Supporting Information

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

Yanbin Chen\textsuperscript{a\&}, Jian Song\textsuperscript{a\&}, Yuexian Li\textsuperscript{a}, Qinghua Tian\textsuperscript{a\*}, Jizhang Chen\textsuperscript{b} and Li Yang\textsuperscript{c\*}

\&Yanbin Chen and Jian Song contributed equally to this work.

\textsuperscript{a}Key Laboratory of Surface & Interface Science of Polymer Materials of Zhejiang Province, Department of Chemistry, Zhejiang Sci-Tech University, Hangzhou, 310018, P. R. China

\textsuperscript{b}College of Materials Science and Engineering, Nanjing Forestry University, Nanjing, 210037, P. R. China

\textsuperscript{c}School of Chemistry and Chemical Engineering, Shanghai Jiao Tong University, Shanghai 200240, P. R. China

\*Corresponding author e-mail address: 09tqinghua@163.com, liyangce@sjtu.edu.cn

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Fig. S1 SEM image of CNTs.}
\caption{SEM image of CNTs.}
\end{figure}
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.
The CNTs@PC was prepared with the same way as CNTs@CoO@PC but using the CNTs to replace the CNTs@Co₃O₄. The CNTs@C was prepared with the same way as CNTs@CoO@C but using the CNTs to replace the CNTs@Co₃O₄.
**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⁻¹) 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$^2$) 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$^{-1}$ 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.