Henmilite $Ca_2CuB_2(OH)_{12}$

Crystal Data: Triclinic. *Point Group:* $\overline{1}$. Prismatic pinacoidal crystals exhibit {100}, {010}, {101}, {102}, {110}, {$0\overline{1}1$}, {$\overline{1}\overline{4}2$}, to 3 mm; massive.

Physical Properties: *Tenacity:* "Fragile". Hardness = < 2.5 D(meas.) = 2.51 D(calc.) = 2.523

Optical Properties: Transparent. *Color:* Blue-violet. *Streak:* Pale violet to nearly white. *Luster:* Vitreous.
Optical Class: Biaxial (–). *Pleochroism:* Strong; X = pale pink; Y = pale purple; Z = very pale blue. *Orientation:* Inclined extinction. $\alpha = 1.585(2)$ $\beta = [1.608]$ $\gamma = 1.615(2)$ 2V(meas.) = ∼58°

Cell Data: *Space Group:* $P\overline{1}$. $a = 5.7617(5)$ $b = 7.9774(6)$ $c = 5.6488(4)$ $\alpha = 109.611(6)°$ $\beta = 91.473(7)°$ $\gamma = 83.686(7)°$ Z = 1

X-ray Powder Pattern: Fuka, Japan.
5.25 (vs), 4.35 (s), 3.709 (s), 3.302 (s), 2.494 (sb), 2.427 (sb), 2.346 (s)

Chemistry:

	(1)	(2)
B_2O_3	19.49	18.85
CuO	21.56	21.53
CaO	29.24	30.36
H_2O	29.57	29.26
Total	99.86	100.00

(1) Fuka, Japan; corresponds to $Ca_{1.91}Cu_{0.99}B_{2.05}(OH)_{12}$. (3) $Ca_2CuB_2(OH)_{12}$.

Occurrence: Very rare, in cavities in borate veins in contact-metasomatized limestone.

Association: Pentahydroborite, tenorite, sillenite, bultfonteinite, cuspidine, thaumasite, brucite, calcite.

Distribution: From Fuka, near Bicchu, Okayama Prefecture, Japan.

Name: Honors Professor Kitinosuke Henmi (1919–1997), and his daughter Dr. Chiyoko Henmi (1949–), Department of Earth Science, Okayama University, Okayama, Japan, in recognition of their mineralogical work on the skarn deposit at Fuka, Japan.

Type Material: National Science Museum, Tokyo, Japan, M-24641; National Museum of Natural History, Washington, D.C., USA, 165482.

References: (1) Nakai, I., H. Okada, K. Masutomi, E. Koyama, and K. Nagashima (1986) Henmilite, $Ca_2Cu(OH)_4[B(OH)_4]_2$, a new mineral from Fuka, Okayama Prefecture, Japan. Part I. Occurrence and description. Part II. Crystal structure. Amer. Mineral., 71, 1234–1239. (2) Kusachi, I. (1992) New data on mineralogical properties of henmilite. J. Mineral. Soc. Japan, 21, 127–130 (in Japanese with English abs.).