Solar container performance of nickel foam

Does heat treatment improve the energy absorption density of open-cell nickel foams?
The heat treatment improved the energy absorption density of open-cell nickel foams for 3.7 times. For the best sample which is a metal foam with 12 h of electroforming with heat treatment the first maximum compressive strength,energy absorption density,and energy absorption efficiency reach 1.84 (MPa),3.29 (mJ/mm 3),and 73%,respectively.

Why is nickel foam a promising 3D porous material?
Therefore, nickel foam is considered a promising 3D porous material for utilization as a catalytic and electronic substrate because of its open-pore structure, low cost, mechanical strength, and relative stability in acid and alkaline solutions [59, 60].

What is the effect of graphene oxide on nickel foam?
The reduced graphene oxide covered on the surface of nickel foam increases broad-band absorption of sunlightand weakens the thermal emittance,and its coarse surface decreases the reflectance of light,which ensures the largest photo-to-heat conversion efficiency.

What is open-cell nickel foam used for?
Open-cell nickel foams are widely used in electrodesfor battery applications. They can be utilized as containers for electrolytes and collectors of electric current.

Is n-doped carbon nanolayer modified nickel foam a novel substrate for supercapacitors?
Su,L. et al. N-doped carbon nanolayer modified nickel foam: A novel substrate for supercapacitors. Appl. Surf. Sci. 546,148754 (2021). Vicente,J.,Topin,F. &Daurelle,J.-V. Open celled material structural properties measurement: From morphology to transport properties. Mater. Trans. 47,2195-2202 (2006).

How does time of electroforming affect the mechanical properties of nickel foams?
According to Fig. 3,the time of electroforming has affected the mechanical properties of the Nickel foams in a good way. The Ni1 samples could be grouped in two group,the first group shows a maximum reaction force around 1 kN,and the other group shows a maximum tolerated force less than 0.5 kN.

Solar-driven desalination technology presents significant potential to alleviate global energy shortages, but synergistic water-electricity generation remains challenging. Herein, we design ...

A solar receiver capable of achieving an outlet temperature of 1200 K and a power of 40 kW th is required to drive He-Xe gas turbines in a newly designed solar dynamic space power system. In the ...

The introduction of highly conductive materials is expected to solve this problem. In here, nickel foam

(NF)/MXene/CoAl-LDH is prepared by electrodepositing CoAl-LDH on the surface ...

A high-performance nickel-zinc alkaline battery comprising a SiC-coated Zn anode and MoCoCu-P medium-entropy alloy-coated nickel foam cathode is designed and fabricated.

Thus, in this review, after an introduction to nickel foam, the role of each active material based on nickel foam for three types of LIBs, LOBs, and LSBs is investigated, and the ...

Herein, we describe an in-situ hybridization of Nickel Selenide (Ni3Se2) with a Nickel Foam (NF) current collector as an efficient, ultra-durable elec...

Nickel foam of cylindrical semi-dense structures is fabricated using powder metallurgy method and ammonium hydrogen carbonate as a space holder. The s...

The fluctuating and intermittent nature of solar heat storage can be mitigated by employing phase change heat storage. Adding metal foam is beneficial in improving the conduction of phase-change ...

Solar TEGs with PCMs can generate electricity from solar radiation based on the photothermal effect and the Seebeck effect [[37], [38], [39]]. The findings demonstrated improvements ...

Abstract: Cobalt oxide/nickel foam (CoO/NF) electrodes with different concentration, reaction time and reaction temperature were synthesized by a simple hydrothermal method in order to improve its ...

The enthalpy-porosity technique was employed to analyze the performance of a thermal energy storage unit with square container and high melting temperature phase change material ...

In this work, several commonly used conductive substrates as electrocatalysts for hydrogen evolution reaction (HER) and oxygen evolution reaction (OER) under alkaline conditions were studied, ...

Herein, a highly efficient ISWE system was designed and fabricated by integrating broadband Co 3 S 4 nanoforests with 3D macroporous nickel foam (NF). In such ISWE, the Co 3 S 4 ...

Accurate spectral radiative transfer simulation and property prediction are basic for improving the performance of combined collecting material in the field of solar photothermal ...

Its use for solar evaporation not only offers a water supply route, makes the evaporator more capable of floating on its own, but also prevents heat transfer to bulk water. However, when it ...

However, its limited charge separation and solar utilization capability have been considered as bottleneck issues, restricting its performance. Herein, a novel Au/Cu/Cu 2 O-decorated nickel foam ...

Solar container performance of nickel foam

Assembling halloysite nanotubes in nickel foam with silica fibers as scaffold for efficiently encapsulating phase change materials towards solar-thermal-electric energy conversion ...

This investigation aims to assess the mechanical behavior and energy absorption properties of the open-cell nickel foams.

This paper presents the design of a novel cavity solar receiver with tubes filled with nickel foams and reports on its performance analysis using a 3D coupled heat transfer model.

It is highly desired to directly use commercial nickel foam (CNF) as an electrocatalyst for the oxygen evolution reaction (OER) via simple surface reconstruction. In our research, a simple ...

This study employed a one-step substitution reaction followed by a thermal reduction technique to successfully affix Ni and Cu nanoparticles onto reduced graphene oxide (rGO) ...

Solar-driven desalination technology presents significant potential to alleviate global energy shortages, but synergistic water-electricity generation remains challenging. Herein, we design a hydrophilic ...

Comparative electrochemical performance in a three-electrode test with (a) Pt-disc and (b) nickel foam as the current collectors. Reprinted (adapted) from Ref. 10, with permission from the ...

Objective comparison between OER catalysts has been blurred by the use of different supports and methods to evaluate performance. Here, we selected nine highly active transition-metal ...

The Ni foam supported PANI cathode with high loading is prepared by PANI electrophoretic deposition, and followed by PANI slurry casting under vacuum filtration. The ...

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