Mos2 lithium ion battery

An ordered hollow MoS2 nanocages/RGO nanocomposite is constructed by a simple solvothermal-assisted assembly method combined with freeze-drying and annealing. In this novel nanostructure, hollow MoS2 nanocages are homogeneously distributed on graphene sheets with a tight bond of C-O-Mo. The nanosized and hollow MoS2 nanocages can ...

Sen, U. K. & Mitra, S. High-rate and high-energy-density lithium-ion battery anode containing 2d MoS2 nanowall and cellulose binder. ACS Appl. Mater. Interfaces 5, 1240-1247 (2013).

Bulky molybdenum disulfide (MoS 2) has rarely been considered as a promising anode for lithium-ion battery due to the high volume strain and structural collapse caused by ...

As a typical transition metal dichalcogenide, MoS2 offers numerous advantages for nanoelectronics and electrochemical energy storage due to its unique layered structure and tunable electronic properties. When used as the anode in lithium-ion cells, MoS2 undergoes intercalation and conversion reactions in sequence upon lithiation, and the reversibility of the ...

MoS2 nanosheets with few layers (<=5 layers) anchored on 3D porous carbon nanosheet networks (3D FL-MoS2@PCNNs) as lithium-ion battery anode. During the synthesis, 3D self-assembly of cubic NaCl particles is ...

The capacity loading per unit area is of importance as specific capacity while evaluating the lithium-ion battery anode. However, the low conductivity of several advanced anode materials (such as molybdenum sulfide, MoS 2) prohibits the wide application of materials.Nanostructural engineering becomes a key to overcome the obstacles.

The theoretical studies have discovered that the incorporation of O atoms in MoS2 endows a highly stable linkage between S-Mo-S layers and improves the microstructural stability to ... MoS 2 nanosheets vertically grown on graphene sheets for lithium-ion battery anodes. ACS Nano, 10 (2016), pp. 8526-8535. Crossref View in Scopus Google Scholar ...

In this article, we report on the preparation of few-layered MoS2/graphene nanocomposite (MoS2/GNS-G) with enlarged interlayer distance as the lithium-ion battery anode via a facile hydrothermal method followed by glucose-assisted thermal annealing. During the synthesis, glucose serving as a small organic molecule can interlay into MoS2 nanosheets, ...

For electrochemical energy storage, dual-ion batteries (DIBs) demonstrate many advantages as rapidly achieved in recent years, such as high energy density, flexible chemical system design and increased safety under high voltage [1], [2], [3].These merits essentially origin from as the characteristic of DIBs cathode, which can store many anions, such as PF 6 - [4, ...

However, we showed that 1T-MoS2 can be stabilized at 600 °C for at least 2 h, and the 1T-MoS2-600 interlayer spacing expanded to 0.95 nm. The high crystallinity of the 1T phase is highly compatible with solid electrolytes ...

Currently, new nanomaterials for high-capacity lithium-ion batteries (LIBs) and sodium- ion batteries (SIBs) are urgently needed. Materials combining porous structure (such as representatives of metal-organic frameworks) and the ability to operate both with lithium and sodium (such as transition-metal dichalcogenides) are of particular interest. Our work reports ...

Layered guest carbon materials could induce interlayer engineering, especially in regulating the interlayer structure and electronic properties of the hosts, leading to high ...

Bulky MoS2 obtained from molybdenite is an inexpensive and naturally abundant product with high intrinsic Li storage capacity originating from the Li storage capabilities of its Mo atoms and active S element. How to release the intrinsic capacity of bulky MoS2 is of great interest but has not been explored t 2019 Journal of Materials Chemistry A HOT Papers

Electrochemically stable molybdenum disulfide (MoS2) with a two-dimensional nanowall structure is successfully prepared by a simple two-step synthesis method followed by thermal annealing at 700 °C in a reducing atmosphere. MoS2 nanowalls provide a better electrochemical performance and stability when cellulose (CMC) binder is used instead of the ...

MoS2/Graphene Hybrid Nanoflowers with Enhanced Electrochemical Performances as Anode for Lithium-Ion Batteries. Journal of Physical Chemistry C 119, 7959-7968 (2015). Article CAS Google Scholar

The increasing cost and limited availability of lithium have prompted the development of high-performance sodium-ion batteries (SIBs) as a potential alternative to lithium-ion batteries. However, it has been a critical challenge to develop high-performance anode materials capable of storing and transporting

This is the first targeted review of the synthesis - microstructure - electrochemical performance relations of MoS2 - based anodes and cathodes for secondary lithium ion batteries (LIBs). Molybdenum disulfide is a highly promising material for LIBs that compensates for its intermediate insertion voltage (~2 V vs. Li/Li+) with a high reversible capacity (up to 1290 mA h g-1) and an ...

