MINERALOGICAL AND GEOCHEMICAL FEATURES OF THE OLENINSKOE GOLD OCCURRENCE (KOLA REGION, RUSSIA)

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The Oleninskoe gold occurrence is situated within the Archean Kolmozero-Voronšja suture structure. The host rocks are basalts and gabbro-diabases metamorphosed in the amphibolite facies. The mineralized zone is bordered in the west by a major fault intersecting the entire structure. The thickness of the zone is approximately 50 m, it strikes over 1.5 km, and dips to at least 100 m. The alteration processes in the rocks of the Oleninskoe occurrence are represented mainly by the silicification (thin quartz veinlet), biotitization, epidotization, diopsidization etc. Based on study of fissure systems in the host rocks, it is established that ore bodies tend to an intersection of disjunctive dislocations of the lower order represented by steep longitudinal and transversal fissures. Pyrrhotite-arsenopyrite mineralization of the Oleninskoe gold occurrence is of the streaky-disseminated type. It can be referred to low-sulfide gold-quartz formation. The major ore minerals are pyrrhotite, arsenopyrite, native gold, electrum, native silver, chalcopyrite, blende, galena and silver sulphosalts. The primary gold-bearing mineral is arsenopyrite, in which early gold is emulsive. The size of gold grains varies from 0.001 mm up to 0.2 mm. Later gold is represented by veinlets in sulphides and silicates being 0.1 up to 0.5 mm in size.

On the basis of 100 individual geochemical analyses, primary geochemical aureoles of Au, Ag and As were mapped. That allowed to reveal a pod-like shape and orientation of the ore bodies. The orientation of the ore bodies coincides spatially with crystallization and metamorphic schistosity of host rocks and corresponds to the general direct strike of the Archean Kolmozero-Voronšja structure. It is noted according to the primary aureoles that the rocks with highest concentration of Au, Ag and As tend to the contact of gabbro-diabases and muscovite-quartz metasomatic rocks.
The gold composition in the Archean Kolmozero-Voronšja structure ranges from high fineness (90-94% Au) to native silver (99.97% Ag).