

Nickel metal hydride (Ni-MH) batteries have demonstrated key technology advantages for applications in new-energy vehicles, while the main challenge derives from the insufficient cycle lives (about 500 cycles) of their negative electrode materials--hydrogen storage alloys. As a result, progress in their devel

A long-life aqueous iron-organic battery is assembled using Fe plate as the anode, and PANI as the cathode, in which the reversible iron plating/stripping and transmission of CF_3SO_3^- in PANI are combined. The battery exhibits a specific capacity of 105.8 mAh g⁻¹ at a current density of 0.05 A g⁻¹ and a stable cycle of over 5,000 cycles at a current density of ...

Dual effects from in-situ polymerized gel electrolyte and boric acid for ultra-long cycle-life Li metal batteries. ... Energy Storage Mater, 2018, 14: 222-229. ... Zhang W, et al. Protecting the Li-metal anode in a Li-O₂ battery by using boric acid as an SEI-forming additive. Adv Mater, 2018, 30: 1803270 ...

Such a polymer electrolyte based LiCoO₂ lithium metal battery delivered significant capacity retention (85% retention after 700 cycles) at 60 °C. A more thorough ...

The lithium-sulfur (Li-S) chemistry may promise ultrahigh theoretical energy density beyond the reach of the current lithium-ion chemistry and represent an attractive energy storage technology for electric vehicles (EVs). 1-5 There is a consensus between academia and industry that high specific energy and long cycle life are two key ...

All-solid-state Li batteries (ASSBs) employing inorganic solid electrolytes offer improved safety and are exciting candidates for next-generation energy storage. Herein, we ...

Therefore, the battery exhibited a high electrical energy efficiency, excellent rate performance, and a long cycle life of over 9000 cycles with 84.1% capacity retention at 1C.

Excitingly, when tested at -40 °C under 10 C, the battery can achieve an ultra-long cycle stability of 10,000 cycles with a capacity retention of ~ 99 %. ... Electrochemical energy storage technologies are of great importance for storage and conversion of ... Aqueous sodium ion hybrid batteries with ultra-long cycle life at -50 °C. Energy ...

Aqueous zinc-iodine batteries, featuring high energy density, safety, and cost-effectiveness, have been regarded as a promising energy storage system. Nevertheless, poor ...

Stationary energy storage systems that can operate for many cycles, at high power, with high round-trip

energy efficiency, and at low cost are required. ... The ultra-long cycle life of CuHCF is ...

High-Areal-Capacity and Long-Cycle-Life All-Solid-State Lithium-Metal Battery by Mixed-Conduction Interface Layer. Ming Yang, Ming Yang. Tianmu Lake Institute of Advanced Energy Storage Technologies, Liyang, Jiangsu, 213300 China ... ultra-high areal capacity (15 mAh cm⁻², corresponding to LZO@LCO mass loadings of 111.11 mg cm⁻²), and ...

By coupling with MnO₂@graphite felt cathode, the MB//MnO₂ batteries deliver an energy density of 198 mWh cm⁻² and outstanding long cycle stability over 8000 cycles. Moreover, the batteries exhibit an excellent electrochemical performance at a low temperature of -20 °C with a capacity of 220 mAh cm⁻² at 0.4 mA cm⁻² and a ...

Fortunately, the redox flow battery that possesses the advantages including decoupled energy and power, high efficiency, good reliability, high design flexibility, fast response, and long cycle life, is regarded as a more practical candidate for ...

Zinc-ion batteries (ZIBs) are viewed as a promising energy storage system for large-scale applications thanks to the low cost and wide accessibility of Zn-based materials, ...

The development of large-scale energy storage systems (ESSs) aimed at application in renewable electricity sources and in smart grids is expected to address energy shortage and environmental issues. ... Herein, recent progress in long-cycle-life and low-cost cathodes for SIBs is focused on, and a comprehensive discussion of the key points in ...

Xcel Energy from Japan, in the year 2010 has announced that it would test a wind farm energy storage battery based on twenty 50 ... Qiang et al. [67] presented work on ultra-long cycle life, low-cost room temperature Na-S batteries enabled by highly doped (N,S) nanoporous carbons.

The potential application of clays in achieving ultra-long cycle stability and outstanding kinetics of the CeO₂ electrode material was demonstrated, proving the practicality of our envisaged doping clays, which provides a potential basis for further research on the application of CeO₂ in electrochemical energy storage.

The lithium-sulfur (Li-S) chemistry may promise ultrahigh theoretical energy density beyond the reach of the current lithium-ion chemistry and represent an attractive energy storage technology for electric vehicles ...

Symmetric Na-ion cells using the NASICON-structured electrodes could simplify the manufacturing process, reduce the cost, facilitate the recycling post-process, and thus attractive in the field of large-scale stationary ...

2D amorphous V₂O₅/graphene heterostructures with highly stable layer-by-layer stacked structure are demonstrated for high-safe, rechargeable aqueous zinc ion batteries, delivering record specific capacity of 447

mAh/g and unprecedented ultra-long cycle life to 20,000 cycles, exceptional flexibility and integration..
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The cells fabricated with the N,S-HPC/S cathodes exhibit ultra-long cycle life over 10,000 cycles with less than 20% decay in capacity (only 3% after 8000 cycles) at a high current density (4.6 A/g) in these coin cells. Larger battery cells are required to determine if this very long cycle life for these N,S-HPC/S cathodes is scalable.

Sodium-ion batteries (SIBs) are highly anticipated energy storage devices due to the low-cost, widely available resources, and similar electrochemical performances with lithium-ion batteries. ... A self-healing Sn anode with an ultra-long cycle life for sodium-ion batteries. J. Mater. Chem. A, 6 ... A high-energy-density sodium-ion full battery ...

An anticorrosive zinc metal anode with ultra-long cycle life over one year ... Energy Environ. Sci., 2022, 15, 1638-1646 Permissions. Request permissions An anticorrosive zinc metal anode with ultra-long cycle life over one year P. Xiao, H. Li, J. Fu, C. Zeng, Y. Zhao, T. Zhai and H. Li, ...

High-areal-capacity and long-cycle-life all-solid-state battery enabled by freeze drying technology ... a Tianmu Lake Institute of Advanced Energy Storage Technologies, Liyang 213300, Jiangsu, ... including an ultra-long life of 30 000 cycles with >70% capacity retention at a superior current rate/density ...

The Co-HITP possesses a stable single-crystal structure, expanded spacing layers, abundant sites, and good conductivity, and exhibits superior properties with ultra-long cycling stability (ultralow decay rate 0.001% per cycle after 15 000 cycles at 8 A g⁻¹), high reversible capacity (450.1 mA h g⁻¹ at 0.2 A g⁻¹), and excellent rate ...

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