

*Short Communication*

## **Formation of hard carbon derived from sulfonated pitch as advanced electrodes for lithium-ion batteries**

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The exploration for low-cost and sustainable anode materials plays a key role in the future of lithium-ion batteries (LIBs). Sulfonated pitch-based hard carbon obtained by using high-temperature calcination of industrial sulfonated pitch as a raw material is evaluated as an anode material for LIBs. Experimental results show that sulfonated pitch-based hard carbon exhibits excellent electrochemical performance as an anode for LIBs. After 50 cycles, the discharge capacity is still at 310 mAh g<sup>-1</sup> with a capacity retention rate of 83.8% under a current density of 0.1C. The low-cost and facile synthesis process of sulfonated pitch-based hard carbon makes it a promising anode material for LIBs in the future.

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**Keywords:** lithium ion batteries, hard carbon, sulfonated pitch

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