

## НОВЫЕ МИНЕРАЛЫ

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### БЬЯКЕЛЛАИТ $(\text{Na}, \text{Ca}, \text{K})_8(\text{Si}_6\text{Al}_6\text{O}_{24})(\text{SO}_4)_2(\text{OH})_{0.5} \cdot \text{H}_2\text{O}$ — НОВЫЙ МИНЕРАЛ ГРУППЫ КАНКРИНИТА<sup>1</sup>

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 N. V. ZUBKOVA, G. GIESTER, D. Yu. PUSHCHAROVKY, K. V. VAN. BIACHELLAITE  
 $(\text{Na}, \text{Ca}, \text{K})_8(\text{Si}_6\text{Al}_6\text{O}_{24})(\text{SO}_4)_2(\text{OH})_{0.5} \cdot \text{H}_2\text{O}$ , A NEW MINERAL OF THE CANCRINITE GROUP

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A new mineral biachellaite was found in a volcanic ejectum in the Biachella Valley, Sacrofano Caldera, Sacrofano municipality, Rome province, Latium region, Italy, in association with rock-forming sanidine, diopside, andradite, leucite and hauyne. The name is given for discovery locality. Biachellaite forms equant diipyramidal-pinacoidal crystals up to 1 cm in cavities. Transparent, colourless, streak is white, lustre is vitreous. Brittle, Mohs' hardness 5. Perfect cleavage is observed on {1010}, imperfect cleavage (parting?) — on {0001}.  $D_{\text{meas}} = 2.51(1) \text{ g/cm}^3$  (by equilibration in heavy liquids). Calculated density is  $2.515 \text{ g/cm}^3$  (with single-crystal X-ray data) and  $2.520 \text{ g/cm}^3$  (with powder data). Uniaxial, positive,  $\omega = 1.512(1)$ ,  $\varepsilon = 1.514(1)$ . IR spectrum is given. Chemical composition (electron microprobe, water — by TG data):  $\text{Na}_2\text{O}$  10.06,  $\text{K}_2\text{O}$  5.85,  $\text{CaO}$  12.13,  $\text{Al}_2\text{O}_3$  26.17,  $\text{SiO}_2$  31.46,  $\text{SO}_3$  12.71, Cl 0.45,  $\text{H}_2\text{O}$  1.6,  $-\text{O}=\text{Cl}_2$  -0.10, total 100.33. The empirical formula ( $Z = 15$ ) is:  $(\text{Na}_{3.76}\text{Ca}_{2.50}\text{K}_{1.44})_{\Sigma 7.70}(\text{Si}_{6.06}\text{Al}_{5.94}\text{O}_{24})(\text{SO}_4)_{1.84}\text{Cl}_{0.15}(\text{OH})_{0.43} \cdot 0.81\text{H}_2\text{O}$ . The simplified formula is:  $(\text{Na}, \text{Ca}, \text{K})_8(\text{Si}_6\text{Al}_6\text{O}_{24})(\text{SO}_4)_2(\text{OH})_{0.5} \cdot \text{H}_2\text{O}$ . Biachellaite is trigonal, space group  $P\bar{3}$ ,  $a = 12.913(1)$ ,  $c = 79.605(5) \text{ \AA}$ ,  $V = 11495(1) \text{ \AA}^3$ . The crystal structure of biachellaite is characterized by the 30-layer stacking sequence  $(ABCABCACACBACBACBACBACBABC)_{\infty}$ . The tetrahedral Al, Si, O framework contains cavities of four types: cancrinite, sodalite, losod and liottite ones. The strongest lines of the X-ray powder diffraction pattern [ $d, \text{\AA}$  (I, %) ( $hkl$ )] are: 11.07 (19) (100, 101), 6.45 (18) (110, 111), 3.720 (100) (2.1.10, 300, 301, 2.0.16, 302), 3.576 (18) (1.0.21, 2.0.17, 306), 3.300 (47) (1.0.23, 2.1.15), 3.220 (16) (2.1.16, 222). The holotype specimen is deposited in Fersman Mineralogical Museum of the Russian Academy of Sciences, Moscow, Russia, with registration number 3642/1.