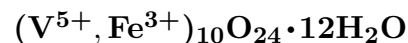


# Navajoite



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**Crystal Data:** Monoclinic, pseudo-orthorhombic. *Point Group:*  $2/m$ . As fibrous cross-vein fillings, to 3 mm; as coatings around pebbles and impregnations of sandstone and shale.

**Physical Properties:** *Tenacity:* Sectile. Hardness = < 2 D(meas.) = 2.56 D(calc.) = 2.53

**Optical Properties:** Semitransparent. *Color:* Dark brown. *Streak:* Brown.

*Luster:* Adamantine to silky.

*Optical Class:* Biaxial (-) (probable). *Pleochroism:*  $X = Y$  = yellowish brown;  $Z$  = dark brown.

*Orientation:*  $Z = b$ .  $\alpha = 1.905(3)$   $\beta = \sim 2.02$   $\gamma = > 2.02$   $2V(\text{meas.}) = \text{n.d.}$

**Cell Data:** *Space Group:*  $C2/m$ .  $a = 34.94(2)$   $b = 3.597(2)$   $c = 11.79(1)$   $\beta = 95.98(6)^\circ$   
 $Z = [2]$

**X-ray Powder Pattern:** Monument No. 2 mine, Arizona, USA; exhibits preferred orientation.

11.79 (100), 3.41 (20), 3.18 (8), 17.38 (7), 5.79 (6), 1.992 (4), 10.54 (3)

## Chemistry:

	(1)
$\text{V}_2\text{O}_5$	71.68
$\text{V}_2\text{O}_4$	3.08
$\text{SiO}_2$	1.20
$\text{Fe}_2\text{O}_3$	3.58
$\text{CaO}$	0.22
$\text{H}_2\text{O}$	20.30
Total	100.06

(1) Monument No. 2 mine, Arizona, USA; corresponds to  $(\text{V}_{9.48}\text{Fe}_{0.52})_{\Sigma=10.00}\text{Ca}_{0.05}\text{O}_{24} \cdot 12\text{H}_2\text{O}$ .

**Occurrence:** In the highly oxidized portion of a Colorado Plateau-type U–V deposit, in a stream channel filled with conglomeratic and silty sandstone; thought to be an oxidation product of corvusite.

**Association:** Corvusite, tyuyamunite, rauvite, hewettite, steigerite, “limonite”.

**Distribution:** In the Monument No. 2 mine, Monument Valley, Apache Co., Arizona, USA.

**Name:** For the Navajo Indians, on whose reservation the mineral was first found.

**Type Material:** Harvard University, Cambridge, Massachusetts, 105102; National Museum of Natural History, Washington, D.C., USA, 106900.

**References:** (1) Weeks, A.D., M.E. Thompson, and A.M. Sherwood (1955) Navajoite, a new vanadium oxide from Arizona. *Amer. Mineral.*, 40, 207–212. (2) Evans, H.T., Jr. and J.M. Hughes (1990) Crystal chemistry of the natural vanadium bronzes. *Amer. Mineral.*, 75, 508–521, esp. 517–519.