CHAPTER V

CONCLUSION

The composite zeolite beta/Al-HMS has been successively synthesized using well crystalline zeolite beta.The XRD patterns of composite material showed both microporous and mesoporous structures. All aluminum atoms which were added into the solution has been incorporated in the tetrahedral framework silica. With increasing aluminum content, the beta structure was mainly observed comparing to the HMS structure. Adsorption-desorption isotherm of nitrogen on zeolite beta/Al-HMS composite exhibited a pattern of type IV isoterm of IUPAC.

The catalytic property of synthesized zeolite beta/Al-HMS composite was investigated in grease, lubricant oil and PP catalytic cracking under different conditions. The catalytic cracking gave higher conversion than thermal cracking due to the influence of acid sites of catalyst, which accelerated the degradation of polymer by carbocation mechanism. In this research, for grease cracking, the composite catalyst showed the highest efficiency in cracking of grease at 400°C for 90 min, whereas zeolite beta/Al-HMS composite catalyst cracking of lubricant oil were 380°C for 90 min. The highest conversion was observed for PP cracking at 380°C for 60min. The regeneration of catalyst in PP cracking was acceptable for 3 cycles due to a high conversion of PP over 90%.

The suggestions for future work

1. To investigate aluminum content in zeolite beta/Al-HMS composite.
2. To identify the components of liquid products individually.
3. To study the optimal flow rate of N_2 carrier gas in catalytic cracking reaction.