CHAPTER V

CONCLUSIONS

Poly (vinylalcohol) (PVA) nanofibers containing Platinum (Pt) and Ruthenium (Ru) nanoparticles were prepared by chemical reduction and electrospinning method. PVA was used both stabilizer to prevent Pt–Ru nanoparticle agglomeration and as the template for fiber formations. The Pt–Ru nanoparticles in PVA aqueous solution were investigated by UV-visible absorption spectra. The UV absorption peaks of Pt appear at 260 nm and Ru at 436 nm. Then the UV absorption peaks of Pt and Ru disappeared as soon as the substances were reduced to metallic Pt and Ru. Scanning electron microscopy (SEM) and transmission electron microscopy (TEM) were carried out to study the morphology of the PVA/ Pt–Ru nanofibers and distribution of the Pt–Ru nanoparticles. It was found that the average diameter of the pure PVA, an average diameter was 166.6 nm. For Pt–Ru loading of 0.38wt%, 1.07% and 1.79% average diameter were 234.4 nm, 199.8 nm and 180.1 nm, respectively. For XRD pattern of the as prepared PVA/Pt–Ru, the diffraction peaks were ascribed to (1 1 1), (2 0 0), (3 1 1) planes of face-centered cubic (fcc) crystal of the nanoparticles. As the Pt–Ru content increased, the intensity of the peak gradually increased. From the FTIR spectra, it was believed that the bond between Pt–Ru nanoparticles and PVA matrix took over the hydroxyl groups.