

Crystal Data: Monoclinic. *Point Group:* 2/m. As elongate platy crystals to 100 μm and in aggregates, to 1 mm.

Physical Properties: *Cleavage:* Distinct on {001}. *Tenacity:* Brittle. *Fracture:* Irregular. Hardness = 3 D(meas.) = 3.77(2) D(calc.) = 3.75(2)

Optical Properties: Transparent to translucent. *Color:* Brown-red to dark reddish orange. *Streak:* Light brown. *Luster:* Adamantine. *Optical Class:* Biaxial (+). $\alpha = 1.785(2)$ $\beta = 1.814(5)$ $\gamma = 1.854(5)$ $2V(\text{meas.}) = 85^\circ$ $2V(\text{calc.}) = 82.4^\circ$ *Dispersion:* Weak, $r < v$.

Cell Data: *Space Group:* C2/m. $a = 9.043(1)$ $b = 6.2314(7)$ $c = 7.3889(9)$ $\beta = 116.392(2)^\circ$ $Z = 2$

X-ray Powder Pattern: Starlera Fe-Mn deposit, Val Ferrera, eastern Swiss Alps. 3.182 (100), 2.555 (100), 4.93 (80), 2.718 (80), 2.927 (70), 2.822 (70), 2.134 (70)

Chemistry:	(1)
Na ₂ O	0.08
MgO	3.95
CaO	12.42
SrO	0.20
NiO	1.07
CoO	0.19
ZnO	0.58
Al ₂ O ₃	0.27
Mn ₂ O ₃	16.70
Fe ₂ O ₃	0.91
As ₂ O ₅	53.41
V ₂ O ₅	0.67
H ₂ O	[8.84]
Total	99.29

(1) Starlera Fe-Mn deposit, Val Ferrera, eastern Swiss Alps; average of 6 electron microprobe analyses supplemented by Raman and IR spectroscopy, H₂O calculated; corresponds to (Ca_{0.94}Sr_{0.01}Na_{0.01})_{Σ=0.96}(Mn³⁺_{0.90}□_{0.52}Mg_{0.41}Ni_{0.06}Fe³⁺_{0.05}Zn_{0.03}Al_{0.02}Co_{0.01})_{Σ=2.00}(As_{1.97}V_{0.03})_{Σ=2.00}H_{4.16}O₁₀.

Mineral Group: Lotharmeyerite subgroup of the tsumcorite group.

Occurrence: In discordant veinlets formed by late-stage remobilization of arsenic during retrograde metamorphism of a carbonate-hosted, syngenetic exhalative massive braunite deposit.

Association: Calcite, tilasite, ailaufite.

Distribution: At the Starlera Fe-Mn deposit, Val Ferrera, eastern Swiss Alps.

Name: The prefix, *mangano*, alludes to the Mn³⁺ dominance within the lotharmeyerite subgroup of the tsumcorite group.

Type Material: Geology Museum, Lausanne, Switzerland (MGL #54000 and MGL #54014).

References: (1) Brugger, J., S.V. Krivovichev, U. Kolitsch, N. Meisser, M. Andrut, S. Ansermet, and P.C. Burns (2002) Description and crystal structure of manganlotharmeyerite, Ca(Mn³⁺,□,Mg)₂{AsO₄,[AsO₂(OH)₂]}₂(OH,H₂O)₂, from the Starlera Mn deposit, Swiss Alps, and a redefinition of lotharmeyerite. *Can. Mineral.*, 40, 1597-1608. (2) (2003) *Amer. Mineral.*, 88, 1627 (abs. ref. 1).