

Effect of fly ash/alkaline activator ratio and sodium silicate/NaOH ratio on fly ash geopolymer coating strength

Abstract

Fly ash geopolymer coating material potential used to protect surface used in exposure conditions. Ratio of fly ash/alkaline activator and $\text{Na}_2\text{SiO}_3/\text{NaOH}$ play important parameter on determining the best flexural strength of geopolymer coating material. Fly ash and alkali activator ($\text{Al}_2\text{O}_3/\text{Na}_2\text{SiO}_3$) were mixed with the solids-to-liquid ratios in range of 1.0-3.0 and different ratios of $\text{Na}_2\text{SiO}_3/\text{NaOH}$ (1.0-3.0) to prepare geopolymer coating material at constant NaOH concentration of 10 M. Effect of fly ash/alkaline activator ratio and $\text{Na}_2\text{SiO}_3/\text{NaOH}$ on geopolymer coating was determined with respect to the highest flexural strength of the 1200°C sintering temperature of geopolymer coating substrates. The results concluded that the highest strength for fly ash geopolymer coating material is achieved 42 MPa when the solid/liquid ratio is 2.0 and the $\text{Na}_2\text{SiO}_3/\text{NaOH}$ ratio is 2.5.

Keywords; Coating, Fly Ash, Geopolymer, Ratio, Strength