

Controllable nanoarchitecture arrays of the transition metal selenide, supported on conductive substrates, are promising materials for high-performance electrochemical energy storage and conversion applications. Herein, Ni₃Se₂ nanowire arrays with a rich-grain-boundary are rationally grown on a nickel foam (NF) substrate by the solvothermal ...

The growth approach offers a new technique for the design and synthesis of transition metal oxide or hydroxide hierarchical nanoarrays that are promising for electrochemical energy storage, catalysis, and gas sensing applications. The high performance of a pseudocapacitor electrode relies largely on a scrupulous design of nanoarchitectures and ...

DOI: 10.1016/J.ELECTACTA.2013.11.081 Corpus ID: 95901426; One-dimension MnCo₂O₄ nanowire arrays for electrochemical energy storage @article{Li2014OnedimensionMN, title={One-dimension MnCo₂O₄ nanowire arrays for electrochemical energy storage}, author={Lingling Li and Yi Zhang and X. Y. Liu and Shaojun Shi and Xiangyu Zhao and Hong Zhang and ...

Cobalt-manganese (Co-Mn)-based bimetallic compounds (such as Co-Mn oxides, hydroxides) have been investigated as a new type of high-performance electroactive materials for energy storage device. Nevertheless, Co-Mn sulfides are seldom investigated, especially for those with hierarchical architectures and structures. Herein, we first adopt a ...

The integration of Ni-Co oxide/phosphide/sulphide composites into nanowire arrays on Ni foam as supercapacitor electrode for boosting energy storage performance Author links open overlay panel Jinyu Wu a, Faxin Yan a, Zeyu Huang a, Junyu Liu b, Haifu Huang a, Yongfang Liang a, Jianghai Li a, Fulin Yuan a, Xianqing Liang a, Wenzheng ...

For WO₃ in an acid electrolyte, energy storage occurs through the redox reactions between W⁶⁺ and W⁵⁺ according to equation (1) [62]. Fig. 9 a shows typical CV curves of the 2% Mo-doped WO₃ nanowire array grown on FTO substrate in a 0.5 M H₂SO₄ electrolyte between -0.7 and 1.0 V at various scan rates ranging from 5 to 100 mV s⁻¹.

Due to their unique structural, electrical, optical, and thermal properties, silicon nanowires (SiNWs) are attracting immense interest as a promising material for advanced ...

Herein, we proposed a 3D sodiophilic current collector of self-assembled hierarchical Cu₂S nanowire arrays on Cu foil (Cu₂S NWs@Cu), which in-situ established a mixed-ion-electron-conducting scaffold (MIECS) after the initial activation of Na depositing. Its benefit was obvious and manifold: (1) the continuous phase of ion-conducting Na₂S and ...

Nowadays, the emerging trends in electric vehicles and global shift to the use of renewable energy require high-performing energy storage devices (i.e., batteries) with high capacity and long ...

DOI: 10.1002/adfm.201303138 Corpus ID: 96883529; Mesoporous NiCo₂O₄ Nanowire Arrays Grown on Carbon Textiles as Binder-Free Flexible Electrodes for Energy Storage @article{Shen2014MesoporousNN, title={Mesoporous NiCo₂O₄ Nanowire Arrays Grown on Carbon Textiles as Binder-Free Flexible Electrodes for Energy Storage}, author={Laifa Shen ...

Electrodes with hierarchical nanoarchitectures could promote electrochemical properties due to their largely exposed active sites and quick charge transfer. Herein, in situ grown hierarchical NiO nanosheet@nanowire films are reported by a one-step hydrothermal process followed by heat treatment. The unique N

Spinel MnCo₂O₄ is a promising energy storage candidate as anode materials in lithium-ion batteries owing to synergistic effects of two intrinsic solid-state redox couples. However, low conductivity, poor rate capacity and rapid capacity fading have seriously impaired its practical applications. To overcome the inferiorities, urchin-like MnCo₂O₄@C core-shell ...

The n-Si/n-TiO₂ nanowire arrays exhibited a larger photocurrent and open circuit voltage than p-Si/n-TiO₂ nanowires since the band alignment at the n-Si/n-TiO₂ junction helped reduce the loss of holes under illumination, ... SiNWs for energy storage applications in rechargeable lithium-ion batteries and supercapacitors will be discussed.

3 · The assembled battery Fe₂O₃@CC-PANI-30 core-shell nanowire arrays provides a capacity of 768.5 mA h g⁻¹ after 100 cycles at 100 mA g⁻¹. Even after 800 cycles at 500 mA ...

The high performance of a pseudocapacitor electrode relies largely on a scrupulous design of nanoarchitectures and smart hybridization of bespoke active materials. We present a powerful two-step solution-based method for the fabrication of transition metal oxide core/shell nanostructure arrays on various conductive substrates. Demonstrated examples include ...

Due to the good integration with the current silicon-based electronic devices, silicon-based supercapacitor have been considered as one of the promising energy storage devices. However, their practical application is largely hindered by complex and costly manufacturing processes. In this study, a novel NiSi@MnOx electrode was fabricated with a ...

The increasing concerns on environmental problems have led to a desire to use eco-friendly and sustainable energy sources [1], [2]. As an advanced energy storage technology, rechargeable batteries like lithium batteries are widely explored and applied in large-scale energy storage [3], [4] spite the promising energy density and cycle durability, lithium batteries are limited by ...

