

Brushite in few fossil bat-guano deposits from caves in Romania

DUMITRAS, D.G.¹, MARINCEA, Ș.¹, DIACONU, G.², IANCU, A., M.¹

¹ Geological Institute of Romania, 1 Caransebeș Str., Bucharest, Romania, e-mail: d_deliaro@yahoo.com, smarincea@yahoo.com, iancu.maruta@yahoo.com

² “Emil Racoviță” Speleological Institute, 11, Frumoasă Str., RO-010985, Bucharest, Romania

Brushite, ideally $\text{Ca}(\text{HPO}_4)\cdot 2\text{H}_2\text{O}$, is one of the most important phosphate species occurring in the guano-bearing caves world-wide. Schadler (1929) first mentioned brushite in the bat guano deposit at Cioclovina, Sureanu Mountains, Romania. The mineral forms at product of reaction between the strongly acidic phosphatic solutions derived from the guano deposits and the carbonate substrate of the cave, or the flows of moonmilk. The aim of this paper is to document the physical properties, the infrared behavior and the crystallographic parameters of brushite from fossil bat guano deposits in eight caves from Romania. Brushite generally associates with hydroxylapatite, occurring as nodular masses or as aggregate powders of bright white (snow white) color. SEM examination of micromounts showed that the brushite masses are generally composed by sheaf-, cluster-like or rarely by radiating aggregates of crystals to a diameter of 0.2 mm. The unit cell parameters were calculated as average of the values obtained by least-squares refinement from XRD powder data from representative samples, using reflections in the 2θ range from 5 to 90° . The band multiplicity on the IR-absorption spectrum suggests that the protonated phosphate groups have C_s punctual symmetries, whereas the strong imprint of the bands assumed to P-O-H vibrations suggests the local presence of $(\text{H}_2\text{PO}_4)^-$ groups. Thermal analyses showed that the molecular water is lost in two steps: at 168°C and 202°C ; the dehydration is complete at 433°C and the dehydration product is amorphous $\text{Ca}_2\text{P}_2\text{O}_7$. An exothermic effect recorded at about 490°C indicates the recrystallization of the anhydrous compound.

Schadler, J. (1929): Mineralogisch-Petrografische charakteristik der phosphat-ablagerung in der Cioclovina-Höhle bei Pui. Publicațiile Muzeului Județului Hunedoara, V (XXVII), 1, Deva.