336a Cellulose Nanofibers Extracted from Microcrystalline Cellulose and Corn Stover

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Corn stover, the mixture of corn stalks, leaves and husks, etc, is one of the major agricultural residuals in the United States. Although part of the stover has to remain in the field to prevent soil erosion and to enhance fertility, the excess stover, as a lingo-cellulosic material, can serve as an inexpensive cellulose supply. Due to their high strength and modulus and low density, cellulose nanofibers have promise to partially replace conventional inorganic composite fillers such as glass fibers. In this study, cellulose nanofibers were prepared both from commercial microcrystalline cellulose and from corn stover by chemical and mechanical treatments. They were then characterized by transmission electron microscopy (TEM). Cellulose nanofibers/polyvinyl alcohol (PVA) composite films were prepared by film casting. The crystallinity of the nanofibers and the composite films was measured by X-ray diffraction (XRD). The dispersion of nanofibers in the composite films was studied by TEM. The tensile and the thermo-mechanical properties were evaluated. This project is financially supported by USDA-MBI, award # 2002-34189-12748-S4057.