

CHAPTER I

INTRODUCTION



1.1 Introduction [1-8]

Over the year natural waxes were used as lubricating agent, such as waxes from vegetable and animal origins, which were found to be useful in reducing friction, heat, and corrosion between two surfaces. These lubricating agents, while still useful, were insufficient for our industrialized society, either in quantities or in desirable properties. So the synthetic waxes were developed into a major international business, and they were employed in many industries, such as for processing polymers, cosmetic, lubricant and pharmaceutical industries. They were compose of various types of chemical compositions (e.g., paraffin hydrocarbons, fatty esters, acids, alcohols and ketones). Amongst these, the type of esters are now use in many applications including processing polymers, textile, pharmaceutical, petroleum processing, cosmetic and food industries as emulsifier, friction modifier and antifoaming agent.

In 1995, Kawin Phattanaphakdee [1] had synthesized the lubricating base oils from palm oil by transesterification with alcohol to obtain the synthetic monoesters that have good properties as the lubricating base oil. Later, in 1996, Darunee Tubthim [2] synthesized diester lubricating base oils by esterification of palm oil and its free fatty acid with alcohol. However this research had studied only the properties of liquid products that suitable to use as automotive lubricating base oils.

Therefore, this research purposes to synthesize the diesters from fatty acids with glycols, which are a wax-like nature. The fatty acid diesters were blended with base oils and their properties were determined.

1.2 Objectives

To synthesize the diester lubricating agents from fatty acids and glycols by esterification and determine the physical and chemical properties of the diester products. Then blend the synthetic diester with the base oil and determine the physical properties of lubricants.

1.3 The scope of Investigations

1. Preparation of fatty acid diester from esterification reaction of fatty acid such as lauric acid, myristic acid, palmitic acid and stearic acid with 1,2-ethanediol and 1,2-propanediol using concentrated sulfuric acid as catalyst.
2. Characterization of the synthetic diestes using spectroscopic techniques such as IR, NMR.
3. Blending the synthetic diester with base oil and determine their physical properties.

1.4 The Advantages of the research

To produce the biodegradable synthetic diester waxes which could be used as lubricating, coating agents and as the lubricant additives, for example, antifoaming agents.