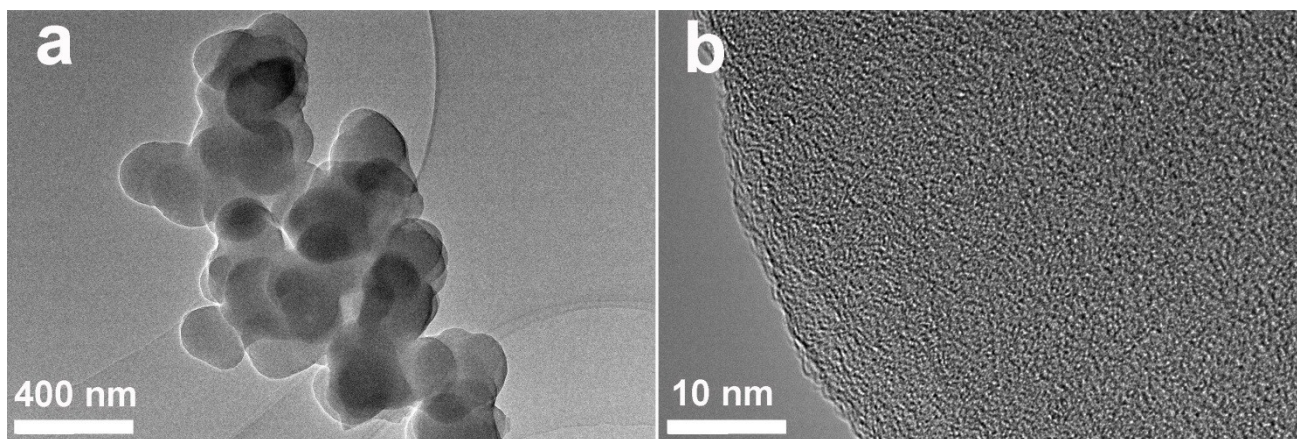


**Supplementary Information for**  
**Self-improving anode for lithium-ion batteries: continuous interlamellar spacing expansion**  
**induced capacity increase in polydopamine-derived nitrogen-doped carbon tubes during**  
**cycling**

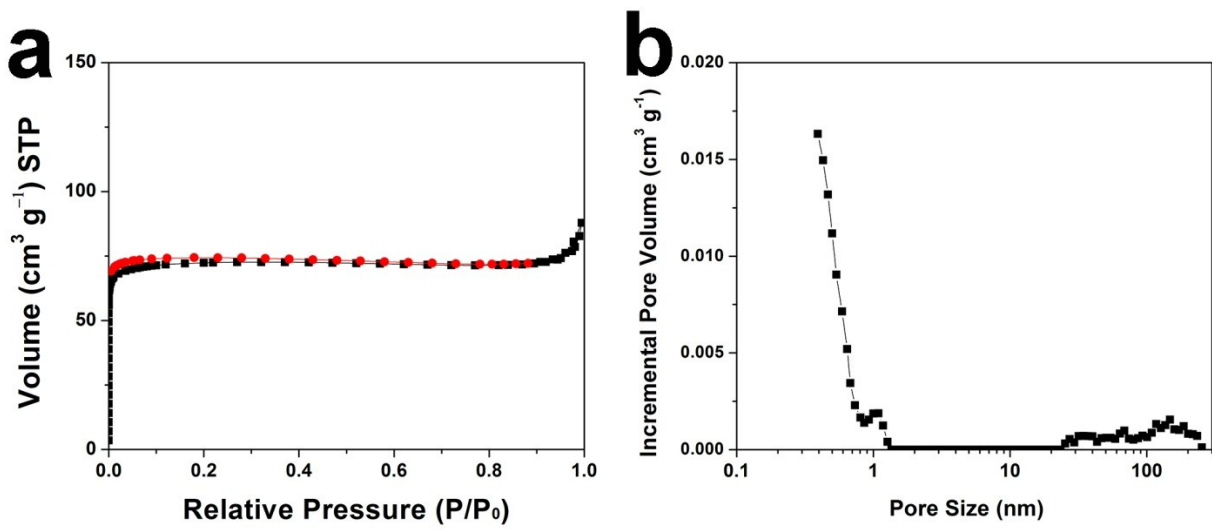
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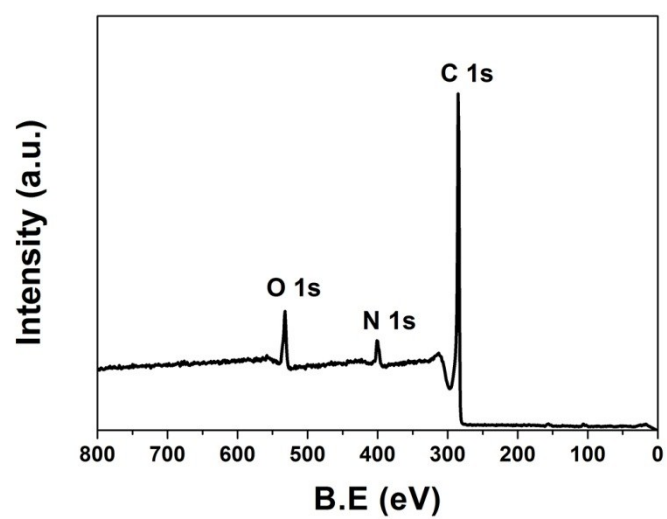
*§ Current address: Department of Chemistry, University of Missouri – Kansas City, Kansas City,  
Missouri 64110, United States*



