

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.

Are lithium-ion batteries a viable energy storage solution?

Lithium-ion batteries (LIBs) have become one of the main energy storage solutions in modern society. The application fields and market share of LIBs have increased rapidly and continue to show a steady rising trend. The research on LIB materials has scored tremendous achievements.

Is  $\text{PTCLi}_4$  a viable anode material for lithium batteries?

The first one is 3,4,9,10-perylene-tetracarboxylic-dianhydride ( $\text{PTCLi}_4$ , material 21), which was proposed for the first time as anode material for lithium batteries by Iordache et al.,<sup>128</sup> demonstrating great stability upon cycling, and viable batteries with only 0.5% of multiwalled carbon nanotubes as conductive additive were assembled.

What is a lithium based battery?

'Lithium-based batteries' refers to Li ion and lithium metal batteries. The former employ graphite as the negative electrode 1, while the latter use lithium metal and potentially could double the cell energy of state-of-the-art Li ion batteries 2.

What are lithium-sufficient organic materials?

Lithium-sufficient organic materials can simplify the battery production process and eliminate the need for a lithium-metal anode; such batteries are easier to manufacture and handle.

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.

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