

Abstract

Polyethylene (PE) films are widely used in packaging. PE is a thermoplastic manufactured from nonrenewable petroleum resources. Due to its non-biodegradability, its films have posed serious pollution problems e.g. visual pollution, blockage of gutters and drains, choking of animals etc. Suitable replacements for PE films especially for single use only, are the starch based thermoplastics such as Polylactic acid (PLA) which are fully biodegradable. This paper reports a comparison of the viscoelastic properties of commercially obtained PLA and PE films, and the degradation of the same under a composting environment. The storage and loss moduli of PLA and PE films were determined using the Dynamic mechanical analyzer (DMA) model 2980. The elastic modulus of PLA was found to be 2222.87 MPa at 50°C and amplitude of 10 μm . This is higher than that of PE which was found to be 236.69 MPa at the same temperature and amplitude. Analysis of composting samples over a time span of 36 days indicated a rapid loss of storage modulus of PLA with that of PE remaining fairly constant. Overall, the results suggest that PLA is a suitable substitute for PE in as far as technical performance and degradability is concerned.