Battery with silicon carbon as negative electrode material

Is silicon a good negative electrode material for lithium ion batteries?
Silicon (Si) is a promising negative electrode materialfor lithium-ion batteries (LIBs),but the poor cycling stability hinders their practical application. Developing favorable Si nanomaterials i...

Can silicon-carbon materials be negative electrode materials for lithium-ion batteries?
Provided by the Springer Nature SharedIt content-sharing initiative Silicon-carbon materials have broad development prospectsas negative electrode materials for lithium-ion batteries. In this paper,polyvinyl butyral (PVB)

Can a negative electrode material be used for Li-ion batteries?
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.

What happens when silicon is used as a negative electrode material?
However,when silicon is used as a negative electrode material,silicon particles undergo significant volume expansion and contraction(approximately 300%) in the processes of lithiation and delithiation,respectively.

Can silicon/carbon nanocomposites be used as anode materials for Li-ion batteries?
Inspired by the possibilities of value-added of this raw material, we propose the facile preparation of silicon/carbon nanocomposites using carbon-coated silicon nanoparticles (<100 nm) and a petroleum pitch as anode materials for Li-ion batteries.

How can silicon-carbon composite materials improve the conductivity of negative electrode materials?
It is an effective way to construct silicon-carbon composite materials, which can enhance the conductivity of silicon based negative electrode materials, improve the dispersion of Si particle and then suppress its aggregation, and alleviate the volume change of electrode materials during the lithiantion and dilithination [26].

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 ...

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 ...

The development of negative electrode materials with better performance than those currently used in Li-ion

technology has been a major focus of recent battery research. Here, we report the synthesis and electrochemical evaluation of in situ-formed nitrogen-doped carbon/SiOC. The materials were synthesized by a sol-gel process using 3 ...

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...

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 ...

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Lithium-ion (Li-ion) batteries with high energy densities are desired to address the range anxiety of electric vehicles. A promising way to improve energy density is through adding silicon to the graphite negative electrode, as silicon has a large theoretical specific capacity of up to 4200 mAh g - 1 [1].However, there are a number of problems when ...

Among Li-alloy forming materials, Silicon (Si) is undoubtedly the most auspicious negative electrode candidate to realize high-energy density LIBs. This is due to its various enticing features such as high theoretical specific capacity of 3590 mAh g -1 (for Li 3.75 Si phase at 20 ° C, which is nearly 10 times greater than that of Gr), high natural abundance in the earth"s crust ...

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 characterize their electrochemical performances, the prepared Si/CNF/rGO and Si/rGO composite films are cut into small pieces and used as independent working ...

As a consequence, the first reversible capacity and initial coulombic efficiency of the silicon/carbon composite are 936.4 mAh g -1 and 88.6% in half-cell and the full-cell 18650 cylindrical battery using our ...

Pitch-based carbon/nano-silicon composites are proposed as a high performance and realistic electrode material of Li-ion battery anodes. Composites are prepared in a simple way by the pyrolysis under argon ...

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Negative electrode active material and rechargeable battery having the same KR101550781B1 (en) 2014-07-23: 2015-09-08 (?)????? : Method of forming silicon based active material for rechargeable battery KR101631300B1 (en) 2014-09-11: 2016-06-20: ????? ?????: Manufacturing method of SiO2/CNFs composite and Lithium Secondary battery using of Ni-Cu ...

Prelithiation conducted on MWCNTs and Super P-containing Si negative electrode-based full-cells has proven to be highly effective method in improving key battery performance indicators including long-term cycling, power output and CE, with more notable positive impact being on MWCNTs-Si/Gr negative electrode-based full-cell compared to its ...

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