A BIODEGRADABLE COMPOSITE MATERIAL BASED ON POLYHYDROXYBUTYRATE (PHB) AND CARNAUBA FIBERS

José Daniel Diniz Melo* and Luiz Fernando Meneses Carvalho†

* Department of Materials Engineering
Universidade Federal do Rio Grande do Norte
Campus Universitário - Lagoa Nova - Natal/RN - CEP: 59078-970, Brazil
e-mail: daniel.melo@ufrnet.br

† e-mail: luizfernandomeneses@gmail.com

Key words: Biodegradable, Composite materials, Polyhydroxybutyrate, Carnauba fibers.

Summary. Biodegradable composites were prepared using carnauba fibers and polyhydroxybutyrate (PHB) as matrix. Carnauba fibers were obtained from the leaves of the carnauba palm tree (Copernicia prunifera). Fiber treatments such as alkali, peroxide, potassium permanganate and acetylation were carried out on the carnauba fibers to improve interfacial bonding. Mechanical properties of the composites prepared with 10 wt % of carnauba fibers were investigated and related to fiber treatment. According to the results, tensile strength of the composites made from peroxide treated fibers was superior to those using untreated fibers or any other fiber treatment. SEM observations on the fracture surface of the composites were conducted to study the effect of fiber treatment on fiber surface modification and fiber–matrix adhesion. The surface modification of the fibers and improved fiber–matrix adhesion after peroxide treatment were found to contribute to the enhancement of the mechanical properties of the composites, even though the tensile strength of the fibers was slightly reduced.