



CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The KOH/Montmorillonite heterogeneous basic catalyst was used as solid catalysts for biodiesel production in a batch reactor. The optimum condition for KOH/Montmorillonite, 5 hours of reaction time and 20–40 mesh of catalyst size, 25%K loading, yielded 89.3 wt% of methyl ester content. On the other hand, the calcination provided a low activity as for comparison to uncalcined catalyst. The regeneration of catalyst did not improve the catalytic activity. However, it made the modification of the catalyst surface. In addition, biodiesel production by heterogeneous catalyst is a new technological process, having many advantages such as easy separation of catalyst and products.

5.2 Recommendations

The regeneration of heterogeneous catalyst requires further study. It is recommended to examine the appropriate method that could clean the spent catalyst in order to give higher methyl ester content. Finding the new type of heterogeneous catalyst with high stability and low-cost is another attractive study.

For the process of biodiesel production, it is very interesting to up-scale the size to the fixed-bed reactor or operating at the industrial condition. Moreover, the new method that could extend the contact time between the reactant and the catalyst is also interesting, for example, the reduction of feed flow rate, the higher amount of catalyst, and the longer of catalyst bed.