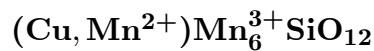


Abswurbachite



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Crystal Data: [Tetragonal] (by analogy to braunite). *Point Group:* $[4/m\ 2/m\ 2/m.]$
Anhedral grains, to 50 μm .

Physical Properties: Hardness = n.d. VHN = 870–950, average 920 (25 g load).
D(meas.) = n.d. D(calc.) = 4.96 (synthetic).

Optical Properties: Opaque. *Color:* Black; gray in reflected light. *Streak:* Brownish black.
Luster: Metallic. *Anisotropism:* Weak.

Cell Data: *Space Group:* $[I4_1/acd.]$ $a = 9.406(1)$ $c = 18.546(3)$ $Z = [8]$

X-ray Powder Pattern: Synthetic $(\text{Cu}_{0.98}\text{Mn}_{0.02}^{2+})_{\Sigma=1.00}\text{Mn}_6^{3+}\text{SiO}_{12}$.
2.702 (100), 1.6507 (30), 2.350 (15), 2.133 (15), 1.459 (14), 1.4016 (11), 1.6627 (10)

Chemistry:	(1)
SiO ₂	10.1
TiO ₂	0.23
Al ₂ O ₃	0.58
Fe ₂ O ₃	4.7
Mn ₂ O ₃	72.1
CuO	11.6
MgO	< 0.04
CaO	0.16
Total	99.47

(1) Evvia Island, Greece; by electron microprobe, corresponds to $(\text{Cu}_{0.88}\text{Mn}_{0.10}^{2+}\text{Ca}_{0.02})_{\Sigma=1.00}(\text{Mn}_{5.51}^{3+}\text{Fe}_{0.36}^{3+}\text{Al}_{0.07}\text{Ti}_{0.02}\text{Cu}_{0.02})_{\Sigma=5.98}\text{Si}_{1.03}\text{O}_{12}$.

Polymorphism & Series: Forms a series with braunite.

Occurrence: In very low-grade, high-pressure metamorphic Mn, Al-rich quartzites.

Association: Quartz, shattuckite, tenorite, sursassite, piemontite, ardennite, rutile, hollandite, clinochlore.

Distribution: At Mili, Evvia Island, and Apikia, Andros Island, Cyclades Islands, Greece.

Name: To honor Dr. Irmgard Abs-Wurbach (1938–), German mineralogist.

Type Material: Institute for Mineralogy, Ruhr University, Bochum, Germany; National Museum of Natural History, Washington, D.C., USA.

References: (1) Reinecke, T., E. Tillmanns, and H.-J. Bernhardt (1991) Abswurbachite, $\text{Cu}^{2+}\text{Mn}_6^{3+}[\text{O}_8/\text{SiO}_4]$, a new mineral of the braunite group: natural occurrence, synthesis, and crystal structure. Neues Jahrb. Mineral., Abh., 163, 117–143. (2) (1992) Amer. Mineral., 77, 670 (abs. ref. 1).