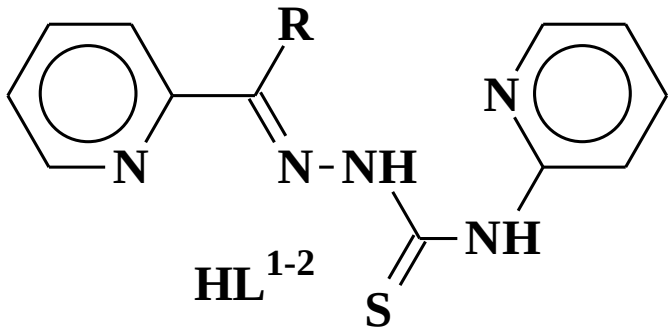
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SYNTHESIS, STRUCTURE, ANTITUMOR AND ANTIMICROBIAL ACTIVITY OF 3D-METAL COMPLEXES WITH SOME DERIVATIVES OF PYRIDINE-2-CARBALDEHYDE 4-(PYRIDINE-2-YL)THIOSEMICARBAZONES

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Thiosemicarbazide derivatives are widely used in medicine in treating various types of diseases. All of them have a wide range of reactive atoms and form with metal ions biologically active coordination compounds with a various composition and properties. It was determined that in many cases biological activity of these compounds consists with their structure. Therefore, the synthesis and the determination of crystal structure features of thiosemicarbazide derivatives are of both scientific and practical interest.



HL^{1-2}

HL^1 : R=H; HL^2 : R=CH_3

The aim of this work is the synthesis, the determination of the composition, the structure, antitumor and antimicrobial activity of the coordination compounds of cobalt, nickel, copper and zinc with pyridine-2-carbaldehyde (HL^1) and 2-acetylpyridine (HL^2) 4-(pyridine-2-yl)thiosemicarbazones.

The experiments showed that chlorides and nitrates of stated above metals react with thiosemicarbazones HL^{1-2} in ethanol solution in molar ratio 1:1 or 1:2 forming fine-crystalline coloured compounds. For these compounds was determined composition $M(HL^{1-2})Cl_2$ (M = Ni, Cu, Zn), $Co(HL^{1-2})_2Cl_2$. Their structure was determined on the basis of data from NMR spectroscopy (^1H and ^{13}C), IR spectroscopy, magnetochemical research, and from X-ray analysis for some of them. The synthesized coordination compounds have monomeric structure. Thiosemicarbazones HL^{1-2} behave as ligands with N,N,S set of donor atoms.

Bacteriostatic and bactericidal activity of these compounds was determined in vitro using the method of double dilution. Their activity was tested on standard strains of *Staphylococcus aureus, Bacillus cereus, Escherihia coli, Shigela sonnei* and *Salmonella abony*. These compounds show selective antimicrobial activity for all of the tested strains in the range of concentration 0.004-20.0mg/ml. The copper(II) coordination compounds show the highest antimicrobial activity. It was found that the minimal bactericidal concentration depends on the thiosemicarbazone and the acid residue in the composition of homotypic complexes in the following way: $HL^2 > HL^1$; $Cl^- > NO_3^-$. Moreover, the sinthisezed coordination compounds inhibid the human promyelocytic leukemia HL-60 cells' proliferation up to 100% in the range of concentration 10^{-5} -10^{-6} mol/l.

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