Concrete Energy Storage Patent

Can concrete be used for energy storage?
The gradual shift to concrete-based materials in the energy storage sector presents an attractive opportunity for leveraging the durability, abundance, and cost-effectiveness of concrete. As evidenced by this review, concrete not only underpins current development but also forms the foundation for future energy storage systems.

How can concrete-based systems improve energy storage capacity?
The energy storage capacity of concrete-based systems needs to be improved to make them viable alternatives for applications requiring substantial energy storage. The integration of conductive materials, such as carbon black and carbon fibers, into concrete formulations can increase production costs.

What are concrete-based energy storage devices?
Concrete-based energy storage devices, characterized by their multifunctional attributes and transformative potential, represent a pivotal convergence of material science, energy technology, and sustainable construction practices.

Can concrete be used as an electrode in energy storage devices?
Conducting polymers,like polyaniline,offer the advantage of easy synthesis and high conductivity,but suffer from poor cycling stability. 13 Concrete can function as an electrode in energy storage devicesby exploiting its integral properties to facilitate the storage and release of electrical energy.

How many articles are related to cement-based energy storage?
Reproduced from ref. 63 with permission from Elsevier, copyright 2024 As we referred to current trends using Scopus-736-Analyze-Year with our query (TITLE-ABS-KEY (cement-based energy storage)), we found 736 articles from the year 2000 related to cement-based energy storage.

Can construction building materials be used for energy storage devices?
This article provides a summary of recent advancements in employing construction building materials for energy storage devices. The gradual shift to concrete-based materials in the energy storage sector presents an attractive opportunity for leveraging the durability,abundance,and cost-effectiveness of concrete.

How to reduce the environmental footprint of concrete and address energy storage challenge? Slide 2 Near future: $200 per ton carbon tax [2] ... method of making it as supercapacitator. Patent. Soliman et al. (2020). Electric energy dissipation and electric tortuosity in electron conductive cement-based materials. Physical Review Materials ...

the article discloses a pumpkin-shaped, underwater, compressed-air-storage devices being trialed at the University of Nottingham. It is described that the compressed-air-storage devices, constructed from steel and polymer, are designed to be pumped full of high-pressure air during times of high winds and low demand,

with the stored energy used to turn turbines to create ...

US20240035620A1 US18/228,115 US202318228115A US2024035620A1 US 20240035620 A1 US20240035620 A1 US 20240035620A1 US 202318228115 A US202318228115 A US 202318228115A US 2024035620 A

The invention provides phase-change energy-storage concrete and a manufacturing method thereof. According to the manufacturing method, a hollow metal material device is used as a carrier of a phase-change energy-storage material, the periphery of the hollow metal material device is sealed, and a feeding hole is formed in the top of the hollow metal material device ...

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The invention relates to light-emitting concrete, particularly a preparation method of energy-storage light-emitting concrete. The energy-storage light-emitting concrete is prepared from the following raw materials in percentage by weight: 2-8% of fluorescent powder, 18% of white cement, 27% of standard sand, 39-47% of gravel and 8% of water.

Thermal storage in and of itself is not new, but what has been elusive is a design that can efficiently store energy in relatively low-cost modules using common materials, rather than expensive salts or geologic formations, which may not exist everywhere. Accordingly, it is an object of this invention to provide a low-cost, modular energy storage device that is ...

A supercapacitor made from cement and carbon black (a conductive material resembling fine charcoal) could form the basis for a low-cost way to store energy from renewable sources, according to...

2019 Patent Analysis for the U.S. Department of Energy . 1113 patent awards resulting from HFTO-funded R& D (1977-2019) 582 fuel cell patents (52%) 397 hydrogen production and delivery patents (36%) 134 hydrogen storage patents (12%) 28% of all patents are available for license or licensed. 43% are actively being used in R& D.

Concrete"s robust thermal stability, as highlighted by Khaliq & Waheed [5] and Malik et al. [6], positions it as a reliable long-term medium for Thermal Energy Storage (TES).This stability ensures the integrity of concrete-based TES systems over extended periods, contributing to overall efficiency and reliability.

MIT engineers have created a "supercapacitor" made of ancient, abundant materials, that can store large amounts of energy. Made of just cement, water, and carbon black (which resembles powdered charcoal), the device ...

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