

## CHAPTER V

### CONCLUSION

The systematic method for dealumination of mordenite has been developed successfully. The relation between various parameters and the Si/Al molar ratio of the catalysts is included and catalyst with different required Si/Al ratios can be prepared using the precisely designed condition. The Si/Al ratios of H-MOR play an important role on the catalyst activity, the selectivity to light olefins, coke formation and the catalyst lifetime. The catalyst with the Si/Al ratio of 120, among the ratios from 11 to 120 presents the best activity with the longest lifetime at various conditions due to the diminished amount of aluminum from the framework. The framework aluminum is necessary for MTO but it must not be too many otherwise it will cause several competitive side reactions and resulted in less production of light olefins. The optimal temperature for running the MTO reaction over H-MOR (Si/Al = 120) is 450°C at a GHSV of 2000 h<sup>-1</sup> with TOS of 40 min using the methanol feed at 20% balance with nitrogen gas.

#### **Suggestions:**

1. Various parameters especially the Si/Al ratio of the catalyst can affect the activity of the catalyst, thus the comparison of catalyst activities must be very careful.
2. The MTO catalysts required a necessary small amount of Brønsted acid as well as Lewis acid. The extension of study on MTO to many other materials should be attempted.
3. Zeolites seem to be very active MTO catalysts with complete conversion of methanol but selectivity to light olefins is not as high as possible yet. Some attempts may improve the MTO catalysts or the process.