Seaborgite $LiNa_6K_2(UO_2)(SO_4)_5(SO_3OH)(H_2O)$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As flattened prisms or blades, to ~0.2 mm, elongated on [100], flattened on {010}, exhibiting {100}, {010}, {001}, and another; in divergent sprays. *Twinning*: Observed optically under crossed polars and is either by reflection on {001} or by rotation around [001].

Physical Properties: *Cleavage*: Good on {100}. *Tenacity*: Brittle. *Fracture*: Curved or conchoidal. Hardness = ~2.5 D(meas.) = 2.97(2) D(calc.) = 3.015 Immediately soluble in H_2O. Bright lime-green fluorescence under a 405 nm laser.

Optical Properties: Transparent. *Color*: Light-yellow. *Streak*: Very pale yellow. *Luster*: Vitreous. *Optical Class*: Biaxial (-). $\alpha = 1.505(2)$ $\beta = 1.522(2)$ $\gamma = 1.536(2)$ 2V(meas.) = 85(1)° 2V(calc.) = 83.6° *Dispersion*: Moderate $r < v$. *Orientation*: $X \wedge a \approx 10°$. *Absorption*: $X < Y \approx Z$. *Pleochroism*: X = colorless, $Y = Z$ = light green-yellow.

Cell Data: *Space Group*: $P\bar{1}$. $a = 5.4511(4)$ $b = 14.4870(12)$ $c = 15.8735(15)$ $\alpha = 76.295(5)°$ $\beta = 81.439(6)°$ $\gamma = 85.511(6)°$ Z = 2

X-ray Powder Pattern: Blue Lizard mine, Red Canyon, San Juan County, Utah, USA. 5.320 (100), 2.954 (98), 14.67 (97), 4.733 (75), 5.093 (67), 3.489 (65), 3.331 (61)

Chemistry:

	(1)	(2)
Li_2O	1.09	1.37
Na_2O	14.83	17.08
K_2O	8.75	8.65
UO_3	26.50	26.28
SO_3	44.27	44.13
H_2O	[2.49]	2.48
Total	97.93	100.00

(1) Blue Lizard mine, Red Canyon, San Juan County, Utah, USA; average electron microprobe analysis; Li, Na, and U by laser ablation-inductively coupled plasma-mass spectrometry, supplemented by Raman spectroscopy, H_2O calculated from structure; corresponds to $Li_{1.00}Na_{5.81}K_{2.19}(UO_2)(SO_4)_5(SO_3OH)(H_2O)$. (2) $LiNa_6K_2(UO_2)(SO_4)_5(SO_3OH)(H_2O)$.

Occurrence: A secondary mineral associated with post-mining oxidation of asphaltum-rich sandstone beds laced with uraninite and sulfides in a damp underground environment.

Association: Gypsum, copiapite, ferrinatrite, ivsite, metavoltine, römerite.

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

Name: Honors American chemist Glenn T. *Seaborg* (1912-1999) who was involved in the synthesis, discovery, and investigation of 10 transuranium elements (including seaborgium), earning him a share of the 1951 Nobel Prize in Chemistry.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (74163).

References: (1) Kampf, A.R., T.A. Olds, J. Plášil, J. Marty, S.N. Perry, L. Corcoran, and P.C. Burns (2021) Seaborgite, $LiNa_6K_2(UO_2)(SO_4)_5(SO_3OH)(H_2O)$, the first uranyl mineral containing lithium. Amer. Mineral., 106, 105-111.