CHAPTER IV
CONCLUSIONS

Silatrane precursor synthesized by the OOPS process is a very good alkoxide precursor to successfully synthesize very high surface area molecular sieve, MCM-41 synthesized in a wide range of temperature. The higher the temperature used, the larger the pore size. At the mixing temperature of 100°C, a high quality MCM-41 is observed. Surfactant concentration affects the BET surface area while no effect on pore size is observed. The surface area of MCM-41 obtained at the surfactant ratio of 0.6 and 60°C is as high as 2400 m^2/g. The pore volume obtained at the same surfactant ratio and 100°C is 1.72 cc/g. High surface area, precise structure and large pore volume make this material useful in catalysis area since higher surface area will allow a higher catalyst concentration to be present. Moreover, precise structure will provide higher selectivity in applications involving size based separation. In this study the subsistence of vanadium oxide on silica support was determined using XRD, DR-UV and TPR techniques. These results indicate that the vanadium species were mainly dispersed on the wall of MCM-41 in the state of monomeric tetrahedral coordination. The reduction temperature of V-MCM-41 is observed in the range 500°-570°C with increasing vanadium content from 0.5 to 20 wt% which demonstrates the formation of an oxide in which vanadium has little V^{4+} oxidation state mixed in the V^{5+} product. That means, catalysts containing oxidation state V^{5+} give better selectivity and activity to olefins at low alkane conversions than those having the oxidation state V^{4+}.