

Is Ni₃Se₂ a good electrolyzer?

The Ni₃Se₂ nanowire array electrode is shown to be a high-performance alkaline water electrolyzer with current density of 10 mA cm⁻² at a cell voltage of 1.62 V. The results demonstrate Ni₃Se₂ as a promising 2D highly active electrode for electrochemical energy storage and conversion applications.

What is the energy density of NiSe@Ni₃Se₂?

The device manifests an eximious energy density of 45.5 Wh Kg⁻¹ at 1.600 kW kg⁻¹, with a capacitance preservation of 96.1% over 12,000 cycles. Additionally, the NiSe@Ni₃Se₂ composite also present a low overpotential of 281 mV at 10 mA cm⁻².

What is the electrochemical double layer capacitance of NiSe nwas@ni₃Se₂ NSS?

The calculated results (Fig. 6 (d)) show that the electrochemical double layer capacitance of the NiSe NWAs@Ni₃Se₂ NSs/NF is 3.25 mF cm⁻², which is higher than NiSe NWAs/NF (2.82 mF cm⁻²) and Ni₃Se₂ NSs/NF (2.67 mF cm⁻²). It reveals the composite electrode possesses more active reaction sites.

Can NiSe@ni₃Se₂ be used for oxygen evolution reaction?

In addition, the as-obtained NiSe@Ni₃Se₂ catalyst can present favorable electrocatalytic performances for oxygen evolution reaction (OER) with a small overpotential of 281 mV at 10 mA cm⁻².

What is a Ni₃Se₂ electrode used for?

When used as a two-dimensional (2D) electrode for water splitting reaction, the Ni₃Se₂ electrode exhibits high catalytic activity to achieve 100 mA cm⁻² at an overpotential of 320 mV in the oxygen evolution reaction and a low overpotential of 95 mV at a current density of 50 mA cm⁻² in the hydrogen evolution reaction in a 1.0 M KOH solution.

What is NiSe@ni₃Se₂?

NiSe@Ni₃Se₂ electrode material are prepared via a two-step in-situ growth technology. The integrated hybrid electrode delivers extraordinary capacitance and OER characteristics. An asymmetric supercapacitor based on NiSe@Ni₃Se₂ was successfully assembled. The device exhibits high power and energy density, and long-term cycling stability.

DOI: 10.1016/j.jallcom.2020.157479 Corpus ID: 225169575; Synthesis of 3D Ni₃Se₂ nano-architectures for electrochemical energy storage and conversion @article{Li2021SynthesisO3, title={Synthesis of 3D Ni₃Se₂ nano-architectures for electrochemical energy storage and conversion}, author={Songyang Li and Jincheng Fan and Shidong Li and ...

All the results make Ni₃Se₂ electrode as a promising 2D highly active electrode for electrochemical energy

storage and conversion applications. Discover the world's research 25+ million members

Rich-grain-boundary of Ni₃Se₂ nanowire arrays as multifunctional electrode for electrochemical energy storage and conversion applications+ Controllable nanoarchitecture ...

3D multifunctional Ni₃Se₂ nano-architecture electrodes on Ni foam for electrochemical energy storage and conversion applications have been achieved, which ...

Electrochemical measurements of the resultant nanostructures in 1 M KOH electrolyte solution revealed that the energy storage performance of the cauliflower-like Ni₃Se₂ nanostructures was ...

Hybrid supercapacitors (HSCs), combining the advantages of the high specific power of electric double-layer capacitive (EDLC) and the high specific energy of rechargeable batteries, attract extensive interest in the development and applications of modern electronic devices [1], [2], [3].As the core part of supercapacitors (SCs), the electrochemical properties of ...

Rich-grain-boundary of Ni₃Se₂ nanowire arrays as multifunctional electrode for electrochemical energy storage and conversion applications. J. Mater. Chem. A, 7 ... fabrication of alpha-Ni(OH)₂ thin films with preheating treatment for long-term stable electrochromic and energy storage applications. J. Mater. Chem. C., 8 (2020), pp. 3010-3016.

The Ni₃Se₂ nanowire array electrode is shown to be a high-performance alkaline water electrolyzer with current density of 10 mA cm⁻² at ...

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 (

In this chapter, the authors outline the basic concepts and theories associated with electrochemical energy storage, describe applications and devices used for electrochemical energy storage, summarize different industrial electrochemical processes, and introduce novel electrochemical processes for the synthesis of fuels as depicted in Fig. 38.1.

