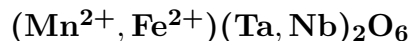


Manganotapiolite



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Crystal Data: Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. Massive, in a zone, to 100 μ wide, in a poorly developed prismatic ferrotapiolite crystal, 1.5 mm long.

Physical Properties: Hardness = n.d. VHN = 665–752, 711 average (100 g load), probably low due to fractures. D(meas.) = n.d. D(calc.) = 7.72

Optical Properties: Opaque, translucent in very thin fragments. *Color:* Dark brown; gray in reflected light, with strong red-brown internal reflections. *Streak:* Dark brown. *Luster:* Adamantine to submetallic.

Optical Class: Uniaxial. *Pleochroism:* Strong; yellowish brown to reddish brown.

Birefractance: Weak; light brownish gray to gray.

R_1 – R_2 : (470) 16.0–15.7, (546) 14.7–14.1, (589) 15.0–14.8, (650) 15.1–14.6

Cell Data: *Space Group:* $P4_2/mnm$. $a = 4.762(5)$ $c = 9.272(5)$ $Z = 2$

X-ray Powder Pattern: Eräjärvi area, Finland.

3.367 (100), 2.592 (90), 1.754 (90), 2.381 (60), 1.682 (60), 4.24 (40), 1.504 (40)

Chemistry:

	(1)
Nb ₂ O ₅	8.5
Ta ₂ O ₅	76.3
SnO ₂	1.0
Sb ₂ O ₃	0.1
FeO	3.2
MnO	10.2
MgO	0.0
CaO	0.4
Total	99.7

(1) Eräjärvi area, Finland; by electron microprobe, corresponds to $(\text{Mn}_{0.70}\text{Fe}_{0.22}\text{Ca}_{0.04})_{\Sigma=0.96}(\text{Ta}_{1.68}\text{Nb}_{0.31}\text{Sn}_{0.03})_{\Sigma=2.02}\text{O}_6$.

Polymorphism & Series: Dimorphous with manganotantalite; forms a series with ferrotapiolite.

Mineral Group: Ferrotapiolite group.

Occurrence: A rare accessory mineral in a lithium-rich granite pegmatite dike.

Association: Ferrotapiolite, antimony, cassiterite, microlite, albite, schorl, apatite.

Distribution: From the Viitaniemi pegmatite, Eräjärvi area, Orivesi, Finland.

Name: For its dominant MANGANEse content and relation to ferroTAPIOLITE.

Type Material: Mineralogical Museum, Geological Survey of Finland, Espoo, Finland.

References: (1) Lahti, S.I., B. Johanson, and M. Virkkunen (1983) Contributions to the chemistry of tapiolite – manganotapiolite, a new mineral. *Bull. Geol. Soc. Finland*, 55, 101–109. (2) (1985) *Amer. Mineral.*, 70, 217 (abs. ref. 1). (3) Wise, M.A. and P. Černý (1996) The crystal chemistry of the tapiolite series. *Can. Mineral.*, 34, 631–647.