



Experimental evidences of calcite dissolution by mixing of carbonate waters: preliminary results

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It is known that the mixing of carbonate solutions which are both saturated with respect to calcite can lead to either undersaturated or supersaturated conditions depending of the type of end-member solutions mixed. Further, dissolution could be produced if the original groundwaters have either different CO₂ partial pressures, salinity or temperature. These aspects of mixing are of considerable importance in explaining diagenetic processes in carbonate sediments and rocks. One of them is calcite dissolution of carbonate aquifers in the seawater intrusion mixing zone. In fact, many studies developed in such coastal environments have argued about the feasibility of these phenomena to explain field measurements and geochemical analysis. However, that theory has still not been quantitatively validated in laboratory or field experiments.

We present the preliminary results of a set of laboratory experiments involving mixing of carbonate-saturated waters of different salinities and CO₂ partial pressures at 25°C, in order to validate calcite dissolution. Experiments are performed at different mixing rates allowing the establishment of the dependency of calcite dissolution rate on mixing ratios and saturation index.