

Heterosite



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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As cleavable blocky masses.

Physical Properties: *Cleavage:* Good on {100}; poor on {010}; surfaces may be curved. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 4–4.5 $D(\text{meas.}) = 3.40$ $D(\text{calc.}) = [3.67]$

Optical Properties: Translucent to opaque. *Color:* Deep rose to purple, black. *Streak:* Pale purple. *Luster:* Satiny on fresh surfaces, dull to earthy.

Optical Class: Biaxial (-). *Pleochroism:* Intense; $X = \text{yellow brown}$, $Y = Z = \text{reddish purple}$; optic axis sections show anomalous green interference colors. *Orientation:* $X = a$.

Absorption: $Z \geq Y > X$. $\alpha = 1.86(1)$ $\beta = 1.89(1)$ $\gamma = 1.91(1)$ $2V(\text{meas.}) = 37^\circ$

Cell Data: *Space Group:* $Pmnb$. $a = 5.83(1)$ $b = 9.79(1)$ $c = 4.769(5)$ $Z = 4$

X-ray Powder Pattern: Palermo #1 mine, New Hampshire, USA. (ICDD 34–134). 2.452 (100), 4.31 (90), 3.46 (85), 2.92 (85), 4.94 (60), 2.412 (40), 2.96 (35)

Chemistry:

	(1)	(2)
P_2O_5	43.45	47.20
Fe_2O_3	38.36	26.55
Mn_2O_3	12.08	26.25
MgO	trace	
CaO	1.37	
Li_2O	trace	
Na_2O	trace	
H_2O	4.82	
insol.	0.19	
Total	100.27	100.00

(1) Hill City, South Dakota, USA. (2) $(\text{Fe}, \text{Mn})\text{PO}_4$ with $\text{Fe}:\text{Mn} = 1:1$.

Polymorphism & Series: Forms a series with purpurite.

Occurrence: A secondary mineral in the oxidized zone of complex granite pegmatites, replacing primary phosphate minerals, principally triphylite.

Association: Triphylite, ferrisicklerite, many secondary Fe–Mn phosphates.

Distribution: Widespread in weathered phosphate-bearing pegmatites. Some prominent localities include: in France, in Haute-Vienne, from near Limoges, Huréaux, and in the La Vilate quarry, near Chanteloube. At Hagedorf, and Hühnerkobel, near Zwiesel, Bavaria, Germany. From the Norrö pegmatite, on Rånö Island; Skruppetorp, Östergötland; and in the Varuträsk pegmatite, 15 km northwest of Skellefteå, Västerbotten, Sweden. At Sukula and Tammela, Finland. In the USA, from the Fletcher and Palermo #1 mines, near North Groton, Grafton Co., New Hampshire; at Newry, Oxford Co., Maine; around Hill City, Pennington Co., and elsewhere in South Dakota. In the Sapucaia pegmatite mine, about 50 km east-southeast of Governador Valadares, and several other localities in Minas Gerais, Brazil. At the Tsaobismund pegmatite, 60 km south of Karibib, Namibia. From the Angarf-Sud pegmatite, Tazenakht Plain, Anti-Atlas Mountains, Morocco.

Name: From the Greek for *another*, probably because it was the second manganese-bearing species described from the type locality.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 675–677. (2) Eventoff, W., R. Martin, and D.R. Peacor (1972) The crystal structure of heterosite. *Amer. Mineral.*, 57, 45–51.

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