Chiyokoite $Ca_3Si(CO_3)[B(OH)_4]O(OH)_5 \cdot 12H_2O$

Crystal Data: Hexagonal. *Point Group*: 6. Forms $\{10\bar{1}0\}$, $\{000\bar{1}\}$ and $\{0001\}$ bound hexagonal tabular to prismatic crystals to 30 μm. Aggregates form friable nests to 1 cm across.

Physical Properties: Cleavage: Good on $\{10\bar{1}0\}$ and $\{0001\}$. *Tenacity*: Brittle. *Fracture*: Stepped. Hardness = n.d. D(meas.) = 1.85(1) D(calc.) = 1.85 Nonfluorescent.

Optical Properties: Translucent. *Color*: Pink to colorless. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Uniaxial (-). ω = 1.523(2) ε = 1.492(3) Non-pleochroic.

Cell Data: *Space Group*: $P6_3$. a = 11.0119(5) c = 10.5252(6) Z = 2

X-ray Powder Pattern: Fuka mine, Fuka, Bicchu-cho, Takahashi City, Okayama Prefecture, Japan. 9.53 (100), 5.50 (24), 3.812 (23), 2.521 (19), 3.412 (15), 2.726 (14), 2.172 (13)

Chemistry:

	(1)
CaO	27.56
B_2O_3	3.47
Al_2O_3	3.05
Fe_2O_3	0.12
As_2O_3	4.77
MnO_2	0.32
SiO_2	6.55
SO_3	0.76
H_2O	46.3
CO_2	7.30
Total	100.2

(1) Fuka mine, Fuka, Bicchu-cho, Takahashi City, Okayama Prefecture, Japan; average electron microprobe and FTIR spectroscopic analyses, H_2O and CO_2 by CHN-analyzer, B by ICP-OES; corresponding to $H_{31.37}Ca_3(Si_{0.67}Al_{0.37}Mn^{4+}_{0.02}Fe^{3+}_{0.01})_{\Sigma=1.07}(C_{1.01}B_{0.61}As^{3+}_{0.29}S_{0.06})_{\Sigma=1.97}O_{24.19}$.

Mineral Group: Ettringite group.

Occurrence: A low-temperature mineral in hydrothermally altered, boron-bearing, low-Fe, calc-silicate skarn.

Association: Calcite, henmilite, tacharanite.

Distribution: From the Fuka mine, Fuka, Bicchu-cho, Takahashi City, Okayama Prefecture, Japan.

Name: Honors Professor *Chiyoko* Henmi (1949-2018), Department of Earth Science, Okayama University, Japan, for his contributions to the mineralogy of skarn minerals from the Fuka mine, including the discovery of several new minerals.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (5412/1) and the Canadian Museum of Nature, Ottawa, Ontario, Canada (CMNMC 87294).

References: (1) Lykova, I., N.V. Chukanov, I.V. Pekov, V.O. Yapaskurt, L.A. Pautov, V.Y. Karpenko, D.I. Belakovskiy, D.A. Varlamov, S.N. Britvin, and K.S. Scheidl (2020) Chiyokoite, $Ca_3Si(CO_3)[B(OH)_4]O(OH)_5 \cdot 12H_2O$, a new ettringite-group mineral from the Fuka mine, Okayama Prefecture, Japan. Can. Mineral., 58, 653-663. (2) Miyawaki, R., F. Hatert, M. Pasero, and S.J. Mills (2021) IMA Commission on New Minerals, Nomenclature and Classification (CNMNC) - Newsletter 59. Eur. J. Mineral., 59, 143 [formula].