SUPPLEMENTARY MATERIAL -Appendix S1

Raman measurements

Micro-Raman scattering measurements were conducted at the department of Earth, Environmental and Life sciences of the University of Genova (Italy) with a Horiba Jobin-Yvon Explora_Plus single monochromator spectrometer equipped with an Olympus BX41 microscope and a Peltier-cooled CCD detector. Raman spectra were excited using the 532 nm line emitted from a YAG solid-state laser and collected via a 50x LWD objective (N.A. 0.5) and a grating of 2400 gr/mm. The nominal spatial resolution at the sample surface was ~1 μm while the spectral resolution was ~2 cm^{-1}. The spectrometer was calibrated to the silicon Raman peak at 520.5 cm^{-1}. Raman spectra were collected in the spectral range between 100 and 4000 cm^{-1} with an acquisition time of 20-30 s averaged over 3 accumulations.

Raman spectra were baseline corrected using the software Origin-Pro® to account for the photoluminescence background.

Chalcedony can be described as an ensemble of fibrous sub-microscopic α-quartz grains [e.g. 65] and its Raman scattering profile is very close to that one of a quartz single crystal (Figure S1-a). However, the Raman spectrum of chalcedony generally shows broader Raman peaks due to the larger concentration of extended defects (i.e. grain boundaries). In addition, chalcedony may host up to 2 wt% of "water" in the form of either fluid inclusions and/or structurally bound hydroxyl groups [66]. In our samples, however, the Raman scattering signal arising from water molecules and /or OH groups vibrations were not detected (Figure S1-b) suggesting that water concentration in the structure of chalcedony is below 2 wt%.

References

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