

## CHAPTER VI

### CONCLUSIONS AND RECOMMENDATIONS

#### 6.1 CONCLUSIONS

In this thesis, the several effects of ZSM-5 and Co/ZSM-5 catalysts were tested for methanol conversion into light olefin. The conclusions of this research were summarized as follow:

1. The Si/Al ratio of H/ZSM-5 and Co/ZSM-5 catalysts affected on methanol conversion and light olefins selectivity. Higher acidity resulted in high methanol conversion, but low light olefin selectivity.
2. Based on the light olefin yield, it was found that the H/ZSM-5 at Si/Al of 80 was the suitable catalyst at 300 °C reaction temperature for methanol conversion into light olefins.
3. The small particle size (1.8µm) showed higher methanol conversion than large particle size (3.4, 4.7 µm) and the small particle size exhibited higher stability than large particle size.
4. The methanol conversion decreased with the introduction of cobalt into the H/ZSM-5 catalyst indicating a textural alternation of the parent zeolite, probably because of pore blocking by cobalt species.
5. The light olefin selectivity at 1% and 5% wt of cobalt loading increased after cobalt loading. On the other hand, at 10% wt of cobalt loading the light olefins selectivity decreased due to increase acidity of catalyst.

6. The small particle size of Co/ZSM-5 (1.8  $\mu\text{m}$ ) showed greater light olefins selectivity than large Co/ZSM-5 particle sizes (3.4, 4.7  $\mu\text{m}$ ) because cobalt species dispersed in the channel of small size higher than large Co/ZSM-5 particle sizes.

## RECOMMENDATIONS

From this research, the recommendations for further study are as follows:

- 1). The effect of cobalt loading on the acidity of Co/ZSM-5 zeolite catalyst, should be further investigated.
- 2). The amount of cobalt loading t higher than 10% wt should be studied.
- 3). The smaller particle size than 1.8  $\mu\text{m}$  should be further investigated.