

## CHAPTER V

### CONCLUSIONS AND SUGGESTION

#### 5.1 Conclusions

An addition of suitable salts, sodium chloride or aluminium ammonium sulfate, into an emulsified wastewater of anionic wax emulsion could demulsify and separation wax particles from wastewater. The suitable amount of salt added to separate wax depends on the solid content in emulsified wastewater. A low (<1.0 %), medium (1.0-4.9 %), and high solid content (>4.9 %) required 3.0, 5.0, and 8.0 wt % NaCl, respectively. At the same solid content, less amount of alum is required than NaCl. Increasing temperature increases the solubility of salt and surfactant and accelerates the phase separation. Stirring rate has effected on mixing efficiency of salt and the simulated wastewater and maximum volume of aqueous phase separation.

The analysis of water quality after wax particle removal showed that oil and grease (O/G) and suspended solid was much lower than the effluent standard for both salts added. The results showed that high efficiency for wax particle removal was achieved. However, chemical oxygen demand (COD) and total dissolved solid (TDS) were exceeded the effluent standard and related to the amount of salts added. Addition of alum brought the pH of aqueous phase down below the pH range allowed.

## 5.2 Suggestions for Further Study

1. Study possibilities of reuse the clear water separated by ion exchanger to remove  $\text{Na}^+$  and  $\text{Al}^{3+}$  ions and recycling of semisolid wax in the wax emulsion process.
2. Enlarge a scale for the emulsified wastewater treatment and study possibility of semi-batch or continuous operation.



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