Ramanite-(Cs) $CsB_5O_6(OH)_4 \cdot 2H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As platy crystals to 20 μm in fluid and melt inclusions.

Physical Properties: *Cleavage*: n.d. *Tenacity*: n.d. *Fracture*: n.d. Hardness = n.d. D(meas.) = n.d. D(calc.) = 2.230 Highly soluble in water.

Optical Properties: [Transparent]. *Color*: Colorless. *Streak*: n.d. *Luster*: n.d. *Optical Class*: [Biaxial]. *n*(meas.) = ~1.520 *n*(calc.) = n.d.

Cell Data: *Space Group*: *C*2/*c*. $a = 8.130(2)$ $b = 12.045(3)$ $c = 11.792(3)$ $\beta = 93.34°$

X-ray Powder Pattern: Il Prado vein, Island of Elba, Italy.
6.023 (100), 3.366 (83), 3.278 (53), 2.943 (49), 3.321 (33), 4.210 (31), 5.886 (29)

Chemistry: Identity confirmed by concurrence of Raman spectra with synthetic β-cesium pentaborate tetrahydrate ($CsB_5O_8 \cdot 4H_2O$).

Occurrence: As daughter minerals in melt and fluid inclusions.

Association: Sassolite, ramanite-(Rb), santite, topaz, boron-rich silicate glass, boric acid-saturated liquid.

Distribution: From the Il Prado vein (also known as Prato alla Valle), 400 m south of the cemetery of the village of San Pietro, Campo, Island of Elba, Italy [TL]; in the Ehrenfriedersdorf pegmatite, in topaz of the Wolfsgrün pegmatite from the Eibenstock granite, W-Erzgebirge, Germany; in smoky quartz from the Malkhan pegmatite, Transbaikalia, Russia; in hambergite from the Mika pegmatite, Rangkul pegmatite field, eastern Pamirs, Tajikistan; and a solid-solution series of $(Rb,K)B_5O_8 \cdot 4H_2O$ in topaz from Gross Spitzkoppe, Namibia. Likely more common in boron-rich pegmatites.

Name: Honors Indian physicist, Sir Chandrasekhara Venkata *Raman* (1888-1970) recipient of a Nobel Prize in Physics in 1930 for discovering the effect that bears his name and is the basis for Raman spectroscopy, an important method for the identification of minerals. A suffix indicates the dominant rare earth element.

Type Material: Museum, Mining Academy Freiberg, Germany (81615).

References: (1) Thomas, R., P. Davidson, and A. Hahn (2008) Ramanite-(Cs) and ramanite-(Rb): New cesium and rubidium pentaborate tetrahydrate minerals identified with Raman spectroscopy. Amer. Mineral., 93, 1034-1042.