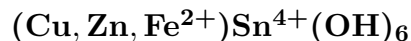


Mushistonite



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Crystal Data: Cubic. *Point Group:* $4/m\bar{3}2/m$. In fine-grained earthy aggregates.

Physical Properties: Hardness = 4–4.4 VHN = 240–254 D(meas.) = n.d. D(calc.) = n.d.

Optical Properties: Semitransparent. *Color:* Brownish green to malachite-green, yellow-brown; colorless in thin section; gray in reflected light. *Luster:* Vitreous.
Optical Class: Isotropic. $n = \text{n.d.}$

Cell Data: *Space Group:* $Pn\bar{3}m$. $a = 7.705\text{--}7.735$ $Z = 4$

X-ray Powder Pattern: Mushiston deposit, Tajikistan.

3.880 (100), 2.740 (50), 1.729 (35), 1.578 (23), 2.230 (20), 1.932 (16), 2.330 (13)

Chemistry:	(1)	(2)
SnO ₂	52.2	47.2
FeO	3.3	10.6
CuO	13.5	11.4
ZnO	11.1	7.0
Ag ₂ O	0.1	
H ₂ O	[19.1]	[23.6]
Total	[99.3]	[99.8]

(1) Mushiston deposit, Tajikistan; by electron microprobe, original analysis elemental, here converted to oxides, H₂O calculated from excess O given, (OH)¹⁻ confirmed by IR; corresponds to (Cu_{0.48}Zn_{0.39}Fe_{0.13})_{Σ=1.00}Sn_{0.98}(OH)_{6.02}. (2) Do.; corresponds to (Cu_{0.48}Zn_{0.39}Fe_{0.17})_{Σ=1.04}Sn_{1.00}(OH)_{5.95}.

Mineral Group: Schoenfliesite group.

Occurrence: In the oxidized zone of a tin deposit, replacing stannite (Mushiston deposit, Tajikistan); from a zoned pegmatite (Etta mine, South Dakota, USA).

Association: Stannite, chalcopyrite, sphalerite, galena (Mushiston deposit, Tajikistan); cassiterite, pseudomalachite, quartz (Etta mine, South Dakota, USA).

Distribution: In the Mushiston tin deposit, Kaznok Valley, Zeravshan Mountains, Tajikistan. From the Etta mine, near Keystone, Pennington Co., South Dakota, USA.

Name: For its occurrence in the Mushiston deposit, Tajikistan.

Type Material: Mining Institute, St. Petersburg, 1999/1; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 81069.

References: (1) Marshukova, N.K., A.B. Pavlovskii, and G.A. Sidorenko (1984) Mushistonite (Cu, Zn, Fe)Sn(OH)₆ – a new tin mineral. *Zap. Vses. Mineral. Obsch.*, 113, 612–617 (in Russian). (2) (1985) *Amer. Mineral.*, 70, 1331 (abs. ref. 1). (3) (1986) *Mineral. Abs.*, 37, 98 (abs. ref. 1). (4) Marshukova, N.K., G.A. Sidorenko, and N.I. Chistyakova (1978) On natural hydrostannates. *New data on minerals of the U.S.S.R.*, 27, 89–95 (in Russian). (5) (1980) *Amer. Mineral.*, 65, 1069–1070 (abs. ref. 4). (6) Dunn, P.J. and W.L. Roberts (1986) Cuprocassiterite discredited as mushistonite; and an unnamed tin mineral from the Etta Mine. *Mineral. Record*, 17, 383.