CHAPTER I

INTRODUCTION

Crude oil from Fang, after being refined by atmospheric distillation and then separating light oil fractions, resulted in residue crude. This residue was further separated in a vacuum tower into three fractions as follows: light distillate, heavy distillate and heavy fuel oil. Because of a large amount of wax content in these products, they were used as heavy fuel oil or low quality fuel oil. However, merely with the appropriate quality-improving process, these products can be converted into the costly oil.

Both heavy and light distillates from Fang were improved to be lubricating base oil by Verasak [1] in 1985. But lubricating base oil which was improved from light distillate had low viscosity and viscosity index, not suitable to lubricate machinery. In order to explore the possibility of improving value added of light distillate fraction, this research was aimed to upgrade this fraction to high purity white oil which is transparent, colorless, almost odorless and not as high viscosity as lubricating base oil.

White oil is widely used as ingredients, or processing aids in fields of pharmaceuticals, food for human, consumption and food packages, cosmetics, toiletries and veterinary preparations. Now, there is no manufacturing white oil in Thailand. It is necessary to import white oil from several foreign countries. If white oil can be produced from a raw material in Thailand, it will save foreign currency and help local industries.

Objective and Scope of This Study

The objectives of this research are to produce white oil from Fang light distillate and to characterize the properties of white oil thus produced.

White oil is produced from Fang light distillate by hydrotreating process in two stages: hydrodesulfurization and hydrogenation. Because of high quantities of wax in light distillate, it is necessary to remove wax by using methyl ethyl ketone to obtain low pour point oil. In the hydrodesulfurization stage, dewaxed oil is contacted with hydrogen in the presence of sulfur-resistant catalyst to remove sulfur compound. The optimum conditions such as hydrodesulfurized catalyst type, reaction temperature, hydrogen pressure, catalyst concentration by weight of oil, reaction time, were determined. If the hydrodesulfurized oil operated at the optimum conditions still contained more than 0.001% of sulfur, it will be hydrodesulfurized again. Then hydrodesulfurized oil is distilled under reduced pressure to obtain hydrodesulfurized oil with a boiling range of 330 to 450°C. In the hydrogenation stage, this hydrodesulfurized oil is hydrogenated with hydrogen in the presence of platinum supported on alumina as catalyst. The suitable conditions are studied in the same way the first stage. If the properties of hydrogenated oil do not meet the requirements of white oil, it will be hydrogenated again.