sub>2</sub> and Co(HL)<sub>2</sub>Cl. Their structures were determined using IR spectroscopy and magnetochemical measurements. In case of nickel and cobalt complexes structures were proved by X-rays diffraction analysis. All substances are monomeric. The thiosemicarbazones H<sub>2</sub>L acts as threedentate ONS-ligands.

The antimicrobial activity of these compounds was studied *in vitro* using the method of two-fold serial dilutions in liquid nutrient medium on standard strains of *Escherichia coli*, *Klebsiella pneumoniae*, and *Pseudomonas aeruginosa*. Both thiosemicarbazone and biometal coordination compounds manifest selective antimicrobial activity in the range of concentrations 0,7 – 1000,0 mg/mL. The nickel coordination compounds are the most active substances from this series. The antimicrobial activity depends on the nature of the central atom and positions of the methyl groups in the thiosemicarbazide moiety.

Identified properties of thiosemicarbazones and biometal coordination compounds with these ligands are of interest in terms of expanding the arsenal of the reserve disinfectants. They can be used in the case of microbial immunity to traditional medicines.

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