CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Asphaltenes have been found to deposit before they are detected by optical microscopy. Capillary deposition can quickly detect instability due to continuous source of destabilized nanoaggregates at the capillary entrance. The deposits were visualized with scanning electron microscopy (SEM). It was found that the deposit is roughly uniform radially, which suggests proper mixing is obtained in the deposition apparatus. The deposit thickness decreases axially down the length of the capillary, which could be due to the asphaltenes preferentially depositing before any significant aggregation occurs. In a parallel study, experiments were performed by flowing a previously precipitated asphaltene solution through a capillary. The results were shown that deposition may be caused by the very small particles asphaltene during aggregation process and does not deposit after it was large enough or matured (95 hours aging time).

5.2 Recommendations

1. To study asphaltene deposition as a function of aging time, centrifugation experiments can be applied by varying the centrifugation force to determine a cut off size that reaches equilibrium at 95 hr.
2. Shear effect can be studied more by adjusting flow rate.
3. In order to characterize the deposit, the experiment should be conducted in larger diameter capillaries for collecting more mass.
4. The improving volume estimate from SEM would likely result in closer prediction for measured mass.
5. In order to improve pressure drop prediction, the accuracy of pressure drop measurement also needs to be considered.