Abstract Template

New glycidyl methacrylate-based copolymers as compatibilizers for polypropylene and polyethylene terephthalate blends

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Abstract

Glycidyl methacrylate (GMA) based materials have been known to act as compatibilizers for polypropylene (PP) and poly(ethylene terephthalate) (PET) blends. PP is a well-known polyolefin that is produced and consumed at significantly high rates worldwide. However, due to its poor mechanical properties, its field of applications is limited. Improving upon PP's mechanical weakness could be done with different particles or polymeric blends. PET is one of the most consumed polyesters due to its rigidity, oxygen barrier effect and thermal stability. Due to its properties, PET can improve the mechanical and thermal properties of other common polymers (polyolefins), if efficiently blended. This work aims to study the influence of the PGMA content in the final properties of PP-PET blends. To achieve this, different ratios of GMA and 2-ethylhexyl acrylate (EHA) were copolymerized by dispersion polymerization (DP). Having a good thermal stability ($T^{5\%}$ > 260 ºC, $T^{10\%}$ > 315 ºC and T_{max} > 370 ºC), the synthesized PGMA-random-PEHA (PGMA-*co*-PEHA) copolymers were studied as potential compatibilizers for PP-PET (70-30 wt%) blends. The blends were processed in a mixer for 10 minutes at 240 ºC, 60 rpm. The effects of adding 1 to 5 wt% of PGMA-*co*-PEHA to the PP-PET (70-30 wt%) blends were assessed under the same processing conditions. Comparative studies were performed with a commercially available PE-*co*-PGMA compatibilizer. The thermal, mechanical and thermomechanical properties of each formulation were evaluated and showing the success of the compatibilization.

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Keywords— *Compatibilization, dispersion polymerization, poly(glycidyl methacrylate), PP-PET blends*

Professional Biography

Mafalda S. Lima received her master in Biomedical Engineering, from the Faculty of Sciences and Technology of the University of Coimbra, Portugal, in 2016. Her MSc thesis was on the synthesis of cationic block copolymers by reversible deactivation radical polymerization for

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