

**Crystal Data:** Monoclinic, pseudo-hexagonal. *Point Group:* 2/m. Irregular crystallites, to 30 μm, in complexly twinned aggregates. *Twining:* Very common to universal, as seen in section; by four complex twin laws determined from structural analysis, enhancing the pseudo-hexagonality.

**Physical Properties:** Hardness = n.d. VHN = 650(100) (50 g load). D(meas.) = n.d. D(calc.) = 4.17

**Optical Properties:** Opaque. *Color:* Black; gray in reflected light. *Streak:* Black. *Luster:* Submetallic.

*Optical Class:* Biaxial. *Anisotropism:* Weak to moderate; in shades of gray.

R: (470) 16.8, (546) 17.4, (589) 17.7

**Cell Data:** *Space Group:* P2<sub>1</sub>/c. *a* = 7.494(5) *b* = 4.552(4) *c* = 10.005(8)  
β = 129.79(2)° *Z* = [4]

**X-ray Powder Pattern:** Calculated from the crystal structure of natural material. 3.880 (100), 2.795 (94), 2.636 (69), 1.693 (31), 1.683 (30), 3.917 (25), 2.535 (24)

**Chemistry:**

	(1)	(2)
TiO <sub>2</sub>	41.03	48.76
Fe <sub>2</sub> O <sub>3</sub>	1.57	
V <sub>2</sub> O <sub>3</sub>	48.27	45.74
H <sub>2</sub> O	[5.97]	5.50
Total	[96.84]	100.00

(1) Lake View mine, Western Australia; by electron microprobe, average of three analyses, total V as V<sub>2</sub>O<sub>3</sub>, total Fe as Fe<sub>2</sub>O<sub>3</sub>, H<sub>2</sub>O calculated from stoichiometry; corresponding to (V<sub>1.09</sub><sup>3+</sup>Fe<sub>0.04</sub><sup>3+</sup>)<sub>Σ=1.13</sub>Ti<sub>0.87</sub>O<sub>2.87</sub>(OH)<sub>1.13</sub>. (2) V<sup>3+</sup>TiO<sub>3</sub>(OH).

**Occurrence:** As a grain in micaceous V–Au-rich stringers in a hydrothermal gold deposit.

**Association:** Quartz, nolanite, vanadium-rich muscovite.

**Distribution:** From the Lake View mine, Kalgoorlie, Western Australia.

**Name:** For Titanium and VANadium in the composition.

**Type Material:** C.S.I.R.O, Perth, Australia, 5996, gone walkabout.

**References:** (1) Grey, I.E. and E.H. Nickel (1981) Tivanite, a new oxyhydroxide mineral from Western Australia, and its structural relationship to rutile and diasporite. *Amer. Mineral.*, 66, 866–871.