CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The catalytic pyrolysis of waste tire using Ru/MCM-48 and Ru/HMOR-based extrudates has been studied. The appropriate composition of a being-developed commercial Ru/HMOR catalyst was determined, and the effect of the type of matrix was also investigated.

The Ru/MCM-48 and Ru/HMOR-based extrudates can improve light hydrocarbons in the pyrolysis gas, and was highly selective to produce light olefins. The matrix in the catalysts has the impact on the activity of the active Ru/MCM-48 and Ru/HMOR zeolite. A matrix dissipates the heat during cracking reaction. The appropriate composition of Ru/MCM-48 was found to be 15 wt% of Ru/MCM-48, 75 wt% of kaolin, and 10 wt% of α-alumina whereas the appropriate composition of Ru/HMOR was found to be 10 wt% of Ru/HMOR, 80 wt% of kaolin, and 10 wt% of α-alumina.

The investigation of matrix type revealed that the bentonite and talc can help to improve or preserve light olefins and naphtha production of Ru/HMOR active catalyst. The both bentonite and talc acted as potential matrixes, which can highly dissipate heat from the active component because they have a high thermal conductivity.

5.2 Recommendations

The extrudates shall be studied on their mechanical properties before use in a pilot scale. Moreover, the pyrolysis shall be developed to a continuous process. Finally, the study of catalyst regeneration shall be performed for the industrial application.