Alumoedtollite $K_2NaCu_5AlO_2(AsO_4)_4$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As prismatic to acicular crystals to 0.1 mm, forming bush-like clusters and open-work aggregates to 1 mm.

Physical Properties: *Cleavage*: None. *Tenacity*: Brittle. *Fracture*: Uneven. Hardness = n.d. D(meas.) = n.d. D(calc.) = 4.280

Optical Properties: Translucent to almost opaque. *Color*: Bronze, gray in reflected light with weak, yellowish internal reflections. *Streak*: Light yellow. *Luster*: Semi-metallic.
Optical Class: *Anisotropy*: Distinct. *Bireflectance*: Weak.
R_1-R_2: (470) 8.7-7.7, (546) 8.3-7.4, (589) 8.3-7.4, (650) 7.6-7.2

Cell Data: *Space Group*: $P\bar{1}$. a = 5.0904(11) b = 9.0778(14) c = 9.6658(2) α = 110.334(17)° β = 102.461(19)° γ = 92.788(15) ° Z = 1

X-Ray Diffraction Pattern: Arsenatnaya fumarole, Tolbachik Volcano, Russia.
3.418 (100), 8.78 (81), 7.62 (67), 2.544 (65), 2.558 (58), 3.147 (52), 2.528 (52)

Chemistry:

	(1)	(2)
Na_2O	2.58	3.00
K_2O	9.09	9.11
Rb_2O	0.11	
CaO	0.52	
CuO	38.35	38.48
Al_2O_3	3.48	4.93
Fe_2O_3	1.79	
As_2O_5	43.66	44.48
Total	99.58	100.00

(1) Arsenatnaya fumarole, Tolbachik Volcano, Kamchatka, Russia; average electron microprobe analysis supplemented by Raman spectroscopy; corresponds to $(K_{1.98}Rb_{0.01})_{\Sigma=1.99}(Na_{0.87}Ca_{0.10}K_{0.03})_{\Sigma=1.00}Cu_{4.02}(Cu_{1.04}Al_{0.72}Fe^{3+}_{0.24})_{\Sigma=2.00}O_{2.04}(AsO_4)_{3.99}$. (2) $K_2NaCu_5AlO_2(AsO_4)_4$.

Occurrence: A sublimate on basaltic scoria at an active volcanic fumarole.

Association: Sylvite, halite, tenorite, dmisokolovite, shchurovskyite, arsmirandite, johillerite, bradaczekite, tilasite, orthoclase (As-bearing), hematite, anhydrite.

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

Name: Prefix, *alumo*, identifies the aluminum analogue of *edtollite*.

Type Material: A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (95906).

References: (1) Pekov, I.V., N.V. Zubkova, A.A. Agakhanov, D.A. Ksenofontov, L.A. Pautov, E.G. Sidorov, S.N. Britvin, M.F. Vigasina, and D.Y. Pushcharovsky (2019) New arsenate minerals from the Arsenatnaya fumarole, Tolbachik volcano, Kamchatka, Russia. X. Edtollite, $K_2NaCu_5Fe^{3+}O_2(AsO_4)_4$, and alumoedtollite, $K_2NaCu_5AlO_2(AsO_4)_4$. Mineral. Mag., 83, 485-495.