

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

- Using the refractive index technique, the onset point for asphaltene precipitation for crude oil K-1 was determined to be at about 55% volume heptane.
- Precipitation results from microscope observation confirmed the onset point determined by refractive index method.
- It was demonstrated that the presence of water in crude oil affects the determination of onset point for asphaltene precipitation.
- A new mixing system for crude and heptane was developed. It was proved that the degree of mixing was good and using this technique the precipitation of asphaltenes before entering the capillary could be eliminated.
- An improved system to investigate asphaltene deposition was designed and tested.
- It was demonstrated that with time the asphaltenes deposit inside the capillary and cause a decrease in the effective radius.

5.2 Recommendations

- It is important to know the location of the deposition – whether the deposition is distributed uniformly over the entire length of capillary, or is it localized to a certain region? Experiments similar to those discussed in section 4.5 should be conducted with a capillary of shorter length. If the pressure drop decreases in proportion to the decrease in length, it suggests uniform deposition. However, if the pressure drop is not significantly changed by decreasing length of capillary, it is probably the case of localized building up of asphaltene particles.

- In order to ascertain the location of deposition, the capillary may be cut into several sections of equal length after the deposition experiments. The deposits from each segment should be collected by dissolving them in toluene. Toluene should be evaporated and the deposit obtained from each segment should be weighed. Comparing the amount of deposits obtained from different sections of the capillary would provide more insight into the distribution of asphaltene deposits along the length of the capillary.
- The designed system should be used to investigate deposition tendency of asphaltenes, by using different crude oils and precipitants.