

Phosphosiderite



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Crystal Data: Monoclinic. *Point Group:* $2/m$. As crystals, tabular on {010}, to stout prismatic [001], with prominent {010}, {110}, {001}, {011}, many others, to 2.5 cm. May be radial fibrous, in botryoidal or reniform crusts and masses. *Twinning:* On {101}, common, typically as interpenetrations.

Physical Properties: *Cleavage:* {010}, good; {001}, indistinct. *Fracture:* Uneven. Hardness = 3.5–4 D(meas.) = 2.74–2.76 D(calc.) = 2.72–2.73

Optical Properties: Transparent to translucent. *Color:* Peach-blossom-red, reddish violet, reddish purple, yellow-orange, may be dark blue, moss-green to nearly colorless; in transmitted light, typically rose-red to colorless. *Luster:* Vitreous to subresinous.

Optical Class: Biaxial (-). *Pleochroism:* X = pale rose-red; Y = carmine-red; Z = colorless. *Orientation:* Y = b; X \wedge c = $\sim 4^\circ$. *Dispersion:* r > v, very strong. $\alpha = 1.692\text{--}1.703$
 $\beta = 1.725\text{--}1.728$ $\gamma = 1.738\text{--}1.739$ $2V(\text{meas.}) = 62^\circ\text{--}66^\circ$

Cell Data: *Space Group:* $P2_1/n$. a = 5.329–5.330 b = 9.798–9.809 c = 8.710–8.714
 $\beta = 90.51^\circ\text{--}90.60^\circ$ Z = 4

X-ray Powder Pattern: The Kreuzberg, Germany. (ICDD 33-666).
4.689 (100), 2.787 (85), 4.363 (75), 3.610 (50), 2.572 (40), 4.912 (35), 2.013 (25)

Chemistry:

	(1)	(2)	(3)
P ₂ O ₅	38.85	37.71	37.99
Fe ₂ O ₃	44.30	44.38	42.73
H ₂ O	17.26	17.31	19.28
Total	100.41	99.40	100.00

(1) Kalterborn mine, Germany. (2) The Kreuzberg, Germany; average of two analyses.
(3) FePO₄·2H₂O.

Polymorphism & Series: Dimorphous with strengite.

Occurrence: Typically an alteration product of triphylite in zoned complex granite pegmatites; may be a component of soils; replacing bones or shells.

Association: Triphylite, barbosalite, leucophosphite, laueite, huréaulite, strengite, turquoise.

Distribution: At many localities in small amounts. In Germany, from the Kalterborn mine, near Eisfeld, North Rhine-Westphalia; on the Kreuzberg, Pleystein; and at Hagendorf and Waidhaus, Bavaria, Germany. From the La Vilate quarry, near Chanteloube, Haute-Vienne, France. At the Mangualde pegmatite, near Mesquitela, and the Bendada pegmatite, near Guarda, Portugal. From the Leveäniemi mine, near Kiruna, Sweden. In the Bomi Hill Caves, Liberia. At the Ficus and West Driefontein Caves, Transvaal, South Africa. In the Alto Ligonha district, Mozambique. In the USA, from the Palermo #1 and Fletcher mines, near North Groton, Grafton Co., New Hampshire; at Mullica Hill, Gloucester Co., New Jersey; near Bethel Church, Pike Co., Indiana; in the Williams pegmatites, about eight km south of Rockford, Coosa Co., Alabama. Large crystals from the Bull Moose mine, five km southeast of Custer, Custer Co., South Dakota; from the Champion mine, Mono Co., and the Stewart mine, Pala, San Diego Co., California; from near Manhattan, Manhattan district, Nye Co., Nevada. At Rapid Creek, Yukon Territory, Canada. In the Sapucaia, Córrego do Urucum, and Énio pegmatite mines, around Galiléia, Minas Gerais, Brazil. From the El Criollo pegmatite, Cerro Blanco, Tanti district, 45 km west of Córdoba, Córdoba Province, Argentina.

Name: From *phosphorus* and the Greek for *iron* in the composition.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 769–771 [metastrengite]. (2) Moore, P.B. (1966) The crystal structure of metastrengite [phosphosiderite] and its relationship to strengite and phosphophyllite. *Amer. Mineral.*, 51, 168–176. (3) Fanfani, L., P.F. Zanazzi, and S.G. Carobbi (1966) La struttura cristallina della metastrengite [phosphosiderite]. *Atti Rend. Accad. Lincei*, 40, 880–889 (in Italian).

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