

current trends and challenges in monitoring of injected CO₂ in saline aquifer storage

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A major challenge in geological sequestration is to map the movement of CO₂ in the subsurface and to demonstrate that the CO₂ is safely contained within the reservoir. When CO₂ is injected into an aquifer, the existing formation water in pore spaces of the reservoir rock will be partially displaced by the CO₂. This process will change the compressibility and density of the reservoir rock. These changes will in turn affect propagation characteristics of seismic waves. Recent research shows that seismic methods are among the most promising monitoring methods. Time-lapse 2D/3D seismic survey has been widely used in CO₂-EOR fields, particular in North America. Achievements in CO₂-EOR strongly suggest effectiveness of seismic survey in monitoring CO₂ migration in an aquifer. Other technologies such as well-based monitoring (VSP, logging, crosswell seismic and EM tomography) are also useful in monitoring the injected CO₂ around the wells with high resolution compared to seismic survey.

Several key questions need to be answered when CO₂ geological storage is to be undertaken worldwide. How should CO₂ be stored underground? Can trapping be assumed in saline formations and can CO₂ be retained for long periods safely in the subsurface? This presentation will give a review on CO₂ monitoring carrying out at the injection sites particular in North America and also provide information on what kind of technology works well and what did not work. Pilot and demonstration CO₂ injection projects provide unique data to develop economically viable, environmentally effective options for reducing carbon emissions in the near future.

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