

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. *Birefractance:* 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:* $P\bar{1}$. $a = 5.0904(11)$ $b = 9.0778(14)$ $c = 9.6658(2)$ $\alpha = 110.334(17)^\circ$ $\beta = 102.461(19)^\circ$ $\gamma = 92.788(15)^\circ$ $Z = 1$

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 ₂ O	2.58	3.00
K ₂ O	9.09	9.11
Rb ₂ O	0.11	
CaO	0.52	
CuO	38.35	38.48
Al ₂ O ₃	3.48	4.93
Fe ₂ O ₃	1.79	
<u>As₂O₅</u>	<u>43.66</u>	<u>44.48</u>
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, dmsokolovite, 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. Vlasina, 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.