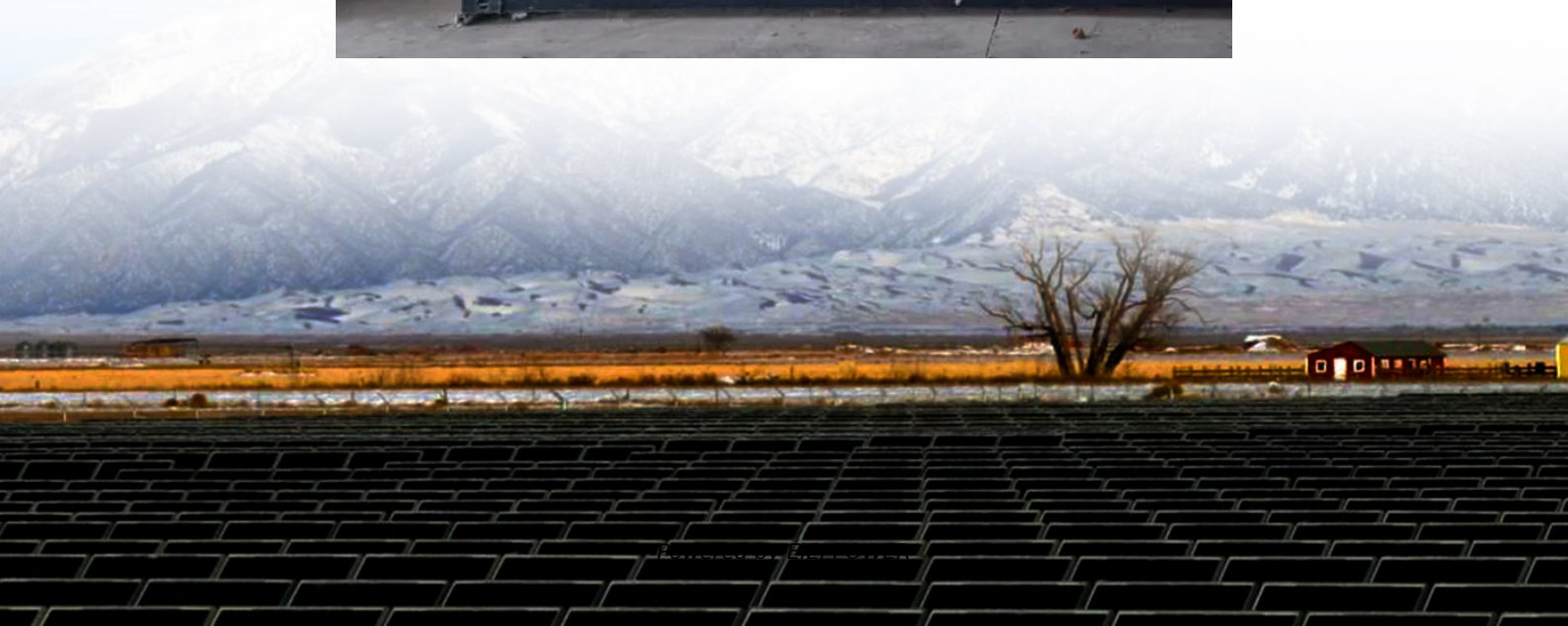


# Do cylindrical lithium batteries need needle coke





## Overview

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Lithium battery anodes require needle coke with ultra-high purity (sulfur content <0.5%, ash content <0.1%), optimal crystallinity, and uniform particle distribution to ensure battery energy density and cycle stability. Why is needle coke a good anode material for lithium-ion batteries?

The rates and specific capacities of lithium-ion battery anodes are important factors used in evaluating the batteries. Needle coke is attracting attention as an anode material for lithium-ion batteries due to its high reaction rates, but its low specific capacity still remains a problem to be solved.

What is needle coke used for?

Needle Coke used in the production of graphite electrodes for arc furnaces in the steel and aluminium industries and is particularly valuable because the electrodes must be replaced regularly. Needle coke is also employed in the production of synthetic graphite for the anode material for lithium-ion batteries used in electric vehicles.

Can ozonation increase the capacity of a needle coke battery?

Needle coke-based lithium-ion batteries with oxygen introduced through ozone treatment showed capacity increases of up to 17.4% and retention rates of 64.25% at 5 C. Therefore, introducing oxygen functional groups into needle cokes through ozonation is a viable strategy for producing rapid and high-capacity anode materials.

Are needle Cokes a good carbon material?

Celzard et al. investigated the high conductivity of needle cokes (331.7 S/cm); this conductivity was significantly greater than those of natural graphite (197.0 S/cm) and artificial graphite (106.5 S/cm). Therefore, needle cokes are considered attractive carbon materials.



## Do cylindrical lithium batteries need needle coke



### [Methods for modifying needle coke raw materials by ...](#)

Feb 15, 2022 · This discovery gave an impetus to the study of needle coke, which is widely used in metallurgy [2], namely by the steel and aluminium [3], [4], [5] industries in the production of ...

### [Improved discharge capacities for lithium-ion batteries ...](#)

Jan 29, 2024 · The rates and specific capacities of lithium-ion battery anodes are important factors used in evaluating the batteries. Needle coke is attracting attention as an anode material for ...



### **Needle Coke**

Needle Coke, also called acicular coke, is a highly crystalline petroleum coke. Needle Coke used in the production of graphite electrodes for arc furnaces in the steel and aluminium industries ...

### [Electrochemical Performance of Coal-Based ...](#)

Sep 27, 2024 · A lithium-ion battery fabricated using four kinds of needle cokes exhibits a maximum high energy density of 1357mAhg<sup>-1</sup>.



