Effect of natural rubber/epoxidized natural rubber (90/10) on mechanical and thermal properties of linear low density polyethylene.

ABSTRACT

The effects of blending different amounts of (90/10) natural rubber/epoxidized natural rubber (NR/ENR-50) with metallocene linear low density polyethylene (mLLDPE) on the tensile strength, elongation at yield point, Young's modulus, hardness and thermal properties were investigated. In this study, N, N-m-phenylenebismaleimide (HVA-2) was used as compatibilizer for the blends. The highest tensile strength was observed in the blend of 90/(9/1) mLLDPE/NR/ENR-50. With increasing mixed rubber content, the tensile modulus is found to decrease continuously, but interestingly the hardness and elongation at yield point is shown to increase. The crystallinity percentage of 10% rubber/mLLDPE was the lowest percentage. The maximum physical crosslinks occur in 90/(9/1) mLLDPE/NR/ENR-50 composite blend. The FTIR showed that the epoxy and double bond groups were found to be absent in all blends indicating thermal stability and compatibility of mLLDPE/rubber blends were improved by addition of 10 and 30% loading of rubber, in the presence of HVA-2 as compatibilizer.

Keyword: mLLDPE; Natural rubber; Mechanical properties; Thermal properties; Blend; Compatibilizer.