



# High-performance solid-state battery technology

LLZO is extremely brittle, and at the high temperatures involved in manufacturing, a large sheet that's thin enough to use in a high-performance solid-state battery is likely to crack or warp. To determine the impact of such failures on cost, they modeled four key processing steps in assembling LLZO-based batteries.

Halide solid-state electrolytes are considered top contenders for advancing all-solid-state battery technology, largely due to the unique chemical attributes of halogen anions []. Key advantages include the weaker coulombic ...

A team of scientists working for Bonn-based company High Performance Battery (HPB), led by Prof. Dr. G&#252;nther Hambitzer, has achieved a decisive breakthrough in battery and storage technology with the development ...

High Performance Solid-state Battery with Integrated Cathode and Electrolyte Feng JIN 1, 2, Jing LI 2, Chenji HU 2, 3, Houcai DONG 2, Peng CHEN 2, Yanbin SHEN 2, \*(), Liwei CHEN 2, 3, \*() 1 School of Nano Technology and Nano Bionics, University of P. R. China ...

The FeS 2, MoS 2, and NbS 2 with cathode weight of 2-5 mg based all-solid-state batteries were assembled by same process with that of the Cr 2 S 3 based all-solid-state ...

As a consequence, R& D efforts in next-generation battery technologies consider solid-state battery (SSB) cell concepts as one of the most promising alternatives to state-of-the-art LE LIB, promising higher energy densities and higher safety ...

Recent advances in all-solid-state batteries for commercialization Junghwan Sung ab, Junyoung Heo ab, Dong-Hee Kim a, Seongho Jo d, Yoon-Cheol Ha ab, Doohun Kim ab, Seongki Ahn \* c and Jun-Woo Park \* ab a Battery Research Division, Korea Electrotechnology Research Institute (KERI), 12, Jeongiui-gil, Seongsan-gu, Changwon-si, Gyeongsangnam-do ...

Solid-state lithium-sulfur batteries (SSLsBs) with high energy densities and high safety have been considered among the most promising energy storage devices to meet the demanding market requirements for electric vehicles.

As one of the more realistic advancements, the solid-state battery (SSB) recently emerged as a potential follow-up technology with higher energy and power densities ...

There are several advantages of using SEs: (1) high modulus to enable high-capacity electrodes (e.g., Li anode); (2) improved thermal stability to mitigate combustion or ...



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As an automaker, we are developing all-solid-state battery technology with an eye toward mass-production, which will enable us to install them to our vehicles and offer high-performance EVs to our customers at affordable prices.

The solid state battery A new basic technology. Safe, twice as green and almost infinite. Photovoltaics could become the world's most important energy source in the coming decades - ahead of all other renewable and fossil energy sources.

Promising preliminary room temperature cycle life results using Lithium metal anode, NMC cathode and proprietary solid-state electrolyte. Highlights the ability of the technology to meet passenger automotive applications, which target 800 ...

Recent advances in all-solid-state battery (ASSB) research have significantly addressed key obstacles hindering their widespread adoption in electric vehicles (EVs). This review highlights major innovations, including ...

All-fiber-based quasi-solid-state lithium-ion battery towards wearable electronic devices with outstanding flexibility and self-healing ability. Nano Energy 51, 425-433 (2018 ...

Solid-state batteries are regarded as a revolutionary advancement over conventional lithium-ion battery technology. Production technology, supply chains, and industrialization still present obstacles. The details. The Long Road to ...

Batteries are essential in modern society as they can power a wide range of devices, from small household appliances to large-scale energy storage systems. Safety concerns with traditional lithium-ion batteries prompted the emergence of new battery technologies, among them solid-state batteries (SSBs), offering enhanced safety, energy density, and lifespan. This ...

The anode of a lithium-ion battery significantly affects its energy density and rate performance [16]. Research on negative electrode materials, particularly those with high capacity, is ongoing. Among the various alloy anode materials, Si-based anodes have attracted ...

To date, there are no uniform standards for research into solid-state batteries, which are also to be used in e-mobility in the long term--even though billions are being invested in this area worldwide. Researchers at the University of Bayreuth have identified the reasons for this and report on them in the journal Nature Energy.

We use this minimalistic system to benchmark the performance of all-solid-state batteries. In a Ragone-type graph, we compare literature data for thiophosphate-, oxide-, ...

Gel polymer electrolytes (GPEs) hold tremendous potential for advancing high-energy-density and safe



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rechargeable solid-state batteries, making them a transformative technology for advancing electric vehicles. GPEs offer high ionic conductivity and mechanical stability, enabling their use in quasi-solid-state batteries that combine solid-state interfaces with ...

Researchers at the School of Engineering of the Hong Kong University of Science and Technology (HKUST) have recently developed a new generation of solid-state electrolytes (SSEs) for lithium-metal batteries (LMBs), ...

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 ...

all-solid-state battery delivered a high discharge capacity of about 1144.6 mAh g<sup>-1</sup> at 167.5 ... A high performance all solid state lithium sulfur battery with lithium thiophosphate solid ...

The performance version next-generation battery is being developed with Prime Planet Energy & Solutions Corporation, while the popularization and high-performance versions of the next-generation batteries and all-solid-state battery for BEVs are being developed

From the perspective of future development trend, energy issues will always accompany with the human development process. The development of new batteries that are friendly to the environment has become a global trend. Safe solid-state electrolytes with high ionic conductivity, excellent electrochemical property, high mechanical/thermal stability, and good ...

A research team has successfully enhanced the performance and durability of all-solid-state batteries. This breakthrough was made possible through the implementation of a novel approach known as bottom ...

identify research targets towards high energy, high power and practical all-solid-state batteries. ... a general evaluation of all-solid-state battery performance is often difficult to derive from ...

This review summarizes the foremost challenges in line with the type of solid electrolyte, provides a comprehensive overview of the advance developments in optimizing the ...

The Horizon 2020 SOLiDIFY consortium has successfully developed a high-performance lithium-metal solid-state battery with 20% higher energy density than current lithium-ion batteries. The innovative prototype battery, manufactured in a state-of-the-art facility at EnergyVille, Belgium, features a unique "liquid-to-solid" processed electrolyte, jointly developed ...

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technology**

**solid-state**

**battery**