

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This thesis work aimed to investigate the effects of hardness and builders on both the phase diagrams of microemulsions with motor oil and the detergency performance of oily soil removal. A mixed surfactant system of 0.1wt.% branched alcohol propoxylate sulfate sodium salt (Alfoterra 145-3PO) and 5wt.% secondary alcohol ethoxylate (Tergitol 15-S-5) was used to form microemulsions with motor oil under the presence and absence of hardness and/or builders

Under this mixed surfactant system, the optimum salinity in the phase diagrams of microemulsions slightly decrease with increasing hardness and the microemulsion diagrams did not change with hardness. From the detergency results, total oil removal (%) decreased with increasing hardness for all three types of fabrics (pure cotton, polyester/cotton [65/35] blend and pure polyester) and total oil removal (%) was improved with increasing hydrophilicity of the fabric with cotton fabric being cleanest and polyester fabric being the most difficult to clean. When the hardness increased, the adsorption of a mixed surfactant decreased but the interfacial tension increased. For the effect of builders on the detergency performance, adding builder to be several times the hardness results in decreasing total oil removal (%) due to the builder reacts with the other divalent and monovalent cations in the system.

5.2 Recommendations

To obtain a better understanding effect of hardness and builder on oily soil detergency, the further study should be studied for contact angle and adsorption isotherm of surfactants in order to correlate with the detergency performance. Moreover, zeta potential and pH should be considered. Besides, the cause of a high amount of lost surfactant and the solution to reduce it should be also studied.