

Recent studies on the mechanical and thermal properties of calcium aluminate cement blends upon exposure to high temperatures

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ABSTRACT

Calcium aluminate cement (CAC) is one of the promising alternatives to Portland cement (PC) in terms of early strength development and high temperature resistance, making it a preferable refractory material in various industries such as kiln linings and the steel industry (Kim et al., 2021). Upon exposure to high temperatures, CAC experiences low levels of strength loss and spalling compared to PC due to the presence of pore characteristics capable of releasing the pore pressure caused by water evaporation (Khaliq & Khan, 2015). Moreover, recent research has shown that incorporating supplementary cementitious materials into CAC can mitigate both microstructure and strength degradations upon exposure to high temperatures (Cheng et al., 2019). In this regard, this study provides an overview of the high temperature resistance of CAC blends. In addition, a preliminary study conducted by the authors regarding the effect of MgO on properties of CAC exposed to high temperatures will be presented (Nawaz et al. 2023).

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