

**Crystal Data:** Orthorhombic. *Point Group:* 222. As sprays or bow-ties of thin hexagonal {100} prisms with pyramidal terminations by {101} and {011}, to ~0.3 mm.

**Physical Properties:** *Cleavage:* Good || [001], probably on {100}. *Fracture:* Splintery. *Tenacity:* Brittle. Hardness = 2.5-3 D(meas.) = n.d. D(calc.) = 3.385 Slowly soluble in water.

**Optical Properties:** Transparent. *Color:* Colorless. *Streak:* White. *Luster:* Vitreous. *Optical Class:* Uniaxial (+).  $\omega = 1.565(1)$   $\epsilon = 1.603(1)$

**Cell Data:** *Space Group:* P3<sub>1</sub>21.  $a = 6.890(2)$   $c = 12.767(2)$   $Z = 3$

**X-ray Powder Pattern:** Blue Lizard mine, Red Canyon, San Juan County, Utah, USA. 3.010 (100), 2.826 (95), 1.849 (67), 5.43 (63), 6.01 (59), 3.457 (46), 2.137 (39)

Chemistry:	(1)	(2)
Na <sub>2</sub> O	4.36	9.62
CaO	4.44	
Y <sub>2</sub> O <sub>3</sub>	28.17	35.06
Ce <sub>2</sub> O <sub>3</sub>	0.44	
Pr <sub>2</sub> O <sub>3</sub>	0.12	
Nd <sub>2</sub> O <sub>3</sub>	0.64	
Sm <sub>2</sub> O <sub>3</sub>	0.40	
Eu <sub>2</sub> O <sub>3</sub>	0.24	
Gd <sub>2</sub> O <sub>3</sub>	1.84	
Dy <sub>2</sub> O <sub>3</sub>	5.67	
Ho <sub>2</sub> O <sub>3</sub>	1.10	
Er <sub>2</sub> O <sub>3</sub>	2.79	
Yb <sub>2</sub> O <sub>3</sub>	0.73	
SO <sub>3</sub>	44.41	49.72
H <sub>2</sub> O	[3.50]	5.59
Total	98.95	100.00

(1) Blue Lizard mine, Red Canyon, San Juan County, Utah, USA; average of 7 electron microprobe analyses, H<sub>2</sub>O calculated from structure; corresponds to (Na<sub>0.507</sub>Ca<sub>0.285</sub>Y<sub>0.176</sub>) $\Sigma=0.968$ (Y<sub>0.724</sub>Dy<sub>0.110</sub>Er<sub>0.053</sub>Gd<sub>0.037</sub>Ho<sub>0.021</sub>Yb<sub>0.013</sub>Nd<sub>0.014</sub>Eu<sub>0.005</sub>Sm<sub>0.008</sub>Ce<sub>0.010</sub>Pr<sub>0.003</sub>La<sub>0.002</sub>) $\Sigma=1.000$ (SO<sub>4</sub>)<sub>2</sub>·H<sub>1.401</sub>O.

(2) NaY(SO<sub>4</sub>)<sub>2</sub>·7H<sub>2</sub>O.

**Occurrence:** A secondary phase formed at ambient temperature by evaporative processes at moderately high relative humidity at the surface of a rock with high relative porosity and in an environment that was relatively oxidizing and generally acidic.

**Association:** Gypsum, hexahydrite, johannite, metauranospinite, natrojarosite.

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

**Name:** For the *Chinle* Formation of Upper Triassic age and a suffix for the dominant rare earth element, yttrium.

**Type Material:** Natural History Museum of Los Angeles County, Los Angeles, California, USA (65632, 65633, and 65634).

**References:** (1) Kampf, A.R., B.P. Nash, and J. Marty (2017) Chinleite-(Y), NaY(SO<sub>4</sub>)<sub>2</sub>·H<sub>2</sub>O, a new rare-earth sulfate mineral structurally related to bassanite. *Mineral. Mag.*, 81(4), 909-916. (2) (2017) *Amer. Mineral.*, 102, 2341-2342 (abs. ref. 1).