

CHAPTER VI

CONCLUSION

In this study, the Pt and Re were loaded into H-ZSM-5 zeolite catalysts by ion-exchanging and tested by methanol conversion reaction. The characterization of XRD showed the same structure pattern between H-ZSM-5 prepared in this study by quick method and H-ZSM-5 of Mobil Oil Corporation. Metal, i.e., Pt, Re, and Re-Pt, loading H-ZSM-5 catalysts showed insignificant difference on the total surface area and morphology from the parent H-ZSM-5. However, the acidity from NH_3 -TPD measuring showed that the strong acid site was increased when metal was loaded into the parent H-ZSM-5 catalyst. This strong acid site is an important role by increasing the selectivity to aromatics. The effect of reaction temperatures were considered that the reaction temperature at 400°C gave the highest selectivity to aromatics. The effect of Pt on methanol conversion showed the strong dehydrogenation reaction on converting of n-paraffins to olefins. The effect of Re to the reaction is lower than Pt because it showed slightly changing in the selectivity to aromatics on product distribution. But, the Re have direct effect on Pt by sharing the oxygen ion on the surface of Pt and made some reducing on the selectivity to aromatics. The deactivation of Pt/H-ZSM-5 catalyst was more rapidly than the deactivation of the parent H-ZSM-5 because the Pt could not play the role of strong hydrogenation reaction when the hydrogen spillover, occurred

on Pt surface by dehydrogenation reaction, was ceased by oxygen ion on the surface of Pt. The Re added on Pt/H-ZSM-5 would make the decreasing in density of oxygen ion on the surface of Pt. Thus, some hydrogen ion spillover to prevent coke on acid site. So the deactivation of Pt/H-ZSM-5 catalyst would rapidly occur because of the accumulation of coke on the outer surface of H-ZSM-5 catalyst and blockage of the pore mouth. Whereas the accumulation of coke of the parent H-ZSM-5 would first occur inside the pore. The mechanism scheme of Pt and Pt-Re on methanol conversion can be explained by the model which is modified from the model proposed by Professor Tomoyuki Inui.

RECOMMENDATION :

The recommendation for further study of this thesis is to study the effect of reactions, which no oxy compound in the reactants (e.g. propylene). Pt and Re-Pt should be loaded to H-ZSM-5 catalyst or other catalysts (e.g. Fe-silicate) to see the deactivation performance of them.

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