

## CHAPTER VI

### CONCLUSIONS AND RECOMMENDATIONS

The isomerization of n-hexane was studied on different forms of Beta zeolite. The desired product included 2,2-Dimethylbutane (2,2-DMB), 2,3-Dimethylbutane (2,3-DMB), 2-Methylpentane (2-MP) and 3-Methylpentane (3-MP). The results obtained lead to the following conclusions:

1. All the prepared catalysts had the same main structure of Beta zeolite as shown in their XRD patterns. They were composed of roughly crystallized spherical particles.
2. Beta zeolite having the higher Si/Al molar ratio showed the smaller size of the crystal obtained.
3. The presence of hydrogen was necessary in n-hexane isomerization to increase the conversion and selectivity of the desired products.
4. Platinum on the catalyst had an important dehydrogenation and hydrogenation effect that promoted the catalyst activity for n-hexane isomerization.
5. The catalyst activities of Pt-loaded zeolite catalyst were : Pt/H-Beta (Si/Al=40) > Pt/H-Beta (Si/Al=50) > Pt/H-Beta (Si/Al=25).
6. Beta zeolite was found to be a potential catalyst for n-hexane isomerization, the best composition of the catalyst was Beta zeolite with Si/Al=40, loaded with 0.6 wt. % of platinum by ion exchange, the best condition of the reaction was reaction temperature of 250 °C , GHSV 1600 h<sup>-1</sup> with the presence of H<sub>2</sub>.

The recommendations for further study are as follows :

1. Study the isomerization of n-hexane to its isomers on platinum-loaded Beta zeolite by varying the n-hexane/H<sub>2</sub> ratio in feed gas.
2. Study in detail the type of acidity, i.e. Bronsted and Lewis type, of the catalyst including to their role on n-hexane isomerization.
3. Study the effect of other metal than Pt loaded on catalyst on n-hexane isomerization.
4. Investigate the chemical state of platinum loaded by ion exchange and wet impregnation on Beta zeolite including to their role on n-hexane isomerization.