Effect of Alkali Treatment on Behavior of Oil Palm Empty Fruit Bunch Fibers

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ABSTRACT

Tensile strength is an essential aspect of cement composites. The tensile strength of cement composites can be enhanced using various methods. Out of all the available methods, natural fibers improve the tensile resistance with a positive impact on the environment. Various natural fibers are in use, and they are chosen depending on availability. The present study aims to effectively use oil palm fibers extracted from palm oil trees. Palm oil industries are growing rapidly, and a vast amount of oil palm empty fruit bunch fibers are disposed of every day. The oil palm empty fruit bunch fibers can be used directly in cement composites or treated before usage for better performance. In the present study, the oil palm empty fruit bunch fibers (spikelet and stalk fibers) are treated with different sodium hydroxide (NaOH) solutions to improve their mechanical and durability properties. This study also focusses on the effect of treatment duration for different concentrations of sodium hydroxide solution. It was found that spikelet fibers treated using 5% NaOH solution with an immersion period of 12 hours has improved the tensile resistance and water absorption properties compared to 3% and 10% concentrated NaOH solution.

Keywords: *Oil Palm fruit Empty bunch fibers, Spikelet fiber, Stalk fiber, Tensile strength, Water absorption, Alkaline treatment, Mechanical properties and Durability properties.*