

CHAPTER I

INTRODUCTION



1.1 General Information

Lubricating industries are important to most machines, which required lubrication. Thus, a high volume of lubricants is consumed and much competition, in form of improving and developing the lubricant quality, takes place to respond to consumer requirements. In general, lubricant consists of 2 main components i.e. base oil and additive. The most favorable base oil are mineral base oils because of the high quality, good stability and low price. The function of additive is to improve the quality of lubricants; for example, viscosity index improver, pour point depressant etc. But some lubricants require better quality for specific tasks such as high viscosity index, low pour point, low volatility that base oils used are synthesized.

Due to the fact that Thailand is agricultural country, certain products such as palm, soybean, castor bean etc. are extracted to obtain oil for consumption. These oils consist of many fatty acids in different forms of esters. Therefore, several researches are being conducted to synthesize these oils to lubricants for specific tasks. The other reason is the raw material that used to produce the lubricants at present, especially mineral oil, was gradually reduced and may be vanish, resulting in high cost of lubricating base oil. And therefore we should find the natural resource instead of mineral oil for this purpose. Similarly, rice, also an agricultural product, is milled and the

resulting rice bran is extracted to obtain oil that consists of many fatty acids in different forms of esters such as palm, soybean etc. The current useful purposes of rice bran oil are only salad oil and oil for cooking. Therefore, this has been an influence to conduct research on the oil's properties, specifically when it is synthesized to produce lubricants and is compared to other vegetable oils that have also passed research. However, rice bran, in large quantities, should be made into rice bran oil that can be used as raw material in lubricant manufacturing. Thus, the advantages of this research are :

- Guide for synthetic ester lubricants in industry
- Decrease quantity of synthetic lubricating oil imported from abroad. In turn, this will help reduce the principal of manufacturing
- Decrease environmental problem because of the inherent biodegradability of synthetic ester lubricant

1.2 Objective of the Research

The aim of this research is to synthesis and compare the physical and chemical properties of synthetic lubricating base oil from rice bran oil and various alcohols with petroleum base oil or mineral oil.

1.3 Scope of the Research

The scope of this research is to synthesize lubricating base oil in the form of a monoester from a chemical reaction between rice bran oil and various alcohol including 1-Butanol, 1-Hexanol, 1-Octanol, 2-Ethyl-1-hexanol and 4-Methyl-2-pentanol. This reaction was carried out at the boiling point of mixture, by varying the reaction time.

The synthesized lubricating base oil will be tested for its properties including viscosity at 40° and 100°C, viscosity index, color, flash point, pour point, thermal stability and oxidation stability when compared to mineral base oil.