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Olovem bohatá oxidační zóna polymetalické mineralizace na lokalitě Kvasetice u Havlíčkova Brodu: distribuce minerálních asociací s pyromorfitem a arzenáty

Lead-rich oxidized zone of base-metal mineralization of the Kvasetice locality near Havlíčkův Brod: distribution of pyromorphite- and arsenate-bearing mineral assemblages

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Abstract

Supergene mineral assemblages rich in Pb, As and P occur on the dumps after the historical mining of the base-metal deposit in Kvasetice (Havlíčkův Brod ore district, Bohemian-Moravian Highlands, Czech Republic). The primary hydrothermal assemblage of pyrite > sphalerite > arsenopyrite > galena >> boulangerite hosted in the quartz veins is partly different from other similar localities in this area, which belong to the typical *k-pol* ores with iron-rich sphalerite, pyrrhotite, pyrite, arsenopyrite and chalcopyrite. Kvasetice locality is characterized by a relatively higher stability of pyrite and sphalerite with a relatively low Fe content (< 0.12 *apfu* of Fe) compared to arsenopyrite and galena in supergene conditions, as well as a total deficit of Cu, Ca and partly S. In the supergene mineral association rich in Pb-P-Fe-As, two main assemblages can be distinguished. Supergene assemblage I contains common microscopic anglesite replacing galena and two sub-groups of arsenates with sulphide relics in small quartz veins: (a) in close association with the relic arsenopyrite are pharmacosiderite and hydroniumpharmacosiderite, both relatively Pb-rich (≤ 0.18 *apfu* of Pb), accompanied by a rare scorodite. (b) More abundant assemblage of segnitite >> beudantite > mimetite >> carminite and coronadite without a direct association with sulphides. Other phases with a non-stoichiometric Fe/As ratio (HFA) are only locally found. A sporadic greenockite is the only detected decomposition product of sphalerite. The Pb-Fe^{3+} sulfates (minerals of the jarosite subgroup), gypsum, and Ca-, Zn-, Sb- and Cu-supergene minerals are missing. Supergene assemblage II is mainly represented by pyromorphite (mostly with As below detection limit, but locally with ≤ 0.44 *apfu*), rarely by mimetite and only locally also by cerussite. They overgrow thin crusts of mainly Fe-oxyhydroxides covering the altered granite matrix or line thin druse quartz veinlets. The supergene mineral assemblages from Kvasetice differ not only from other localities in the ore district studied, but also from other localities of supergene mineralization in the Bohemian-Moravian Highlands. They are the product of weathering in the shallow supergene zone, however, they could also have been arised by subrecent weathering of materials deposited on the dumps during the 13-16th century.

Key words: *pyromorphite, arsenate minerals, lead, arsenic, supergene zone, base-metal mineralization, Bohemian Massif, Czech Republic*

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