CHAPTER V

CONCLUSIONS

According to these studies of isomerization of NGL, there were four significant reactions occurred on the bifunctional catalysts (Pt/Al_2O_3 or $Pt-F/Al_2O_3$), i.e., the skeletal isomerization reactions, the aromatization reactions (or the dehydrocyclization reactions), the dehydrogenation reactions of cycloparaffins, and the hydrocracking reactions. These reactions occurred principally under the high reaction temperatures (approximately 370°C and above) during flowing of hydrogen gas.

The studies of the effects of temperature, hydrogen pressure and catalyst concentration indicated that the optimum reaction condition in isomerization of NGL was at 370°C under 60 psi hydrogen pressure over the 0.6% Pt-1.0% F/Al_2O_3 catalyst, since the operation on this reaction condition could be obtained the product (isomerate) that was increased in branched-chain paraffins, meanwhile, its percentages of aromatic hydrocarbons were appropiate for blending into the mixture of reformate and MTBE to produce the blended gasoline. Furthermore, the hydrocracking reactions, which were the side reactions of isomerization, were carried out in the lowest percentages of conversion by operating on this optimum reaction condition.

The Research Octane Number (RON) of the isomerate (the product from the optimum reaction condition) was higher than NGL's. Therefore, blending with isomerate into reformate and MTBE could give the higher RON of blended gasoline than blending with NGL.

Further studies of the activities of used catalysts and the reproducibility indicated that the isomerization of NGL could be reproducible and the activity of catalyst was reduced after the second regeneration.

SUGGESTIONS FOR FUTURE WORKS

1. The products from the higher temperature operations (at 420-450°C) are mostly the aromatic hydrocarbons (as presented in the percentages of composition data of products in Appendix B), therefore this perhaps is a way leading to a further study of using NGL as a feed in the BTX industries.

2. Since the big branched-chain hydrocarbons have more value in the octane numbers than the small ones, then the further study in isomerization of NGL should have the goal to increase the amount of big branched-chain hydrocarbons.

3. The reaction should be carried out in the continuous reactor which has ways to control all factors involved for example, temperature, flow rate, pressure, etc.

4. The regeneration of catalyst should be thoroughly studied in order to find the most efficient way to regenerate them.