Program Book

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GRUTI

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Fine Fibrosis Characteristics of Four Tropical Woods for Nanocellulose Production

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ABSTRACT

Nanocellulose in nano-scales has attracted attention in many different research areas, especially nanocomposite development, by virtue of its impressive mechanical properties (Kaliaet *al.*, 2011).Nanocellulose can be produced from any kind of plant cell walls by simple mechanical methods or a combination of both chemical and mechanical methods. In this study, fine fibers and nanocelluloses were prepared from four different tropical wood species (Albizia, Gmelina, Mangium, Mindi) by using mechanical grinder, such as cutter mill and wetdisk mill. The energy consumption, filtration time and dimensions of the fibers were varied with grinding time. The effect of grinding time on the dimensions of fibers was investigated with measuring microscope and scanning electron microscope. Dimension of nanocellulose from Albizia was further decreased with increasing grinding time showing the least length and diameter of 620nm and 22nm, respectively. Albizia consumed significantly lower energy at same grinding time compared with other species. Filtration time of Albizia showed comparable value even though it spent lower grinding time compared with other species.Nanocellulose-reinforced polyvinyl alcohol nanocomposites were prepared by film casting. There was no significant difference in transparency among the nanocomposites reinforced by four different species of nanocellulose at the same level of grinding time.

Keywords : nanocellulose, cellulose nanofiber, microfibrillated cellulose, tropical wood, nanocomposite

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