Supporting Information

Facile Synthesis of Carbon Nanobranches towards Cobalt Ion Sensing and High-Performance Micro-Supercapacitors

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Supplementary Figures

Figure S1. The chemical reaction principle of the two-path modification of CNBs.

Figure S2. Particle size distribution of CDs.
Figure S3. Evolutionary FT-IR spectra (270 °C to 370 °C) of gas produced from starch combustion.

Figure S4. TGA curve of starch from 26 °C to 600 °C.

Figure S5. XPS spectrum of the CNBs.
Figure S6. High resolution XPS spectrum of C 1s peak of the CNBs.

Figure S7. FT-IR spectra of CNBs and CNBs before passivation.

Figure S8. Laser confocal fluorescence microscopy (LCFM) image of CNBs at excitation wavelengths of 405 nm.
**Figure S9.** (a) PL emission spectra and (b) normalized PL emission spectra of CNBs in aqueous solution at excitation wavelengths starting from 380 nm to 540 nm in 40 nm increments.

**Figure S10.** UV-vis absorption spectrum of CNBs aqueous solution.

**Figure S11.** Plot of $\alpha^{1/2}$ vs $E_{\text{phot}}$ for indirect transitions, where $\alpha$ is absorption coefficient and $E_{\text{phot}}$ is photon energy. Band gaps $E_g$ are obtained by extrapolation to $\alpha = 0$. 
Figure S12. PL spectra of fresh and six-month-stored solutions of CNBs ($\lambda_{ex} = 460$ nm).

Figure S13. The photograph shows the electrical conductivity of a CNBs/TPU fiber.

Figure S14. Typical stress-strain curve of a CNBs/TPU fiber.
Figure S15. (a) Optical photograph of a long CNBs/TPU fiber. SEM images of side (b) and cross-sectional (c) view of a CNBs/TPU fiber.

Figure S16. SEM image of cross-sectional view of a CNBs/TPU fiber-based micro-SCs. Red arrow area is H$_3$PO$_4$/PVA gel electrolyte.

Figure S17. The calculated specific capacitances under different current densities.
Figure S18. Corresponding energy density and power density of the CNBs/TPU fiber-based micro-SCs.

Figure S19. Three micro-SCs connected in series.

Figure S20. Three micro-SCs connected in parallel.