

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In this study, we have reported methods of preparing NaY zeolite under microwave-assisted conditions. The microwave heating could reduce the crystallization times and crystallite size of zeolite due to not only fast heated up to the hydrothermal temperature but also apparently increased kinetics synthesis. The synthesized NaY zeolite had a completed structure after crystallization time of 2 h at 100 °C. Different crystal sizes e.g., 0.74, 0.51 and 0.32 μm were successful prepared by using the different synthesis parameters (aging time, alkalinity, and crystallization temperature). It was demonstrated that those parameters played an important role in giving the zeolite crystal with small size. In terms of catalytic activity and selectivity, the smaller crystallite size of zeolite resulted in decreasing hydrocracking activity in the following order Y-T100A3>Y-T110A2>Y-T110A1. Moreover, the benefit of small crystallite size could contribute to a higher selectivity of jet fuel. Smallest crystal size (T100A3) could give the highest selectivity of jet fuel.

5.2 Recommendations

This work investigated that the microwave-assisted digestion can be used to a source of heating to synthesis of small crystallite size NaY zeolite. Although the synthesized catalyst has small crystallite size, this catalyst still has low thermal stability. Then, it is difficult to increase the Si/Al ratio by steaming process. For the better thermal stability of synthesized zeolite, the conventional-hydrothermal method is interesting for the synthesis of NaY zeolite to study hydrothermal stability compare with the Microwave digestion.

Moreover, in this work, the exchanged capacity of ammonium precursor is not complete due to limitation of catalyst properties and exchanged precursor, resulting in the remaining Na-ions inside the catalyst that can be effect on the acidity and performance of catalyst. In the further study, we should study the effect of

ammonium precursor on the exchanged capacity and find the optimum condition in different crystallite sizes of prepared zeolite.