

CHAPTER VI

CONCLUSIONS AND RECOMMENDATION

In this research, the combination of the metal species and the acidic function was studied for investigation of catalyst deactivation. Moreover, the distribution of coke on the metal and support was examined with various techniques. The probability of chain growth of the extracted coke was also significantly investigated on both sites. The conclusions of these results were summarized as follows:

1. It can be applied a combination of acid and metal species for study catalyst deactivation for dehydrogenation reaction. The small grain size of Pt/SiO₂ with 100-120 mesh and Al₂O₃ with 60-80 mesh is represented to Pt/Al₂O₃.

2. The predominant route of coke formation transfers coke precursors by gas phase.

3. Coke on both sites is amorphous and polyaromatic structure.

4. A small part of coke is located on the metal sites whereas the major fraction is accumulated on the acidic sites

5. The probability of chain growth on both sites is quite similar. The main composition of coke on the metal and support is C₈-C₁₂ fraction attributed the transformation of coke precursor from the metal to the support.

6. Compared various effects on the coke reduction, the order of decreasing coke is effect of promoter > effect of H₂/HC ratio > effect of temperature > effect of time. Significantly, the effect of Pt-Sn-K catalyst on decrease of coke formation is due to reducing of coke precursor other than adjustment of acidic property.

From this study, the recommendations for further study can be as follows:

1. To gain more precise in coke formation mode, the other effects, such as reactant, space velocity etc., would recommended in order to understand which species of products create during the reaction progress.
2. To apply the combination of metal species and acidic function with other catalysts, some catalytic behavior of Pt/SiO₂ and Al₂O₃ system does not close to Pt/Al₂O₃ for better catalytic design.
3. It was found that the soluble coke is composed of C₈-C₁₂. Improve the extraction of coked catalysts, the solvent and the other methods can be applied to completely extract for better understand the structure of intermediate.
4. Study the more detailed of the K promoter, the confusion of the reason to decrease coke formation was resulted from the decreasing of the coke precursor or the modification of support.