Mengxianminite $Ca_2Sn_2Mg_3Al_8[(BO_3)(BeO_4)O_6]_2$

Crystal Data: Orthorhombic. *Point Group: mm*2. As irregular crystals, to 200 μm.

Physical Properties: *Cleavage:* Perfect on {100}, good on {010}. *Tenacity*: Brittle. *Fracture*: Irregular. Hardness = 8 D(meas.) = n.d. D(calc.) = 4.170

Optical Properties: Translucent to transparent. *Color*: Green. *Streak*: n.d. *Luster*: Vitreous. *Optical Class:* Biaxial (-). α = 1.80(2) β = 1.83(2) γ = 1.84(2) 2V(calc.) = 60° *Pleochroism*: *X* = light green, *Y* = light green, *Z* = colorless. *Orientation*: *X* = *a*, *Y* = *b*, *Z* = *c*.

Cell Data: *Space Group: Fdd*2. *a* = 60.699(4) *b* = 9.914(1) *c* = 5.745(1) Z = 8

X-ray Powder Pattern: Xianghualing sharn, Linwu County, Hunan Province, southern China. 2.931 (100), 2.375 (100), 1.530 (98), 2.028 (52), 3.000 (35), 1.807 (35), 2.430 (30)

Chemistry:	(1)	(2)
Al_2O_3	40.00	38.41
SnO_2	25.96	28.38
MgO	6.57	11.39
CaO	8.56	10.56
FeO	4.83	
B_2O_3	6.53	6.56
BeO	4.37	4.71
ZnO	1.81	
MnO	1.23	
Na_2O	1.13	
TiO_2	0.10	
SiO_2	0.04	.
Total	101.12	100.00

(1) Xianghualing sharn, Linwu County, Hunan Province, southern China; average of 6 electron microprobe analyses supplemented by SIM, Raman, and IR spectroscopy; corresponds to $(Ca_{1.64}Na_{0.39})_{\Sigma=2.03}(Sn_{1.85}Zn_{0.24})_{\Sigma=2.09}(Mg_{1.75}Fe_{0.72}Al_{0.42}Mn_{0.19}Ti_{0.01})_{\Sigma=3.09}Al_8[(B_{1.01}O_3)(Be_{0.94}O_4)O_6]_2$.
(2) $Ca_2Sn_2Mg_3Al_8[(BO_3)(BeO_4)O_6]_2$.

Occurrence: In a hsianghualite-bearing vein in the exocontact of a contact metamorphic rock.

Association: Fluorite, phlogopite, hsianghualite, magnetite, dravite, magnesiotaaffeite-2*N*′2*S*, calcite.

Distribution: From the Xianghualing sharn, Linwu County, Hunan Province, southern China.

Name: Honors "Meng Xianmin" (1900-1969), a Chinese geologist, who made significant contributions to our understanding of ore deposits in China.

Type Material: Geological Museum of China, Beijing, People's Republic of China (M13293) and the Laboratory of Mineralogy, University of Liège, Belgium (20395).

References: (1) Rao Can, F. Hatert, F. Dal Bo, Rucheng Wang, Xiangping Gu, and M. Baijot (2017) Mengxianminite ($Ca_2Sn_2Mg_3Al_8[(BO_3)(BeO_4)O_6]_2$) a new borate mineral from Xianghualing skarn, Hunan Province, China, with a highly unusual chemical combination (B + Be + Sn). Amer. Mineral., 102, 2136-2141.