

## CHAPTER V

### CONCLUSIONS AND RECOMMENDATIONS

The mixed metal oxide nanofibers of copper-indium-tin oxides ( $\text{CuInSnO}_4$ ) were successfully prepared by sol-gel method and electrospinning technique, using 10% PVA to mix with the corresponding precursors at 20 cm distance and 16 kV voltage. The mixed metal oxide fibers obtained were calcined at 950 °C with 0.3 °C per min heating rate for 36 h to give higher surface area of 60  $\text{m}^2/\text{g}$ , as compared with the powder synthesized using the same condition (6  $\text{m}^2/\text{g}$ ).

Since the synthesized product in this work is not identified whether it has the spinel structure. However, the mixed metal oxide compound was compared the spinel phase pattern by using Bragg's Law equation and the results showed mixed phase between spinel phase and other metal oxide phase. Therefore, the future work should thus be focused on the finding of the structure. The applications also need to be studied.