

Geomechanical evaluation of CO₂ storage in a depleted chalk reservoir

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Abstract

When starting CO₂ injection into depleted chalk formations, that have experienced elastic and visco-plastic deformation during production, two main processes can occur simultaneously. Firstly, the reservoir compaction will continue due to viscous deformation even after the cessation of hydrocarbon production. Secondly, reservoir expansion is often expected as reservoir pressure builds up and effective stresses drops. This study investigates the safest scenarios for CO₂ injection, taking into consideration these two effects. The simulation uses experimental and well log data from Danish North Sea chalk. We evaluate the impact of various operational conditions on the long-term deformation of the CO₂ injection and storage site.