

Theoretical Modeling of Mechanical Properties of Eco-Friendly Composites Derived from Sugar Palm

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Abstract : Eco-friendly composites have been successfully prepared by using sugar palm tree as a sources. The effect of fibre content on mechanical properties of (SPF/SPS) biocomposites have been done and the experimentally tensile properties (tensile strength and modulus) of biocomposites have been compared with the existing theories of reinforcement. The biocomposites were prepared with different amounts of fibres (i.e. 10%, 20% and 30% by weight percent). The mechanical properties of plasticized SPS improved with the incorporation of fibres. Both approaches (experimental and theoretical) show that the young's modulus of the biocomposites is consistently increased when the sugar palm fibre (SPF) are placed into the sugar palm starch matrix (SPS). Surface morphological study through scanning electron microscopy showed homogeneous distribution of fibres and matrix with good adhesion which play an important role in improving the mechanical properties of biocomposites. The observed deviations between the experimental and theoretical values are explained by the simplifying model assumptions applied for the configuration of the composites, in particular the sugar palm starch composites.

Keywords : eco-friendly, biocomposite, mechanical, experimental, theoretical

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