CHAPTER 1

INTRODUCTION

Due to the rapid growth in Thailand s industrial sector, lubricating oil is in a great demand. Nevertheless Thailand has to import the oil from several foreign countries such as Taiwan, China, Singapore and England. In 1991 the import figure reached about 9,000 tons of oil which costed Thailand about 1,131 billion baht. To minimize the trade deficit domestic resources must first be utilized. As crude oils are found in several parts of Thailand particularly in Fang Resource of Cheingmai, Sirikit Resource of Kampangpetch, as well as in Chaiyapoom province. Thus the research to produce lubricating oil from our own resources is therefore very worthwhile.

Crude oil from Fang after being refined by the atmospheric distillation resulted in which called the reduced crude. The crude oil, after seperating of light oil fraction, was further distillated in the vacuum tower. The products were identified as 1) light ditillate:LD 2) heavy distillate:HD 3) heavy fuel oil. These products were collected as a solid at room temperature which they were also containing wax. However, merely with the appropriate quality-improving process, these solid can be converted into the costly lubricating oil.

The upgrading of distillate fractions by mean of

catalytic hydrotreating process has two important objectives as follow 1) the attainment of an increased viscosity index 2) the stability improvement of oil by reducing the aromatic carbon content. These properties are very important for lubricating oil. The higher a viscosity index of an oil, the more resistant a viscosity change caused by temperature fluctuation. Unsaturated linkages generally are undesirable because such linkages are more readily oxidized than saturated linkages especially at elevated temperatures and oxidation result in degradation of the oil. The catalysts which are useful in hydrotreating process generally serve a multiplicity of functions such as selective cracking, hydrogenation, and sulfur removal. Generally, hydrotreating catalysts comprise at least one Group VI metal, metal oxide, or metal sulfide, and at least one Group VIII metal, metal oxide, or metal sulfide supported on a carrier. Molybdenum oxide and nickel oxide on alumina with its high hydrogenation activity is the example of hydrotreating catalyst.

The objective of this study is:

- To determine the optimum operating condition for hydrotreating of prepared oil which obtained from dewaxed and bleached heavy distillate using catalyst comprised 10 % MoO_3 and 5 % NiO on alumina support.
- To determine the physical and chemical properties of hydrotreated oil.