

Zapatalite

$\text{Cu}_3\text{Al}_4(\text{PO}_4)_3(\text{OH})_9 \cdot 4\text{H}_2\text{O}$

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Crystal Data: Tetragonal. *Point Group:* n.d. Massive, as botryoidal crusts and filling cavities.

Physical Properties: *Cleavage:* {001}, good. *Tenacity:* Sectile or gummy. Hardness = 1.5
D(meas.) = 3.016(26). D(calc.) = 3.017

Optical Properties: Semitransparent. *Color:* Pale blue to turquoise-blue. *Streak:* Paler blue.
Luster: [Dull.]

Optical Class: Uniaxial (-), may be biaxial. *Pleochroism:* Weak; in shades of pale green.

Absorption: $E > O$. $\omega = 1.646$ $\epsilon = 1.635$ $2V(\text{meas.}) = \text{Small to moderate}$.

Cell Data: *Space Group:* n.d. $a = 15.223$ $c = 11.518$ $Z = 6$

X-ray Powder Pattern: Cerro Morita, Mexico.

7.617 (100), 11.60 (99), 5.754 (73), 6.817 (69), 3.042 (48), 2.531 (45), 4.584 (44)

Chemistry:

	(1)	(2)
P_2O_5	25.63	26.33
Al_2O_3	23.98	25.22
Fe_2O_3		
CuO	31.85	29.51
ZnO		
H_2O	18.54	18.94
Total	[100.00]	100.00

(1) Cerro Morita, Mexico; average of two analyses, recalculated to 100%; corresponds to $\text{Cu}_{3.23}\text{Al}_{3.80}(\text{PO}_4)_{2.93}(\text{OH})_{9.23} \cdot 3.70\text{H}_2\text{O}$. (2) $\text{Cu}_3\text{Al}_4(\text{PO}_4)_3(\text{OH})_9 \cdot 4\text{H}_2\text{O}$.

Occurrence: A secondary mineral in the oxidized zone of a hydrothermal base-metal prospect in silicified brecciated limestone.

Association: Libethenite, pseudomalachite, chrysocolla.

Distribution: In a prospect pit at the northwest end of Cerro Morita, about 27 km southwest of Agua Prieta, Sonora, Mexico. At Battle Mountain, Lander Co., Nevada, USA. From the Miguel Vacas mine, Villa Viçosa, near Estremoz, Portugal.

Name: To honor Emiliano Zapata (1879–1919), Mexican revolutionary.

Type Material: The Natural History Museum, London, England, 1972,174; National Museum of Natural History, Washington, D.C., USA, 135060.

References: (1) Williams, S.A. (1972) Zapatalite, a new mineral from Sonora, Mexico. *Mineral. Mag.*, 38, 541–544. (2) (1972) *Amer. Mineral.*, 57, 1911–1912 (abs. ref. 1).