

# CHAPTER V

## CONCLUSION

This research aimed to study the effect of impregnated nickel catalyst at 10%, 15% and 20% nickel on alumina support, in the continuous hydrogenation using in-house continuous tubular reactor. The operating condition was studied for each concentration of catalyst, in order to produce methyl 12-hydroxystearate.

The suitable catalyst for continuous hydrogenation of methyl ricinoleate to give the highest yield of methyl 12-hydroxystearate was 10% nickel catalyst, which indicated that the optimum condition of this reaction was performed at 120 °C reaction temperature under 20 psig hydrogen/nitrogen pressure. At higher hydrogen/nitrogen pressure, it gave only insignificant increase in the percentage of methyl 12-hydroxystearate. Under this reaction condition, the continuous hydrogenation of methyl ricinoleate provided the hydrogenated product, which composed of 92.04% w/w of methyl 12-hydroxystearate with iodine value 1.18 and melting point was 49.0 °C.

Furthermore, in this research, when the reaction was performed at reaction temperature higher than 150 °C the methyl 12-ketostearate was formed by slowly dehydrogenation reaction after hydrogenation reaction and the rate of this reaction was increased with increasing the reaction temperature.

**Suggestion for further work**

The impregnated catalyst should be prepared on various supports in order to study the effect of various supports in the continuous hydrogenation reaction.



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