

Behavior of contaminated liquid CO₂ droplets in the deep sea

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Abstract

Carbon Capture and Storage with ocean sequestration is being considered as one of the most effective option for reducing the CO₂ net flux from atmosphere nowadays. But it is still possible for CO₂ substance to leaks out from transport pipeline or from the under seabed storage sites and causing damage to ambient environment. The behavior of liquid CO₂ under droplet shape would be strongly affected by the presence of other contaminants such as SO₂ comes from processing processes. This presentation shows the behavior in the sea water of pure liquid CO₂ droplets as well as droplets that consist of SO₂ substances. The study uses computational fluid dynamic models in comparison with experimental data from other previous researchers. Droplet of liquid CO₂ is assumed to be released at several depths in deep ocean, with other environmental conditions are set up respectively. All calculations are conducted with many different ratio of contaminant SO₂ to provide fundamental data of those particles rising characteristics. The effect of contaminants on the behavior of CO₂ droplets would be clearly shown through the results of particle deformation, terminal rising velocity happen due to buoyancy force driving from the difference in density of CO₂ substance and ocean water around.

Keywords : CO₂, SO₂, Droplet, Carbon Capture and Storage

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