



New Energy New Energy Battery Breakthrough

Can K-Na/S batteries save energy?

In a new study recently published by Nature Communications, the team used K-Na/S batteries that combine inexpensive, readily-found elements -- potassium (K) and sodium (Na), together with sulfur (S) -- to create a low-cost, high-energy solution for long-duration energy storage.

Could a new energy source make batteries more powerful?

Columbia Engineers have developed a new, more powerful "fuel" for batteries--an electrolyte that is not only longer-lasting but also cheaper to produce. Renewable energy sources like wind and solar are essential for the future of our planet, but they face a major hurdle: they don't consistently generate power when demand is high.

Could new batteries provide a reliable power supply?

If they are successful, these new batteries could provide a stable and reliable power supply from renewable sources, even during times of low sun or wind. The team is now working on optimizing the electrolyte composition.

Is the next generation of battery storage a good idea?

Backed by research at NREL, the next generation of battery storage looks promising. The laboratory's research not only focuses on improving industry-favored Li-ion batteries, but simultaneously continues to explore new opportunities in battery designs.

How do EV batteries work?

A typical EV may have 4,000 batteries arranged in modules controlled by a battery management system, an electronic brain that monitors and controls battery performance. In a lithium metal battery, the existing management system can be programmed to discharge an individual module completely so that it has zero capacity left.

What are emerging battery technologies?

Emerging battery technologies must focus on reducing costs, while maintaining lifetime and density performance. Using ultramodern capabilities and world-class laboratory facilities, NREL's energy storage researchers continue to push battery boundaries with materials development, thermal management, diagnostics, and modeling.

4 ???· The material, called sodium vanadium phosphate ($\text{Na}_x\text{V}_2(\text{PO}_4)_3$), improves sodium-ion batteries by increasing their energy density--the amount of energy stored per kilogram--by more than 15%.

Columbia Engineering material scientists have been focused on developing new kinds of batteries to transform how we store renewable energy. In a new study published September 5 by ...



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Energy company boasts battery breakthrough that could soon make EVs even more affordable: "Cost-effective and high-performance energy storage" Rick Kazmer Mon, September 16, 2024 at 10:45 AM UTC

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 lithium metal batteries that go 500 to 700 miles on a single charge, twice th

6 ???· Yuqi Li "Because we don't use active metals for permanent electrodes and the electrolyte is water-based, this design should be easy and cheap to manufacture," said Yuqi ...

With the shift to renewable energy, a new era of electrification is on the horizon, supported in large part by the breakthrough battery designs that researchers at the National Renewable Energy Laboratory (NREL) believe are ...

Scientists have created an anode-free sodium solid-state battery. This brings the reality of inexpensive, fast-charging, high-capacity batteries for electric vehicles and grid storage closer...

Battery technology has emerged as a critical component in the new energy transition. As the world seeks more sustainable energy solutions, advancements in battery technology are transforming electric transportation, renewable energy integration, and grid resilience.

The image conceptualizes the processing, structure and mechanical behavior of glassy ion conductors for solid state lithium batteries. Credit: Adam Malin/ORNL, U.S. Dept. of Energy. When electricity flows ...

2 ???· New superionic battery tech could boost EV range to 600+ miles on single charge. The vacancy-rich γ -Li₃N design reduces energy barriers for lithium-ion migration, increasing ...

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5 ???· The new material, sodium vanadium phosphate with the chemical formula $\text{Na}_x\text{V}_2(\text{PO}_4)_3$, improves sodium-ion battery performance by increasing the energy density -- the ...

5 ???· Researchers have developed a new material for sodium-ion batteries, sodium vanadium phosphate, that delivers higher voltage and greater energy capacity than previous sodium-based materials. This breakthrough could make sodium-ion batteries a more efficient and affordable alternative to lithium-ion, using a more abundant and cost-effective resource.



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6 ???· Yuqi Li "Because we don't use active metals for permanent electrodes and the electrolyte is water-based, this design should be easy and cheap to manufacture," said Yuqi Li, a postdoctoral researcher with Professor Yi Cui in Stanford's Department of Materials Science & Engineering. "Zinc manganese batteries today are limited to use in devices that don't need a ...

In January, Chinese firm Beijing Betavolt New Energy Technology Company Ltd claimed to have developed a miniature nuclear battery that can generate electricity stably and autonomously for 50 years without the need for charging or maintenance. It said the battery is currently in the pilot stage and will be put into mass production on the market.

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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