

Mn-based materials for aqueous energy storage are reaching the capacity ceiling due to the limited Mn<sup>4+</sup>/Mn<sup>3+</sup> redox. The disproportionation of Mn<sup>3+</sup> often occurs, forming soluble Mn<sup>2+</sup> and thus leading to severe capacity decays. Here, an amorphous manganese phosphate material [AMP, Na<sub>1.8</sub>Mn<sub>4</sub>O<sub>1.4</sub>(PO<sub>4</sub>)<sub>3</sub>] is fabricated using an electrochemical method for the first ...

Over the last decade, there has been significant effort dedicated to both fundamental research and practical applications of biomass-derived materials, including electrocatalytic ...

Sodium-ion batteries (SIBs) are required to possess long cycle life when used for large-scale energy storage. The polyanionic Na<sub>4</sub>MnV(PO<sub>4</sub>)<sub>3</sub> (NMVP) reveals good cyclic stability due to its unique three-dimensional (3D) frame structure, but it still faces the challenge of interfacial degradation in practical applications. In this work, NASICON-type ...

With the ever-increasing adaption of large-scale energy storage systems and electric devices, the energy storage capability of batteries and supercapacitors has faced increased demand and challenges. The electrodes of these devices have experienced radical change with the introduction of nano-scale materials.

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Cold storage technologies using clathrate hydrates as working media have recently attracted more attention in the energy storage field because they undergo phase transitions with large latent ...

These advancements have significantly boosted the performance of energy storage devices. DNA biotemplates not only enhance supercapacitor capacitance and increase Li-S ...

Shiwei Xia received the Ph.D. degree in power systems from The Hong Kong Polytechnic University, Hung Hom, Hong Kong, in 2014. Then, he worked as a Research Associate and subsequently as a ...

This review investigates the energy storage performances of linear dielectric, relaxor ferroelectric, and antiferroelectric from the viewpoint of chemical modification, macro/microstructural design, and electrical property ...

Recently, the application of metal-organic frameworks (MOFs) in thermal energy storage has attracted increasing research interests. MOF-ammonia working pairs have been proposed for controlling/sensing the air quality, while no work has yet been reported on the immense potential of MOFs for thermal e ...

With excellent thermal energy storage capacity, good shape-stability and superior heat transfer ability, the prepared composite PCMs show considerable potential in solar-thermal applications and sustainable development. ... Ling Xia: Supervision, Writing - review & editing. Shaoxian Song: Resources, Supervision, Writing - review & editing ...

The vanadium flow battery (VFB) as one kind of energy storage technique that has enormous impact on the stabilization and smooth output of renewable energy. Key materials like membranes, electrode, and electrolytes will finally determine the performance of VFBs. In this Perspective, we report on the current understanding of VFBs from materials to stacks, ...

Dielectric polymers are widely used in electrostatic energy storage but suffer from low energy density and efficiency at elevated temperatures. Here, the authors show that all ...

Hollow carbon spheres have garnered great interest owing to their high surface area, large surface-to-volume ratio and reduced transmission lengths. Herein, we overview hollow carbon sphere-based materials and their noble metal-free hybrids in catalysis. Firstly, we summarize the key fabrication techniques for various kinds of hollow carbon spheres, with a ...

Energy Storage Materials. Volume 42, November 2021, Pages 209-218. ... F. Xia and Y. Zhao proposed and designed the research. F. Xia and D. Tie carried out materials synthesis and electrochemical characterization. ... H. Song and J. Wu conducted the TEM and CSTEM characterizations, W. Wen and X. Ye carried out the in-situ XRD characterizations ...

Xinran Xia's 7 research works with 38 citations and 339 reads, including: Energy assessment and thermodynamic evolution of a novel semi-clathrate hydrate cold storage system with internally ...

The large energy barrier for lithium-ion transport across polymer-ceramic interface limits the significant improvement of the ionic conductivity of composite solid-state ...

The thermal conductivity measurement of metal-organic frameworks (MOFs), which plays an important role in thermal management of MOF-based gas separation, storage, and thermal energy conversion (e ...

This review investigates the energy storage performances of linear dielectric, relaxor ferroelectric, and antiferroelectric from the viewpoint of chemical modification, macro/microstructural design, and electrical property optimization. ... Wang Y, Song Y, Xia Y. Electrochemical capacitors: Mechanism, materials, systems, characterization and ...

