

Can COF membranes be used for solar-thermal water production from seawater?

The evaporation system not only works for clean and pure water generation but also for solar desalination. The good performance and reusability of COF membranes make them promising platforms for solar-thermal water production from seawater. Copyright © 2023 American Chemical Society

Are covalent organic frameworks suitable for solar-driven water evaporation?

Covalent organic frameworks (COFs) characterized by structural diversity, face-to-face stacking and open channels exhibit unique advantages as photothermal materials but have rarely been applied in solar-driven water evaporation due to complicated framework design, tedious synthesis, and low solar-to-vapor efficiency.

What is a covalent organic framework photocatalyst?

In 2014, the first example of a covalent organic framework (COF) photocatalyst for the hydrogen evolution reaction was reported by our group, which has not only marked the beginning of COF photocatalysis for solar fuel production but also helped to accelerate research into "soft photocatalysis" based on porous polymers in general.

What are the milestones in the development of COFs for solar fuel production?

We review milestones in the development of COFs for solar fuel production and related photocatalytic transformations, including hydrogen evolution, oxygen evolution, overall water splitting, CO₂ reduction, N₂ fixation, oxygen reduction, and alcohol oxidation.

What is a covalent organic framework membrane?

Covalent organic framework (COF) membranes exhibit immense potential in various applications, including seawater desalination, ion transport and gas separation, owing to their distinctive properties such as ordered nanopores, tunable pore sizes and programmable functional groups 1, 2, 3, 4, 5.

Why do we need a COF in organic nanomaterials?

COFs emergence in the domain of innovative organic nanomaterials offers an effective chemical framework for complex structured design and tailored operational enhancement because of the availability of chemical subunits and the diverse range of topologies and linkages.

Covalent organic frameworks (COFs) are an emerging class of porous crystalline materials which are completely constructed from organic building blocks through robust covalent bonds. High surface ...

Herein, an innovative Fe-coordinated 2D Z-scheme heterojunction composed of TpPa-1-COF (TP1C) and Bi₂WO₆ (BWO) is developed for ...

Some of the PCM candidates were characterized for: chemical stability with some container materials; phase change transformation temperatures; and latent heats.

Noteworthy, Covalent Organic Frameworks (COFs), discovered in 2005 (roughly one decade later than MOFs), share many similarities and advantages with MOFs. COFs have recently ...

Herein, a range of RP/TpPa-1-COF (RP/TP1C) composites have been successfully prepared through solvothermal method. The two-dimensional structure of the two materials causes ...

Covalent organic frameworks (COFs) have proven to be an appealing photocatalyst due to their high crystallinity and tunable optical and electronic properties. Although a variety of ...

Covalent organic frameworks (COFs) represent an advanced class of crystalline materials, distinguished by their modular design and precise atomic-level arrangement. Since their ...

However, they did not take into account that the compatibility of these novel nanomaterials with the container materials could be modified with respect to the base salts. Indeed, ...

Its application scope includes solar energy storage systems, cold chain logistics, the construction industry, and so on. However, PCM is usually encapsulated in a container, and its ...

Moreover, the possible mechanisms for ion extraction and separation using COF-based materials are investigated. Finally, the advances, challenges, and prospects in developing ...

Finally, a possible mechanism to well explain the improved photocatalytic performance of the photocatalytic system was proposed. The present work provides a new idea to construct highly ...

Covalent-organic frameworks (COFs) are emerging organic crystalline materials with a porous framework that extends into two or three ...

A new direction toward lighter, denser, and faster-deployment solar arrays is motivating Future Trends in Solar Technology: The Evolution of ...

Covalent organic frameworks (COFs) are crystallized porous organic polymers with persistent permeability and stable coordinated frameworks. COFs funct...

We establish an interfacial heating-evaporation system based on the photothermal COFs, which yields solar-energy-to-vapor efficiency of 90.7% ...

1 Introduction Covalent organic frameworks (COFs) have attracted much interest in recent years due to the

enormous potential design space ...

Covalent organic frameworks (COFs) are burgeoning crystalline porous materials that are constituted with organic building units and covalent bonds. The pre-designable porous structures ...

Five researchers affiliated with Nagoya University have been named in Clarivate's Highly Cited Researchers List for 2025. This list recognizes researchers who demonstrate significant ...

Covalent organic frameworks (COFs) characterized by structural diversity, face-to-face stacking and open channels exhibit unique advantages as ...

In the past few years, "off-network life", "energy independence" and "independent power supply" have quickly entered the public's vision from niche concepts. Whether you want to ...

Covalent organic frameworks (COFs) have emerged as a new class of porous materials. In COFs, the basic rigid molecular building blocks are linked thro...

Two-dimensional covalent organic frameworks (2D COFs) are periodic, permanently porous, lightweight solids with remarkable structural ...

Covalent organic framework (COF) membranes are an attractive option for this application due to their porosity, well-defined pores and tunable surface chemistry. However, precise ...

Covalent organic frameworks (COFs) are porous, crystalline materials formed through the covalent bonding of organic units. They are characterized by high surface areas and tunable pore ...

Covalent organic frameworks (COFs), as porous crystalline polymer materials, can provide a promising platform for high-performance electrocatalytic CO₂ ...

In this process, exciting research activities have emerged, ranging from synthesis methods to energy-related applications of COF membranes.

Our study presents a feasible approach to rationally design functional COFs-based CNT composites, thereby enhancing their potential applications in integrated energy systems.

Solarcontainer is a mobile solar solution powering 32-50 homes with up to 140kWp. Innovative, efficient, and portable renewable energy.

Two-dimensional covalent organic frameworks (COFs) are an emerging class of semiconducting materials for

photocatalysis solar fuel production. They uniquely feature ...

In this paper, COF-2CN is selected as a representative material, and computational studies are conducted based on density functional theory (DFT) to gain further insight into its ...

Covalent organic frameworks (COFs), which offer an excellent platform to construct unique photocatalytic systems, have emerged as potential materials for the production of solar fuels.

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