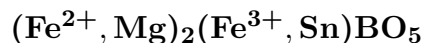


Hulsite



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Crystal Data: Monoclinic. *Point Group:* $2/m$. As rough rectangular tabular crystals, showing {100}, {010}, {001}, {110}, to 1 cm; in aggregates of parallel prismatic individuals. *Twinning:* Simple twins by 120° rotation.

Physical Properties: *Cleavage:* On {110}, good. Hardness = ~ 3 D(meas.) = 4.28–4.57 D(calc.) = 4.62

Optical Properties: Opaque. *Color:* Black with greenish, brownish, or reddish tinge. *Streak:* Black. *Luster:* Submetallic to vitreous. *Optical Class:* [Biaxial.] $\alpha = \text{n.d.}$ $\beta = \text{n.d.}$ $\gamma = \text{n.d.}$ $2V(\text{meas.}) = \text{n.d.}$

Cell Data: *Space Group:* $P2_1/m$. $a = 10.695(4)$ $b = 3.102(1)$ $c = 5.431(1)$
 $\beta = 94.21(3)^\circ$ $Z = 2$

X-ray Powder Pattern: Brooks Mountain, Alaska, USA.
2.664 (100), 5.35 (70), 2.585 (70), 2.039 (50), 4.99 (35), 2.491 (35), 2.370 (20)

Chemistry:	(1)
B ₂ O ₃	12.98
TiO ₂	0.30
SnO ₂	12.03
Al ₂ O ₃	1.27
Fe ₂ O ₃	20.02
FeO	42.21
MnO	0.74
MgO	10.45
Total	100.00

(1) Brooks Mountain, Alaska, USA; corresponds to $(\text{Fe}_{1.43}^{2+}\text{Mg}_{0.63}\text{Mn}_{0.03})_{\Sigma=2.09}(\text{Fe}_{0.61}^{3+}\text{Sn}_{0.19}\text{Al}_{0.06}\text{Ti}_{0.01})_{\Sigma=0.87}\text{BO}_5$.

Mineral Group: Ludwigite group.

Occurrence: Very rare, in a contact-metamorphosed limestone, close by an intrusive granite.

Association: Calcite, vesuvianite, magnetite, garnet, fluorite, diopside.

Distribution: From a prospect pit on the northwest flank of Brooks Mountain, Seward Peninsula, Alaska, USA.

Name: Honors Alfred Hulse Brooks (1871–1924), geologist in charge of the Division of Alaskan Mineral Resources, U.S. Geological Survey.

Type Material: Natural History Museum, Paris, France, 110240; The Natural History Museum, London, England, 1912,612; Harvard University, Cambridge, Massachusetts, 96246, 96247; National Museum of Natural History, Washington, D.C., USA, 86791, 86989.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 326. (2) Clark, J.R. (1965) Crystallographic data for the iron borate mineral, hulsite. *Amer. Mineral.*, 50, 249–254. (3) Konnert, J.A., D.A. Appleman, J.R. Clark, L.W. Finger, T. Kato, and Y. Miura (1976) Crystal structure and cation distribution of hulsite, a tin-iron borate. *Amer. Mineral.*, 61, 116–122. (4) Yamnova, N.A., M.A. Simonov, and N.V. Belov (1975) Crystal structure of the Fe,Mg borate hulsite $(\text{Fe}^{2+}, \text{Mg}, \text{Fe}^{3+}, \text{Sn})_3\text{BO}_3\text{O}_2$. *Kristallografiya (Sov. Phys. Crystal.)*, 20, 156–159 (in Russian). (5) Knopf, A. and W.T. Schaller (1908) Two new boron minerals of contact-metamorphic origin. *Amer. J. Sci.*, 25, 323–331.

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