Supporting Information

A hollow-shaped ZIF-8-N-doped porous carbon fiber for high-performance Zn-ion hybrid supercapacitors

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1 Calculation

The gravimetic capacity (C_m, mA h g^{-1}) was calculated from GCD by Eq. S1:

$$C_m = \frac{I\Delta t}{m} \quad \text{Eq. S1}$$

where I, Δt and m are discharge current (A), discharge time (h), mass of active material in the working electrode (g), respectively.

The gravimetric energy density (E, Wh kg^{-1}) and power density (P, W kg^{-1}) of the ZHSCs were calculated with following equations:

$$E = \frac{I \int V dt}{m} \quad \text{Eq. S2}$$

$$P = \frac{E}{t} \quad \text{Eq. S3}$$

The surface capacitive contribution and diffusion-limited battery-type Faradaic contribution could be further quantified according to the following equation:

$$i(V) = k_1 v + k_2 v^{1/2} \quad \text{Eq. S4}$$

Where *v* is the scan rate, *i* (V) represents the current response at the specific potential, $k_1 v$ is the surface capacitive contribution; $k_2 v^{1/2}$ is the diffusion-limited battery-type Faradaic contribution; *k_1, k_2 are constant.*

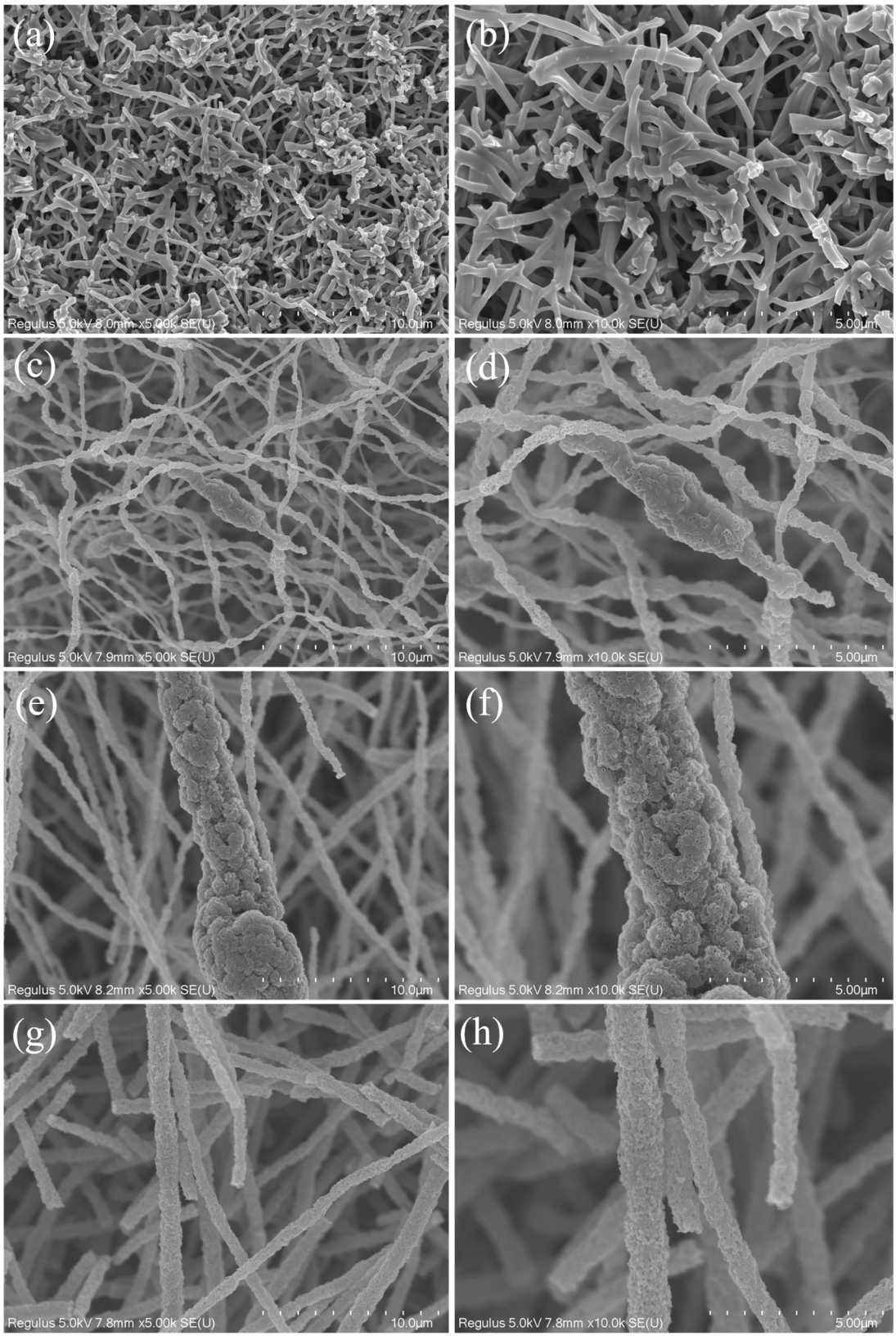

Figure S1. SEM images of PCNF (a, b), ZPCNF-0.5 (c, d), ZPCNF-1.0 (e, f) SEM images of ZPCNF-1.5 (g, h).

