Hexagonal Prism-like Hierarchical Co$_9$S$_8$@Ni(OH)$_2$ Core-shell Nanotubes on Carbon Fibers for High-Performance Asymmetric Supercapacitors

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**Fig. S1** (a) XPS survey spectrum of the Co$_9$S$_8$@Ni(OH)$_2$ core-shell nanotube arrays; (b) O 1s XPS spectrum of the Co$_9$S$_8$@Ni(OH)$_2$ electrode.

**Fig. S2** SEM image of the precursor Co(CO)$_{3.35}$Cl$_{0.20}$(OH)$_{1.10}$$\cdot$1.74H$_2$O solid nanoneedles on CFs.
Fig. S3 SEM image of as-prepared hollow Co$_9$S$_8$ nanoneedles.

Fig. S4 SEM images of the Co$_9$S$_8$ nanotubes synthesized at 150 °C for 10h.
Fig. S5 SEM images of the as-prepared Co$_9$S$_8$@Ni(OH)$_2$ core-shell nanotube arrays at different magnification.

Fig. S6 (a) CV curves of bare Co$_9$S$_8$ electrode at different scan rates; (b) GCD curves of Co$_9$S$_8$ electrode at different current densities.
Fig. S7 (a) CV curves of the Co$_9$S$_8$/AC device collected in different voltage window; (b) CV curves of the Co$_9$S$_8$/AC device at different scan rates in the operation window of 1.6 V; (c) GCD curves of the ASC device measured at different current densities.
Fig. S8 (a) CV curves of Co₉S₈@Ni(OH)₂ core-shell nanotubes obtained for different exposition time: 0 s, 120 s, 240 s, 360 s, 420 s. (b) Discharge curves of the Co₉S₈@Ni(OH)₂ core-shell electrodes with different electrodeposition times. (c) The plot of specific capacitance versus different deposition times for Co₉S₈@Ni(OH)₂ electrodes at a current density of 1 A g⁻¹. (d) The specific capacity of the electrodes with different exposition time at different current densities.
**Fig. S9** (a) CV curves of the AC electrode at different scan rates; (b) Galvanostatic charge-discharge curves at different current densities.