Parabrandtite $Ca_2Mn^{2+}(AsO_4)_2 \cdot 2H_2O$

Crystal Data: Triclinic. *Point Group:* 1. As aggregates of subparallel crystals, to 1.5 mm.

Physical Properties: *Cleavage:* On {010} and {110}, perfect. Hardness = 3–4
D(meas.) = 3.55(8) D(calc.) = 3.60

Optical Properties: Transparent. *Color:* Colorless. *Streak:* White. *Luster:* Vitreous. *Optical Class:* Biaxial (+). *Orientation:* $\theta = 48.4°$; $\psi = 132.7°$; $\phi = 64.6°$. *Dispersion:* $r > v$, weak. $\alpha = 1.701(2)$ $\beta = 1.721(2)$ $\gamma = 1.751(2)$ 2V(meas.) = 79.9(4)° 2V(calc.) = 79.7°

Cell Data: *Space Group:* $[P1]$ (by analogy to talmessite). $a = 5.89(1)$ $b = 7.031(7)$ $c = 5.64(1)$ $\alpha = 96.77(10)°$ $\beta = 109.32(10)°$ $\gamma = 108.47(8)°$ Z = 1

X-ray Powder Pattern: Sterling Hill, New Jersey, USA.
2.811 (100), 3.090 (80), 3.61 (70), 3.231 (50), 2.778 (50), 5.11 (40), 3.37 (40)

Chemistry:

	(1)
As_2O_5	51.3
FeO	0.2
MnO	14.7
ZnO	0.7
MgO	0.8
CaO	25.1
H_2O	8.3
Total	101.1

(1) Sterling Hill, New Jersey, USA; by electron microprobe, total Fe as FeO, total Mn as MnO, H_2O by TGA-EGA; corresponds to $(Ca_{1.94}Mn_{0.06})_{\Sigma=2.00}(Mn_{0.84}Mg_{0.09}Zn_{0.04}Fe_{0.01})_{\Sigma=0.98}(As_{0.96}O_{3.90})_2 \cdot 2H_2O$.

Polymorphism & Series: Dimorphous with brandtite.

Mineral Group: Fairfieldite group.

Occurrence: Very rare, in a vein in primary ore from a metamorphosed stratiform zinc orebody.

Association: Sarkinite, franklinite, willemite, calcite.

Distribution: From Sterling Hill, Ogdensburg, Sussex Co., New Jersey, USA.

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

Type Material: National Museum of Natural History, Washington, D.C., USA, 163210.

References: (1) Dunn, P.J., D.R. Peacor, S.-C Su, F.J. Wicks, and F.J. Parker (1987) Parabrandtite, the manganese analog of talmessite, from Sterling Hill, Ogdensburg, New Jersey. Neues Jahrb. Mineral., Abh., 157, 113–119. (2) (1988) Amer. Mineral., 73, 1496 (abs. ref. 1).