P27. Synthesis and antitumor activity of copper(II), nickel(II) and cobalt(III) coordination compounds with 2-[(pyridin-2-ylmethylidene)amino]butan-1-ol and its derivatives

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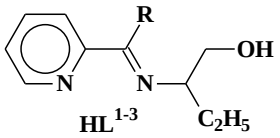
The aim of this work is the determination of synthesis conditions, composition, structure, antitumor properties of copper(II), nickel(II) and cobalt(III) coordination compounds with 2-[(pyridin-2-ylmethylidene)amino]butan-1-ol (HL^1), 2-{[1-(pyridin-2-yl)ethylidene]amino}butan-1-ol (HL^2) and 2-{[phenyl(pyridin-2-yl)methylidene]amino}butan-1-ol (HL^3).

The synthesis of coordination compounds was performed in ethanolic solutions using template method. 2-Aminobutanole reacts with 2-formylpyridine (HL^1), 2-acetylpyridine (HL^2) and 2-benzoylpyridine (HL^3) in presence of copper(II), nickel(II) and cobalt(II) chlorides, bromides, nitrates, perchlorates and acetates taken in molar ratio 2:2:1 or 1:1:1. The composition of these compounds was determined using elemental analysis: $Cu(HL^{1-3})X_2$, $Cu(L^{1-3})X$, $Ni(L^{1-3})_2$ and $Co(L^{1-3})_2X$ ($X = Cl^-$, Br^-, NO_3^-, ClO_4^-). The magnetochemical research showed that the synthesized coordination compounds of copper are polynuclear, coordination compounds of nickel and cobalt have octahedral structure. Azomethines HL^{1-3} behave as neutral or mono-deprotonated tridentate ligands with N,N,O set of donor atoms.

The antiproliferative activity of the synthesized coordination compounds was studied on cancer cells Hep G-2 and BxPC-3. It was determined that these compounds inhibit the proliferation of these tumor cells in the range of concentration 100-0.1 μmol/L. The inhibitory concentrations IC_{50} towards the Hep G-2 cells are in the range of 26.7-99.6 μmol/L. Towards the BxPC-3 cells IC_{50} values are in the range of 11.7-40.7 μmol/L. It was shown that the nature of the central atom and substituent R in the corresponding azomethine and also the acid residue have an influence on the antitumor activity of these complexes. For the homotypic complexes the activity diminishes in the following way: Cu > Co ≈ Ni; $HL^1 > HL^2 \approx HL^3$; $Cl^- \approx Br > NO_3^- \approx ClO_4^-$. Synthesized compounds manifest better activity towards BxPC-3 cells.



R =H(HL^1), CH_3(HL^2), C_6H_5(HL^3)

The determinated properties of the synthesized substances are of interest for medical practice for enhancement of the arsenal of antitumor preparations.

Aknowledgment
This work was fulfilled with the financial support of the Institutional Project **15.817.02.24F**.

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