FORMATION OF VOID IN BFS/$CACO_3$ DIFFUSION COUPLE

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Abstract

This study investigates void formation in the blast furnace slag (BFS) and calcium carbonate ($CaCO_3$) diffusion couple, which is critical for understanding the interdiffusion process in cement production. The experimental analysis involved high-temperature diffusion experiments, focusing on the volume fraction of void at the BFS/$CaCO_3$ interface, the activation energy of void formation, and the I-V measurement of void formation at the BFS/$CaCO_3$ interface. Void measurements revealed a 25% increase after exposure to the specified temperature, while the activation energy for void formation was calculated to be – 41.48 kJ/mol. I-V measurements revealed ionic diffusion as the dominant mechanism for void formation, with an average decomposition rate of 1.4598×10^{-12} m^2s^{-1}. These findings provide valuable insights for utilizing BFS in cement production.

Author keywords

blast furnace slag; calcium carbonate; diffusion couple; void formation

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