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Assessment of biodegradation and biological properties of modified biopolymers

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There has been a growing interest over the past few years in the development of biopolymers partly because of their renewable, sustainable and biodegradable properties. They generally display interesting properties such as biodegradability, biocompatibility and their generated products are not toxic. Therefore, they possess various biological activities such as antibacterial, antioxidant and antifungal activities. These advantages, in parallel with the recent technological developments in biopolymer production, have rapidly expanded their applications as a competitive commodity polymer in a variety of processes. However, because of their inherent brittle nature, biopolymers generally need to be modified to be suitable for use in various applications where mechanical properties are important. So it is very interesting to toughen them with the goal of balancing and increasing tensile strength, impact strength and modulus while retaining the biocompatible and biodegradable nature of the polymer. The study concentrates on the biological activity and biodegradation capability of biopolymer blends in the solid state and in the liquid phase under aerobic and anaerobic conditions. To this end, blends were processed by casting method and on a twin-screw extruder with a film die and to determine the efficiency of the biodegradation of polymers, quantitative (mass variations, BOD) and qualitative (DSC and SEM) analyses were made. Otherwise, biopolymers were evaluated for their biological, structural and thermal properties.

Biography

Tasnim Kossentini Kallel is an associate professor in the Materials Engineering Department in the National School of Engineers of Sfax (Sfax University; Tunisia). In 1998-1999 she was Senior Safety Engineer at the Association of Health and Security at Work of Sfax "ASSETS" and in 2000-2003 she was a Researcher Member in the Laboratory of Macromolecular Materials INSA Lyon: Institute National des Sciences Appliqués de Lyon (France). In the Laboratory of Advanced Materials, she currently supervises a research team investigating the areas of advanced polymer blends and composite materials. She has been interested in various research areas including, polymer blends and composites designed for recycling, processing control of nano-composites and bio-composites via solvent casting method and reactive extrusion. She has planned, managed and completed projects under collaboration agreements with several foreign laboratories and industrial businesses. She has published a patent and 27 research articles.

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