

The effect of chain extender on viscosity and mechanical properties of poly (butylene terephthalate) blending with recycled poly(ethylene terephthalate)-glass fiber composite

Abstract :

In this study, multi-functional styrene-acrylic oligomers was used as the chain extender in poly butylenes terephthalate/recycled glass-filled polyethylene terephthalate (PBT/RGF-PET) blends. Normally, usage of recycled plastics is favourable but somehow, during the reprocessing causes loss of properties. Thus, chain extender was added to restore the viscosity and mechanical properties of PBT/PET blends due to the incorporation of recycled poly (ethylene terephthalate) has lowered viscosity and molecular weight. Chain extender at 0.50 and 0.65 wt% was added into 50/50 PBT/RGF-PET using melt compounding method to compare viscosity and mechanical properties with virgin PBT and RGF-PET, respectively. Addition of chain extender has improved the viscosity of the PBT/RGF-PET which was in relation to the increment of molecular weight. When 0.50 w\%. of chain extender was added to PBT/RGF-PET blend at ratio of 50:50, the flexural modulus increased 9.6% to 3530 1.1Pa compared to the original flexural modulus at 3220 1.1Pa. This showed that a small amount of chain extender was successfully to improve the flexural modulus. The increment of molecular weight as induced by the addition of chain extender improved the impact resistance of the PBT/RGF-PET from 17 to 20.3 kJ m⁻² for addition of 0.50 wt.% chain extender