

The evolution of gas dissociation species during sequestration of a CO₂/NO stream

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Separated CO₂ streams from industrial sources such as coal may contain variable quantities of impurities including SO_x, NO_x, and O₂ [1]. The speciation of NO_x dissolution products and their interaction with reservoir or cap-rock at carbon sequestration conditions is not well known. A series of batch experiments were performed with a CO₂/NO stream and a highly quartzose reservoir rock sample from a potential geosequestration site in the Surat Basin, Australia. Nitrate was found to preferentially form over nitrite. Reactions also revealed enhanced brine-rock interactions and a lower initial pH value compared to a pure CO₂ experiment. This work is part of a project on the feasibility of modifying Welldog's novel Downhole Reservoir Raman Spectroscopy (DRRS) tool to monitor in situ SO_x, NO_x and CO₂ dissolution species during CO₂ sequestration in Precipice Sandstone. Additional experiments with CO₂/SO₂ and Precipice Sandstone core are in progress to facilitate further calibration of the DRRS tool.

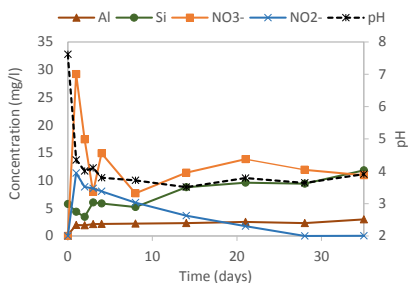


Fig 1: Water chemistry during reaction of Precipice Sandstone core (1165 m) with a low salinity brine and CO₂/50 ppm NO at 12 MPa and 60 °C.

[1] Talman (2015), *IJGGC*, 10.1016/.ijggc.2015.04.019.