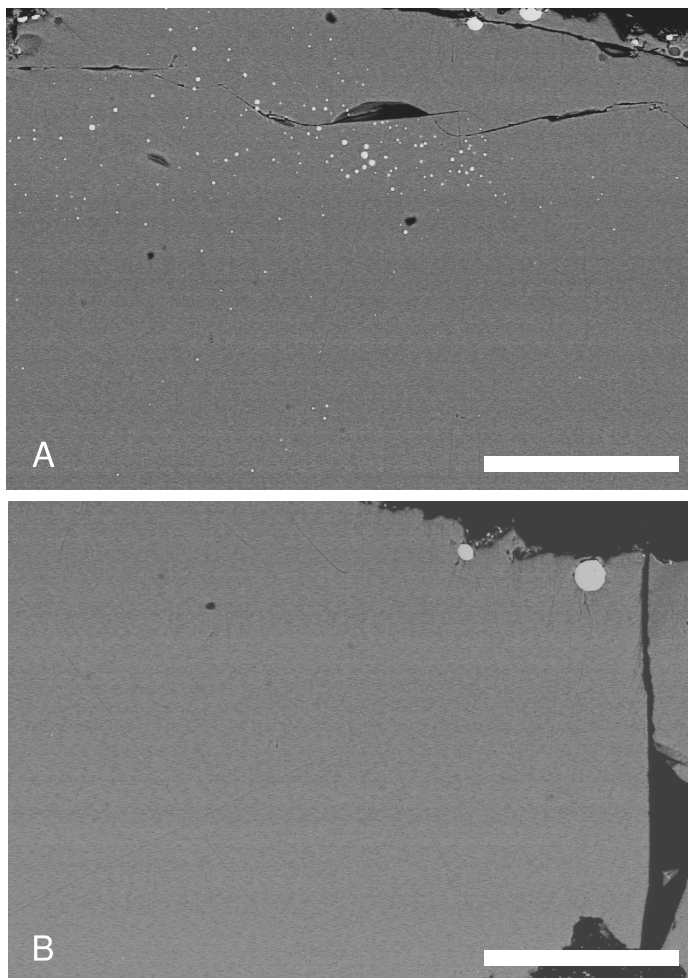


**FIGURE A-1.** Representative examples of the Raman spectra that we obtained to quantify H<sub>2</sub>O using the method as described in the text. The spectra are corrected and baseline subtracted. Although some structure is visible in the low wavenumber regions corresponding to the silicate structure, we are unable to determine from this data the relative intensities of peaks known to be related to S bonds (i.e. sulfate at 990 cm<sup>-1</sup>, sulfide at 372 and 2574 cm<sup>-1</sup>; Klimm et al. 2012). We note the increase in intensity of a peak at 1080 cm<sup>-1</sup> with increasing alkalinity.



**FIGURE A-2.** Backscattered electron images of glasses from experiments (a) P470 (RD0K), and (b) P474 (RD6K), showing the different sizes and generally circular shape of sulfide droplets typical of the run products from this study. The white scale bar in both images represents 100  $\mu\text{m}$ .