

**IN VITRO ANTILEUKEMIA ACTIVITY (HL-60 CELLS), OF SOME 3d METAL
COMPLEXES. CHEMICAL SYNTHESIS AND STRUCTURE –
ACTIVITY RELATIONSHIP**

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28 years after the first approval of cisplatin in the clinic against a number of cancer diseases, cisplatin and related compounds continue to be among the most efficient anticancer drugs used so far. Efforts are focused to develop novel platinum- and non-platinum-based antitumor drugs to improve clinical effectiveness, to reduce general toxicity and to broaden the spectrum of activity. Thiosemicarbazones and their transition metal complexes demonstrated potent cytotoxic activity against a series of murine and human suspended cultured tumor cells. The aim of our communication is to report the synthesis of novel 3d metal complexes with some di- and tri-dentate ligands containing N, O and S donor atoms which have different electronic and geometrical structure confirmed by elemental and thermal analyses, molar conductance, magnetic measurements, IR and NMR data. In order to investigate the antileukemia activity 27 metal complexes were tested as inhibitors of HL-60 cells growing.

It was established that the nature, electronic structure and coordination number of the central atom, the geometric configuration of metal complexes and the nature of the ligands (donor atoms) are important in biological activity prediction. In investigated series of complexes the most active are those having a copper (II) or a cobalt (II) species.

For the octahedral environment of the cobalt complexes the electronic configuration is important $\text{Co}^{2+} (3d^7) > \text{Co}^{3+} (3d^6)$. This different activity can be explained by the fact that in solutions Co^{2+} complexes with inner coordination sphere lifetime of the ligands $10^{-4} - 10^{-5}$ s are more labile in comparison with the inert Co^{3+} complexes (lifetime $10^3 - 10^5$ s). Copper (II) complexes with different type of electronic hybridisation and geometric structure produce also different activity. We find that a square planar Cu^{2+} complexes have essential activity. The activity of such square planar complexes is influenced also by the nature of the ligand donor atoms. In fact complexes with coordinated ligands containing N, O and S chelate donor atoms are essentially more active than complexes including inner sphere only nitrogen or oxygen. In this case the presence of coordinated ligand containing sulphur donor atom is indicated. If sulphur ligand donor atom is blocked by CH_3 group the biological activity became insignificant.