

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$ or $mm2$. As bent, scaly crystals flattened on [001] to 0.080 mm; in spherical aggregates to 0.3 mm.

Physical Properties: *Cleavage:* Perfect on {001}. *Tenacity:* Flexible. *Hardness* = 2-2.5
D(meas.) = 3.2(2) D(calc.) = 3.356

Optical Properties: Transparent. *Color:* Pale blue to greenish blue; colorless in transmitted light.
Streak: Very pale blue. *Luster:* Vitreous.
Optical Class: Biaxial (-). $a = 1.642(2)$ $\beta = \gamma = 1.644(2)$ $2V(\text{meas.}) = 10(8)^\circ$ $2V(\text{calc.}) = 0^\circ$
Orientation: $X = c$.

Cell Data: *Space Group:* Pbn , $Pbam$, or $Pba2$. $a = 10.01(1)$ $b = 8.199(5)$ $c = 22.78(1)$
 $Z = 4$

X-ray Powder Pattern: Christiana no. 132 mine, Kamareza, Laurion District, Attika, Greece.
22.8 (100), 5.01 (90), 2.780 (70), 11.36 (60), 3.38 (50), 2.503 (50), 2.682 (30)

Chemistry:	(1)
MgO	0.17
CaO	17.48
FeO	0.12
CuO	16.28
Al ₂ O ₃	10.61
P ₂ O ₅	0.89
As ₂ O ₅	45.45
SO ₃	1.39
<u>H₂O</u>	<u>7.61</u>
Total	100.00

(1) Christiana no. 132 mine, Kamareza, Laurion District, Attika, Greece; average of 4 electron microprobe analyses, H₂O by difference, IR confirms OH and H₂O, corresponding to $\text{Ca}_{2.94}\text{Cu}^{2+}_{1.93}\text{Al}_{1.97}\text{Mg}_{0.04}\text{Fe}^{2+}_{0.02}[(\text{As}_{3.74}\text{S}_{0.16}\text{P}_{0.12})_{\Sigma=4.02}\text{O}_{16.08}](\text{OH})_{3.87} \cdot 2.05\text{H}_2\text{O}$.

Occurrence: In the oxidized portions of polymetallic sulfide-quartz veins.

Association: Arsenocrandallite, arsenogoyazite, conichalcite, olivenite, philipsbornite, azurite, malachite, carminite, beudantite, goethite, quartz, allophane.

Distribution: Christiana no. 132 mine, Kamareza, Laurion District, Attiki Prefecture (Attika), Greece.

Name: For the place of its first occurrence, the historically significant region, Attika, Greece.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow (catalog no. 3435/1).

References: (1) Chukanov, N.V., I.V. Pekov, and A.E. Zadov (2007) Attikaite, $\text{Ca}_3\text{Cu}_2\text{Al}_2(\text{AsO}_4)_4(\text{OH})_4 \cdot 2\text{H}_2\text{O}$, a new mineral. *Zap. Ross. Mineral. Obshch.*, 136(2), 17–24 (in Russian, English abstract); (2007) *Geology of Ore Deposits*, 49, 720–726 (in English).
(2) (2009) *Amer. Mineral.*, 94, 1076 (abs. ref. 1).