

Fukalite**Ca₄Si₂O₆(CO₃)(OH, F)₂**

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Crystal Data: Orthorhombic. *Point Group:* $mm2$ or $2/m\ 2/m\ 2/m$. As flaky crystals, to 0.2 mm.

Physical Properties: Hardness = ~ 4 $D(\text{meas.}) = 2.770(5)$ $D(\text{calc.}) = 2.77$

Optical Properties: Translucent. *Color:* White to pale brown; colorless in transmitted light. *Optical Class:* Biaxial. $\alpha = 1.59(5)$ $\beta = 1.60(6)$ $\gamma = 1.62(9)$ $2V(\text{meas.}) = \sim 90^\circ$

Cell Data: *Space Group:* $Bm2_1b$, $B2mb$, or $Bmmb$. $a = 5.48(1)$ $b = 3.78(1)$
 $c = 23.42(3)$ $Z = 2$

X-ray Powder Pattern: Fuka, Japan.

2.854 (100), 3.084 (90), 2.926 (65), 2.338 (30), 1.756 (30b), 5.86 (25), 3.904 (20)

Chemistry:	(1)	(2)	(1)	(2)	
SiO ₂	29.09	28.98	K ₂ O	0.01	0.02
TiO ₂	0.00	0.00	F	0.32	0.43
Al ₂ O ₃	0.55	0.27	H ₂ O ⁺	4.45	4.26
Fe ₂ O ₃	0.10	0.14	H ₂ O ⁻	0.23	0.39
MnO	0.00	0.00	CO ₂	10.32	10.22
MgO	0.14	0.02	P ₂ O ₅	0.01	0.07
CaO	54.40	54.81	-O = F ₂	0.13	0.18
Na ₂ O	0.17	0.05	<hr/>		
			Total	99.66	[99.48]

(1) Fuka, Japan; corresponding to $(\text{Ca}_{3.97}\text{Na}_{0.02}\text{Mg}_{0.01}\text{Fe}_{0.01})_{\Sigma=4.01}(\text{Si}_{1.98}\text{Al}_{0.04})_{\Sigma=2.02}\text{O}_{6.03}(\text{CO}_3)_{0.96}[(\text{OH})_{2.02}\text{F}_{0.07}]_{\Sigma=2.09}$. (2) Mihara, Japan; original total given as 99.38%, corresponding to $(\text{Ca}_{4.03}\text{Fe}_{0.01}\text{Na}_{0.01})_{\Sigma=4.05}(\text{Si}_{1.99}\text{Al}_{0.02})_{\Sigma=2.01}\text{O}_{6.08}(\text{CO}_3)_{0.96}[(\text{OH})_{1.95}\text{F}_{0.09}]_{\Sigma=2.04}$.

Occurrence: A retrograde mineral and alteration product in skarns formed from metasomatism of limestone.

Association: Cuspidine, xonotlite, calcite, spurrite, hillebrandite, scawtite, foshagite, wollastonite, fluorite, gehlenite, perovskite, grossular, hydrogrossular, vesuvianite, monticellite.

Distribution: In Japan, at Fuka, near Bicchu, and Mihara, Okayama Prefecture, and at Kushiro, Hiroshima Prefecture.

Name: For the locality where it was first discovered, Fuka, Japan.

Type Material: Department of Earth Sciences, Okayama University, Okayama, ONM-02; National Science Museum, Tokyo, Japan; National Museum of Natural History, Washington, D.C., USA, 136583.

References: (1) Henmi, C., I. Kusachi, A. Kawahara, and K. Henmi (1977) Fukalite, a new calcium carbonate silicate hydrate mineral. *Mineral. J. (Japan)*, 8, 374–381. (2) (1978) *Amer. Mineral.*, 63, 793 (abs. ref. 1).