

Lokkaite-(Y)**CaY₄(CO₃)₇•9H₂O**

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Crystal Data: Orthorhombic. *Point Group:* 2/*m* 2/*m* 2/*m* or *mm*2. Fibrous crystal bundles, to 0.5 mm, in isolated radial aggregates, and in powdery incrustations.

Physical Properties: *Tenacity:* Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = [2.92]

Optical Properties: Semitransparent. *Color:* White, may be discolored to pale yellow. *Optical Class:* Biaxial (-). *Orientation:* Z = c; positive elongation. $\alpha = 1.569$ $\beta = 1.592$ $\gamma = 1.620$ 2V(meas.) = n.d.

Cell Data: *Space Group:* *Pbmm*, *Pb2m*, or *Pbm*2. *a* = 39.07–39.35 *b* = 6.079–6.104 *c* = 9.19–9.26 *Z* = 8

X-ray Powder Pattern: Pyörönmaa pegmatite, Finland.
3.808 (100), 4.594 (75), 3.902 (60), 6.509 (55), 9.77 (50), 5.792 (45), 2.931 (40)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
CO ₂	32.4	28.09	31.51	Ho ₂ O ₃	trace	1.12	
Y ₂ O ₃	29.0	20.64	46.18	Er ₂ O ₃	4.0	2.35	
La ₂ O ₃	0.2	0.33		Tm ₂ O ₃	0.9	0.28	
Ce ₂ O ₃	0.7	0.43		Yb ₂ O ₃	2.2	0.80	
Pr ₂ O ₃	0.3	0.61		Lu ₂ O ₃	trace	0.10	
Nd ₂ O ₃	1.3	7.13		Fe ₂ O ₃	0.4		
Sm ₂ O ₃	1.8	3.84		CaO	3.2	5.25	5.73
Eu ₂ O ₃		1.72		H ₂ O ⁺	1.6		
Gd ₂ O ₃	4.6	7.47		H ₂ O ⁻	5.4		
Tb ₂ O ₃	1.2	1.22		H ₂ O		14.13	16.58
Dy ₂ O ₃	6.8	6.02		Total	96.0	101.53	100.00

(1) Pyörönmaa pegmatite, Finland; by electron microprobe, CO₂ and H₂O by “conventional procedures,” corresponds to Ca_{0.23}RE_{3.85}(C_{1.05}O₃)₇•3.85H₂O. (2) Kirigo, Japan; by ICP, corresponds to Ca_{1.03}(Y_{2.00}Gd_{0.45}Nd_{0.40}Dy_{0.35}Sm_{0.24}Er_{0.14}Eu_{0.11}Tb_{0.07}Ho_{0.06}Yb_{0.04}Pr_{0.04}Ce_{0.03}Tm_{0.02}La_{0.02}Lu_{0.01})_{Σ=3.98}(CO₃)_{7.00}•8.60H₂O. (3) CaY₄(CO₃)₇•9H₂O.

Occurrence: A secondary mineral formed by alteration of primary rare-earth minerals.

Association: Tengerite-(Y) (Pyörönmaa pegmatite, Finland); lanthanite, kimuraite-(Y) (Kirigo, Japan).

Distribution: From the Pyörönmaa pegmatite, Kangasala, Finland. At Ytterby, on Resarö Island, near Vaxholm, and in the Åskagen pegmatite quarry, Värmland, Sweden. In Japan, from Kirigo and Yokatake, Higashi Matsuura district, Saga Prefecture, and at Lisaka, Date district, Fukushima Prefecture. In the Evans-Lou quarry, near Hull, Quebec, Canada.

Name: To honor Professor Lauri Lokka (1885–1966), Finnish mineralogist and Chief Chemist, Geological Survey of Finland, Helsinki, Finland.

Type Material: n.d.

References: (1) Perttunen, V. (1970) Lokkaite, a new hydrous RE-carbonate from Pyörönmaa pegmatite in Kangasala, SW-Finland. Bull. Geol. Soc. Finland, 43(1), 67–72. (2) (1971) Amer. Mineral., 56, 1838 (abs. ref. 1). (3) Nagashima, K., R. Miyawaki, J. Takase, I. Nakai, K. Sakurai, S. Matsubara, A. Kato, and S. Iwano (1986) Kimuraite, CaY(CO₃)₄•6H₂O, a new mineral from fissures in an alkali olivine basalt from Saga Prefecture, Japan, and new data on lokkaite. Amer. Mineral., 71, 1028–1033.

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