CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

1. The catalyst prepared by ion exchange method gives higher activity than the catalyst prepared by wet impregnation method.

2. Comparison with 10% Co/HY, 10% Co/NaY shows very low activity for non-oxidative methane coupling.

3. The appropriate weight percentage of cobalt, ruthenium and platinum are 10,15 and 15%, respectively.

4. The optimum reaction temperatures for operation of 10%Co/HY, 15%Ru/HY and 15%Pt/HY catalyst for non-oxidative methane coupling are 300, 200 and 400°C, respectively.

5. The distribution of products, ethane and propane, depend on the Gas Hourly Space Velocity (GHSV) of methane.

6. 10%Co/HY produces only propane. On the other hand, 15%Ru/HY and 15%Pt/HY produce ethane and propane. Furthermore, ethane is produced in the methane adsorption step only on 15%Pt/HY.

7. In stead of hydrogen, the much higher amount of propane is produced when argon is used as medium gas .

6.2 Recommendations for future studies

From the above conclusions, there are some points that need more explanations and should be further studied.

1. It will be interesting to study the effect of the other inert gases such as helium and nitrogen in the hydrogenation step of the non-oxidative methane coupling.

2. The bimetallic catalyst on H form e.g. Co-Pt/HY, Co-Ru/HY and Ru-Pt/HY should be used in non-oxidative methane coupling to improve the products selectivity.

3. With the temperature of hydrogenation step, it will be interesting to study this effect on this reaction.