Influence of selected treatment on tensile properties of short pineapple leaf fiber reinforced tapioca resin biopolymer composites

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ABSTRACT

This work reports the influence of various treatments of pineapple leaf fibers (PALF) reinforced tapioca biopolymer (TBP) on the tensile properties. Three different treatments were selected, such as maleic anhydride polypropylene (MAPP) compatibility, maleic anhydride polyethylene (MAPE) compatibility and alkali treatment. Samples with 10% of PALF composition with different concentrations of MAPP and MAPE (1%, 3%, 5% and 7% by weight) and samples with three different treatments were prepared with different PALF compositions (10%, 20%, 30% and 40% by weight). Results revealed that PALF–TBP with 7% of MAPP showed the highest tensile strength and good interfacial adhesion with the matrix as evidenced by the Scanning electron microscopy analysis. Moreover, the chemical analysis by Fourier transforms infrared spectroscopy demonstrated that the MAPP had improved the PALF compatibility and matrix interfaces. Findings suggested that PALF–TBP composites have a great potential to be used for products in engineering applications.

KEYWORDS:

Tapioca biopolymer; Pineapple leaf fiber; Coupling agent; Alkali treatment; Natural fiber composites