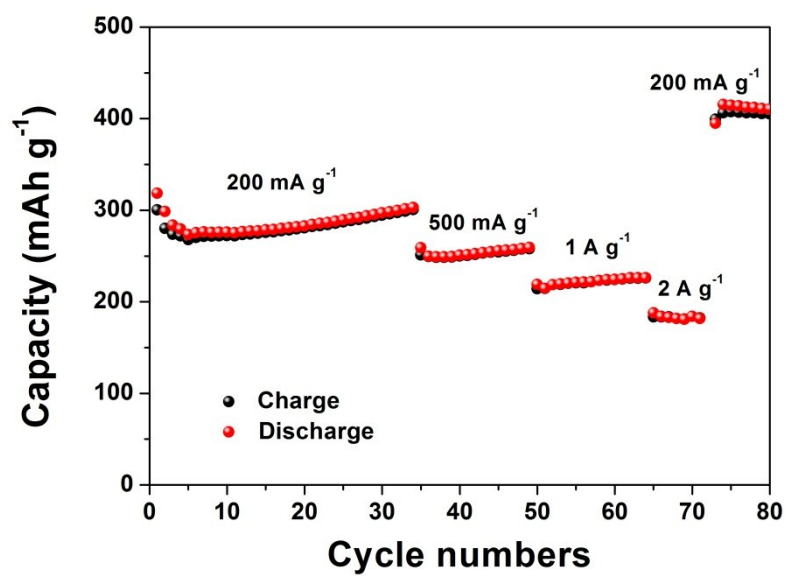
**Fig. S1** HR-TEM images of polydopamine-derived N-doped solid carbons (N-SCs) at low (a) and high (b) magnification.



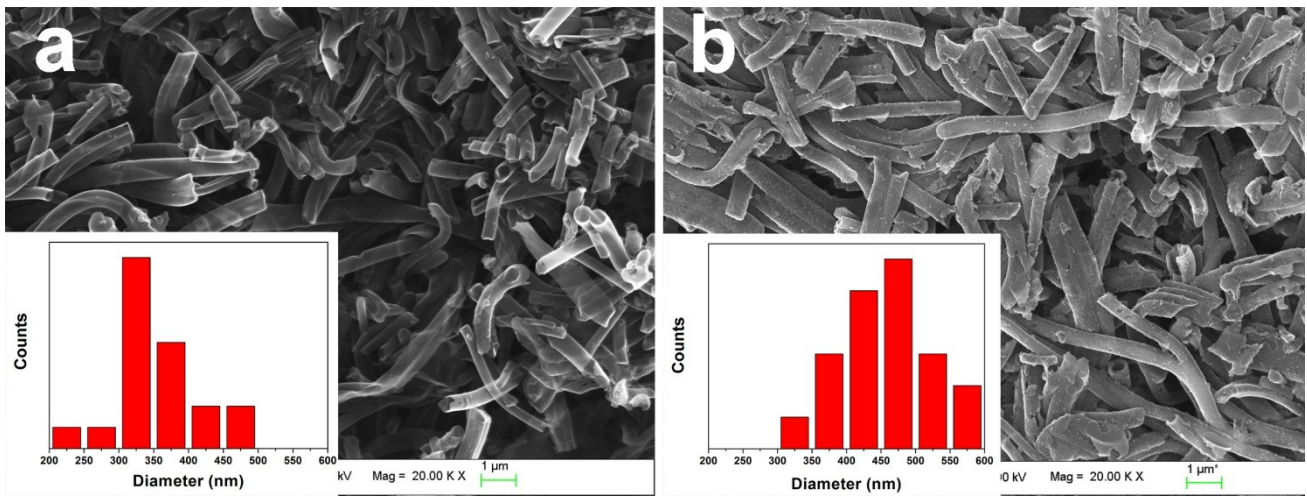
**Fig. S2** (a) Nitrogen adsorption–desorption isotherms and (b) pore size distribution of N-SCs.



