

CHAPTER V

CONCLUSION

A systematic studies on the variation of product composition from hydroisomerization of HDPE wax as a function of the catalyst concentration, reaction temperature, hydrogen pressure and reaction time were performed. Processing conditions for high-yield conversion of HDPE wax into diesel fuel were identified. The suitable condition from the study are shown below.

catalyst concentration, % by wt	5
temperature, °C	500
hydrogen pressure, psig	300
reaction time, min	10

The following properties of optimum product were found :

Kinematics Viscosity @ 40 °C, cSt	2.7716
Specific Gravity @ 15.6/15.6 °C	0.8142
Colour	<4
Pour Point, °C	13
Flash Point, °C	70
Sulfur Content, % wt	0.00
Distillation, °C	359
Calculated Cetane Index	63.8354

The advantage of the present process resides in the high calculated Cetane Index of the diesel fuel compares to commercial diesel fuel. In addition, sulfur is not present in this oil.

Suggestion for future work

From this study, there were several limitations of the experimental conditions which could not produce diesel fuel with better properties than this. Firstly, the continuous process should be implemented in order to understand the reaction more under continuous condition which should be useful in scaling up in the later stage. Secondly, different types of catalysts should be investigated to select the best one.