

Elaboration and Characterization of a Composite Based on Plant Sisal Fiber

Authors : Biskri Yasmina, Laidi Babouri, Dehas Ouided, Bougherira Nadjiba, Baghloul Rahima

Abstract : Algeria is one of the countries which have extraordinary resources in vegetable fibers (Palmier, Alfa, Cotton, Sisal). Unfortunately, their valorization in the practical fields, among other things, in building materials, is still little exploited. Several works align with the fact that the use of plant fibers in mortar is an advantageous solution, given its abundance and its socio-economic and environmental impact. The idea of introducing plant fiber into the field of Civil Engineering is not new. Based on the work of several researchers in this field, we propose to study the mechanical behavior of mortar based on Sisal fibers. This work consists of the experimental characterization in the fresh state (workability) and in the hardened state (mechanical resistance to compression and traction by three-point bending) on the scale of mortar mortars based on sisal plant fibers. The main objective of this work is the study of the effect of fiber incorporation on mechanical properties (compressive strength and three-point bending strength). In this study, we varied two parameters, such as the length of the fiber (7cm, 10 cm) and the fibers percentage (0.25%, 0.5%, 0.75%, 1%, 1.25% and 1.5%). The results show that there is a slight increase in the compressive strength of the fiber-reinforced mortars compared to the reference mortar (mortar without fibers). With regard to the three-point bending tests, the fiber-reinforced mortars presented higher resistances compared to the reference mortar and this was for the different lengths and different percentages studied.

Keywords : mortar, plant fiber, experimentation, mechanical characterization, analysis

Conference Title : ICSCABPC 2023 : International Conference on Synthesis, Characterization and Applications of Biodegradable Polymer Composites

Conference Location : Paris, France

Conference Dates : August 24-25, 2023