

Verplanckite**Ba₂(Mn²⁺, Fe²⁺, Ti)Si₂O₆(O, OH, Cl, F)₂•3H₂O**

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Crystal Data: Hexagonal. *Point Group:* 6/m 2/m 2/m. Crystals hexagonal, elongated || [0001], or subhedral, to 3 mm; as radial masses or disseminated grains.

Physical Properties: *Cleavage:* Good on {11 $\bar{2}$ 0}; on {0001}, poor or a fracture. *Hardness* = 2.5–3 D(meas.) = 3.52(2) D(calc.) = 3.33

Optical Properties: Transparent to translucent. *Color:* Brownish orange to light brownish yellow. *Streak:* Pale orange. *Luster:* Vitreous. *Optical Class:* Uniaxial (-). *Pleochroism:* O = yellow-orange; E = colorless. ω = 1.683(2) ϵ = 1.672(2)

Cell Data: *Space Group:* P6/mmm. *a* = 16.398(10) *c* = 7.200(4) *Z* = 1

X-ray Powder Pattern: Big Creek, California, USA.
3.95 (100), 2.97 (70), 2.738 (70), 13.8 (65), 5.39 (45), 3.58 (30), 2.858 (30)

Chemistry:	(1)		(1)	
	SiO ₂	20.9	BaO	52.33
	TiO ₂	1.72	K ₂ O	< 0.05
	Al ₂ O ₃	0.41	F	0.6
	FeO	1.9	Cl	3.5
	MnO	8.7	LOI	10.6
	MgO	0.15	<u>-O = (F, Cl)₂</u>	<u>1.05</u>
	CaO	0.19	Total	[100.0]

(1) Big Creek, California, USA; by D-C arc spectroscopy, K and Cl by X-ray spectroscopy, loss on ignition taken as H₂O, recalculated to 100.0%; corresponds to (Ba_{2.00}Ca_{0.02}K_{0.01})_{Σ=2.03}(Mn_{0.72}Fe_{0.16}Ti_{0.13}Mg_{0.02})_{Σ=1.03}(Si_{2.04}Al_{0.05})_{Σ=2.09}O_{6.19}[(OH)_{0.98}Cl_{0.58}O_{0.25}F_{0.18}]_{Σ=1.99}•2.96H₂O.

Occurrence: In thin layers in a metamorphic sanbornite-quartz rock.

Association: Quartz, sanbornite, celsian, diopside, taramellite, fresnoite, muirite, traskite, pyrrhotite, pyrite.

Distribution: In the Esquire No. 7 mine, Big Creek, and on Rush Creek, Fresno Co., California, USA.

Name: For William E. Ver Planck (1916–1963), geologist of the California Division of Mines & Geology, California, USA.

Type Material: California Division of Mines & Geology, San Francisco, California, USA.

References: (1) Alfors, J.T., M.C. Stinson, R.A. Matthews, and A. Pabst (1965) Seven new barium minerals from eastern Fresno Co., California. *Amer. Mineral.*, 50, 314–340. (2) Alfors, J.T. and G.W. Putman (1965) Revised chemical analyses of traskite, verplanckite and muirite from Fresno County, California. *Amer. Mineral.*, 50, 1500–1503. (3) Kampf, A.R., A.A. Khan, and W.H. Bauer (1973) Barium chloride silicate with an open framework: verplanckite. *Acta Cryst.*, 29, 2019–2021.