



Pb-Zn Sulphide mineralization of Hajvalia-Badovci-Kizhnica and Artana Ore Field, Kosova: Geology and Sulphur Isotopic Composition

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Received August 05, 2010; Accepted November 25, 2010

Abstract: The Pb-Zn sulphide mineralization of ore field “Hajvalia-Badovci-Kizhnica” and ore deposit Perroi i ngjyrosur (the ore field of Artana) areas belongs to the metallogenic region of Kopaonik, mineral belt of Trepça, and is characterized by high Pb, Zn and Ag content (up to 25% Pb+Zn and 125ppm Ag). Mineralization is located in limestones (the ore deposits: Hajvalia, Badovci and Perroi i ngjyrosur-Artana), serpentinites, or andesite - serpentinite contact (the ore deposits of Badovci and Kizhnica), and rarely in flysch and gneisses (Kizhnica ore deposit). The mineralization is controlled by primary, pre-mineralization dislocation zones that are accompanied by lower orders faults (*longitudinal*, NW-SE with 60°-70° dip towards NE, *diagonal*, approximately meridian and *transversal*, E-W). In the Hajvalia ore deposit the mineralization is controlled also by a folded structure in the crystalline schists and cretaceous sediments. The main mineralogical paragenesis is sphalerite, galena and pyrotine, characteristic for all ore deposits. In Hajvalia and Badovci deposits is also present the iron, manganese carbonate paragenesis (oligonite ore bodies). A siderite-smithsonite paragenesis is also characteristic for the ore deposit Përroi i ngjyrosur (Artana). The $\delta^{34}\text{S}$ of galena, sphalerite and pyrite in all four deposits varies from -0.48 ‰ (galena from Badovci) to 4.01 ‰ (pyrite from Artana). The calculated $\delta^{34}\text{S}$ ‰ of the hydrothermal H_2S in equilibrium with sphalerite and galena for Kizhnica and Badovci ore deposits (1.36 ‰ to 1.57 ‰) is typical of mantle-magma origin. Heavier sulphur (1.99 ‰ to 2.42 ‰) in Hajvalia and Artana ore deposits may be explain by contamination with surrounding rocks during the metasomathosis. Based on the $\Delta^{34}\text{S}_{\text{sphalerite-galena}}$, the assemblage sphalerite-galena have an equilibrium temperature of around 300-400 °C with a fall in temperature following this order: Badovci (279 ± 20°C) < Përroi I ngjyrosur-Artana < Hajvalia < Kizhnica (397 ± 20°C).

Key words: Poly-metallic mineralization, Pb, Zn, sulphur isotopes, Hajvalia, Badovci, Kizhnica, Përroi i ngjyrosur -Artana, Kosovo.

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