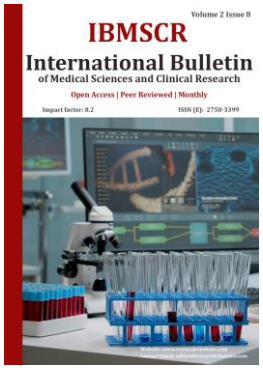

INVESTIGATION OF MIXED LIGAND COMPLEX COMPOUNDS OF A NUMBER OF METALS

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Abstract.
The creation of new chemical compounds and materials with valuable useful properties for their use in various fields of the national economy is one of the urgent tasks of modern chemistry.
Keywords: Complex compounds, metal carboxylates, ligand, amides, synthesis, cotton growth stimulator.

INTRODUCTION

The intensive development of the chemistry of complex compounds is due to the discovery of new fields of application in a variety of objects with the identification of useful properties. A review of the world literature has shown that to date the composition, structure and properties of numerous coordination compounds of chlorides, bromides, iodides, nitrates, phosphates, rhodanides, sulfates, formates, acetates, benzoates, salicylates, fatty acid salts of various metals with nitrogen, oxygen, sulfur containing organic ligands have been synthesized and studied. It should be noted that most compounds are used in analytical chemistry, medicine, agriculture and industry. Of course, it should be stated that this class of coordination compounds will have extremely important, scientific and practical significance in terms of features of formation, structure, electronic structure, reactivity and many imaginative areas of their application.

Main part: The purpose of this work is to develop conditions for the synthesis of a new class of complex compounds containing two types of ligands, carboxylate groups, water molecules around the central ion and to establish the structure, electronic structure, reactivity, thermal and biomedical properties of complex complexes.

The object of this study of metal carboxylates are formates, acetates, palmitates, oleates, stearates, benzoates, nicotinates of magnesium, calcium, manganese(II), cobalt(II), nickel(II), copper(II) and zinc. Amides, amines and amino acids were selected as neutral ligands. By using various methods, more than 250 new complex compounds of metal carboxylates with two different ligand molecules have been synthesized. The composition and individuality of the selected complexes are established. Methods of coordination of two types of ligands of carboxylate groups and geometric configurations of coordination nodes have been proved using IR absorption spectra and diffuse reflection spectra. The mutual arrangement of ligands,

carboxylate groups and water molecules with a change in the nature of the metal and carboxylate anions is discussed.

The quantum chemical study of the selected free and coordinated molecules of organic compounds allows us to trace changes in the energy, geometric, thermodynamic characteristics of ligands depending on their conformations, tautomeric forms, as well as the nature of substituents in the main fragment, which can serve as a criterion for evaluating the coordination ability of ligands in the search for optimal ways of directed synthesis of coordination compounds. Consequently, new quantum-chemical data of mixed-ligand complex compounds of a number of metal carboxylates make it possible to analyze from the point of view of the reactivity of complexes from the position of searching for optimal ways of directed synthesis of chemical compounds with specified properties. Experimental data are needed not only as reference materials, but also for the synthesis of new coordination compounds, extractants, biologically active compounds and for the interpretation of absorption spectra of organic and coordination compounds. It is noted that the change in the nature of organic ligands around the central atom leads to a significant redistribution of charges on the atoms and thereby affect the energy of the boundary orbitals, which contributes to the regulation of the reactivity of complex compounds. The thermal behavior of synthesized complex compounds is investigated. Some intermediate products of thermolysis have been identified.

Low-toxic effective growth stimulators of cotton and grain crops of multifunctional action have been created: M-2, Ca BTK, SMR, Zn-II, TX-2004, AS-2005. New compositions created on the basis of the above stimulants show a pronounced stimulating effect on the growth and development of cotton. Anti-atherosclerotic, antianemic and anti-inflammatory drugs for medical use have been identified. The possibilities of purification, separation and determination of compounds of metals and organic ligands based on the selective interaction of metal carboxylates with amides are shown.

CONCLUSIONS: The synthesis of new mixed-ligand complex compounds of a number of metals, which are expanded by a new class of complex compounds of inorganic chemistry, is important for the progress of world science. The obtained data on composition, structure, reactivity and properties are used as reference materials and for the synthesis of new coordination compounds, extractants, biologically active compounds. The data obtained are used to interpret the absorption spectra of organic and complex complex compounds.

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