

**Vanadio-oxy-dravite****NaV<sub>3</sub>(Al<sub>4</sub>Mg<sub>2</sub>)Si<sub>6</sub>O<sub>18</sub>(BO<sub>3</sub>)<sub>3</sub>(OH)<sub>3</sub>O**

**Crystal Data:** Hexagonal. *Point Group:* 3m. As terminated prismatic crystals, to 0.3 mm.

**Physical Properties:** *Cleavage:* [Poor/indistinct on {0001}.] *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 7.5 D(meas.) = n.d. D(calc.) = 3.14

**Optical Properties:** Transparent. *Color:* Green. *Streak:* Pale green. *Luster:* Vitreous. *Optical Class:* Uniaxial (−).  $\omega = 1.693(5)$   $\varepsilon = 1.673(5)$  *Pleochroism:* O = yellow-green; E = pale olive green.

**Cell Data:** *Space Group:* R3m.  $a = 16.0273(3)$   $c = 7.2883(3)$  Z = 3

**X-ray Powder Pattern:** Calculated pattern.

2.5958 (100), 2.9928 (67), 4.0041 (66), 4.2606 (52), 3.5221 (47), 2.0573 (43), 6.4467 (37)

<b>Chemistry:</b>	(1)		(1)
SiO <sub>2</sub>	35.34	MgO	9.65
TiO <sub>2</sub>	0.29	CaO	1.24
B <sub>2</sub> O <sub>3</sub>	[10.23]	Na <sub>2</sub> O	2.11
Al <sub>2</sub> O <sub>3</sub>	20.36	K <sub>2</sub> O	0.09
Cr <sub>2</sub> O <sub>3</sub>	1.48	H <sub>2</sub> O	[2.86]
V <sub>2</sub> O <sub>3</sub>	15.97	Total	100.12
Fe <sub>2</sub> O <sub>3</sub>	[0.34]		
FeO	[0.15]		

(1) Pereval marble quarry, Sludyanka, Lake Baikal, Russia; average of 10 electron microprobe analyses supplemented by FTIR spectrometry, B<sub>2</sub>O<sub>3</sub> and Fe<sub>2</sub>O<sub>3</sub>:FeO calculated; corresponds to  $\text{Na}_{0.70}\text{Ca}_{0.23}\square_{0.05}\text{K}_{0.02}\Sigma=1.00\text{Y(V}^{3+})_{1.39}\text{Mg}_{1.16}\text{Al}_{0.35}\text{Fe}^{3+}_{0.04}\text{Ti}^{4+}_{0.04}\text{Fe}^{2+}_{0.02}\Sigma=3.00\text{Z(Al}_{3.74}\text{Mg}_{1.28}\text{V}^{3+}_{0.78}\text{Cr}^{3+}_{0.20}\Sigma=6.00\text{T(Si}_{6.00}\text{O}_{18})^{\text{B}}(\text{BO}_3)_3^{\text{V}}(\text{OH})_3^{\text{W}}[\text{O}_{0.74}(\text{OH})_{0.26}\Sigma=1.00}$ .

**Polymorphism & Series:** Complete solid-solution exists between the species oxy-dravite, vanadio-oxy-dravite, and oxy-vanadium-dravite.

**Mineral Group:** Tourmaline supergroup, alkali group, oxy-subgroup 3.

**Occurrence:** A primary mineral in metaquartzite (granulite facies) in marble.

**Association:** Quartz, Cr-V-bearing tremolite and mica, diopside-kosmochlor-natalyite, Cr-bearing goldmanite, escolaite-karelianite, dravite–oxy-vanadium-dravite, V-bearing titanite and rutile, ilmenite, oxyvanite-berdesinskiite, shreyerite, plagioclase, scapolite, zircon, pyrite.

**Distribution:** From the Pereval marble quarry, Sludyanka, Lake Baikal, Russia.

**Name:** As an oxy-dravite with dominant vanadium in the Y site and V<sup>3+</sup> contents between 5 and 1.5 atoms per formula unit.

**Type Material:** Museum of Mineralogy, Earth Sciences Department, Sapienza University, Rome, Italy (33068).

**References:** (1) Bosi, F., H. Skogby, L. Reznitskii, and U. Hålenius (2014) Vanadio-oxy-dravite, NaV<sub>3</sub>(Al<sub>4</sub>Mg<sub>2</sub>)(Si<sub>6</sub>O<sub>18</sub>)(BO<sub>3</sub>)<sub>3</sub>(OH)<sub>3</sub>O, a new mineral species of the tourmaline supergroup. Amer. Mineral., 99, 218-224.