

Manganvesuvianite

Crystal Data: Tetragonal. *Point Group:* 6. As prismatic, often striated, crystals, to 1.5 cm, with {100} dominant, {110} minor, and {101} termination. *Twinning:* Merohedral{110}.

Physical Properties: *Cleavage:* n.d. *Tenacity:* Brittle. *Fracture:* Subconchoidal. Hardness = 6-7
D(meas.) = n.d. D(calc.) = 3.404

Optical Properties: Transparent, opaque (thick crystals). *Color:* Maroon-red to black with dark red internal reflections. *Streak:* Colorless. *Luster:* Vitreous.

Optical Class: Uniaxial (-). $\epsilon = 1.731(1)$ $\omega = 1.719(1)$ *Pleochroism:* Strong, *E* = yellowish, *O* = dark red.

Cell Data: *Space Group:* P4/n. $a = 15.575(2)$ $c = 11.824(2)$

X-ray Powder Pattern: n.d. Chemically zoned material precluded a good pattern. Similar to other vesuvianite group members.

Chemistry:	(1)
SiO ₂	36.15
Al ₂ O ₃	14.73
Fe ₂ O ₃	1.12
Mn ₂ O ₃	6.79
MgO	2.35
CaO	35.73
CuO	0.02
SrO	0.11
Na ₂ O	0.03
F	0.12
Cl	0.01
H ₂ O	[2.67]
<u>-O = (F, Cl)</u>	<u>0.07</u>
Total	99.76

(1) N'Chwaning II mine, South Africa; average electron microprobe analysis, H₂O calculated; corresponds to simplified formula Ca₁₉Mn³⁺(Al,Mn³⁺,Fe³⁺)₁₀(Mg,Mn²⁺)₂Si₁₈O₆₉(OH)₉.

Mineral Group: Vesuvianite group.

Occurrence: In calc-silicate lenses formed by hydrothermal alteration of primary sedimentary and low-grade metamorphic manganese ores.

Association: Grossular, xonotlite, calcite, serandite-pectolite, strontioepimontite-tweddillite, mozartite, hydrogrossular, henritermierite.

Distribution: At the Wessels mine and N'Chwaning II mine [TL], Kalahari manganese fields, South Africa.

Name: Prefix, *mangan*, indicates a *vesuvianite* group mineral with the five-coordinated (Y') position occupied by Mn³⁺.

Type Material: Natural History Museum, Bern, Switzerland (NMBE 35474).

References: (1) Armbruster, T., E. Gnos, R. Dixon, J. Gutzmer, C. Hejny, N. Döbelin, and O. Medenbach (2003) Manganvesuvianite and tweddillite, two new Mn³⁺-silicate minerals from the Kalahari manganese fields, South Africa. *Mineral. Mag.*, 66(1), 137-150. (2) (2002) *Amer. Mineral.*, 88, 251-252 (abs. ref. 1).