

## Swinefordite



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**Crystal Data:** Monoclinic. *Point Group:* n.d. Resembles petroleum jelly when hydrated; on dehydration, becomes fibrous, in thin ribbons, folded and twisted, and in curled sheets.

**Physical Properties:** *Tenacity:* Tough; greasy when hydrated. Hardness = ~1  
D(meas.) = n.d. D(calc.) = n.d. Positive identification of minerals in the smectite group may need data from DTA curves, dehydration curves, and X-ray powder patterns before and after treatment by heating and with organic liquids.

**Optical Properties:** Translucent. *Color:* Greenish yellow to light olive when hydrated; light greenish gray to grayish olive after dehydration. *Streak:* White. *Luster:* Glistening when hydrated; dull when partially dehydrated.

*Optical Class:* Biaxial (-). *Pleochroism:* Y = almost colorless; Z = pale yellow-brown.  
*Orientation:* X  $\simeq$  c; Y = a.  $\alpha = [1.492]$   $\beta = 1.524(2)$   $\gamma = 1.526(2)$  2V(meas.) = 29°–45°  
2V(calc.) = 37°

**Cell Data:** *Space Group:* C2/m. a = 5.2 b = 9.0 c = 13.0  $\beta$  = n.d. Z = n.d.

**X-ray Powder Pattern:** Kings Mountain, North Carolina, USA; partly hydrated. (ICDD 29-809).

12.96 (vvs), 4.53 (vs), 1.508 (vs), 3.09 (s), 2.62 (m), 1.713 (m), 1.304 (m)

### Chemistry:

	(1)
SiO <sub>2</sub>	54.1
Al <sub>2</sub> O <sub>3</sub>	13.1
Fe <sub>2</sub> O <sub>3</sub>	1.9
MgO	6.8
CaO	0.8
Li <sub>2</sub> O	4.7
Na <sub>2</sub> O	0.63
H <sub>2</sub> O	15.6
F	1.49
-O = F <sub>2</sub>	[0.63]
Total	[98.49]

(1) Kings Mountain, North Carolina, USA; original total given as 99.12%, corresponding to  $(\text{Li}_{0.38}\text{Na}_{0.08}\text{Ca}_{0.06}\text{Mg}_{0.02})_{\Sigma=0.54}(\text{Li}_{0.93}\text{Al}_{0.80}\text{Mg}_{0.68}\text{Fe}_{0.10}^{3+})_{\Sigma=2.51}(\text{Si}_{3.74}\text{Al}_{0.26})_{\Sigma=4.00}\text{O}_{10}[(\text{OH})_{1.68}\text{F}_{0.32}]_{\Sigma=2.00} \cdot 2\text{H}_2\text{O}$ .

**Mineral Group:** Smectite group.

**Occurrence:** Deposited from ground water, as coatings on the walls of fracture zones and fissures, or replacing spodumene, in a Li-Sn-rich pegmatite.

**Association:** Spodumene, switzerite, vivianite, quartz, albite, apatite.

**Distribution:** From the Foote mine, Kings Mountain, Cleveland Co., North Carolina, USA.

**Name:** For Dr. Ada Swineford (1917–1993), clay mineralogist and Professor of Geology at Western Washington State College, Bellingham, Washington, USA.

**Type Material:** National School of Mines, Paris, France; Department of Geology, East Carolina University, Greenville, North Carolina; University of Delaware, Newark, Delaware; Harvard University, Cambridge, Massachusetts, 125477; National Museum of Natural History, Washington, D.C., USA, 126826, 131848, 144722.

**References:** (1) Tien, P.-L., P.B. Leavens, and J.A. Nelen (1975) Swinefordite, a dioctahedral-trioctahedral Li-rich member of the smectite group from Kings Mountain, North Carolina. *Amer. Mineral.*, 60, 540–547.

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