

**Britholite-(Y)****(Y, Ca)<sub>5</sub>(SiO<sub>4</sub>, PO<sub>4</sub>)<sub>3</sub>(OH, F)**

©2001 Mineral Data Publishing, version 1.2

**Crystal Data:** Hexagonal. *Point Group:* 6/*m*. As short prismatic hexagonal crystals, to 1.3 cm; more commonly massive.

**Physical Properties:** *Cleavage:* Imperfect on {0001}, {10 $\bar{1}$ 0}. *Fracture:* Uneven to splintery. Hardness = 6 D(meas.) = 4.35 D(calc.) = [4.44]

**Optical Properties:** Translucent to transparent. *Color:* Dark reddish brown; in thin section, yellowish brown. *Streak:* Faint brown. *Luster:* Resinous to dull.

*Optical Class:* Uniaxial (+).  $\omega = 1.728\text{--}1.750$   $\epsilon = 1.730\text{--}1.752$

**Cell Data:** *Space Group:*  $P6_3/m$ .  $a = 9.43$   $c = 6.81$   $Z = 2$

**X-ray Powder Pattern:** Suishoyama pegmatite, Japan.

2.813 (100), 2.753 (90), 2.727 (80), 3.13 (50), 3.09 (50), 3.39 (30), 1.885 (30)

| <b>Chemistry:</b>              | (1)   | (2)   |                               | (1)     | (2)   |
|--------------------------------|-------|-------|-------------------------------|---------|-------|
| SiO <sub>2</sub>               | 22.70 | 21.80 | MgO                           | 0.10    | 0.07  |
| TiO <sub>2</sub>               |       | 0.04  | PbO                           |         | 0.13  |
| UO <sub>2</sub>                |       | 0.23  | CaO                           | 9.58    | 13.31 |
| ThO <sub>2</sub>               | 0.51  | 1.55  | Na <sub>2</sub> O             |         | 0.20  |
| Al <sub>2</sub> O <sub>3</sub> | 0.75  | 0.72  | K <sub>2</sub> O              |         | 0.06  |
| Y <sub>2</sub> O <sub>3</sub>  | 46.91 | 37.47 | F                             | 0.50    | 1.48  |
| $\Sigma\text{Ce}_2\text{O}_3$  | 4.47  | 6.02  | H <sub>2</sub> O <sup>+</sup> | 0.68    |       |
| $\Sigma\text{La}_2\text{O}_3$  | 5.76  | 10.92 | H <sub>2</sub> O <sup>−</sup> | 0.15    |       |
| Fe <sub>2</sub> O <sub>3</sub> | 1.44  | 0.69  | H <sub>2</sub> O              |         | 1.35  |
| Nb <sub>2</sub> O <sub>5</sub> |       | 0.06  | CO <sub>2</sub>               | 0.10    |       |
| FeO                            | 0.79  | 0.50  | P <sub>2</sub> O <sub>5</sub> | 1.73    | 2.98  |
| MnO                            | 3.67  | 0.66  | −O = F <sub>2</sub>           | 0.21    | 0.62  |
|                                |       |       | Total                         | [99.63] | 99.62 |

(1) Suishoyama pegmatite, Japan; original total given as 99.58%. (2) “European Russia.”

**Occurrence:** In pegmatites.

**Association:** Yttrialite, thorogummite, tenerite, allanite.

**Distribution:** In the Suishoyama pegmatite, near Iisaka, Fukushima Prefecture, and from Shinden, Gifu Prefecture, Japan. From an undefined locality given only as “European Russia.”

**Name:** For its chemical relation to *britholite-(Ce)* and dominant *yttrium* in its composition.

**Type Material:** n.d.

**References:** (1) Hata, S. (1938) Abukumalite [britholite-(Y)], a new mineral from pegmatites of Iisaka, Fukushima prefecture. Sci. Pap. Inst. Phys. Chem. Res., Tokyo, 34, 1018–1023. (2) Omori, K. and S. Hasegawa (1953) Yttrialite and abukumalite [britholite-(Y)] from pegmatite of Suishoyama, Iisaka village, Fukushima, Japan. J. Japan. Assoc. Mineral. Petrol. Econ. Geol., 37, 21–29. (3) Ito, J. (1968) Silicate apatites and oxyapatites. Amer. Mineral., 53, 890–907. (4) (1970) Introduction to Japanese minerals. Geol. Sur. of Japan, 62–63.