

# Synthesis and Study of Arsenic-containing Borates, Coordination Compounds of tetrathioestibates (V) of some d- and f-metals with Hydroxy- and Amino-groups Containing Aromatic Ligands

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In the chemistry of boron great place takes of important representatives of boron-organic compounds – alkyl(aryl)borates  $(RO)_2BR/$  and  $ROB(OR/)_2$  ( $R = \text{alk.}$ ,  $R = \text{aryl}$ ,  $R = R/$ ,  $R \neq R/$ ), which synthesis and study of properties intensively have been investigated from last century from the seventies and still do not lose actuality. They possess not only preparative, but also theoretical and practical meaning. They are used in many organic syntheses, also as borated agents and as lewis acids. Last years intensively investigate synthesis of borates effective towards of various aggressive microorganisms, among them especial interest provokes borates containing other elements, privately arsenic. By us have been synthesized and studied arsenic-containing borates based on ethylene glycole, pyrocatechin, 2,3-dihydroxynaphthalene, p-oxyphenylarsonic acid and salicylic acid.

By taking into account the technological availability of obtaining and towards various microorganisms expected activity by us have been synthesized and studied also simultaneously two metals containing coordination compounds, privately, Ag, Cu(II), Ni(II), Ho, Dy and Tm of tetrathioestibates (V) with difunctional ligands - 2-aminophenole, 1,2-diaminobenzene and 1,2-N,N'-dimethylaminobenzene have been synthesized. Synthesis with chosen ligands and salts of d- and f-metals has been carried out by exchange reaction in the presence of sodium tetrathioestibate as sedimentation agent.

By means of quantum-chemical semi empirical AM1 method [CS MOPAC (Chem3D Ultra-version 8.03)] the estimation of complex forming capacity and study of geometrical parameters and electronic structure of synthesized borates and nitrogen-containing ligands have been carried out. It was established, that chosen ligands represents as bidentate ligands and is capable to form coordination compounds with d- and f-metals in the form of 5-member cycle.

The composition and structure of synthesized compounds have been established based on chemical, IR spectral, NMR and Mass spectral analyses and roentgenophase measurement. Their thermal properties by thermogravimetric and differential-thermal analysis method have been studied.

For estimation of probable bioactivity of synthesized compounds their virtual (theoretical) bio-screening by using of internet-system program PASS C&T have been carried out. It was established, that these compounds with experimentally high probability ( $P_a = 0.53-0.98$ ) possibly will show Antibacterial, Antiviral and Antiparasitic activity.

The synthesized compounds were tested as inhibitors of growth of some phytopathogenic bacteria. As test objects the following microorganisms were used: *Agrobacterium tumefaciens*, *Xanthomonas campestris*, *Pectobacterium aroideae* and *streptomyces spp.* It was established, that synthesized compounds in various degree oppress growth of studied test organisms and can be used against these phytopathogenic microorganisms.