CHAPTER V
CONCLUSIONS AND RECOMMENDATION

5.1 Conclusions

It was found that for sulfur-free feed, the addition of Sn improved the catalytic activity and selectivity of *n*-octane aromatization on Pt/KL catalyst. The result showed that bi- and trimetallic catalysts obtained similar trends on both *n*-octane conversion and product selectivity. That means the addition of rare earth elements as the third metal did not significantly affect the catalytic activity and product selectivity.

In the presence of sulfur, the sulfur resistance of PtSn/KL was low. The catalytic activity gradually decreased as a function of time on stream and gave similar extent with Pt/KL. The reason could be because sulfur does not adsorb on tin, it therefore interacts with active Pt instead. As a result, metal interaction broke. This induced the deactivation by Pt particle growth. However, there was somehow different results in the activity when RE-promoted catalysts was used in sulfur-containing feed. *n*-Octane conversion of PtSn/RE/KL catalysts was higher than that obtained from mono- and bimetallic catalysts, while C8-aromatics selectivity of all catalysts was not significantly different. It was clearly seen that RE helps retart the adsorption of sulfur on active site by acting as sulfur anchoring or sulfur getter. Consequently, it temporarily prevents Pt agglomerization. As a result, sulfur tolerance increased.

5.2 Recommendation

In this work, for trimetallic catalysts, we have done experiment with the preparation of sequential RE impregnation, then co-impregnation of Pt and Sn. The results exhibited in a good way for the catalytic activity but not for the selectivity. However, it is an interesting idea to vary ratio of added Pt, Sn, and Tm including preparation methods to see how they effect to catalytic activity and selectivity of sulfur-free and sulfur-containing feed.