Petalite $LiAlSi_4O_{10}$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals tabular on {010}, or elongated ‖ [100], to 2 m; some faces may be striated. Commonly foliated cleavable, massive. *Twinning:* Common on {001}, lamellar.

Physical Properties: *Cleavage:* Perfect on {001}, poor on {201}; (001) ∧ (201) = 38.5°. *Fracture:* Imperfectly conchoidal. *Tenacity:* Brittle. Hardness = 6.5 D(meas.) = 2.412–2.422 D(calc.) = [2.40] Thermoluminescent.

Optical Properties: Transparent to translucent. *Color:* Colorless, white, gray, rarely reddish or greenish; colorless in thin section. *Streak:* White. *Luster:* Vitreous, pearly on {001}. *Optical Class:* Biaxial (+). *Orientation:* $Z = b$; $X \wedge a = -2°$ to $-8°$. *Dispersion:* $r > v$, weak, crossed. $\alpha = 1.504$–1.507 $\beta = 1.510$–1.513 $\gamma = 1.516$–1.523 2V(meas.) = 82°–84°

Cell Data: *Space Group:* $P2/a$. $a = 11.737$ $b = 5.171$ $c = 7.630$ $\beta = 112.54°$ Z = 2

X-ray Powder Pattern: Harare, Zimbabwe (Salisbury, Rhodesia) (?). (ICDD 14-90). 3.731 (100), 3.672 (34) 3.649 (24), 3.510 (16), 1.934 (7), 2.570 (6), 2.071 (5)

Chemistry:

	(1)
SiO_2	77.80
Al_2O_3	16.41
Fe_2O_3	0.008
MgO	0.038
CaO	0.018
Li_2O	4.45
Na_2O	0.048
K_2O	0.076
H_2O^-	0.08
LOI	0.43
Total	99.358

(1) Rubicon pegmatite, Namibia; Si and Al by XRF, other elements by AA, loss on ignition taken as H_2O^+; corresponds to $Li_{0.92}Al_{0.99}Si_{3.99}O_{10}$.

Occurrence: In granite pegmatites, locally constituting an ore of lithium.

Association: Spodumene, pollucite, lepidolite, tourmaline, topaz, albite, microcline, quartz.

Distribution: On the Island of Utö, and in the Varuträsk pegmatite, 15 km northwest of Skellefteå, Västerbotten, Sweden. Around San Piero in Campo, Elba, Italy. From Hirvikallio, Tammela, and Pajula, Finland. From the Rubicon pegmatite, south of Karibib, Namibia. At Bikita, Zimbabwe. In the USA, at Peru, Oxford Co., Maine; from Bolton, Worcester Co., Massachusetts; in California, on Queen and Hiriart Mountains, Pala, and in the Clark vein at Rincon, San Diego Co. In the Tanco pegmatite, Bernic Lake, Manitoba, Canada. In Brazil, from Minas Gerais, in the Maxixe, Lavra Velha, and Lavra do Genipapo pegmatites, near Araçuaí, and in the Taquaral mine, Itinga. In the Londonderry quarry, Coolgardie, Western Australia. At Nagatareyama, Fukuoka Prefecture, Japan. Additional minor localities are known.

Name: From the Greek for *leaf*, in allusion to its perfect basal cleavage.

Type Material: Mining Academy, Freiberg, Germany, 26512.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 311–312. (2) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 4, framework silicates, 271–275. (3) Tagai, T., H. Ried, W. Joswig, and M. Korekawa (1982) Kristallgraphische Untersuchungen eines Petalits mittels Neutronenbeugung und Transmission-elektronenmikroskopie. Zeits. Krist., 160, 159–170 (in German with English abs.). (4) Černý, P. and D. London (1983) Crystal chemistry and stablity of petalite. Tschermaks Mineral. Petrog. Mitt., 31, 81–96.