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Problems of noble metals extraction from carbon bearing rocks with invisible ore mineralization

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Over the past decades there has been increasing interest in carbon bearing rocks enriched with gold and PGEs (Platinum Group Elements). Recently an economic content of gold (2.2－30 ppm) and platinum have been first found in graphite bearing rocks of the Khanka terrane, Primor'e, Russian Far East. Notwithstanding considerable measured by ion mass spectrometry PGEs contents, visible PG-minerals were not observed in polished thin sections, while native gold was found sporadically as discrete thin films.

A fractionation of the some samples in aqua regia and HF on solute and graphite as insoluble residue allowed to suppose an association of PGEs and most of Au with graphite that is consistent with the concept of an interplanal position of metals in graphite structure.

An extraction of noble metals from these rocks represents a hard problem because of necessity of breakdown of molecular metal carbonic bonds. To solve the problem subsequent laboratory studies are necessary.

To solve the problem, graphite enrichment of samples from the Khanka terrane and extraction of the noble metal are necessary. For this purpose distribution of the noble metals in the process of flotation concentration as well as possibility of their separation by sorption leaching of the flotation concentrates will be tested. Moreover, conditions of noble metals desorption from graphite-like systems and their electrochemical separation from the leaching solutions are also being determined.

Various combined pyrohydromatallurgical, electrochemical and mechano-chemical methods will be also used for separation of the noble metals from the above mentioned raw materials.

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