

Geochemistry Of The Jizan Group Volcanics, Saudi Arabia And Its Suitability For Carbon Storage and Mineralization

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Carbon mineralization in basaltic rocks has been emerging as a promising solution to permanently sequester carbon dioxide (CO₂) in solid form, which has been successfully demonstrated at the CarbFix pilot in Iceland^{1,2}. Several researchers globally have been investigating the feasibility of implementing carbon mineralization technology at different potential sites. Saudi Arabia contains several potential locations for carbon mineralization, particularly proximal to major industrial CO₂ emission sites in the coastal areas of the Red Sea³. The Jizan Group, consisting of basalts in the southwestern region of Saudi Arabia, is a prospective area with an estimated storage capacity of ~4.2 Gt of CO₂⁴. However, previous studies considered a limited number of samples from key localities in the Jizan Group. Thus, a detailed investigation of systematically collected samples is necessary to understand the hydrothermally induced alterations of the composition of the basalts.

A structural study on the Jizan Group confirms the presence of fracture networks that could facilitate injection⁵. This work focuses on conducting geochemical analyses of the basalts to determine their compositional alterations at various locations. Such information is crucial to understand the reactivity potential and site selection for CO₂ mineralization. In this presentation, petrographic and major element chemistry data, and their implications on the potential for carbon storage and mineralization processes will be discussed.

References

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