

Soddyite

$(\text{UO}_2)_2\text{SiO}_4 \cdot 2\text{H}_2\text{O}$

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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As crystals of pyramidal to platy habit, to 3 mm. As subparallel to divergent crystal clusters; in cross-fiber veinlets; also massive to earthy.

Physical Properties: *Cleavage:* Perfect on {001}, good on {111}. *Hardness* = 3.5
D(meas.) = 4.63–4.70 D(calc.) = [5.09] Radioactive.

Optical Properties: Translucent to transparent. *Color:* Amber to yellow or greenish yellow. *Streak:* Pale yellow. *Luster:* Vitreous to adamantine, dull when earthy. *Optical Class:* Biaxial (-). *Pleochroism:* X = colorless; Y = very pale yellow; Z = pale yellow-green. *Orientation:* X = c; Y = b; Z = a. *Dispersion:* $r > v$, negligible to strong. $\alpha = 1.650\text{--}1.654$ $\beta = 1.680\text{--}1.685$ $\gamma = 1.699\text{--}1.715$ $2V(\text{meas.}) = 70^\circ\text{--}84^\circ$

Cell Data: *Space Group:* $Fddd$. $a = 8.32$ $b = 11.21$ $c = 18.71$ $Z = [8]$

X-ray Powder Pattern: Ruggles mine, New Hampshire, USA.
3.32 (100), 4.48 (90), 6.14 (80), 2.69 (70), 2.47 (60), 1.855 (50), 2.09 (40)

Chemistry:	(1)	(2)
SiO ₂	7.61	8.99
UO ₃	85.79	85.62
H ₂ O	6.16	5.39
Total	99.56	100.00

(1) Kasolo, Congo. (2) $(\text{UO}_2)_2\text{SiO}_4 \cdot 2\text{H}_2\text{O}$.

Occurrence: A secondary mineral formed by oxidation of uraninite.

Association: Kasolite, sklodowskite, uranophane, torbernite, curite.

Distribution: From Kasolo, Swambo, and in the Musonoi mine, Kolwezi, Katanga Province, Congo (Shaba Province, Zaire). At the Norrabees pegmatite, Namaqualand, Cape Province, South Africa. In the Krunkelbachtal mine, near Menzenschwand, Black Forest, Germany. In the USA, in the Ruggles pegmatite, Grafton, Grafton Co., New Hampshire; at the Steel City mine, Yavapai Co., Arizona; from the Jackpile mine, Laguna, Valencia Co., New Mexico; in the Lucky Mc mine, Fremont Co., Wyoming; from the Honeycomb Hills, Juab Co., Utah; and at the Lookout No. 22 claim, Marshall Pass, Saguache Co., Colorado. On Mt. Painter, Flinders Ranges, South Australia, and from South Alligator Valley, Northern Territory, Australia.

Name: For Frederick Soddy (1877–1956), British radiochemist.

Type Material: Natural History Museum, Paris, France, 122.122/3

References: (1) Schoep, A. (1922) La soddite [soddyite], nouveau minéral radioactif. *Compt. Rendus Acad. Sci. Paris*, 174, 1066–1067 (in French). (2) (1922) *Amer. Mineral.*, 7, 179–180 (abs. ref. 1). (3) Gorman, D.H. (1952) Studies of radioactive compounds: V - soddyite. *Amer. Mineral.*, 37, 386–396. (4) Stohl, F.V. and D.K. Smith (1981) The crystal chemistry of the uranyl silicate minerals. *Amer. Mineral.*, 66, 610–625.