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PLA ACTIVE PACKAGING WITH NATURAL ANTIOXIDANTS

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Biopolymers such as PLA have gained a lot of popularity as active packaging, to protect food products from oxidation by the delivery of natural antioxidants, thanks to their ease of thermo-conformation and relatively low price compared to other biopolymers. This research studied the application of PLA active films containing several natural antioxidants into food models to simulate real application of these types of films in food packaging. PLA films were prepared and charged with varying amounts of antioxidants or extracts such as α-tocopherol, gallic acid, red fruits, etc. Films were characterized with FTIR, DSC, TGA and SEM. Active films were applied to different food models to assess their protective action with different methods. Food simulant was used to determine the migration of antioxidants from the film to the food model, and HPLC analyses were performed to quantify results. Oil-in-water (O/W) emulsions with sunflower oil were used as a fatty food model and primary oxidation was measured with peroxide value method. Finally, meat burgers were prepared and covered with active films. Secondary oxidation of burgers was monitored during a month with TBARs method. Results showed that some natural antioxidants improved the thermal stability of prepared films, acting as nucleating agents favoring the crystallization of PLA films. A good inclusion of natural additives in the polymer matrix was proved by the single Tg observed in prepared films. The antioxidant capacity of active films was demonstrated by several tests, which revealed that active films can have strong protection levels.

Biography

Gádor Indra Hidalgo studied a Master's degree in chemical engineering with polymer specialization, and is currently studying a PhD in Polytechnic University of Catalonia (UPC). Her research interests are biopolymers, and polymers for food packaging and she is currently collaborating with industries during industrial trials. Her main research topic is focused on the addition of antioxidants to polymer films to increase lifespan of packaged foods and the sustainability of polymeric packaging solutions.

María Pilar Almajano is a teacher in UPC, specialist in natural antioxidants and has recently started a research path on polymeric active films, its characterization and improvement. Research Interests: Food packaging, biopolymers, multilayer films, new materials.

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