Good Stays

Solar container hydrogel photonic crystals

Overview

We introduce recent studies of hydrogel-based photonic structures, including waveguides, optical fibers, photonic crystals, and plasmonic structures. Optically active photonic devices have been reported by doping luminescent agents into the hydrogel. Plasmonic–photonic crystal (PPC) photocatalysts have emerged as a promising class of materials that integrate nanoscale light management with catalytic functionality for solar-driven chemical conversions. Hydrogels are three-dimensional, hydrophilic networks of cross-linked polymers that can retain water molecules in the structures and respond to physical/chemical stimulus by changing their phase and volume.

Solar container hydrogel photonic crystals

Dual-network photonic crystal hydrogels with mechanochromic ...

Photonic crystal hydrogels are obtained by assembling Fe 3 O 4 @C nanoparticles within the agar/P (N-isopropylacrylamide-acrylamide) (agar/P (NIPAm-Am)) dual-networks. The dual ...

Design and functionalization of responsive hydrogels ...

Abstract Photonic crystals embedded in analyte responsive hydrogels provide a powerful platform for biosensing and have benefitted from recent advances in ...

Self-assembled Photonic Crystals for Solar Cells

Summary

Self& #x2010;assembled photonic crystals have been widely adopted in dye& #x2010;sensitized solar cells, perovskite solar cells, and silicon solar cells for photon ...

Bio-inspired micropatterned thermochromic hydrogel for

Herein, inspired by the fast and concurrent optical regulation mechanisms of squid skin, we propose a novel micropatterned thermochromic hydrogel (MTH) to realize the concurrent control

...

Hydrogel-Based Colloidal Photonic Crystal Devices for Glucose Sensing

Hydrogel-based responsive PC materials are noninvasive options for glucose detection. Here, we briefly review glucose-sensing materials and devices comprising hydrogels and colloidal ...

Applications of inverse opal photonic crystal hydrogels in the

Inverse opal photonic crystal hydrogels (IOPCHs) can produce corresponding visual color responses to a change in acid or alkali in an external humid environment, which has wide ...

Orderly-assembled photothermal photonic crystals with multiple

Photonic crystals (PCs) with periodically arranged structure can effectively manipulate the light propagation and photon motion via their photonic band gap (PBG), which helps to manipulate ...

Recent advances in spherical photonic crystals: Generation and

Applications of the spherical PCs in optics are also outlined. Spherical photonic crystals (PCs), generated by assembly of monodisperse colloidal nanospheres in a spherical confined ...

Study on the Preparation and Application of Flexible Photonic Crystal

This paper introduces the optical properties of photonic crystals and the synthesis of hydrogel polymers, and describes the working principle of photonic crystal hydrogel sensors.

Advances in hydrogel photonics and their applications

We introduce recent studies of hydrogel-based photonic structures, including waveguides, optical fibers, photonic crystals, and plasmonic structures. Optically active photonic devices have ...

Architecting light for catalysis: emerging frontiers in plasmonic

Given the growing body of promising studies, a comprehensive review is needed to consolidate recent progress, clarify underlying mechanisms, and provide design guidelines that can ...

A Flexible and Free-standing Photonic Crystal-Hydrogel Film for

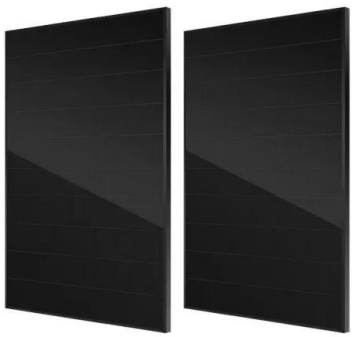
The composite structure utilizes the Photonic Crystal Enhanced Fluorescence (PCEF) technique and incorporates a self-assembled 3D photonic crystal onto a photopolymerizable ...

Marine biomass-derived bilayer hydrogel for efficient solar

Here, we report a marine-biomass-bilayer-hydrogel (MBBH) evaporator composed of chitosan, sodium alginate, and squid-ink pigment for efficient solar-driven water purification. The ...

