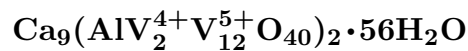


# Sherwoodite



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**Crystal Data:** Tetragonal. *Point Group:*  $4/m\ 2/m\ 2/m$ . As euhedral crystals, showing {110} and {011}, equant or flattened along [001], to 1 mm; in polycrystalline aggregates.

**Physical Properties:** *Fracture:* Subconchoidal to uneven. Hardness =  $\sim 2$  D(meas.) = 2.8(1) D(calc.) = 2.56 H<sub>2</sub>O varies zeolitically.

**Optical Properties:** Semitransparent. *Color:* Dark blue-black, with progressive alteration becoming blue-green and yellow-green. *Streak:* Pale blue. *Luster:* Vitreous to earthy. *Optical Class:* Uniaxial (-). *Pleochroism:* *O* = green to yellow-brown; *E* = blue to deep blue-green.  $\omega = 1.765$   $\epsilon = 1.735\text{--}1.738$

**Cell Data:** *Space Group:*  $I4/amd$ .  $a = 28.06(3)$   $c = 13.56(2)$   $Z = 4$

**X-ray Powder Pattern:** Colorado Plateau, USA.

12.3 (s), 10.0 (s), 9.3 (ms), 2.61 (m), 2.10 (mb), 7.8 (w), 7.1 (w)

## Chemistry:

	(1)	(2)
V <sub>2</sub> O <sub>5</sub>	52.1	52.85
V <sub>2</sub> O <sub>4</sub>	[6.2]	8.03
Al <sub>2</sub> O <sub>3</sub>	2.7	2.47
Fe <sub>2</sub> O <sub>3</sub>	0.8	
MgO	0.5	
CaO	13.7	12.22
H <sub>2</sub> O	24.0	24.43
Total	[100.0]	100.00

(1) Peanut mine, Colorado, USA; total V and V<sub>2</sub>O<sub>4</sub> determined directly, V<sub>2</sub>O<sub>5</sub> by difference, recalculated to 100% after deduction of insoluble 3.8%; corresponds to  $(\text{Ca}_{8.7}\text{Mg}_{0.5})_{\Sigma=9.2}\text{Al}_{2.0}\text{Fe}_{0.4}^{3+}\text{V}_{4.0}^{4+}\text{V}_{23.6}^{5+}\text{O}_{80} \cdot 56\text{H}_2\text{O}$ . (2)  $\text{Ca}_9\text{Al}_2\text{V}_4^{4+}\text{V}_{24}^{5+}\text{O}_{80} \cdot 56\text{H}_2\text{O}$ .

**Occurrence:** An oxidation product of lower valent vanadium minerals, on fracture surfaces and replacing fossil wood in Colorado Plateau-type U–V deposits; likely widely distributed.

**Association:** Selenium, metatyuyamunite, melanovanadite (Colorado Plateau, USA); pascoite, pyrite, copper, gypsum, patrónite, melanovanadite (Minasragra, Peru).

**Distribution:** In the USA, in Colorado, from the Peanut and Jo Dandy mines, Bull Canyon district, Uravan district, Montrose Co., at the Fall Creek mine, Placerville, San Miguel Co., and the Matchless mine, Calamity Mesa, Mesa Co.; on Wilson Mesa, Grand Co., Utah; in the Shadyside mine, east Carrizo Mountains, San Juan Co., New Mexico; and in the Joleo mine, Apache Co., Arizona. From Minasragra, 46 km from Cerro de Pasco, Peru.

**Name:** To honor Alexander M. Sherwood (1888–?), American analytical chemist, U.S. Geological Survey.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 115883, 121951.

**References:** (1) Thompson, M.E., C.H. Roach, and R. Meyrowitz (1958) Sherwoodite, a mixed vanadium(IV)-vanadium(V) mineral from the Colorado Plateau. *Amer. Mineral.*, 43, 749–755.

(2) Evans, H.T., Jr. and J.A. Konnert (1978) The crystal chemistry of sherwoodite, a calcium 14-vanadoaluminate heteropoly complex. *Amer. Mineral.*, 63, 863–868.