

Anatolyite**Na₆(Ca, Na)(Mg, Fe³⁺)₃Al(AsO₄)₆**

Crystal Data: Hexagonal. *Point Group:* $\bar{3} 2/m$. As rhombohedral-prismatic, equant, or slightly elongated along [001] crystals to 0.2 mm in aggregates to 2 mm..

Physical Properties: *Cleavage:* None. *Tenacity:* Brittle. *Fracture:* Uneven. Hardness = ~4.5
D(meas.) = n.d. D(calc.) = 3.872

Optical Properties: Transparent. *Color:* Pale brownish pinkish, colorless in thin section.

Streak: White. *Luster:* Vitreous.

Optical Class: Uniaxial (-). $\omega = 1.703(4)$ $\epsilon = 1.675(3)$ Nonpleochroic.

Cell Data: *Space Group:* $R\bar{3}c$. $a = 13.6574(10)$ $c = 18.2349(17)$ $Z = 6$

X-Ray Diffraction Pattern: Arsenatnaya fumarole, Tolbachik Volcano, Russia.

2.827 (100), 7.21 (33), 3.196 (31), 4.347 (27), 3.421 (20), 2.981 (17), 2.589 (18)

Chemistry:	(1)	(2)		(1)	(2)
Na ₂ O	16.55	16.27	Fe ₂ O ₃	7.94	6.99
K ₂ O	0.43		TiO ₂	0.18	
CaO	2.49	4.91	SnO ₂	0.17	
MgO	5.80	7.05	SiO ₂	0.04	
MnO	0.16		P ₂ O ₅	0.55	
CuO	0.69		As ₂ O ₅	60.75	60.32
ZnO	0.55		SO ₃	0.03	
Al ₂ O ₃	5.01	4.46	Total	101.34	100.00

(1) Arsenatnaya fumarole, Tolbachik Volcano, Kamchatka, Russia; average electron microprobe analysis; corresponds to (Na_{5.90}K_{0.10}) $\Sigma=6.00$ (Ca_{0.50}Na_{0.13}Zn_{0.08}Mn_{0.03}) $\Sigma=0.74$ (Mg_{1.63}Fe³⁺_{1.12}Al_{0.15}Cu_{0.10}) $\Sigma=3.00$ (Al_{0.96}Ti_{0.03}Sn_{0.01}) $\Sigma=1.00$ (As_{5.97}P_{0.09}Si_{0.01}) $\Sigma=6.07$ O₂₄. (2) Na₆(Ca)(Mg₂Fe³⁺)Al(AsO₄)₆.

Occurrence: A sublimate at an active volcanic fumarole.

Association: Potassic feldspar, hematite, tenorite, cassiterite, johillerite, tilasite, ericaxmanite, lammerite, arsmirandite, sylvite, halite, apthitalite, langbeinite, anhydrite, wulfite, krashennikovite, fluoborite, pseudobrookite, fluorophlogopite.

Distribution: From the Arsenatnaya fumarole, Second scoria cone, Northern Breakthrough of the Great Tolbachik Fissure Eruption, Tolbachik Volcano, Kamchatka, Russia.

Name: Honors Russian crystallographer, mineralogist, and mathematician *Anatoly* Kapitonovich Boldyrev (1883-1946) Professor of Crystallography and Mineralogy, Leningrad Mining Institute.

Type Material: A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (95620 and 95913).

References: (1) Pekov, I.V., I.S. Lykova, V.O. Yapaskurt, D.I. Belakovskiy, A.G. Turchkova, S.N. Britvin, E.G. Sidorov, and K.S. Scheidl (2019) New arsenate minerals from the Arsenatnaya fumarole, Tolbachik volcano, Kamchatka, Russia. XI. Anatolyite, Na₆(Ca,Na)(Mg,Fe³⁺)₃Al(AsO₄)₆. Mineral. Mag., 83, 633-638.