

Effect of hybridization on the mechanical properties of pineapple leaf fiber/kenaf phenolic hybrid composites

ABSTRACT

In this study, pineapple leaf fiber (PALF), kenaf fiber (KF) and PALF/KF/phenolic (PF) composites were fabricated and their mechanical properties were investigated. The mechanical properties (tensile, flexural and impact) of the PALF/KF/PF hybrid composites were investigated and compared with PALF/KF composites. The 3P7K exhibited enhanced tensile strength (46.96 MPa) and modulus (6.84 GPa), flexural strength (84.21 MPa) and modulus (5.81 GPa), and impact strength (5.39 kJ/m²) when compared with the PALF/PF and KF/PF composites. Scanning electron microscopy (SEM) was used to observe the fracture surfaces of the tensile testing samples. The microstructure of the 7P3K hybrid composite showed good interfacial bonding and the addition of KF improved the interfacial strength. It has been concluded that the 3P7K ratio allowed obtaining materials with better mechanical properties (tensile, flexural and impact strengths) than PALF/PF and KF/PF composites. The results obtained in this study will be used for further comparative study of untreated hybrid composites with treated hybrid composites.

Keyword: Hybrid composites; Kenaf fiber; Mechanical properties; Phenolic resin; Pineapple leaf fiber