Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information

N-doped CNTs Wrapped Sulfur-Loaded Hierarchical Porous Carbon Cathode for for Li-Sulfur Battery Studies

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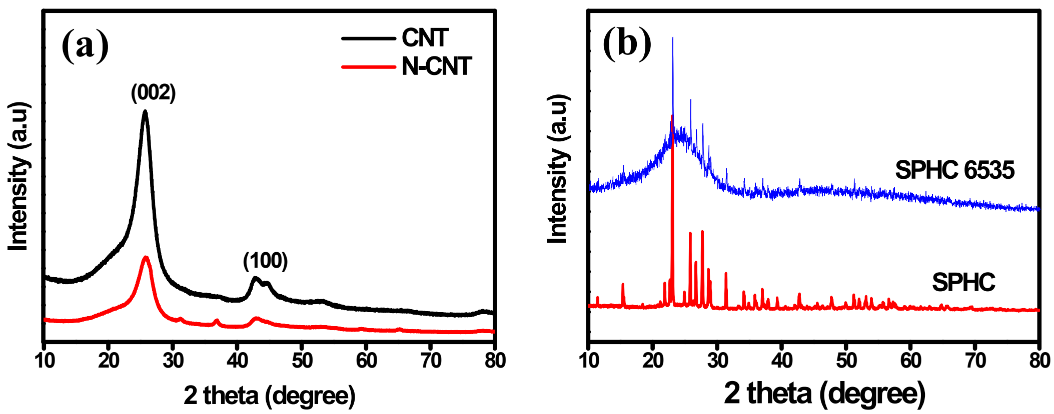


Fig. S1. XRD patterns (a) CNT and N-doped CNTs (b) SHPC and SHPC 6535.

