

Petrographic Properties of Sedimentary-Exhalative Type Ores of Filizchay Polymetallic Deposit

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Abstract : The Filizchay polymetallic deposit is located on the southern slope of the Greater Caucasus Mountain Range, northwest of Azerbaijan in the Balaken district. Filizchay is the largest polymetallic deposit in the region and the second-largest polymetallic deposit in Europe. The mineral deposits in the region are associated with two different geodynamic evolutions that began with the Mesozoic collision along the Eurasian continent and the formation of a magmatic arc after the collision and continued with subduction in the Cenozoic. The bedrocks associated with Filizchay mineralization are Early Jurassic aged. The stratigraphic sequence of the deposit is consisting of black metamorphic clay shales, sandstones, and ore layers. Shales, sandstones, and siltstones are encountered in the upper and middle sections of the ore body, while only shales are observed at the lowest ranges. The ore body is mainly layered by the geometric structure of the bedrock; folding can be observed in the ore layers along with the bedrock foliation, and just in few points indirect laying due to the metamorphism. This suggests that the Filizchay ore mineralization is syngenetic, which is proved by the mineralization by the bedrock. To determine the ore petrography properties of the Filizchay deposit, samples were collected from the region where the ore is concentrated, and a polished section was prepared. These collected samples were examined under the mineralogical microscope to reveal the paragenesis of the mineralization and to explain the relation of ore minerals to each other. In this study, macroscopically observed minerals and textures of these minerals were used in the cores revealed during drilling exploration made by AzerGold CJS company. As a result of all these studies, it has been determined that there are three main mineralization types in the Filizchay deposit: banded, massive, and veinlet ores. The mineralization is in the massive pyrite; furthermore, the basis of the ore-mass contains pyrite, chalcopyrite, sphalerite, and galena. The pyrite in some parts of the ore body transformed to pyrrhotite as a result of metamorphism. Pyrite-chalcopyrite, pyrite-sphalerite-galena, pyrite-pyrrhotite mineral assemblages were determined during microscopic studies of mineralization. The replacement texture is more developed in Filizchay ores. The banded polymetallic type mineralization and near bedrocks are cut by quartz-carbonate veins. The geotectonic position and lithological conditions of the Filizchay deposit, the texture, and interrelationship of the sulfide mineralization indicate that it is a sedimentary-exhalative type of Au-Cu-Ag-Zn-Pb polymetallic deposit that is genetically related to the massive sulfide deposits.

Keywords : Balaken, Filizchay, metamorphism, polymetallic mineralization

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