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Characterization of Musaceae and Saccharum Officinarum Cellulose Fibers for Composite Application

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ABSTRACT

This paper presents experimental results on the effect of alkalis such as Potassium Hydroxide (KOH) and Sodium Hydroxide (NaOH) on morphological changes, physical, heat resistance, chemical, and tensile properties of the Musaceae (PF) and Saccharum Officinarum (BF) rods fibreers. Modified fibers were made using a chemical solution of NaOH and KOH with a concentration of 8% for 2 hours. Physical, chemical, thermal and tensile properties were characterized by density, chemical composition, tensile, and thermogravimetric tests. The surface structure of the fibers was analyzed by SEM. The results show that both fibers have superior properties in terms of tensile strength, and thermal resistance after chemical treatment because hemicellulose and lignin were reduced from the fibers. The superiority of Musaceae fibers was obtained after chemical treatment with KOH while the best properties of Saccharum fiber were obtained after alkali treatment with NaOH. The Scanning Electronic Microscopy (SEM) image also shows that the fiber surface becomes coarse and fibrils. The results show that the effect of alkalis provides a thorough change in terms of properties and morphologies on different fibers.

Keywords: Musaceae Fiber, Saccharum Officinarum Fiber, FTIR, Tensile Strength, Thermal Properties and SEM.