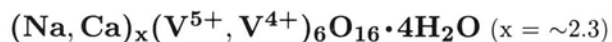


Grantsite

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:* $X = \text{green}$; $Y = \text{greenish brown}$; $Z = \text{brown}$.

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

(1) F-33 mine, New Mexico, USA; corresponds to $\text{Na}_{1.90}\text{Ca}_{0.46}\text{Sr}_{0.01}\text{V}_{6.02}\text{O}_{16} \cdot 3.49\text{H}_2\text{O}$.

(2) Golden Cycle mine, Colorado, USA; corresponds to $\text{Na}_{1.91}\text{Ca}_{0.38}\text{V}_{6.03}\text{O}_{16} \cdot 4.59\text{H}_2\text{O}$.

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.