KN-2-552

Wednsday, May 11, 2011, 02:55-03:35 pm
Room: Reda 5

REINFORCEMENT OF POLYPROPYLENE-WOOD FIBER NANOCOMPOSITE BY BACTERIA CELLULOSE: PRELIMINARY ASSESSMENT OF THE MANUFACTURING AND PERFORMANCE

Fayçal Mijiyawa[a], Demagna Koffi[a], Bohuslav V. Kokta[b] Fouad Erchiqui[c]

[a]LMEM(Laboratoire de Mécanique et Éco-Matériaux)Department of Mechanical Engineering, *University of* Quebec at Trois-Rivières **(***UQTR),* PO Box 500, Trois**-***Rivières,*(Québec),* G9A 5H7, Canada**,** *b Integrated Pulp and Paper Centre, University of Quebec at Trois-Rivières 3351 boul. des Forges C.P. 500, Trois-Rivières, Québec, G9A 5H7, Canada and c Unity of teaching and research in applied sciences, University of Quebec in Abitibi-Témiscamingue (UQAT), 445, boulevard de l'Université Rouyn-Noranda (Québec) J9X-5E4, Canada.*

**Corresponding author: koffi@uqtr.ca*

Currently, much effort has been made to replace glass fibers by wood fibers to reinforce thermoplastic composites for the production of biomaterials. The main objective of this study is to analyze the effect of bacterial cellulose in the polypropylene -wood fibers composite . Cellulose has attracted much attention because it is biodegradable and renewable, cheaper and capable of being produced in large quantities. In thiswork, the effect of concentration of maleate polypropylene (MAPP) of nanoclay (NC), bacterial cellulose (BC), 30% wood fibers (fibers of birch) on the tensile properties of composites of Birch - polypropylene was studied. The statistical software "Stagraphics Centurion ®" has been used to optimize the properties. Composite materials have been prepared at a temperature around 180 °C by a method called "conventional" on two rollers rotating at 60 rpm, while undergoing mixing (compounding) of 25-30 min. The specimens are cast in the form of ASTM D638 Type V alters with 10 samples for traction. The mold is maintained at 190 ± 2 °C by means of a pre ss Dake and 15 minutes at a pressure of 25 MPa. Then the mold is cooled to 60 ° C by cold wate r flowing in the coils of the plateau. The biggest problem encountered in these composites is the inherent incompatibility between the hydrophilic fibers and hydrophobic polymer matrices. Chemical coupling (MAPP) plays an important role in improving the covalent bonds at the interface in composites of wood fibers. Tensile tests have thus shown that the bacterial cellulose, not only would have no significant effect on the elastic modulus and tensile strength, but also degrade the polypropylene-wood fiber composite in high proportions. Keywords: Cellulose bacterial nanofiber; polypropylene fiber wood composites with natural fibers.