

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The conversion of PFAD to aromatics hydrocarbon was investigated over parent HZSM-5 and modified HZSM-5 catalyst. The results showed that HZSM-5 (30) provided the highest BTEX yield (36 wt%). The HZSM-5 (23) exhibited the lowest BTEX yield due to the strong adsorption of water on the surface acidity. In order to improve BTEX yield, metal species including Zn and Ga were incorporated into HZSM-5 (30) by incipient wetness impregnation (IWI) method. The presence of Ga and Zn on HZSM-5 (30) catalysts could enhance the BTEX yield. Even though both catalysts enhanced the aromatization activity, the oxygen removal pathways were obviously different. HZSM-5 (30) and Ga/HZSM-5 exhibited high amount of CO production, which the strong Brønsted acid site catalyzed the decarbonylation reaction. While, Zn/HZSM-5 promoted the decarboxylation reaction, leading to the great amount of CO₂ and H₂ production.