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Mechanical and physical properties of unsaturated polyester reinforced kenaf core fiber with hybrid cellulose nanocrystal (CNC) and graphene Nanoplatelet(GNP) nanofillers

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Abstract

In this study, the exploration of kenaf core fiber (KCF) was done by incorporating into unsaturated polyester (UPE) as to keep the environment sustain and also due to its potential properties which are good mechanical properties, low cost and importantly massively abundant. The hybridization technique also were applied with the incorporation of total loading level of 3 wt% Cellulose nanocrystal (CNC) and graphene nanoplatelet (GNP) into UPE-KCF bio-composite as to support and provide better performance of UPE bio-composite. In revealing the effect of nanofillers utilization towards mechanical and physical properties of UPE-KCF bio-composite, the fabrication of UPE-KCF/CNC/GNP bio-composite were successfully done by using hand lay-up technique and hot compression moulding. The samples were characterized through tensile and flexural test for mechanical analysis and water absorption for physical analysis. Morphology characterization also was done to support the result. The results showed the incorporation of KCF had contributed for the slightly improvement in tensile modulus while both

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inclusion of nanofillers help the single reinforcement bio-composite to enhance flexural strength and modulus up to 48.2% and 84.21% respectively. The addition of 2 wt% GNP also positively influence physical properties showed by the least percentage of water absorption. © 2022

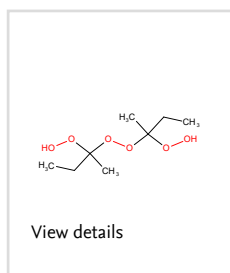
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