Advances in photonic crystal hydrogels for biomedical research: A

By combining photonic crystals with hydrogels, the new material not only inherits the optical properties of photonic crystals, but also possesses the responsiveness and good ...



Dual-network photonic crystal hydrogels with

The dual-network photonic crystal hydrogel offers a combination of structural color, mechanochromic behavior, water retention, solvent identification features, making it an exciting ...

Periodic nanostructures imprinted on high-temperature stable sol-gel

This material allows the realization of highly effective light-trapping architectures for polycrystalline silicon thin-film solar cells on glass but also for the preparation of 2D photonic crystals ...

Advances in photonic crystal hydrogels for biomedical research: A review

By combining photonic crystals with hydrogels, the new material not only inherits the optical properties of photonic crystals, but also possesses the responsiveness and good biocompatibility of hydrogels. ...

Fabrication of Photonic Crystal Hydrogels with Controllable Structural

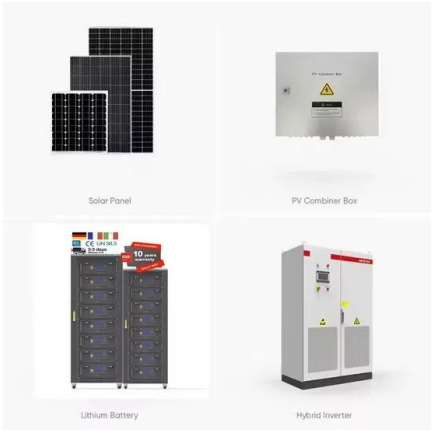
Here, we present the successful preparation of an inverse opal photonic crystal (PC) hydrogel film that exhibits remarkable responsiveness to both temperature and pressure.

Mild Sol-Gel Conditions and High Dielectric Contrast: A Facile

Solution processing of highly performing photonic crystals has been a towering ambition for making them technologically relevant in applications requiring mass and large-area production. It would indeed ...

Hydrogels for active photonics

In this review, we provide an overview of hydrogels in photonic design and discuss recent progress in hydrogel-based photonics platforms using micro/nanoprocessing techniques (Table 1).



Microgel-hydrogel composite photonic crystals to monitor and extract

We fabricate microgel-hydrogel composite photonic crystals and investigate their spectroscopic response to uranyl ion (UO22+) in aqueous solution. Upo...

Hydrogel-Encased Photonic Microspheres with Enhanced Color ...

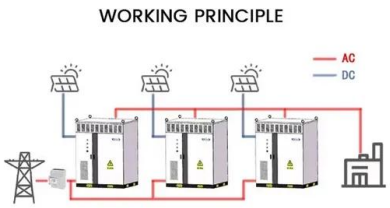
Photonic microparticles, however, suffer from intense incoherent scattering and lack of suspension stability. We propose a microfluidic technique to generate hydrogel-shelled photonic ...

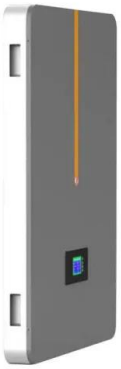
Dynamic Colloidal Photonic Crystal Hydrogels with Self-Recovery and

Motivated by the dynamic characteristics of PC nanostructures, here, we present a new strategy for the design of hydrogel-based artificial PC materials with reversible interactions in the periodic ...

Sol-Gel Derived Photonic Crystals BaTiO3/SiO2 , Request PDF

Request PDF , On Feb 14, 2022, N. V. Gaponenko and others published Sol-Gel Derived Photonic Crystals BaTiO3/SiO2 , Find, read and cite all the research you need on ResearchGate





Photonic Crystal Hydrogel Sensors

Photonic Crystal Hydrogel Sensors: Merging Photonics and Soft Robotics for Revolutionary Sensing Technology The evolution of sensor technology has always been at the heart of advances in ...

Absorbing photonic crystals for silicon thin-film solar cells: Design

In this paper, we present the integration of an absorbing photonic crystal within a thin-film photovoltaic solar cell. Optical simulations performed o...

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