Conichalcite

CaCu(AsO₄)(OH)

Crystal Data: Orthorhombic. Point Group: 222. Rarely as euhedral crystals, equant to short prismatic along [010], to 3 mm, terminated by many forms, both left- and right-handed; typically in radial fibrous aggregates, as botryoidal to reniform crusts, massive. Twinning: Rare on {001}.


Optical Properties: Subtranslucent. Color: Grass-green to yellowish green, pistachio-green, emerald-green; in transmitted light, pale green to yellowish green, commonly zoned. Streak: Green. Luster: Vitreous to somewhat greasy. Optical Class: Biaxial (+), may be biaxial (-), commonly zoned. Pleochroism: X = colorless to green; Y = pale greenish to yellow-green; Z = pale bluish to blue-green. Orientation: X = c; Y = b; Z = a. Dispersion: r > v, strong, to r < v, moderate. α = 1.778–1.800 β = 1.795–1.831 γ = 1.801–1.846 2V(meas.) = 0°–90°

Cell Data: Space Group: P2₁2₁2₁. a = 7.38–7.40 b = 9.21–9.24 c = 5.82–5.84 Z = 4

X-ray Powder Pattern: Higgins mine, Bisbee, Arizona, USA. 2.84 (10), 2.59 (10), 3.14 (9), 1.609 (7), 1.720 (6), 4.10 (5), 2.56 (5)

Chemistry:

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\begin{align*}
P_2O_5 & \quad 8.81 & \quad 1.4 & \quad \text{ZnO} & \quad 0.7 \\
As_2O_5 & \quad 30.68 & \quad 42.6 & \quad 44.27 & \quad \text{CaO} & \quad 21.36 & \quad 21.6 & \quad 21.61 \\
V_2O_5 & \quad 1.78 & \quad \text{H}_2O & \quad 5.61 & \quad [3.6] & \quad 3.47 \\
\text{CuO} & \quad 31.76 & \quad 30.1 & \quad 30.65 & \quad \text{Total} & \quad 100.00 & \quad [100.0] & \quad 100.00
\end{align*}
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(1) Hinojosa de Córdoba, Spain. (2) Higgins mine, Bisbee, Arizona, USA; by electron microprobe, H₂O by difference. (3) CaCu(AsO₄)(OH).

Polymorphism & Series: Forms three series; with austinite, with cobaltaustinite, and with tangeite.

Mineral Group: Adelite group.

Occurrence: An uncommon secondary mineral in the oxidized zone of copper deposits, typically an alteration product of enargite.

Association: Austinite, olivenite, clinoclase, libethenite, chenevixite, brochantite, malachite, azurite, jarosite, “limonite”.

Distribution: Many minor occurrences. Some providing good specimens include: from Hinojosa de Córdoba, Andalusia, Spain. In England, at Wheal Kendall, St. Hilary, and the Hingston Down quarry, Calstock, Cornwall; from Caldbeck Fells, Cumbria. In the USA, at the American Eagle and a number of other mines in the Tintic district, Juab Co., and in the Gold Hill mine, Tooele Co., Utah; from Bisbee, Cochise Co., Arizona; in the Bristol mine, Lincoln Co., and the Empire-Nevada mine, Yerington, Lyon Co., Nevada. From the Ojuela mine, Mapimí, Durango, Mexico. At Collahuasi, Tarapacá, Chile. From the Guchab mine, near Otavi, and at Tsumeb, Namibia.

Name: From the Greek for lime and copper, as both elements are essential to the composition.

Type Material: Mining Academy, Freiberg, Germany, 21297.