POSTMAGMATIC ALACRANITE (?) FROM THE CIOMADU AREA, SOUTH HARGHITA, ROMANIA

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Alacranite, As_8S_9, monoclinic with space group $P2/c$, was first described by POPOVA *et al.* (1986) from the Uzon caldera (Kamchatka, Russian Federation). The mineral occurs with realgar and uzonite as flattened and prismatic grains up to 0.5 mm across, serving as cement in sandy gravel. Alacranite and other arsenic minerals are recent products of solfataras and hot springs in the central part of the Uzon caldera.

The structure of alacranite consists of an ordered sequence of As_4S_4 and As_4S_5 cage-like molecules, with a molecular packing closely resembling that found in the β-As_4S_4 phase (BONAZZI *et al*., 2003a). The unnamed natural β-As_4S_4 phase was first described by CLARK (1970) from Alacrán mine, Chile, as a high-temperature phase (stable in the As-S system at temperatures above 256 °C), whereas realgar is the low-temperature (α-) form of As_4S_4. Alacranite was named by POPOVA *et al.* (1986) for the similarities of the XRD pattern of the samples from the Uzon caldera to those from Alacrán mine. New chemical and crystallographic data (BONAZZI *et al.,* 2003b) suggest the existence of a continuous series between natural β-As_4S_4 and alacranite. It is now evident that minerals with chemical composition ranging continuously from As_8S_8 to As_8S_9 can crystallize.

Arsenic mineralizations in the surroundings of Ciomadu area

The first reference to arsenic mineralization in the area was published by HAUER (1860). He described realgar, sulfur and aragonite from the Hankó Valley at Covasna (~30 km E from Sfântu Gheorghe). Since then another occurrence have been discovered at Bodoc, Covasna County (~10 km NNE from Sfântu Gheorghe); during drilling of a mineral water well a drill core with calcite and orpiment was found. In 2001, during the reconstruction works of the "Nyírfürdő" spa at Lăzăreşti, Harghita County (~40 km NNE from Sfântu Gheorghe) some realgar-like minerals were found. The locality at Lăzăreşti is situated 5 km N from the Ciomadu volcanic area on the contact of the Pleistocene deposits of the Ciuc Basin and the Ciuc Mountains. The latter belongs to the Carpathian flysch (sandstone) area. At the "Nyírfürdő" spa a great number of mineral water springs and mofettes (openings emitting CO_2) can be found.

Arsenic minerals can be found as cement in the sand of the upper part of the flysch. The sand (consisting mainly of detrital quartz and muscovite) is originated from the weathered Cretaceous flysch (sandstone). Here alacranite occurs together with realgar as flattened or prismatic grains up to 0.3 mm across. Alacranite is orange, with a yellow-orange streak, greasy to adamantine lustre; it is very brittle with a conchoidal fracture. The strongest reflections on the X-ray powder pattern of Lăzăreşti specimens are, *d* in Å (int.) [in square brackets: data of POPOVA *et al.* (1986)]: 5.869 (62), [5.91 (90)], 5.063 (20), [5.11 (80)], 3.273 (58), [3.291 (50)], 3.080 (50), [3.064 (100)], 2.937 (70), [2.950 (90)].

According to our examinations we might have $As_8S_{(9-x)}$ crystals with a wide range of the x value. The powder patterns of the crystals with different x values resemble each other very nearly and it is not easy to index correctly the reflection in order to obtain reliable unit cell dimension. Single crystal diffractometry will be the best way to obtain unit cell dimensions in the future.

The available data suggest that this occurrence were formed by similar processes as that in the Uzon caldera, *i.e.* it may be related to the late volcanism of the Harghita Mts., the last known active volcanoes in the region being those in the Ciomadu area. Arsenic minerals were formed by low-temperature solfataras and springs.

References

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