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АЛЛОРИИТ $Na_5K_{1.5}Ca(Si_6Al_6O_{24})(SO_4)(OH)_{0.5} \cdot H_2O$ — НОВЫЙ МИНЕРАЛ ГРУППЫ КАНКРИНИТА[1]

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ALLORIITE, $Na_5K_{1.5}Ca(Si_6Al_6O_{24})(SO_4)(OH)_{0.5} \cdot H_2O$, A NEW MINERAL OF THE CANCRINITE GROUP

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A new mineral alloriite has been found in volcanic ejectum at Cavalluccio Mt (Campagnano municipality, Roma province, Latium region, Italy), in association with sanidine, biotite, andradite, apatite. The mineral is named for an amateur mineralogist and prominent mineral collector Roberto Allori (b. 1933) who carried out extensive and detailed field mineralogical investigations of volcanogenic localities in the Latium region. Alloriite forms short-prismatic and tabular crystals up to 1.5 × 2 mm in size. Transparent, colorless or pale-violet; streak is white, luster vitreous. Non-fluorescent, brittle, Mohs' hardness 5; imperfect cleavage on $\{10\bar{1}0\}$. D_{meas} = = 2.35 g/cm^3 (by equilibration in heavy liquids). Calculated density is 2.358 g/cm^3 (with single-crystal data) and 2.333 g/cm^3 (with powder data). Uniaxial, positive, $\omega = 1.497(2)$, $\varepsilon = 1.499(2)$. IR spectrum is given. Chemical composition (electron microprobe, water — by Penfield method, CO_2 — by selection sorption, wt %): Na_2O 13.55, K_2O 6.67, CaO 6.23, Al_2O_3 26.45, SiO_2 34.64, SO_3 8.92, Cl 0.37, H_2O 2.1, CO_2 0.7, –O = Cl_2 – 0.08, total 99.55. Empirical formula ($Z = 1$) is: $Na_{19.16}K_{6.21}Ca_{4.87}(Si_{25.26}Al_{22.74}O_{96})(SO_4)_{4.88}(CO_3)_{0.70}Cl_{0.46}(OH)_{0.76} \cdot 4.73H_2O$. Simplified formula (taking into account structural data, $Z = 4$) is: $[Na(H_2O)][Na_4K_{1.5}(SO_4)] \cdot [Ca(OH,Cl)_{0.5}](Si_6Al_6O_{24})$. The crystal structure has been studied ($R = 0.052$). Alloriite is trigonal, space group $P31c$, $a = 12.892(3)$ Å, $c = 21.340(5)$ Å, $V = 3071.6(15)$ Å^3. The crystal structure of alloriite is based on the same tetrahedral framework as that of afghanite. Unlike afghanite containing $[Ca—Cl]^+$ clusters and the chains

…Ca—Cl—Ca—Cl…, alloriite contains $[Na—H_2O]^+$ clusters and the chains …—Na—H_2O—Na—H_2O—… The strongest lines of the powder diffraction pattern [*d*, Å (*I*, %) (*hkl*)] are: 11.3 (70)(100), 4.85 (90)(104), 3.76 (80)(300), 3.68 (70)(301), 3.33 (100)(214), 2.694 (70)(314, 008). Holotype material is deposited in the Fersman Mineralogical Museum of the Russian Academy of Sciences, Moscow, Russia; the registration number 3459/1.