Effect of deposition time on the morphology and structural properties of indium antimonide nanowires (InSb) by template assisted electrodeposition

ABSTRACT

Semiconductor InSb nanowire have been synthesized by the typical three-electrode electrochemical cell. The deposition is from tartaric acid aqueous solution into anodic alumina oxide (AAO) at different time deposition varies from 15 to 40 mins with constant deposition potential of -1.5 V. The morphology and structural properties of InSb nanowires were studied using XRD and FESEM equipped with EDX. The nanowires have diameter varying and the length of the template assisted InSb nanowires varied from the deposition time of 15 to 40 mins, from 100 to 200 nm respectively. The length of synthesized InSb nanowires increases from 1.8 to 5.5 μm with the increasing deposition time of 15 to 40 min. The XRD analysis shows that the diffraction peaks of nanowires are on a plane (111) and (220). Based on the elemental composition from the EDX, almost stoichiometric composition with ratio 1:1.1 was achieved for the samples deposited for 35 and 40 minutes.

Keyword: Deposition; Morphology; Structural Properties; Indium antimonide nanowires (InSb); Template assisted electrodeposition