

Pre-treatment of low-grade waste PET for depolymerization to monomers

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The continual increase of polyethylene terephthalate (PET) demand poses serious environmental and economic concerns to the world. Chemical recycling of waste PET is a promising option for the conservation of resources and environment. Glycolysis is widely used on a commercial scale because the process is the simplest and least capital intensive for the monomer production. The monomer generated during glycolysis is bis (2-hydroxyethyl) terephthalate (BHET). The depolymerization of waste PET to monomers has been studied by many researchers but the process was limited by the quality of waste PET. The low-grade waste PET contains high amounts of impurities that should be removed before depolymerization. The impurities in monomer mixture affect the property of the newly synthesized PET. In this study, we proposed a new approach to chemically recycle the low-grade waste PET to BHET monomers by depolymerization. The impurities in the depolymerized monomer mixture were considerably removed and the monomer product was confirmed by conventional analytic tools. Reducing impurity level in the monomer mixture can enhance the crystallization and therefore provide better property of PET product.