Molybdenum disulfide (MoS2) is a promising anode material for lithium ion batteries (LIBs) due to its high theoretical capacity, but it is suffered from intrinsically poor electronic/ionic conductivity and vast volume expansion/contraction during repeated charge-discharge process. In the present work, we report a spherical C@MoS2 nanocomposite as a high-performance ...

In this report, we describe a facile method of synthesizing IF-MoS2 hollow structures with a diameter of ~100

nm by a facile solution-phase reduction process to obtain a 2015 Journal of Materials Chemistry A Hot Papers ... Bubble-template-assisted synthesis of hollow fullerene-like MoS 2 nanocages as a lithium ion battery anode material X ...

Advances in lithium ion batteries would facilitate technological developments in areas from electrical vehicles to mobile communications. While two-dimensional systems like MoS2 are promising electrode materials due to their potentially high capacity, their poor rate capability and low cycle stability are severe handicaps. Here, we study the electrical, ...

MoS2 is a highly promising anode material for lithium ion batteries. Here, aided by atomic force microscopy, the authors reveal the formation of an ultra-thin solid electrolyte interphase between ...

Molybdenum disulfide, an excellent two-dimensional building block, is a promising candidate for lithium-ion battery anode. However, the stacked and brittle two-dimensional ...

This is the first targeted review of the synthesis - microstructure - electrochemical performance relations of MoS2 - based anodes and cathodes for secondary lithium ion batteries (LIBs).

A three-dimensional (3D) flexible hybrid foam composed of graphene foam@carbon nanotubes decorated with MoS 2 nanoparticles is synthesized for flexible anode applications in lithium-ion battery. The inner layer of graphene foam (GF), serving as a 3D skeleton of the hybrid foam, enlarges the electrode/electrolyte contact, shortens the diffusion distance of Li + ions ...

Layered MoS 2 nanostructures are attractive candidates as high-capacity anodes for lithium-ion batteries (LIB). However, the low intrinsic electrical conductivity of MoS 2 limits ...

Currently, new nanomaterials for high-capacity lithium-ion batteries (LIBs) and sodium- ion batteries (SIBs) are urgently needed. Materials combining porous structure (such as representatives of metal-organic ...

Single-layered MoS 2 is a promising anode material for lithium-ion batteries (LIBs), sodium-ion batteries (SIBs), and potassium-ion batteries (PIBs) due to its high capacity and isotropic ion transport paths. However, the low intrinsic conductivity and easy-agglomerated feature hamper its applications. Here, a charge-driven interlayer expansion strategy that Co 2+ ...

Li-ion batteries function by Li intercalating into and through the layered electrode materials. Intercalation is a solid-state interaction resulting in the formation of new phases. The new ...

The layered structure of MoS2 resembles graphite, and its theoretical specific capacity is about twice higher than that of graphite (670 mAh g-1 against 372 mAh g-1) due to its higher interlayer spacing (~0.6 nm) for a Li-ion intercalation. In this work MoS2 nanopowder (MoS2-NP), prepared by self-propagating high-temperature synthesis (SHS), is ...

Mos2 lithium ion battery

MoS 2 is usually applied on anode of lithium-ion batteries (LIBs), which are one of the mostly used rechargeable batteries in our daily life. To overcome the above shortages of ...

MoS2 nanosheets with few layers (<=5 layers) anchored on 3D porous carbon nanosheet networks (3D FL-MoS2@PCNNs) as lithium-ion battery anode. During the synthesis, 3D self-assembly of cubic NaCl particles is adopted to not only serve as a template to direct the growth of 3D porous carbon nanosheet networks, but also create a 2D-confined space ...

Abstract. This is the first targeted review of the synthesis - microstructure - electrochemical performance relations of MoS 2 - based anodes and cathodes for secondary lithium ion batteries (LIBs). Molybdenum disulfide is a highly promising material for LIBs that compensates for its intermediate insertion voltage (~2 V vs. Li/Li +) with a high reversible capacity (up to 1290 mA ...

Molybdenum disulfide (MoS 2), an outstanding two-dimensional (2D) structural block, is considered as a hopeful candidate for the lithium-ion batteries (LIBs) anode.However, the stacked and breakable 2D layered structure restricts its rate and cycling performance. Herein, a novel architecture of spherical nanoflower MoS 2 /MoO 3 heterostructures is rationally ...