

How can hydrogen be stored?

Hydrogen can be stored in a variety of physical and chemical methods. Each storage technique has its own advantages and disadvantages. It is the subject of this study to review the hydrogen storage strategies and to survey the recent developments in the field. 1. Introduction

What are the requirements for hydrogen storage?

A storage method that gives both a high gravimetric energy density and a high volumetric energy density is, therefore, a requirement. Additionally, moderate operating conditions, low enthalpy change, and fast kinetics of the hydrogen storage and release are the requirements. Safety, low cost, and public acceptance are the other important factors.

How is hydrogen stored in a solid state?

Currently, storing hydrogen through compression and liquefaction methods is the most mature and widely adopted approach. However, the high pressure of gaseous storage and the issue of evaporation loss in liquid storage have driven the continuous development of solid-state storage.

Can hydrogen be used as an energy carrier?

Key advances in hydrogen utilization and transportation techniques were elucidated. Hydrogen storage on materials and in subsurface were extensively analyzed. Abstract Indubitably, hydrogen demonstrates sterling properties as an energy carrier and is widely anticipated as the future resource for fuels and chemicals.

What are the benefits of underground hydrogen storage?

Emerging technologies like underground storage may offer higher benefits. Alternative energy carriers (e.g., ammonia) could reduce the demand for tank-based hydrogen storage. Material Potential for high volumetric storage capacity, which is crucial for long-range transport applications.

Are hydrogen storage systems economically feasible?

However, techno-economic feasibility of hydrogen storage systems is yet to be realized as none of the current metal hydrides fulfill all the essential criteria for a practical hydrogen economy, mainly because of low hydrogen storage capacity, sluggish kinetics and unacceptable temperatures of hydrogen absorption/desorption.



# Hydrogen energy storage and environmental protection



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