CHAPTER V
CONCLUSIONS AND RECOMMENDATION

5.1 Conclusion

- Fractionation procedure by using different ratio of dichloromethane and n-pentane as precipitant gave asphaltene fractions with different solubility.

- Venezuelan asphaltene showed the same solubility distribution including characteristics as fraction 1.

- The most polarity asphaltene (fraction 1) appeared to have the most amorphous structure resulting in the highest porosity but the lowest density.

- The highest degree of aromaticity as well as the highest ion contents were the predominant characteristics of the most polar asphaltene (fraction 1).

- The amount of ion (Fe) in the most polar asphaltene (fraction 1) appeared significantly higher than that in the less one (i.e. 0.03 wt% for fraction 1 and 0.01 wt% for fraction 3).

- According to the evolution time for dissolving all asphaltene aggregates required or the specific rate constant (min^{-1}) of asphaltene dissolution, the most polar asphaltene (fraction 1) and the least polar one (fraction 4) were considered as the least and the most stable fraction, respectively.

- The acid-base interaction and BET surface area of the studied asphaltene confirmed that the reaction rate constant (g/m^2-min) was highest in the most polar asphaltene.

- Apart from the effect of surface area, the metal contents also played an important role in asphaltene dissolution mechanism and enhanced the reaction

rate of asphaltene dissolution. It is believed that the metals favor to form porphyrin structures resulting in forming the reactive and complex compounds.

5.2 Recommendation

As described before, the atmospheric oxidation appeared in the fractionation step causing the overweight oxygen content. Hence, the fractionation step should be conducted in a closed system.