



Graphene energy storage for seawater desalination

Professor Rahul Nair, a researcher at Manchester, will develop graphene-based membranes designed to treat seawater and brackish water more efficiently. The goal is to increase ...

The demand for desalination is steadily rising due to dwindling fresh water sources and the abundant saline water in our oceans. Among the various techniques available, ...

Such a seawater desalination and electricity generation integrating system based on MCB-MPCC provides an innovative strategy for high-efficient solar energy harvest ...

Currently, he is working on forming a scientific research team in material science and its applications in different fields such as seawater desalination, wastewater treatment, ...

Schematics of the superwicking-FROC solar hybrid photovoltaic/thermal system. This system provides simultaneous high efficiency electricity generation and on-site water ...

Fig. 1: Graphene oxide membrane: from fabrication to separation properties. Therefore, substantial efforts are required in this field to develop membranes for desalination ...

Graphene oxide (GO)-enhanced membranes are being developed to solve major limitations in both reverse osmosis (RO) and membrane distillation (MD) technologies, which ...

The graphene oxide (GO) membrane has recently emerged as a promising material for nanofiltration. However, its application in seawater desalination is limited because ...

Seawater desalination has been considered as a viable option to meet the growing demand for freshwater [3]. Developments of efficient materials and advanced storage ...

Graphene oxide (GO) stands at the forefront of seawater desalination innovation due to its unique layered structure and remarkable chemical properties. In ...

Despite the challenges faced by graphene membranes for desalination, current research and development activities aim to overcome these hurdles and unlock the full ...

In addition, the application of macroscopic bodies assembled based on 2D materials in the fields of energy storage and seawater desalination is also introduced.



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All-weather solar-powered desalination systems are more demanding in terms of materials and system design compared to daytime-only systems. This Review discusses all ...

Ultimately, the review underscores the role of seawater desalination electrolysis technology in addressing acute water shortages, considering energy demands and ...

Fig. 1 shows the typical stages in seawater desalination plant system. The process begins with the intake of ocean or brackish water, which then undergoes pretreatment such as ...

In this article, the recent advances of the graphene and graphene-based nanomaterials and its applications for desalination have been reviewed along with the ...

Seawater desalination powered by solar energy is the most environmentally and economical solution in responding to the global water and energy crisis.

The use of anion storage materials has played an important role in the development of electrochemical energy storage systems and water desalination. Herein, the ...

This work highlights the promise of graphene on a substrate for water desalination membranes. Our approach strongly suggests investigating low-dimensional materials for desalination membranes, ...

Membrane distillation has attracted great attention in the development of sustainable desalination and zero-discharge processes because of its possibility of recovering ...

Considering the value of seawater desalination, few studies have attempted to collect data on the results of global graphene-based membrane seawater desalination. In this paper, a quantitative analysis of scholarly publications ...

This study not only clarifies the dual functions of aerogels in environmental remediation and renewable energy applications, but also provides a green and efficient ...

The growing global demand for fresh water, coupled with the environmental impact of conventional desalination technologies, underscores the urgent need for more ...

The current review summarizes the next-generation hybrid graphene-based membrane materials for water cleansing to come across global freshwater supplies. In this ...

Graphene and its nanomaterials have demonstrated considerable potential for its use in energy storage devices like lithium-ion batteries (LIB) and supercapacitors.



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From an environmental standpoint, the high efficiency of GO membranes has the potential to lower energy consumption in seawater desalination, which in turn could reduce ...

Renewable energy-based desalination technologies like solar-based interfacial evaporation are very efficient and sustainable desalination methods. Solar-based interfacial ...

In contrast, RO offers a more energy-efficient and environmentally friendly alternative, making it a crucial approach to mitigating the global water shortage [4, 5]. RO ...

Download Citation | On Jan 1, 2025, Long Zeng and others published Highly efficient and stable solar-driven seawater desalination using composite photothermal structures with energy ...

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