EVALUATION AND CHARACTERIZATION OF POLYSTYRENE BLENDING WITH POLYPROPYLENE BY USING VARIOUS COMPATIBILIZERS

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ABSTRACT

The use of Polymer based materials (PBM) is rapidly increasing to replace the metal parts because of their lower densities, easy maintenance & inexpensive prices. Among a variety of PBM's PP/PS belong to the most important ones. These blends are suitable for low performance parts like dash boards, computer cases. However they cannot be used for high performance parts like automotive & aviation because they exhibit low impact strength, tensile strength, flexural, compression. To increase the mixture properties suitable chemicals/substances are needed. These chemicals are called as compatibilizers. This study focuses on the exploration of a suitable compatibilizer for the said mixtures. These compatibilizers should be such that the mechanical and thermal properties of the mixture should be enhanced. Blends of 100/0, 75/25, 50/50, 25/75 and 0/100 wt% PP/PS were prepared through melt blending in a Twin screw extruder at a blend temperature of 200°C and a screw speed of 60 rpm. Three compatibilizers, viz. Styrene-Ethylene/Butylenes-Styrene (SEBS), Ethylene Vinyl Acetate (EVA) and Surlyn with concentration of 5% w/w were used. The tensile strength, flexural, compression, impact, strength of blends was compared and Heat Deflection Temperature (HDT), Melt Flow Index and Glass Transition temperature were also compared. The blends containing SEBS and EVA showed a positive effect on the ductility of the blend. In the presence of Surlyn the strength of the blend increased.

KEYWORDS: Polymer Based Materials, Polystyrene, Polypropylene, Styrene-Ethylene/Butylenes-Styrene (SEBS), Ethylene Vinyl Acetate (EVA) and Surlyn