

HYDROTHERMAL ASSOCIATION OF ZEOLITES FROM COPĂCENI, CLUJ COUNTY, ROMANIA

STREMTAN, C.

Department of Mineralogy, Babeş-Bolyai University, 1 Kogălniceanu Str., RO-400084 Cluj-Napoca, Romania
E-mail: cstremtan@bioge.ubbcluj.ro

In the eastern part of the Apuseni Mts. (Romania), Mesozoic island arc volcanics *e.g.* basaltic pillow-lavas, massive basaltic lava flows and basaltic breccias occur, as part of the Bedeleu Nappe (BALINTONI & IANCU, 1986). They are partly covered by Oxfordian-Tithonian radiolarites and limestones, and Badenian clastic sediments. In the Copăceni area, in an old quarry, nowadays abandoned, a succession of basalt flows, with basaltic breccias on top, contain veins and voids filled with a hydrothermal mineral association composed mainly of carbonates (calcite), silica (both micro- and macro-crystallized), clay minerals and zeolites.

Here we present new mineralogical and chemical data on the zeolite association, which completes the data obtained previously by KRISTÁLY *et al.* (2003). Twelve samples were analyzed by polarized light microscopy, X-ray powder diffraction, X-ray single-crystal diffraction and electron microprobe.

Six different species of zeolites were identified: stilbite, heulandite, analcime, chabazite-Ca, barrerite and mordenite.

Stilbite is the most abundant zeolite in the Copăceni association and it was identified in 9 of the 12 analyzed samples. Some stilbite crystals show an intergrowth with another zeolite, richer in Na₂O, i.e. barrerite.

Heulandite is the second zeolite in terms of abundance (6 out of 12 analyzed samples) and is associated mostly with

chabazite-Ca, calcite, quartz and microcrystalline quartz. The single-crystal diffraction pattern of the C10_4 sample proves a lower value for the β angle ($113.2^\circ \pm 0.3^\circ$), which does not fit the references data (MORTIMER & PEARCE, 1981). It is possible to have here a new structure, as the chemistry of the sample shows no peculiarities (Table 1).

Analcime occurs together with calcite and clay minerals and was identified by both X-ray diffractometry and the Na/(Na + Ca) = 0.4 relation. The Na/(Na + Ca) = 0.6 value points on the possible presence of another zeolite, wairakite.

Barrerite, the most “exotic” species found in Copăceni, was studied by X-ray powder and single-crystal diffraction. The last two zeolites, chabazite-Ca and mordenite are associated always with calcite and clay minerals.

References

- BALINTONI, I. & IANCU, V. (1986): Dări de Seamă ale Şedintelor Institutul de Geologie şi Geofizică, 5. Tectonică şi geologie regională, 70–71: 45–56.
KRISTÁLY, F., STREMTAN, C., TÓTH, A. (2003): Acta Mineralogica Petrographica (Szeged), Abstract Ser. 1: 56.
MORTIMER, J. & PEARCE, J. (1981): American Mineralogist, 66: 309–314

Table 1: Major elements composition of two heulandite single crystals (electron microprobe).

Sample	SiO ₂ %	Al ₂ O ₃ %	MgO %	Na ₂ O %	CaO %	K ₂ O %	FeO _(tot) %	Total %
C10_2	63.39	11.76	0.12	0.4	4.77	0.97	0.27	81.68
C10_4	63.63	12.28	0.15	0.43	5.2	1.04	0.36	83.09