Bobcookite $NaAl(UO_2)_2(SO_4)_4 \cdot 18H_2O$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As prismatic crystals elongated on [$10\bar{1}$] with irregular terminations, to 2 mm.

Physical Properties: *Cleavage*: None. *Fracture*: Conchoidal. *Tenacity*: Brittle. Hardness = ~ 2.5 D(meas.) = n.d. D(calc.) = 2.669 Moderately hygroscopic, easily soluble in H_2O. Fluoresces bright greenish white under UV.

Optical Properties: Transparent. *Color*: Lime-green to greenish yellow. *Streak*: Very pale yellowish green. *Luster*: Vitreous.
Optical Class: Biaxial (–). α = 1.501(1) β = 1.523(1) γ = 1.536(1) 2V(meas.) = 78(1)° 2V(calc.) = 74° *Dispersion*: Moderate, $r < v$. *Absorption*: $X < Y < Z$. *Pleochroism*: X = colorless, Y = very pale yellow-green, Z = pale yellow-green. *Orientation*: Z ^ [$10\bar{1}$] ≈ 10°.

Cell Data: *Space Group*: $P\bar{1}$. a = 7.7912(2) b = 10.5491(3) c = 11.2451(8) α = 68.961(5)° β = 70.909(5)° γ = 87.139(6)° Z = 1

X-ray Powder Pattern: Blue Lizard mine, White Canyon district, San Juan County, Utah, USA. 9.82 (100), 7.14 (99), 5.25 (83), 3.082 (57), 6.33 (55), 3.563 (52), 3.441 (49)

Chemistry:	(1)	(2)
Na_2O	2.29	2.39
Al_2O_3	4.26	3.92
UO_3	44.47	44.07
SO_3	23.96	24.65
H_2O	[24.75]	24.97
Total	99.73	100.00

(1) Blue Lizard mine, White Canyon district, San Juan County, Utah, USA; average of 7 electron microprobe analyses supplemented by Raman spectroscopy, H_2O calculated from stoichiometry; corresponding to $Na_{0.97}Al_{1.09}(U_{1.02}O_2)_2(S_{0.98}O_4)_4(H_2O)_{18}$. (2) $NaAl(UO_2)_2(SO_4)_4 \cdot 18H_2O$.

Occurrence: As efflorescent crusts, on the surfaces of mine walls, derived from the oxidation of primary minerals (uraninite, pyrite, chalcopyrite, bornite and covellite) in a relatively humid underground environment.

Association: Wetherillite, boyleite, chalcanthite, dietrichite, gypsum, hexahydrite, johannite, pickeringite, rozenite.

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

Name: Honors Robert (Bob) B. Cook (b. 1944), Professor Emeritus, Department of Geology and Geography, Auburn University, Auburn, Alabama, USA, recognizing his professional achievements.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (64164) and the A. E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4560/1).

References: (1) Kampf, A.R., J. Plášil, A.V. Kasatkin, and J. Marty (2015) Bobcookite, $NaAl(UO_2)_2(SO_4)_4 \cdot 18H_2O$ and wetherillite, $Na_2Mg(UO_2)_2(SO_4)_4 \cdot 18H_2O$, two new uranyl sulfate minerals from the Blue Lizard mine, San Juan County, Utah, USA. Mineral. Mag., 79(3), 695-714. (2) (2016) Amer. Mineral., 101, 1240-1241 (abs. ref. 1).