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Honeycomb-like Nitrogen and Sulfur Dual-Doped Hierarchical Porous Biomass Carbon Bifunctional Interlayer for Advanced Lithium-Sulfur Batteries

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Abstract

The nitrogen and sulfur dual-doped hierarchical porous biomass carbon (NSHPC) is prepared by a simple and environment-friendly one-step method and employed as flexible interlayer for lithium-sulfur batteries (LSBs). The composition analysis and structure characteristic of NSHPC sample are measured by X-ray powder diffraction, scanning electron microscopy and raman spectra. The electrochemical performances are measured by galvanotactic charge/discharge (GCD) and electrochemical impedance spectroscopy (EIS) measurement. The results show that the NSHPC sample with unique honeycomb-like micro/mesoporous structure possesses high specific surface area of 2543.8 m^2 g^{-1} and large pore volume of 2.14 cm^3 g^{-1}. The charge transfer resistance (R_{ct}) of the LSBs with the NSHPC flexible interlayer is much smaller than that of the LSBs with only Celgard separator. The pure sulfur

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