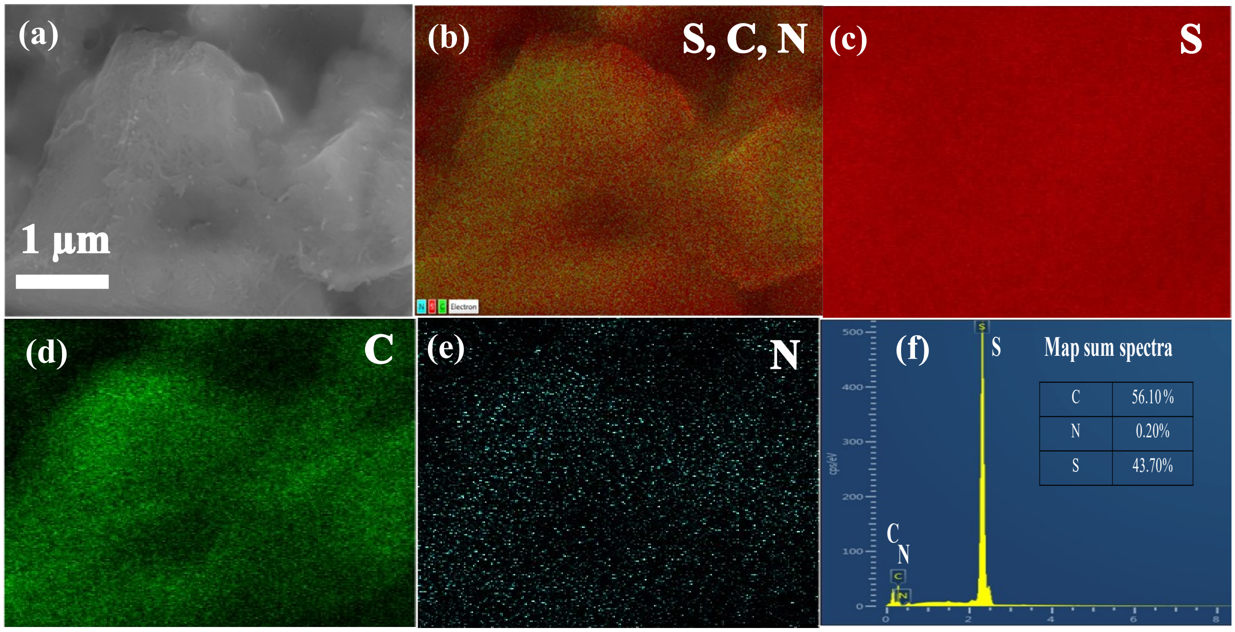


Fig. S2. Elemental analysis mapping by SEM-EDX of SHPC-NCNT (a) SEM image (b) EDX element layered Image (c) S mapping (d) C mapping (e) N-mapping (f) Corresponding SEM-EDX spectra of SHPC-NCNT.

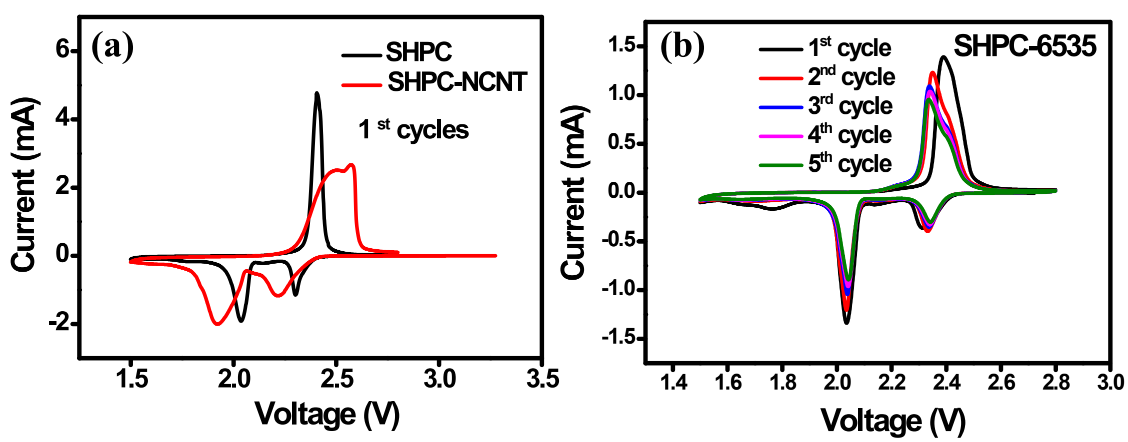


Fig. S3. Cyclic voltammograms (a) First cycles of SHPC and SHPC-NCNT (b) SHPC-6535.

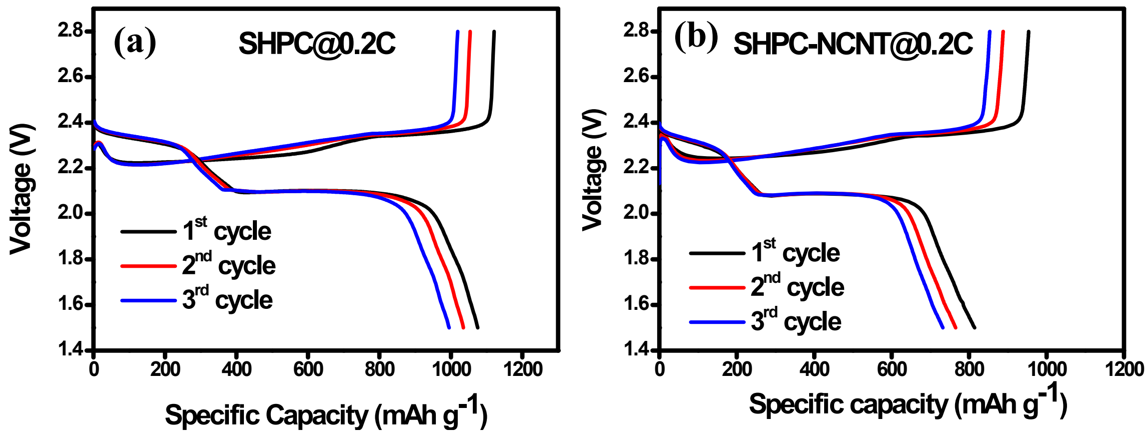


Fig. S4. Specific capacity vs. voltage plots for the first three cycles (a) SHPC at 0.2 C (b) SHPC-NCNT at 0.2 C.

