CHAPTER 4

CONCLUSIONS

4.1 Molybdenum Oxide synthesized by a Hydrothermal method

In summary, α-MoO3 nanobelts with > 10 μm long and 100-200 nm wide were successfully produced under hydrothermal method at 180 °C for 20 h in controlling agent – free solution. It was found that α-MoO3 nanobelts grew along the c axis, with the ±(100) top and bottom surfaces and ±(010) side surfaces. Finally, α-MoO_3 nanobelts with E_g = 3.75 eV show the emission peak at 437 nm due to the $O_{2p} \rightarrow Mo_{4d}$ charge transition, excited by 337 nm wavelength. These proved that the reaction hydrothermal temperature, holding reaction time and type of acid are the key factors used to control pure phase and uniform α-MoO_3 nanobelts. Therefore, the best condition for the synthesis of uniform α-MoO_3 nanobelts with high crystallinity in this research is the 180 °C and 20 h hydrothermal heating of the solution containing 15 ml 2 M HNO_3.

4.2 Silver composited on Molybdenum Oxide nanobelts synthesized by a Sonochemical method

In this work, Molybdenum Oxide nanobelts were ultrasonic irradiation synthesized by Ag coating on nanobelts and using propylene glycol as solvent. The products were characterized by XRD, TEM, SEM, EDS, Raman, and UV-visible spectroscopy. The XRD patterns revealed pure phase orthorhombic MoO_3 structure by comparing with its JSPDS database. Their morphologies were observed by SEM and TEM that show nanopbelts with Ag composited on top. The Ag nanoparticles on α-MoO_3 nanobelts for in 10 wt.% Ag was with the energy gap(E_g) = 2.83 eV.