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Technology of Recovering Precious Metals from Technogenic Formations

The most of the alluvial gold deposits have been practically worked-out during the past centuries. It has led to generation of numerous technogenic formations (so called technogenic deposits) on the territory of Siberia and Far East which were unpractical because of different attitude to the quality and quantity of mineral deposits , absence of modern, ecologically and economically profitable technologies concerning their developing. Gold dumps of thermal power plants are the other perspective technogenic source of precious metals. Some of the coal deposits are characterized by higher content of Au, Pt, Pd as well as other elements. Anomalously high concentrations of precious metals as well as Mo, Ni, Co, Zn, Cu, Pd and S are located within overburden and foundations of coal deposits. While coal burning precious metals pass into gold dumps which can be the objects of hydrometallurgical processing (after processing) using solutions without cyanide to extract precious metals.

Nowadays cyanide leaching is used to extract precious metals from mineral raw materials after processing. Taking into account increased attention to environmental protection and overall application of toxic cyanide method of extracting precious metals it is more perspective to use solutions of gold and silver without cyanide.

As the study showed, precious metals are more efficiently extracted from technogenic raw materials by thiocarbomid and thiocyanate solutions with the following extraction of precious metals from leaching solutions.

The aim of the study is to solve the problem of extracting precious metals, particularly gold and metals of platinum group, from technogenic formations as well as the problem of ecology and rational nature use connected with liquidation consequence of environmental pollution raised due to alluvial gold extraction during the recent years and using technogenic mercury in the process of gold extraction from concentrates.

The previous study showed the possibility of extracting free (fine and fine-grained) and inherent gold, and elements of platinum group from the dumps of gold extraction using the method of hydrometallurgy.

Using technogenic raw materials of solutions without cyanide for leaching with the following extraction of precious metals from leaching solutions by the method of liquid extraction will enable to minimize the losses concerning expensive reagent (carbamide) during raw materials processing. These investigations can be applied in the mining sector.