

**Crystal Data:** Triclinic. *Point Group:*  $\bar{1}$ . As crude blades and lozenge-shaped tablets to ~100  $\mu\text{m}$ , commonly in irregular and bowtie-like intergrowths to ~200  $\mu\text{m}$ . *Twinning:* Ubiquitous, by 180° rotation around the perpendicular to {011} (indicated by single-crystal diffraction data); under crossed polars the twinning appears polysynthetic.

**Physical Properties:** *Cleavage:* Good on {101} and {010}. *Tenacity:* Brittle. *Fracture:* Uneven. Hardness = ~2 D(meas.) = n.d. D(calc.) = 4.403 Weak green-gray fluorescence under 405 nm laser. Slowly soluble in dilute HCl.

**Optical Properties:** Transparent. *Color:* Light yellow. *Streak:* Very pale yellow.

*Luster:* Vitreous.

*Optical Class:* Biaxial.  $\alpha' = 1.615(5)$   $\gamma' = 1.685(5)$

**Cell Data:** *Space Group:*  $P\bar{1}$ .  $a = 5.5635(3)$   $b = 6.1152(4)$   $c = 7.8283(4)$   $\alpha = 85.572(5)^\circ$   $\beta = 89.340(4)^\circ$   $\gamma = 82.468(5)^\circ$   $Z = 1$

**X-ray Powder Pattern:** Burro mine, Slick Rock district, San Miguel Co., Colorado, USA. 4.52 (100), 3.888 (80), 3.180 (51), 6.06 (45), 4.97 (34), 5.52 (33), 2.604 (32)

Chemistry:	(1)	(2)
UO <sub>3</sub>	82.66	81.94
C <sub>2</sub> O <sub>3</sub>	[10.40]	10.32
H <sub>2</sub> O	[7.81]	7.74
Total	100.87	100.00

(1) Burro mine, Slick Rock district, San Miguel Co., Colorado, USA; average electron microprobe and Raman and IR spectroscopic analyses, C<sub>2</sub>O<sub>3</sub> and H<sub>2</sub>O are based on the structure; corresponds to (U<sub>1.00</sub>O<sub>2</sub>)<sub>2</sub>(C<sub>2</sub>O<sub>4</sub>)(OH)<sub>2</sub>(H<sub>2</sub>O)<sub>2</sub>. (2) (UO<sub>2</sub>)<sub>2</sub>(C<sub>2</sub>O<sub>4</sub>)(OH)<sub>2</sub>(H<sub>2</sub>O)<sub>2</sub>.

**Occurrence:** A post-mining secondary phase found in efflorescent crusts on mine walls on asphaltum-quartz matrix in bedded or roll-front U-V deposits in sandstone. Oxalate, C<sub>2</sub>O<sub>4</sub><sup>2-</sup>, likely derived from the asphaltum matrix (probably fossilized wood) and the uranyl, UO<sub>2</sub><sup>2+</sup>, from primary (esp. uraninite) and/or secondary uranium-bearing minerals.

**Association:** Uroxite, abernathyite, gypsum, tyuyamunite, uranopilite.

**Distribution:** From the Burro mine, Slick Rock district, San Miguel Co., Colorado, USA.

**Name:** The prefix *meta* indicates the compositional similarity to *uroxite*, with one less H<sub>2</sub>O group per formula unit. *Uroxite* identifies a uranyl (UR) oxalate (OX).

**Type Material:** Natural History Museum of Los Angeles County, Los Angeles, California, USA (67289 and 67290).

**References:** (1) Kampf, A.R., J. Plášil, B.P. Nash, I. Němec, and J. Marty (2020) Uroxite and metauroxite, the first two uranyl oxalate minerals. *Mineral. Mag.*, 84, 131-141.