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Title: Rapid Delignification of Bamboo Particles by a Modified Microwave-assisted Solvolysis Liquefaction Process Using a Binary Glycerol/Methanol Solvent

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Abstract

Bioconversion of lignocellulosic biomass to biofuels and isolation of cellulosic fibers from renewable natural resources requires significant delignified biomass. For the industrial scale production of cellulosic or carbohydrate products, a high-efficiency, low-cost, and environmentally-friendly delignification process is needed. This study focused on the use of microwave-assisted solvolysis liquefaction process as a novel method for the delignification of bamboo. The results showed that lignin in bamboo particles was almost completely removed by using an optimized process (120°C/9min), and the residual lignin in the delignified fibers was as low as 0.65%. Small cracks were observed on the SEM images of the delignified fibers which indicated that the isolated fibers may be more susceptible to chemical access and or enzyme attack.