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Styrene-co-Acrylonitrile / Ethylene-Propylene-Diene Morphology and Mechanical Properties

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The blending of styrene-acrylonitrile copolymer (SAN) and ethylene-propylene-diene terpolymer (EPDM) by reactive extrusion was studied. SAN and EPDM are known as immiscible polymers but its blends are interesting for application because of good stability in use. SAN/EPDM blends were investigated to obtain higher miscibility and to determine the effect of rubber (EPDM) on the polymer morphology, and mechanical properties. The first series of samples were prepared with different types of free radical initiators (2,5-dimethyl-2,5-di-(t-butylperoxy) hexane (Luperco 101 XL), 2,5-dimethyl-2,5-di-(t-butylperoxy)hexyne-3 (Luperco 130 XL), α,α'-di(t-butylperoxy)diisopropyl-benzene (Peroximon F40) and 2,2-azo-di-(2-acetoxy) propane (Luazo AP)), the second series with addition of high impact polystyrene (HIPS)as a compatibilizer and the third series with different ratios of SAN and EPDM. Before extraction the measurements of mechanical properties - tensile strength of blends were made and after then blends were separated on its components: SAN, EPDM, graft (EPDM-g-SAN) and gel to elucidate the extrusion process. The identification of extracted polymers have been made on IR spectr ophotometer. Scanning electron microscopy (SEM) and differential scanning calorimetry (DSC) was used to observe the blends morphology. The dominant grafting reaction was observed in blends prepared by Peroximon F40 initiator and by HIPS compatibilizer. Tensile strength of the blends significantly decreased when the fraction of the EPDM was 20 mass-% and higher.