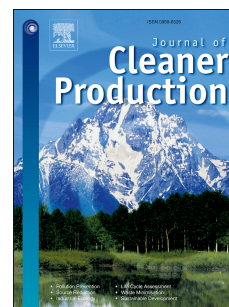


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Utilization of precipitated CaCO_3 from carbon sequestration of industrially emitted CO_2 in cementless CaO-activated blast-furnace slag binder system

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Abstract

This study explores the use of precipitated calcium carbonate (PCC), an industrial by-product from the carbon sequestration process for emitted CO_2 from factories, in the cementless CaO-activated ground-granulated blast-furnace slag (GGBFS) system in an aim not only to improve the strength but also to develop more sustainable structural binder for concrete. The 28-day strength improved with increasing PCC content up to 20 wt%, and its highest strength showed an ~23% increase from the original strength of the sample without PCC. The analysis revealed that the PCC was not a simple inert filler, but it might promote more dissolution of GGBFS, resulting in a higher strength from additional formation of reaction products. In particular, even the sample with 50 wt% PCC yielded a very similar strength compared to the sample without PCC at 28 days. Thus, this binder system could be a decent solution that can store a large amount of PCC

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