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An overview of the characteristics of carbonation-cured alkali-activated slag: Effect of activator type and curing condition

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ABSTRACT

Slag is nominated as an environmentally friendly choice to mitigate carbon emissions associated with Portland cement, which accounts for 8% of worldwide CO_2 emissions (Zhao et al. 2020). The degree of alkalinity in the slag-incorporated mixtures is crucial for slag to exhibit its strength development (Jeong et al. 2016). Therefore, numerous attempts have been given to investigate the proper combinations for alkali-activated slag mixtures (Cheah et al. 2021). These include the use of alkali hydroxides, waterglass, calcium oxide (CaO), alkali sulfates, and CO_3-bearing minerals, with each of these candidates yielding different outcomes in the phase assemblages and mechanical strength development (Cheah et al. 2021). Meanwhile, carbonation curing of cementitious materials has been widely elucidated for its potential for accelerating the strength development and for its ability to bind CO_2 (Luo et al. 2021). Carbonation curing is regarded as different from weathering carbonation given that the carbonation curing strategy is typically applied at an early age with high levels of CO_2 concentration. In this regard, an overview on the carbonation curing of alkali-activate slag will be provided, and a preliminary work on the effect of sodium bicarbonate solution as a curing medium for the carbonation of CaO-activate slag will briefly be presented(Choi et al. 2024 TBD).

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