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Biodegradable films from renewable resources

J. Rodolfo Rendón-Villalobos, Emmanuel Flores-Huicochea and Javier Solorza-Feria
CEPROBI-IPN, MEXICO

The negative impact of waste accumulation of package materials, usually produced from fuel derived synthetic polymers, has generated serious ecological problems contributing to the environmental contamination caused by the bad management of solid waste of low degradation. In the recent times, there has been tremendous interest in the use of natural polymers to manufacture less aggressive products with the environment. The best examples of renewable resource biopolymers to produce biodegradable films are polysaccharides (starch, cellulose derivatives) and polylactic acid (PLA) with various application sectors ranging from packaging to automotive components and other high value applications. The purpose of this study was to simulate ultraviolet (UV) exposure occurring in nature. A UV treatment was conducted, and the effects of UV light illumination on the degradation of biodegradable films were then investigated by means of thermal analyses. Therefore a study of its biodegradability has been conducted in compost media according to ASTM standard procedures and by weighing carbon balances during the degradations. The UV treatment showed that the gellatin/glycerol (blend A) were more susceptible to UV irradiation comparing to cellulose/gellatin/glycerol (blend B) during glass transition temperature where a decreased between A and B blends was observed. The final rate of biodegradation in the compost process, only released CO₂ was measured and corresponded to 88.16 % (blend A) and 84.05 % (blend B). These values allowed the conclusion that these materials may be considered to be biodegradable, because the minimum required degradation percentage according to the established standards is only about 60 %.

Biography

J. Rodolfo Rendón Villalobos has completed his Ph D., Polymer Science from Zacatepec Institute of Technology. He is a Research – Professor at Dept. of Technological Development, National Polytechnic Institute, Mexico. He has more than 50 scientific publications, 6 chapter's ok book and has been serving as an academic editor board member of reputed journals. Reviewer for International Journal in areas such as Polymer, Biochemistry, Engineering, Food Sciences. Expertise in development of Biopolymers used to produce composites biodegradables; evaluation of the biopolymers in its structural characteristics as spectrophotometry FT-IR, SEM, XRD; as well as Biodegradation studies, Rheological and Thermal analysis.

rrendon@ipn.mx