Weeksite  

\[ \text{K}_2(\text{UO}_2)_2(\text{Si}_5\text{O}_{13}) \cdot 4\text{H}_2\text{O} \]

**Crystal Data:** Monoclinic.  
*Point Group: 2/m.* As bladed or acicular crystals, flattened on \{010\} and elongated along [001], and as flat plates; also as spherulites and radiating fibrous clusters.

**Twinning:** By two-fold rotation around [401].

**Physical Properties:**  
*Cleavage:* Two good prismatic cleavages noted.  
*Hardness:* \(< 2\)  
*D(meas.) = \(\sim 4.1\)  
*D(calc.) = 3.80*  
*Radioactive.*

**Optical Properties:**  
*Color:* Yellow.  
*Luster:* Waxy to silky.  
*Optical Class:* Biaxial (-).  
\(\alpha = 1.596\)  
\(\beta = 1.603\)  
\(\gamma = 1.606\)  
*2V(meas.) = \(\sim 60^\circ\)  
*2V(calc.) = 66°*  
*Pleochroism:*  
\(X = \) colorless,  
\(Y = \) pale yellow-green,  
\(Z = \) yellow-green.  
*Dispersion:* \(r > v\), strong.  
*Orientation:*  
\(X = b, Y = c, Z = a.\)

**Cell Data:**  
*Space Group: C2/m.*  
*a = 14.26(2)*  
*b = 35.88(10)*  
*c = 14.20(2)*  
*\(\beta = 111.578(3)^\circ\)*  
*\(Z = 4\)*

**X-ray Powder Pattern:** Thomas Range, Utah, USA.  
7.11 (10), 5.57 (9), 8.98 (8), 3.55 (7), 3.30 (7), 2.91 (6), 3.20 (5)

**Chemistry:**  
\[ \begin{array}{ccc} 
\text{Na}_2\text{O} & 0.53 & \text{Al}_2\text{O}_3 & 0.6 \\
\text{K}_2\text{O} & 4.73 & \text{SiO}_2 & 29.44 \\
\text{CaO} & 0.67 & \text{UO}_2 & 55.78 \\
\text{BaO} & 3.11 & \text{H}_2\text{O} & [7.02] \\
\text{MgO} & 0.18 & \text{Total} & 101.28 \\
\text{SrO} & 0.20 & & \\
\end{array} \]

(1) Anderson mine, Arizona, USA; average of 8 electron microprobe analyses, supplemented by TGA, \(\text{H}_2\text{O}\) calculated from structure, corresponds to \((\text{K}_{1.031}\text{Na}_{0.176}\text{Ca}_{0.123}\text{Ba}_{0.208})\Sigma=1.537(\text{UO}_2)_2\cdot 0.002(\text{Si}_{5.03} \text{O}_{13}) \cdot 4\text{H}_2\text{O}.\)

**Occurrence:** In “opal” veinlets in rhyolite, agglomerates, sandstones and limestones.

**Association:** “Opal,” “chalcedony,” calcite, gypsum, fluorite, uraninite, thorogummite, uranophane, boltwoodite, carnottite, margaritasite.

**Distribution:** In the USA, in Utah, at the Autunite No. 8 and Good Will claims, Thomas Range, Juab Co.; in California, from the Coso Mountains, Inyo Co., and in the Red Rock district, Lassen Co.; in New Mexico, from the Jackpile mine, Laguna, Valencia Co.; in Wyoming, in the Silver Cliff mine, near Lusk, Niobrara Co.; and in Nevada, at Teels Marsh, Mineral Co. From the Mammoth mine, near Presidio, Presidio Co.; and from the Williams quarry, Easton, Northampton Co., Pennsylvania, USA. At the Margaritas and other mines, Sierra Peña Blanca, Chihuahua, Mexico. In France, from Les Bois-Noirs, Loire. From Rössing, Namibia.

**Name:** Honors Dr. Mary Alice Dowse Weeks (1909-1988), mineralogist with the U.S. Geological Survey, noted specialist in the mineralogy of uranium and vanadium.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 128713, 115886, 121949.

**References:**  
(3) Fejfarova, K., J. Plášil, H. Yang, J. Čejka, M. Dušek, R.T. Downs, M.C. Barkley, and R. Škoda (2012) Revision of the crystal structure and chemical formula of weeksite, \(\text{K}_2(\text{UO}_2)_2(\text{Si}_5\text{O}_{13}) \cdot 4\text{H}_2\text{O}.\) Amer. Mineral., 97, 750-754.  