

*Supporting Information*

**High lithium storage performance of CoO with a dual-carbon-confined nanoarchitecture**

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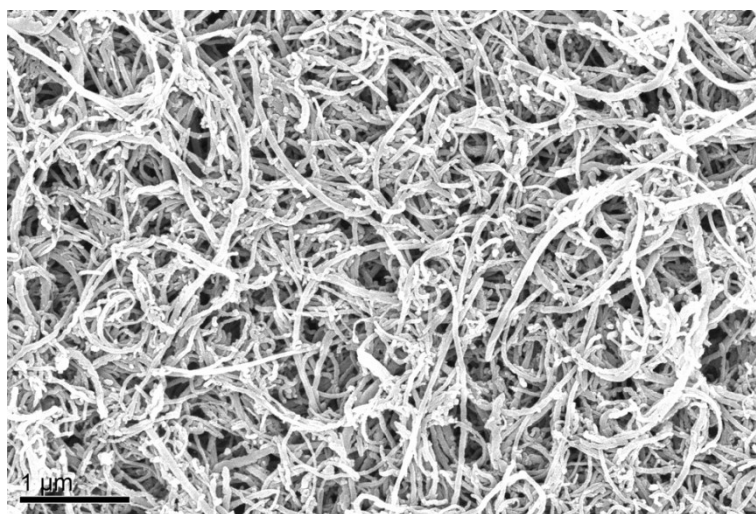
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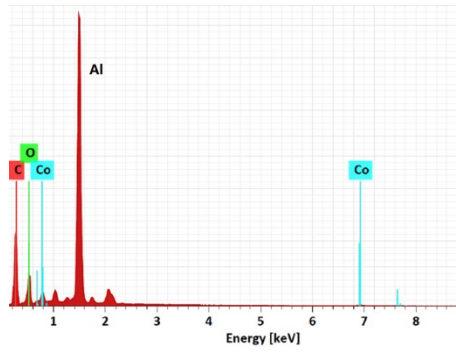
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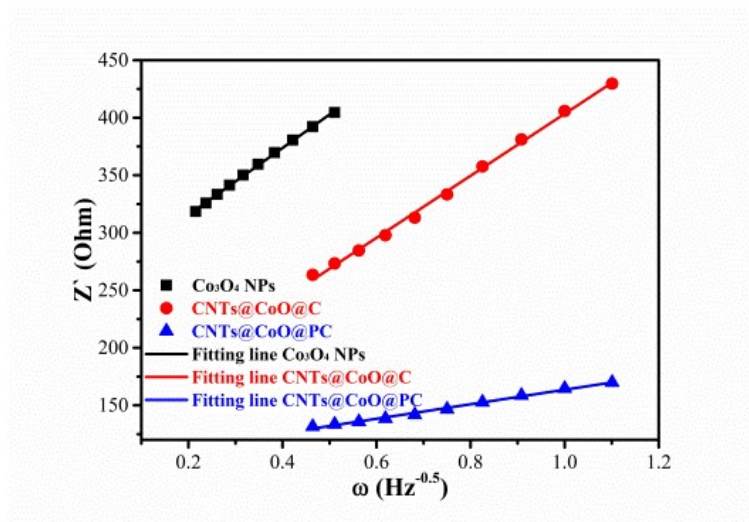
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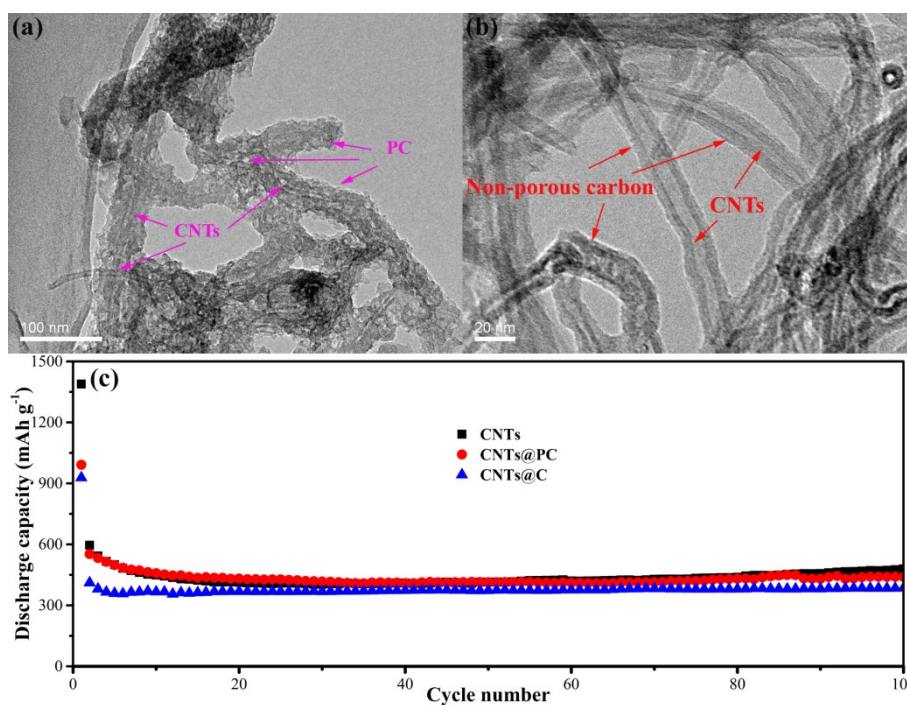
**Fig. S1** SEM image of CNTs.



