Leucostaurite $Pb_2[B_5O_9]Cl{\cdot}0.5H_2O$

Crystal Data: Orthorhombic. *Point Group: mm*2. 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*(calc.) = 1.849 2V (meas.) = ~ 30° *Dispersion*: *r* > *v*, strong.

Cell Data: *Space Group: Pnn*2. *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_2O_3	26.73	26.50
H_2O	[1.34]	1.37
– O = (Cl,I)	1.29	1.22
Total	98.68	100.00

(1) Asunción mine, Sierra Gorda, Atacama Desert, Chile; average of 23 electron microprobe analyses, B by PIGE, H_2O from stoichiometry; corresponds to $(Pb_{1.967}Sr_{0.026}Ca_{0.007})_{\Sigma=2.000}(B_{4.983}Si_{0.017})_{\Sigma=5.000}(Cl_{1.073}I_{0.004})_{\Sigma=1.077}O_{8.971}{\cdot}0.5H_2O$. (2) $Pb_2[B_5O_9]Cl{\cdot}0.5H_2O$.

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, $Pb_2[B_5O_9]Cl{\cdot}0.5H_2O$, 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.