**Alwilkinsite-(Y)**

\[ \text{Y(H}_2\text{O)}_7[(\text{UO}_2)_3(\text{SO}_4)_2(\text{OH})_3]\cdot7\text{H}_2\text{O} \]

**Crystal Data:** Orthorhombic.  
**Point Group:** 222.  
Acicular crystals display \{102\}, \{12\}, \{301\}, are elongated along [010], and possess domatic terminations, to 0.5 mm.

**Physical Properties:** 
**Cleavage:** Perfect \parallel [010], probably on \{102\}.  
**Fracture:** Splintery.  
**Tenacity:** Slightly flexible; brittle.  
**Hardness:** 2-2.5  
**D(meas.)** = n.d.  
**D(calc.)** = 3.371  
Easily soluble in dilute HCl.  
Fluoresces greenish grey under a 405 nm laser.

**Optical Properties:**  
Transparent.  
**Color:** Yellowish green.  
**Streak:** Pale yellow-green.  
**Luster:** Vitreous.  
**Optical Class:** Biaxial (+).  
\(a = 1.573(1)\)  
\(\beta = 1.581(1)\)  
\(\gamma = 1.601(1)\)  
2V(meas.) = 65.3(1)°  
2V(calc.) = 65.3°  
**Orientation:** \(Y = a, X = c, Z = b\).  
**Dispersion:** Weak, \(r > v\).

**Cell Data:**  
**Space Group:** \(P2_12_12\).  
\(a = 11.6194(5)\)  
\(b = 12.4250(6)\)  
\(c = 19.4495(14)\)  
\(Z = 4\)

**X-ray Powder Pattern:** Blue Lizard mine, Red Canyon, San Juan County, Utah, USA.  
9.88 (100), 3.322 (46), 4.483 (18), 5.621 (17), 3.145 (16), 3.886 (14), 7.47 (13)

**Chemistry:**  
\(\text{CaO} 0.01\)  
\(\text{Y}_2\text{O}_3 5.49\)  
\(\text{Ce}_2\text{O}_3 0.15\)  
\(\text{Nd}_2\text{O}_3 0.38\)  
\(\text{Sm}_2\text{O}_3 0.29\)  
\(\text{Gd}_2\text{O}_3 0.76\)  
\(\text{Dy}_2\text{O}_3 1.11\)  
\(\text{Er}_2\text{O}_3 0.67\)  
\(\text{Yb}_2\text{O}_3 0.37\)  
\(\text{SO}_3 11.97\)  
\(\text{UO}_3 63.25\)  
\(\text{H}_2\text{O} [20.59]\)  
\(\text{Total} 105.04\)

(1) Blue Lizard mine, Red Canyon, San Juan County, Utah, USA; average of 7 electron microprobe analyses supplemented by Raman spectroscopy, \(\text{H}_2\text{O}\) calculated from by stoichiometry; corresponds to \((\text{Y}_{0.66}\text{Dy}_{0.08}\text{Gd}_{0.06}\text{Er}_{0.05}\text{Nd}_{0.03}\text{Yb}_{0.00}\text{Sm}_{0.02}\text{Ce}_{0.01})_{z=0.26}\cdot(\text{H}_2\text{O})\cdot[2(\text{UO}_2)_3(\text{Si}_{0.10}\text{O}_2)_2\text{O(OH)}_3]\cdot7\text{H}_2\text{O}.

(2) \(\text{Y(H}_2\text{O)}_7[(\text{UO}_2)_3(\text{SO}_4)_2(\text{OH})_3]\cdot7\text{H}_2\text{O}\).

**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:** Calcite, dickite, gypsum, johannite, natrozippeite, zinczippeite.

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

**Name:** Honors Alan (Al) J. Wilkins, MD (b. 1955), of Coto de Caza, California, for discovering the mineral.

**Type Material:** Natural History Museum of Los Angeles County, Los Angeles, California, USA (65629).

**References:**  
Alwilkinsite-(Y), a new rare-earth uranyl sulfate mineral from the Blue Lizard mine, San Juan County, Utah, USA. Mineral. Mag., 81(4), 895-907.  
(2) (2017) Amer. Mineral., 102, 2341 (abs. ref. 1).