CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The performance of hydroprocessing of different *n*-paraffin feedstocks (*n*-C_{15} – *n*-C_{18}) over a bi-functional 0.1 wt.% Pt/HY catalyst prepared by different methods, IWI and IE techniques, was investigated in a continuous flow packed-bed reactor at 310-320 °C, 490-510 psig, liquid hourly space velocity of 0.5-2.5 h^{-1}, and H_2/feed molar ratio of 30. The conversion of hydrocracking of different *n*-paraffin feedstocks over Pt/HY increased with increasing feedstock chain length. This could also be ascribed to their stronger physisorption, which led to greater density on the catalyst surface and consequently to be converted more efficiently or prevent other compounds from being transformed. Considering product distribution, hydrocracking of octadecane gave the highest jet product yield of 47%. The effect of catalyst preparation, the reactivity on the IE catalysts was higher than that of the IWI catalysts, which might be due to Pt dispersion, resulting in the reduction of the diffusion limitation between the metallic and acidic sites. Moreover, different catalyst preparations gave the same reaction pathway but different in reaction rates.

5.2 Recommendations

In this work, the effect of catalyst preparation (ion exchange method compared to incipient wetness impregnation method) was investigated. The results found that the better metal dispersion on the support catalysts is one of the key factors to enhance the activity and product yield. From this hypothesis, the other steps in preparing catalyst in order to increase metal dispersion are interesting for investigation. From some literatures, calcination and reduction are both critical for the dispersion of the reduced platinum (Park *et al.*, 1986). Thus the condition for calcination and reduction such as temperature, heating rate, and carried gas should be investigated. And next thesis might use other techniques to find metal dispersion such as TEM or DRIFTs to confirm H_2 chemisorpsion results.