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The effect of Metakaolin on compressive strength of rice husk ash concrete at varying temperatures.

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Abstract

In the case where the concrete is exposed to high temperatures such as fire which undergo severe loss of compressive strength due to permeability interconnected durability. The use of metakaolin as a recent material in the construction industry, proves to be very useful to modify the properties of concrete. The study investigates the effect of Metakaolin on compressive strength of rice husk ash (RHA) concrete at varying temperatures. The plain and binary blended with 10%MK cement replacement and ternary MK-RHA blended concrete cube specimens were produced by incorporating 5%, 10%, 15%, 20%, 25% and 30%RHA as cement replacement levels while 10%MK addition was fixed. All the concrete specimens were cured for 28 days inside water tank at room temperature, air dried for 24 hours, thermally treated at 200°C, 400°C, 600°C, and 800°C for one hour and then allowed to cooled. Three specimens for each temperature including control sample of the same mix were tested for compressive strength at room temperature. The compressive strength were assessed before and after fired. The results show that the inclusion of 10% MK has improved the fire resistance beyond the maximum temperature of plain concrete. The 10%RHA replacement gives better fire resistance than other replacement levels with 22% relative residual strength gain up to 600°C.

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3. concrete
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5. kaolinite
6. rice husks
7. temperature

Identifiers

1. compression strength
2. crushing strength
3. rice hulls

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