

Modeling and simulation of DMT (dimethyl terephthalate) production process from waste PET

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With extensive use of PET in various applications, its recycling has received wide attention for the preservation of resources and the protection of the environment. Chemical recycling technology is a promising technology for sustainable development of PET depolymerization process. The products obtained are DMT (dimethyl terephthalate) and EG (ethylene glycol) which are actually building blocks of PET. PET depolymerization process are simulated and the yields of DMT and EG are optimized using Aspen polymer plus®.

In this study, we consider methanolysis of PET at 260 oC and 3.0 atm. Polymer feed rate was 70 kg/hr and the reactor volume was 2000 L. Step-growth reaction model was used to account for chemical reaction kinetics and Polymer-NRTL model was used for phase equilibrium thermodynamics. The largest yield of DMT was 87 wt % and that of EG was 40 wt %.