



## CHAPTER V

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Conclusions

The adsorption of sodium dodecyl sulfate (SDS) onto carbon black surfaces displayed strong interaction between hydrophobic tail groups of surfactants and carbon surfaces. The presumable configuration of adsorbed surfactants was tail-down and/or laying down orientation. The plateau adsorption of SDS in the absence of calcium salt at pH of 7 and 9 occurred near the CMC of SDS, and was approximately to  $2.06 \mu\text{mole}/\text{m}^2$  that corresponded to 65.73% of close-packed monolayer coverage of SDS on surfaces. The effect of pH between pH of 7 and 9 to the adsorption of SDS on carbon was not considerable, however, at pH of 7 the SDS adsorption was slightly greater than the SDS adsorption at pH of 9. In the presence of calcium ions, the adsorption of SDS increased at increasing calcium concentration because the addition of calcium salt led to the decrease in repulsive forces between head groups of SDS.

From the experiments, SDS and calcium concentrations had impact on the zeta potential. With increasing SDS concentration, the zeta potential increased and with increasing calcium concentration, the zeta potential also decreased. With the adsorption of calcium onto carbon substrate, the result indicated that the interaction of calcium adsorption was purely electrostatic and non-associative. The influence of SDS concentration and pH of suspensions resulted in calcium adsorption. From the experiments, the presence of small amount of SDS in the system diminished the calcium adsorption. It was probably because some parts of hydrophobic tail groups might locate on negatively charged sites that might consequently be the

barriers for calcium to adsorb. It was also found that the adsorption of calcium ions at high pH was greater than that at low pH.

## **5.2 Recommendations**

The mechanism of surfactant and calcium adsorption on carbon surfaces depends on many factors. It is recommended that the further studies should be carried out to investigate the effect of types of surfactants and counterions, and the surfactant mixture.