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Continued development of an injection strategy for homogenous calcium carbonate distribution by Sporosarcina pasteurii

With the current increase of carbon emissions, several techniques of mitigation are being explored. One of those methods is carbon sequestration in underground reservoirs. A potential problem associated with storing CO_2 underground is the possible leakage of the gas back into the atmosphere. This experiment investigated the implementation of ureolytically induced mineralization to plug cracks in caprock that would permit leakage. Specifically the purpose of this experiment was to gain further understanding of the importance of soluble oxygen during microbially induced mineralization. In this experiment such cracks were modeled with a two foot long tube filled with sand. A pulse procedure was practiced in which calcium about the inlet was displaced. Samples were collected at various points along the column to spatially resolve oxygen and calcium concentrations over time. The experiment also entailed both a growth phase and mineralization phase on a daily basis. This experiment was a success. Not only was the required amount of time for efficient calcium deposition determined, correlations between oxygen content and mineralization were also determined. This latest column experiment also had more efficient calcium deposition than all previous five column experiments.