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Title: Fractionation of Microwave-assisted Liquefied Lignocellulosic Biomass for the Preparation of High Value Added Bio-based Products

Authors:

Jiulong Xie, School of Renewable Natural Resources, Louisiana State University
Chung-Yun Hse, Southern Research Station - USDA Forest Service
Todd F. Shupe, Louisiana State University Agricultural Center

Abstract

A microwave liquefaction process was investigated as a platform for the integrated utilization of lignocellulosic biomass. The liquefied products were separated into three fractions (cellulosic fibers, lignin, and water soluble fraction) via a simple separation method. The weight percentage and fundamental characteristics of each fraction was determined. The cellulosic fiber and lignin fractions were used to prepare nanofibers and lignin-based composites. The results indicated the average diameter of the nanofibers isolated from the cellulosic fibers were 2-18nm, the length was about several hundred nanometers, the time required for the total process was 52min, which is significant efficient compared to conventional methods. The addition of lignin fraction into the PLA matrix resulted in improvement in tensile properties of PLA-lignin composites. PLA films with low lignin content had good UV light resistant properties, indicating that the recovered lignin has potential for packaging light sensitive products.