CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This work was to formulate a mixed surfactant system with a low salinity to form microemulsion with motor oil for detergency application. Dowfax 8390, AOT and Span 80 were used for formulation selection. The mixed surfactants of 1.5% Dowfax, 5% AOT and 5% Span80 were selected to conduct the detergency experiments because it gave the lowest optimum salinity at 2.83 wt% to form a Winsor Type III microemulsion.

From the detergency results, the detergency performance on cotton was the highest followed by polyester/cotton blend and polyester, respectively, indicating that the high hydrophobic oil is more difficult to remove from non-polar substrate. The oil removal in the first rinse was found to be as high as that in the wash step. In the wash step, the oil removal was found to be not as high as expected because of the spreading effect. The remaining oil on the fabric is further removed by the rinse step since the IFT increases resulting in reduction of the spreading effect. In addition, the amount of rinsing water affects the oil removal of each step but does not affect the overall oil removal, therefore the low rinsing water can be used in real application. Moreover, it was found that two times of rinsing are sufficient for detergency process because insignificant oil removal was found beyond the second rinse.

In this study, the maximum detergency coincides with the minimum IFT for rinsing experiments, that means the low interfacial tension can improve detergency performance.

5.2 Recommendations

Due to the high viscosity of motor oil, conducting phase behavior studies and detergency test at a higher temperature may enhance the detergency performance.

Na_2CO_3 and Na_2SO_4 should be used to control salinity since they are commonly used in commercial detergents.

The effects of hardness on phase behavior and detergency performance should be studied.