

The Effects of Alkalization to the Mechanical Properties of Biocomposite PLA reinforced the Ijuk Fibers

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Abstract : The pollution due to non-degradable material such as plastics, has led to studies about the development of environmental-friendly material. Because of biodegradability obtained from natural sources, polylactid acid (PLA) and ijuk fiber are interesting to modify into a composite. This material is also expected to reduce the impact of environmental pollution. Surface modification of ijuk fiber through alkalization with 0.25 M NaOH solution for 30 minutes, was aimed to enhance it's compatibility to PLA, in order to improve properties of the composite such as the mechanical properties. Alkalization of the ijuk fibers annihilates some surface components such as lignin, wax and hemicellulose, so the pore on the surface clearly appeared, decreasing of the density and diameter of the ijuk fibers. The change of the ijuk fiber properties leads to increase the mechanical properties of PLA composites reinforced the ijuk fibers through strengthening of the mechanical interlocking with the PLA matrix. An addition to enhance the distribution of the fibers in the PLA matrix, the stirring during DCM solvent evaporation from the mixture of the ijuk fibers and the dissolved-PLA can reduce amount of the trapped-voids and fibers pull-out phenomena, which can decrease the mechanical properties of the composite.

Keywords : polylactic acid, Arenga pinnata, alkalization, compatibility, adhesion, morphology, mechanical properties, volume fraction, distribution

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