Re-examination of the historical ore samples from the Au-Ag-Pb-Zn epithermal mineralisation around Parádfürdő, Recsk Ore Complex (NE-Hungary)

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The Paleogene Recsk Ore Complex consists of a Cu-Mo(-Au) porphyry, Cu-Zn skarn and metasomatic Pb-Zn ore mineralisation at depth, while the shallow volcanic cover contains epithermal Cu-Au-Ag and Au-Ag-Pb-Zn mineralisation. The aims of our study are to re-examine the historical samples from the shallow Au-Ag-Pb-Zn ore mineralisation around Parádfürdő, and to refine our knowledge about this mineralisation in order to understand the formation of the ore complex.

The studied mineralisation is located above the mineralised diorite intrusion and hosted by altered dacite and dacitic tuff units. The most widespread alteration of this area is the intermediate argillic alteration with sparse kaolinitization (Molnár, 2007; Molnár *et al.*, 2008). The ore mineralisation is controlled by siliceous veins (Hegyeshegy, Orczy and Antal Adit) and hydrothermal breccia dykes (Macskahegy, Etelka, Orczy, Egyezség, Jószomszéd and Veresagyagbérc Adits).

Reflected light and scanning electron microscopy with standardized energy dispersive X-ray analysis were used to identify the ore minerals and to observe the precipitation sequence of these minerals (Fig. 1.). Quartz crystals are always related to the ore minerals and usually precipitated at the early stages of the ore formation. The ore formation usually started with the precipitation of pyrite, but in some adits (Orczy, Etelka, Antal, Hegyeshegy and Macskahegy Adits) these pyrite crystals contain bornite, calaverite, hessite, wittichenite and aikinite grains. The presence of aikinite and wittichenite has not been known previously (Nagy, 1983, Kisvarsányi, 1954) in the area. Two different pyrite textures were observable in the samples; the euhedral pyrite crystals with mineral inclusions and the collomorphous pyrite with pseudomorphs after marcasite. The first one is present in every sample, while the collomorphous pyrite was only observable in the Veresagyagbérc and Macskahegy Adits. Then galena and sphalerite precipitated in locally different quantities. The last formed minerals are the tetrahedrite and tennantite. The tetrahedrite is more dominant in the Jószomszéd, Orczy, Antal, Macskahegy and Veresagyagbérc Adits, while the Egyezség, Etelka, Macskahegy, Hegyeshegy Adits are characterized by tennantite. The fahlore is usually associated with chalcopyrite and in the Hegyeshegy Adit with achantite. The chalcopyrite usually represents a boundary between the sphalerite and fahlore crystals and forms small inclusions in sphalerite. According to the study of Bortnikov and *et al.* (1991) this chalcopyrite presumably formed as a reaction product, when the FeS content of the sphalerite reacted with the Cu-rich fluid, which formed the fahlore crystals at the final stage. This well-defined event can be traced in most of the adits.

Considering the above mentioned mineral phases more than one ore forming stage can be distinguished. The samples from the different adits beautifully represent these stages with their mineral composition.

Bortnikov, N. S., Gnkin, A. D., Dobrovol'skaya, M. G., Muravitskayaa, G. N., Filimonova, A. A. (1991): Econ Geol, 86: 1070-1082.

Kisvarsányi, G. (1954): Földt Közl, 84/3: 191-200.

Molnár, F. (2007): Proc 9th Biannual SGA Meeting, Dublin, Ireland, 1: 153-157.

Molnár, F., Jung, P., Kupi, L., Pogány, A., Vágó, E., Viktorik, O., Pécskay, Z., Hurai, V. (2008): Publ Univ Miskolc Series A, Mining, 73: 99-128.

Nagy, B. (1983): A Magyar Állami Földtani Intézet évi jelentése az 1983. évről: 322-333.

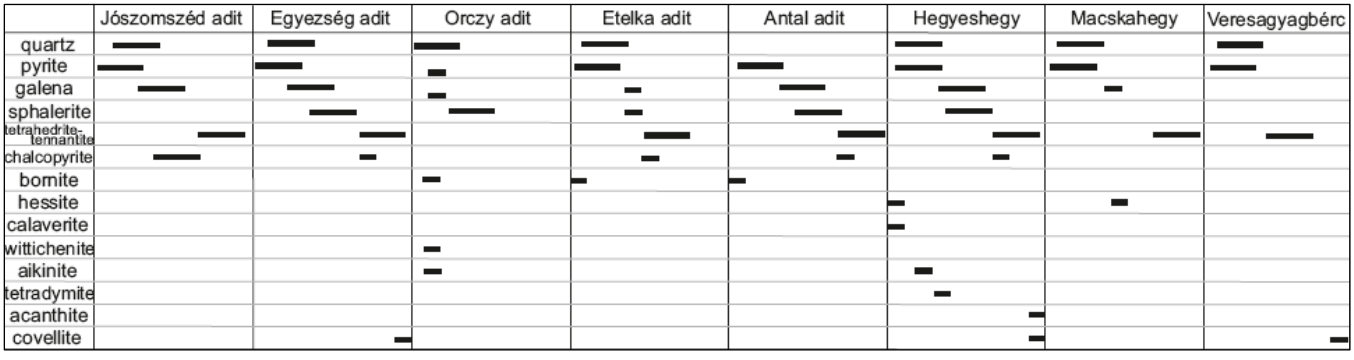

Fig.1. Observed succession of the ore minerals in different adits (from North to South)