

**Microlite****(Ca, Na)<sub>2</sub>Ta<sub>2</sub>O<sub>6</sub>(O, OH, F)**

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**Crystal Data:** Cubic; metamict when uranoan. *Point Group:*  $4/m\bar{3}2/m$ . Commonly as euhedral to subhedral octahedra, modified by the dodecahedron, cube, and {113}, to 8 cm; also granular, massive. *Twinning:* Rare, according to the spinel law, twin plane {111}.

**Physical Properties:** *Cleavage:* {111}, poor. *Fracture:* Subconchoidal to uneven. *Tenacity:* Brittle. Hardness = 5–5.5 D(meas.) = 5.90–6.43 D(calc.) = 6.33 (for Ca:Na = 1:1). May be radioactive.

**Optical Properties:** Opaque, transparent in thin fragments. *Color:* Pale yellow to brown, hyacinth-red, greenish yellow, grass-green, emerald-green; white, gray, black; colorless, yellow, brown in transmitted light, may be zoned. *Streak:* Pale yellow or brown. *Luster:* Vitreous to adamantine, resinous on fractures.

*Optical Class:* Isotropic.  $n = 1.93\text{--}2.02$

**Cell Data:** *Space Group:*  $Fd\bar{3}m$ .  $a = 10.36\text{--}10.46$   $Z = 8$

**X-ray Powder Pattern:** Onça, Brazil.

1.568 (100), 1.838 (84), 3.00 (68), 1.193 (68), 1.000 (68), 1.354 (63), 1.163 (63)

<b>Chemistry:</b>		(1)	(2)	(1)	(2)	(1)	(2)
	Nb <sub>2</sub> O <sub>5</sub>		3.4	RE <sub>2</sub> O <sub>3</sub>	0.50	Na <sub>2</sub> O	3.26
	Ta <sub>2</sub> O <sub>5</sub>	73.72	77.9	FeO	2.77	K <sub>2</sub> O	0.64
	TiO <sub>2</sub>	1.58	1.1	MnO		0.2	H <sub>2</sub> O
	SnO <sub>2</sub>		1.1	MgO	0.34		
	UO <sub>2</sub>	4.21		CaO	10.48	15.7	
							<b>Total</b>
							100.22
							100.1

(1) Landås, Norway. (2) Wodgina, Australia; by electron microprobe, corresponds to (Ca<sub>1.52</sub>Na<sub>0.12</sub>Sn<sub>0.04</sub>Mn<sub>0.02</sub>)<sub>Σ=1.70</sub>(Ta<sub>1.92</sub>Nb<sub>0.14</sub>Ti<sub>0.08</sub>)<sub>Σ=2.14</sub>O<sub>7</sub>.

**Polymorphism & Series:** Forms a series with pyrochlore.

**Mineral Group:** Pyrochlore group, microlite subgroup; (Na + Ca)<sub>A</sub> > 20%; (Nb + Ta)<sub>B</sub> > 2Ti<sub>B</sub>; Ta<sub>B</sub> ≥ Nb<sub>B</sub>.

**Occurrence:** A primary mineral in lithium-bearing granite pegmatites, or replacing tantalum minerals; in miarolitic cavities in granites.

**Association:** Albite, lepidolite, topaz, beryl, tourmaline, spessartine, tantalite, fluorite.

**Distribution:** Many localities, but only a few have large crystals. Well-studied material from: in the USA, at Chesterfield, Hampshire Co., Massachusetts; Haddam and Middletown, Middlesex Co., Connecticut; from Topsham, Sagadahoc Co., and Newry, Oxford Co., Maine; large crystals from Amelia, Amelia Co., Virginia. In the Harding mine, Taos Co., New Mexico; from the Brown Derby pegmatite, Gunnison Co., Colorado; in the Tin Mountain mine, near Custer, Custer Co., South Dakota. From the Iveland district, Norway. In the Muiâne and other pegmatites, Alto Ligonha district, Mozambique. At Antandranokomby, Madagascar. From Mapembe, Mumba, and Lueshe, Kivu Province, Congo (Zaire). In Brazil, at Onça, Picuí, Paraíba; large crystals from the Virgem da Lapa pegmatite, Minas Gerais. At Wodgina and Greenbushes, Western Australia.

**Name:** From the Greek for *small*, for the size of crystals at the original locality.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 128730.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 748–757. (2) Frondel, C. (1958) Systematic mineralogy of uranium and thorium. U.S. Geol. Sur. Bull. 1064, 326–333. (3) Vlasov, K.A., Ed. (1966) Mineralogy of rare elements, v. II, 519–525. (4) Kerr, P.F. and R.J. Holmes (1945) X-ray study of the tantalum mineral simpsonite. Bull. Geol. Soc. Amer., 56, 479–504. (5) Clark, A.M. (1972) Calciotantalite confirmed as a mixture. Mineral. Mag., 38, 765–767. (6) Hogarth, D.D. (1977) Classification and nomenclature of the pyrochlore group. Amer. Mineral., 62, 403–410. (7) von Knorring, O. and A. Fadipe (1981) On the mineralogy and geochemistry of niobium and tantalum in some granite pegmatites and alkali granites of Africa. Bull. Minéral., 104, 496–507.

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