

Stibiocolumbite

Sb(Nb, Ta)O₄

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Crystal Data: Orthorhombic. *Point Group:* *mm*2. Crystals prismatic || [010]; {001} and {101} striated || [010]. *Twinning:* About [010] with composition plane {001}, commonly an irregular junction, or polysynthetic.

Physical Properties: *Cleavage:* {001}, distinct; {100}, indistinct. *Fracture:* Subconchoidal. *Tenacity:* Brittle. Hardness = 5.5 D(meas.) = 5.68 (synthetic SbNbO₄). D(calc.) = [5.72] Strongly pyroelectric.

Optical Properties: Semitransparent. *Color:* Dark brown to light yellowish brown; reddish yellow, reddish brown, greenish yellow; in transmitted light, pale yellow-brown to brown, may be zoned. *Streak:* Pale yellow to yellow-brown. *Luster:* Resinous to adamantine. *Optical Class:* Biaxial (+). *Orientation:* X = a; Y = b; Z = c. *Dispersion:* r < v, strong. α = 2.398 β = 2.419 γ = 2.459 2V(meas.) = n.d. 2V(calc.) = 73°25'

Cell Data: *Space Group:* *Pc*2₁*n* (synthetic SbNbO₄). a = 4.929 b = 11.797 c = 5.559 Z = 4

X-ray Powder Pattern: Synthetic SbNbO₄; nearly identical to stibiocolumbite. 3.125 (100), 2.947 (28), 1.735 (21), 3.517 (18), 1.891 (12), 2.779 (10), 2.023 (10)

Chemistry:	(1)	(2)	(3)
WO ₃		12.34	
Nb ₂ O ₅	37.30	29.82	47.70
Ta ₂ O ₅	13.00	8.64	
TiO ₂		0.10	
SnO ₂		1.05	
Bi ₂ O ₃	0.53		
Sb ₂ O ₃	49.28	43.99	52.30
PbO		3.54	
Total	100.11	99.48	100.00

(1) Mesa Grande district, California, USA. (2) Pamir Mountains, Tajikistan; by electron microprobe, corresponding to (Sb_{0.93}Pb_{0.05})_{Σ=0.98}(Nb_{0.69}W_{0.16}Ta_{0.12}Sn_{0.02})_{Σ=0.99}O₄.

(3) SbNbO₄.

Mineral Group: Forms a series with stibiotantalite. [As stibiocolumbite was originally defined from its analysis only, some properties given here are likely for stibiotantalite].

Occurrence: A rare accessory mineral in complex granite pegmatites.

Association: Tourmaline, beryl, lepidolite (Mesa Grande district, California, USA).

Distribution: From the Mesa Grande district, San Diego Co., California, USA. At Emd, Mattertal, Valais, Switzerland. From an undisclosed locality in the Pamir Mountains, Tajikistan.

Name: From the Latin for antimony, STIBium, in its composition, and relation to *columbite*.

Type Material: The type crystal was totally consumed during analysis before realization it was of a new species.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 767–769. (2) Roth, R.S. and J.L. Waring (1963) Synthesis and stability of bismutotantalite, stibiotantalite and chemically similar ABO₄ compounds. *Amer. Mineral.*, 48, 1348–1356. (3) Konovalenko, S.I., A.V. Voloshin, Y.A. Pakhomovskii, L.N. Rossovskii, and A.N. Anan'yev (1982) Tungsten varieties of tantaloniobates in granitic miarolitic pegmatites of southwestern Pamirs. *Mineral. Zhurnal*, 4(1), 65–74 (in Russian with English abs.).

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