

CHAPTER V

CONCLUSION

Reclamation of TPA from used PET bottles could be achieved by both saponification and neutral hydrolysis. The optimum condition for saponification was 50% w/w (NaOH/PET), 210°C, and 1 minute. For neutral hydrolysis, 270°C and 5 minutes were optimum.

The saponification and neutral hydrolysis methods are compared in Table 5.1.

Table 5.1 Comparison of Saponification and Neutral Hydrolysis Methods

	Saponification	Neutral hydrolysis
Reactant	NaOH and water	Water
Temperature	210°C	270°C
Time	1 minute	5 minutes
%Yield	97.4	96.5
Purification method	Precipitation	Sublimation
By-product	NaCl	none

Neutral hydrolysis was a recommended method, because there was no by-products need to be disposed.

These methods could be applied to reclaiming TPA from municipal plastic wastes. The five major components of plastic waste are polyethylene (PE), polypropylene (PP), polystyrene (PS), polyvinyl chloride (PVC), and polyethylene terephthalate (PET). PE, PP, and PS can be separated out by well-known density-classification methods such as floatation or hydrocyclone. However, mixed plastics would not affect either chemical reaction as they cannot be hydrolyzed.

In the case of PVC mixed with PET, two procedures can be adopted. First, PVC can be removed from PET by electrostatic separation or automated sortation. PET can then depolymerized by neutral hydrolysis. In other procedure, it is not necessary to separate PVC from PET. The mixed plastics could be charged into the reactor and saponified.