

Comparison between CO₂ sequestrations in ocean and underground

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Carbon Dioxide Sequestration Technology promoted in the Kyoto Protocol of the Framework Convention of Climate Change means an intentional intervention to climate, because it allows continuous usage of fossil fuels.

Once sequestered, this portion of CO₂ should not affect our predictability of climate. We are relying on the CO₂ sink mechanisms of seafloor carbonate dissolution in the case of ocean sequestration, and of CO₂ - H₂O - rock interaction in the case of underground sequestration.

In this sense our knowledge is still based on the classical Urey reaction: (calcium silicate + 2 units of carbon dioxide + water) system changes to (calcium ion + silica + bicarbonate ion) in aquatic environment where mainly by marine organisms the system is transformed into (carbonate + solid silica + one unit of carbon dioxide) .

Since the ocean floor carbonate dissolution has a response time of about 10 thousand years to the injection of CO₂, the key understanding of the reliability of the ocean sequestration technology is the possibility of irreversible modification of marine ecosystem, which could occurs in shorter time period. On the other hand, noting that underground sequestration of CO₂ is site-specific by nature, we should know better the key processes of CO₂ gas dissolution into the ambient groundwater and of mineral dissolution, or the neutralization, because the economical operation would be the injection of the supercritical CO₂.