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Unlocking the Potential: A Comprehensive Review geochemical studies in basaltic Rocks for CO_2 Storage

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In contemporary science, CO_2 storage has emerged as a primary area of interest that the entire world is watching in the area of carbon capture and storage (CCS), and numerous advancements have already been made. A recent development involves the subterranean storage of CO_2 in mafic rocks. Because of their natural geochemistry and reactive mineral content, basalts offer a far more promising option for the efficient and long-term sequestration of CO_2 [1,2,3]. Carbon mineralization is the result of CO_2 sequestration in basaltic rocks. An alternative to conventional geologic sequestration is carbon mineralization. Carbonate minerals are produced in this process when CO_2 reacts with metal cations present in the silicates such as calcium, magnesium, and iron. This carbon mineralization can occur in two different ways in-situ and ex-situ. This follows the natural weathering process in either scenario, where carbonates are formed by the reaction of calcium and magnesium silicates with CO_2[2]. In this context, a thorough investigation into the geochemical analysis and reactivity of basaltic minerals is required. Understanding the long-term fate of CO_2 storage requires a broad understanding of the geochemical processes taking place in basaltic rock, which is presented in this study. In addition, the study offers an overall review of earlier research that clarified both in-situ and ex-situ storage techniques, opening up new avenues for investigation towards a modern approach in geochemistry.

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