**Fig. S2** EDS spectrum of the CNTs@CoO@PC.



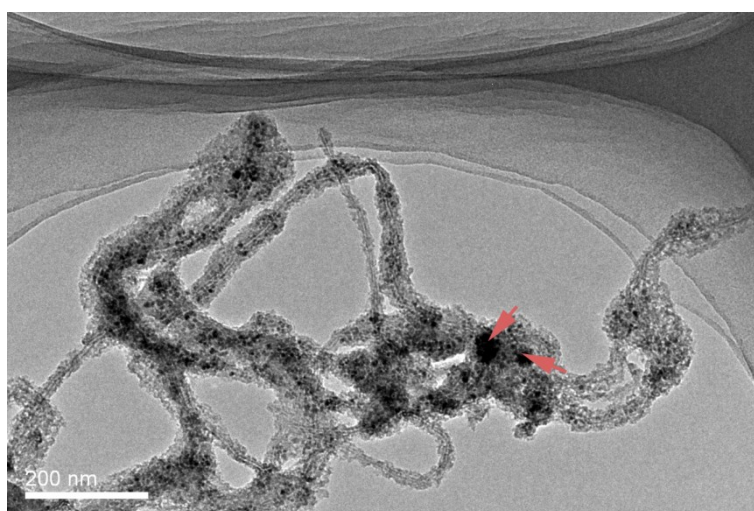
**Fig. S3** Plot of Real part of the complex impedance versus  $\omega^{-0.5}$  based on Fig. 6d.



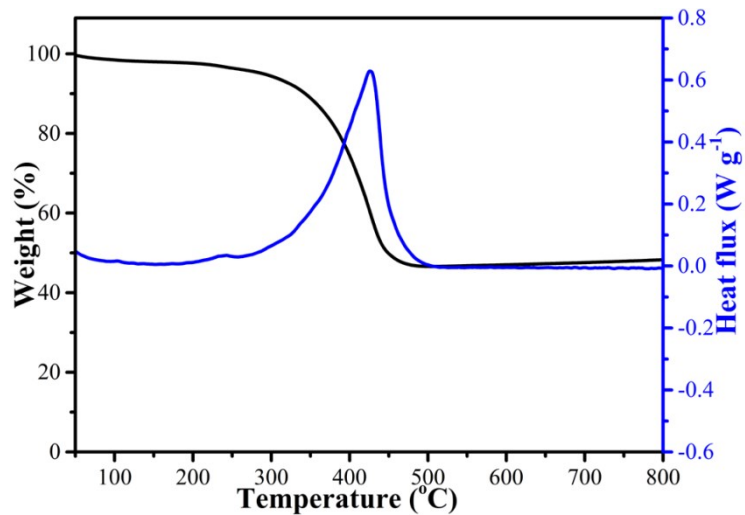
**Fig. S4** TEM images of (a) CNTs@PC and (b) CNTs@C; (c) Cycling performance of CNTs@PC,

CNTs@C and CNTs electrodes at 200 mA g<sup>-1</sup> between 0.01 and 3.0 V.

