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IMPROVEMENT OF SOME POST-CONSUMER POLYPROPYLENE (rPP) BY MELT MODIFICATION WITH STYRENE-DIENE BLOCK COPOLYMERS

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Abstract

Nowadays, the polyolefins (polyethylene, polypropylene) are increasingly consumed in large amounts for many applications. This issue causes a concern regarding the environmental impact of the waste materials generated after the first use. Mechanical recycling of polyolefin wastes helps to conserve oil and gas resources and reduce the polymeric waste accumulation in environment.

In this paper, the modification of some post-consumer polypropylene (rPP) properties coming from packaging processing is investigated by the use of styrene-isoprene-styrene triblock copolymers (SIS). Thus, SIS block copolymers up to 20 wt.% in content with respect to rPP were introduced into the melted polymeric matrix by means of a twin rolls under the processing temperature of 185-190 °C. The mechanical, thermal and structural properties of rPP/SIS blends have been studied with regard both to the content of SIS from blends and of polystyrene (PS) from SIS. The obtained results showed that the used SIS block copolymers led to the decrease of the degree of crystallinity and to increase of crystallite sizes of blends, with SIS20-10% being the most pronounced effect. Although by introduction of SIS into rPP a slight decrease of tensile strength is recorded, a remarkable increase on elongation at break and impact strength of rPP/SIS blends are exhibited. The good mechanical properties were achieved even by using of 10 wt% SIS.

Key words: elastomer, environment, melt processing, polypropylene, property, recycling

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