

"Mechanical Properties & Durability Of Mortar Containing Rice Husk Ash As a Supplementary Cementing Materials"

Supervision

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Rice husk is an agricultural residue which accounts for 20% of the 649.7 million tons of rice produced annually worldwide. The produced partially burnt husk from the milling plants when used as a fuel also contributes to pollution and efforts are being made to overcome this environmental issue by utilizing this material as a supplementary cementing material. The chemical composition of rice husk is found to vary from one sample to another due to the differences in the type of paddy, crop year, climate and geographical conditions.

Burning the husk under controlled temperature below 800 °C can produce ash with silica mainly in amorphous form. Recently, Nair et al. reported an investigation on the pozzolanic activity of RHA by using various techniques in order to verify the effect of incineration temperature and burning duration. He stated that the samples burnt at 500 or 700 °C and burned for more than 12 hours produced ashes with high reactivity with no significant amount of crystalline material. The short burning durations (15 – 360 minutes) resulted in high carbon content for the produced RHA even with high incinerating temperatures of 500 to 700 °C. A state-of-the-art report on rice husk ash (RHA) was published by Mehta in 1992, and contains a review of physical and chemical properties of RHA, the effect of incineration conditions on the pozzolanic characteristics of the ash, and a summary of the research findings from several countries on the use of RHA as a supplementary cementing pozzolanic material.

Rice husk contains 75-90 % organic matter such as cellulose, lignin etc. and rest mineral components such as silica, alkalis and trace elements [8]. Rice husk is unusually high in ash

compared to other biomass fuels in the range 10-20%. The ash is 87-97% silica .highly porous and light weight, with a very high external surface area. Presence of high amount of silica makes it a valuable material for use in industrial application. Other constituents of RHA, such as K_2O , Al_2O_3 , CaO , MgO , Na_2O , Fe_2O_3 are available in less than 1 %ref. Various factors which influence ash properties are incinerating conditions (temperature and duration), rate of heating, burning technique, crop variety and fertilizer used. The silica in the ash undergoes structural transformations depending on the conditions of combustion such as time and temperature.