

CHAPTER V

CONCLUSIONS AND RECOMMENDATION

5.1 Conclusions

Different crude oils contain different major hydrocarbon compositions which can be related to crude properties (initial boiling point, density, pour point, WAT, and WDT). The study of characteristics and properties of three crude oils show that Lankrabue crude oil had highest initial boiling point, density, pour point, WAT, and WDT while Fang crude oil had the lowest. When employing different solvent separation methods, total waxes (micro-,macro-crystalline) obtained from Nguyen's method were lower than that obtained from modified method. P-Xylene used in Nguyen's method has higher polarity than n-heptane used in modified method, therefore had the higher ability to dissolve saturates than n-heptane. Nonetheless, the FTIR spectra of microcrystalline fractions obtained from both methods indicated the presence of asphaltenes and macro-crystalline fraction, by comparing well with the reference spectrum. While the asphaltene fraction indicated the presence of other components. Various solvents were used to dissolve paraffin wax, thus decreased the pour points. The carbon number of the solvents had a slight effect on the pour point reduction. Various polymeric chemical inhibitors were also employed. The influence of wax inhibitors depended on copolymer composition and the optimum condition. The best condition for reducing pour point was obtained for Lankrabue, U-thong and Fang with the addition 800 ppm of poly(maleic anhydride-alt-1-octadecene) (PMAO), 600 ppm poly(octadecyl methacrylate) (POMA) and 400 ppm (Ethylene-Vinyl acetate) (EVA) at 18% VA, respectively. It was observed that no one type of wax inhibitor was equally effective for all crude oils. These results constitute an important correlation between major hydrocarbon composition in crude oil and the polarity of wax inhibitors, including their chain lengths. The combined effect if the solvent and wax inhibitor was also studied, and found that pour point reduction was better than employing only solvent or inhibitor alone.

5.2 Recommendation for Future Work

From the result, it is possible to combine two or more chemicals that can improve pour points of crude oils. Therefore, in future work, the combined chemicals and solvent effect should be explored in greater details. Further studies on the relation between crude oil, macro-, micro-crystalline wax composition should also give valuable information that will lead to better selection criteria to prevent wax deposition of each crude oil for the industry.