Enhanced mechanical properties plaster of paris with addition of rice husk fibers

ABSTRACT

The incorporation of additives materials into gypsum alters water absorption and mechanical properties of the final products. Plaster of Paris were prepared by using conventional methods with distinctive sizes of rice husk fibers in the range of 38 μm, 63 μm, and 250 μm. The density, water absorption, porosity, and mechanical properties prior to compressive strength were examined. The density, water absorption, porosity, and mechanical properties of plaster lies in the range of 1.521 – 1.673 g/cm^3, 25.107 – 33.989%, 40.196 – 53.295%, and 2.666 – 9.438 MPa, respectively. Variation in density, water absorption and porosity due to alteration in the distance among the gypsum crystals and void fractions. The incorporation of a small size of rice husk fibers of 38 μm weakened the compressive strength of plaster due to the impact of rice husk fibers as filler. Meanwhile, the incorporation of moderate size rice husk fibers in the range of 63 μm and 250 μm enhanced the compressive strength due to the contribution of rice husk fibers as reinforcement agent in the gypsum network.