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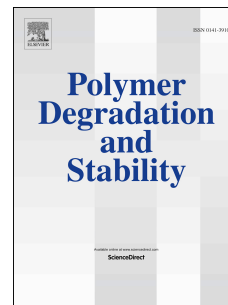
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Interfacial interaction between degraded ground tire rubber and polyethylene

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Abstract

The interfacial interaction between the linear low density polyethylene (LLDPE) and ground tire rubber (GTR) suffered from various degrees of degradation was investigated using the scanning electron microscopy (SEM), thermogravimetric analyses (TGA), differential scanning calorimetry (DSC) and mechanical testing. The effect of the maleic anhydride-grafted high density polyethylene (HDPE-g-MAH) on the interaction was also investigated. The results showed that the interfacial interaction was greatly influenced by the degradation degree of ground tire rubber and the presence of HDPE-g-MAH. During the melt process, a mechanochemical reaction between LLDPE and the degraded GTR was observed. The addition of the HDPE-g-MAH promoted a more homogeneous dispersion of degraded GTR in the LLDPE, and the thermal and mechanical performance of the composites was higher than those of without HDPE-g-MAH. The degraded molecular chains and the exposed carbon black reacted with the HDPE-g-MAH, which was confirmed by the Fourier transform infrared spectroscopy (FTIR).

Keywords: polyethylene; ground tire rubber; interfacial interaction; light pyrolysis

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