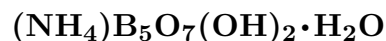


**Larderellite**

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**Crystal Data:** Monoclinic. *Point Group:* 2/m. Crystals are rhombic, flattened on {001}, to 0.1 mm; typically powdery.

**Physical Properties:** *Cleavage:* On {100}, {010}, perfect. *Hardness* = n.d.  
D(meas.) = 1.905(4) D(calc.) = 1.887

**Optical Properties:** Semitransparent. *Color:* White, pale yellow if impure.  
*Optical Class:* Biaxial (+). *Orientation:* Y = b; Z ∧ c ≈ 15°. *Dispersion:* r > v or r < v.  
α = 1.493(1) β = 1.509(1) γ = 1.561(1) 2V(meas.) = 58°

**Cell Data:** *Space Group:* P2<sub>1</sub>/a. a = 11.63–11.65 b = 7.615–7.63 c = 9.447–9.47  
β = 96°45'–97°05' Z = 4

**X-ray Powder Pattern:** Larderello, Italy.  
4.70 (100), 2.921 (100), 2.887 (100), 5.44 (71), 2.960 (71), 9.45 (50), 5.12 (50)

<b>Chemistry:</b>	(1)	(2)
B <sub>2</sub> O <sub>3</sub>	71.64	68.49
(NH <sub>4</sub> ) <sub>2</sub> O	9.93	10.24
H <sub>2</sub> O	[18.43]	21.27
Total	[100.00]	100.00

(1) Larderello, Italy; average of four analyses, H<sub>2</sub>O by difference. (2) (NH<sub>4</sub>)B<sub>5</sub>O<sub>7</sub>(OH)<sub>2</sub>•H<sub>2</sub>O.

**Occurrence:** In boric-acid-rich fumarolic lagoons.

**Association:** Sassolite, ammonioborite, santite.

**Distribution:** From Larderello, Val di Cecina, Tuscany, Italy.

**Name:** Honoring Francesco de Larderel (1848–1925), principal operator of the Tuscan borax works.

**Type Material:** Natural History Museum, Paris, France, 100.1384, 100.1386, 100.1388.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 365–366. (2) Clark, J.R. (1960) X-ray crystallography of larderellite, NH<sub>4</sub>B<sub>5</sub>O<sub>6</sub>(OH)<sub>4</sub>. Amer. Mineral., 45, 1087–1093. (3) Merlino, S. and F. Sartori (1969) The crystal structure of larderellite, NH<sub>4</sub>B<sub>5</sub>O<sub>7</sub>(OH)<sub>2</sub>•H<sub>2</sub>O. Acta Cryst., 25, 2264–2270.