Pseudomeisserite-(NH_4) $(NH_4)_2Na_4[(UO_2)_2(SO_4)_5]\cdot 4H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As stout prisms, to ~0.3 mm, typically in tightly intergrown aggregates. Crystals elongate along [010] and exhibit {100}, {001}, {110}, and {011}.

Physical Properties: *Cleavage*: Perfect on {100}. *Tenacity*: Brittle. *Fracture*: Curved or conchoidal. Hardness = 2.5 D(meas.) = 3.22(2) D(calc.) = 3.289 Bright lime green fluorescence (405 nm laser). Dissolves easily in H_2O.

Optical Properties: Transparent. *Color*: Light yellow. *Streak*: Very pale yellow. *Luster*: Vitreous. *Optical Class*: Biaxial (-). $\alpha = 1.536(2)$ $\beta = 1.559(2)$ $\gamma = 1.565(2)$ 2V(meas.) = 53(1)° 2V(calc.) = 53.5° *Dispersion*: $r > v$, distinct. *Pleochroism*: X = colorless, Y = light yellow, Z = pale yellow. *Absorption*: $X < Z < Y$. *Orientation*: $Z = b$, $Y \wedge c = 33°$ in obtuse β.

Cell Data: *Space Group: P*$2_1/c$. $a = 13.1010(3)$ $b = 10.0948(2)$ $c = 19.494(1)$ $\beta = 104.285(7)°$ $Z = 4$

X-Ray Diffraction Pattern: Blue Lizard mine, Red Canyon, San Juan Co., Utah, USA.
6.01 (100), 6.83 (84), 12.69 (76), 3.135 (76), 3.959 (67), 4.414 (57), 8.88 (55)

Chemistry:

	(1)	(2)
$(NH_4)_2O$	3.20	4.27
Na_2O	9.90	10.16
K_2O	2.32	
UO_3	47.24	46.87
SO_3	33.58	32.80
H_2O	[5.79]	5.90
Total	101.80	100.00

(1) Blue Lizard mine, Red Canyon, San Juan Co., Utah, USA; average electron microprobe and Raman spectroscopic analyses, H_2O calculated from structure; corresponds to $(NH_4)_{1.49}K_{0.60}Na_{3.87}U_{2.00}S_{5.04}O_{28}H_{7.78}$. (2) $(NH_4)_2Na_4[(UO_2)_2(SO_4)_5]\cdot 4H_2O$.

Occurrence: Secondary, post-mining phase in efflorescent crusts on mine walls by oxidation of primary uraninite, montroseite, and coffinite in sandstones in a humid underground environment.

Association: Belakovskiite, blödite, changoite, ferrinatrite, gypsum, ivsite, metavoltine, tamarugite.

Distribution: At the Blue Lizard mine, Red Canyon, White Canyon District, San Juan Co., Utah, USA.

Name: The prefix recognizes the similarity in appearance to *meisserite* and the suffix as the NH_4-dominant member of a series that probably exists with a hypothetical K-dominant member.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (67621 and 67622).

References: (1) Kampf, A.R., T.A. Olds, J. Plášil, P.C. Burns, and J. Marty (2020) Pseudomeisserite-(NH_4), a new mineral with a novel uranyl-sulfate linkage from the Blue Lizard mine, San Juan County, Utah, USA. Mineral. Mag., 84, 435-443.