

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Single anionic surfactant, Lipolan PB-800CJ, Lipal 835I, SDS, MES and SDBS, were studied phase behavior with decane as function of salinity (NaCl) concentration from 1wt% to 10wt%. Microemulsion or Winsor Type III phase behavior could not provide from any single anionic surfactant systems at 30°C and 50°C. Ion precipitation of surfactant from SDBS and Lipolan PB-800CJ occurred when salinity increased, while Lipal 835I surfactant provided a thin surfactant accumulated layer at the middle phase. SDS and MES systems could not provide interested phase behavior from salinity screened method.

Nonionic surfactant, Triton[®] X-100 or Tergitol[®] TMN6, could improve phase behavior with SDBS anionic surfactant. The perfect middle phase or microemulsion phase behavior was obtained from mixed SDBS/Tergitol[®] TMN6 surfactant at 7wt% to 10wt% NaCl and mixed SDBS/Triton[®] X-100 surfactant at above 8wt% NaCl. However, have no microemulsion phase behavior for mixed Lipolan PB-800CJ and Lipal 835I surfactant systems. Temperature increase from 30°C to 50°C could not effect to phase behavior of the studied mixed anionic-nonionic surfactant systems.

Microemulsion or Windsor type III phase behavior which determined as the suitable surfactants formulas by optimum solubilization parameter and the lowest ultralow interfacial tension for mixed SDBS/Tergitol[®] TMN6 surfactant was obtained at 8.5wt% NaCl, for mixed SDBS/Triton[®] X-100 surfactant was obtained at 12.5wt% NaCl.

Spontaneous imbibition test was performed to determine the decane recovery performance by the suitable surfactant formulas. The result showed that 39.55% is the highest amount of decane recovered by mixed SDBS/Tergitol[®] TMN6 surfactant with 8.5wt% NaCl. While mixed SDBS/Triton[®] X-100 surfactant with 12.5wt% NaCl could recover 14.837% decane from the same

sandstone core sample. So, the suitable surfactant formulas which were determined from this thesis are able to recover decane from sandstone core at different salinity, this is good probability for applied in enhanced oil recovery process in sandstone reservoir.

5.2 Recommendations

The microemulsion formation of the suitable surfactants should be performed with real crude oil at specific conditions of the target oil reservoir. Other anionic and nonionic mixtures also interesting to determine the microemulsion phase behavior. Applying the suitable surfactant in pilot scale also importance to determine the performance of surfactant which aim for applying toin surfactant enhanced oil recovery.