CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This experimental work has shown that the effectiveness of a surfactant on the deinking process depends on the process pH, type of surfactant and the surfactant concentration. The results are in good agreement with the previous study of deinking of polyethylene film (Gecol, 1998). Cationic CTAB above CMC is the most effective surfactant for deinking at pH 12 with or without added abrasive. Pre-soaking time prior to mechanical agitation is also essential for ink removal since pre-soaking in surfactant solution for 2 hours significantly increases the deinking level and decreases the shaking time needed for complete deinking. To increase the degree of deinking using nonionic surfactant $NP(EO)_{10}$ above the CMC, pre-soaking in the surfactant solution for 48 hours is needed together with mechanical action in the presence of abrasive which help to detach the loosened ink from the plastic surface. But in the previous study of deinking of polyethylene film (Gecol, 1998), only 2 hours shaking time was needed to get complete deinking with the use of nonionic surfactant. Anionic surfactants SDS were not effective for deinking even at high pH levels.

5.2 Recommendations for Further Study

Further study of deinking is recommended to determine the zeta potential of ink particles as the electrical potential on the ink particles is anticipated to be important in the ability to remove the ink from the plastic surfaces and also for the dispersion stability of the detached ink particles. In addition, the effect of anionic surfactant in the presence of hardness ions (e.g.

calcium ions) should be investigated since this type of surfactant is more biodegradable and economical than the other surfactants. Changing other variables such as type of surfactant and studying different colors of ink is also recommended.