

Crystal Data: Monoclinic. *Point Group:* $2/m$. Platy triangular crystals, tabular on {100}, to 0.2 mm, and in subparallel aggregates.

Physical Properties: *Cleavage:* Perfect on {100}. *Tenacity:* Brittle. Hardness = Very soft. $D(\text{meas.}) = 3.22(4)$ $D(\text{calc.}) = 3.22$

Optical Properties: Transparent. *Color:* Red. *Streak:* Brownish red. *Luster:* Vitreous. *Optical Class:* Biaxial (-). *Pleochroism:* Weak; $X =$ yellowish brown; $Y = Z =$ reddish brown. *Orientation:* $Y = b$; $Z \wedge c = 4(2)^\circ$. *Absorption:* $Z = Y > X$. $\alpha = 1.79(1)$ $\beta = 1.81(1)$ $\gamma = 1.83(1)$ $2V(\text{meas.}) = 84(2)^\circ$ $2V(\text{calc.}) = 85^\circ$

Cell Data: *Space Group:* $P2_1/c$. $a = 8.825(3)$ $b = 13.258(4)$ $c = 11.087(3)$
 $\beta = 101.19(4)^\circ$ $Z = 4$

X-ray Powder Pattern: Tip Top mine, South Dakota, USA.
8.69 (100), 2.772 (70), 5.66 (60), 2.884 (60), 2.611 (60), 2.163 (60), 5.44 (50)

Chemistry:	(1)	(2)
P_2O_5	35.2	34.57
Fe_2O_3	0.1	
Mn_2O_3	38.0	38.45
CaO	18.3	18.21
H_2O	[8.4]	8.77
Total	[100.0]	100.00

(1) Tip Top mine, South Dakota, USA; by electron microprobe, total Fe as Fe_2O_3 , total Mn as Mn_2O_3 , H_2O by difference; corresponds to $\text{Ca}_{2.01}(\text{Mn}_{2.97}\text{Fe}_{0.01})_{\Sigma=2.98}\text{O}_{1.88}(\text{PO}_4)_{3.06} \cdot 2.88\text{H}_2\text{O}$.

(2) $\text{Ca}_2\text{Mn}_3\text{O}_2(\text{PO}_4)_3 \cdot 3\text{H}_2\text{O}$.

Polymorphism & Series: Dimorphous with robertsite.

Occurrence: A rare secondary mineral in a complex zoned granite pegmatite.

Association: Whitlockite, carbonate-apatite, quartz.

Distribution: In the Tip Top mine, 8.5 km southwest of Custer, Custer Co., South Dakota, USA.

Name: From the Greek *para*, for *near*, and its relation to *robertsite*.

Type Material: Royal Ontario Museum, Toronto, Canada, M43771; National Museum of Natural History, Washington, D.C., USA, 149606.

References: (1) Roberts, A.C., B.D. Sturman, P.J. Dunn, and W.L. Roberts (1988) Pararobertsite, $\text{Ca}_2\text{Mn}_3^{3+}(\text{PO}_4)_3\text{O}_2 \cdot 3\text{H}_2\text{O}$, a new mineral species from the Tip Top pegmatite, Custer County, South Dakota, and its relationship to robertsite. *Can. Mineral.*, 27, 451–455.
(2) (1990) *Amer. Mineral.*, 75, 1211 (abs. ref. 1).