

Using Different Compatibilization Approaches In Eva/Starch Composites

Hamadache Hassiba¹, Djidjelli Hocine¹, José Antonio Jofre-Reche²,
José Miguel Martín-Martínez²

¹Laboratoire des Matériaux Polymères Avancés (LMPA), Département Génie des Procédés,
Université de Abderrahmene Mira, Route de Tara Ouzammour, Béjaia 06000, Algeria.

²Adhesion and Adhesives Laboratory, University of Alicante, 03080 Alicante, Spain.

Abstract. For improving the compatibility biocompostability composite ethylene-co-vinyl acetate (EVA)/starch, two different compatibilization approaches has been proposed: addition of polyethylene-grafted maleic anhydride (PE-g-MA) and reactive extrusion with maleic anhydride (MA) and benzoyl peroxide (BPO) followed by. EVA/starch composites were prepared in twin-screw extruder. The crystallinity of non-compatibilized composites increased by increasing their starch content, but the crystallinity of PE-g-MA compatibilized composites increased upon adding up to 20wt% starch. The thermal stability of EVA/starch composites decreased by increasing the amount of starch, but the addition of PE-g-MA compatibilizer increased their thermal stability. On the other hand, the in situ grafting increased the thermal stability of the composites, in greater extent by increasing their starch content. Furthermore, the mechanical properties of compatibilized EVA/starch composites were improved, more noticeably by increasing their starch content. The improved properties of compatibilized composites were ascribed to the improved interfacial interactions between starch.

Keywords: Reactive extrusion, PE-g-MA, EVA/starch composite.