Arctite $Na_5Ca_7Ba(PO_4)_6F_3$

Crystal Data: Hexagonal. *Point Group:* $\overline{3}\ 2/m$. As crystals, to 3 cm.

Physical Properties: *Cleavage:* Perfect on {0001}. Hardness = ∼5 D(meas.) = 3.13 D(calc.) = 3.19

Optical Properties: Transparent. *Color:* Colorless. *Luster:* Vitreous, pearly on the perfect cleavage.
Optical Class: Uniaxial (–), may be anomalously biaxial. $\omega = 1.578(2)$ $\epsilon = 1.577(2)$

Cell Data: *Space Group:* $R\overline{3}m$. $a = 7.094$ $c = 41.320$ Z = 1

X-ray Powder Pattern: Vuonnemiok River, Kola Peninsula, Russia.
2.746 (100), 3.43 (32), 13.80 (25), 3.06 (25), 2.804 (25), 3.54 (21), 2.719 (21)

Chemistry:

	(1)	(2)
P_2O_5	33.83	36.72
SiO_2	3.60	
ZrO_2	3.25	
Fe_2O_3	0.20	
CaO	31.80	33.85
BaO	12.00	13.22
Na_2O	9.72	13.36
K_2O	1.64	
F	5.25	4.92
H_2O	0.50	
$-O = F_2$	2.20	2.07
S	0.22	
Total	99.81	100.00

(1) Vuonnemiok River, Kola Peninsula, Russia; K, Fe, Zr, S, Si, and some F attributed to impurities. (2) $Na_5Ca_7Ba(PO_4)_6F_3$.

Occurrence: A late-stage pneumatolytic mineral in pegmatitic veinlets in a differentiated alkalic massif.

Association: Natrosilite, vuonnemite, lomonosovite, zirsinalite, natisite, rasvumite, villiaumite, aegirine, thenardite, umbite, paraumbite, kostylevite, wadeite.

Distribution: In the valley of the Vuonnemiok River, [on Mt. Koashva,] Khibiny massif, Kola Peninsula, Russia.

Name: For the locality in the Arctic region.

Type Material: Mining Institute, St. Petersburg, 120/1; Geology Museum, Kola Branch, Academy of Sciences, Apatity, 5708/2; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 82132; The Natural History Museum, London, England, 1994,2.

References: (1) Khomyakov, A.P., A.V. Bykova, and T.A. Kurova (1981) Arctite, $Na_2Ca_4(PO_4)_3F$, a new mineral. Zap. Vses. Mineral. Obshch., 110, 506–508 (in Russian). (2) (1982) Amer. Mineral., 67, 621 (abs. ref. 1). (3) (1982) Mineral. Abs., 33, 168 (abs. ref. 1). (4) Sokolova, E.V., N.A. Yamnova, Y.K. Yegorov-Tismenko, and A.P. Khomyakov (1984) Crystal structure of a new phosphate of Na, Ca, and Ba $(Na_5Ca)Ca_6Ba[PO_4]_6F_3$, Doklady Acad. Nauk SSSR, 274, 78–83 (in Russian). (5) Khomyakov, A.P. (1995) Mineralogy of hyperagpaitic alkaline rocks. Clarendon Press, Oxford, 165.