



Overview

What is the world's first anode-free sodium solid-state battery?

UChicago Pritzker Molecular Engineering Prof. Y. Shirley Meng's Laboratory for Energy Storage and Conversion has created the world's first anode-free sodium solid-state battery. The team hopes the breakthrough brings the reality of inexpensive, fast-charging, high-capacity batteries for electric vehicles and grid storage closer than ever.

How does a sodium battery work?

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 battery is charging. While the battery is in use, the ions flow from the anode through an electrolyte to a cathode.

Could sodium be a viable alternative to lithium ion batteries?

"The thicker the cathode is, the theoretical energy density of the battery - the amount of energy being held within a specific area - improves," Oh said. The current research advances sodium as a viable alternative for batteries, a vital step to combat the rarity and environmental damage of lithium. It's one of many steps ahead.

Can sodium solid-state batteries work better than lithium?

"Sodium solid-state batteries are usually seen as a far-off-in-the-future technology, but we hope that this paper can invigorate more push into the sodium area by demonstrating that it can indeed work well, even better than the lithium version in some cases," Deysher said. The ultimate goal?



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