

What is research in lithium-ion batteries?

Research in lithium-ion batteries has produced many proposed refinements of lithium-ion batteries. Areas of research interest have focused on improving energy density, safety, rate capability, cycle durability, flexibility, and cost.

Can cathode materials increase the energy density of lithium-ion batteries?

The CATMAT project is researching next-generation cathode materials that could significantly increase the energy density of lithium-ion batteries. There is an urgent need to increase the range of electric vehicles (EVs) by developing battery materials that can store more charge at higher voltages, achieving a higher energy density.

What are lithium-ion batteries used for?

Lithium-ion batteries are essential components in a number of established and emerging applications including: consumer electronics, electric vehicles and grid scale energy storage. However, despite their now widespread use, their performance, lifetime and cost still needs to be improved.

Are lithium-ion batteries safe?

The increasing demand for electric vehicles (EVs) and grid energy storage requires batteries that have both high-energy-density and high-safety features. Despite the impressive success of battery research, conventional liquid lithium-ion batteries (LIBs) have the problem of potential safety risks and insufficient energy density.

Can artificial intelligence be used for lithium-ion battery research?

Artificial intelligence (AI) and machine learning (ML) is becoming popular in many fields including using it for lithium-ion battery research. These methods have been used in all aspects of battery research including materials, manufacturing, characterization, and prognosis/diagnosis of batteries.

Are solid-state lithium batteries the future of energy storage?

Abstract In recent years, solid-state lithium batteries (SSLBs) using solid electrolytes (SEs) have been widely recognized as the key next-generation energy storage technology due to its high safety, high energy density, long cycle life, good rate performance and wide operating temperature range.

5 ???· Mexican Lithium-ion Battery Import Market. Dublin, Jan. 31, 2025 (GLOBE NEWSWIRE) -- The "Mexico Lithium-ion Battery Import Research Report 2025-2034" has been added to ResearchAndMarkets 's offering. The demand for lithium-ion batteries has grown rapidly, especially in the fields of electric vehicles and renewable energy storage, which has ...

These replace metal-rich cathodes with cheaper sulphur cathodes, and graphite anodes with lithium metal, and can offer greater energy density than current lithium-ion batteries. Research is ...

The lithium-ion battery (LIB), a key technological development for greenhouse gas mitigation and fossil fuel displacement, enables renewable energy in the future. LIBs possess superior energy density, high discharge power and a long service lifetime. These features have also made it possible to create portable electronic technology and ubiquitous use of ...

1 ??· A research scientist at De Montfort University Leicester (DMU) has invented a novel manufacturing method that could revolutionise the world of rechargeable batteries.

To address the major drawbacks of traditional lithium-ion batteries, researchers have suggested the creation of solid-state lithium-ion batteries (SSLIBs) as a viable panacea. In contrast to conventional lithium-ion batteries, which utilize polymer electrolytes or organic liquid, SSLIBs incorporate solid electrolytes of inorganic origin.

Today, most electric cars run on some variant of a lithium-ion battery. Lithium is the third-lightest element in the periodic table and has a reactive outer electron, making its ...

For lithium-ion batteries, silicate-based cathodes, such as lithium iron silicate ($\text{Li}_2\text{FeSiO}_4$) and lithium manganese silicate ($\text{Li}_2\text{MnSiO}_4$), provide important benefits. They are safer than conventional cobalt-based cathodes because of their large theoretical capacities (330 mAh/g for $\text{Li}_2\text{FeSiO}_4$) and exceptional thermal stability, which lowers the chance of overheating.

A lithium-ion or Li-ion battery is a type of rechargeable battery that uses the reversible intercalation of Li^+ ions into electronically conducting solids to store energy. ... Major producers (2023) ...

Lithium-ion batteries have become a vital component of the electronic industry due to their excellent performance, but with the development of the times, they have gradually revealed some shortcomings. Here, sodium-ion batteries have become a potential alternative to commercial lithium-ion batteries due to their abundant sodium reserves and safe and low-cost ...

Lithium-ion Battery Research Group at Projects Development Institute (PRODA), P.M.B. 01609, Emene, Enugu ... Figure 1: Major lithium deposits by type (Sources, Deutsche . Bank, USGS, Bloomberg New ...

The CATMAT project is researching next-generation cathode materials that could significantly increase the energy density of lithium-ion batteries. There is an urgent need to increase the range of electric vehicles ...

Web: <https://www.vielec-electricite.fr>