

НОВЫЕ МИНЕРАЛЫ

УДК 549.6

© Д. чл. Ю. В. АЗАРОВА,* д. чл. З. В. ШЛЮКОВА,* А. А. ЗОЛОТАРЕВ, мл.,** д. чл. Н. И. ОРГАНОВА*

БУРОВАИТ-Са, (Na,K)₄Ca₂(Ti,Nb)₈[Si₄O₁₂]₄(OH,O)₈ · 12H₂O — НОВЫЙ МИНЕРАЛ ГРУППЫ ЛАБУНЦОВИТА И ЕГО МЕСТО В ПРОЦЕССАХ НИЗКОТЕМПЕРАТУРНОГО МИНЕРАЛООБРАЗОВАНИЯ В ПЕГМАТИТАХ ХИБИНСКОГО МАССИВА (КОЛЬСКИЙ ПОЛУОСТРОВ, РОССИЯ)¹

Yu. V. AZAROVA, Z. V. SHLYUKOVA, A. A. ZOLOTAREV, jr., N. I. ORGANOVA.

BUROVAITE-Ca, (Na,K)₄Ca₂(Ti,Nb)₈[Si₄O₁₂]₄(OH,O)₈ · 12H₂O — THE NEW LABUNTSOVITE GROUP MINERAL AND ITS POSITION IN LOW-TEMPERATURE MINERAL-FORMING PROCESSES WITHIN PEGMATITES OF Khibiny MASSIF, RUSSIA

* Институт геологии рудных месторождений, петрографии, минералогии и геохимии РАН, 109017, Москва, Старомонетный пер., 35; e-mail: <azarova@igem.ru

** Санкт-Петербургский государственный университет, Санкт-Петербург, 199034, Университетская наб., д. 7/9

The paper displays data on the mineral — burovaite-Ca — the first Ti-dominant representative of labuntsovite group with a calcium D-octahedron. Idealized formula of burovaite-Ca — (K,Na)₄Ca₂(Ti,Nb)₈[Si₄O₁₂]₄(OH,O)₈ · 12H₂O. The mineral has been found in hydrothermal zone of aegirine-microcline pegmatite located in khibinites on the Khibinapakhkchorr Mt. in Khibiny massif (Kola Peninsula). The radiated intergrowths of burovaite-Ca and labuntsovite-Mn were detected in caverns inside microcline in association with lemmleynite-Ba, analcime, apophyllite, etc. Mean composition of the mineral (wt %): Na₂O 3.72, K₂O 2.76, CaO 4.22, SrO 0.47, BaO 0.23, MnO 0.01, Fe₂O₃ 0.30, Al₂O₃ 0.14, SiO₂ 42.02, TiO₂ 17.30, Nb₂O₅ 15.21, H₂O (meas.) 12.60; total sum 98.98. Its empirical formula was calculated for [(Si,Al)₁₆O₄₈] as following: {(Na_{3.10}K_{1.07}Ca_{0.37}Sr_{0.04}Ba_{0.04})_{4.62}}(Ca_{1.28}Zn_{0.01})_{1.29}(Ti_{4.97}Nb_{2.56}Fe_{0.08}Ta_{0.02})_{7.63}(Si_{15.93}Al_{10.07})₁₆O₄₈(OH_{6.70}O_{0.93})_{7.63} · 12H₂O. The most intensive lines of X-ray powder diffraction pattern of burovaite-Ca [*d*-Å]: 70—7.08; 40—6.39; 40—4.97; 30—3.92; 40—3.57; 100—3.25; 70—3.11; 50—2.61; 70—2.49; 40—2.15; 50—2.05; 70—1.712; 70—1.577; 70—1.444. The structure of burovaite-Ca was solved by A. A. Zolotarev, jr. The mineral is monoclinic, space group *C2/m*. Unit cell parameters: *a* = 14.529(3), *b* = 14.203(3), *c* = 7.899(1), β = 117.37(1), *V* = 1447.57 Å³. Burovaite-Ca is the isostructural Ti-dominant analogue of karupmollerite-Ca and gjerdingenite-Ca. They were defined in host pegmatite two stages of mineral-forming — the mere pegmatite and hydrothermal ones. The hydrothermal stage included some sub-stages: potassium-barium-sodium, sodium-potassium-calcium and sodium-strontium. Burovaite-Ca is related to the intermediate — sodium-potassium-calcium sub-stage. During the first one labuntsovite-Mn and lemmleynite-Ba have been formed, during the final sub-stage — tsepinite-Na, paratsepinite-Nd and tsepinite-Sr. Thus, the consequence of crystallization of the labuntsovite group minerals shows the replacement of a potassium regime of the solutions alkalinity by the sodium one in development of the host pegmatite.