

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The following conclusions can be drawn from the experimental results:

1. Hydrogenation of toluene over NiMo/Al₂O₃ catalyst occurs at higher temperature than hydrodesulfurization of thiophene.

2. The addition of organometallic compounds in feed-stock solution affect both hydrodesulfurization reaction of thiophene and coke formation. The effects depend on the types of organometallic compound.

3. The addition of ferrocene or vanadyl acetylacetonate result in the reduction of coke formation on the catalyst, while the hydrodesulfurization activity is not affected.

4. The addition of titanocene dichloride to feed-stock solution decreases both hydrodesulfurization activity and coke formation.

6.2 Recommendations

1. The same set of studies should be done using other types of organometallic compounds such as nickelocene and diphenyl mercury to study the effect of the other metal compounds.

2. The same organometallic compounds should be added

in feed solution of nitrogen compounds to study the effect of the organometallic compounds in hydrodenitrogenation reaction.

3. The same set of study should be conducted at a higher operating temperature to study the effect of temperature on the hydrodesulfurization.

4. A homogeneous reaction between organometallic compounds and thiophene solution should be studied. The product oil and solid particles from the homogeneous reaction should be analyzed to identify the compounds and structure.

5. Another hydrodesulfurization catalyst, $\text{CoMo/Al}_2\text{O}_3$, should be used in the same operating condition and feed composition.

6. Other sulfur compounds, heterocyclics and straight chain of sulfur compounds, should be conducted at the same condition to study structure effects of sulfur compounds.

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย