A Geochemical and Experimental Evaluation of Geologic CO_2-SO_2 Co-Sequestration

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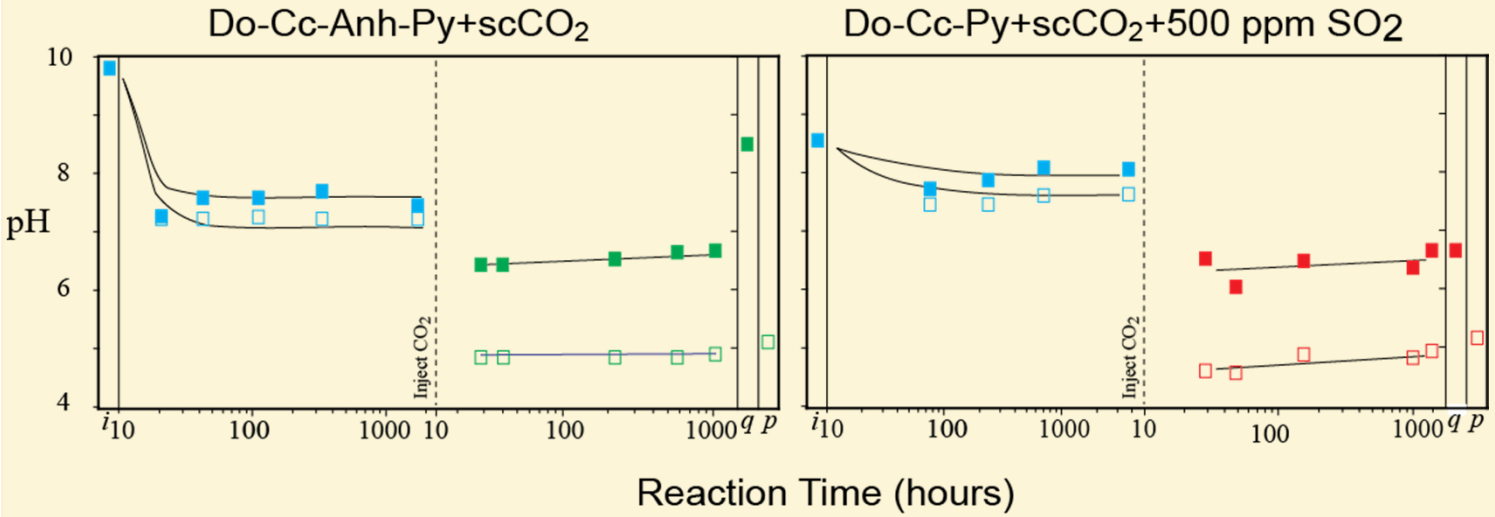

Calcite

A) Unreacted
B) Brine+rock reaction
C) Brine+rock+scCO$_2$ reaction
D) Brine+rock+scCO$_2$+500 ppm

Modeling studies hypothesize that co-injected SO_2 decreases pH in formation waters at least one unit more than acidification by CO_2 alone.

Hydrothermal experiments evaluate CO_2-SO_2-brine-rock reactions and processes in carbonate and siliclastic reservoirs.

Injection of supercritical CO_2 decreases pH, as expected from dissolution of CO_2 and creation of carbonic acid. Injection of supercritical CO_2 + 500 ppm SO_2 produces similar pH decrease.

Supercritical CO_2 and reservoir rock determine pH, co-injected SO_2 does not appreciably affect buffering capacity of the system.

Anhydrite precipitates in response to injection of supercritical CO_2-SO_2 and provides a mineral trap for sulfur.