Alumotantite $AlTaO_4$

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Crystals euhedral to subhedral, to 1 mm, elongated with rhombic to rectangular cross-section. As rims and parallel oriented intergrowths on simpsonite, also rims around natrotantite, which in turn rims simpsonite crystals.

Physical Properties: Hardness = n.d. VHN = 1650–1690 (100 g load). D(meas.) = n.d. D(calc.) = 7.48 Bright blue cathodoluminescence.

Optical Properties: Transparent to translucent. *Color:* Colorless to white.
Luster: Adamantine to greasy.
Optical Class: Biaxial (–). $\alpha = > 2.0$ $\beta = > 2.0$ $\gamma = > 2.0$ 2V(meas.) = 66(2)°
Anisotropism: Observed.
R_1–R_2: (486) 15.6–14.7, (589) 15.4–14.6, (656) 15.9–15.1

Cell Data: *Space Group: Pbcn.* a = 4.473–4.477 b = 11.308–11.309 c = 4.767–4.775
Z = 4

X-ray Powder Pattern: Kola Peninsula, Russia.
3.13 (10), 2.89 (8), 3.64 (7b), 5.66 (5), 2.439 (5), 1.837 (5), 1.649 (5)

Chemistry:

	(1)	(2)	(3)
Nb_2O_5	0.80	0.0	0.0
Ta_2O_5	81.13	80.9	81.6
SnO_2		1.0	0.2
Al_2O_3	18.47	18.9	18.6
Total	100.40	100.8	100.4

(1) Kola Peninsula, Russia; by electron microprobe, corresponding to $Al_{0.98}(Ta_{0.99}Nb_{0.02})_{\Sigma=1.01}O_4$. (2) Bikita, Zimbabwe; by electron microprobe, corresponding to $Al_{1.00}Ta_{0.98}Sn_{0.02}O_4$. (3) Alto do Giz pegmatite, Brazil; by electron microprobe, corresponding to $Al_{0.99}Ta_{1.00}O_4$.

Occurrence: In albitized areas of highly fractionated rare element-enriched granite pegmatites.

Association: Simpsonite, natrotantite, microlite, cesstibtantite, sosedkoite, albite (Kola Peninsula, Russia); simpsonite, manganoan tapiolite, manganotantalite, zirconian hafnon, apatite, albite, muscovite (Bikita, Zimbabwe); simpsonite, manganotantalite, microlite, parabariomicrolite (Alto do Giz pegmatite, Brazil).

Distribution: From an undisclosed locality [Leshaia pegmatite, Vuoriyarvi carbonatite complex] on the Kola Peninsula, Russia. In the Mdara mine, Bikita, Zimbabwe. From the Alto do Giz pegmatite, near Parelhas, Rio Grande do Norte, Brazil.

Name: For ALUMinum and TANTalum in the composition.

Type Material: Geology Museum, Kola Branch, Academy of Sciences, Apatity, Russia.

References: (1) Voloshin, A.V., Y.P. Men'shikov, and Y.A. Pakhomovskii (1981) Alumotantite and natrotantite, new tantalum minerals in granitic pegmatites. Zap. Vses. Mineral. Obshch., 110, 338–345 (in Russian). (2) (1982) Amer. Mineral., 67, 413 (abs. ref. 1). (3) Ercit, T.S., F.C. Hawthorne, and P. Černý (1992) The crystal structure of alumotantite: its relation to the structures of simpsonite and the $(Al, Ga)(Ta, Nb)O_4$ compounds. Can. Mineral., 30, 653–662.