

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 Co_3O_4 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 substitutes for 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 candidates for 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.

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 ...

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} .

LiCoO₂ (LCO), because of its easy synthesis and high theoretical specific capacity, has been widely applied as the cathode materials in lithium-ion ba...

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 ...

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 ...

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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 ...

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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.

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

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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 ...

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 ...

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 ...

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 ...

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 ...

The growing electric vehicle market and the expanding electrochemical energy storage industry are in pursuit of advanced battery technologies with high-energy, high-safety and non-scarcity ...

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.

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...

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....

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.

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...

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Rechargeable lithium, sodium and aluminium metal-based batteries are among the most versatile platforms for high-energy, cost-effective electrochemical energy storage. Non-uniform metal deposition ...

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.

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 ...

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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 ...

@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.

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 ...

Energy Storage Materials. Volume 26, April 2020, Pages 73-82. High energy density lithium metal batteries enabled by a porous graphene/MgF₂ 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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