

## CHAPTER V

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Conclusions

This work was to study the correlations between phase behavior of microemulsion conditions and detergency application of mixed surfactant system that consisted of Methyl Ester Sulfonate (MES) and Alcohol Ethoxylate (AE). The experimental results indicated that MES and AE were excellent to form microemulsion with motor oil. Moreover, the mixed system can decrease the interfacial tension (IFT) well with motor oil that means it was applicable in the detergency performance. To formulate a mixed surfactant system, MES and AE with 3 EO groups were used for formulation selection. As the result, the mixture of 88.23 %MES and 11.77 %AE<sub>3</sub> were chosen as the proper formulation in detergency experiment. In addition, the 0.3 % active concentration of the selected formulation provided the highest efficiency in oil removal when compared to other surfactants. In detergency performance, The mixed surfactant systems were studied their efficiency in motor oil removal from 100% cotton, polyester/cotton blend, and 100% polyester fabrics. From the results, the mixed system with the proper formulation under microemulsion conditions could provide higher oil removal efficiency than commercial detergent in three fabrics. In addition, the amount of residue surfactants on the fabric of selected formulation was approximately lower than the commercial detergent and LAS. Therefore, the mixed system of MES and AE<sub>3</sub> was a good detergent for a use in washing process.

#### 5.2 Recommendations

Due to the important of water hardness on foaming and detergency performance, the effect of water hardness should be studied.

The biodegradability of all surfactants should be investigated.