CHAPTER VI

CONCLUSIONS

In this study the following conclusions were drawn :

1) The optimum composition to obtain the pure phase of SAPO-34 was 2 Al $(OC_3H_7)_3$: 0.6 SiO_2 : 2 H_3PO_4 : 1.3 TEAOH : 0.5 HF

2) The formation of moonophasic SAPO-34 was sensitive to the variationin the amounts of each ingredients as well as the amount of template used.

3) The chabazite structure of SAPO-34 favored the methanol conversion to light olefins, namely, ethylene, propylene, and butanes. SAPO-5 or SAPO-11 cocrystallized with SAPO-34 had and adverse effect on selectivity to light olefins.

4) The ethylene selectivity was enchanced with the increasing crystallinity of SAPO-34. F ion from HF added to the mixture may play a major role as the co-template with TEAOH to increase the rate of crystallization and had an evidently promotion effect to increase the crystallinity of SAPO-34.

5) The good performance of SAPO-34 on selectivity conversion of methanol to light olefins was attributed to the proper acidity of SAPO-34 which was strong enough dto produce light olefins but too weak to obtain aromatics.

6) The presence of water in the mathanol feed markedly increased th ethylene selectivity. The proposed reaction machanism was stepwise methylation of olefins which , with the presence of water , the formation of methyl cation and hence the methylation of ethylene to propylene were suppressed.

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

1) In order to maximize the space time yield (STY) of ethylene, one possible way is to increase the methanol composition. Since the decrease of ethylene selectivity with the increasing methanol content is the bottleneck of the process, the liquid-solid reaction system by using methanol-water mixture as the feed is recommended.

2) In this study the attempts to incorporate some transition metals such as Ni, Co, Fe, into the framework of SAPO-34 were made; however, the catalytic performances were almost the same as that of SAPO-34. Further study of the introduction of transiton metals to SAPO-34 framework either by incorporation or ion-exchange was suggested to improve the catalytic performances for any specific reactions.