



Tipapplication of carbonized membrane in energy storage

Can carbon molecular sieve membranes be used for CO₂ removal?

Carbon molecular sieve membranes for selective CO₂/CH₄ and CO₂/N₂ separation: experimental study, optimal process design, and economic analysis *Ind Eng Chem Res*, 62(2023), pp. 19116-19132 Google Scholar Y.Chu, X. He Process simulation and cost evaluation of carbon membranes for CO(2) removal from high-pressure natural gas

Does MXene coating improve capacitance performance of carbon nanofiber membrane?

The CV curve area of the pure carbon nanofiber membrane is smaller than that of other electrodes, indicating that the addition of MXene coating enhances the capacitance performance of the carbon nanofiber membrane.

Can a graphene membrane be fabricated on a two-layer composite carbon support?

The Agrawal group also reported a graphene membrane fabricated on a two-layer composite carbon support consisting of a 100 nm thick NPC film and a 500 nm thick multi-walled carbon nanotube film to reinforce the graphene film and to minimize defects, achieving an H₂ permeance of 328 GPU and a H₂/CO₂ selectivity of up to 8.

Are carbon molecular sieve membranes derived from crosslinkable copolyimide for gas separation?

Advanced carbon molecular sieve membranes derived from molecularly engineered cross-linkable copolyimide for gas separations *Nat Mater*, 22(2023), pp. 109-116 Google Scholar S.Xu, N.Zhao, L.Wu, S.Kang, Z.Zhang, G.Huo, et al. Carbon molecular sieve gas separation membranes from crosslinkable bromomethylated 6FDA-DAM polyimide

Are ultra-selective carbon molecular sieve membranes suitable for natural gas separation?

Ultra-selective carbon molecular sieve membranes for natural gas separations based on a carbon-rich intrinsically microporous polyimide precursor *J Membr Sci*, 585(2019), pp. 1-9 Google Scholar Z.Liu, W.Qiu, W.J.Koros New insights into physical aging-induced structure evolution in carbon molecular sieve membranes

How can advanced membrane materials improve the performance of membrane separation technology?

The development of advanced membrane materials is a key research direction for enhancing the performance of membrane separation technology. Optimizing the selectivity and permeability of inorganic membranes, polymer membranes, and mixed-matrix membranes is crucial for improving CO₂ capture efficiency and reducing the cost of separation processes.

Abstract This review focuses on the application of membrane materials based on electrospinning technology for carbon capture. First, the principles of electrospinning ...



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Therefore, it is urgent to improve the energy storage capacity of carbonized wood, and endow it with high flexibility and deformable properties to improve its utility in energy ...

This review delves into the comprehensive analysis of biomass feedstocks and methods employed in the synthesis of flexible self-supporting carbon electrodes. Subsequently, the advancements in their ...

Graphical abstract Ultrafine NiS nanocrystals embedded in N, S co-doped flexible carbon fiber membranes were developed, demonstrating excellent lithium storage performance ...

This review summarizes the current trends and the future perspectives on ion exchange membranes for carbon capture and utilization from three aspects: carbon capture, ...

Water contamination and freshwater shortage are calling for advanced technologies of water recycling. High performance of membrane separation has been recently obtained using carbon ...

Integrating electrochemical redox-active materials with 3D conductive scaffolds holds high promise to the development of high-performance energy storage devices. Herein, a ...

Electrospun porous carbon nanofiber mats have excellent properties, such as a large surface area, tunable porosity, and excellent electrical conductivity, and have attracted great attention ...

VA-CNT membranes were reported as potential materials for membrane separation and energy storage applications due to the well-ordered structure of the aligned ...

The integration of photo-thermal conversion and thermal energy storage is an efficient way to improve the solar energy utilization. Phase change material (PCM) with excellent thermal storage ability is often used in solar energy ...

This work systematically studied the ion-transport behavior of three types of GO-based membranes by controlling hydrophilic microstructures. Because of their precise ion ...

The eggshell membrane can be easily available from domestic waste, and the carbonized eggshell membrane (CEM) presents a unique 3D interconnected fibrous framework ...

The review underscores the integration of renewable energy sources for eco-friendly desalination and separation processes. The future trajectory unfolds with next-gen ...

Carbon-based nanomaterials, including graphene, fullerenes, and carbon nanotubes, are attracting significant attention as promising materials for next-generation energy storage and conversion ...



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These features offered by hydrogen energy storage can make the renewable electricity used at a different time and even different location to provide more flexibility potential ...

These modeling efforts suggest that, even with modest performance of commercial membranes, membrane separation can already achieve better energy and ...

Flexible membranes created from porous carbon nanofibers (CNFs) hold great promise in the next generation wearable energy storage devices, but challenges still remain due to the ...

Abstract Free-standing N-doped carbon nanofiber membranes have been obtained from cellulose acetate (CA) and soy protein isolate (SPI). As an environmental ...

In this study, membrane distillation-crystallization is used to facilitate the controllable production of carbonate minerals directly from carbon dioxide-loaded amine solutions and waste materials such as fly ...

The superior mechanical, electrical, thermal, and electrochemical properties of Carbon nanotubes (CNTs) make them a promising next-generation material for energy ...

The eggshell membrane (EM) [1], [2] is a main component of eggshell waste [3], consisting of collagens, glycosamine, sialoprotein with abundant chemical groups (e.g., -NH₂, ...

1 Introduction Carbon nanofibers (CNFs) are advanced fiber materials known for their exceptional qualities, including high-temperature resistance, corrosion resistance, ...

In particular, the emergence of COF membranes has dramatically expanded the application scenarios for insoluble and un-processable COF powders and opened new doors for their utilization in ...

Membrane technology represents a innovative pathway for sustainable carbon capture and storage, offering significant for reduced energy consumption, simplicity and adaptability.

Carbon nanotubes have properties such as high electrical conductivity and strength, which make them suitable as supplemental materials for energy conversion and storage devices. Their use may ...

This study conducted weight-specific capacitance calculations for all hybrid membranes and pure carbon nanofiber membranes to verify that the introduction of MXene ...

Research on carbon-based materials in renewable energy technologies have become increasingly important for future renewable energy production and storage ...

Carbon nanotubes have properties such as high electrical conductivity and strength, which make them suitable



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as supplemental materials for energy conversion and ...

We have accomplished these objectives and have used the resulting aligned carbon-tubule membranes to demonstrate some of these proposed energy-related applications.

This review article provides a state-of-the-art overview of carbon-doped polymeric membrane separators, their properties, fabrication processes, and performance in lithium batteries, as well as supercapacitors.

Water hyacinth is an alien invasive species, which seriously harms the ecological environment [33], [34], [35]. Based on the above research, this study aims to develop a method ...

The present review offers readers with an update over current and novel developments of carbon nano onions (CNOs) in recent years. Here we concisely detailed out ...

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