Lu yingying lithium battery energy storage

Can transition metal oxides improve the energy density of lithium ion batteries?
Transition metal oxides have been considered as one of the most promising alternative anode materials for high performance lithium ion batteries. Here, we fabricated porous Co3O4 nanofibers by electrospinning, and used as the anode material to improve the energy density of lithium-ion batteries (LIBs).

Are zinc metal anode-based batteries a good substitute for lithium-ion batteries?
Zinc metal anode-based batteries (ZMBs) are regarded as promising substitutesfor lithium-ion batteries (LIBs) in large-scale energy storage devices and wearable electronics due to their merits of intrinsic safety,cost-effectiveness and abundant reserves.

What are lithium-sulfur (Li-S) batteries?
Lithium-sulfur (Li-S) batteries are one of the most promising battery technologies to support the fast-expanding electrical vehicle and large-scale energy storage market. Reducing the electrolyte amount is critical for the high specific energy of Li-S batteries in practice.

Can polymer electrolytes be used for reliable lithium metal batteries?
[...] [...] The advancement of polymer electrolytes (PEs) for reliable lithium metal batteries (LMBs) is highly desired but is limited by the lack of polymers that have satisfied stability for lithium metal anodes and high-voltage cathodes.

Is lithium metal a good anode for high-energy lithium-based batteries?
Lithium metal is considered as one of the most promising anode candidatesfor high-energy lithium-based batteries. However,batteries using lithium metal encounters many issues,such as forming lithium dendrites and huge volume fluctuation.

Is artificial electrode/electrolyte interface useful for high-energy lithium metal batteries?
Low cycling reversibility and safety concerns are hindering the practical application of high-energy lithium metal batteries. Rational design an artificial electrode/electrolyte interface is regarded as an effective way to circumvent the above problems.

As a promising choice of next-generation energy storage system, high-energy lithium metal batteries (LMBs) are facing degradation and safety problems mainly caused by undesired side ...

Unfortunately, as its energy density increases, a battery system become unstable, and potential safety issues such as fire hazard and thermal runaway seriously hinder the practical application of batteries [[7], [8], [9]].The severe side reaction between active lithium metal and electrolyte forms an uneven, unstable solid electrolyte interface (SEI), which in turn induces ...

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?, 20106,;20146(Cornell University); ...

As a promising choice of next-generation energy storage system, high-energy lithium metal batteries (LMBs) are facing degradation and safety problems mainly caused by undesired side...

Due to the use of graphite with a smaller capacity as the negative electrode material, the specific energy of lithium ion batteries has approached the theoretical limit, and there is an urgent need to develop more efficient electrode materials to meet the growing demand of the energy storage market. Lithium metal anode has smaller density ...

Jiale Mao, Jiazhi Miao, Yingying Lu, Zheming Tong. Machine learning of materials design and state prediction for lithium ion batteries[J]. , 2021, 37(9): 1-11. Jiale Mao, Jiazhi Miao, Yingying Lu, Zheming Tong. Machine learning of materials

Sodium metal batteries (SMBs) with potentially high theoretical capacity are considered as one of the most promising candidates for high energy density batteries. However, the safety problems caused by sodium dendrite seriously hinder the practical application of SMBs. Composite gel polymer electrolytes (CGPE) composed of inorganic ionic conductors and ...

Yingying Lu has been dedicated to energy-related fundamentals and safety problems in batteries for years. By revealing the underlying mechanisms of the formation of lithium dendrite, she found new ways to undermine or even ...

Ionic liquid-tethered hybrid materials and their applications in secondary batteries, including high energy lithium ion batteries, lithium metal batteries, sodium O2/CO2 and so forth....

A reliable and safe energy storage system utilizing lithium-ion batteries relies on the early prediction of remaining useful life (RUL). Despite this, accurate capacity prediction can be challenging if little historical capacity data is available due to the capacity regeneration and the complexity of capacity degradation over multiple time scales.

Lithium cobalt oxide (LiCoO 2, LCO) dominates in 3C (computer, communication, and consumer) electronics-based batteries with the merits of extraordinary volumetric and gravimetric energy density, high-voltage plateau, and facile synthesis.Currently, the demand for lightweight and longer standby smart portable electronic products drives the development of ...

Energy Storage Materials. Volume 26, April 2020, Pages 73-82. High energy density lithium metal batteries enabled by a porous graphene/MgF 2 framework. Author links open overlay panel Qingshuai Xu a c 1, ... Qingshuai Xu, Yongcai Qiu, and Yingying Lu conceived and designed the research. Qingshuai Xu synthesized materials and conducted all the ...

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Zinc metal anode-based batteries (ZMBs) are regarded as promising substitutes for lithium-ion batteries (LIBs) in large-scale energy storage devices and wearable electronics due to their...

