

## Paravauxite

## $\text{Fe}^{2+}\text{Al}_2(\text{PO}_4)_2(\text{OH})_2 \cdot 8\text{H}_2\text{O}$

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**Crystal Data:** Triclinic. *Point Group:*  $\bar{1}$ . Short prismatic [001] crystals, may be thick tabular {010}, to 3 cm; forms include {010}, {110}, {100},  $\{\bar{1}10\}$ ,  $\{1\bar{2}0\}$ , {011}, {001},  $\{0\bar{1}1\}$ , many others. As subparallel to radial aggregates.

**Physical Properties:** *Cleavage:* {010}, perfect. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 3 D(meas.) = 2.36 D(calc.) = [2.37]

**Optical Properties:** Transparent to translucent. *Color:* Pale greenish white to colorless; colorless in transmitted light. *Streak:* White. *Luster:* Vitreous, pearly on cleavages. *Optical Class:* Biaxial (+). *Orientation:* X ( $61^\circ, 56^\circ$ ); Y ( $180^\circ, 55^\circ$ ); Z ( $-61^\circ, 54^\circ$ ) [using  $(\phi, \rho)$ ].  $\alpha = 1.552\text{--}1.554$   $\beta = 1.558\text{--}1.559$   $\gamma = 1.572\text{--}1.573$   $2V(\text{meas.}) = 72^\circ$

**Cell Data:** *Space Group:*  $P\bar{1}$ .  $a = 5.233$   $b = 10.541$   $c = 6.962$   $\alpha = 106.9^\circ$   $\beta = 110.8^\circ$   $\gamma = 72.1^\circ$   $Z = 1$

**X-ray Powder Pattern:** Llallagua, Bolivia.  
9.82 (10), 6.38 (9), 4.20 (9), 3.18 (8), 2.85 (6), 2.58 (5), 4.91 (4)

Chemistry:	(1)	(2)
$\text{P}_2\text{O}_5$	29.58	29.70
$\text{SiO}_2$	0.02	
$\text{Al}_2\text{O}_3$	21.48	21.34
$\text{Fe}_2\text{O}_3$	0.60	
FeO	13.59	15.03
$\text{H}_2\text{O}^+$	18.07	
$\text{H}_2\text{O}^-$	16.08	
$\text{H}_2\text{O}$		33.93
Total	99.42	100.00

(1) Llallagua, Bolivia. (2)  $\text{FeAl}_2(\text{PO}_4)_2(\text{OH})_2 \cdot 8\text{H}_2\text{O}$ .

**Polymorphism & Series:** Dimorphous with metavauxite.

**Mineral Group:** Paravauxite group.

**Occurrence:** A rare mineral in hydrothermal tin veins (Llallagua, Bolivia); in complex granite pegmatites.

**Association:** Vauxite, metavauxite, wavellite, sigloite, crandallite, childrenite, quartz (Llallagua, Bolivia).

**Distribution:** From Llallagua, Potosí, Bolivia. At the Foote mine, Kings Mountain, Cleveland Co., North Carolina; from the Palermo #1 mine, near North Groton, Grafton Co., New Hampshire, USA. At Santa Eulalia, Chihuahua, Mexico. From Hagendorf, and in the Silbergrube quarry, near Waidhaus, Bavaria, Germany. In the Bendada pegmatite, near Guarda, Portugal. From the Leveäniemi mine, Svappavaara, near Kiruna, Sweden.

**Name:** From the Greek *para*, for *near*, and its chemical relation to *vauxite*.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 112735, 136012, R5467.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 972–973. (2) Hurlbut, C.S., Jr. and R. Honea (1962) Sigloite, a new mineral from Llallagua, Bolivia. *Amer. Mineral.*, 47, 1–8. (3) Baur, W.H. (1969) The crystal structure of paravauxite,  $\text{Fe}^{2+}\text{Al}_2(\text{PO}_4)_2(\text{OH})_2(\text{OH}_2)_6 \cdot 2\text{H}_2\text{O}$ . *Neues Jahrb. Mineral., Monatsh.*, 430–433.

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