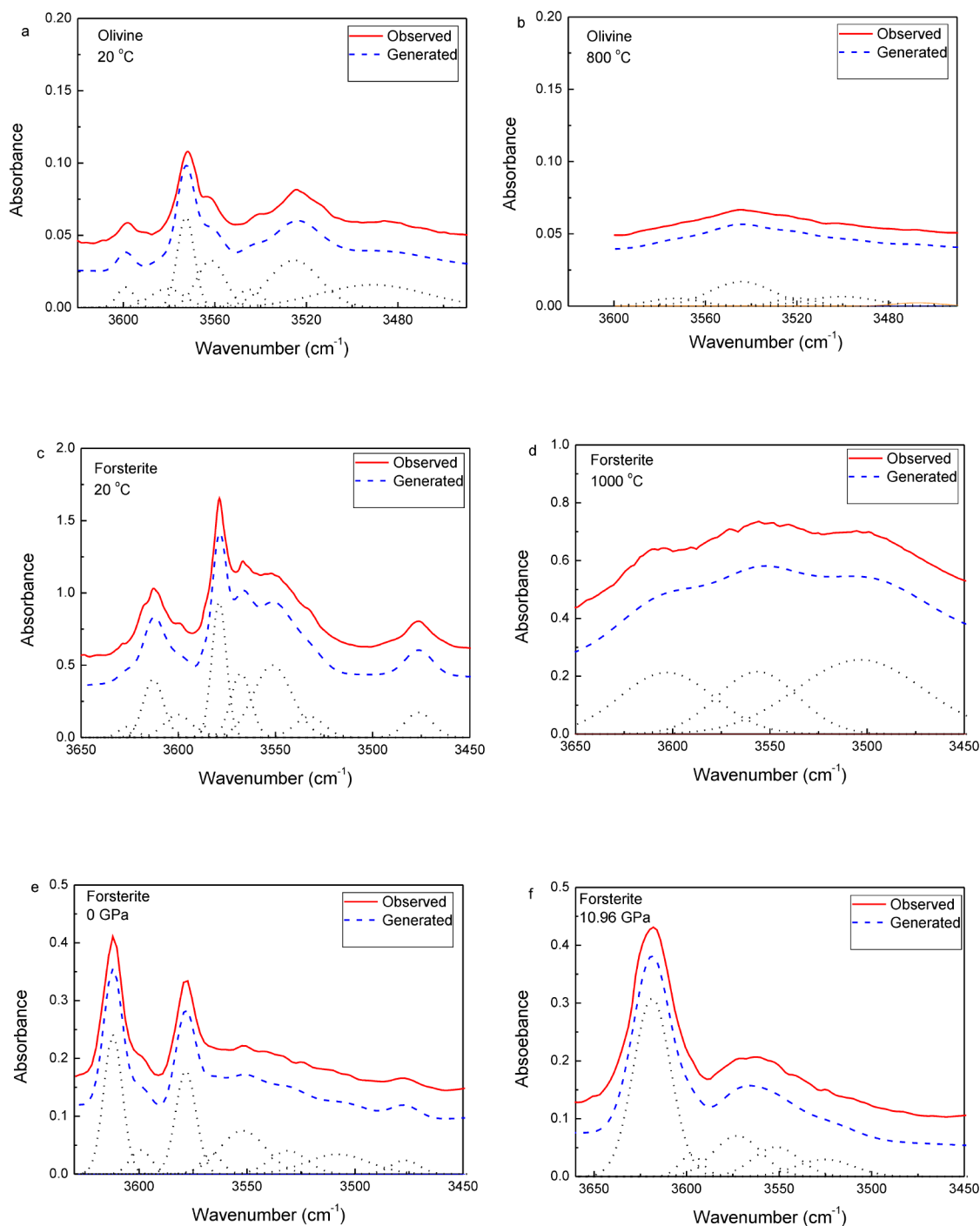
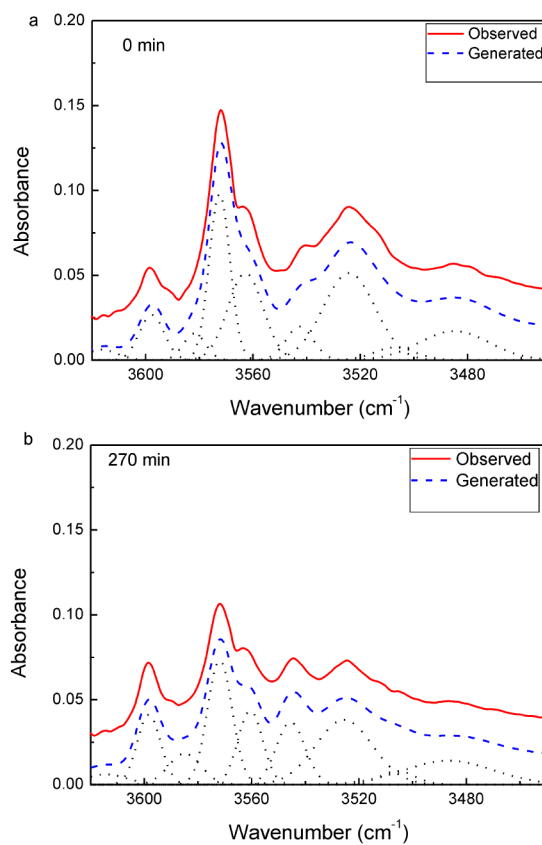


**SUPPLEMENTAL FIGURE S1.** IR spectrum of the natural olivine in DAC at ambient conditions.



**SUPPLEMENTAL FIGURE S2.** Examples of deconvolution of the spectra for olivine and forsterite at ambient conditions and at high temperature/pressure, respectively: the red solid lines are spectra observed, the blue dashed lines and black dotted lines are generated and deconvoluted peaks.



**SUPPLEMENTAL FIGURE S3.** Examples of deconvolution of the spectra of olivine before and after annealing at 800 °C: the red solid lines are spectra observed, the blue dashed lines and black dotted lines are generated and deconvoluted peaks.