

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

From this research results, the specific conclusion are made as follow;

For phase behavior study, surfactant structures were not affected to amount of surfactants in palm oil/diesel blend with ethanol to formulate a single phase microemulsion. For microemulsion droplet size and size distribution study, droplet size of Span 80 system was smaller than that of methyl oleate and PME systems. This led to the kinematic viscosity of Span 80 systems was higher than those of the other systems. However, cloud point, density and heat of combustion of each microemulsion systems have no significant difference.

For the effect of cosurfactant structures in which branching chain of 2-ethyl-1-hexanol was compared with 1-octanol, types of cosurfactant did not affect to phase behavior, kinematic viscosity, droplet size, turbidity, cloud point, density and heat of combustion.

Comparably, palm oil and RBDPO systems were observed their phase behavior and kinematic viscosity, the fatty acid composition of palm oil and RBDPO was different. As a result, minimum amount of surfactant required to formulate a single phase microemulsion of RBDPO system were slightly less than that of palm oil system but their kinematic viscosity and turbidity have no difference significantly.

5.2 Recommendations

Although several conclusions can be drawn but there are a few remarks that need further investigation. Crystallization of solid fat in RBDPO's systems which can limit the use of microemulsion biofuels in diesel engines. Therefore, this problem should be further investigated in order to eliminate solid fat in RBDPO's systems. According to the fuel property of the microemulsion biofuels, there are some limitations including viscosity, cloud point and energy content for the use of the biofuel in high performance diesel engine, however, the small size engine for agricultural application might be an option. In order to maintain an acceptable viscosity level of the microemulsion biofuels, ethanol as a viscosity reducer is then required at a certain amount. Thus, handling and storage need to be done with proper caution.