Ottohahnite $Na_6(UO_2)_2(SO_4)_5(H_2O)_7 \cdot 1.5H_2O$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As equant crystals to ~0.1 mm, typically with rounded faces and edges.

Physical Properties: *Cleavage*: None. *Tenacity*: Brittle, slightly sectile. *Fracture*: Irregular. Hardness = ~ 2.5 D(meas.) = n.d. D(calc.) = 2.973 Bright bluish green fluorescence under SW & LW UV. Easily soluble in water; slightly deliquescent.

Optical Properties: Transparent. *Color*: Greenish yellow. *Streak*: Pale green-yellow. *Luster*: Vitreous.
Optical Class: Biaxial (–). α = 1.511(1) β = 1.514(1) γ = 1.537(1) 2V(meas.) = 42(2)° 2V(calc.) = 40.2° *Pleochroism*: *X* = light yellowish green, *Y* = colorless, *Z* = yellowish green.
Absorption: *Y* < *X* < *Z*. *Orientation*: *X* ^ *a* = 43°, *Y* ^ *b* = 11°, *Z* ^ *c* = 29°.
Dispersion: *r* > *v*, strong.

Cell Data: *Space Group*: $P\bar{1}$. *a* = 9.97562(19) *b* = 11.6741(2) *c* = 14.2903(10) α = 113.518(8)° β = 104.282(7)° γ = 91.400(6)° Z = 2

X-ray Powder Pattern: Blue Lizard mine, Red Canyon, San Juan County, Utah, USA.
6.21 (100), 2.977 (63), 3.462 (52), 2.913 (42), 6.81 (41), 4.650 (39), 3.156 (35)

Chemistry:	(1)	(2)
Na_2O	13.73	14.18
UO_3	42.68	43.62
SO_3	30.44	30.52
H_2O	[11.55]	11.68
Total	98.40	100.00

(1) Blue Lizard mine, Red Canyon, San Juan County, Utah, USA; average of 12 electron microprobe analyses supplemented by Raman spectroscopy, H_2O calculated from stoichiometry; corresponds to $Na_{5.88}(U_{0.99}O_2)_2(S_{1.01}O_4)_5(H_2O)_{8.5}$. (2) $Na_6(UO_2)_2(SO_4)_5(H_2O)_{8.5}$.

Occurrence: As efflorescent crusts on mine walls, formed by hydration-oxidation weathering of primary uranium minerals (mainly uraninite) by acidic solutions from the decomposition of sulfides.

Association: Tamarugite, blödite, bluelizardite, bobcookite, epsomite, gypsum, hexahydrite, konyaite, plášilite.

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

Name: Honors German chemist Otto Hahn (1879-1968) who discovered nuclear fission (of uranium) in 1938, for which he received the Nobel Prize in Chemistry.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (65610, 65611, 65614 and 65617); A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4782/1).

References: (1) Kampf, A.R., J. Plášil, A.V. Kasatkin, J. Marty, and J. Čejka (2017) Klaprothite, péligotite and ottohahnite, three new minerals with bidentate UO_7-SO_4 linkages from the Blue Lizard mine, San Juan County, Utah, USA. Mineral. Mag., 81(4), 753-779. (2) (2017) Amer. Mineral., 102, 2343-2344 (abs. ref. 1).