

Preliminary investigations of inclusions in some topaz crystals from Volodarsk-Volynski Massif (Western Ukraine)

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The aim of this paper is the gemmological and microthermometric studies of colour types of topazes (colourless, light pink and blue) from pegmatites of the Volodarsk-Volynski massif (Western Ukraine). These topaz crystals are characterized by the presence of numerous solid and fluid inclusions, mainly of a secondary origin as well as the abundance of micropores. The solid inclusions include mainly albite, tourmaline, Fe-bearing mineral phases and probably organic matter. Among the groups of fluid inclusions, secondary two-phase (liquid-vapour) inclusions distinctly dominate over sparse inclusions of a primary origin. The measured values of temperature homogenization (Th) for selected primary and secondary fluid inclusion assemblages range from 350-380°C and 322°C, respectively. Topaz from Volodarsk-Volynski Massif crystallized during hydrothermal stage in medium temperature conditions. The presence of different secondary and pseudosecondary fluid inclusions together with the traces of necking down processes, point that after the crystallization the topaz was also affected by mechanical, thermal and metasomatic processes.

Geodiversity in the Natural Park “Porțile de Fier”: cave mineralogy and mineral deposits

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The Iron Gates (“Porțile de Fier”) Natural Park is located in South-Western Romania and extends along the Danube Gorges and the affluent valleys. The Park is one of the biggest in Romania, having a surface of 115665.8 hectares and including 18 Natural Reserves. The geodiversity of the Iron Gates Natural Park is given by the distribution of a large variety of magmatic, metamorphic and sedimentary rocks, and particularly of limestones of Jurassic and Cretaceous age, affected by a large number of karst phenomena: caves, swallow-holes, gorges, dolina, lapies, uvalas.

The most representative caves in the Park are those from Gura Ponicovei, Padina Matei and Gaura cu Muscă. All of them contain important deposits of fossil bat guano, with a large diversity of phosphate species, including apatite-(CaOH), taranakite, ardealite, brushite, monetite, francoanellite and leucophosphate. These mineral species generally occurs as crusts of yellow cream or reddish brown color deposited on the cave floor or on some speleothems, or, rarely, as earthy masses of white or white cream color. They were identified using a combination of X-ray powder diffraction, Fourier-transform infrared absorption and electron microscopy.

In the upper basin of Mraconia Valley, a system of galleries opened a tungsten-bearing skarn deposit, which develops at the very contact between crystalline limestones and a porphyric granodiorite of Mesozoic age. The skarn is mainly andraditic, but also contains plagioclase, potassic feldspar, ferroactinolite, magnetite, epidote, apatite, vesuvianite and wollastonite. Four stages of mineralization overprint the primary skarn: (1) a high temperature stage conducted to the deposition of scheelite in the mass of skarn; a parallel deposition of quartz and molybdenite on cracks affecting the granodiorite mass is likely; (2) a second hydrothermal stage conducted to deposition of pyrite, chalcopyrite and calcite on the cracks and of impregnations of pyrite and chalcopyrite in the skarn mass; (3) a third hydrothermal stage conducted to the massive deposits of chalcopyrite, pyrite, sphalerite, galena, scarce pyrrhotite and tertahedrite, as veins and lenses in the skarn mass; (4) a low temperature