

# Research progress of high-pressure gas storage and solar container technology

Finally, the paper conducts a comprehensive analysis of the key challenges confronting stationary high-pressure gaseous hydrogen storage pressure vessels and proposes recommendations for future ...

Abstract Solid-state hydrogen storage technology has emerged as a disruptive solution to the "last mile" challenge in large-scale hydrogen energy applications, ...

This paper reviews the research progress of phase change thermal storage technology in air-source heat pumps from three fields: phase change thermal storage technology applied to air ...

Abstract Hydrogen energy has emerged as a pivotal pathway for facilitating the global energy transition. The efficient and safe operation of hydrogen storage equipment is important for ...

The CCES system, based on the underground gas storage chamber, operates on the following principle: during periods of low power consumption, the compressor uses excess electric energy to ...

Through the identification and evolution of key topics, it is determined that future research should focus on technologies such as high-performance electrode material preparation for ...

Sustainability spotlight Global energy storage demands are rising sharply, making the development of sustainable and efficient technologies ...

As a result, the evolution, trends, updates, and research progress on hydrogen storage related topics were assessed in this bibliometric review, along with the difficulties posed by the ...

This article integrates solar heat pump systems and phase change heat storage technology. Related technologies and research are outlined from the three perspectives of solar heat ...

Abstract High-pressure hydrogen refueling stations currently face challenges due to their reliance on mechanical compressors with high electricity consumption, grid dependency, durability ...

Some prospective research directions of the hydrate-based gas storage technology could be to develop greener and more effective promoters, evaluate the value chain based on sII ...

Review article Progress in research and technological advancements of thermal energy storage systems for concentrated solar power

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The efficient and safe operation of hydrogen storage equipment is important for hydrogen widespread application, while high-pressure gaseous hydrogen storage technology has emerged as the prevailing ...

As the global energy system shifts to renewable energy, high-density energy storage methods are crucial for stable output and efficiency, but several challenges remain. This article ...

The storage technology for hydrogen is continuously developing, including various methods such as high-pressure gas storage, low-temperature ...

The storage and transportation technologies of high-pressure gas and cryogenic liquid hydrogen are relatively mature and have the potential for large-scale applications.

At present, the natural gas transportation pipeline network is relatively complete, while hydrogen transportation technology faces many challenges, such as the lack of technical ...

Hydrogen storage method Advantages Disadvantages Examples Compressed Gas Storage -Relatively mature technology -Low capital cost -Can be refueled quickly - Requires high ...

The study findings reveal that (1) hydrogen storage facilities are primarily categorized into salt cavern storage, depleted oil and gas reservoir storage, and ...

The first part of this paper reviews the technology, equipment, and application progress of high-pressure hydrogen storage and transportation. High-pressure hydrogen storage uses high-pressure ...

However, its unique characteristics of leakage and autoignition pose significant challenges to the development of high-pressure hydrogen ...

Because pre-combustion capture and oxy-fuel combustion capture technologies require appropriate materials and certain conditions to meet high-temperature requirements, the ...

The efficiency of hydrogen storage and transportation utilizing existing infrastructure, such as storage tanks and natural gas pipelines. By elucidating these aspects, our research ...

&lt;p indent="0mm"&gt;Hydrogen energy is a renewable energy source with significant advantages. The vigorous development of hydrogen energy is an effective way to achieve "carbon peak and carbon ...

These formations offer high-capacity storage solutions, with salt caverns capable of holding up to 6 TWh of hydrogen and depleted gas reservoirs exceeding 1 TWh per site. Case ...

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This article systematically presents the manufacturing processes and materials used for a variety of high-pressure hydrogen storage containers, including metal ...

High Pressure Research is the leading journal for research in high pressure science and technology. The journal publishes original full-length ...

This paper compared the performance of several commercial high-pressure hydrogen storage tanks. It focused on the hydrogen storage mechanism, the technical status, and the research related to glass ...

Metal-organic frameworks (MOFs) are porous materials that may find application in numerous energy settings, such as carbon capture and hydrogen-storage technologies.

Moreover, although the pressure and gravimetric storage density of hydrogen have increased a lot with the technological advancement, its volumetric storage density has not been ...

Compressed carbon dioxide energy storage (CCES) offers several benefits over other existing energy storage systems, including ease of liquefaction, high energy storage density, and ...

Climate change lends urgency to measures towards emission reduction. Carbon capture and storage is a technique that enables separation and storage of CO<sub>2</sub> from gas mixtures before ...

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