

**Crystal Data:** Orthorhombic. *Point Group:* *mm*2. Anedral crystals, to 0.06 mm, typically in aggregates; as an efflorescent crust.

**Physical Properties:** Hardness = n.d. *D*(meas.) = n.d. *D*(calc.) = 1.74 Soluble in H<sub>2</sub>O.

**Optical Properties:** Transparent. *Color:* Colorless.

*Optical Class:* Biaxial (+). *Orientation:* *X* = *c*; *Y* = *b*; *Z* = *a*.  $\alpha = 1.422(2)$   $\beta = 1.435(2)$   
 $\gamma = 1.480(1)$   $2V(\text{meas.}) = 70^\circ$

**Cell Data:** *Space Group:* *Aba*2. *a* = 11.10(2) *b* = 11.18(2) *c* = 9.08(2) *Z* = 4

**X-ray Powder Pattern:** Synthetic.

3.36 (100), 3.52 (84), 5.60 (71), 2.767 (50), 2.181 (21), 3.28 (18), 5.93 (15)

**Chemistry:** (1) Larderello, Italy; partial analysis of a mixture was estimated to contain larderellite 66%, santite 25%, sassolite 9%; identification depends on agreement of optics, X-ray powder pattern, and unit cell size with synthetic material.

**Occurrence:** Very rare, formed in fumaroles, probably a product of reaction between potassium-rich solutions and larderellite (Larderello, Italy); as a deposit around a thermal spring (Eagle Borax Spring, California, USA).

**Association:** Larderellite, sassolite (Larderello, Italy); aristarainite, hydroboracite, kaliborite, mcallisterite, pinnoite, rivadavite (Eagle Borax Spring, California, USA).

**Distribution:** From Larderello, Val di Cecina, Tuscany, Italy. In the USA, at the Eagle Borax Spring, Furnace Creek district, Death Valley, Inyo Co., California.

**Name:** Honors Giorgio Santi (1746–1822), Italian chemist and Director, Museum of Natural History, University of Pisa, Pisa, Italy.

**Type Material:** Mineralogical Museum, University of Pisa, Pisa, Italy.

**References:** (1) Merlino, S. and F. Sartori (1970) Santite, a new mineral phase from Larderello, Tuscany. *Can. Mineral.*, 27, 159–165. (2) (1971) *Amer. Mineral.*, 56, 636 (abs. ref. 1). (3) Cook, W.R., Jr. and H. Jaffe (1957) The crystallographic, elastic, and piezoelectric properties of ammonium pentaborate and potassium pentaborate. *Acta Cryst.*, 10, 705–707. (4) Clark, J.R. and C.L. Christ (1959) Studies of borate minerals (VII): X-ray studies of ammonioborite, larderellite, and the potassium and ammonium pentaborate tetrahydrates. *Amer. Mineral.*, 44, 1150–1158.