Dielectric polymers are widely used in electrostatic energy storage but suffer from low energy density and efficiency at elevated temperatures. Here, the authors show that all-organic ...

Herein, we report a convenient approach to instantly initiate the chemical polymerization of pyrrole-based

substances by the electrolyte during battery assembly process for ultrafast in-situ production of p-conjugated redox-active polymer material, which can serve as high-performance cathode materials for RMBs (Fig. 1 a). To demonstrate this proof-of ...

It is of great scientific and practical significance to develop high-rate and LT batteries to meet the demand of energy storage/release under extreme ... G. Pan, Q. Xiong, X. Wang, X. Xia, J. Tu. Boosting fast energy storage by synergistic engineering of carbon and deficiency ... Z. Song, H. Zhan. A metal-free battery working at -80°C. Energy ...

Herein, we report a low-temperature sulfurization method to synthesize sulfur-doped MnO<sub>2</sub> (S-MnO<sub>2</sub>) nanosheets as a robust cathode for RAZIBs, which features high capacity, high-rate performance and a long lifespan. The S-MnO<sub>2</sub> cathode delivers a maximum specific capacity of 324 mAh g<sup>-1</sup> at a current density of 200 mA g<sup>-1</sup> and a stable reversible ...

The thermal energy storage density (reaching over 1200 kJ kg<sup>-1</sup>) and coefficient of performance of MIL-101(Cr)-based system are both higher than ZIF-8(Zn)-based one due to larger average isosteric enthalpy and cycle sorption capacity. This experimental work paves the way for developing the high efficient and stable thermal energy storage ...

High-energy-density CF<sub>x</sub>/Li batteries have attracted wide applications, but encountered poor environmental adaptability at high/low temperatures. Guided with unique electrolyte-involved reaction mechanism, propylene carbonate (PC)/methyl butyrate (MB) co-solvent formulation was optimized to tune the desolvation barrier and stability for wide ...

Abstract Zinc-air batteries deliver great potential as emerging energy storage systems but suffer from sluggish kinetics of the cathode oxygen redox reactions that render ...

For its high specific capacity of 3860 mAh g<sup>-1</sup> and low redox potential of -3.04 V (vs. SHE), lithium (Li) metal has been regarded as one of the most promising anode materials for the next-generation batteries. However, the limited Li utilization and the detrimental dendrite growth severely impede the practical application of Li metal batteries.

Energy Storage Materials. Volume 48, June 2022, Pages 375-383. Topology crafting of polyvinylidene difluoride electrolyte creates ultra-long cycling high-voltage lithium metal solid-state batteries. ... Heyi Xia: Investigation, Validation. Xin Song: Software, Resources. Wei Lv: Resources, Writing - review & editing.

@article{Wang2023GuestMO, title={Guest molecule optimum aggregation hypothesis and optimal concentrations for energy storage from the perspective of hydrate phase change-induced liquid layer}, author={Fan Wang and Yuan Lv and Xinran Xia and Lizhong Yang and Dawei Guan and Chuanxiao Cheng and Wenfeng Hu and Lunxiang Zhang and ...

Metal-organic frameworks (MOFs) have received a lot of attention because of their diverse structures, tunable properties and multiple applications such as gas storage, catalysis and magnetism. Recently, there has been a rapidly growing interest in developing MOF-based materials for electrochemical energy storage. In 2015, the most accessed Energy & ...

The rapid developments of the Internet of Things (IoT) and portable electronic devices have created a growing demand for flexible electrochemical energy storage (EES) devices. Nevertheless, these flexible devices suffer from poor flexibility, low energy density, and poor dynamic stability of power output during deformation, limiting their ...

Zinc-air batteries deliver great potential as emerging energy storage systems but suffer from sluggish kinetics of the cathode oxygen redox reactions that render unsatisfactory cycling lifespan. The exploration on bifunctional electrocatalysts for oxygen reduction and evolution constitutes a key solution, where rational design strategies to ...

@article{Lv2022ClathrateHF, title={Clathrate hydrate for phase change cold storage: Simulation advances and potential applications}, author={Yuanshan Lv and Xinran Xia and Fan Wang and Xiaodong Wu and Chuanxiao Cheng and Lunxiang Zhang and Lei Yang and Jiafei Zhao and Yongchen Song}, journal={Journal of Energy Storage}, year={2022}, url={https ...

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