

DEGRADATION OF PE FOILS WITH PDQ-H® ADDITION

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Abstract

Main field of PE foils application is the food industry. Most of today's products are covered in PE foil during production or in shops.

The aim of this research was to investigate the potential for degradation of LDPE and HDPE foil modified with 3% of PDQ-H® This additive manufactured by Willow Ridge Plastics (WRP) (USA) to enhance photo-oxy-biodegradation potential of plastic-based materials.

Biodegradable plastics should be able to be degraded by bacteria and other microorganisms after prior shortening of polymer chains in the process of photo-oxidation. Such plastics should be constructed in a way that would allow such rapid changes in their chemical structure..

Tests conducted on the same materials in Australia for the duration of 6 weeks in standard composting conditions in commercial composting plant showed total reduction of existing plastics samples. The aim of this research was to repeat those test in typical European conditions.

Samples of PDQ-H® modified PE foil used for manufacturing single-use packaging's were treated in compost from Lodz Municipal Composting Plant. Temperature was monitored and high humidity of soil was maintained with sprayed water.

In order to start the process plastics were pre-treated for one hour in WOM Ci 400 weatherometer using PN-EN ISO 4892-2 conditions. After that samples weight was determined and than they were analyzed in Jasco FTIR-410 spectrophotometer and Atomic Force Microscope.

Preliminary analysis of experimental data revealed that the samples IR spectra did not change significantly during first few weeks of composting. In macroscopic scale samples lost their flexibility. No other signs of decay were observed.

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