



CHAPTER 1 INTRODUCTION

Synthetic fluids have been used as lubricants for a variety of specialized applications for more than 50 years. They have been developed with physical and chemical properties. Synthetic lubricants are problem solvers and are used for special applications where petroleum products are inadequate. The use of synthetic lubricants is always advisable when they can have a positive cost-efficient effect on machine reliability, oil life, energy consumption, safety, and environment in spite of their relatively high price.

Synthetic products normally are produced by chemical reactions in which pressure, temperature, and the percentage of component elements can be carefully controlled. The part of reaction up to the desired end products frequently include several steps, each of which necessitates a purification of an intermediate product. It is this resulting that gives synthetic lubricants their distinctive characteristics and this is reasonable for these synthetic lubricants can be controlled and can provide desired properties. This is in contrast to petroleum base stocks (mineral oil) which are composed of the same basic elements in varying chemical compositions depending upon refining techniques and source of crude.

There are two reasons for a decision in favor of a synthetic fluid instead of a mineral oil: 1) the desired or required property 2) the extent or quality of the desired or required property cannot be obtained by mineral oils, even those containing additives. These required properties such as thermal stability, oxidation stability, viscosity temperature behavior, etc. The synthetic

lubricants may have some disadvantage such as hydraulic behavior, corrosion behavior, price, etc.

Many compounds have been investigated as possible base stocks for synthetic lubricants. The seven major types are polyalphaolefins, alkylated aromatics, polybutenes esters, polyalkyleneglycols and phosphate esters. During the development of synthetic oils, ester lubricating is proved that it has some advantages in high viscosity index, low pour point, low volatility and good thermal stability. In response to increased environmental, the chemistry of esters is being modified so as to produce compounds which have high biodegradabilities, low toxicity and clean engine emissions.

The raw material for synthesis can be obtained by the refining of petroleum and extraction of desired hydrocarbon from natural gas. Otherwise synthetic lubricants can be produced from basic material i.e. raw material that received significant attention for providing synthetic esters are animal fats, vegetable oil such as sperm oil and lard oil or in vegetable oils such as rapeseed oil, castor oil or coconut oil.

The purpose of this present study was to synthesize ester used as lubricating oil from coconut oil by tranesterification and then hydrogenation using platinum catalyst and to determine the physical and chemical properties of prepared ester.