

**Hingganite-(Ce)****(Ce, Y)BeSiO<sub>4</sub>(OH)**

**Crystal Data:** Monoclinic. Point Group:  $2/m$ . As rims on prismatic crystals of hingganite-(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 (+).  $a = 1.745(5)$   $\gamma = 1.770(5)$   $2V > 75^\circ$

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

**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 <sub>2</sub>	22.27	25.47	23.27
B <sub>2</sub> O <sub>3</sub>	trace		
Y <sub>2</sub> O <sub>3</sub>	10.91	0.72	
La <sub>2</sub> O <sub>3</sub>	3.40	11.11	
Ce <sub>2</sub> O <sub>3</sub>	16.77	28.32	63.56
RE <sub>2</sub> O <sub>3</sub>	30.73	7.33	
FeO	5.65	3.61	
BeO	[9.27]	[10.60]	9.69
CaO	0.39	7.07	
H <sub>2</sub> O	[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<sub>2</sub>O<sub>3</sub> = Nd<sub>2</sub>O<sub>3</sub> 9.79%, Pr<sub>2</sub>O<sub>3</sub> [3.5%], Sm<sub>2</sub>O<sub>3</sub> 4.70%, Eu<sub>2</sub>O<sub>3</sub> trace, Gd<sub>2</sub>O<sub>3</sub> 4.18%, Tb<sub>2</sub>O<sub>3</sub> [0.5%], Dy<sub>2</sub>O<sub>3</sub> 3.82%, Ho<sub>2</sub>O<sub>3</sub> 1.08%, Er<sub>2</sub>O<sub>3</sub> 1.84%, Tm<sub>2</sub>O<sub>3</sub> trace, Yb<sub>2</sub>O<sub>3</sub> 1.02%, Lu<sub>2</sub>O<sub>3</sub> [0.3%]; corresponds to (Ce<sub>0.54</sub>Y<sub>0.51</sub>RE<sub>1.07</sub>) $\Sigma=2.12$ Fe<sub>0.41</sub>Be<sub>1.96</sub>Si<sub>1.96</sub>O<sub>8.87</sub>(OH)<sub>1.13</sub>. (2) Iwaguro Sekizai quarry, Japan; by electron microprobe, Be and B confirmed by SIMS; RE<sub>2</sub>O<sub>3</sub> = Pr<sub>2</sub>O<sub>3</sub> 2.11, Nd<sub>2</sub>O<sub>3</sub> 4.70, Sm<sub>2</sub>O<sub>3</sub> 0.39, Gd<sub>2</sub>O<sub>3</sub> 0.08, Tb<sub>2</sub>O<sub>3</sub> trace, Dy<sub>2</sub>O<sub>3</sub> 0.05, Ho<sub>2</sub>O<sub>3</sub> trace, Er<sub>2</sub>O<sub>3</sub> trace, Tm<sub>2</sub>O<sub>3</sub> trace, Yb<sub>2</sub>O<sub>3</sub> trace, Lu<sub>2</sub>O<sub>3</sub> trace; corresponds to (Ce<sub>0.82</sub>La<sub>0.32</sub>Nd<sub>0.13</sub>Pr<sub>0.06</sub>Y<sub>0.03</sub>Sm<sub>0.01</sub>Gd<sub>0.002</sub>Dy<sub>0.001</sub>Ca<sub>0.60</sub>) $\Sigma=1.15$ S<sub>1.97</sub>Fe<sub>0.24</sub>Be<sub>2.02</sub>(SiO<sub>4</sub>)<sub>2.02</sub>(OH)<sub>1.52</sub>. (3) CeBeSiO<sub>4</sub>(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) Hingganite-(Ce) and hingganite-(Y) from Tahara, Hirukawa-mura, Gifu Prefecture, Japan: The description on a new mineral species of the Ce-analogue of hingganite-(Y) with a refinement of the crystal structure of hingganite-(Y). *J. Mineral. Petrol. Sciences*, 102, 1-7. (4) (2008) *Amer. Mineral.*, 93, 1688 (abs. ref. 3).