

Self-potential Monitoring Study for Geological Storage of CO₂ in AIST

*Yuji Nishi¹, Tsuneo Ishido¹

1.National Institute of Advanced Industrial Science and Technology (AIST), Geological Survey of Japan, Institute for Geo-Resources and Environment

An appropriate monitoring program is important for an CO₂ geological storage project to detecting subsurface changes within the reservoir, to provide for potential risk, and to improve the predictive capability of reservoir simulation. AIST have studied passive geophysical monitoring method to reduce the repetition of the expensive seismic sounding, especially in post-injection period (Nishi et al., 2015).

The self-potential (SP) method is mainly used in volcanic or geothermal field to delineate thermal anomaly from streaming potential generated by subsurface fluid flow. In CO₂ geological storage site, SP changes due to stream-potential might be a promising geophysical tool to monitor pressure changes in shallower levels (Ishido et al., 2009).

SP anomaly just around a well could be another important target for SP monitoring. As subsurface changes in geochemical condition might change the well-casing SP due to geo-battery effect (Ishido et al., 2013), simple surface SP monitoring could be an early warning alarm for CO₂ plume arrival to the well bottom.

In the presentation, some of our recent advances in SP monitoring & modeling will be summarized.

Keywords: monitoring, self-potential, geo-battery