

Crystal Data: Orthorhombic. *Point Group:* mm2. As tabular crystals, flattened on {010} and striated along [100]; sometimes grouped into sheaf-like aggregates to 0.8 mm.

Twinning: Interpenetrated cruciform twins typical, most probably on either (101) or (011).

Physical Properties: *Cleavage:* Perfect on {010}, good on {100}. *Tenacity:* Brittle.

Hardness = ~ 4 D(meas.) = n.d. D(calc.) = 5.071 Weak, light-yellow fluorescence under SW UV.

Optical Properties: Transparent to translucent. *Color:* Colorless to white. *Streak:* White.

Luster: Adamantine.

Optical Class: Biaxial. $n(\text{calc.}) = 1.849$ $2V(\text{meas.}) = \sim 30^\circ$ *Dispersion:* $r > v$, strong.

Cell Data: *Space Group:* Pnn2. $a = 110376(2)$ $b = 11.505(2)$ $c = 6.5558(7)$ $Z = 4$

X-ray Powder Pattern: Asunción mine, Sierra Gorda, Atacama Desert, Chile.

4.04 (100), 2.84 (100), 5.71 (80), 2.019 (70), 3.29 (40), 2.55 (40), 1.877 (40)

Chemistry:	(1)	(2)
Cl	5.68	5.40
I	0.07	
PbO	65.54	67.95
CaO	0.06	
SrO	0.40	
SiO ₂	0.15	
B ₂ O ₃	26.73	26.50
H ₂ O	[1.34]	1.37
<u>- O = (Cl,I)</u>	<u>1.29</u>	<u>1.22</u>
Total	98.68	100.00

(1) Asunción mine, Sierra Gorda, Atacama Desert, Chile; average of 23 electron microprobe analyses, B by PIGE, H₂O from stoichiometry; corresponds to (Pb_{1.967}Sr_{0.026}Ca_{0.007})_{Σ=2.000} (B_{4.983}Si_{0.017})_{Σ=5.000}(Cl_{1.073}I_{0.004})_{Σ=1.077}O_{8.971}·0.5H₂O. (2) Pb₂[B₅O₉]Cl·0.5H₂O.

Mineral Group: Hilgardite group.

Occurrence: A secondary mineral by the interaction of evaporitic brines within the oxidation zone of a base-metal deposit.

Association: Boleite, paralaurionite, caracolite, bindheimite, gypsum, penfieldite, challacolloite, schwartzembergite, cesanite, seeligerite.

Distribution: From the Asunción mine, Sierra Gorda, Atacama Desert, Caracoles District, Antofagasta Province, Chile.

Name: From the Greek “leukos” (white) and “stauros” (cross) in allusion to the white or transparent, colorless cruciform twinned crystals.

Type Material: Musée géologique cantonal, Lausanne, Switzerland (MGL 90000).

References: (1) J. Brugger, N. Meisser, S. Ansermet, S.V. Krivovichev, V. Kahlenberg, D. Belton, and C.G. Ryan (2012) Leucostaurite, Pb₂[B₅O₉]Cl·0.5H₂O, from the Atacama Desert: The first Pb-dominant member of the hilgardite group, and micro-determination of boron in minerals by PIGE. *Amer. Mineral.*, 97, 1206-1212.