

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The results can be concluded that for any given type of surfactant, %detergency increased with increasing either surfactant concentration or solution pH and the maximum performance was found at pH 11. In addition, the MES was found to exhibit a better detergency than the AE9 since the zeta potential on the ferric oxide surface in the MES solutions is more negative than that in the AE9 solutions. In a comparison among the three fabrics, the highest detergency performance from using the MES was found to be 58%, 58% and 63% for the polyester, polyester/cotton blend, and the cotton, respectively. The results can be explained in that the cotton fabric has the hydroxyl and carboxyl groups, leading to the interfibrillar swelling, causing the further reducing soil-substrate interactions. The MES adsorption on surfaces; ferric oxide and cotton can be explained in that head down with the hydrophilic surface while tail down with the hydrophobic polyester surface. For the MES adsorptions on the blend polyester/cotton, there are both tails down and head down on the surface. The AE9 adsorption on these three test fabrics showed the similar trends as compared to the case of the MES. In comparisons among the three fabrics, the degree of the MES adsorption was found to be cotton > polyester/cotton blend > polyester which corresponds to the degree of hydrophilicity of the studied fabrics: cotton > polyester/cotton blend > polyester. Interestingly, the effect of solution pH on the MES adsorption on any fabric was found to be higher than the AE9. For any given type of fabric and solution pH, the maximum adsorption of MES was found to be significantly higher than that of the AE9. However for any given type of surface the contact angles of the MES solution was slightly lower than the contact angle of the AE9 solution.

5.2 Recommendations

In this research the ferric oxide was selected as a hydrophilic particulate soil, for further study mixed soil should be studied for example the mixture of clay, iron oxides, carbon black and motor oil. To gain a better understanding of particulate soil removal, other types of surfactants should be also studied.