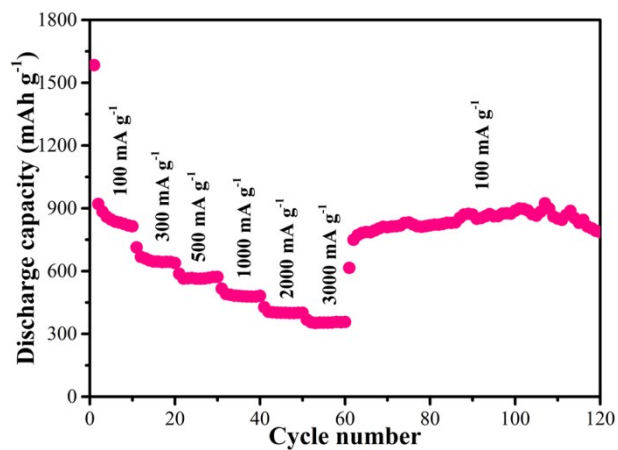
The CNTs@PC was prepared with the same way as CNTs@CoO@PC but using the CNTs to replace the CNTs@Co<sub>3</sub>O<sub>4</sub>. The CNTs@C was prepared with the same way as CNTs@CoO@C but using the CNTs to replace the CNTs@Co<sub>3</sub>O<sub>4</sub>.



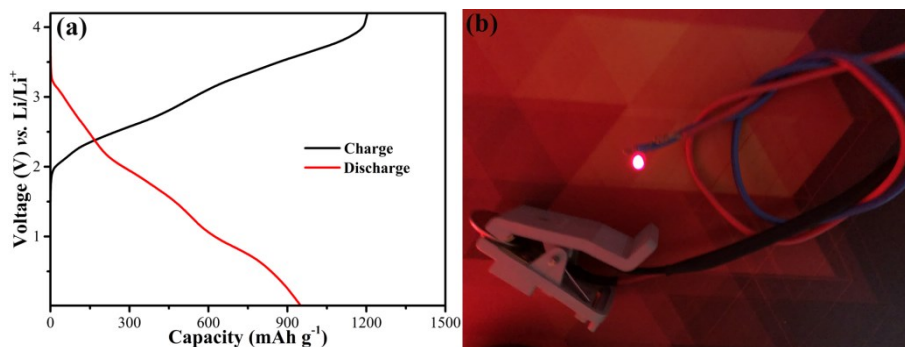
**Fig. S5** TEM image of CNTs@H-CoO@PC.



**Fig. S6** TG and DSC curves of CNTs@H-CoO@PC.



**Fig. S7** Rate performance of CNTs@CoO@C.



**Fig. S8** (a) The initial galvanostatic charge/discharge curves of a full cell at 0.2 C (1 C = 175 mA g<sup>-1</sup>)

between 0.01 and 4.2 V; (b) A LED bulb lighted by thus full cell.

For assembling full cells, the commercial LFP electrode (with a loading level of 6 mg/cm<sup>2</sup>) was employed as the cathode and the as-prepared CNTs@CoO@PC electrode as the anode. The mass loading for LFP is about 5 times larger than that for the CNTs@CoO@PC anode. The CNTs@CoO@PC anode were activated for two cycles with lithium metal counter electrode at 200 mA g<sup>-1</sup> between 0.01 and 3.0 V before assembling the full cells. The galvanostatic charge/discharge test of the as-assembled full cells was achieved at 0.2 C between 0.01 and 4.2 V based on a LAND CT2001a cell test system.