

Anapaite

Ca₂Fe²⁺(PO₄)₂·4H₂O

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Crystals are tabular on {110}, modified by {001}, {010}, {100}, {1 $\bar{1}$ 1}, { $\bar{1}\bar{1}$ 1}, {011}, to 1 cm. Commonly in rosettes and subparallel aggregates and crusts of crystals; fibrous, and in nodules.

Physical Properties: *Cleavage:* On {001}, perfect; on {010}, distinct. Hardness = 3.5
D(meas.) = 2.816 D(calc.) = 2.811

Optical Properties: Transparent. *Color:* Green to pale green; colorless to pale green in transmitted light. *Streak:* White. *Luster:* Vitreous.
Optical Class: Biaxial (+). *Orientation:* X (-119°,81°); Y (147°,70°); Z (-6°,21°) [using (ϕ,ρ)].
Dispersion: $r > v$, weak. $\alpha = 1.602(3)$ $\beta = 1.613(3)$ $\gamma = 1.649(3)$ $2V(\text{meas.}) = 54(2)^\circ$

Cell Data: *Space Group:* $P\bar{1}$. $a = 6.447(1)$ $b = 6.816(1)$ $c = 5.898(1)$ $\alpha = 101.64(3)^\circ$
 $\beta = 104.24(3)^\circ$ $\gamma = 70.76(4)^\circ$ $Z = 1$

X-ray Powder Pattern: San Giovanni, Italy. (ICDD 34-148).
3.764 (100), 2.883 (75), 3.158 (70), 3.391 (55), 3.188 (45), 6.39 (35), 4.551 (35)

Chemistry:	(1)	(2)
P ₂ O ₅	35.51	35.66
FeO	18.07	18.05
CaO	27.77	28.18
H ₂ O	18.47	18.11
Total	99.82	100.00

(1) Taman Peninsula, Russia. (2) Ca₂Fe(PO₄)₂·4H₂O.

Occurrence: In oolitic iron ore, and in the stems of fossil trees (Anapa, Russia); in lacustrine sediments.

Association: Fairfieldite, vivianite, siderite.

Distribution: In Russia, at an iron mine on Cape Zheleznyi Rog Cape, near Anapa, Taman Peninsula. As fine specimens at Kerch, Crimean Peninsula, Ukraine. In the Castelnuovo and Allori mines, Santa Barbara lignite district, near San Giovanni, Tuscany, Italy. At Messel, Hesse, Germany. In the Cerdanya basin, east to southwest of Belver, Catalonia Province, Spain. In the USA, from Lewis Well, near Corcoran, Kings Co., California; at the MacArthur mine, near Yerington, Lyon Co., Nevada; in the Palermo #1 mine, near North Groton, Grafton Co., New Hampshire.

Name: For its first discovery near Anapa, Russia.

Type Material: n.d.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 731–732. (2) Catti, M., G. Ferraris, and G. Ivaldi (1979) Refinement of the crystal structure of anapaite, Ca₂Fe(PO₄)₂·4H₂O: hydrogen bonding and relationships with the bihydrated phase. Bull. Minéral., 102, 314–318.