

CHAPTER V

CONCLUSIONS

This study demonstrated that the asphaltenes with different polarities derived from the pentane-insoluble asphaltenes could be dissolved by n-heptane based fluids containing two alkylbenzene-derived amphiphiles, dodecylbenzene sulfonic acid, and nonylphenol. The factors influencing the rate of asphaltenes dissolution are summarized as follow:

- 1) Effect of the concentration of amphiphiles : The rates of asphaltene dissolution in both fractions appear to follow Langmuir-Hinshelwood kinetics with respect to the concentration of amphiphile.
- 2) Effect of flow rate : The dissolution rate of asphaltene for AspF1-10DBSA, AspF2-10DBSA, AspF2-20NP are dominated by the mass transfer process, while the dissolution rate of asphaltene for AspF1-20NP is dominated by the surface reaction process.
- 3) Effect of temperature : The reactions on asphaltene surface involve the transition from asphaltene-asphaltene associations to asphaltene-amphiphile associations through the re-distribution of inter-molecular hydrogen bonding and charge transfer interactions. It appears that the asphaltene-asphaltene attractive interactions among asphaltene fraction 1 are stronger than that among asphaltene fraction 2.