Attikaite $Ca_3Cu_2Al_2(AsO_4)_4(OH)_4 \cdot 2H_2O$

Crystal Data: Orthorhombic. *Point Group*: 2/*m* 2/*m* 2/*m* or *mm*2. 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 (-). $\alpha = 1.642(2)$ $\beta = \gamma = 1.644(2)$ 2V(meas.) = 10(8)° 2V(calc.) = 0°
Orientation: $X = c$.

Cell Data: *Space Group*: *Pban*, *Pbam*, or *Pba*2. $a = 10.01(1)$ $b = 8.199(5)$ $c = 22.78(1)$
$Z = 4$

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_2O_3	10.61
P_2O_5	0.89
As_2O_5	45.45
SO_3	1.39
H_2O	7.61
Total	100.00

(1) Christiana no. 132 mine, Kamareza, Laurion District, Attika, Greece; average of 4 electron microprobe analyses, H_2O by difference, IR confirms OH and H_2O, corresponding to $Ca_{2.94}Cu^{2+}_{1.93}Al_{1.97}Mg_{0.04}Fe^{2+}_{0.02}[(As_{3.74}S_{0.16}P_{0.12})_{\Sigma=4.02}O_{16.08}](OH)_{3.87} \cdot 2.05H_2O$.

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, $Ca_3Cu_2Al_2(AsO_4)_4(OH)_4 \cdot 2H_2O$, 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).