CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

This thesis observed the catalyst activity of Pt/KL and Pt/Ce-KL prepared by incipient wetness impregnation (IWI) and vapor-phase impregnation (VPI) method for both n-hexane and n-octane aromatization. Moreover, the characterizations by varied techniques were done in order to explain the behavior of each catalyst in different conditions.

The results indicated that the VPI catalysts gave better catalytic performance than the IWI catalysts, and also the characterization results (H_2 chemisorption, FT-IR of adsorbed CO and TPO) showed that the Pt/KL prepared by VPI method exhibited higher %Pt dispersion which well dispersed inside the channels of L-zeolite than the IWI catalysts. Therefore, the methods of preparation have strong affect to Pt/KL catalysts to obtain the high performance in all clean, sulfur- and water-poisoned condition.

For both n-hexane and n-octane aromatization reactions the presence of sulfur in the feed can cause the significant decrease in activity and selectivity. It was investigated by the FT-IR of adsorbed CO and TPO that the presence of sulfur can cause the Pt agglomeration and inhibited the Pt-catalyzed oxidation of carbon, respectively. Therefore, the way to improve sulfur resistant catalysts was done by the addition of Ce as rare earth promoter. For both catalytic testing and catalyst characterizations results showed that the Ce acts as sulfur getters, thus the Pt/Ce-KL catalyst gave better performance than the unpromoted Pt/KL catalysts.

As well as the presence of sulfur, the presence of water vapor in feed also caused the decrease in catalytic performance. It was observed by the characterization results (FT-IR of adsorbed CO, TPO) that the water vapor might cause the Pt agglomeration. Therefore, the investigation to observed the

effective catalysts that can increase sulfur and water tolerance is one of the further studies

Moreover, it is recommend that for n-C$_8$ aromatization should be further investigated in the longer reaction time for observation the deactivation of catalyst. Furthermore, the other types of support (i.e. NaX, NaY) should be studied to obtain the effective catalysts.