

SW-P016

Ruthenium Oxide Nanoparticles Electrodeposited on the Arrayed ITO Nanorods and Its Application to Supercapacitor Electrode

Ilhwan Ryu, Jinho Lee, Dasom Park, Sanggyu Yim

Department of chemistry, Kookmin University, Seoul 136-702, Korea

Supercapacitor is a capacitor with extraordinarily high energy density, which basically consists of current collector, active material and electrolyte. Ruthenium oxide (RuO_2) is one of the most widely studied active materials due to its high specific capacitance and good electrical conductivity. In general, it is known that the coating of RuO_2 on nanoarchitected current collector shows improved performance of energy storage device compared to the coating on the planar current collector. Especially, the surface structure with standing coaxial nanopillars are most desirable since it can provide direct paths for efficient charge transport along the axial paths of each nanopillars and the inter-nanopillar spacing allows easy access of electrolyte ions. However, well-known fabrication methods for metal or metal oxide nanopillars, such as the process using anodize aluminum oxide (AAO) templates, often require long and complicated nanoprocess. In this work, we developed relatively simple method fabricating indium tin oxide (ITO) nanopillars via sputtering. We also electrodeposited RuO_2 nanoparticles onto these ITO nanopillars and investigated its physical and electrochemical properties.

Keywords: Ruthenium oxide, Supercapacitor, ITO nanorod