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**Compressibility of Epistilbite  $\text{CaAl}_2\text{Si}_6\text{O}_{16}\cdot 5(\text{H}_2\text{O})$**

C. David Martin (SUNY, Stony Brook), Yongjae Lee (NSLS, BNL), Thomas Vogt (NSLS, BNL), John B. Parise (SUNY, Stony Brook)

Beamline(s): X7A

**Introduction:** Since the discovery of pressure-induced super-hydration in natrolite [Lee et al. 2001], interest has convened on other zeolite types that might demonstrate an increase in unit cell volume upon compression. Like natrolite, epistilbite has large open framework channels [Perrotta 1967].

**Methods and Materials:** High-resolution x-ray powder diffraction patterns were collected at a wavelength of .68392(5) angstroms using a position-sensitive detector with a spatial resolution of less than 50 microns. The 200 micron beam was obtained using a Si 220 focusing monochromator. A 16:4:1 methanol + ethanol + water solution was used as a pressure transmitting medium and pressure was calibrated using the ruby fluorescence scale.

**Results:** Six diffraction patterns collected up to 3.16 GPa record a steady decrease in unit cell volume as pressure is increased. Rietveld analysis indicates epistilbite remains monoclinic in space group C2 throughout all pressures reached in this experiment. Bulk modulus was obtained by plotting normalized pressure (F) vs. strain (f) see Hienz and Jeanloz (1984) and a preliminary value of bulk modulus is estimated at 15.8 GPa by fitting a straight line to data points on the F vs, f plot.

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**References:**

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