# CHAPTER V
# CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Conclusions

In this research, the mesoporous-assembled $SrTi_xZn_{1-x}O_3$ nanocrystal photocatalysts with various Ti-to-Zn molar ratios were synthesized by a sol-gel process with the aid of a structure-directing surfactant and were used to investigate the photocatalytic phenol degradation. Among the investigated $SrTi_xZn_{1-x}O_3$ photocatalysts, the mesoporous-assembled $SrTi_{0.97}Zn_{0.03}O_3$ was found to show the best photocatalytic phenol degradation activity. The effects of various synthetic parameters, including calcination conditions and metal loadings (Ag, Cu, and Pt), on the photocatalytic degradation performance of the synthesized mesoporous-assembled $SrTi_{0.97}Zn_{0.03}O_3$ photocatalyst were examined. The results showed that the presence of Pt on the $SrTi_{0.97}Zn_{0.03}O_3$ photocatalyst could greatly enhance the photocatalytic activity. The optimum conditions for synthesizing the effective $SrTi_{0.97}Zn_{0.03}O_3$ photocatalyst were a Pt loading of 0.5 wt.%, a calcination temperature of 700 °C, and a calcination time of 4 h, providing the highest photocatalytic phenol degradation activity. In addition, dissolved oxygen gas could further enhance the photocatalytic activity.

## 5.2 Recommendations

To further apply the synthesized mesoporous-assembled 0.5 wt.% Pt-loaded $SrTi_{0.97}Zn_{0.03}O_3$ photocatalyst, the photocatalytic degradation of other organic pollutants with more complex molecular structures should be investigated.