CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The influence of soluble asphaltenes and oxygen on asphaltenes aggregation has been investigated. The soluble asphaltenes help stabilize the insoluble asphaltene and delay the aggregation. They do not solvate the insoluble, but instead are all molecularly dispersed in the medium. As they are molecularly dispersed, the soluble increase the solubility parameter of the medium, promoting hospitality for insoluble asphaltenes. Unlike the soluble asphaltenes, the effect of dissolved oxygen is small that can be negligible. There is no significant difference between experimental results collected under air and nitrogen environment for both aggregation kinetics and equilibrium solubility. The research presented here validates the asphaltene experiments conducted under air environment.

5.2 Recommendations

In order to gain more insights about the influence of soluble asphaltenes on the equilibrium solubility, it is advised to perform experiment on different soluble asphaltene concentration while kept the concentration of the insoluble constant. For example, compare the equilibrium solubility of a model oil containing 3 wt% insoluble and 10 wt% soluble with a model oil containing 3 wt% and 40 wt% soluble. In this approach, the effect of soluble asphaltenes, if present, will be more pronounce. It is also advised that the cake from centrifugation should be washed several times with a solution of same toluene/heptane ratio to remove any trapped soluble asphaltenes to get better value of equilibrium solubility.

The effect of oxygen from air on asphaltene aggregation is likely to be some sorts of oxidation process. So, a good way to examine this effect is to use an oxidizer instead of air, which we could barely control the dissolved oxygen concentration. In this way, the concentration of oxidizer could be controlled and if there is an effect of oxidation on asphaltene,aggregation it will be shown up.