

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals elongated on [010] and flattened on $\{10\bar{1}\}$; as divergent sprays and jackstraw aggregates, to 1 mm.

Physical Properties: *Cleavage:* Perfect on $\{10\bar{1}\}$ and fair on $\{010\}$. *Fracture:* Conchoidal to curved. *Tenacity:* Brittle. *Hardness* = ~ 2 *D(meas.)* = n.d. *D(calc.)* = 2.626
Moderately hygroscopic, easily soluble in H_2O .

Optical Properties: Transparent. *Color:* Pale greenish yellow. *Streak:* White. *Luster:* Vitreous. *Optical Class:* Biaxial (+). $\alpha = 1.498(1)$ $\beta = 1.508(1)$ $\gamma = 1.519(1)$ $2V(\text{meas.}) = 88(1)^\circ$ $2V(\text{calc.}) = 87.9^\circ$ *Orientation:* $Z = b$, $X \wedge a = 54^\circ$ in obtuse β . *Dispersion:* $r < v$, distinct. *Absorption:* $X < Y \approx Z$. *Pleochroism:* X = colorless, $Y = Z$ = pale yellow-green.

Cell Data: *Space Group:* $P2_1/c$. $a = 20.367(1)$ $b = 6.8329(1)$ $c = 12.903(3)$ $\beta = 107.879(10)^\circ$ $Z = 2$

X-ray Powder Pattern: Blue Lizard mine, White Canyon district, San Juan County, Utah, USA. 9.74 (100), 4.80 (64), 6.46 (50), 3.510 (50), 6.01 (48), 3.202 (47), 5.41 (40)

Chemistry:	(1)	(2)
Na_2O	4.56	4.70
MgO	1.75	3.06
FeO	0.49	
CuO	0.62	
ZnO	1.43	
UO_3	44.24	43.38
SO_3	23.35	24.28
H_2O	[24.13]	24.59
Total	100.57	100.00

(1) Blue Lizard mine, White Canyon district, San Juan County, Utah, USA; average of 8 electron microprobe analyses supplemented by Raman spectroscopy, H_2O calculated from stoichiometry; corresponding to $\text{Na}_{1.98}(\text{Mg}_{0.58}\text{Zn}_{0.24}\text{Cu}_{0.11}\text{Fe}^{2+}_{0.09})_{\Sigma=1.02}(\text{U}_{1.04}\text{O}_2)_2(\text{S}_{0.98}\text{O}_4)_4(\text{H}_2\text{O})_{18}$.

(2) $\text{Na}_2\text{Mg}(\text{UO}_2)_2(\text{SO}_4)_4 \cdot 18\text{H}_2\text{O}$.

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: Bobcookite, 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 John Wetherill (1866-1944), discoverer of the deposit that was exploited as the Blue Lizard mine, and for George W. Wetherill (1925-2006) for his seminal work on the spontaneous fission of uranium which led to techniques for dating of rocks based on radioactive decay.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (64164, 64172) and the A. E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4574/1).

References: (1) Kampf, A.R., J. Plášil, A.V. Kasatkin, and J. Marty (2015) Bobcookite, $\text{NaAl}(\text{UO}_2)_2(\text{SO}_4)_4 \cdot 18\text{H}_2\text{O}$ and wetherillite, $\text{Na}_2\text{Mg}(\text{UO}_2)_2(\text{SO}_4)_4 \cdot 18\text{H}_2\text{O}$, 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).