

Preliminary Method to Determine CO₂ Sequestration in Cementitious Units

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Abstract:

Satisfying environmental concerns within cementitious-based industries has led to many production-oriented improvements in recent years; not only in the manufacturing of the constituent cements, but in the subsequent concrete products manufactured using these contemporary cements. This in turn has engendered identifying and defining acceptable methods and metrics to accurately and consistently measure and confirm such improvements; particularly as it relates to reductions in greenhouse gases. While it has been known for nearly a century that cementitious-based materials absorb (sequester) atmospheric carbon dioxide (CO₂), methods to accurately quantify the net amount of carbon dioxide sequestered has remained elusive. This paper presents a preliminary analytical measurement and reporting protocol to document the net amount of carbon dioxide absorbed by a manufactured concrete product post-production. Variables considered include the differences between the various inherent crystalline structures of calcium carbonates as well as latent CO₂ present in the constituent raw materials, which can significantly alter the results if not accounted for in the analysis. Following this protocol, the net CO₂ sequestration measured within 28 days of specimen production is shown to provide a relative minimum accuracy of approximately +/-2%.

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