With the increasing demand for high energy and power energy storage devices, lithium metal batteries have received widespread attention. Li metal has long been regarded as an ideal candidate for negative electrode due to its high theoretical specific capacity (3860 mAh g -1) and low redox potential (-3.04 V vs. standard hydrogen electrode ...

With the increasing demand and development of energy storage technology [1], LMBs which utilize the so-called "Holy Grail" anode [2] (lithium metal) have always been a worthwhile goal as high-energy-density batteries.However, due to high reactivity of lithium metal and volume change during cycling result from the formation of heterogeneous growing lithium ...

LU Yingying: At present, we can raise the mileage on one charge of electric cars with lithium batteries in two ways. One is to add battery packs, like the 18650 and 21700 Li-ion ...

Lithium-ion batteries (LIBs) are broadly used in cleaner productions as they can storage and utilize clean energy (Zhang et al., 2019a). Due to high mobility and good electrochemical property (Zhang et al., 2017; Tong et al., 2021a), LIBs are utilized in various types of energy storage devices such as electric vehicles, portable electronic devices, and even ...

Read the latest articles of Energy Storage Materials at ScienceDirect , Elsevier"s leading platform of peer-reviewed scholarly literature ... Modeling of contact stress among compound particles in high energy lithium-ion battery. Xiang Gao, Peng He, Jianguo Ren, Jun Xu. Pages 23-33 View PDF. ... Siyuan Li, Lei Fan, Yingying Lu. Pages 205 ...

As a promising choice of next-generation energy storage system, high-energy lithium metal batteries (LMBs) are facing degradation and safety problems mainly caused by undesired side reactions and growth of lithium dendrite. Thus, electrode design, modification of electrode interphase and electrolyte have therefore become key issues for future LMBs.

Sodium metal anode has great potential in high energy density battery system due to its high specific capacity (1166 ... Y. Wei, Q. Yu, W. Lv, Y. Yu, B. Li, Q.H. Yang, Y. Yang, J. Lu, F. Kang. Cross-linked beta alumina nanowires with compact gel polymer electrolyte coating for ultra-stable sodium metal battery ... Energy Storage Mater., 26 ...

The growing energy demand is pursuing the alternatives of traditional lithium-ion batteries (LIBs) [1]. Lithium metal has been recently revitalized great interest as the ultimate anode due to its remarkable specific capacity (3860 vs. 372 mAh g -1 for graphite) and lowest redox potential (-3.04 V vs. standard hydrogen

electrode) [2]. Pairing with the high-voltage ...

Author links open overlay panel Jiale Mao 1, Jiazhi Miao 2, Yingying Lu 1 ... All solid state lithium ion batteries (ASSLBs) are considered to be the next generation of energy storage devices with advantages such as high safety and high energy density, and are currently a popular research direction in the field of LIBs [20], [21], [22 ...

Zhang Shichao, ; Shen Zeyu, ; Lu Yingying, ; College of Chemical and Biological Engineering, Zhejiang University, Hangzhou 310027, China. Corresponding author: Lu Yingying, yingyinglu@zju .cn Received Date: 22 August 2020 Revised Date: 15 September 2020 Accepted Date: 16 September 2020 Available Online: 21 September 2020 Fund Project: the ...

Lithium ion batteries have been widely used in the fields of portable energy storage devices and electric vehicles due to their high energy density and high safety, and have a profound impact ...

From aqueous liquid electrolytes for lithium-air cells to ionic liquid electrolytes that permit continuous, high-rate cycling of secondary batteries comprising metallic lithium anodes, ...

Lithium-based batteries have had a profound impact on modern society through their extensive use in portable electronic devices, electric vehicles, and energy storage systems.

Lithium-sulfur (Li-S) batteries are one of the most promising battery technologies to support the fast-expanding electrical vehicle and large-scale energy storage market.

Lithium-sulfur (Li-S) batteries are attractive candidates for next generation energy storage devices due to their high theoretical energy density of up to 2600 Wh kg-1.

,?.??,NCM,(EC)?(DEC) ...

Yingying Lu. State Key Laboratory of Chemical Engineering, Institute of Pharmaceutical Engineering, College of Chemical and Biological Engineering, Zhejiang University, Hangzhou, 310027 China ... 1.1 Lithium (Li)-Based Batteries. Energy is a crucial topic in modern societies for creating a sustainable environment. Developing energy storage ...

@article{osti_1370439, author = {Tu, Zhengyuan and Nath, Pooja and Lu, Yingying and Tikekar, Mukul D. and Archer, Lynden A.}, title = {Nanostructured Electrolytes for Stable Lithium Electrodeposition in Secondary Batteries}, annote = {Secondary batteries based on lithium are the most significant energy storage technology for contemporary portable devices.

The omnipresent lithium ion battery is reminiscent of the old scientific concept of rocking chair battery as its

most popular example. Rocking chair batteries have been intensively studied as prominent electrochemical energy storage devices, where charge carriers "rock" back and forth between the positive and negative electrodes during charge and discharge ...

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