CHAPTER V
CONCLUSIONS

5.1 Conclusions

Silatrane and titanium glycolate precursors synthesized from the OOPS process were successfully used to prepare the Ti-MCM-41 catalyst. The BET surface area was as high as 1400 m^2/g for Ti loadings in the range of 1-5%. The Ti incorporation is mainly in the form of isolated Ti species, as probed by DRUV. The dispersion of molybdenum onto MCM-41 supports was also successfully prepared using silatrane and molybdenum glycolate precursors synthesized from the OOPS process. The surface area of Mo-MCM-41 obtained is higher than 700 m^2/g. The DRUV pattern of Mo-MCM-41 was assigned to Mo (T_d) and Mo (O_h). The hexagonal pore structure of both Ti-MCM-41 and Mo-MCM-41 was observed using XRD. The pore sizes are remarkably uniform, as shown by the presence of sharp and clear separation of 100, 110 and 200 reflections peaks. Degradation and decolorization of reactive black 5 are studied using photocatalytic oxidation process. The influence on photocatalytic oxidation process is pH and H_2O_2 concentration. The highest efficiency of the reaction is found at pH 3 with 30 mmol of H_2O_2. However, the higher efficiency is observed when adding Ti-MCM-41 and Mo-MCM-41 catalyst. The efficiency depends on the amount of titanium and molybdenum in MCM-41 which is varied in the range of 1-5%. Mo-MCM-41 catalyst provides a better photocatalytic oxidation reactivity of the dye than Ti-MCM-41 catalyst.

5.2 Recommendation

According to this work, it is recommended that the other transition metals should be loaded on MCM-41 in order to compare the activity in photocatalytic oxidation process. The reactive black 5 dye is a model of textile wastewater so the photocatalytic oxidation process with both catalysts should be tested in the wastewater from the textile industry.