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L.L. Lizárraga-Laborín, J.M. Quiroz-Castillo, J.C. Encincas-Encinas, M.M. Castillo-Ortega, S.E. Burruel-Ibarra, J. Romero-García, J.A. Torres-Ochoa, D. Cabrera-German, D.E. Rodríguez-Félix

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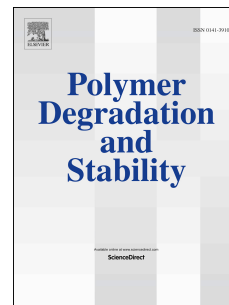
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## Accelerated weathering study of extruded Polyethylene/Poly (lactic acid)/Chitosan films

L.L. Lizárraga-Laborín<sup>a</sup>, J.M. Quiroz-Castillo<sup>b</sup>, J.C. Encinas-Encinas<sup>a</sup>, M.M. Castillo-Ortega<sup>a</sup>, S.E. Burruel-Ibarra<sup>a</sup>, J. Romero-García<sup>c</sup>, J.A. Torres-Ochoa<sup>d</sup>, D. Cabrera-German<sup>a</sup>, D.E. Rodríguez-Félix<sup>a\*</sup>

*a* Departamento de Investigación en Polímeros y Materiales, Universidad de Sonora, C.P. 83000 Hermosillo, Sonora, México.

*b* Universidad Estatal de Sonora, C.P. 83100 Hermosillo, Sonora, México.

*c* Centro de Investigación en Química Aplicada, Saltillo, Coahuila, México.

*d* CINVESTAV-Unidad Querétaro, Querétaro, C.P. 76230, México.

\*Corresponding Author: [dora@polimeros.uson.mx](mailto:dora@polimeros.uson.mx)

### Abstract

Polyethylene/poly (lactic acid)/chitosan films, with and without poly(ethylene-g-maleic anhydride) (PEgMA) as compatibilizer, were prepared by extrusion and the degradation behavior under different times of standard weathering conditions was analyzed. The materials were characterized by means of infrared spectroscopy, scanning electron microscopy, tensile strength, differential scanning calorimetry and thermogravimetric analysis. It was demonstrated that blends of synthetic and natural polymers have a higher susceptibility to degradation in comparison to neat polyethylene and poly (lactic acid) films. Additionally, it is found that the incorporation of PEgMA into the extruded films apparently favored the polymer degradation, as it deduced from the fall of the mechanical properties when the films are exposed to accelerated weathering simulation.

**Keywords:** accelerated weathering, extruded films, chitosan, polyethylene, Poly (lactic acid)

### 1 Introduction

Polyethylene (PE) is one of the most used polyolefin in the world, due to its attractive properties such as high chemical and mechanical resistance; in addition, it is odorless and non-toxic. Therefore, PE has multiple applications, especially in the manufacture of containers or wrappings for different goods including electronics, chemicals and many other products or food items. However, after a short life PE films are discarded to the environment and because of the resilience to be degraded, they remain in the environment for long periods of time, causing serious problems of contamination and damage to animals and other species of living organisms. [1–4].

The blend of synthetic and natural polymers is a simple way to combine their best properties, obtaining materials with acceptable physicochemical and mechanical properties,

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