Ammoniomathesiusite $(NH_4)_5(UO_2)_4(SO_4)_4(VO_5)\cdot 4H_2O$

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 (-). ω = 1.653(2) ε = 1.609(2) *Pleochroism*: Distinct, *O* = green-yellow, *E* = colorless. *Absorption*: *O* > *E*.

Cell Data: Space Group: *P*4/*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)
$(NH_4)_2O$	7.35	7.06	7.41
V_2O_5	5.38	5.17	5.17
UO_3	67.95	65.26	65.10
SO_3	19.02	18.27	18.22
H_2O	[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, H_2O calculated from structure; corresponds to $(NH_4)_{4.75}(UO_2)_4(SO_4)_4(VO_5)\cdot 4(H_{2.07}O)$. (2) Do., normalized analysis (1).
(3) $(NH_4)_5(UO_2)_4(SO_4)_4(VO_5)\cdot 4H_2O$.

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 NH^{4+} 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).