

HYDRONIUM JAROSITE FROM IZA CAVE (RODNEI MTS., ROMANIA)

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Several secondary deposits consisting of crusts and flowstones have been investigated in Iza Cave (Rodnei Mountains, Maramureş county, Romania). The cave is formed at the contact between Eocene limestones and conglomerates and crystalline rocks (sericite-chlorite schists and crystalline limestones).

Previous studies carried out in Iza Cave reported a large clay-like deposit, consisting of muscovite, illite, kaolinite, dickite, quartz and possibly rutile, formed by subaerial weathering of schists in the cave environment (VIEHMANN *et al.*, 1979, 1981). We found that the heavy fraction of the weathered schists is composed mainly of quartz and pyrite, evidenced by XRD and SEM - EDAX.

The secondary deposits studied consist of hydronium jarosite [(H₃O,K)Fe₃(SO₄)₂(OH)₆] deposited over goethite flowstone. Hydronium jarosite forms millimeter to centimeter-sized orange crusty nodules, composed of small (1–3 µm), relatively isometric rhombohedral crystals.

The X-ray diffraction pattern shows the major participation of hydronium jarosite, associated with small amounts of alunite (most intense reflections, partially covered by hydronium jarosite lines), and quartz (the peak at 3.34) and kaolinite (peak corresponding at 7.2), the latter two as impurities.

The normative calculus based on the EDAX analysis allowed us to determine the participation of hydronium jarosite, which is the main mineral (87.50%), associated with

small amounts of alunite (5.1%), quartz (4.97%), and kaolinite (0.67%).

The thermal analysis on the sulfate sample shows a weight loss of 5.79% until 163 °C, which was assigned to the loss of H₂O. The following weight losses, totaling 9.75%, were assigned to the decomposition of OH from the jarosite structure, which was theoretically calculated at 9,77%.

Both goethite and hydronium jarosite formed through the action of percolating water over pyrite that is present as accessory mineral in the crystalline schists.

Minerals from the jarosite group are rarely present in caves; a survey of the known records around the world shows very peculiar depositional conditions (HILL & FORTI, 1997). Iza Cave is the first known occurrence of hydronium jarosite in Romania. Moreover, this mineral has not been previously reported from the cave environment.

References

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