

Could a new lithium-ion battery make electric cars more sustainable?

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 cathode based on organic materials, instead of cobalt or nickel (another metal often used in lithium-ion batteries).

Can new battery materials be made in a laboratory?

Nature Energy 8,329-339 (2023) Cite this article While great progress has been witnessed in unlocking the potential of new battery materials in the laboratory, further stepping into materials and components manufacturing requires us to identify and tackle scientific challenges from very different viewpoints.

Why do we need a new battery chemistry?

These should have more energy and performance, and be manufactured on a sustainable material basis. They should also be safer and more cost-effective and should already consider end-of-life aspects and recycling in the design. Therefore, it is necessary to accelerate the further development of new and improved battery chemistries and cells.

Can lithium-based batteries accelerate future low-cost battery manufacturing?

With a focus on next-generation lithium ion and lithium metal batteries, we briefly review challenges and opportunities in scaling up lithium-based battery materials and components to accelerate future low-cost battery manufacturing. 'Lithium-based batteries' refers to Li ion and lithium metal batteries.

Could a new MIT battery make electric cars more sustainable?

A new MIT battery material could offer a more sustainable way to power electric cars. Instead of cobalt or nickel, the new lithium-ion battery includes a cathode based on organic materials. In this image, lithium molecules are shown in glowing pink. Image: Courtesy of the researchers. Edited by MIT News.

How are new batteries developed?

See all authors The development of new batteries has historically been achieved through discovery and development cycles based on the intuition of the researcher, followed by experimental trial and error--often helped along by serendipitous breakthroughs.

A new energy battery is also one of the future development goals of mankind, it is an ... help of nano-phase materials, we can make new materials that are important for human development.

The energy transition depends on technologies that allow the inexpensive temporary storage of electricity from renewable sources. A promising new candidate is aluminium ...

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 amount of energy stored per ...

Next-generation batteries will need to store significantly more energy per charge (energy density), be able to charge and discharge very quickly (power density), cycle thousands of times (cycle life), operate over a wide ...

With the rapid development of new energy battery field, the repeated charge and discharge capacity and electric energy storage of battery are the key directions of research. Therefore, the selection standards of electrode materials and electrolyte are continuously improved, ordinary battery materials can no longer meet the needs of development.

In the present work, a new class of high entropy materials for energy storage applications is introduced. Multi-anionic and -cationic compounds are prepared by facile mechanochemistry using a recently designed multi-cationic transition-metal-based high entropy oxide as the precursor and LiF or NaCl as the reactant, leading to formation of lithiated or ...

In addition, this paper sorted out the energy storage systems of new energy batteries, anode materials, cathode materials, safety issues, and applications. Finally, the application of nanomaterials in new energy batteries is discussed. It is found that nanomaterials can be divided into nanoparticles, nanosolids, and nano-assembly systems, but ...

"This new Al-ion battery design shows the potential for a long-lasting, cost-effective and high-safety energy storage system. The ability to recover and recycle key ...

(Yicai Global) March 16 -- Hunan Yuneng New Energy Battery Material, a Chinese supplier of the cathode materials used in lithium iron phosphate batteries, is linking arms with battery giant Contemporary Amperex ...

This special issue invites contributions in all areas of new energy materials from concepts and theoretical prediction through synthesis and characterisation to new ...

4 ???&#0183; Researchers compared the environmental impacts of lithium-ion battery recycling to mining for new materials and found that recycling significantly outperforms mining in terms of ...

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