Synthesis of 3D Ni₃Se₂ nano-architectures for electrochemical energy storage and Journal of Alloys and Compounds (IF 6.2) Pub Date : 2021-02-01, DOI: 10.1016/j.jallcom.2020.157479

In this study, a particular nanostructure consisting of the Ni₃Se₂ NSs grown on the surface of NiSe NWAs were successfully synthesized directly on nickel foam via one-step in ...

NiCo₂S₄ has received wide attention as a promising electrode material for supercapacitors (SCs), Li-ion

batteries (LIBs), and Na-ion batteries (SIBs) in the past few years because of its excellent mechanical property, low cost, and rich redox chemistry. In addition, NiCo₂S₄ has higher electronic conductivity than the corresponding nickel cobaltite oxide (NiCo₂...

In this work, NiCo₂S₄@Ni₃Se₂ nanocomposites were fabricated by the facile hydrothermal + electrodeposition method on Ni foam. NiCo₂S₄@Ni₃Se₂ nanocomposites demonstrate the outstanding electrochemical performances for energy storage and H₂ production. The asymmetric supercapacitor of NiCo₂S₄@Ni₃Se₂//active carbon possess ...

In this paper, we report a one-step electro-deposited synthesis strategy for directly growing NiCoSe₂/Ni₃Se₂ lamella arrays (LAs) on N-doped graphene nanot

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 ...

The scalable and sustainable manufacture of thick electrode films with high energy and power densities is critical for the large-scale storage of electrochemical energy for application in ...

Download scientific diagram | Electrochemical performance comparison of Ni₃Se₂-A, Ni₃Se₂-B and Ni₃Se₂-C prepared at 160 °C, 140 °C and 140 °C, and bare nickel foam, respectively: a CV curves at ...

The design and development of electrode materials for energy-storage applications is an area of prime focus around the globe because of the shortage of natural resources.

@article{Shi2019RichgrainboundaryON, title={Rich-grain-boundary of Ni₃Se₂ nanowire arrays as multifunctional electrode for electrochemical energy storage and conversion applications}, author={Xin Shi and Hui Wang and Palanisamy Kannan and Jieting Ding and Shan Ji and Fusheng Liu and Hengjun Gai and Rongfang Wang}, journal={Journal of Materials ...

All the results make Ni₃Se₂ electrode as a promising 2D highly active electrode for electrochemical energy storage and conversion applications. View Show abstract

The limited energy density of SCs in relation to alternative electrochemical energy technologies restricts their use in many applications. To conquer this, it had been discovered that increasing the specific capacitance (C_s) or widening the working voltage (V) of the SCs are the two important parameters to boost the energy density (E) of SC ...

Developing novel electrode materials with reasonable structures and ideal conductivity is of great significance

for energy storage devices. In this work, Ni₃Se₂@C yolk-shell nanorods are grown on nickel foam (NF) via a one-step selenization and carbonization process. The carbon shell not only improves the conductivity and charge transfer of ...

The MoV-Ni₃Se₂//Zn battery delivers an impressive surface energy density of 2.93 mWh cm⁻² and a remarkable power density of 51.55 mW cm⁻² with outstanding cycling ...

Controllable nanoarchitecture arrays of the transition metal selenide, supported on conductive substrates, are promising materials for high-performance electrochemical energy ...

Request PDF | On Nov 1, 2024, Mahendran Mathankumar and others published Electrodeposited Co_{0.85}Se/Ni₃Se₂ heterostructure as an efficient binder-free cathode for fast electrochemical energy ...

In this paper, we report a one-step electro-deposited synthesis strategy for directly growing NiCoSe₂/Ni₃Se₂ lamella arrays (LAs) on N-doped graphene nanotubes (N-GNTs) as advanced free-standing positive electrode for asymmetric supercapacitors. Benefiting from the synergetic contribution between the distinctive electroactive materials and the skeletons, the ...

Fossil fuel utilization leads to environmental pollution and depletion of energy supplies, prompting the preparation of environmentally friend and advanced energy storage ...

Supercapacitors are known as promising excellent electrochemical energy storage devices because of their attractive features, including quick charge and discharge, high power density, low cost and high security. ... which demonstrate greatly practical applications in energy storage devices. ... Facile synthesis of hierarchical Ni₃Se₂ ...

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