

EGU2020-3603

<https://doi.org/10.5194/egusphere-egu2020-3603>

EGU General Assembly 2020

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## Parameters controlling the incorporation of Cu in calcite

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Carbonate minerals record, through their chemical and isotopic composition, the environmental conditions occurring at the time of their formation. Thus, the incorporation of traces/impurities in CaCO<sub>3</sub> minerals calcite and aragonite, have been widely studied over the last five decades in order to provide the fundamental knowledge needed for the use of these traces in paleoenvironmental reconstructions. The processes controlling the uptake of traces in natural samples, however, are manifold and hard to distinguish from each other. Thus, experimental co-precipitation studies on synthetic material under strictly controlled abiotic conditions can provide fundamental understanding on the effect of each process involved in the chemical signatures of natural carbonates. In this study, we explore the incorporation of Cu in calcite and its potential as proxy of reactive fluid composition. This transition metal commonly occurs complexed with organic ligands in natural waters, however, it exhibits very high affinity for calcite. Our experiments were performed at pH 6.3 and 8.3, with varying growth rate ranging between 10<sup>-8.5</sup> and 10<sup>-7.6</sup> (mol/m<sup>2</sup>/s). Our first results highlight that the partitioning coefficient of Cu is positively correlated to the calcite growth rate at both pH conditions, indicating an increase of Cu entrapment at higher growth rate. These new preliminary findings could bring fundamental understanding of Cu incorporation in calcite and highlight the potential of Cu partitioning coefficient as a proxy of mineral growth rate.