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Compressive strength and microstructure analysis of treated rice husk ash (TRHA) incorporated mortar (Article)

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Abstract

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High amount of reactive silica is ubiquitous in pozzolanic reaction for concrete strength increment. Rice husk ash (RHA) is proven contains high content of amorphous silica that is essential in the pozzolanic reaction of effective additive in concrete. Nevertheless, incorporation of RHA as cement replacement material (CRM) or additive is very minimal in current concrete industry. Therefore, improvement on the RHA properties by introduction of thermal and chemical pretreatment prior to incineration process is considered as a promising way in order to achieve the goal. This treatment process has been reported widely in literature. In this paper, the effect of treated rice husk ash (TRHA) and non-treated rice husk ash (NTRHA) incorporated mortar in terms of its compressive strength and microstructure properties are examine subsequently. The strength activity of TRHA from the optimum treatment process was measured by testing the compressive strength of mortars. The highest compression value obtained was 50.73MPa with 3% UFTRHA replacement at 28 days. At a longer curing period i.e. 90 days, it was recorded that 3% of UFTRHA mortar had the highest compression value at 53.87MPa. As for microstructure properties, a denser microstructure with excellent aggregate bonding and cement matrix in the interfacial transition zone (ITZ) was observed. © 2018 Authors.

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Cement replacement material (CRM) Compressive strength High energy milling Microstructure properties
Non-treated rice husk ash (NTRHA) Physicochemical properties of rice husk ash (RHA) Treated rice husk ash (TRHA)

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