CHAPTER VI
CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

This thesis dealt with studies on conversion of methane over Mo-modified HZSM-5 (MFI) and HY catalysts in the absence of oxygen. The following conclusions of this study were drawn:

1. The 8%Mo/HZSM-5 catalyst had the best performance for methane conversion (12.43%) and benzene selectivity (73%).

2. The optimum reaction condition for methane conversion at atmospheric pressure was at temperature of 700°C and GHSV of 2000 h^{-1}.

3. The oxides of Mo (MoO_3) were reduced so as to form an active MoC_x species during the initial stages of methane conversion and the initial products were H_2O, CO_2, CO and H_2.

4. Methane activation on MoC_x sites generated ethylene and the formation of benzene possibly proceeded via ethylene intermediate.

5. The zeolite structure had a significant effect on the catalytic performance.

6. CO can be generated via reaction of methane with O-atoms in HZSM-5 zeolite framework at high temperature (ca. 700°C).

6.2 Recommendations

From this research, the recommendation for future study are as follows:

1. Study in more detail on state of Mo species in HZSM-5.
2. Study the stability and lifetime of Mo/HZSM-5 catalyst.
3. Study the bimetallic catalyst on H form or the other transition metals to improve the methane conversion and product selectivity.