Journal of Vinyl and Additive Technology, vol.20 (1), 2014, pages 42-48

Degradability in a natural compost medium of (linear low-density polyethylene)/(soya powder) blends compatibilized with epoxidized natural rubber

Abstract

The objective of this study was to investigate the degradability of linear low-density polyethylene (LLDPE)/(soya powder) blends. The blends were compatibilized by epoxidized natural rubber with 50 mol% of epoxidation. They were exposed to a natural compost medium located in northern Malaysia. The degradability was evaluated by using tensile tests, a morphological study, carbonyl indices, crystallinity measurements, weight loss, and molecular-weight changes. The tensile strength and elongation at break of the compatibilized blends decreased during one year of exposure. The colonization of fungus and the formation of pores were observed in micrographs. The carbonyl indices, crystallinity, and weight loss increased during exposure, thereby indicating the degradation of the blends. The reduction in molecular weight revealed the degradation of the LLDPE upon composting. Surprisingly, after composting, the compatibilized blends showed more degradation than the uncompatibilized ones.

Keywords; Linear low-density polyethylene (LDPE), Soya powder, Degradability, Natural compost