CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

From the dissolution study, it was found that the percentage of asphaltene dissolved and apparent rate constant of the dissolution of aged asphaltene decreased with increasing aging time and aging temperature.

From potentiometric titration, for the asphaltenes aged under nitrogen environment, both the acid and base numbers tended to decrease with increasing aging time and aging temperature. However, for asphaltene aged in air, the acid number firstly decreased and then increased with increasing aging time and aging temperature and the base number decreased with increasing aging time and aging temperature.

There was a good correlation between the base number and the percentage of asphaltene dissolved as well as apparent rate constant of asphaltene dissolution. Both the rate constant and the percentage of asphaltene dissolved increased when the base number increased due to the acid- base interaction of the asphaltene base site and the DBSA acid site. In contrast, there was no general relationship between the acid number and the asphaltene dissolution.

From elemental analysis data, FT-IR spectra and molecular weight analysis, it was confirmed that the condensation and oxidation reactions occur during the thermal aging process.

Morphology and BET surface area of asphaltenes aged under different conditions should have been conducted in order to elucidate the effect of thermal aging process on physical properties and well as specific dissolution rate constant ($min^{-1}m^{-2}$).

Acid and base properties of fractionated asphaltenes should also be done to determine the reason of the difference in dissolving each fraction.