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HIGH PERFORMANCE CEMENTITIOUS COMPOSITE FROM ALKALI-ACTIVATED LADLE SLAG REINFORCED WITH POLYPROPYLENE FIBERS

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Abstract

Alkali-activated ladle slag (AALS) is a promising cementitious material with environmental benefits. However, the brittleness of material has been limiting the use in construction. Therefore, in this experimental investigation, different polypropylene (PP) fibers were employed as a short randomly reinforcement in cementitious matrix in order to improve mechanical performance of the AALS composites.

The study reveals that the AALS composite could gain very high ductility with an appropriate fibrous reinforcement. Fracture energy and fracture toughness of PP fiber reinforced AALS mortars increased by approximately 150 and 7.6 times, respectively, compared to the unreinforced material. Additionally, the flexural strength of the composite increased by roughly 300%. Pseudo strain hardening (PSH) behavior was observed along

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