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# Prussian-Blue-Doped Super-Activated Carbon as a High Performance Supercapacitor Electrode Material

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A Prussian-blue-doped super activated carbon (PB/SAC) nanocomposite was prepared by a simple reduction method under mild condition. Scanning electron microscopy, X-ray diffraction, Fourier-transform infrared spectroscopy, and transmission electron microscopy experiments revealed that PB nanoparticles were incorporated in the pores of the SAC. Cyclic voltammetry measurements indicated that the combination of PB and SAC significantly enhanced the capacity of the composite. The hybrid PB/SAC electrode yielded the maximum capacitance performance with a specific capacitance up to 263.7 F $g^{-1}$ at a current density of 5 A $g^{-1}$. The rational combination of these two materials provides the devices with an extended voltage window of 0.8 V in acid solution. Cyclic stability measurements indicated that the specific capacitance of the PB/SAC nanocomposite electrode could retain 94.8% of its initial value over 1500 charge/discharge cycles. More significantly, the supercapacitors were designed to be low in cost and environmentally benign, and are therefore highly suitable for future energy storage systems.

**Keywords:** Supercapacitor; Super activated carbon; Prussian blue; Nanocomposite

FULL TEXT

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