**Foitite**

\[
\text{Na}_x[\text{Fe}^{2+}_2 \text{(Al, Fe}^{3+}_3)]\text{Al}_6(\text{BO}_3)_3\text{Si}_6\text{O}_{18}(\text{OH})_4
\]

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**Crystal Data:** Hexagonal.  **Point Group:** 3m.  Crystals prismatic, elongated and striated || [0001], with triangular cross section, to 5.5 cm.

**Physical Properties:**  **Fracture:** Irregular.  **Tenacity:** Brittle.  **Hardness:** \(\sim 7\)
\[
D(\text{meas.}) = 3.17 \quad D(\text{calc.}) = 3.14
\]

**Optical Properties:** Translucent in thin fragments. **Color:** Bluish black. **Streak:** Grayish white. **Luster:** Vitreous. **Optical Class:** Uniaxial (−). **Pleochroism:** Strong; \(O = \) pale lavender; \(E = \) dark blue.
\[
\omega = 1.664(1) \quad \epsilon = 1.642(1)
\]

**Cell Data:**  **Space Group:** R3m.  \(a = 15.967(2) \quad c = 7.126(1) \quad Z = 3\)

**X-ray Powder Pattern:** “Southern California,” USA.

| 2.573 (100), 3.452 (91), 6.338 (84), 2.944 (71), 4.212 (48), 3.989 (38), 2.038 (29) |

**Chemistry:**

\[
\begin{array}{lcc}
\text{SiO}_2 & 35.90 \\
\text{B}_2\text{O}_3 & [10.37] \\
\text{Al}_2\text{O}_3 & 34.90 \\
\text{FeO} & 11.45 \\
\text{MnO} & 1.71 \\
\text{MgO} & 0.21 \\
\text{CaO} & 0.03 \\
\text{Li}_2\text{O} & [0.31] \\
\text{Na}_2\text{O} & 0.75 \\
\text{H}_2\text{O} & [3.56] \\
\text{Total} & [99.19]
\end{array}
\]

(1) “Southern California,” USA; by electron microprobe, average of 10 analyses; Ti, Cu, K, F not detected, \(\text{B}_2\text{O}_3\), \(\text{Li}_2\text{O}\), and \(\text{H}_2\text{O}\) from stoichiometry to fill their respective sites; corresponds to \(\text{Na}_{0.25}(\text{Fe}_{1.60}\text{Al}_{0.89})\text{Mn}_{0.24}\text{Li}_{0.22}\text{Mg}_{0.05}\Sigma=3.00\text{Al}_{6.00}(\text{BO}_3)_3\text{Si}_{6.01}\text{O}_{18}(\text{OH})_4\).

**Mineral Group:** Tourmaline group.

**Occurrence:** Probably in granite pegmatites.

**Association:** The original specimens are loose crystals without matrix.

**Distribution:** Found as museum specimens designated only as “southern California,” USA. [White Queen mine, Pala district, San Diego Co., California, USA.] At the Kazionnitsa mine, Alabashka, Ural Mountains, Russia.

**Name:** To honor Franklin F. Foit, Jr. (1942–), of Washington State University, Pullman, Washington, USA, for his work on tourmaline group minerals.

**Type Material:** Canadian Museum of Nature, Ottawa, Canada, 81512.

**References:** (1) MacDonald, D.J., F.C. Hawthorne, and J.D. Grice (1993) Foitite, \([\text{Fe}^{2+}_2(\text{Al, Fe}^{3+}_3)]\text{Al}_6(\text{BO}_3)_3\text{Si}_6\text{O}_{18}(\text{OH})_4\); a new alkali-deficient tourmaline: description and crystal structure. Amer. Mineral., 78, 1299–1303.