

CO₂ Capture Processes Monitored with Noble Gas Measurements

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In the ICO₂P project [1] a monitoring scheme for carbon capture and storage is developed with the aim to use noble gases as signatures for capture products.

One approach to capture CO₂ is amine-based temperature swing absorption. During such processes there is a potential for depletion of radiogenic noble gases from the fossil source, due to the addition of a gas phase void of radiogenic noble gases. The influence on the noble gas fingerprints of such techniques is investigated by single, analysed samples with full isotope resolution. This is combined with in-line, continuous noble gas measurements with a portable mass spectrometer [2]. This is a new approach that will provide knowledge of the uniqueness and temporal variations of noble gas fingerprints in the product stream from CO₂ capture operations.

The feasibility of such an on-site measurement system was successfully tested at a CO₂ capture testing facility in Norway (TCM). Matching of the data with the reservoir source combusted at that time, forms the basis for setting up geochemical analytical schemes in mixing scenarios. Monitoring data from CO₂ product streams are key in designing leakage detection schemes for future storage sites.

[1] www.mn.uio.no/geo/english/research/projects/ico2p/

[2] Brennwald et al. (2016), *Environ. Sci. Technol.* 50, 13455-13463,