Breakthrough in new lithium battery materials

Many owners of electric cars have wished for a battery pack that could power their vehicle for more than a thousand miles on a single charge. Researchers at the Illinois Institute of Technology (IIT) and U.S. Department of Energy"s (DOE) Argonne National Laboratory have developed a lithium-air battery that could make that dream a ...

The year of AI is indeed upon us, following Microsoft"s recent announcement detailing its breakthrough in finding new battery materials. Most of the batteries available at the moment are lithium ...

Sodium, common in ocean water and soda ash mining, is an inherently more environmentally friendly battery material. The LESC research has made it a powerful one as well. Innovative architecture. To ...

After Microsoft"s team discovered 500,000 stable materials with AI that could be used across a variety of transformative applications, we were able to modify, test, and tune the chemical composition of this new material and quickly evaluate its technical viability for a working battery, showing the promise of advanced AI to accelerate the ...

MIT engineers designed a battery made from inexpensive, abundant materials, that could provide low-cost backup storage for renewable energy sources. Less expensive than lithium-ion battery technology, the new architecture uses aluminum and sulfur as its two electrode materials with a molten salt electrolyte in between.

A brand new substance, which could reduce lithium use in batteries, has been discovered using artificial intelligence (AI) and supercomputing. The findings were made by Microsoft and the...

Harvard"s latest solid-state battery breakthrough. The lithium metal battery researchers developed at the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS) can also be ...

3 · A multi-institutional research team led by Georgia Tech"s Hailong Chen has developed a new, low-cost cathode that could radically improve lithium-ion batteries ...

Sodium, which is common in ocean water and soda ash mining, is an inherently more environmentally friendly battery material. The LESC research has made it a powerful one as well. Innovative architecture. To create a sodium battery with the energy density of a lithium battery, the team needed to invent a new sodium battery architecture.

This breakthrough could lead to a more sustainable and affordable battery technology, reducing the dependence on lithium and other rare materials. Safety and Lifespan Advantages Furthermore, sodium-ion batteries have a longer lifespan and are safer than lithium-ion batteries, making them an attractive option for various ...

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To create a sodium battery with the energy density of a lithium battery, the team needed to invent a new sodium battery architecture. Traditional batteries have an anode to store the ions while a ...

This breakthrough, utilizing an enhanced rock-salt structure and a high-entropy strategy, overcomes previous challenges in magnesium diffusion and transport. Scientists at Tohoku University have ...

Group14"s SCC55 ® advanced silicon battery material has made Molicel"s performance breakthrough possible, Yeh confirmed this week in a presentation at the Advanced Automotive Battery Conference ...

This breakthrough, utilizing an enhanced rock-salt structure and a high-entropy strategy, overcomes previous challenges in magnesium diffusion and transport. Scientists at Tohoku University have achieved a significant breakthrough in battery technology by creating a new cathode material for rechargeable magnesium batteries ...

The researchers queried AQE for battery materials that use less lithium, and it quickly suggested 32 million different candidates. From there, the AI system had to discern which of those materials ...

Researchers from the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS) have developed a new lithium metal battery that can be ...

Microsoft says the new material could cut down the amount of lithium used in a battery by as much as 70 percent. On top of that, it could be used to create a solid ...

Toyota says it has made a breakthrough that will allow "game-changing" solid-state batteries to go into production by 2028. ... host of promising materials replacing the lithium, including ...

Breakthrough in all-solid-state battery technology with a novel electrodeposition method increases efficiency and lifespan. A research team, consisting of Professor Soojin Park from the Department of Chemistry, PhD candidate Sangyeop Lee from the Division of Advanced Materials Science, and Dr. Su

Japan"s TDK is claiming a breakthrough in materials used in its small solid-state batteries, with the Apple supplier predicting significant performance increases for devices from wireless ...

Article Content. Researchers have moved one step closer to making solid-state batteries from lithium and sulfur a practical reality. A team led by engineers at the University of California San Diego developed a new cathode material for solid-state lithium-sulfur batteries that is electrically conductive and structurally healable--features that ...

Tunnel Vision Pays Off for Battery-Charging Breakthrough . A new approach expands structure tunnels,

providing swift electricity for many battery-powered gadgets. ... A Johns Hopkins materials scientist was part of a team that has discovered how to make the lithium-ion batteries used in smartphones and electric vehicles charge ...

Microsoft searched for materials to build what"s called a solid-state electrolyte battery; these have a greater energy density than liquid ion batteries and do not present a fire or leakage risk. The material used for the prototype contained some lithium - but up to 70 percent less than the amount found in existing batteries.

Microsoft and Pacific Northwest National Laboratory winnowed down millions of possible electrolyte materials into viable candidates in less than nine months. ...

KAIST has unveiled a groundbreaking development in energy storage technology. A research team led by Professor Kang Jeong-gu from the Department of Materials Science and Engineering has created a high-energy, high-power hybrid Sodium-ion Battery.This next-generation battery boasts rapid charging capabilities, setting a ...

"This new material is an enabling solution for future high energy density solid-state batteries." The Future of Solid-State Batteries. To validate the effectiveness of the new cathode material, the researchers constructed a test battery and subjected it to repeated charge and discharge cycles.

The new electrolyte is similar to a known material containing lithium, yttrium and chlorine, but swaps some lithium for sodium -- an advantage as lithium is costly and in high demand (SN: 5/7/19).

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 ...

Now, Li and his team have designed a stable, lithium-metal, solid-state battery that can be charged and discharged at least 10,000 times -- far more cycles ...

Researchers have developed a sustainable lithium-ion battery using manganese, which could revolutionize the electric vehicle industry. Published in ACS Central Science, the study highlights a breakthrough in using nanostructured LiMnO2 with monoclinic symmetry to improve battery performance and s

MIT researchers have now designed a battery material that could offer a more sustainable way to power electric cars. The new lithium-ion battery includes a ...

The new battery is formulated with a lithium metal anode, a high-quality material favored for rechargeable batteries due to its capabilities for long-term energy storage.

A new AI-powered breakthrough could revolutionize battery technology by slashing lithium use by up to 70%.

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Read about the promising new material N2116 and its potential to create safer, more sustainable batteries for the future.

Dr Nuria Tapia-Ruiz, who leads a team of battery researchers at the chemistry department at Imperial College London, said any material with reduced amounts of lithium and good energy storage ...

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 through a battery, the materials inside it gradually wear down.

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For example, the DoE"s Pacific Northwest National Laboratory in Richland, Washington, is working with Microsoft to rapidly come up with new battery materials; a lithium-sodium solid ...

AI looked most promising for breakthroughs for solid-state materials and disorder rock salts, which would drastically improve the driving range of an electric car ...