

MINERALOGY AND GENESIS OF METACINNABAR FROM RÓKA HILL, BUDAPEST, HUNGARY

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The metacinnabar and cinnabar occurrence on Róka Hill was described and studied by NAGY & PELIKÁN (1976). The main mass of the area is built up of Dachstein Limestone and brecciated dolomite. Eocene sedimentary sequence overlies unconformably the Triassic carbonates. The deformed rocks are rich in hydrothermal occurrences. The dispersed pyritization of the Triassic limestone with high As bearing pyrite, marcasite, sphalerite, goethite and gypsum preceded the deposition of mercury.

The metacinnabar and cinnabar occur as veins and cavity fillings in the Eocene sandy limestone along a clayey-silicified zone. The minerals accompanying the metacinnabar are: calcite, cinnabar, barite, pyrite, galena (?), goethite, lepidocrocite, and quartz and well ordered kaolinite. The crystals are idiomorphic, the predominating crystal forms are tetrahedra, rarely hexahedra. Inhomogeneity of the grains and the zonation can be seen in microscope: black, inclusion free metacinnabar and red inclusion rich cinnabar zones alternate parallel to (111). Maybe this zonal pattern of texture represents the deposition of the two HgS phases following the oscillating physico-chemical parameters (e.g. pH, f_S). Electron microprobe studies revealed that the cinnabar's composition is pure HgS, while the metacinnabar contains 1.5 at% of zinc. On the basis of XRD, the calculated a_0 cell parameter proves also the presence of Zn in the structure.

The real crystal structure was studied with TEM. The SAED patterns reveal the presence of the disordered metacinnabar phase besides the presence of cinnabar, metacinnabar. Based on structural analogy between sphalerite and metacinnabar, disorder can be interpreted as the appearance of hexagonal close packed lamellae in the cubic close packed host. To define the degree of the disorder (PANDEY & LELE, 1986), fault concentration and growth probability were used as parameters. Intensity curves were plotted with a set of different input parameters. By comparing the measured intensities with the calculated curves, the metacinnabar can be characterised by low fault concentration and high growth probability. The hexagonality varies between 30–50 %.

According to the data of fluid inclusion of barite related to metacinnabar, it was deposited from boiling hydrothermal solution of medium salinity, at about 180 °C. The low Sr content of barite also supports the volcanic hydrothermal genesis.

References

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