

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

Various type metallosilicates with the MFI structure were prepared, and their properties were modified during synthesis with the same Si/Metal ratio as well as by isomorphous substitution of Al, Fe, Ga or Zn for silicon and pass hydrothermal treatment. The modifications in metallosilicate properties loaded by various type of metals were studied by various methods: XRD, XRF, SEM, ^{29}Si MAS NMR, ^{27}Al MAS NMR, FTIR and FT-RAMAN. The results of these investigations showed

1. The elements are in the same family of fourth row of the periodic table can easily be substituted for silicon with MFI type structure.
2. The hydrothermal treatment condition at 600°C in 10 mole% water, 24 hr do not affect to change the structure but effect to crystallinity of catalysts.
3. Crystallinity of metallosilicates depend on type of metals in metallosilicate structure
4. The stability of structure and the hydrothermal stability on hydrothermal treatment of metallosilicate catalysts are related to type of metals and chemical bond strength during Metal – Oxygen in metallosilicates structure on crystallinity under hydrothermal condition.
5. Addition of second metal into structure is addition acidity of silicalite.
6. Fe_2O_3 on surface catalyst will not effect to add acidity.

The following further studies were recommended:

Investigate the change of local structure of various type of metal in ZSM-5 framework with the modification of loading second metal in synthesis to consider acidity and durability on crystallinity under hydrothermal treatment.