

Abstract Submitted
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Flexible symmetric supercapacitors based on vertical TiO₂ and carbon nanotubes C.J. CHIEN, PAI-CHUN CHANG, JIA G. LU, University of Southern California — Highly conducting and porous carbon nanotubes are widely used as electrodes in double-layer-effect supercapacitors. In this presentation, vertical TiO₂ nanotube array is fabricated by anodization process and used as supercapacitor electrode utilizing its compact density, high surface area and porous structure. By spin coating carbon nanotube networks on vertical TiO₂ nanotube array as electrodes with 1M H₂SO₄ electrolyte in between, the specific capacitance can be enhanced by 30% compared to using pure carbon nanotube network alone because of the combination of double layer effect and redox reaction from metal oxide materials. Based on cyclic voltammetry and galvanostatic charge-discharge measurements, this type of hybrid electrode has proven to be suitable for high performance supercapacitor application and maintain desirable cycling stability. The electrochemical impedance spectroscopy technique shows that the electrode has good electrical conductivity. Furthermore, we will discuss the prospect of extending this energy storage approach in flexible electronics.

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