สำนักงานวิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In this research, the effects of surfactant concentration, surfactant type, type of fabric, and solution pH on the detergency performance in hydrophobic particulate removal were investigated. The results can be concluded that for any given type of surfactant, the detergency performance increased with increasing solution pH and the maximum performance was found at pH 11. In addition, SDS was found to exhibit a better detergency than Triton X-100 since the zeta potential on the carbon black surface in SDS solutions is more negative than that in Triton X-100 solutions. In a comparison among the three fabrics, the highest detergency performance was found to be 71%, 69% and 66% for the polyester, polyester/cotton blend, and the cotton, respectively. The results can be explained in that the polyester fabric has the highest negative charge, leading to the highest repulsion force between the head group of surfactant adsorption onto the carbon black surface and the negative-charged surface of the polyester fabric.

SDS adsorb on the surface of carbon black and polyester with tail down while adsorbs with head down on the hydrophilic cotton surface. The SDS adsorption on polyester/cotton blend should be both tail down and head down on the surface. The Triton X-100 adsorption on these three fabrics showed the similar trends as compared to the case of SDS. In comparisons among the three fabrics, the degree of SDS adsorption was found to be cotton > polyester/cotton blend > polyester which correspond to the degree of hydrophilicity of the studies fabric: cotton > polyester/cotton blend > polyester. Interestingly, the effect of solution pH on the SDS adsorption on any fabric was found to be higher than Triton X-100. For any given type of fabric and solution pH, the maximum adsorption of SDS was found to be significantly higher than that of Triton X-100. However for any given type of surface the contact angles of Triton X-100 solution was significantly lower than the contact angle of SDS solution. The explanation is that the adsorption of

Triton X-100 on these surfaces was stronger than SDS adsorption since Triton X-100 has longer tail than SDS.

5.2 Recommendations

In this research carbon black was selected as the hydrophobic particulate soil, for further study hydrophilic particulate soil should be selected for example clay and iron oxides. To gain a better understanding of particulate soil removal others types of surfactant should be studied.