

Structures and performances of simultaneous ultrasound and alkali treated oil palm empty fruit bunch fiber reinforced poly(lactic acid) composites

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Abstract

In this study composites were produced using extrusion followed by injection molding with alkali and ultrasound treated oil palm empty fruit bunch (EFB) fibers with poly(lactic acid). The fiber content, alkali solution concentration, exposing time and treatment temperature were optimized. The optimized EFB fibers were treated with hyper branched polyester solution. The composites were characterized by tensile testing, impact testing, scanning electron microscopy, thermogravimetric analysis, differential scanning calorimetry and Fourier transformation infra-red spectroscopy. A significant increase in mechanical and interfacial properties was found for composites due to simultaneous alkali and ultrasound treatment.

Keywords : Polymer–matrix composites (PMCs), Mechanical properties, Thermal properties, Injection molding

<http://dx.doi.org/10.1016/j.compositesa.2012.06.012>