Lévyclaudite $Pb_8Cu_3Sn_7(Bi, Sb)_3S_{28}$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. Crystals platy on {100}, to 300 μm.
Twinning: Observed in X-ray analysis.

Physical Properties: *Cleavage*: Perfect on {100}. *Fracture*: n.d. *Tenacity*: n.d.
Hardness = 2.5-3 VHN = 80-87, 83 average (25 g load). D(meas.) = n.d. D(calc.) = 6.04
D(calc.) = 5.71 (synthetic).

Optical Properties: Opaque. *Color*: In reflected light, gray. *Streak*: Black. *Luster*: Metallic.
Optical Class: *Anisotropism*: Strong, with orange tints. *Pleochroism*: Weak.
R_1-R_2: (470) 35.8-34.2, (546) 34.0-32.5, (589) 33.1-31.6, (650) 32.1-30.5

Cell Data: *Space Group*: $P\bar{1}$. pseudo-tetragonal sub-cell (Q type) a = 11.84(1) b = 5.825(10) c = 5.831(10) β = 92.6(2)° Z = 2; pseudo-hexagonal sub-cell (H type) a = 11.84(1) b = 3.67(1) c = 6.31(1) β = 92.6(2)° Z = 2

X-ray Powder Pattern: Aghios Philippos Pb-Zn deposit, Kirki district, Greece.
3.93 (100), 2.92 (100), 4.06 (30), 2.82 (30), 2.068 (30), 3.17 (20), 2.95 (20)

Chemistry:

	(1)	(2)
Pb	40.24	40.26
Sn	18.88	20.19
Cu	4.38	4.63
Bi	12.16	10.15
Sb	1.95	2.96
S	21.40	21.81
Total	99.01	100.00

(1) Aghios Philippos Pb-Zn deposit, Kirki district, Greece; average of 22 electron microprobe analyses; corresponds to $Pb_{8.14}Sn_{6.64}Cu_{2.89}(Bi_{2.44}Sb_{0.67})_{\Sigma=3.11}S_{28}$. (2) $Pb_8Sn_7Cu_3Bi_2SbS_{28}$.

Polymorphism & Series: Isomorphism with cylindrite.

Occurrence: In a vein in a Pb-Zn deposit.

Association: Pyrite, sphalerite, kirkiite, galena, tennantite, kestérite.

Distribution: From a drill hole in the Aghios Philippos Pb-Zn deposit, Kirki district, Greece.

Name: Honors Dr. Claude Lévy (France), University of Paris, in recognition of his contribution to the mineralogy of complex sulfides.

Type Material: School of Mines, Paris, France and at the University of Copenhagen, Denmark.

References: (1) Moelo, Y., E. Makovicky, S. Karup-Moller, B. Cervelle, and C. Maurel (1990) La lévyclaudite, $Pb_8Sn_7Cu_3(Bi,Sb)_3S_{28}$, une nouvelle espèce à structure incommensurable, de la série de la cylindrite. Eur. J. Mineral., 2, 711-723. (2) Evain, M., V. Petricek, Y. Moëlo, and C. Maurel (2006) First (3+2)-dimensional superspace approach to the structure of lévyclaudite-(Sb), a member of the cylindrite-type minerals. Acta Crystallogr., B62, 775-789. (3) (2007) Amer. Mineral., 92(4), 706-707 (abs. ref. 2).