Metasomatic replacements in the phosphate mineral association from the Li-bearing pegmatites in Conţu, Romania

NICOLAE CĂLIN[(1)], DELIA-GEORGETA DUMITRAŞ [(1)], ŞTEFAN MARINCEA[(1)], AURORA MĂRUŢA IANCU [(1)], CRISTINA SAVA[(1)]

[1] Geological Institute of Romania, Bucharest, Romania, 012271, e-mail: nicolae_cln@yahoo.com

The Conţu pegmatitic field, located in the middle valley of the homonymous brook (Cibin Mountains, South Carpathians, Romania), is famous for the micashist- and gneiss-hosted bodies of pegmatite that closely matches the granitic ones. They host a rich phosphate association, including, as primary phases: amblygonite - montebrasite, sicklerite - ferrisicklerite, fluorapatite, monazite, whereas the secondary phosphates are represented by heterosite - purpurite, hydroxylapatite, lithiophilite - triphylite, vivianite, wolfeite, gatehouseite, maricite, crandallite. Other associated minerals include spodumene, quartz, muscovite, K-feldspar, plagioclase, beryl, cassiterite, columbite-group minerals, lepidolite, rutile, scarce schorl, uraninite, topaz, spessartine, sillimanite, titanite. The alteration sequences of phosphates are generally controlled by the Na metasomatism and hydrothermalism. Fracture-controlled pseudomorphic alteration of the primary lithium phosphates (i.e. amblygonite - montebrasite) is widespread, producing low-F secondary montebrasite, crandallite, hydroxylapatite.

At Conţu, the minerals in the heterosite - purpurite series are always associated with sicklerite - ferrisicklerite, the former being an alteration product of the latter, in a process of topotactic alteration. Triphylite [a = 4.715(4) Å; b = 10.374(5) Å; c = 6.037(6)] abundantly contains inclusions of ferrogatehouseite and of wolfeite [$Ca_{0.0151}Fe_{1.0475}Mn_{0.9673}Mg_{0.0072}Al_{0.0031})_{2.0251}(OH)(PO_4)$] both of them occurring in the (001) perfect cleavage plane of triphylite. Ferrisiklerite [a = 5.944(7) Å; b = 10.064(8) Å; c = 4.794(5) Å] is, on its turn, replaced by maricite [$(Na_{0.9413}Ca_{0,.0082})_{0.9495}(Fe_{0.,6719}Mn_{0.3197}Mg_{0.0021})_{0.9937}(PO_4)$], during the early Na metasomatism.

No alluaudite was identified in our samples, which suggests that the metasomatism had reduced intensity. Initial subsolidus metasomatism of the lithium minerals took place in an alkaline environment, as evidenced by albitization of spodumene and calcium metasomatism of the phosphates.