Low density solid state battery

Low density solid state battery

Therefore, the introduction of the density of solid-state electrolyte in the battery design principles is very critical, as the density is a more accurately measurable parameter and the area of SSE is a defined value. The low-density, low-thickness, and low-mass SSEs are one of the key routes to reduce the battery mass.

Sulfur utilization in high-mass-loading positive electrodes is crucial for developing practical all-solid-state lithium-sulfur batteries. Here, authors propose a low-density inorganic...

This unprecedented battery configuration demonstrates high-rate (2C) performance and long cycle life (over 300 cycles), which exceeds preciously-reported sulfide SE/lithium batteries at low stack pressures, and may open up a promising route for high-energy-density, cost-effective and safe rechargeable lithium batteries.

All-solid-state batteries have been recognized as a promising technology to address the energy density limits and safety issues of conventional Li-ion batteries that employ organic liquid electrolytes.

Here, we present all-solid-state batteries reduced to the bare minimum of compounds, containing only a lithium metal anode, v-Li 3 PS 4 solid electrolyte and Li (Ni 0.6 Co 0.2 Mn 0.2)O 2...

This unprecedented battery configuration demonstrates high-rate (2C) ...

,?,,?????????,,,?...

Thank you for visiting nature . You are using a browser version with limited support for CSS. To obtain the best experience, we recommend you use a more up to date browser (or turn off compatibility mode in Internet Explorer). In the meantime, to ensure continued support, we are displaying the site without styles and JavaScript.

a SEM, b STEM, and c SAED images of LPB powders. d XRD patterns, e Raman spectra, and f 31P MAS NMR of LPB. g 7Li MAS NMR of LPB, LPS, and LiBH4. A Beryllium air-sensitive sample holder for XRD measurement was employed with its background patterns presented in Supplementary Fig. 11.

a XRD patterns of S-C-LPS and S-C-LPB cathode powders. b SEM images of S-C-LPS and S-C-LPB cathode powders. c-f Ex-situ SEM and EDS mapping images of c pristine S-C-LPS cathode, d pristine S-C-LPB cathode, e lithiated S-C-LPS cathode, and f lithiated S-C-LPB cathode. g Schematic illustration of the influence of SE"s volumetric content on interparticle Li+ transport and formation of inactive bulky sulfur particles. h GITT and OCV curves of S-C-LPB and S-C-LPS cathodes at the third cycle. Current pulses of 50.25 mA g-1 for 30 mins were employed, followed by 4 h resting. i Overpotential profiles of S-C-LPB and S-C-LPS cathodes from the GITT measurement.

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

This work was supported by the Assistant Secretary for Energy Efficiency and Renewable Energy, Office of Vehicle Technologies of the US Department of Energy, through the Advanced Battery Materials Research (BMR) Program award no. DE-EE0008862. We would like to thank Dr. Christy George from the Department of Chemistry at the Pennsylvania State University for her help with the NMR measurement, Dr. Jennifer Gray for her help with the TEM measurement, and Dr. Ekaterina Bazilevskaya for her help with the density measurement using Helium Pycnometry.