

Batteries getting solid

What is the ionic conductivity of a solid-state lithium battery?

Materials with high ionic conductivity are urgently needed for the development of solid-state lithium batteries. Now, an inorganic solid electrolyte is shown to have an exceptionally high ionic conductivity of 25 mS cm^{-1} , which allows a solid-state battery to deliver 70% of its maximum capacity in just one minute at room temperature.

How are solid-state batteries made?

Solid-state batteries can then be made by simply laminating these bipolar electrodes together. The advantages of this process are the controlled thickness of the layers and its scalability. The wet coating process has already been employed to fabricate solid polymer batteries that are used in Bluecar electric vehicles 7,8.

Are solid-state batteries better than Li-ion batteries?

Solid-state batteries (SSBs) have important potential advantages over traditional Li-ion batteries used in everyday phones and electric vehicles. Among these potential advantages is higher energy density and faster charging.

Are all-solid-state batteries safe?

All-solid-state batteries (all-SSBs) have emerged in the last decade as an alternative battery strategy, with higher safety and energy density expected. The substitution of flammable liquid electrolytes (LEs) with solid electrolytes (SEs) promises improved safety.

What is a solid-state Li metal battery?

Solid-state Li metal batteries that utilize a Li metal anode and a layered oxide or conversion cathode have the potential to almost double the specific energy of today's state-of-the-art Li-ion batteries, which use a liquid electrolyte.

Are solid-state batteries with lithium metal anodes a good idea?

No eLetters have been published for this article yet. Science Solid-state batteries with lithium metal anodes have the potential for higher energy density, longer lifetime, wider operating temperature, and increased safety. Although the bulk of the research h...

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Claims of higher energy density, much faster recharging, and better safety are why solid-state-battery technology appears to be the next big thing for EV batteries.

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As solid electrolytes are often not compatible with the cathode and anode materials used in batteries, the researchers fabricated two types of solid-state cells -- one with ...

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By using lithium thioborophosphate iodide glass-phase solid electrolytes in all-solid-state lithium-sulfur batteries, fast solid-solid sulfur redox reaction is demonstrated, ...

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As a next-generation lithium battery technology, all-solid-state lithium batteries hold significant potential for application due to their superior safety, energy density, cycling, ...

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Abstract Lithium dendrite penetration has caused internal short-circuits that have limited the life of lithium metal all-solid-state batteries. Defects and pores in dry compacted ...

The development of all-solid-state batteries requires fast lithium conductors. Here, the authors report a lithium compound, $\text{Li}_{9.54}\text{Si}_{1.74}\text{P}_{1.44}\text{S}_{11.7}\text{Cl}_{0.3}$, with an exceptionally high conductivity and ...

Batteries: Getting solid Yong-Sheng Hu (yshu@aphy.iphy.ac.cn) Additional contact information Nature Energy, 2016, vol. 1, issue 4, 1-2 Abstract: Materials with high ionic conductivity are ...

Abstract Lithium dendrite penetration has caused internal short-circuits that have limited the life of lithium metal all-solid-state batteries. Defects and pores in dry compacted solid electrolytes promote dendrite growth.

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What makes a solid-state battery different from a "regular" battery, such as the alkaline batteries in a flashlight, or the lead-acid batteries in our cars?

Solid-state batteries are a promising beyond-lithium-ion technology, but their development largely hinges on the availability of solid electrolytes with high ionic conductivity. Kato et al. now ...

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