

Technological breakthroughs in new battery materials

Which companies have made advances in battery recycling technology in 2024?

Several companies made advances in battery recycling technology in 2024. Altilium has developed a hydrometallurgical recycling technology that achieved over 97% lithium recovery from LFP batteries. The company has demonstrated its ability to recycle both LFP and NMC batteries.

What are alternative materials and chemistries for batteries?

Researchers are currently investigating alternative materials and chemistries for batteries, such as sodium- (Liu M. et al., 2022), potassium- (Yuan et al., 2021), magnesium- (Li et al., 2023b) and calcium-ion (Gummow et al., 2018) batteries, aiming to develop next-generation energy storage solutions.

Can new manufacturing processes reduce the environmental impact of batteries?

Corporations and universities are rushing to develop new manufacturing processes to cut the cost and reduce the environmental impact of building batteries worldwide.

Are next-generation batteries the future?

In the pursuit of next-generation battery technologies that go beyond the limitations of lithium-ion, it is important to look into the future and predict the trajectory of these advancements. By doing so, we can grasp the transformational potential these technologies hold for the global energy scenario.

Can new battery technologies reshape energy systems?

We explore cutting-edge new battery technologies that hold the potential to reshape energy systems, drive sustainability, and support the green transition.

Are graphene-based batteries a breakthrough energy storage technology?

Graphene-based batteries are emerging as a groundbreaking energy storage technology due to their unique material properties. Graphene, a single layer of carbon atoms arranged in a two-dimensional honeycomb lattice, has exceptional electrical conductivity, high mechanical strength, and superior thermal properties.

Most battery-powered devices, from smartphones and tablets to electric vehicles and energy storage systems, rely on lithium-ion battery technology. Because lithium-ion batteries are able to store a significant ...

The new lithium-ion battery includes a cathode based on organic materials, instead of cobalt or nickel (another metal often used in lithium-ion batteries). In a new study, the researchers showed that this material, ...

The race is on to generate new technologies to ready the battery industry for the transition toward a future with more renewable energy. In this competitive landscape, it's hard to say which ...

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Ford Lightning battery pack. Image used courtesy of Ford . The demand for better battery packs has led to rapid changes in battery design, with the industry desperately aiming for enhanced performance, sustainability, and ...

2 ???· Mixed conductors streamline ion and electron pathways, boosting the capacity of sulfur electrodes in all-solid-state Li-S batteries.

Battery 2030+ is the "European large-scale research initiative for future battery technologies" with an approach focusing on the most critical steps that can enable the acceleration of the ...

Lithium iron phosphate (LFP) batteries have emerged as one of the most promising energy storage solutions due to their high safety, long cycle life, and environmental friendliness. In recent years, significant progress has been made in enhancing the performance and expanding the applications of LFP batteries through innovative materials design, electrode ...

Previous studies have struggled with solid precipitates and low capacity and the search has been on for a new technique to improve these types of batteries. Yang's group developed a new electrolyte, a solvent of acetamide ...

Technological advances enable manufacturers to meet the ever-increasing demand for batteries through sustainable and cost-effective methods. New materials and technologies are being ...

A brand new substance, which could reduce lithium use in batteries, has been discovered using artificial intelligence (AI) and supercomputing.

Computational screening could assist for the discovery of new Li-ion conductors based on lattice dynamics or high-entropy mechanism. 35,36 Additionally, there are also other factors to consider from a practical perspective, including (1) use more economical materials to reduce the dependency on rare-earth elements; (2) environmentally benign materials and ...

As the demand for batteries continues to surge in various industries, effective recycling of used batteries has become crucial to mitigate environmental hazards and ...

A new structural battery material from Chalmers University promises to boost electric car range by 70% and reduce weight. Explore the revolutionary technology that could transform EV efficiency and portable electronics. ... Sweden have developed what they call a structural battery. This breakthrough material not only stores energy but can also ...

Researchers are exploring alternative materials (Peng et al., 2016), solid-state electrolytes (Bates et al., 2022), and new chemistries/technologies, such as lithium-sulfur (Guo et al., 2024) and lithium ...

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Stanford's breakthrough in lithium metal battery technology promises to extend EV ranges and battery life through a simple resting protocol, enhancing commercial viability. Next-generation electric vehicles could run on ...

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