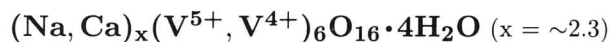


**Grantsite**

**Crystal Data:** Monoclinic. *Point Group:*  $2/m$ . As aggregates of microscopic fibrous or bladed crystals elongated on [010]. Also as botryoidal crusts.

**Physical Properties:** *Tenacity:* Smears easily. *Hardness =* Soft.  $D(\text{meas.}) = 2.94(1)$   
 $D(\text{calc.}) = 2.95$

**Optical Properties:** Translucent. *Color:* Dark olive-green to greenish black; shades of green and brown in transmitted light. *Streak:* Olive-green to brownish green. *Luster:* Silky or pearly to subadamantine.

*Optical Class:* Biaxial (-). *Pleochroism:*  $X =$  green;  $Y =$  greenish brown;  $Z =$  brown.

*Orientation:*  $Z = b$ . *Absorption:*  $Z > Y > X$ .  $\alpha = 1.82(1)$   $\beta = > 2.0$   $\gamma = > 2.0$

$2V(\text{meas.}) = \text{n.d.}$

**Cell Data:** *Space Group:*  $P2_1/m$ .  $a = 12.429$   $b = 3.604$   $c = 17.542$   $\beta = 95.33^\circ$   $Z = [2]$

**X-ray Powder Pattern:** Golden Cycle mine, Colorado, USA.

8.74 (100), 3.606 (28), 12.4 (18), 3.008 (14), 2.869 (12), 2.280 (11), 4.37 (10)

**Chemistry:**

	(1)	(2)
UO <sub>3</sub>	0.3	
V <sub>2</sub> O <sub>5</sub>	65.2	65.6
V <sub>2</sub> O <sub>4</sub>	10.8	9.3
Fe <sub>2</sub> O <sub>3</sub>		0.2
CaO	4.4	2.9
SrO	0.1	< 0.1
Na <sub>2</sub> O	8.3	8.2
K <sub>2</sub> O		< 0.1
H <sub>2</sub> O <sup>+</sup>	10.1	11.4
CO <sub>2</sub>	0.6	
insol.	0.3	1.9
Total	100.1	99.5

(1) F-33 mine, New Mexico, USA; corresponds to Na<sub>1.90</sub>Ca<sub>0.46</sub>Sr<sub>0.01</sub>V<sub>6.02</sub>O<sub>16</sub> • 3.49H<sub>2</sub>O.

(2) Golden Cycle mine, Colorado, USA; corresponds to Na<sub>1.91</sub>Ca<sub>0.38</sub>V<sub>6.03</sub>O<sub>16</sub> • 4.59H<sub>2</sub>O.

**Occurrence:** In partially oxidized portions of sandstone seams and coalified wood in vanadiferous uranium deposits of the Colorado Plateau type.

**Association:** Häggite, paramontroseite, corvusite, rauvite, hewettite, carnotite, tyuyamunite.

**Distribution:** In the USA, from the F-33 mine, Grants district, McKinley Co., New Mexico; the Golden Cycle mine, Atkinson Mesa, Uravan district, and the La Salle mine, Club Mesa, Montrose Co., Colorado; and in the Parco No. 23 mine, about 21 km southeast of Thompson, Grand Co., Utah.

**Name:** For the town of Grants, New Mexico, USA, near which it was first discovered.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 121956.

**References:** (1) Weeks, A.D., M.L. Lindberg, A.H. Truesdell, and R. Meyrowitz (1964) Grantsite, a new hydrated sodium calcium vanadate from New Mexico, Colorado, and Utah. *Amer. Mineral.*, 49, 1511–1526. (2) Evans, H.T., Jr. and J.M. Hughes (1990) Crystal chemistry of the natural vanadium bronzes. *Amer. Mineral.*, 75, 508–521, esp. 513–515.