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

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Crystal Data:  Hexagonal.  \textit{Point Group}: 3\textit{m}.  Crystals prismatic, elongated and striated \( \parallel [0001] \), with triangular cross section, to 5.5 cm

Physical Properties:  \textit{Fracture}: Irregular.  \textit{Tenacity}: Brittle.  Hardness = \(~7 \\
D(\text{meas.}) = 3.17  \quad D(\text{calc.}) = 3.14

Optical Properties:  Translucent in thin fragments.  \textit{Color}: Bluish black.  \textit{Streak}: Grayish white.  \textit{Luster}: Vitreous.  \textit{Optical Class}: Uniaxial (\(-\)).  \textit{Pleochroism}: Strong; \( O = \) pale lavender; \( E = \) dark blue.  \( \omega = 1.664(1) \quad e = 1.642(1) \)

Cell Data:  \textit{Space Group}: R\textit{3m}.  \( a = 15.967(2) \quad c = 7.126(1) \quad Z = 3 \)

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:

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

(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 \( \text{Na}_{0.25}[\text{Fe}_{1.60}\text{Al}_{0.89}\text{Mn}_{0.48}\text{Li}_{0.22}\text{Mg}_{0.05}/\Sigma_{=3.06}\text{Al}_{6.00}(\text{BO}_3)_3\text{Si}_{6.01}\text{O}_{18}(\text{OH})_4 \).

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 from “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, \( \text{Na}_{x}[\text{Fe}^{2+}_2(\text{Al}, \text{Fe}^{3+}_3)]\text{Al}_6(\text{BO}_3)_3\text{Si}_6\text{O}_{18}(\text{OH})_4 \), a new alkali-deficient tourmaline: description and crystal structure.  Amer. Mineral., 78, 1299–1303.