

Abstract Submission

T4 - The dynamical world of minerals

Spectroscopy of Earth materials from the crust to core

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Crystal-chemistry, structure, Raman and infrared behavior of vesuvianite from Oravița

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Abstract Content: As part of the efforts to characterize vesuvianite from the high-temperature skarns in Romania, vesuvianite from Oravița (Aninei Mountains, Banat, Romania) was characterized from crystal-chemical and structural points of view, using EMPA, X-ray based structural refinement, infrared and polarized Raman spectrometry. The analyzed vesuvianite occurs in the outer zone of a gehlenite-, and monticellite-bearing proximal skarn, as crystals of up to 4 cm across. The hosting skarn is developed on Crișenilor Brook, near the contact of a dioritic body of Upper Cretaceous age with limestones and marls of Mesozoic age. The crystal-chemical formula of the analyzed sample, normalized on the basis of 56 cations and 76(O,OH,F,Cl) is:

$(\text{Ca}_{18.864}\text{K}_{0.006}\text{Na}_{0.028})(\text{Mg}_{2.263}\text{Fe}^{2+}_{1.165}\text{Mn}_{0.020})\text{Al}_{8.000}(\text{Al}_{0.396}\text{Ti}_{0.006}\text{Si}_{0.598}\text{O}_4)_{10}(\text{Si}_{7.222}\text{O}_7)_4(\text{OH}_{6.900}\text{F}_{0.214}\text{Cl}_{0.016})$. The refinement was successfully performed with a final agreement index $R_1 = 0.0271$, in the “classical” space group $P4/nnc$. The cell parameters are $a = 15.6042(2)$ Å and $c = 11.8345(1)$ Å. The multiplicity of the bands assumable to the (Al,Si)O₄ structural groups in both the Raman and IR spectra seems $(1n_3 + 1n_1 + 1n_4 + 1n_2)$, being consistent with an ideal T_d punctual symmetry of the orthosilicate anion. The positions of the four bands in the polarized Raman spectrum are at: 937 (n₃), 859 (n₃), 486 (n₄) and 366 (n₂) cm⁻¹, respectively (962, 870, 488 and 372 cm⁻¹ in the infrared spectra). The multiplicity and relative position of the diorthosilicate “lateral” groups is identical to those recorded in gehlenite. The infrared bands at 372 cm⁻¹ and 318 cm⁻¹ (recorded at 366 and 312 cm⁻¹ in the Raman spectrum), can be attributed to O-Ca-O vibrations.

Disclosure of Interest: None Declared