

Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. [Crystals short prismatic or equant, also tabular; in groups of parallel or subparallel crystals; massive] (by analogy to columbite-(Fe)).

Twinning: [On {021} and {023}, may produce pseudohexagonal trillings.]

Physical Properties: *Cleavage:* [{100}, distinct; {010}, less distinct.] *Fracture:* [Subconchoidal to uneven.] *Tenacity:* [Brittle.] *Hardness =* [6] *VHN =* 488-681 (100 g load). *D(meas.) =* 6.65-8.00 *D(calc.) =* 8.01

Optical Properties: Opaque, transparent in thin edges. *Color:* Pink to nearly colorless, or reddish brown to black; colorless, reddish brown to red in transmitted light. *Streak:* Red, scarlet to black. *Luster:* Submetallic to vitreous.

Optical Class: Biaxial (+). $\alpha = 2.14$ $\beta = 2.15$ $\gamma = 2.22$ $2V(\text{meas.}) = \text{n.d.}$ *Pleochroism:* Strong; red, red-brown, orange. *Dispersion:* $r < v$. *Absorption:* Strong; $Z > X$. *Orientation:* $X = a$; $Y = b$; $Z = c$. R_1 - R_2 : (400) 15.5-16.4, (420) 15.1-16.0, (440) 14.8-15.7, (460) 14.6-15.4, (480) 14.3-15.2, (500) 14.1-15.0, (520) 13.9-14.8, (540) 13.8-14.7, (560) 13.6-14.5, (580) 13.6-14.4, (600) 13.5-14.4, (620) 13.5-14.3, (640) 13.4-14.3, (660) 13.4-14.3, (680) 13.3-14.2, (700) 13.3-14.2

Cell Data: *Space Group:* Pbcn (synthetic). $a = 14.440(2)$ $b = 5.7661(8)$ $c = 5.0930(9)$ $Z = 4$

X-ray Powder Pattern: Salinas, Brazil.

2.99 (10), 3.69 (9), 2.41 (7), 1.738 (7), 1.483 (7), 7.25 (5), 3.61 (5)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
Nb ₂ O ₅	4.47	0.29		MnO	13.88	13.8	13.83
Ta ₂ O ₅	79.81	85.8	86.17	CaO	0.17		
SnO ₂ + WO ₃	0.67	0.03		<u>LOI</u>	<u>0.16</u>		
FeO	1.17	0.04		Total	100.33	99.96	100.00

(1) Sanarka, Russia. (2) Morrua mine, Zambesia, Mozambique; by electron microprobe, corresponds to Mn_{1.00}(Ta_{1.99}Nb_{0.01})_{Σ=2.00}O₆. (3) MnTa₂O₆.

Polymorphism & Series: Dimorphous with tapiolite-(Mn); forms series, with columbite-(Mn), and with tantalite-(Fe) and tantalite-(Mg).

Mineral Group: Columbite group.

Occurrence: An accessory and primary constituent of granite pegmatites; detrital in placers.

Association: [Albite, microcline, beryl, lepidolite, muscovite, tourmaline, spodumene, lithiophilite, triphylite, amblygonite, triplite, samarskite, apatite, microlite, cassiterite.]

Distribution: Found on the Island of Utö, Sweden. At Glenbuchat, Aberdeenshire, Scotland. From Facciatoia, Elba, Italy. In the Zambesia, Tete, and Alto Ligonha districts, Mozambique. From Bikita, Zimbabwe. At the Steinkopf, Namaqualand, South Africa. In Brazil, from Salinas, Minas Gerais, and the Alto do Giz pegmatite, near Parelhas, Rio Grande do Norte. At Stak Nala, Gilgit district, Pakistan. From Wodgina, Greenbushes, and on Mt. Holland, Western Australia. In the USA, large crystals from Amelia, Amelia Co., Virginia; at Pala, San Diego Co., California. From the Tanco pegmatite, Bernic Lake, Manitoba, Canada. A few other less-well-defined localities are known.

Name: Suffix for dominant Mn in the composition and relation to *tantalite-(Fe)* and *tantalite-(Mg)*, named for the Greek mythical Tantalus, for the difficulty in bringing the mineral into solution.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 780-787. (2) Grice, J.D., R.B. Ferguson, and F.C. Hawthorne (1976) The crystal structures of tantalite, ixiolite and wodginite from Bernic Lake, Manitoba; I, Tantalite and ixiolite. Can. Mineral. 14, 540-549. (3) Sahama, T.G. (1980) Minerals of the tantalite-niobite series from Mozambique. Bull. Minéral., 103, 190-197. (4) Wise, M.A., A.C. Turnock, and P. Černý (1985) Improved unit cell dimensions for ordered columbite-tantalite end members. Neues Jahrb. Mineral., Monatsh., 372-378.