CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The electrospinning method was used for the preparation of TiO_2 in the fiber form. The as-spun and the calcined TiO_2 nanofibers had the fibers' size in the range of 60-100 nm. Effects of Ti-precursors, calcination temperature, and Ag doping in the batch system on the photocatalytic activity of TiO_2 nanofibers for the degradation of 4-CP were investigated. Varying the Ti-precursors with different molecular weights and hydrolysis rates did not affect the activity of the prepared-TiO_2 nanofibers. However, increasing in the calcination temperature had significant effects on the activity of TiO_2 nanofibers. When the calcination temperature increased, the photocatalytic activity of catalysts decreased, because the decrease in the active surface areas (BET). Adding a small amount of Ag improved the photocatalytic activity of catalysts, the optimum of the amount of Ag was 1 wt% of TiO_2. The activity of the prepared Ag doped TiO_2 was close to the activity of Degussa P25. The small amount of Ag on TiO_2 enhanced the rate of super oxide radicals' formation and also reduced the probability of the e^-/h^+ recombination. However, adding too much Ag reduced the catalytic activity because Ag could block the active site exposed to the UV light.

5.2 Recommendations

The effect of heating rate for the calcination of catalyst should be investigated because it may affect the phase and structure formation of TiO_2 during the calcination. The flake form of TiO_2 nanofibers can be used instead of being immobilized on a solid substrate because of its high weight and it can be more easily separated from the treated solution than the powder form.