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Methanolysis of Poly(ethylene terephthalate) in Supercritical Phase

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摘要 The depolymerization of poly(ethylene terephthalate, PET) in supercritical methanol is studied using a stainless stirred autoclave at temperature of 255~260°C, pressure of 8.5~14.0 MPa, and methanol/PET weight ratio of 3~8. Under the optimal conditions, the PET is depolymerized completely to its monomers in 60 min. The main products of the reaction are dimethyl terephthalate and ethylene glycol. There are still some small amounts of byproducts, such as methyl-(2-hydroxyethyl) terephthalate, bis(hydroxyethyl) terephthalate, dimers and oligomers. Reversed-phase high performance liquid chromatography and gas chromatography are used to analyze solid products and liquid products respectively. The results of depolymerization show that the yield of dimethyl terephthalate and the degree of PET depolymerization are dependent on the reaction temperature, weight ratio of methanol to PET and reaction time. But the reaction pressure has little influence on the depolymerization as long as methanol is in supercritical state.

关键词 [polyethylene terephthalate \(PET\)](#) [methanolysis](#) [chemical recycling](#) [supercritical fluid](#) [depolymerization](#)

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