

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

It was found that propenal, acetol and acetaldehyde were formed as primary product from glycerol via acid-catalyzed dehydration and dissociation respectively. Olefin products from carbonyl bond dissociation of acetaldehyde and oxygenate pool (propenal, propanal, propen-2-ol and methanol) tended to react each other to produce aromatics via oligomerization and dehydration. The conversion of glycerol to aromatics hydrocarbon was investigated over HZSM-5 modified with silylation with different amount of TEOS and cycle number. The results showed that conversion of glycerol was not influenced by the $\text{SiO}_2/\text{Al}_2\text{O}_3$ ratios of HZSM-5. The aromatics yield decreased with the increase of $\text{SiO}_2/\text{Al}_2\text{O}_3$ ratio (from 30 to 280) except HZSM-5(23) which show low aromatics yield due to the strong adsorption of water on the surface acidity. The *p*-xylene selectivity in xylenes was enhanced with increasing the amount of TEOS. For the effect of CLD cycle number, the two-cycle of TEOS deposition showed higher *p*-xylene selectivity in xylenes than one cycle of TEOS deposition with the same amount of TEOS. It can be conclude that, multi-cycle deposition could increase the amount of silica deposited on HZSM-5 zeolite external surface.

5.2 Recommendations

Although, the silylation can improve the *p*-xylene selectivity but the yield of xylenes and aromatics is very low. So, the metal should be added to help the support HZSM-5.