Nano-carbon composite battery negative electrode material

Current research appears to focus on negative electrodes for high-energy systems that will be discussed in this review with a particular focus on C, Si, and P. This new generation of batteries requires the optimization of Si, and black and red phosphorus in the case of Li-ion technology, and hard carbons, black and red phosphorus for Na-ion ...

We have developed a method which is adaptable and straightforward for the production of a negative electrode material based on Si/carbon nanotube (Si/CNTs) composite for Li-ion batteries. Comparatively inexpensive silica and magnesium powder were used in typical hydrothermal method along with carbon nanotubes for the production of silicon nanoparticles. ...

As the main body of lithium storage, negative electrode materials have become the key to improving the performance of lithium batteries. The high specific capacity and low lithium insertion potential of silicon materials make them the best choice to replace traditional graphite negative electrodes.

We propose and realize a new nano lead-doped mesoporous carbon composite as the negative electrode additives, which realize the abundant nano-lead electrodeposition into carbon pores and the remarkable suppression of irreversible sulfation, to effectively prolong the cycle life of lead-carbon batteries. We show that through NaOH activation and followed air ...

Silicon (Si) is a promising negative electrode material for lithium-ion batteries (LIBs), but the poor cycling stability hinders their practical application. Developing favorable Si nanomaterials is expected to improve their cyclability. Herein, a controllable and facile electrolysis route to prepare Si nanotubes (SNTs), Si nanowires (SNWs), and Si nanoparticles (SNPs) ...

Tin-based nanocomposite materials embedded in carbon frameworks can be used as effective negative electrode materials for lithium-ion batteries (LIBs), owing to their high theoretical capacities with stable cycle performance. In this work, a low-cost and productive facile hydrothermal method was employed for the preparation of a Sn/C ...

In this study, two-electrode batteries were prepared using Si/CNF/rGO and Si/rGO composite materials as negative electrode active materials for LIBs. To test the electrodes and...

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At present, silicon-carbon composite materials commonly use Si powder, silicon oxide, and other silicides as raw materials, and organic polymers such as polyvinyl alcohol as carbon sources. These raw materials are

processed by mechanical ball milling [73], high-temperature pyrolysis [74, 75], CVD [76], spray drying [77], and other methods to obtain ...

In this work, we show the benefit of a mixed composite electrode containing ionic and electronic conducting additives for a sodium-ion battery negative elec-trode. Hard carbon electrodes with 5% additive containing different proportions of ...

A new type of nano-sized cobalt oxide compounded with mesoporous carbon spheres (MCS) as negative electrode material for lithium-ion batteries was synthesized. The composite containing about 20 wt.% cobalt oxide exhibits a reversible capacity of 703 mAh/g at a constant current density of 70 mA/g between 0.01 and 3.0 V (vs. Li + /Li), and ...

Silicon-carbon materials have broad development prospects as negative electrode materials for lithium-ion batteries. In this paper, polyvinyl butyral (PVB)-based carbon-coated silicon (Si/C) composite materials were prepared using PVB-coated Si particles and then high-temperature carbonization methods. Furthermore, the PVB-based carbon-coated ...

In this work, we show the benefit of a mixed composite electrode containing ionic and electronic conducting additives for a sodium-ion battery negative electrode. Hard carbon...

h Comparison of Mg plated capability of the Mg@BP composite negative electrode with current Mg composite negative electrode 20,38,39,40,41,42 and Li composite negative electrode 11,39,43,44,45,46 ...

We propose and realize a new nano lead-doped mesoporous carbon ...

We report a new class of high-capacity chalcogen-carbon composite negative electrodes for Na rechargeable batteries, consisting of tellurium-infiltrated ordered mesoporous carbon CMK-3. Its unparalleled electric conductivity makes Te a promising electrode material with high-capacity utilization.

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