



**INVESTIGATION ON THE TRANSESTERIFICATION REACTION IN PBT/PC BLEND: THE EFFECT OF MIXING TIME AND TEMPERATURE, NANOCCLAY AND CATALYST**

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The transesterification reaction in polyester blends during melt mixing plays an important role in their compatibility, and the ultimate properties of the blend affected by this reaction. In this study the transesterification reaction and compatibility in the blend of poly (butylene terephthalate) (PBT) / polycarbonate (PC) at blend ratio of 50/50 wt% were investigated by Fourier Transform Infrared Spectroscopy (FTIR) , Dynamic Mechanical Thermal Analysis (DMTA) and Scanning Electron Microscope (SEM). Samples were prepared in an internal mixer at different temperatures (260°C and 300°C) and different mixing times(10min and 16min ) in absence and presence of Antimony trioxide ( $Sb_2O_3$ ) and closite 30B. The rotor speed was set at 60rpm for all samples.  $Sb_2O_3$  is a commercial catalyst which is used in synthesis of PBT and closite 30B nanoclay is an organomodified montmorillonite (O-MMT). The DMTA results showed two glass transition temperature ( $T_g$ ) for the blend, that shifted toward each other compared to  $T_g$ s of neat polymers. This behavior indicates a partially miscible system and is an evidence which confirms transesterification reaction takes place even in samples without  $Sb_2O_3$ . The results showed that transesterification reaction takes place in these samples, because of catalyst residues that were used for PBT synthesis and now is present in it. The FTIR spectra showed that increasing the mixing temperature had only a little effect on transesterification reaction while increasing mixing time and presence of  $Sb_2O_3$  catalyst and closite30B increased the rate of this reaction.