CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

The phase behavior of the alcohol-free microemulsion systems using octanoic acid as cosurfactant shows the transformation of microemulsion type I to III, IV and II upon varying the NaCl concentrations. Gel-like solution, but less viscous, occurs in the excess oil phase of microemulsion type I at low surfactant concentrations and becomes milky at high surfactant concentrations. The long equilibrium time is required to prepare clear middle phase microemulsion. Even when the temperature is raised to 35 ^{o}C, gel-like solution still occurs.

The selection of appropriate microemulsion to solubilize hexane depends not only on the appropriate SP* value but also on the physicochemical properties of the microemulsion phase. Solubilization of hexane decreases as equilibrium time increases and with increasing temperature. The microemulsion system containing octanoic acid yields ultralow interfacial tension property. The interfacial tension and electrical conductivity values decrease with increasing the surfactant concentration.

From the results, octanoic acid gives the physicochemical properties of the microemulsion system similar to those obtained by using an alcohol cosurfactant. The optimum systems require a compromise among the surfactant concentration, time, temperature and the quantity of oil solubilization capacity.

In this study, octanoic acid co-surfactant was used to replace flammable alcohol co-surfactant, however, the system was sensitive to gel-like formation. Therefore it is recommended that further studies should investigate microemulsion formation by using SDS mixed with co-surfactant such as

alcohol and octanoic acid or a branched acid or di-acid to avoid the formation of gel-like phase.