

Structural batteries are multi-functional composites that combine the functions of energy storage and mechanical load support. Bipolar current collectors allow batteries to be electrically stacked in series, increasing power and energy density while maintaining device integrity. In this study, bipolar current collectors (CCs) were fabricated in a sheet of carbon ...

The fabricated supercapacitor reported a high capacitance value of 637 mAh/g with a maximum energy density of 227 Wh/kg. H. Zhang et al. reported the fabrication of nitrogen-doped carbon cathode for enhanced adsorption of zinc ions and carbon paper as the current collector on which the electrode slurry was deposited). The developed Zn ion ...

First, the metallic current collectors, conductive additives, and binders are electrochemically inactive and do not contribute to the lithium storage, thus greatly reduce the overall energy and ...

Multilayer pouch cells equipped with this current collector demonstrate high specific energy (276 Wh kg⁻¹) and remarkable fast-charging capabilities at rates of 4 C (78.3% state of charge), 6 C ...

The review provides a comprehensive overview of carbon-coated current collectors across various types of metal and nonmetal substrates in lithium-ion batteries and supercapacitors, ...

Light weight carbon nanofibers (CNF) fabricated by a simple electrospinning method and used as a 3D structured current collector for a sulfur cathode. Along with a light weight, this 3D current collector allowed us to ...

mance energy storage devices such as LIBs and supercapacitors.^{14,15} In this study, a sulfuric acid-hydrogen peroxide mixture (SPM) solution, also known as piranha solution, was employed to increase the surface affinity between carbon paper and a solvent by generating the oxygen containing functional groups on a carbon paper surface.^{16,17}

In conclusion, we have made highly conductive CNT paper by conformal coating of CNTs onto commercial paper, whose conductivity can be further enhanced by incorporating metal nanowire strips as global current ...

Based on environmental and energy problems, low-carbon economy has become a main direction for the future development. Nowadays, lithium-ion batteries (LIBs) are widely used in electric vehicles, but the energy density of batteries still cannot meet the requirements of battery life owing to the limited theoretical specific capacity of the commercial ...

Advanced strategies for the development of porous carbon as a Li host/current collector for lithium metal batteries, Energy Storage ... Advanced strategies for the development of porous carbon as a Li host/current collector for lithium metal Energy Storage Materials (IF 20.4) Pub Date : 2021-06-17, DOI: 10.1016/j.ensm.2021.06

In conclusion, we have made highly conductive CNT paper by conformal coating of CNTs onto commercial paper, whose conductivity can be further enhanced by incorporating metal nanowire strips as global current collectors for large-scale energy-storage devices (Figs. S4D). The intrinsic properties of paper, such as high solvent absorption and ...

Lithium metal is considered a promising anode material for high-energy-density rechargeable batteries because of its high specific theoretical capacity (3860 mAh g⁻¹), low mass density (0.534 g cm⁻³), and low electrochemical redox potential (-3.04 V vs. the standard hydrogen electrode). However, the high reactivity of Li with the electrolyte leads to the formation of an ...

Application and research of carbon-based materials in current collector. Since Herbet and Ulam used sulfur as cathode materials for dry cells and batteries in 1962 [], and Rao [] proposed the theoretical energy density of metal sulfur batteries in 1966, lithium-sulfur battery systems have been proved to have extremely high theoretical capacity. After the prototype ...

This paper focuses [6] on carbon fibre/carbon aerogel (CF/CAG) structural electrodes [6], glass fibre structural separators, a bicontinuous structural electrolyte [7] and copper current collectors (Fig. 1). During the development of SPCs, little attention has been paid to the design of the current collectors (CCs), which draw electric current ...

surface area and good electrical conductivity of GH, and its intimate contact with carbon paper. Keywords: carbon paper; graphene hydrogel; supercapacitors; current collectors 1. Introduction Supercapacitors represent an important class of energy storage devices with a high power density, rapid charge/discharge rate, and long cycle life. The ...

Energy storage structural composites combine the function of storing energy with that of bearing mechanical load. Electrode and electrolyte components can simply be laminated to fabricate composite energy devices. We advance here a ...

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