Zn-Pb MINERALIZATION IN RUDABÁNYA (HUNGARY): A RECOGNIZED NEW DEPOSIT TYPE

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The Rudabánya Ore Complex (ROC) is a traditional mining site of various ore types. In the modern times an iron ore mine was operated from the 1870's to 1985, opening a series of pits along the Rudabánya Range, where copper ore was also exploited, barite and lead ore resources has been registered too. Both primary and secondary oxidized ores were the target of the iron mining. The primary metasomatic hydrothermal siderite ore has been formed epigenetically in Mesozoic carbonate rocks. The secondary one is its near-surface oxidized zone of about 100 m thickness with supergene limonites. The recorded geological information concerns the exploration and mining facilities of this mine mainly, summarized by PANTÓ (1956).

The ROC is situated in the Darnó Zone, which is a regional, 2–5 km wide, NNE–SSW striking strike-slip fault zone. Its activity lasted probably from the Mesozoic times up to Quaternary. The ROC is an imbricated stack of horses, bounded by Darnó master faults on both sides. Permian–Lower Triassic rocks of the Silicikum stratigraphic unit host the polygenetic mineralizations.

The ROC has been target of subsequent base and precious metal prospecting after the closure of the iron ore mine. The hydrothermal galena mineralization in the barite dominated rim facies of the siderite blocks was known and described previously (PANTÓ, 1956; KOCH, 1985). During a recent exploration program the Institute of Mineralogy and Geology, University of Miskolc in cooperation with the Rotaqua Ltd. discovered significant sphalerite and galena resources. The assay of our rock chip and drill core samples showed the Zn content exceeds Pb by a factor of 4.5 on average, although it was hard to discern sphalerite in the host rock, even at high Zn grades. The sampling of further sphalerite-galena enrichments has given up to 15–20 wt% Zn and 4–5 wt% Pb contents in quartz and mica dominated, reductive facies calcareous siltstone (surrounding the iron ore bearing carbonate blocks). This has led to the recognition of a new, stratiform mineralization type ore.

The main components of this new paragenesis are pyrite, barite, sphalerite and galena, just like in the siderite rim facies, but the grain size here is smaller, 10 μm scale in general. Sulphide-rich beds show rhythmical layering of pyrite, then sphalerite and finally galena, but pyrite was formed also later. Pyrite is often framboidal and collomorph. The laminar texture of this ore has suffered ductile deformation. The mosaic texture of galena indicates dynamic recrystallization, in contrast with the hydrothermal ore. The stratiform ore type can also be distinguished from the hydrothermal one by chemical composition, its sphalerite having lower Cd- and Fe-content and its galena having lower Ag-content.

These characteristics indicate an early, low temperature, probably sedimentary-exhalative origin of this ore type, preceding the subsequent fracture-controlled mineralizations. Our observations may give rise to new economic ore potential of the analogous Lower Triassic sedimentary complexes.

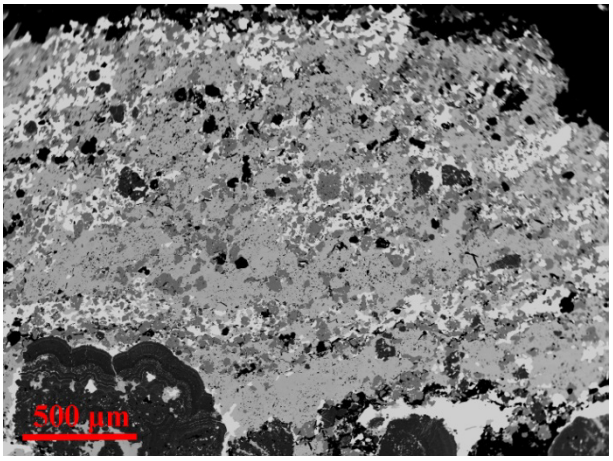

Fig. 1. *BSE image of a typical sedimentary-exhalative type ore texture from Rudabánya. Minerals from dark grey to white: pyrite, sphalerite, barite, galena.*

References

KOCH, S. (1985): Magyarország ásványai [Minerals of Hungary]. 2nd ed. Akadémiai Kiadó, Budapest, 562 p. (in Hungarian)

PANTÓ, G. (1956): Yearbook of the Hungarian Geological Institute, 44(2): 329–637.