

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Microemulsion systems composing of water, hexanes, SDS, NaCl, and fatty acids with carbon chain varying from 3 to 7 were studied. From the study of microemulsion phase behavior upon the NaCl scan, the transformation of microemulsion from Winsor type I to III to II was observed at low SDS concentration and the transformation from Winsor type I to IV to II was found at high SDS concentration. Gel formation occurred in the microemulsion systems containing fatty acid with alkyl chain ranging from 5 to 7. The gel phase totally or partially disappeared at elevated temperature. This indicated a very long equilibration time required for preparing clear isotropic microemulsion containing long chained fatty acid. The study of pH showed that fatty acid in these systems was mostly in the acid form and the pH of microemulsion was dependent on the acid dissociation and aqueous solubility of fatty acid. The results of solubilization study showed high solubilization of hexanes in all systems. The optimum solubilization parameter (SP^*) and optimum salinity (S^*) decreased upon increasing SDS concentration. When the fatty acid chain length increased, S^* was diminished while SP^* was enhanced. For the microemulsion conductivity related to phase transition during salinity scan, it could be relatively unchanged, gradually decreased, or reaching a maximum value reflecting the change in the continuous phase composition and micellar phase structure. Moreover, the studied systems also yielded ultralow interfacial tension. In conclusion, fatty acids have a potential for use as cosurfactant in place of alcohol in microemulsion systems.

5.2 Recommendations

It is recommended that further study should examine the effect of pH on microemulsion containing fatty acids as cosurfactants because pH has an effect on the acid dissociation. For example, the basic condition will promote the acid dissociation and dissociated fatty acid will be predominant.

In addition, the use of mixed cosurfactant, e.g. alcohol and fatty acid, should be investigated in order to remove the gel in the systems.