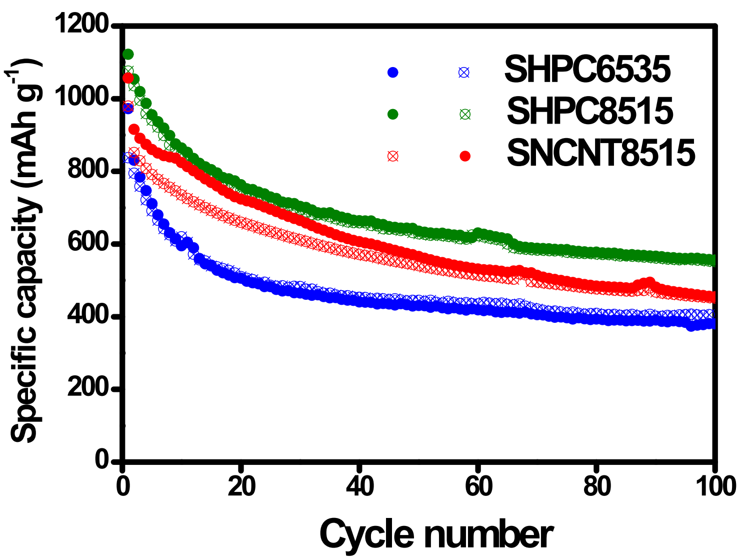


Fig. S5. Cylability results of SHPC6535, SHPC8515, and SNCNT8515 materials.

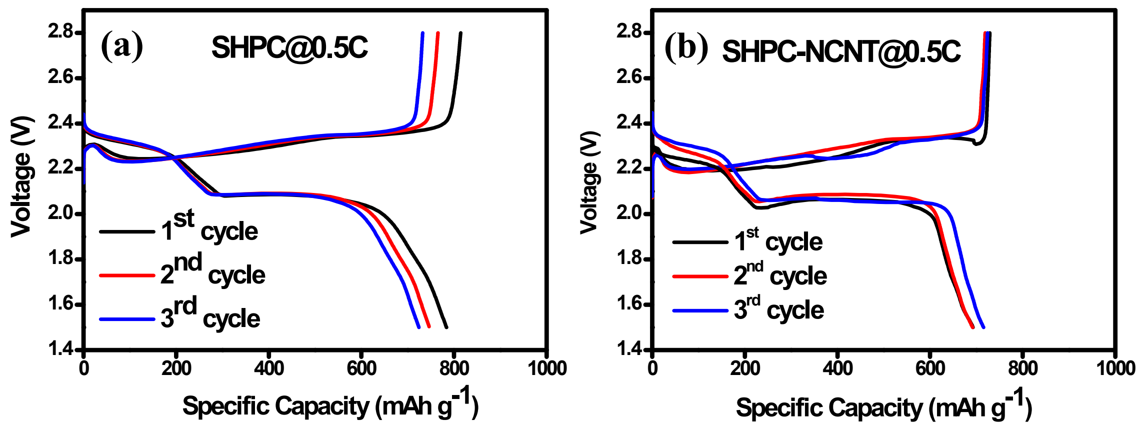
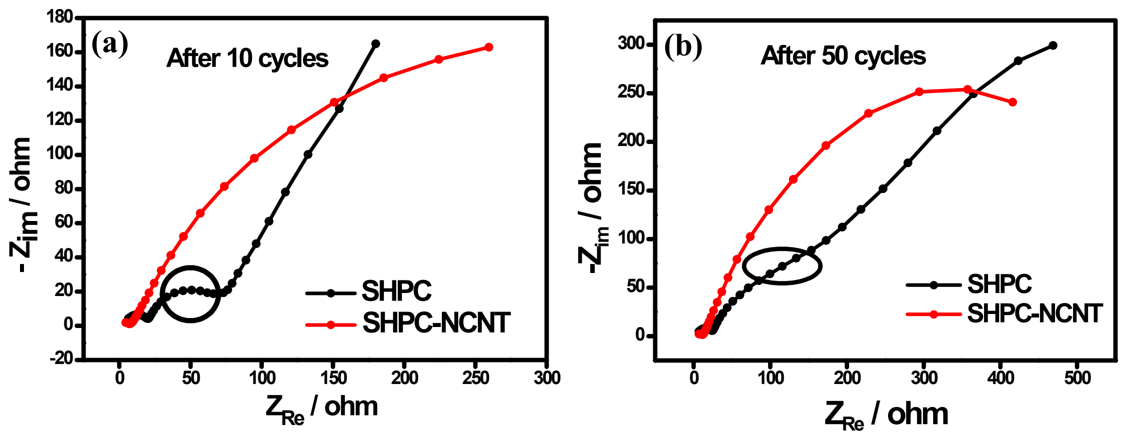


