

# Montroseite



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**Crystal Data:** Orthorhombic. *Point Group:*  $2/m\ 2/m\ 2/m$ . As microscopic bladed crystals, to 0.5 mm, flattened on {010}, with {110}, and terminated by {0.10.1}(?) and {121}; in very fine-grained aggregates.

**Physical Properties:** *Cleavage:* {010} and {110}, good. *Tenacity:* Brittle. Hardness = Soft.  $D(\text{meas.}) = 4.0$   $D(\text{calc.}) = 4.11$  Rapidly transforms topotactically to paramontroseite in air.

**Optical Properties:** Opaque. *Color:* Black to grayish black. *Streak:* Black.

*Luster:* Submetallic.

*Optical Class:* Biaxial.

$R_1$ – $R_2$ : (400) 16.6–18.7, (420) 15.8–18.0, (440) 15.0–17.3, (460) 14.6–17.0, (480) 14.4–16.8, (500) 14.3–16.6, (520) 14.4–16.7, (540) 14.6–16.8, (560) 14.9–16.9, (580) 15.1–17.1, (600) 15.5–17.4, (620) 15.8–17.8, (640) 16.2–18.2, (660) 16.6–18.7, (680) 17.0–19.2, (700) 17.5–19.8

**Cell Data:** *Space Group:*  $Pbnm$ .  $a = 4.54$   $b = 9.97$   $c = 3.03$   $Z = 4$

**X-ray Powder Pattern:** Unspecified locality, USA.

4.31 (s), 2.644 (s), 3.38 (m), 2.495 (m), 2.217 (m), 1.512 (m), 2.423 (w)

## Chemistry:

	(1)	(2)	(3)
$\text{V}_2\text{O}_4$	72.5	66.90	
$\text{V}_2\text{O}_3$	10.5	11.10	89.27
$\text{SiO}_2$		6.12	
$\text{Al}_2\text{O}_3$		3.00	
FeO	8.8	8.26	
$\text{H}_2\text{O}$	5.0	4.82	10.73
Total	[96.8]	100.20	100.00

(1) Bitter Creek mine, Colorado, USA; partial analysis. (2) Matchless mine, Colorado, USA.

(3) VO(OH).

**Occurrence:** In relatively unoxidized Colorado Plateau-type U–V ores in sandstones; thought to be a primary mineral (Colorado, Utah, and Arizona, USA); in vanadiferous anthraxolite bitumen (Guangxi, China).

**Association:** Paramontroseite, uraninite, corvusite, hewettite, melanovanadite, pascoite, hummerite, pyrite, galena, barite, quartz.

**Distribution:** In the USA, at the Bitter Creek, Jo Dandy, Whitney, and Virgin mines, Uravan district, Montrose Co., and the Matchless mine, Gateway district, Mesa Co., Colorado; in the Juniper mine, near Thompson, Grand Co., the Rex No. 2 mine, Temple Mountain, and Mi Vida mine, Monticello district, Emery Co., Utah. In the Martin, Mesa 4-1/2, and Cove mines, Carrizo Mountains, and the Monument No. 2 mine, Monument Valley, Apache Co., Arizona; in the Grants district, McKinley Co., New Mexico; and in the Runge mine, Edgemont, Fall River Co., South Dakota. At Příbram, and in the Novoveska Huta deposit, Czech Republic. In the Urcal deposit, La Rioja, and in the Huemul mine, Malargüe district, Mendoza Province, Argentina. From the Mounana uranium mine, Franceville, Gabon. In the Shanglin and Hechi bitumens, Guangxi, Zhuang Autonomous Region, China.

**Name:** For Montrose Co., Colorado, USA, where it was first found.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 106897, 106898.

**References:** (1) Weeks, A.D., E.A. Cisney, and A.N. Sherwood (1953) Montroseite, a new vanadium oxide from the Colorado Plateaus. *Amer. Mineral.*, 38, 1235–1241. (2) Evans, H.T., Jr. and S. Block (1953) The crystal structure of montroseite, a new vanadium member of the diasporite group. *Amer. Mineral.*, 38, 1242–1250. (3) Weeks, A.D. and M.E. Thompson (1954) Identification and occurrence of uranium and vanadium minerals from the Colorado Plateaus. *U.S. Geol. Sur. Bull.* 1009-B, 52–53. (4) Evans, H.T., Jr. and M.E. Mrose (1955) A crystal chemical study of montroseite and paramontroseite. *Amer. Mineral.*, 40, 861–875.

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