

Fabrication and characterization of TiO₂ nanowire arrays using AAO template

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Anodic aluminum oxide(AAO), which is formed by the anodization of aluminum has been attracted as a starting material for the fabrication of functional devices with nanometer dimensions due to nanometer-order channel array structure with a high aspect ratio. Metal nanostructured materials, such as metal nanoparticles, nanowires and nanoarrays have been studied extensively on account of their interesting electronic and optical properties and potential applications in nanodevices. In this study, highly ordered TiO₂ nanowire arrays were successfully prepared by using a nanoporous AAO template. Scanning electron microscopy (SEM), transmission electron microscopy(TEM) and X-ray diffraction(XRD) are used to characterize the morphology and crystalloid structure of TiO₂ nanowire arrays. The results show that the TiO₂ nanowires are assembled very uniformly and parallel to each other in the pores of the AAO template. The fabricated TiO₂ nanowire arrays on AAO template can be applied to various engineering materials.