Hingganite-(Ce) $(Ce, Y)BeSiO_4(OH)$

Crystal Data: Monoclinic. Point Group: 2/*m*. As rims on prismatic crystals of hingannite-(Y).

Physical Properties: Hardness = 5-6 D(meas.) = n.d. D(calc.) = [4.82]
Cleavage: None detected.

Optical Properties: Transparent. *Color:* Pale tan. *Streak*: White.
Luster: Vitreous. Nonfluorescent.
Optical Class: Biaxial (+). $\alpha = 1.745(5)$ $\gamma = 1.770(5)$ $2V > 75°$

Cell Data: Space Group: $P2_1/a$ [by analogy to hingganite-(Y)]. $a = 9.8973(1)$ $b = 7.6282(8)$ $c = 4.7505(6)$ $\beta = 90.416(8)°$ $Z = 2$

X-ray Powder Pattern: Iwaguro Sekizai quarry, Japan.
2.85 (100), 3.13 (86), 2.56 (46), 6.06 (42), 3.74 (37), 3.44 (34), 2.21 (33)

Chemistry:

	(1)	(2)	(3)
SiO_2	22.27	25.47	23.27
B_2O_3	trace		
Y_2O_3	10.91	0.72	
La_2O_3	3.40	11.11	
Ce_2O_3	16.77	28.32	63.56
RE_2O_3	30.73	7.33	
FeO	5.65	3.61	
BeO	[9.27]	[10.60]	9.69
CaO	0.39	7.07	
H_2O	[1.90]	[2.88]	3.49
Total	[101.29]	97.10	100.00

(1) Iwaguro Sekizai quarry, Japan; by electron microprobe, BeO calculated so Be:Si = 1:1; $RE_2O_3 = Nd_2O_3$ 9.79%, Pr_2O_3 [3.5%], Sm_2O_3 4.70%, Eu_2O_3 trace, Gd_2O_3 4.18%, Tb_2O_3 [0.5%], Dy_2O_3 3.82%, Ho_2O_3 1.08%, Er_2O_3 1.84%, Tm_2O_3 trace, Yb_2O_3 1.02%, Lu_2O_3 [0.3%]; corresponds to $(Ce_{0.54}Y_{0.51}RE_{1.07})_{\sum=2.12}Fe_{0.41}Be_{1.96}Si_{1.96}O_{8.87}(OH)_{1.13}$. (2) Iwaguro Sekizai quarry, Japan; by electron microprobe, Be and B confirmed by SIMS; $RE_2O_3 = Pr_2O_3$ 2.11, Nd_2O_3 4.70, Sm_2O_3 0.39, Gd_2O_3 0.08, Tb_2O_3 trace, Dy_2O_3 0.05, Ho_2O_3 trace, Er_2O_3 trace, Tm_2O_3 trace, Yb_2O_3 trace, Lu_2O_3 trace; corresponds to $(Ce_{0.82}La_{0.32}Nd_{0.13}Pr_{0.06}Y_{0.03}Sm_{0.01}Gd_{0.002}Dy_{0.001}Ca_{0.60})_{\sum=1.15}S_{1.97}Fe_{0.24}Be_{2.02}(SiO_4)_{2.02}(OH)_{1.52}$. (3) $CeBeSiO_4(OH)$.

Mineral Group: Gadolinite group.

Occurrence: In drusy pegmatite.

Association: Quartz, potassium feldspar, albite, zinnwaldite, cassiterite, stokesite, fluorite, chlorite, titanite,

Distribution: In the Iwaguro Sekizai quarry, Tahara, Gifu Prefecture, Japan.

Name: For the predominance of cerium and relation to *hingganite-(Y).*

Type Material: National Science Museum, Tokyo, Japan (NSM-M28552).

References: (1) Miyawaki, R., I. Nakai, K. Nagashima, A. Okamoto, and T. Isobe (1987) The first occurrences of hingganite, hellandite and wodginite in Japan. Kobutsugaku Zasshi, 18(1), 17-30 (in Japanese). (2) (1990) Amer. Mineral., 75, 432 (abs. ref. 1). (3) Miyawaki, R., S. Matsubara, K. Yokoyama, and A. Okamoto (2007) Hingannite-(Ce) and hingannite-(Y) from Tahara, Hirukawa-mura, Gifu Prefecture, Japan: The description on a new mineral species of the Ce-analogue of hingannite-(Y) with a refinement of the crystal structure of hingannite-(Y). J. Mineral. Petrol. Sciences, 102, 1–7. (4) (2008) Amer. Mineral., 93, 1688 (abs. ref. 3).