

**Crystal Data:** Monoclinic. *Point Group:* 2/m. As submillimeter domains intergrown with Ti-rich ferrowodginite in aggregates, to 0.7 cm, with diamond-shaped cross-sections. *Twinning:* By penetration with (001) or (100) as composition planes of individuals defined mainly by {111} faces.

**Physical Properties:** *Cleavage:* None. *Fracture:* Irregular. *Tenacity:* Brittle. *Hardness* = 5.5  
D(meas.) = n.d. D(calc.) = 7.368

**Optical Properties:** Translucent. *Color:* Very dark brown to black; creamy white in reflected light with abundant yellow, orange, and purplish orange internal reflections in air, and green, yellow, orange, and purplish brown in oil. *Streak:* Dark brown. *Luster:* Submetallic.

*Optical Class:* n.d.

*Anisotropism:* Distinct, light greenish-gray to gray in air; light greenish gray to olive-greenish gray in oil. *Birefractance:* Moderate. *Pleochroism:* Moderate, creamy white to creamy gray in air; light greenish gray to gray in oil.

R<sub>1</sub>-R<sub>2</sub>: (400) 22.2-22.2, (440) 19.5-18.6, (460) 19.1-18.1, (470) 18.7-18.2, (480) 18.4-17.5, (500) 18.6-17.2, (520) 18.4-17.0, (540) 18.8-17.7, (546) 19.1-18.1, (560) 18.5-17.0, (580) 17.9-16.6, (589) 17.9-16.9, (600) 18.1-16.8, (620) 16.4-14.6, (650) 16.4-15.6, (680) 15.9-15.2, (700) 12.9-11.5

**Cell Data:** *Space Group:* C2/c. *a* = 9.403(4) *b* = 11.384(3) *c* = 5.075(1) *β* = 90.55° *Z* = 4

**X-ray Powder Pattern:** San Elías pegmatite, San Luis province, Argentina.  
2.963 (100), 2.939 (90), 3.626 (70), 1.715 (50), 2.484 (45), 1.759 (45), 1.711 (45)

<b>Chemistry:</b>	(1)	(2)	(1)	(2)	
WO <sub>3</sub>	0.02		Sb <sub>2</sub> O <sub>3</sub>	0.02	
Nb <sub>2</sub> O <sub>5</sub>	6.52	7.18	Bi <sub>2</sub> O <sub>3</sub>	0.03	0.04
Ta <sub>2</sub> O <sub>5</sub>	70.68	64.11	Fe <sub>2</sub> O <sub>3</sub>	2.18	0.62
TiO <sub>2</sub>	7.10	7.15	MgO	0.01	0.08
SnO <sub>2</sub>	1.25	7.66	CaO	0.01	0.03
ThO <sub>2</sub>	0.01		MnO	1.05	4.58
UO <sub>2</sub>	0.02		FeO	10.27	6.82
As <sub>2</sub> O <sub>3</sub>	0.03	0.02	<u>PbO</u>	<u>0.05</u>	
			Total	99.25	98.29

(1) San Elías pegmatite, San Luis province, Argentina; average electron microprobe analysis; corresponds to (Fe<sup>2+</sup><sub>0.869</sub>Mn<sup>2+</sup><sub>0.088</sub>□<sub>0.039</sub>Mg<sub>0.001</sub>Ca<sub>0.001</sub>Sb<sup>3+</sup><sub>0.001</sub>Pb<sup>2+</sup><sub>0.001</sub>)<sub>Σ=1.000</sub>(Ti<sup>4+</sup><sub>0.540</sub>Ta<sub>0.244</sub>Fe<sup>3+</sup><sub>0.166</sub>Sn<sup>4+</sup><sub>0.050</sub>)<sub>Σ=1.000</sub>(Ta<sub>1.702</sub>Nb<sub>0.297</sub>)<sub>Σ=1.999</sub>O<sub>8</sub>. (2) La Viquita pegmatite; corresponds to (Fe<sup>2+</sup><sub>0.574</sub>Mn<sup>2+</sup><sub>0.390</sub>□<sub>0.017</sub>Mg<sub>0.013</sub>Ca<sub>0.003</sub>Bi<sub>0.002</sub>Zn<sub>0.001</sub>Sb<sub>0.001</sub>)<sub>Σ=1.000</sub>(Ti<sup>4+</sup><sub>0.541</sub>Sn<sup>4+</sup><sub>0.307</sub>Ta<sub>0.082</sub>Fe<sup>3+</sup><sub>0.047</sub>Zr<sup>5+</sup><sub>0.021</sub>As<sub>0.001</sub>)<sub>Σ=0.999</sub>(Ta<sub>1.672</sub>Nb<sub>0.327</sub>)<sub>Σ=1.999</sub>O<sub>8</sub>.

**Mineral Group:** Wodginite group.

**Occurrence:** In complex rare-element pegmatite in locally tourmalinized quartz-mica schist of medium metamorphic grade.

**Association:** Ferrowodginite, ferrotapiolite, cleavelandite, quartz (San Elías); wodginite, ferrowodginite, titanowodginite, ferrotapiolite, muscovite, quartz (La Viquita).

**Distribution:** From the San Elías and La Viquita pegmatites, Sierra de la Estanzuela, Chacabuco, San Luis province, Argentina.

**Name:** Prefixes, *ferro* indicates Fe<sup>2+</sup>-dominant in the A site and *titano* indicates Ti-dominant in the B site in a member of the *wodginite* group.

**Type Material:** Mineralogical Museum Prof. Manuel Tellechea, Mendoza, Argentina (8554).

**References:** (1) Galliski, M.A., P. Černý, M.F. Márquez-Zavalía, and R. Chapman (1999) Ferrotitanowodginite, Fe<sup>2+</sup>TiTa<sub>2</sub>O<sub>8</sub>, a new mineral of the wodginite group from the San Elías pegmatite, San Luis, Argentina. *Amer. Mineral.*, 84, 773-777.