### [a perfect storm in the needle coke sector?](#)

May 30, 2019 · Needle coke is also employed in the production of synthetic graphite for other uses, including the anode material for lithium-ion ...

### **Effects of the oxyfluorination of needle coke-based anode ...**

Oct 1, 2024 · Compared with those of pristine needle coke-based lithium-ion batteries, the capacities of the lithium-ion batteries based on oxyfluorinated needle cokes increased by ...



### [Lithium Battery Uncalcined Needle Coke: Disruptive ...](#)

May 21, 2025 · The global lithium-ion battery uncalcined needle coke market is experiencing robust growth, projected to reach a market size of \$3163 million in 2025, exhibiting a ...



### Progress of petroleum coke as anode material ...

The high-quality petroleum coke represented by needle-shaped petroleum coke has a series of advantages, such as low thermal expansion ...

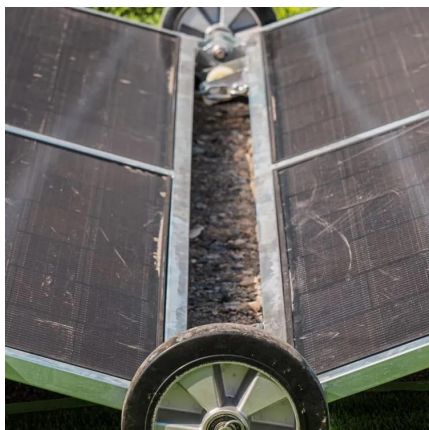


### Improved discharge capacities for lithium-ion batteries ...

Feb 9, 2024 · The ozone treatment did not significantly affect the carbon structural properties of the needle coke but produced hydroxyl, ether, carbonyl, and carboxyl groups on the surface. ...

### Low-Sulfur Petroleum Coke for Battery Anode Production

Mar 2, 2025 · Low-sulfur petroleum coke is crucial for lithium-ion anode producers because it serves as a key raw material for producing graphite anodes. Graphite anodes are essential for ...



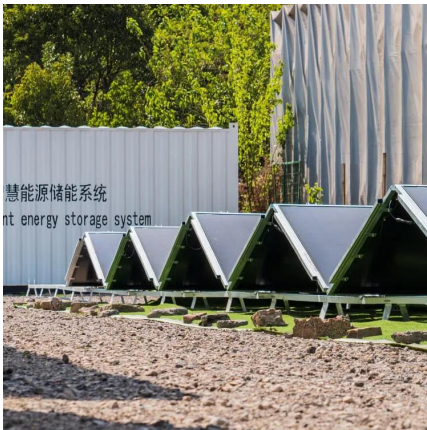
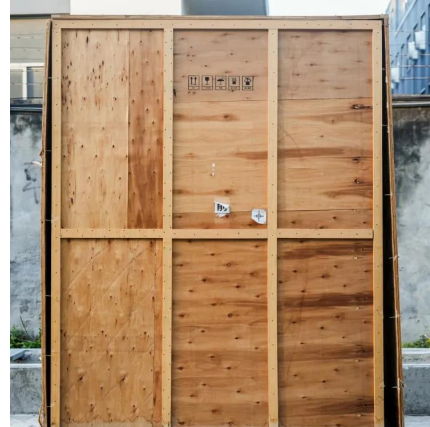
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## Lithium Battery Anode Materials Needle Coke in the Real

By 2025, needle coke's role in lithium battery anodes is set to expand significantly. Trends point toward increased adoption driven by EV growth and renewable energy integration.



## **Electrochemical Performance of Coal-Based Needle Coke Anode for Lithium**

Sep 27, 2024 · A lithium-ion battery fabricated using four kinds of needle cokes exhibits a maximum high energy density of 1357mAhg<sup>-1</sup>.

## **Enhanced electrochemical performance of N, F co-doped and etched needle**

May 20, 2024 · NF<sub>3</sub> plasma treatments were used to improve the electrochemical properties of needle coke-based lithium-ion battery (LIB) anode materials. The effects of the NF<sub>3</sub> plasma ...



## **Production of needle cokes via mild condition co-pyrolysis of FCC-DO**

Mar 15, 2024 · The conventional needle coke production process suffers from high reaction temperature and pressure, and therefore, alternative approaches for needle coke production ...



## [Needle Coke for EV Batteries Market](#)

The global market size for needle coke used in EV batteries is projected to grow significantly from an estimated USD 1.5 billion in 2023 to an ...



## **Improved electrochemical properties of lithium-ion batteries**

...

Dec 1, 2024 · High-rate capacities and specific capacities are important indicators for evaluating lithium-ion battery (LIB) anodes. To improve the electrochemical properties of needle coke ...



## [Silicon/Needle Coke Composites as Efficient Anodes for ...](#)

Silicon/Needle Coke Composites as Efficient Anodes for Lithium Ion Batteries Jing Xia 1, \*, Shuxiang Li 1, Yuan Gao 1, Dakui Zhang 2, Qionguang Li 3, Yanhong Wang 3



## [How to Choose a Cylindrical Lithium Battery](#)

How do cylindrical lithium batteries compare to other battery types? Cylindrical lithium batteries provide advantages over prismatic and pouch types in terms of durability and thermal ...



## [The role of petroleum coke in the negative ...](#)

Jul 27, 2023 · Both needle coke and petroleum coke have the characteristics of easy graphitization, and the prepared artificial graphite anode material ...



## [Lithium Battery Anode Materials Needle Coke Market](#)

Apr 6, 2025 · A 2023 survey of 150 lithium battery supply chain investors revealed that 68% would reject funding for needle coke facilities lacking ISO 14001 environmental certification. This has ...



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