Influence of the organoclay addition system on the characteristics of the EVA/PS/SBS ternary blend nanocomposites.

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The growth in the use of polymer blends is mainly due to their ability to combine the properties of their phases in a unique product. The final properties of polymer blends are directly related to the quality of their morphology, which in turn depends on the rheological properties of the phases of the blend, on the composition of the blend, on the processing conditions of the blend, and on the compatibility between the polymers forming the blend. However, most of polymer blends are incompatible, resulting in materials with coarse morphology, weak adhesion among phases and poor mechanical properties. The compatibility between the phases of a blend can be improved by the addition of compatibilizers which results in a finer and more stable morphology, better adhesion between the phases of the blends and consequently better properties of the final product. The most popular way of compatibilization is to apply a third component, in many cases, a copolymer, during the processing of the blends. On the other hand, to overcome this problem inorganic rigid particles have been used to toughen brittle polymers. In the area of nanotechnology, polymer matrix based nanocomposites have recognized that exfoliated clays could yield significant mechanical property advantages as a modification of polymeric systems. The preparation of polymer nanocomposites requires extensive delamination of the layered clay structure and great dispersal of the resulting platelets throughout the polymer matrix. In this work, an experimental study of the influence of addition organoclay/mineral oil system on the flow characteristics, morphology, thermal properties and mechanical properties of EVA/PS/SBS blend were carried out. The composites are prepared in a twin-screw extruder. The structure of the resulting micro- or nanocomposites was investigated by melt flow index (MFI), X-ray diffraction (DRX), scanning electron microscopy (SEM), thermal analysis (DSC and TG) and impact resistance. The flow ability of the ternary blend was improved by the organoclay presence, with or without oil. The attainment of nanocomposites was indicated by DRX analysis. The oil presence contributed significantly to the nanocomposites homogenization. The impact resistance changes only were changed at higher contents of organoclay.