



Alteration of casing cement and mudstones due to CO₂ sequestration

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Underground sequestration of CO₂ is a key technology to reduce the CO₂ emission to the atmosphere. In order to avoid possible leakage of the gas to the surface in the time scale of a few thousand years, we should understand how much CO₂ could alter the formation barrier such as the cap rocks and the casing cement. The purpose of this experimental research is to examine possible changes in mineral compositions and physical properties of such formation barrier when exposed to super critical CO₂ for a few months to years. Preliminary results on specimens that were immersed in super critical CO₂ for 3 months suggest that some visible changes in cement specimens and little change on mudstones. The cement specimens had some aragonite crystallization on the surface and in the pore space, which reduces porosity and permeability. This suggests the casing cement could upgrade the sealing ability during exposure to super critical CO₂.