

CHAPTER V

CONCLUSION AND SUGGESTION

5.1 Conclusion

The sulfonated methyl ester from vegetable oil soapstocks such as palm oil and rice bran oil could be synthesized and used as lubricity improver in diesel fuel. The esterification of vegetable oil soapstock with methanol using sulfuric acid as a catalyst gave a methyl ester products. Then, sulfonation of methyl ester product with oleum gave an sulfonated methyl ester products.

The sulfonated methyl ester were obtained in high yield and easily blended in base diesel fuel which did not change their physical properties within the specification of diesel fuel when blended with base diesel fuel at concentration of 0.05% to 10% by weight. Then, the lubricity of the product was carried out by using High Frequency Reciprocating Rig. It was found that, the sulfonated methyl ester of palm oil and rice bran oil soapstock gave the same value of mean wear scar diameter of 192 μm (the standard value of mean wear scar diameter less than 460 μm). In addition, the sulfonated methyl ester in blended base diesel fuel at low concentration up to 10% gave an acid value of 0.0367 mg KOH/g (the standard of acid value less than 0.1 mg KOH/g) From these results, it could be concluded that the sulfonated methyl esters from palm oil and rice bran oil soapstock could improve lubricity performance when blended with base diesel fuel at 5 % by weight.

5.2 Suggestions for further work

Further work is necessary for lubricity performance test on various concentration blended with base diesel fuel and compared with the other lubricity additive from soapstocks or others waste sources such as glycerine waste.