

## Planerite

## $\text{Al}_6(\text{PO}_4)_2(\text{PO}_3\text{OH})_2(\text{OH})_8 \cdot 4\text{H}_2\text{O}$

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**Crystal Data:** Triclinic. *Point Group:*  $\bar{1}$ . Microcrystalline, generally spherulitic, to 2 mm; in botryoidal crusts and massive.

**Physical Properties:** *Fracture:* Splintery. *Tenacity:* Brittle. Hardness = 5  
D(meas.) = 2.65–2.68 D(calc.) = 2.71

**Optical Properties:** Translucent on edges. *Color:* White, verdigris-green, lime-green, pale blue-green; olive-green on exposure. *Luster:* Dull, chalky to earthy.  
*Optical Class:* [Biaxial.]  $n = 1.60(1)$

**Cell Data:** *Space Group:*  $P\bar{1}$ .  $a = 7.505(2)$   $b = 9.723(3)$   $c = 7.814(2)$   $\alpha = 111.43^\circ$   
 $\beta = 115.56^\circ$   $\gamma = 68.69^\circ$   $Z = 1$

**X-ray Powder Pattern:** “Gumeshevsk copper mines,” Russia.  
3.745 (100), 6.809 (90), 3.692 (60), 4.727 (36), 3.090 (36), 3.285 (35), 6.182 (28)

Chemistry:	(1)	(2)	(3)
$\text{P}_2\text{O}_5$	33.94	37.1	37.76
$\text{Al}_2\text{O}_3$	37.48	40.1	40.68
$\text{Fe}_2\text{O}_3$		0.8	
FeO	3.52		
CuO	3.72		
$\text{H}_2\text{O}$	20.93	21.1	21.56
Total	99.59	99.1	100.00

(1) “Gumeshevsk copper mines,” Russia. (2) Mt. Ida, Arkansas, USA; by electron microprobe, total Fe as  $\text{Fe}_2\text{O}_3$ ,  $\text{H}_2\text{O}$  by the Penfield method; corresponds to  $(\text{Al}_{5.92}\text{Fe}_{0.08})_{\Sigma=6.00}(\text{PO}_4)_{1.92}(\text{PO}_3\text{OH})_{2.00}(\text{OH})_8 \cdot 4.07\text{H}_2\text{O}$ . (3)  $\text{Al}_6(\text{PO}_4)_2(\text{PO}_3\text{OH})_2(\text{OH})_8 \cdot 4\text{H}_2\text{O}$ .

**Polymorphism & Series:** Forms a series with turquoise.

**Mineral Group:** Turquoise group.

**Occurrence:** A rare secondary mineral formed in phosphate-rich aluminous deposits.

**Association:** Wavellite, variscite, metavariscite (Mt. Ida, Arkansas, USA).

**Distribution:** From Mt. Chernovskaya, near the Chernaya River, Middle Ural Mountains, Russia. At Poniklá, Jilemnice, Czech Republic. From Bruguers, Barcelona Province, Spain. In the USA, at General Trimble’s mine, Chester Co., Pennsylvania; in Arkansas, from the Mauldin Mountain quarry, near Mt. Ida, Montgomery Co., at the Coon Creek mine and Buckeye Mountain, Polk Co., and on Dug Hill, near Avant, Garland Co.; at Erin, Clay Co., Alabama; from Brewer, east of Cedartown, Polk Co., Georgia; at Cripple Creek, Teller Co., Colorado; from the Rain mine, Carlin district, Elko Co., Nevada. At Toyoda, near Kochi, Shikoku Prefecture, Japan. More localities are likely as additional turquoise group specimens are re-examined.

**Name:** To honor Dimitrii Ivanovich Planer (1821–1882), mineralogist and Director of the Gumeshevsk copper mines, Polevskoi, Russia, who discovered the mineral at some distance east from those mines.

**Type Material:** A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 5404; National Museum of Natural History, Washington, D.C., USA, R9710.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana’s system of mineralogy, (7th edition), v. II, 762. (2) Foord, E.E. and J.E. Taggart, Jr. (1998) A reexamination of the turquoise group: the mineral aheylite, planerite (redefined), turquoise and coeruleolactite. Mineral. Mag., 62, 93–111. (3) Pekov, I.V. (1998) Minerals first discovered on the territory of the former Soviet Union, 166–167.

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