Obtaining of Initial Compounds based on Arsenic-containing Industrial Wastes for producing of various bioactive compounds

Kristina Giorgadze, Maia Rusia, Nodar Lekishvili
e-mail: kristina.giorgadze@tsu.ge
Department of Chemistry; Ivane Javakhishvili Tbilisi State University; Faculty of Exact and Natural Sciences
Institute of Inorganic-organic Hybrid Compounds and Non-traditional Materials
3, Ilia Chavchavadze Ave., 0179, Tbilisi, Georgia

Realgar-auripigment and arsenopyrite deposits by their high content of arsenic are unique in the world. Transformation of arsenic containing industrial waste into practically important compounds with specific properties with the purpose of their further application belongs to a variety of topical issues of applied chemistry. Successful solution of this problem will not only creates new raw materials resource base, but also will solve important ecological problem – will protect environment from pollution by arsenic containing waste.

Extraction of arsenic from wastes of mining-chemical factory, - privately, residues obtained by fumigation of realgar (As_4S_4) - auripiginent (As_4S_6) ore was carried out by higher aliphatic alcohols, privately, by iso-C_5H_{11} alcohol by the method of azeotropic drying. This method is based on the high selectivity of the reaction of used alcohols with the components of the waste. The obtained with high condition arsenical acid's esters $(RO)_3As$ undergo hydrolysis in aqueous solution with formation of white arsenic and corresponding alcohol. This alcohol can be again used as extragent, so process becomes cyclic and continuous. The alcohol exstracts can be used as initial compounds for obtaining of barium and stroncium hydro arsenates, which maybe used in medicine in particular in homeopathy and in veterinary as anthelminths. The cationic-anionic complexes with some transition metals (Hg) have been obtained, which have perspectives for using in analytical chemistry.

The possibilities of use of obtained oxo-compounds have been studied: