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Dissolution of strontianite at high *P-T* conditions: An in-situ synchrotron X-ray fluorescence study

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ABSTRACT

In-situ measurements of the amount of dissolution of carbonate minerals at high pressures (up to 3.6 GPa) and temperatures (up to 523 K) are reported. Using an externally heated diamond anvil cell (DAC) and synchrotron X-ray fluorescence (SXRF), the extent of dissolution of strontianite ($SrCO_3$) has been followed as a function of time by monitoring the fluorescence of Sr cations in the fluid surrounding the crystal. This work demonstrates that Sr^{2+} concentrations as low as 1000 ppm can be detected and measured in-situ in a DAC, using a forward transmission geometry. The preliminary data presented here indicate that this technique has high potential for determining solution composition in high-pressure and high-temperature geochemical studies.