



Thermo-mechanical modelling of behaviour of rocks overlying a Underground Coal Gasification cavity

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Coal seams have a high potential for the permanent storage of CO₂. Coal seams however generally have a low permeability and an increase of permeability of the coals would significantly improve the injectivity and effectivity of CO₂ storage in coal seam reservoirs. Underground Coal Gasification (UCG) may be used to increase the permeability of coal seams. The underground gasification of coal and subsequent formation of a gasification cavity will induce both temperature and stress changes in the rocks overlying the UCG cavity. These changes will create fractures, which will improve the permeability of the overlying coal seams. The objective of the modelling described here is to understand the thermo-mechanical processes that take place in the overlying roof rocks of an UCG cavity. Both the finite element package of DIANA and the discrete particle flow code PFC are used to model the thermo-mechanical behaviour of the rocks. The research was performed within the framework of CO₂-Geonet and financed by the European Commission.