

## Cesstibtantite

Cs(Sb<sup>3+</sup>, Na)Ta<sub>2</sub>(O, OH, F)<sub>7</sub>

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**Crystal Data:** Cubic. *Point Group:*  $4/m\bar{3}2/m$ . As cubo-octahedral crystals; granular, to 3 mm.

**Physical Properties:** *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = ~5 VHN = 670–780 (100 g load). D(meas.) = 6.4–6.6 D(calc.) = 6.49 Fluoresces yellow-orange to orange under LW UV; weak yellowish cathodoluminescence.

**Optical Properties:** Transparent; may be opaque except in thinnest fragments.

*Color:* Colorless to gray, yellow-orange, black. *Luster:* Adamantine to vitreous.

*Optical Class:* Isotropic.  $n = > 1.8$

R: (480) 13.8, (551) 13.6, (589) 13.6, (656) 13.0

**Cell Data:** *Space Group:*  $Fd\bar{3}m$ .  $a = 10.496$ – $10.515$   $Z = 8$

**X-ray Powder Pattern:** Kola Peninsula, Russia.

3.04 (10), 1.860 (10), 1.587 (10), 1.012 (10), 3.17 (9), 1.370 (9), 1.017 (9)

<b>Chemistry:</b>	(1)	(2)	(3)		(1)	(2)	(3)
Nb <sub>2</sub> O <sub>5</sub>	2.3	2.8	1.2	CaO	0.1		0.6
Ta <sub>2</sub> O <sub>5</sub>	72.0	70.8	72.5	Na <sub>2</sub> O	1.3	1.7	2.4
Bi <sub>2</sub> O <sub>3</sub>	0.7	0.3	0.6	K <sub>2</sub> O		0.0	0.05
Sb <sub>2</sub> O <sub>3</sub>	13.6	14.2	9.7	Cs <sub>2</sub> O	7.3	7.4	5.4
SnO			0.1	H <sub>2</sub> O		[1.5]	[1.2]
PbO	1.6	0.8	5.3	Total	98.9	[99.5]	[99.0]

(1) Kola Peninsula, Russia; by electron microprobe, average of five analyses; (OH)<sup>1-</sup> confirmed by IR. (2) Do.; by electron microprobe, H<sub>2</sub>O calculated from structural considerations; corresponds to [Cs<sub>0.31</sub>(OH, F)<sub>0.69</sub>]<sub>Σ=1.00</sub>(Sb<sub>0.57</sub>Na<sub>0.31</sub>Pb<sub>0.02</sub>Bi<sub>0.01</sub>)<sub>Σ=0.91</sub>(Ta<sub>1.88</sub>Nb<sub>0.12</sub>)<sub>Σ=2.00</sub>[O<sub>5.69</sub>(OH, F)<sub>0.31</sub>]<sub>Σ=6.00</sub>. (3) Tanco pegmatite, Canada; by electron microprobe, H<sub>2</sub>O calculated from structural considerations; corresponds to [Cs<sub>0.22</sub>K<sub>0.01</sub>(OH, F)<sub>0.55</sub>]<sub>Σ=0.78</sub>(Na<sub>0.45</sub>Sb<sub>0.40</sub>Pb<sub>0.14</sub>Ca<sub>0.06</sub>Bi<sub>0.02</sub>Sn<sub>0.01</sub>)<sub>Σ=1.08</sub>(Ta<sub>1.95</sub>Nb<sub>0.05</sub>)<sub>Σ=2.00</sub>[O<sub>5.78</sub>(OH, F)<sub>0.22</sub>]<sub>Σ=6.00</sub>.

**Mineral Group:** Pyrochlore group, intermediate between normal and inverse pyrochlores.

**Occurrence:** A rare accessory in some highly fractionated granite pegmatites.

**Association:** Simpsonite, stibiotantalite, microlite, wodginite, tantalite, pollucite, sosedkoite (Kola Peninsula, Russia); kimrobinsonite, manganotantalite, antimonian microlite (Mt. Holland, Western Australia).

**Distribution:** From the Leshaiia pegmatite, Vuoriyarvi carbonatite complex, Kola Peninsula, Russia. In the Czech Republic, at the Dobrá Voda pegmatite, Velké Meziříčí. In the Tanco pegmatite, Bernic Lake, Manitoba, Canada. From near Mt. Holland, Western Australia.

**Name:** For CESium, antimony (STIBium), and TANTalum in the composition [deviant from IMA pyrochlore nomenclature].

**Type Material:** Mining Museum, St. Petersburg, 1324/1; Geology Museum, Kola Branch, Academy of Sciences, Apatity, 5518; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 80827, 81058, vis6317.

**References:** (1) Voloshin, A.V., Y.P. Men'shikov, Y.A. Pakhomovskii, and L.I. Polezhaeva (1981) Cesstibtantite, (Cs, Na)SbTa<sub>4</sub>O<sub>12</sub> – a new mineral from granitic pegmatites. Zap. Vses. Mineral. Obsch., 110, 345–351 (in Russian). (2) (1982) Amer. Mineral., 67, 413–414 (abs. ref. 1). (3) Nickel, E.H. and B.W. Robinson (1985) Kimrobinsonite, a new tantalum mineral from Western Australia, and its association with cesstibtantite. Can. Mineral., 23, 573–576. (4) Ercit, T.S., P. Černý, and F.C. Hawthorne (1993) Cesstibtantite – a geologic introduction to the inverse pyrochlores. Mineral. Petrol., 48, 235–255.

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