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Short Communication

A Non-aqueous Hybrid Supercapacitor with Porous Anatase TiO_2 Nanoparticles Anode and Activated Carbon Cathode

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The porous anatase TiO_2 nanoparticles were synthesized by a facile hydrothermal method and characterized by scanning electronic microscopy (SEM), transmission electronic microscopy (TEM) and powder X-ray diffraction (XRD). A non-aqueous hybrid supercapacitorwith the as-prepared TiO_2 nanoparticles anode and activated carbon (AC, BP-2000) cathode was fabricated and investigated electrochemically. The results showed that the hybrid supercapacitor with the optimal mass ratio 1:2 of AC to TiO_2 delivers a specific capacitance of 48 F g^{-1} at a current rate of 100 mA g^{-1} and exhibits a good cycling stability. Within a voltage window of 0-3 V, 60.75 W h kg^{-1} of energy is acquired at 150 W kg^{-1}, indicating the promising application of such hybrid supercapacitor in achieving both high energy density and power density to power the burgeoning hybrid electric vehicles (HEVs)/electric vehicles (EVs).

Keywords: Porous anatase TiO_2; Non-aqueous electrolyte; Hybrid supercapacitor; Electrochemical performance.

FULL TEXT