Triploidite $(Mn^{2+},Fe^{2+})_2(PO_4)(OH)$

Crystal Data: Monoclinic. *Point Group:* $2/m$. As prismatic crystals, elongated and striated ‖ [001], to 1 mm, columnar to parallel fibrous, may be spherulitic to divergent fibrous; rarely granular.

Physical Properties: *Cleavage:* {100}, good; {120}, fair; {010}, poor. *Fracture:* Uneven to subconchoidal. Hardness = 4.5–5 D(meas.) = 3.70 D(calc.) = [3.80]

Optical Properties: Transparent to translucent. *Color:* Pinkish brown, wine-yellow, yellowish brown, red-orange; pale pink in transmitted light. *Streak:* White, nearly. *Luster:* Vitreous, adamantine, greasy.
Optical Class: Biaxial (+); abnormal interference colors due to strong dispersed extinction. *Pleochroism:* Faint in thick grains. *Orientation:* $X = b$; $Z \wedge c = 4°$–$14°$. *Dispersion:* $r > v$, very strong. *Absorption:* $Z > X = Y$. $\alpha = 1.709$–1.735 $\beta = [1.710]$–1.736 $\gamma = 1.714$–1.740
2V(meas.) = ∼50°

Cell Data: *Space Group:* $P2_1/a$. $a = 12.366$ $b = 13.276$ $c = 9.943$ $\beta = 108.23°$
Z = 16

X-ray Powder Pattern: Branchville, Connecticut, USA; close to wolfeite.
2.94 (10), 3.10 (9), 3.19 (8), 1.80 (6), 3.41 (5), 2.58 (5), 2.31 (5)

Chemistry:

	(1)	(2)	(3)
P_2O_5	32.11	28.54	31.86
As_2O_5		3.64	
SiO_2		0.68	
FeO	14.88	0.03	32.25
MnO	48.45	59.16	31.85
CaO	0.33	0.34	
H_2O	4.08	[7.61]	4.04
Total	99.85	[100.00]	100.00

(1) Branchville, Connecticut, USA. (2) Wheal Owles, England; H_2O by difference, corresponds to $(Mn_{1.95}Ca_{0.01}Si_{0.03})_{\Sigma=1.99}[(P_{0.94}As_{0.07})_{\Sigma=1.01}O_4](OH)_{1.00} \bullet 0.49H_2O$. (3) $(Mn,Fe)_2(PO_4)(OH)$ with Fe:Mn = 1:1.

Polymorphism & Series: Forms a series with wolfeite.

Occurrence: An uncommon hydrothermal alteration product of primary phosphates in complex zoned granite pegmatites.

Association: Triplite, lithiophilite, triphylite, eosphorite, dickinsonite, rhodochrosite.

Distribution: In the USA, from Branchville, Fairfield Co., Connecticut; at the Ross (Highland Lode) mine, 6.5 km west of Custer, Custer Co. and the Peerless mine, near Keystone, Pennington Co., South Dakota; in the White Picacho district, Maricopa and Yavapai Cos., Arizona; from the Foote mine, Kings Mountain, Cleveland Co., North Carolina; in the Emmons quarry, Greenwood, Oxford Co., Maine. At Wheal Owles, St. Just, Cornwall, England. In the Hunnakko pegmatite, Alavus district, Finland. From Vídeň, near Velkého Meziříči, Czech Republic. In Germany, at Hagendorf and Waidhaus, Bavaria. In the Lion Hill mine, Urungwe, Zimbabwe. From Parelhas, Rio Grande do Norte, Brazil.

Name: From *triplite* and the Greek for *form*, as it closely resembles that species.

Type Material: Yale University, New Haven, Connecticut, USA, 5.5646–5.5648.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 853–855. (2) Waldrop, L. (1970) The crystal structure of triploidite and its relation to the structures of other minerals of the triplite–triploidite group. Zeits. Krist., 131, 1–20. (3) Clark, A.M. and A.G. Couper (1979) End-member triploidite from Cornwall. Mineral. Mag., 43, 179–180. (4) Frondel, C. (1949) Wolfeite, xanthoxenite, and whitlockite from the Palermo mine, New Hampshire. Amer. Mineral., 34, 692–705.