Fig. S6. Specific capacity vs. voltage plots for the first three cycles (a) SHPC at 0.5 C (b) SHPC-



NCNT at 0.5 C.

Fig. S7. EIS Spectra of SHPC and SHPC-NCNT electrodes (b) after 10 cycles (c) after 50 cycles.

Table S1. Comparison of electrochemical performance of biomass-derived carbons and other porous carbons as sulfur cathode host.

Host material	Applied current	Cycle life	Specific capacity after cycling	Capacity retention (vs. 2nd cycle)	Ref.
Biomass-derived carbon hosts					
Nano-porous carbon beads	0.1 C	100	480 mAh g^{-1}	~70.5%	1
Porous ramie Carbon/MWCNT	0.1 C	500	812 mAh g^{-1}	~62.0%	2
Honeycomb-derived N-doped hierarchical porous carbon	1 C	500	350 mAh g^{-1}	~69.0%	3
Mango-stone-derived porous carbon	800 mA g^{-1}	500	526 mAh g^{-1}	~61.8%	4
Rice straw-derived CoO-embedded porous carbon host	1 C	800	412 mAh g^{-1}	~46.0%	5
biomass silkworm feces derived porous carbon	3 C	1000	641 mAh g^{-1}	~54.0%	6
Corncob-derived activated carbon	0.3 C	200	799 mAh g^{-1}	~60.9%	7
Hair-derived porous carbon	0.5 C	300	870 mAh g^{-1}	~82.0%	8
waste tea-based porous carbons	0.05 C	100	627 mAh g^{-1}	~59.7%	9
Yam derived carbon	1 C	450	401 mAh g^{-1}	~48.6%	10

Other porous carbon hosts					
Multi porous carbon	200 mA g-1	70	500 mAh g^{-1}	~35.7%	11
N-doped porous carbon	0.5 C	400	571 mAh g^{-1}	~71.7%	12
G/CNT hybrids	1 C	100	530 mAh g^{-1}	~58.8%	13
Porous carbon	0.2 C	200	446 mAh g^{-1}	~55.7%	14
N-doped porous carbon	0.1 C	239	502 mAh g^{-1}	~54.2%	15
Interconnected Micro/meso porous carbon	0.1 C	100	700 mAh g^{-1}	~57.3%	16
This work Spent coffee waste-derived hierarchical porous carbon (HPC)/ N-MWCNT	0.2 C 0.5 C	150 150	664 mAh g^{-1} 532 mAh g^{-1}	74.8% 73.9%	This work

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