Takéuchiite $(Mn^{2+},Mg)_2Mn^{3+}BO_5$

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As acicular crystals, to 1 cm, with rhomboidal cross section ⊥ to the dominant form {320}.

Physical Properties: *Fracture:* Uneven. Hardness = ∼6 D(meas.) = n.d. D(calc.) = 3.93

Optical Properties: Opaque. *Color:* Black. *Streak:* Brown. *Luster:* Metallic.
Optical Class: [Biaxial.] α = n.d. β = n.d. γ = n.d. 2V(meas.) = n.d.

Cell Data: *Space Group: Pnnm.* a = 27.585(4) b = 12.561(3) c = 6.027(2) Z = 24

X-ray Powder Pattern: Långban, Sweden.
1.511 (100), 2.60 (90), 5.20 (85), 2.035 (80), 2.73 (70), 2.209 (70), 3.02 (65)

Chemistry:

	(1)
B_2O_3	17.10
Mn_2O_3	35.56
Fe_2O_3	7.43
MnO	8.99
MgO	30.84
TiO_2	0.50
Total	100.42

(1) Långban, Sweden; by electron microprobe, average of 12 analyses of 4 specimens; total Fe as Fe_2O_3, Mn^{3+}:Mn^{2+} derived from crystal-structure analysis; corresponds to $(Mn^{2+}_{1.56}Mg_{0.26}Fe^{3+}_{0.19}Ti^{4+}_{0.01})_{\Sigma=2.02}Mn^{3+}_{0.92}BO_5$.

Occurrence: Very rare in museum specimens from a metamorphosed Fe–Mn orebody.

Association: Dolomite, calcite.

Distribution: From Långban, Värmland, Sweden.

Name: Honors Professor Yoshio Takéuchi (1924–), University of Tokyo, Tokyo, Japan, who predicted the existence of the species and its crystal structure.

Type Material: Swedish Museum of Natural History, Stockholm, Sweden; National Museum of Natural History, Washington, D.C., USA, 138548.

References: (1) Bovin, J.-O. and M. O'Keeffe (1980) Takéuchiite, a new oxyborate mineral from Långban, Sweden. Amer. Mineral., 65, 1130–1133. (2) Norrestam, R. and J.-O. Bovin (1987) The crystal structure of takéuchiite, $Mg_{1.71}Mn_{1.29}BO_5$. Zeits. Krist., 181, 135–149. (3) Cooper, M.A. and F.C. Hawthorne (1998) The crystal structure of blatterite, $Sb^{5+}_3(Mn^{3+},Fe^{3+})_9(Mn^{2+},Mg)_{35}(BO_3)_{16}O_{32}$, and structural hierarchy in Mn^{3+}−bearing zigzag borates. Can. Mineral., 36, 1171–1193.