

Charlesite **$\text{Ca}_6(\text{Al, Si})_2(\text{SO}_4)_2\text{B}(\text{OH})_4(\text{OH, O})_{12} \cdot 26\text{H}_2\text{O}$**

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Crystal Data: Hexagonal. *Point Group:* $3m$ (probable). Crystals are tabular $\{0001\}$, dominated by $\{10\bar{1}4\}$, to 6 mm, may be rounded.

Physical Properties: *Cleavage:* Perfect on $10\bar{1}0$. *Tenacity:* Brittle. Hardness = ~ 2.5
 $D(\text{meas.}) = 1.77$ $D(\text{calc.}) = 1.79$ Pale violet or pale green fluorescence under SW UV, weaker under LW UV.

Optical Properties: Transparent, may appear opaque due to surficial alteration.
Color: Colorless, white, pale yellow, pale pink. *Streak:* White. *Luster:* Vitreous to dull.
Optical Class: Uniaxial (-). $\omega = 1.492(3)$ $\epsilon = 1.475(3)$

Cell Data: *Space Group:* $[P31c]$ (by analogy to ettringite). $a = 11.16(1)$ $c = 21.21(3)$
 $Z = 2$

X-ray Powder Pattern: Franklin, New Jersey, USA.
9.70 (100), 5.58 (80), 3.855 (80), 2.749 (70), 2.538 (70), 2.193 (70), 2.133 (50)

Chemistry:	(1)
	SO_3 12.8
	SiO_2 3.1
	B_2O_3 3.2
	Al_2O_3 5.1
	CaO 27.3
	H_2O 48.6
	Total 100.1

(1) Franklin, New Jersey, USA; corresponds to $\text{Ca}_{5.94}(\text{Al}_{1.22}\text{Si}_{0.63})_{\Sigma=1.85}(\text{SO}_4)_{1.95}[\text{B}(\text{OH})_4]_{1.12}[(\text{OH})_{10.97}\text{O}_{1.03}]_{\Sigma=12.00} \cdot 25.16\text{H}_2\text{O}$.

Mineral Group: Ettringite group.

Occurrence: Very rare, coating fractures and vugs in a metamorphosed stratiform zinc deposit.

Association: Clinohedrite, ganophyllite, xonotlite, pectolite, prehnite, "Mn-chlorite", roebbingite, willemite, datolite.

Distribution: From Franklin, Sussex Co., New Jersey, USA.

Name: Honors Dr. Charles Palache (1869–1954), eminent American crystallographer and mineralogist, Harvard University, Cambridge, Massachusetts, USA.

Type Material: Harvard University, Cambridge, Massachusetts, 107733; National Museum of Natural History, Washington, D.C., USA, 148689, C6247, C6401.

References: (1) Dunn, P.J., D.R. Peacor, P.B. Leavens, and J.L. Baum (1983) Charlesite, a new mineral of the ettringite group, from Franklin, New Jersey. *Amer. Mineral.*, 68, 1033–1037.