Carbon fiber pre-oxidation energy storage

Does pre-oxidation enhance reversible capacity of hard carbon with lignin as precursor?
Herein,we demonstrate a pre-oxidation strategy to enhance the reversible capacity of hard carbon with lignin as precursor. The pre-oxidation mechanism and its influence on the microstructures of the resulted hard carbon are systematically studied.

How to improve electrochemical energy storage performance of carbon materials?
Electrochemical energy storage performance of carbon materials is strongly depended on the pore structure,surface property and specific surface area. Pore engineering and heteroatom dopingare effective strategies to improve the electrochemical performance of carbon materials [28-29].

What are structural energy storage composites?
Structural energy storage composites present advantages in simultaneously achieving structural strength and electrochemical properties. Adoption of carbon fiber electrodes and resin structural electrolytes in energy storage composite poses challenges in maintaining good mechanical and electrochemical properties at reasonable cost and effort.

Does pre-oxidation improve hard carbon performance?
Further analysis shows that with the pre-oxidation procedure,the enlarged d002 spacing,the much disordered microstructure,and the increased content of oxygen-containing functional groups are responsible for the performance enhancementof hard carbon.

Can pre-oxidation facilitate sodium storage in a carbon anode?
Here,a facile strategy of pre-oxidation is successfully adopted to tune the microstructure of carbon anode to facilitate sodium storage. Pitch is selected as the low-cost and high carbon yield precursor.

Can pre-oxidation improve the salt adsorption capacity of carbon clothes?
Here, we report a pre-oxidized strategy to significantly improve the salt adsorption capacity and cycling lifespan of carbon clothes. By the simple pre-oxidation treatment, it creates abundant ultramicropores and a superhydrophilic surface, which lead to a high salt adsorption capacity (31.5 mg g -1 and 13 mg cm -3) in 0.01 M NaCl aqueous solution.

In this work, pre-oxidized polyacrylonitrile fibers are treated with ultrasonic etching and solution etching to produce ultra-thin sections. The evolution of the fibers" microstructure in the pre-oxidation process is observed, ...

FSSCs are predominantly categorized into two classes based on their energy storage mechanisms: electrical double-layer capacitors (EDLCs) and pseudocapacitors. 9 In EDLCs, ...

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When matched with a layered O3-NaNi 1/3 Fe 1/3 Mn 1/3 O 2 cathode, the full cell achieves an energy density of ca. 256.2 Wh kg -1 with superior rate performance. This work sheds light on the positive effect of pre ...

The significantly improved Na-storage capacity (301 mAh g -1 vs. 94.0 mAh g -1 for CPP-1400 °C without pre-oxidation treatment) verifies the superiority of the microstructure ...

Supercapacitor is a kind of green energy storage device which is friendly to environment, less pollution, practical and efficient [1, 2] pared with traditional capacitors ...

In this review, we discuss the research progress regarding carbon fibers and their hybrid materials applied to various energy storage devices (Scheme 1).Aiming to uncover ...

Carbon fibers enjoy the intrinsic advantages in large specific surface area, controllable chemical compositions, excellent electrical conductivity, and rich composite forms, ...

Compared with the carbonized pristine pitch, the carbonized pre-oxidation pitch increases the carbon yield from 54 to 67%, the sodium storage capacity from 94.0 to 300.6 mAh g -1, and ...