

Bicchulite

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Crystal Data: Cubic. *Point Group:* $\bar{4}3m$. As an extremely fine powder.**Physical Properties:** Hardness = n.d. D(meas.) = n.d. D(calc.) = 2.813 (synthetic).**Optical Properties:** Semitransparent. *Color:* White or gray; colorless in thin section.*Luster:* Powdery, earthy.*Optical Class:* Isotropic. $n = 1.625$ **Cell Data:** *Space Group:* $I\bar{4}3m$. $a = 8.82\text{--}8.83$ $Z = 4$ **X-ray Powder Pattern:** Fuka, Japan.

2.786 (100), 2.753 (95), 3.60 (90), 2.597 (50), 1.559 (50), 3.04 (40), 2.96 (40)

Chemistry:

	(1)	(2)	(3)
SiO ₂	28.51	23.77	20.56
TiO ₂	0.09	0.92	
Al ₂ O ₃	21.79	23.59	34.89
Fe ₂ O ₃	2.66	6.72	
FeO	0.25	0.20	
MnO	0.03	0.02	
MgO	2.72	2.00	
CaO	35.26	36.89	38.38
Na ₂ O	0.25	0.14	
K ₂ O	0.18	0.11	
H ₂ O ⁺	8.03	4.79	6.17
H ₂ O ⁻	0.43	0.40	
P ₂ O ₅	0.02	0.02	
Total	100.22	99.57	100.00

(1) Fuka, Japan; mixed with vesuvianite. (2) Do.; contaminated by small amounts of gehlenite, vesuvianite, and hydrogrossular. (3) Ca₂Al₂SiO₆(OH)₂.**Polymorphism & Series:** Dimorphous with kamaishilite.**Occurrence:** In skarns in limestones, formed through alteration of gehlenite subjected to later retrograde hydration reactions.**Association:** Vesuvianite, hydrogrossular, gehlenite, melilite, calcite.**Distribution:** From Fuka, near Bicchu, Okayama Prefecture, and in the Akagané mine, Iwate Prefecture, Japan. At Carneal, Co. Antrim, Ireland.**Name:** For Bicchu, the town encompassing the Japanese type locality.**Type Material:** Department of Earth Sciences, Okayama University, Okayama, Japan, ONM-01; Institute of Geological Sciences, London, England.**References:** (1) Henmi, C., I. Kusachi, K. Henmi, P.A. Sabine, and B.R. Young (1973) A new mineral bicchulite, the natural analogue of gehlenite hydrate, from Fuka, Okayama Prefecture, Japan, and Carneal, County Antrim, Northern Ireland. *Mineral. J. (Japan)*, 7, 243–251. (2) (1974) *Amer. Mineral.*, 59, 1330 (abs. ref. 1). (3) Sahl, K. and N.D. Chatterjee (1977) The crystal structure of bicchulite, Ca₂[Al₂SiO₆](OH)₂. *Zeits. Krist.*, 146, 35–41. (4) Gupta, A.K. and N.D. Chatterjee (1978) Synthesis, composition, thermal stability, and thermodynamic properties of bicchulite, Ca₂[Al₂SiO₆](OH)₂. *Amer. Mineral.*, 63, 58–65. (5) Sahl, K. (1980) Refinement of the crystal structure of bicchulite, Ca₂[Al₂SiO₆](OH)₂. *Zeits. Krist.*, 152, 13–21.

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