

Alkali Activated Paste Composites of Blast Furnace Slag and PFA, Strength and Microstructures

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Pastes of composites of blast furnace slag and PFA were activated with different %Na₂O using water glass of various modulus. The slag was replaced by PFA in 25, 50, 75 and 100 wt.%. The pastes were cured 24h at 75°C and then in air at 20°C. Neat slag pastes registered the highest strengths of about 80Mpa after 24h; the presence of the PFA reduced markedly the strength. For 100% PFA and the fluidity attained by water addition, low %Na₂O affected strength development, 4%Na₂O registered less than 4Mpa, whereas for 8% increased to 24Mpa (modulus =1). Higher strength was noted when the fluidity was increased by adding more alkaline. SEM and XRD showed the formation of reaction products. The slag was glassy, whereas the PFA was ~70% amorphous and showed less reactivity. The lower reactivity and relatively low density of the PFA reduced the strength as compared to neat slag pastes.