

Crystal Data: Hexagonal. *Point Group:* 32. Equant trigonal crystals, to 2 mm, showing two prisms, {11 $\bar{2}$ 0} and {2 $\bar{1}$ 10}, and right and left rhombohedra, {10 $\bar{1}$ 2} and {01 $\bar{1}$ 2}.

Physical Properties: *Fracture:* Conchoidal. Hardness = 4 D(meas.) = 2.68(2)
D(calc.) = 2.74

Optical Properties: Semitransparent. *Color:* Pale blue or pale beige, white when altered.
Luster: Vitreous to pearly, dull if altered.
Optical Class: Uniaxial (-). $\omega = 1.622(1)$ $\epsilon = 1.619(1)$

Cell Data: *Space Group:* R32. $a = 20.870(4)$ $c = 16.002(4)$ $Z = [24]$

X-ray Powder Pattern: Liberty Bell Mountain, Washington, USA.
5.231 (100), 3.013 (30), 3.137 (20), 5.993 (12), 2.607 (9), 2.900 (7), 3.197 (6)

Chemistry:	(1)	(2)	(3)
SiO ₂	38.81	41.16	43.58
TiO ₂	0.09	0.04	
ZrO ₂	31.64	33.58	29.79
Al ₂ O ₃	2.61	0.05	
FeO	0.03	0.12	
CuO	0.19	0.42	
CaO	11.25	11.62	13.56
Na ₂ O	0.20	0.13	
H ₂ O	[15.18]	[12.88]	13.07
Total	[100.00]	[100.00]	100.00

(1–2) Liberty Bell Mountain, Washington, USA; by electron microprobe, H₂O by difference.

(3) CaZrSi₃O₉•3H₂O. (4) Near Saint-Amable, Canada; by electron microprobe, corresponds to (Ca_{0.99}K_{0.01})_{Σ=1.00}(Zr_{0.96}Ti_{0.02}Mn_{0.01})_{Σ=0.99}(Si_{3.00}Al_{0.01})_{Σ=3.01}O_{8.98}.

Occurrence: In miarolitic cavities in a peralkalic alaskitic border granite of a batholith (Liberty Bell Mountain, Washington, USA); in miarolitic cavities in a nepheline syenite sill (near Saint-Amable, Canada).

Association: Microcline, quartz, albite, fluorite, chlorite, bastnäsite, zircon, malachite (Liberty Bell Mountain, Washington, USA); nenadkevichite, rhodochrosite, polyolithionite, fluorite, aegirine, astrophyllite, eudialyte, microcline, mangan-neptunite, pyrite (near Saint-Amable, Canada).

Distribution: In Washington Pass, on Liberty Bell Mountain, Okanogan Co., Washington, USA. From near Saint-Amable, Quebec, Canada.

Name: For the *calcium* content and relation to *hilairite*.

Type Material: National Museum of Natural History, Washington, D.C., USA, 161901, 162182.

References: (1) Boggs, R.C. (1988) Calciohilairite, CaZrSi₃O₉•3H₂O, the calcium analogue of hilairite from the Golden Horn batholith, northern Cascades, Washington. *Amer. Mineral.*, 73, 1191–1194. (2) Horváth, L., E. Pfenninger-Horváth, R.A. Gault, and P. Tarasoff (1998) Mineralogy of the Saint-Amable Sill, Varennes and Saint-Amable, Québec. *Mineral. Record*, 29, 83–118, esp. 95.