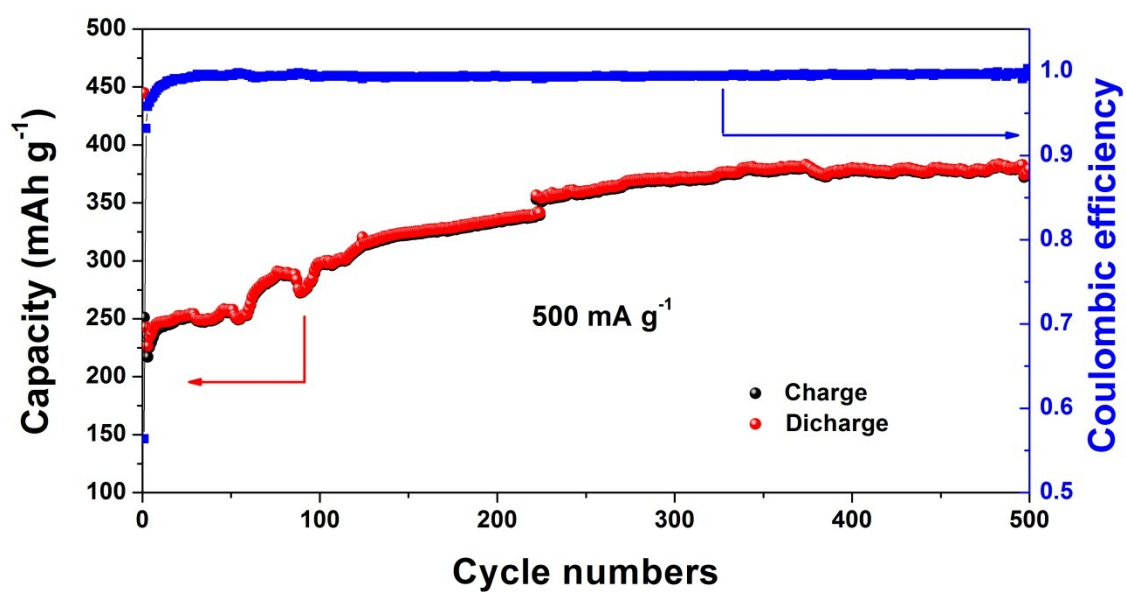
**Fig. S3** XPS spectrum of general spectra of polydopamine-derived N-doped carbon tubes (N-CTs).



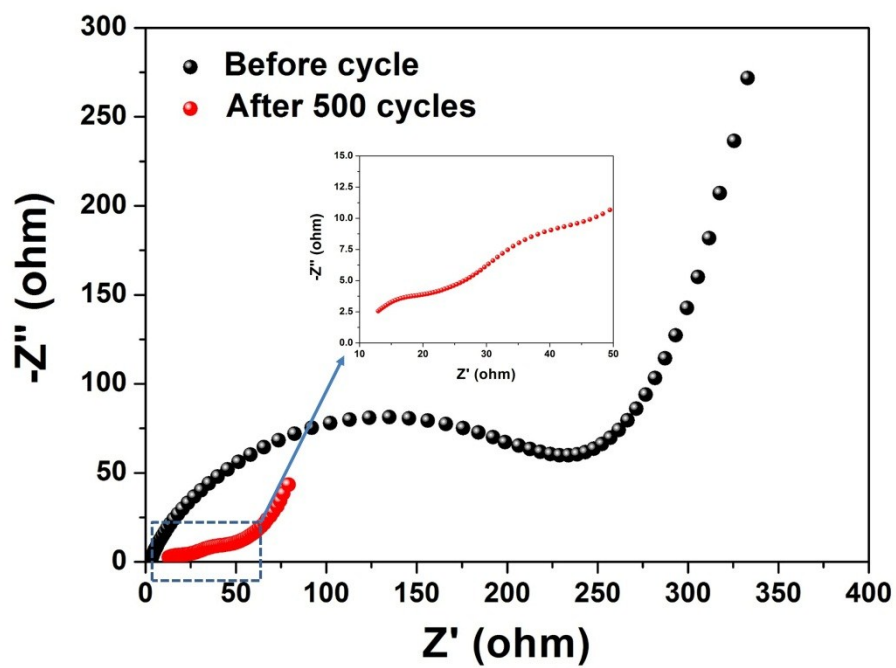
**Fig. S4** Rate performance of N-SCs electrode.



**Fig. S5** SEM images of (a) before-cycle and (b) after-cycle (after 500 cycles) N-CTs with histograms of outer fibrous diameter.



**Fig. S6** Cycling performance of N-SCs electrode at 500 mA g<sup>-1</sup>. It is noted that the capacity of N-SCs electrode also remarkably increased with cycling. The reversible capacity (charge) reached 378 mAh g<sup>-1</sup> after 500 cycles, which is much higher than the initial one (251 mAh g<sup>-1</sup>).



**Fig. S7** Electrochemical impedance spectra of N-SCs electrode before and after cycling.