

Study of the Effect of Using Corn-Cob Ash on Mortar and Concrete Properties: Case Study of Sudan

Authors : Taghried I. M. Abdel-Magid, Gheida T. A. Al-Khelifa, Ahmed O. Adam, Esra G. A. Mohamed, Saeed M. S. Saeed

Abstract : The use of pozzolanic materials in concrete industry is facing challenges due to unpredictable behavior of natural materials. Corncob ash (CCA) is considered to be one of the promising plant-based materials that possess cementitious properties. Corn is one of the major planted crops in Sudan. Corncob is considered as waste and normally thrown away or burnt. The main purpose of this research was to test the hypothesis that CCA can sufficiently replace cement in a concrete mixture or a cement mortar. In this study, CCA was used to replace cement in mortar in three percentages: 0, 20, and 25%. The effect of this replacement was found to be positive in terms of long-term compressive strength, while not as such in short-term compressive strength. In the concrete mix, the introduction of CCA was found to have a positive impact on the slump test characteristics, whereas the early and late compressive strengths deteriorated by approximately 30%. More research is needed in this area to upgrade the efficient use of CCA in cement mortar and concrete properties.

Keywords : cementitious materials, compressive strength, corncob ash, pozzolanic materials

Conference Title : ICSDCE 2018 : International Conference on Sustainable Design and Construction Engineering

Conference Location : Toronto, Canada

Conference Dates : June 21-22, 2018