

**Crystal Data:** Monoclinic. *Point Group:* 2/m. As elongated ellipsoidal grains to 0.15 mm.

**Physical Properties:** *Cleavage:* None. *Tenacity:* Brittle. *Fracture:* Conchoidal. Hardness = 7-7.5 VHN = 1064-1266, 1180 average (30 g load). D(meas.) = n.d. D(calc.) = 4.66(2)

**Optical Properties:** Opaque. *Color:* Black; pale cream in reflected light. *Streak:* Black.

*Optical Class:* Isotropic. *Luster:* Resinous.

R: (440) 17.8, (460) 18, (480) 18.2, (520) 18.6, (520) 18.6, (540) 18.8, (560) 18.9, (580) 19, (600) 19.1, (620) 19.2, (640) 19.3, (660) 19.4, (680) 19.5, (700) 19.7

**Cell Data:** *Space Group:* C2/c. *a* = 10.03(2) *b* = 5.050(1) *c* = 7.000(1)  $\beta$  = 111.14(1)° *Z* = 4

**X-ray Powder Pattern:** Slyudyanka Complex, southern Baikal region, Russia.

3.28 (5), 2.88 (5), 2.65 (5), 2.44 (5), 1.717 (5), 1.633 (5), 1.379 (5)

Chemistry:	(1)	(2)	(3)
TiO <sub>2</sub>	14.04	0.12	
V <sub>2</sub> O <sub>3</sub>	[53.97]	[47.58]	64.37
VO <sub>2</sub>	[21.25]	[35.10]	35.63
Cr <sub>2</sub> O <sub>3</sub>	10.76	16.02	
Fe <sub>2</sub> O <sub>3</sub>	0.04	0.24	
Al <sub>2</sub> O <sub>3</sub>	0.01	0.09	
MgO	0.02		
Total	100.03	99.19	100.00

(1) Slyudyanka Complex, southern Baikal region, Russia; average electron microprobe analysis supplemented, total V as V<sub>2</sub>O<sub>3</sub> = 73.13 assigned to VO<sub>2</sub> and V<sub>2</sub>O<sub>3</sub>; corresponds to (V<sup>3+</sup><sub>1.70</sub>Cr<sub>0.30</sub>) $\Sigma=2.0$  (V<sup>4+</sup><sub>0.59</sub>Ti<sub>0.41</sub>) $\Sigma=1.0$ O<sub>5</sub>. (2) Green Giant deposit, Madagascar; electron microprobe analysis, includes MnO = 0.04, SiO<sub>2</sub> = 0.01; corresponds to (V<sup>3+</sup><sub>1.49</sub>Cr<sub>0.5</sub>) $\Sigma=1.99$ V<sup>4+</sup><sub>1.00</sub>) $\Sigma=1.0$ O<sub>5</sub>. (3) V<sup>3+</sup><sub>2</sub>V<sup>4+</sup>O<sub>5</sub>.

**Polymorphism & Series:** End member of the oxyvanite-berdesinskiite series.

**Occurrence:** An accessory mineral in Cr-V-bearing quartz-diopside metamorphic rocks (Russia); in amphibolite to granulite facies quartzo-feldspathic gneisses (Madagascar).

**Association:** Quartz, Cr-V-bearing tremolite and micas, calcite, clinopyroxenes of the diopside-kosmochlor-natalyite series, Cr-bearing goldmanite, eskolaite-karelianite, dravite-vanadiumdravite series, V-bearing titanite, ilmenite, and rutile, berdesinskiite, schreyerite, plagioclase, scapolite, baryte, zircon (Russia); pyrrhotite, alabandite, phlogopite (Madagascar).

**Distribution:** From the Slyudyanka Complex, southern Baikal region, Russia [TL] and the Green Giant vanadium-graphite deposit, 145 km southeast of Toliara, Tulear Region, Madagascar.

**Name:** After constituents of its essential composition, oxygen and vanadium.

**Type Material:** A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (3733/1-2).

**References:** (1) Reznitsky, L.Z., E.V. Sklyarov, T. Armbruster, Z.F. Ushchapovskaya, E.V. Galuskin, Yu.S. Polekhovskiy, and I.G. Barash (2010) Oxyvanite, V<sub>3</sub>O<sub>5</sub>, a new mineral species and the oxyvanite-berdesinskiite V<sub>2</sub>TiO<sub>5</sub> series from metamorphic rocks of the Slyudyanka complex, Southern Baikal region. *Geology of Ore Deposits*, 52(7), 574-583. (2) Armbruster, T., E.V. Galuskin, L.Z. Reznitsky, and E.V. Sklyarov (2009) X-ray structural investigation of the oxyvanite (V<sub>3</sub>O<sub>5</sub>) - berdesinskiite (V<sub>2</sub>TiO<sub>5</sub>) series: V<sup>4+</sup> substituting for octahedrally coordinated Ti<sup>4+</sup>. *Eur. J. Mineral.*, 21, 885-891. (3) Di Cecco, V.E., K.T. Tait, E.T.C. Spooner, and C. Scherba (2018) The vanadium-bearing oxide minerals of the Green Giant vanadium-graphite deposit, southwest Madagascar. *Can. Mineral.*, 56, 247-257.