

CHAPTER 4

CONCLUSIONS

4.1 Synthesized of ZnO-TiO₂ nanocomposites, ZnTiO₃, Zn₂TiO₄ and Zn₂Ti₃O₈

ZnO-TiO₂ (anatase/rutile) nanocomposites were successfully synthesized by a hydrothermal method. The samples were transformed into Zn₂TiO₄ nanoparticles by calcination of ZnO-anatase at 700 °C for 3 h and ZnTiO₃ nanoparticles by calcination of ZnO-rutile at 750 °C for 3 h. The Zn₂Ti₃O₈ sample was able to be synthesized by calcination of Zn₂TiO₄-anatase composites at 750 °C for 3 h. The Zn₂TiO₄ and Zn₂Ti₃O₈ samples show strong emission at 386 nm and ZnTiO₃ sample at 370 nm.

4.2 Template synthesis of Zn₂TiO₄ and Zn₂Ti₃O₈ nanorods by hydrothermal-calcination combined processes

Zinc orthotitanate(Zn₂TiO₄) nanorods and zinc polytitanate(Zn₂Ti₃O₈) nanorods have been synthesized via hydrothermal-calcinations combined processes by the reaction of ZnO nanorods as a template coated with anatase TiO₂ nanoparticles. On the basis of experimental results from the reaction temperatures and durations, we propose that the nanorods zinc titanate developed via high surface are to volume ratio TiO₂ nanoparticles incorporated into lattice of ZnO nanorods template which still preserved the nanorods structures. The precursors ZnO-TiO₂ nanocomposites were successfully synthesized by a hydrothermal method. The samples were transformed into Zn₂TiO₄ nanoparticles by calcination of ZnO-anatase (2:1) atomic mole ratio at 750 °C for 5 h and Zn₂Ti₃O₈ sample was able to be synthesized by calcination of ZnO-anatase (2:3) atomic mole ratio at 750 °C for 5 h.