

Campigliaite

$\text{Cu}_4\text{Mn}^{2+}(\text{SO}_4)_2(\text{OH})_6 \cdot 4\text{H}_2\text{O}$

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Crystal Data: Monoclinic. *Point Group:* 2. In tufts of crystals, elongated along [010], bladed on {100}, to 0.2 mm. *Twinning:* Polysynthetic, with {100} as twin plane, ubiquitous.

Physical Properties: *Cleavage:* On {100}, perfect. Hardness = n.d. $D(\text{meas.}) = 3.0$
 $D(\text{calc.}) = 3.063$

Optical Properties: Transparent. *Color:* Pale blue; pale greenish blue in transmitted light.
Luster: Vitreous.

Optical Class: Biaxial (-). *Orientation:* $X \simeq a$; $Y \simeq c$; $Z = b$. *Dispersion:* $r < v$, weak.
 $\alpha = 1.589$ $\beta = 1.645$ $\gamma = 1.659$ $2V(\text{meas.}) = 52^\circ$

Cell Data: *Space Group:* $C2$. $a = 21.725(8)$ $b = 6.118(6)$ $c = 11.233(7)$ $\beta = 100.40(5)^\circ$
 $Z = 4$

X-ray Powder Pattern: Temperino mine, Italy.
10.68 (100), 5.34 (60), 3.56 (44), 2.673 (5), 2.768 (2), 2.570 (2), 1.781 (2)

Chemistry:	(1)	(2)
SO ₃	20.15	23.71
MnO	9.95	10.50
CuO	40.60	47.11
ZnO	4.47	
H ₂ O	[24.83]	18.68
Total	[100.00]	100.00

(1) Temperino mine, Italy; by electron microprobe, average of three analyses, total Mn as MnO, H₂O by difference; corresponds to $(\text{Cu}_{3.62}\text{Zn}_{0.39})_{\Sigma=4.01}\text{Mn}_{0.99}(\text{SO}_4)_{1.78}(\text{OH})_{6.44} \cdot 6.55\text{H}_2\text{O}$.

(2) $\text{Cu}_4\text{Mn}(\text{SO}_4)_2(\text{OH})_6 \cdot 4\text{H}_2\text{O}$.

Occurrence: A rare secondary mineral in the oxidized zone of a metallic sulfide skarn deposit.

Association: Gypsum, brochantite, antlerite.

Distribution: From the Temperino mine, Campiglia Marittima, Tuscany, Italy.

Name: For the locality which provided the first specimens, Campiglia Marittima, Italy.

Type Material: Mineralogical Museum, University of Florence, Florence, 214/I; National Museum of Natural History, Washington, D.C., USA, 148483–148485.

References: (1) Menchetti, S. and C. Sabelli (1982) Campigliaite, $\text{Cu}_4\text{Mn}(\text{SO}_4)_2(\text{OH})_6 \cdot 4\text{H}_2\text{O}$, a new mineral from Campiglia Marittima, Tuscany, Italy. *Amer. Mineral.*, 67, 385–393.