

Ammoniomathesiusite

Crystal Data: Tetragonal. *Point Group:* 4/m. As sprays or bow-tie-like intergrowths of prismatic {110} crystals to ~0.3 mm with square cross-sections and flat {001} terminations, sometimes modified by {111}.

Physical Properties: *Cleavage:* Perfect on {110}; good on {001}. *Tenacity:* Brittle. *Fracture:* Stepped. Hardness = 2.5 D(meas.) = n.d. D(calc.) = 3.672
Fluoresces bright yellow-green under a 405 nm laser.

Optical Properties: Transparent. *Color:* Yellow to greenish yellow. *Streak:* Very pale yellow. *Luster:* Vitreous.

Optical Class: Uniaxial (-). $\omega = 1.653(2)$ $\varepsilon = 1.609(2)$ *Pleochroism:* Distinct, *O* = green-yellow, *E* = colorless. *Absorption:* $O > E$.

Cell Data: Space Group: *P4/n*. $a = 14.9405(9)$ $c = 7.1020(5)$ $Z = 2$

X-ray Powder Pattern: Burro mine, San Miguel County, Utah, USA.
6.41 (100), 7.10 (62), 10.57 (46), 3.226 (44), 3.340 (35), 4.71 (27), 3.460 (26)

Chemistry:	(1)	(2)	(3)
(NH ₄) ₂ O	7.35	7.06	7.41
V ₂ O ₅	5.38	5.17	5.17
UO ₃	67.95	65.26	65.10
SO ₃	19.02	18.27	18.22
H ₂ O	[4.42]	4.25	4.10
Total	104.12	100.00	100.00

(1) Burro mine, San Miguel County, Utah, USA; average of 7 electron microprobe analyses supplemented by Raman spectroscopy, H₂O calculated from structure; corresponds to (NH₄)_{4.75}(UO₂)₄(SO₄)₄(VO₅)·4(H_{2.07}O). (2) Do., normalized analysis (1). (3) (NH₄)₅(UO₂)₄(SO₄)₄(VO₅)·4H₂O.

Occurrence: In a U-V roll-front deposit in sandstone; a product of postmining oxidation of a montroseite-corvusite assemblage with pyrite and chalcopyrite. The NH⁴⁺ presumably derived from organic matter.

Association: Ammoniozippeite, gypsum, jarosite, natrozippeite, asphaltum, quartz.

Distribution: From the Burro mine, Slick Rock district, southern end of the Uravan Mineral Belt, Colorado Plateau, San Miguel County, Utah, USA.

Name: The prefix indicates the ammonium analogue of K-dominant *mathesiusite*.

Type Material: The Natural History Museum of Los Angeles County, Los Angeles, California, USA (67248, 67249, 67250 and 69251).

References: (1) Kampf, A.R., J. Plášil, B.P. Nash, and J. Marty (2019) Ammoniomathesiusite, a new uranyl sulfate-vanadate mineral from the Burro mine, San Miguel County, Colorado, USA. *Mineral. Mag.*, 83(1), 115-121. (2) (2021) *Amer. Mineral.*, 106, 157-158 (abs. ref. 1).