Kaliophilite $KAlSiO_4$

Crystal Data: Hexagonal. *Point Group:* 622. In bundles of slender acicular to threadlike crystals.

Physical Properties: *Cleavage:* {0001}, perfect. *Tenacity:* Brittle. Hardness = 6
D(meas.) = 2.493–2.649 D(calc.) = [2.65]

Optical Properties: Transparent. *Color:* Colorless. *Luster:* Silky, brilliant.
Optical Class: Uniaxial (–). $\omega = 1.536$ $\epsilon = 1.531$

Cell Data: *Space Group:* $P6_322$. $a = 26.930$ $c = 8.522$ Z = 54

X-ray Powder Pattern: Vesuvius, Italy.
3.09 (100), 2.593 (30), 2.131 (25), 4.26 (15), 3.76 (12), 3.02 (12), 2.814 (12D)

Chemistry:

	(1)	(2)	(3)
SiO_2	39.2	38.87	37.99
TiO_2		0.00	
Al_2O_3	33.36	31.89	32.23
FeO		0.07	
MnO		0.00	
CaO	0.47	0.05	
Na_2O	2.88	0.77	
K_2O	24.13	28.76	29.78
Total	100.04	100.41	100.00

(1) Monte Somma, Italy. (2) Do.; by electron microprobe. (3) $KAlSiO_4$.

Polymorphism & Series: Polymorphous with kalsilite, panunzite, and trikalsilite.

Occurrence: In blocks of biotite-pyroxenite volcanic ejecta.

Association: Biotite, pyroxene, augite, melilite, calcite (Monte Somma, Italy); clinopyroxene, garnet, leucite, haüyne, latiumite (Albano, Italy).

Distribution: In Italy, from Monte Somma and Vesuvius, Campania; at Albano and Marino, Colle Cimino, near Rome, Lazio.

Name: From the Greek for potassium, *kalium*, and for *friend*, recognizing potassium's presence.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 427.
(2) Bannister, M.A. (1931) A chemical, optical, and X-ray study of nepheline and kaliophilite. Mineral. Mag., 22, 569–608. (3) Smith, J.V. and O.F. Tuttle (1957) The nepheline–kalsilite system: I. X-ray data for the crystalline phases. Amer. J. Sci., 255, 282–305. (4) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 4, framework silicates, 231–270. (5) Abbott, R.N., Jr. (1984) $KAlSiO_4$ stuffed derivatives of tridymite: phase relationships. Amer. Mineral., 69, 449–457.