Meanwhile, CoS₂ nanowire arrays with high surface-to-volume ratios can improve wettability of electrolyte and promote redox reactions. Furthermore, an advanced Zn-CoS₂/CC hybrid ion ...

Photochemical reactions that promote energy storage, such as water splitting and oxygen-hydrogen evolution reactions, play a crucial role in this context. Here, we ...

Dense nanowire arrays are grown in situ on NF skeleton, cross-linked and constructed into 3D network structure. As an anode, it exhibits excellent electrochemical properties. The initial discharge capacity of NiCo₂O₄/NF is as high as 1316 mAh g⁻¹ at a current density of 0.2 A g⁻¹, and the specific capacity of 790 mAh g⁻¹ can be ...

As a major energy storage device, lithium ion batteries (LIBs) are the most prevailing power sources for high-end and portable electronic products, such as laptops and mobile phones for quite a ...

The development of high-performance energy storage device is of great importance for portable electronics, electrical vehicles and electrical grids [1,2,3,4]. As one of the most feasible alternatives for the new-generation high-performance energy storage device, supercapacitors (SCs) possess high power density, ultrafast charging and discharging ...

Nanomaterials provide many desirable properties for electrochemical energy storage devices due to their nanoscale size effect, which could be significantly different from bulk or micron-sized materials. Particularly, confined dimensions play important roles in determining the properties of nanomaterials, such as the kinetics of ion diffusion, the magnitude of ...

The design of three-dimensional (3D) core-shell heterostructures is an efficient method to achieve high mass specific capacity of electroactive materials under high mass loading. In this work, porous Ni₄Co₁-OH nanosheets with a mass loading of 7.7 mg·cm⁻² are obtained by using Ni₄Co₁-(NO₃)₂(OH)₄ supported on the CuO nanowires as precursors via an ...

In this paper, a novel NiCo₂S₄@NiWO₄ honeycomb core-shell nanorod array significantly improved the electrochemical storage properties of supercapacitors. The characteristic architecture of the NiCo₂S₄@NiWO₄ electrode showed a remarkable specific capacity of 1273.5 C g⁻¹ at a current density of 1 A g⁻¹. The asymmetric supercapacitor ...

Tungsten trioxide (WO₃) is recognized as a promising anode material for asymmetric supercapacitors (ASCs), yet its low conductivity and stability as well as energy density greatly limit its development. Herein, a flexible Ce-doped WO₃ (Ce 1.5%-WO₃) nanowire array with rich oxygen vacancies is grown on carbon cloth by a solvothermal synthesis. The specific ...

It is essential for energy storage and conversion systems to construct electrodes and electrocatalysts with superior performance. In this work, ZnCo₂S₄@Ni(OH)₂ nanowire arrays are synthesized on nickel foam

by hydrothermal methods. As a supercapacitor electrode, the $\text{ZnCo}_2\text{S}_4 @ \text{Ni(OH)}_2$ structure exhibits a specific capacitance of 1,263.0C g ...

The uses of nanostructured TiO_2 arrays for energy storage are then discussed, with a focus on methods for enhancing electrochemical performance [6,18,19,20,21,22]. ... Alkaline hydrothermal techniques are frequently used to prepare nanowire arrays [31,32]. The alkaline hydrothermal method uses diluted alkaline solution to heat Ti foil at ...

Energetic Cost for Being "Redox-Site-Rich" in Pseudocapacitive Energy Storage with Nickel-Aluminum Layered Double Hydroxide Materials. The Journal of Physical Chemistry Letters 2020, 11 (9) ...
a- $\text{Fe}_2\text{O}_3 @ \text{PANI}$ Core-Shell Nanowire Arrays as Negative Electrodes for Asymmetric Supercapacitors. ACS Applied Materials & Interfaces 2015, 7 (27) ...

Ordered WO_3 nanowire arrays on carbon cloth (WNCC) conductive substrates are successfully prepared by a facile hydrothermal method. ... High-performance energy-storage devices based on WO_3 nanowire arrays/carbon cloth integrated electrodes L. Gao, X. Wang, Z. Xie, W. Song, L. Wang, X. Wu, F. Qu, D. Chen and G. Shen, J. Mater. Chem. A, 2013, 1 ...

$\text{Na}_2\text{Ti}_2\text{O}_5$ (NTO) nanowire arrays coated with VS_2 nanosheets (NTO- VS_2) have been directly prepared on a current collector as a 3D anode for Na-ion batteries pared to graphite, the larger interlayer spacing of two dimensional VS_2 can offer facile intercalation of lithium and/or sodium ions. Aside from its natural metallic behavior, VS_2 also possesses a ...

Ordered WO_3 nanowire arrays on carbon cloth (WNCC) conductive substrates are successfully prepared by a facile hydrothermal method. The as-prepared samples were characterized by ...

Introduction. Heterostructured nanomaterial is drawing a tremendous amount of attention in energy storage devices. To date, intensive efforts have been devoted to the synthesis of self-supported core/shell heterostructures, which could combine the advantages of different materials and exhibit several interesting features [1], [2], [3].For instance, the core/shell ...

We introduced a facile method to construct hierarchical nanocomposites by combining one-dimensional (1D) conducting polyaniline (PANI) nanowires with 2D graphene oxide (GO) nanosheets. PANI nanowire arrays are aligned vertically on GO substrate. The morphologies of PANI nanowires can be controlled by adjusting the ratios of aniline to GO, ...

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