

Výskyty sideritovej (Fe karbonátovej) a kremeňovo-sulfidickej mineralizácie pri Lovinobani a Uderinej (Slovenské rudohorie-veporikum), Slovenská republika

Siderite (Fe carbonate) and quartz-sulphidic mineralization occurrences near Lovinobaňa and Uderiná (Slovenské Rudohorie Mts.-Veporic Unit), Slovak Republic

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FERENC Š., BAKOS F., DEMKO R., KODĚRA P. (2014) Výskyty sideritovej (Fe karbonátovej) a kremeňovo-sulfidickej mineralizácie pri Lovinobani a Uderinej (Slovenské rudohorie-veporikum), Slovenská republika. *Bull. mineral.-petrolog. Odd. Nár. Muz. (Praha) 22, 1, 25-41. ISSN 1211-0329.*

Abstract

Siderite-quartz-sulphidic veins in the Kohút Zone of Veporic Unit, are best developed at Cinobaňa, Lovinobaňa, and Uderiná villages, in vicinity of the Veporic/Gemic Units tectonic contact (the Lubeník-Margecany Zone). The mineralization occurs at the small historical deposits, localised within Alpine shear zones (NNE - SSW to W - E directions) in Variscan granitoids, amphibolites and mica schists. Succession of the mineralised structures filling is as follows: relics of host-rock minerals (garnet, xenotime, ilmenite, rutile, magnetite, hematite)→metamorphic mineralization (quartz with CO₂-N₂ rich fluid inclusions)→Ni-Co sulphidic stage (quartz, pyrite, arsenopyrite, siegenite, polydymite, gersdorffite)→carbonate stage (siderite, ankerite, Fe dolomite, calcite)→alpine-type paragenesis stage (quartz, apatite, monazite, xenotime, schorl, dravite, foitite, ilmenite, rutile, muscovite, chamosite, calcite)→quartz-sulphidic stage, with two sub-stages: a) Cu sulphidic (pyrite, chalcopyrite, tetrahedrite, galena, sphalerite, stibnite, eugenite?), b) cinnabar (cinnabar, calcite, marcasite)→hematite stage (hematite). Supergene stage is represented by: cinnabar, covellite, chalcocite, limonite and a mixture of Fe, Cu, As, Sb, Ni sulphates/oxides. Quartz with CO₂-N₂ rich fluid inclusions forms only relics in Fe carbonates and contains a high- salinity aqueous phase (31.9 - 39.8 wt. % NaCleq.) fluid inclusions with CO₂ and N₂ (up to 41 mol. % N₂). Variability in size of gaseous phase and halite crystals, as well as, total homogenization temperatures between 223 - 364°C, suggest a heterogeneous fluid. Bottom of homogenisation temperatures approaching to the real quartz crystallisation temperatures. Two phase, CO₂- rich aqueous fluid inclusions in quartz of alpine paragenesis has a salinity 9.6 - 15.2 wt. % NaCl eq., total homogenization temperature ranged from 272 to 347°C. Stable C-O isotope ratios in siderites ($\delta^{13}\text{C}_{\text{[PDB]}}$ -9.6 to -5.6 ‰, $\delta^{18}\text{O}_{\text{[SMOW]}}$ 15.2 - 16.4 ‰) are reminiscent of south Gemic siderite-polymetallic veins. We assume that quartz with N₂- rich inclusions is a product of pre-Upper Cretaceous tectonometamorphic processes, occurring during Lower - Middle Cretaceous (P, T maximum of the Alpine metamorphosis). Siderite was formed during Upper Cretaceous, probably from „Gemic type“ formation brines circulating in the Lubeník - Margecany line and adjacent tectonic structures, after collision of the Gemic-Veporic Units. Formation of quartz with alpine-type paragenesis was caused by precipitation from SiO₂-rich fluids circulating in shear zones after maximum of the Early Cretaceous metamorphism, as a consequence uplift and cooling of the Central Western Carpathians.

Key words: siderite, polydymite, tetrahedrite, siegenite, sulphidic mineralization, nitrogen, Veporic Unit, Western Carpathians

Obdrženo: 10. 1. 2014; přijato: 11. 6. 2014