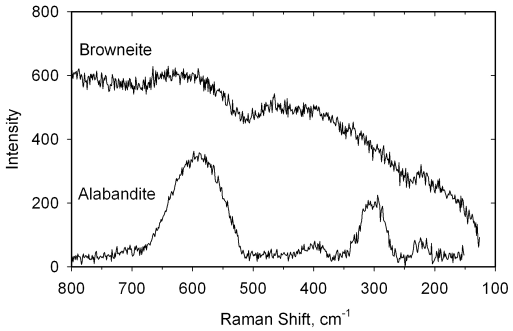
Electronic Supplement

Raman micro-analysis of browneite was carried out using a Renishaw M1000 micro-Raman spectrometer system and a 514.5 nm laser with the methods described in Ma and Rossman (2008, 2009), but using only 25% laser power (1.5 mW at the sample) to avoid the possibility of decomposition of the type (and only) sample [see Ma et al. (2012) for an example of sulfide decomposition at higher power]. The browneite spectrum is of comparatively low intensity but it does show a hint of very weak Raman features at ~220 and around 600 cm^{-1}, as shown in Figure 4. A Raman spectrum from terrestrial alabandite obtained under the same instrumental conditions (Deposited Fig. 1) is also fairly weak but there is a clear peak centered at ~600 cm^{-1}, where browneite may also have a feature, and another around 300 cm^{-1} for which we can discern no corresponding expression in the browneite spectrum.



Deposited Figure 1. Raman spectra of the type browneite and alabandite from the Trench Mine, Harshaw, Santa Cruz County, Arizona run under the same instrumental conditions. Both spectra were corrected for weak artifacts arising from the glass optics in the instrument. The Raman intensities of both phases are comparatively weak.