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Effect of coupling agent on durian skin fibre nanocomposite reinforced polypropylene (Conference Paper) (Open Access)

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Abstract

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This paper reports on the development of a composite-based natural fiber to reduce the reliance on petroleum-based product in order to amplify environmental awareness. The production of Durian Skin Nanofiber (DSNF) was conducted using biological fermentation method via rhizopus oryzae in order to obtain the nano dimension of the particle size. Polypropylene (PP) and DSNF were produced using Haake internal mixer via melt blending technique. The significant effect of maleic anhydride grafted polypropylene (MAPP) on the properties of PP/DSNF nanocomposite was investigated to study its mechanical properties which are tensile strength and thermal stability using thermogravimetric (TGA) and differential scanning analysis (DSC). The tensile property of PP nanocomposites increased from 33 MPa to 38 MPa with the presence of MAPP. The addition of MAPP also increased the thermal stability of PP/DSNF nanocomposite where the char residue increased by 52%. Besides that, the thermal degradation of PP/DSNF and PP/DSNF-MAPP were higher than PP where they exerted higher amount of weight loss at an elevated temperature. The percentage of crystallinity, %Xc, of PP nanocomposites improved with the addition of MAPP by 35% based on the differential scanning calorimetry (DSC) result. The SEM analysis showed that the PP/DSNF-MAPP exerts ductile fracture while PP/DSNF exerts brittle fracture.

SciVal Topic Prominence

Topic: Natural fibers | Fibers | natural fibre

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Indexed keywords

Engineering controlled terms: Blending | Brittle fracture | Coupling agents | Differential scanning calorimetry | Ductile fracture | Fracture | Manufacture | Nanocomposites | Particle size | Reinforced plastics | Tensile strength | Thermodynamic stability | Thermogravimetric analysis

Engineering uncontrolled terms: Differential scanning analysis | Elevated temperature | Environmental awareness | Haake internal mixers | Maleic anhydride grafted polypropylene | Petroleum based products | PP nanocomposite | Thermo-gravimetric

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1 Cheung, H.-y., Ho, M.-p., Lau, K.-t., Cardona, F., Hui, D.
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(2009) *Composites Part B: Engineering*, 40 (7), pp. 655-663. Cited 311 times.
doi: 10.1016/j.compositesb.2009.04.014

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2 Anuar, H., Zuraida, A.
Improvement in mechanical properties of reinforced thermoplastic elastomer composite with kenaf bast fibre

(2011) *Composites Part B: Engineering*, 42 (3), pp. 462-465. Cited 94 times.
doi: 10.1016/j.compositesb.2010.12.013

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3 Prasad, P., Kochhar, A.
(2014) *Journal of Environmental Science, Toxicology and Food Technology*, 5, pp. 1-7.