G02.01

Influence of the PBT Molecular Weight and Reactive Compatibilizers (MMA-GMA-EA) on the Morphology of PBT/SAN Blends.

*Elias Hage Jr. (b), Edson Noriyuki Ito (a), Nelson Marcos Larocca (a), Rosario Elida Suman Bretas (b)

(a) *Graduate Program on Materials Science and Engineering - PPG-CEM*
(b) *Materials Engineering Department - DEMa*
Federal University of Sao Carlos
Rod. Washington Luiz, km 235 CEP 13565-905- Sao Carlos - SP Brazil

Polybutylene terephthalate (PBT) has been impact modified by elastomers and rubber modified thermoplastics, such as acrylonitrile-butadiene-styrene (ABS) terpolymers. PBT has been already successfully toughened by high rubber ABS. The ABS rubbery rich phase is generated during its synthesis and has its morphology determined by the reacting processing conditions. On the other hand, the ABS thermoplastic rich phase is formed by the also synthesized styrene-acrylonitrile (SAN) copolymers. For PBT/ABS blends, the rubber phase stay dispersed in the blend matrix, while the SAN forms the interface with PBT. Studies of the influence of the PBT molecular weight on the PBT/SAN blends were performed. The compatibilization between phases in the system PBT/SAN was obtained by addition of the terpolymer MMA-GMA, which was synthesized from the monomers methyl methacrylate (MMA) and glycidyl methacrylate (GMA). Both components are acrylic monomers and the only difference between them is the presence of epoxy groups in the GMA molecular structure. The epoxy functional group is able to react to carboxylic and hydroxyl end groups from PBT molecule giving grafted molecules PBT-g-GMA-MMA. That reaction occurs in situ during melt blending. MMA-GMA segments are miscible with SAN molecules, which leads to the interfacial compatibilization between PBT and SAN phases. The PBT/SAN blends were obtained by melt blending in a torque rheometer (Haake) and characterized by the scanning electron microscopy (SEM). Different viscosity ratios were used by changing the PBT molecular weight. Image analysis showed that lower molecular weight PBT promotes less dispersed SAN phase due to lower PBT/SAN viscosity ratio. Compatibilizers showed to be very effective in reducing the size of the SAN particles dispersed in the PBT matrix.