Leifite $\mathbf{Na_2(Si,Al,Be)_7(O,OH,F)_{14}}$

Crystal Data: Hexagonal. *Point Group:* $3m$. Crystals hexagonal prisms, acicular and deeply striated, to 3 cm. In radiating fibrous masses and spherical aggregates.

Physical Properties: *Cleavage:* Distinct on $\{10\bar{1}0\}$. *Fracture:* Uneven to splintery. *Tenacity:* Brittle. Hardness = 6 D(meas.) = 2.57 D(calc.) = 2.59

Optical Properties: Transparent to translucent. *Color:* Colorless. *Luster:* Silky. *Optical Class:* Uniaxial (+). $\omega = 1.511$–1.518 $\epsilon = 1.519$–1.522

Cell Data: *Space Group:* $P3m1$. $a = 14.352(2)$ $c = 4.852(3)$ $Z = 3$

X-ray Powder Pattern: Narssârssuk, Greenland. (ICDD 18-710).
3.13 (100), 3.34 (70), 2.45 (70), 4.67 (60), 2.21 (60), 2.38 (50), 4.11 (40)

Chemistry:

	(1)	(2)
SiO_2	67.55	58.68
TiO_2		trace
Al_2O_3	12.69	16.40
Fe_2O_3		0.06
MnO	0.41	
ZnO		3.26
BeO		2.58
MgO		0.78
Na_2O	15.47	9.18
K_2O		1.55
F	4.93	
H_2O^+	0.77	5.00
H_2O^-		2.50
$-O = F_2$	2.08	
Total	99.74	99.99

(1) Narssârssuk, Greenland. (2) Mt. Karnasurt, Russia; apparently contaminated with zincian montmorillonite.

Occurrence: In pegmatite (Narssârssuk, Greenland); in a differentiated alkalic massif (Lovozero massif, Russia); associated with an intrusive alkalic gabbro-syenite complex (Mont Saint-Hilaire, Canada).

Association: Microcline, aegirine, zinnwaldite, calcite (Narssârssuk, Greenland); albite, natrolite (Lovozero massif, Russia); rhodochrosite, sérandite (Mont Saint-Hilaire, Canada).

Distribution: From Narssârssuk, Greenland. On Mt. Karnasurt, Lovozero massif, and in the Kukisvumchorr apatite deposit, Khibiny massif, Kola Peninsula, Russia. From Mont Saint-Hilaire and near Saint-Amable, Quebec, Canada.

Name: For Leif Ericson, Norse adventurer and discoverer of Greenland in 982.

Type Material: University of Copenhagen, Copenhagen, Denmark, 1915–1918; National Museum of Natural History, Washington, D.C., USA, 136173.

References: (1) Bøggild, O.B. (1915) Leifit, et nyt mineral fra Narsarsuk. Medd. Grønland, 51, 427–433 (in Danish). (2) Vlasov, K.A., Ed. (1966) Mineralogy of rare elements, v. II, 141–143. (3) Micheelsen, H. and O.V. Petersen (1971) Leifite, revised, and karpinskyite, discredited. Proc. IMA, 7th Gen. Meet., Tokyo, 1970 [Mineral. Soc. Japan Spec. Paper 1, 264–265] (abs.). (4) (1972) Amer. Mineral., 57, 1006 (abs. ref. 3). (5) Coda, A., L. Ungaretti, and A. Della Giusta (1974) The crystal structure of leifite, $Na_6[Si_{16}Al_2(BeOH)_2O_{39}]\cdot 1.5H_2O$. Acta Cryst., 30, 396–401. (6) Mandarino, J.A. and V. Anderson (1989) Monteregian Treasures. Cambridge Univ. Press, 123.