

DOI: 10.1039/c1ee02201f Corpus ID: 97576972; Electrospinning: designed architectures for energy conversion and storage devices @article{Cavaliere2011ElectrospinningDA, title={Electrospinning: designed architectures for energy conversion and storage devices}, author={Sara Cavaliere and Surya Subianto and ...

Electrospinning has gained constant enthusiasm and wide interest as a novel sustainable material processing technique due to its ease of operation and wide adaptability for fabricating eco-friendly fibers on a nanoscale. In addition, the device working parameters, spinning solution properties, and the environmental factors can have a significant effect on the fibers" ...

In this review, the fundamentals and properties of electrospun NFs are presented and applications in solar cells, fuel cells, nanogenerators, hydrogen energy harvesting and ...

Table 1 summarizes recent studies on the use of lignin-based ECNFs in energy storage applications showing the material combination used for the electrospinning, the carbonization temperatures, the surface activating agents that were used, the surface area measured by the Brunauer-Emmett-Teller (BET) method, the electrolyte used, and the ...

Electrospinning is a simple and versatile technique that relies on the electrostatic repulsion between surface charges to continuously draw nanofibers from a viscoelastic fluid. ... heterogeneous catalysis, environmental protection, smart textiles, surface coating, energy harvesting/conversion/storage, encapsulation of bioactive species, drug ...

Electrospinning is a versatile and viable technique for generating ultrathin fibers. Remarkable progress has been made with regard to the development of electrospinning methods and engineering of electrospun ...

Advances in biomass-based nanofibers prepared by electrospinning for energy storage devices. Author links open overlay panel Haifeng Jiang a, Mingfu Yao a, Jie Chen b, Mingyue Zhang c ... Facile synthesis of nitrogen-doped porous carbon materials using waste biomass for energy storage applications. Chemosphere, 289 (2022), Article 133225, 10. ...

Electrospinning: The State of Art Technique for the Production of Nanofibers and Nanofibrous Membranes for Advanced Engineering Applications. In: Balakrishnan, N.T.M., Prasanth, R. (eds) Electrospinning for Advanced Energy Storage Applications. Materials Horizons: From Nature to Nanomaterials.

Among them are MOF based composite nanofibers prepared via electrospinning with the advantages of inorganic porous materials and polymeric nanofibers, which have witnessed intensive development and extensive applications in energy storage and environment conservation fields. Beyond that, preparing MOF based composite nanofibers is also ...

Electrospinning is used to fabricate microscale to nanoscale materials from polymeric solutions based on electrohydrodynamics. Material modifications are achieved through physical and chemical ...

Dielectric composites based on ferroelectric ceramics nanofibers are attracting increasing attention in capacitor application. In this work, the sol-gel method and electrospinning technology are ...

Fuel cells, rechargeable metal-air batteries, metal-ion batteries, and supercapacitors have been regarded as prospective energy sources technologies to replace the fossil energy. Moreover, electrochemical sensors also have been successfully developed as promising platforms for detecting pollutants, drug analysis, and healthcare monitoring. ...

Electrospinning for Advanced Energy and Environmental Applications delivers a state-of-the-art overview of the use of electrospun fibers in energy conversion and storage, as well as in environmental sensing and remediation. It first introduces electrospinning and its origins, outlining achievable one-dimensional nanoscaled materials and their applications. It then discusses the ...

Among them, electrospinning shows the unique advantages, since it has the wide applicability in fiber fabrications for nearly all kinds of materials (organics, inorganics, and hybrids), as well as excellent controllability for dimensions and microstructures of the resultant nanofibers. [12, 13]

The combination of electrospinning and hot pressing, namely the electrospinning-hot pressing technique (EHPT), is an efficient and convenient method for preparing nanofibrous composite materials with good energy storage performance. The emerging composite membrane prepared by EHPT, which exhibits the advantages of large surface area, controllable ...

MOF/polymer nanofiber membranes are generally acquired by electrospinning. Electrospinning is a unique nanofiber manufacturing process in which polymer solution systems are jet-spun under the action of high-voltage static electricity [117,118,119,120]. Numerous polymer solution systems have been widely used in electrospun, such as polyvinylpyrrolidone (PVP) in ...

Dielectric composites based on ferroelectric ceramics nanofibers are attracting increasing attention in capacitor application. In this work, the sol-gel method and electrospinning technology are utilized to prepare one ...

With global concerns about the shortage of fossil fuels and environmental issues, the development of efficient and clean energy storage devices has been drastically accelerated. Nanofibers are used widely for energy storage devices due to their high surface areas and porosities. Electrospinning is a ...

Download Citation | Electrospinning for Advanced Energy Storage Applications | This book provides a

consolidated description of the process of electro-spinning and detailed properties and ...

First, it briefly describes the history of this novel approach, followed by discussing its principles and the advantages of electrospun nanofibers. Then, state-of-the-art applications of ...

Herein, a self-supported cathode with a high specific capacity (on the basis of the whole cathode) is fabricated via facile electrospinning. The prepared cathodes have about 10 ...

The special morphology of nanofibers prepared by electrospinning is significant to the functional materials for energy storage. Schematics of: (a) Li-ion batteries; (b) lithium-sulfur batteries ...

The possibility to produce materials for energy storage and piezoelectric sensor applications through the electrospinning technique is here investigated. Electrospun lithium-ion battery separators, piezoelectric sensors are characterized and tested in order to exhibit the outstanding properties of such nanostructured materials which can be successfully implemented on the ...

Electrospinning is a simple and versatile technique that relies on the electrostatic repulsion between surface charges to continuously draw nanofibers from a viscoelastic fluid. ... heterogeneous catalysis, environmental ...

Electrospinning is a material processing technique used to produce nanofibers through the application of an electric field and has an interesting history full of developments over time.

They have broad applications in filtration membranes, catalytic supports, energy storage, biomedical research, and photonic and electronic devices [14,15,16,17,18,19,20,21,22,23,24]. At present, the applications of electrospinning have not only been studied in the laboratory, but have also made some achievements in the field of ...

The demand for energy storage systems is rising due to the rapid development of electric transportation vehicles, and this demand is stimulating research on the next generation of high-performance, high-density energy storage devices. In this work, nanomaterials with excellent electrochemical properties are of particular significance. This review summarizes a variety of ...

This book provides a consolidated description of the process of electro-spinning and detailed properties and applications of electro-spun electrodes and electrolytes in energy storage devices. It discusses the preparation, structure and electrochemical properties of nanofiber electrode and electrolyte materials. It focuses exclusively on Lithium Ion batteries, ...

Electrospinning is a popular technique to prepare 1D tubular/fibrous nanomaterials that assemble into 2D/3D architectures. When combined with other material processing techniques such as chemical vapor deposition and hydrothermal treatment, electrospinning enables powerful synthesis strategies that can tailor structural and

compositional features of ...

Electrospinning is becoming more popular, and it is causing a lot of buzz in the food, pharmaceutical, and energy industries. There's a feature on nanofiber in this review. Download chapter PDF. ... This technology uses ceramics and metal blend polymers to create flexible nanofibers in energy storage and energy applications. And, The ...

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