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Title: THERMAL, DYNAMIC MECHANICAL ANALYSIS AND MECHANICAL PROPERTIES OF POLYBUTYLENE TEREPHTHALATE/POLYETHYLENE TEREPHTHALATE BLENDS

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Abstract: Differential scanning calorimetry (DSC), dynamic mechanical analysis (DMA) and mechanical tests were conducted to characterize the properties of polybutylene terephthalate/polyethylene terephthalate (PBT/PET) blends. PBT and PET were blended at different PBT/PET ratios (80/20, 60/40, 40/60, 20/80) via twin screw extruder prior to injection molding. DSC characterization showed a single glass transition temperature for all PBT/PET blends indicating that the miscibility occurred in the amorphous region. From DMA results, loss modulus and tan δ also showed a single peak for all PBT/PET blends, confirming the DSC results. At room temperature, PBT/PET 20/80 has the highest storage modulus followed by PBT/PET 80/20 blend. PET has higher tensile strength, flexural strength, Young's and flexural modulus than PBT but lower in elongation at break and impact strength. PBT/PET 80/20 blend has the highest tensile strength, flexural strength, elongation at break, and impact strength compared to other PBT/PET blends. PBT/PET 80/20 blend can be suggested as an optimum formulation with balanced mechanical properties in terms of stiffness and toughness.

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