

Time, temperature and amount of distilled water effects on the purity and yield of bis (2-hydroxyethyl) terephthalate purification system

ABSTRACT

Polyethylene terephthalate (PET) bottle is one of the common plastic wastes existed in the municipal solid waste in Malaysia. One alternative to solve the abundant of PET wastes is chemical recycling of the wastes to produce a value added product. This technology not only can decrease the PET wastes in landfill sites but also can produce many useful recycled PET products. Bis(2-hydroxyethyl) terephthalate (BHET) obtained from glycolysis reaction of PET waste was purified using crystallization process. The hot distilled water was added to glycolysis product followed by cooling and filtration to extract BHET in white solid form from the product. The effect of three operating conditions namely crystallization time, crystallization temperatures and amount of distilled water used to the yield of crystallization process were investigated. The purity of crystallization products were analyzed using HPLC and DSC. The optimum conditions of 3 hours crystallization time, 2 °C crystallization temperature and 5:1 mass ratio of distilled water used to glycolyze solid gave the highest yield and purity of the crystallization process.

Keyword: Optimum conditions; BHET; Crystallization Process; PET Waste; Yield