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Preparation of Copolymer from Recycle Plastic Bottle and Study of Its Applications in the Electrochromic Devices

In this study, waste poly(ethylene terephthalate) (PET) bottle was depolymerized using excess ethylene glycol (EG) in the presence of zinc acetate as a catalyst. It was found that the reacted products consist mainly of bis-2-hydroxy ethylene terephthalate (BHET) monomer. Poly(ethylene terephthalate)-poly(lactic acid) (PET-PLA) copolymers were synthesized by the reaction of BHET with L-lactic acid monomers (LLA) using the catalytic system. The samples were analyzed by nuclear magnetic resonance (NMR) and differential scanning calorimetry (DSC). The 1H and 13C NMR studies confirm the incorporation of lactate units in PET chains after reaction. Further, we report the use of graphene conductive ink and PET-PLA as the electrochromic device. Copolymer film was coated with graphene ink by spin coating method. Our results primarily indicate that the configuration presents an easy and expeditious way of preparing the electrochromic device.

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