Short Communication

Phytic Acid Assisted Formation of Phosphorus-Doped Graphene Aerogel as Electrode Material for High-Performance Supercapacitor

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In this study, a simple solvothermal method was used to prepare a highly porous phosphorus-doped graphene aerogel (PGA), using graphene oxide (GO) as the precursor and phytic acid as the dopant. The morphostructural characterization of PGA was conducted by scanning electron microscopy (SEM) and X-ray photoelectron spectroscopy (XPS). For supercapacitor applications, PGA materials showed superior capacitance performance (225.3 F g⁻¹ at 1A/g) and long-term cycle stability. The specific capacitance retention rate reached 95% after 10,000 charge and discharge cycles. Even if the current density was doubled after 10 times, it can reach 196.8 F g⁻¹ (10 A/g). The as-prepared PGA in this study has the advantages of low cost, safety, reliability, and excellent electrochemical performance, and thus has superior application potential.

Keywords: phosphorus-doped graphene aerogel, electrode material, supercapacitors

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