

Induced seismicity potential of CCS

Victor Vilarrasa

Spanish National Research Council (CSIC)

Abstract

The feasibility of geologic carbon storage as an option to significantly reduce CO₂ emissions to the atmosphere has been questioned recently. It has been argued that the overpressure induced by CO₂ injection would reactivate faults through which CO₂ could migrate upwards, ruining the objective of permanently storing CO₂ deep underground. In this presentation, it will be shown that geologic carbon storage can be performed safely, i.e., without inducing seismic events that could reactivate faults and without compromising the caprock sealing capacity. A brief view of the CO₂ storage site at Pohang will be also given. Overall, we conclude that a proper site characterization and pressure management are required to achieve a safe CO₂ storage.

REFERENCES

- Vilarrasa, V., Carrera, J., Olivella, S., Rutqvist, J. and Laloui, L. (2019). Induced seismicity in geologic carbon storage. *Solid Earth*, 10(3): 871-892.
- Vilarrasa, V. and Rutqvist, J. (2017). Thermal effects on geologic carbon storage. *Earth-Science Reviews*, 165: 245-256.
- Vilarrasa, V., Makhnenko, R. and Gheibi, S. (2016). Geomechanical analysis of the influence of CO₂ injection location on fault stability. *Journal of Rock Mechanics and Geotechnical Engineering*, 8: 805-818
- Vilarrasa, V. and Carrera, J. (2015). Geologic carbon storage is unlikely to trigger large earthquakes and reactivate faults through which CO₂ could leak. *Proceedings of the National Academy of Sciences*, 112(19): 5938-5943.