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Assessment of the natural absorption of CO2 performed by electric steelmaking slag

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This study aims to evaluate the natural CO2 absorption potential of steelmaking slag, focusing on both black (EAF) and white (LF) slag generated during steel production. Such slags contain significant amounts of calcium and magnesium compounds capable of reacting with atmospheric CO2 through carbonation, forming stable carbonates and thereby enabling permanent carbon sequestration. Representative samples of black and white slag were monitored to assess their physicochemical properties, mineral composition, and carbonation behaviour under natural environmental conditions over time. The investigation seeks to characterize and quantify the tendency and rate of CO2 uptake for each slag type, highlighting differences in carbonation efficiency. Preliminary findings contribute to understanding the role of steel slag as potential carbon sinks within the steel industry, supporting sustainability goals. Furthermore, the study discusses factors influencing carbonation, such as particle size, exposure time, and ambient conditions, providing insights into optimizing slag management to enhance CO2 sequestration. This research represents a step forward in incorporating natural carbonation processes of steelmaking by-products into carbon accounting frameworks and promoting their beneficial reuse in climate change mitigation strategies.

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