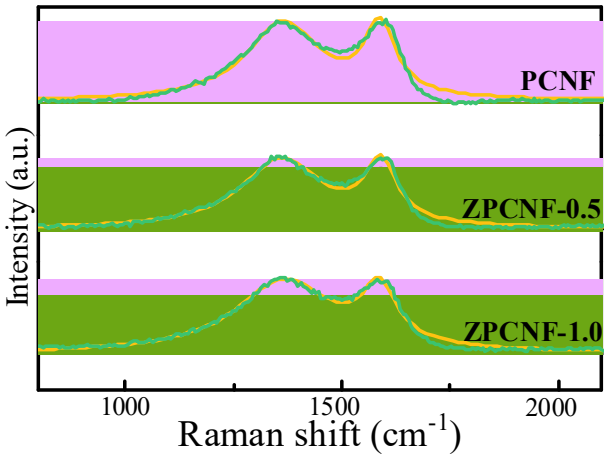

Figure S2 Raman spectra of the obtained PCNF, ZPCNF-0.5, and ZPCNF-1.0

Catalyst	I_D	I_G	I_D/I_G
PCNF	**131598**	**47428**	**2.78**
ZPCNF-0.5	**103863**	**36214**	**2.87**
ZPCNF-1.0	**153792**	**47161**	**3.26**
ZPCNF-1.5	**99693**	**29466**	**3.38**

Table S1. The integral areas values of D and G peaks of the obtained samples measured from Raman results

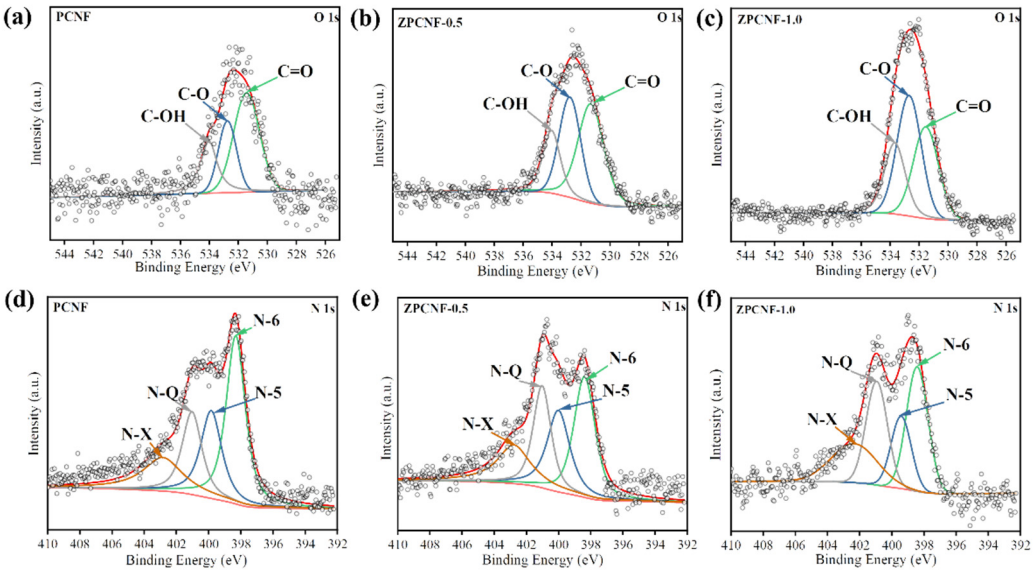

Figure S3. High resolution O 1s, N1s spectra of PCNF (a, d), ZPCNF-0.5 (b, e), ZPCNF-1.0 (c, f).

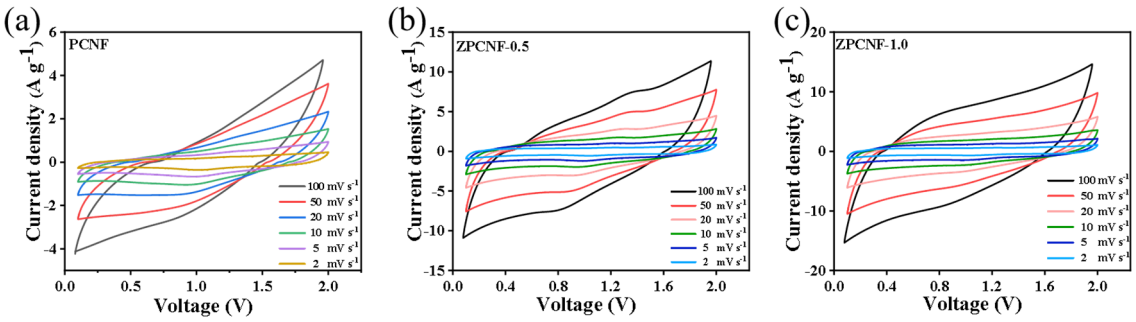

Figure S4. The CV curves of PCNF (a), ZPCNF-0.5 (b), ZPCNF-1.0 (c).

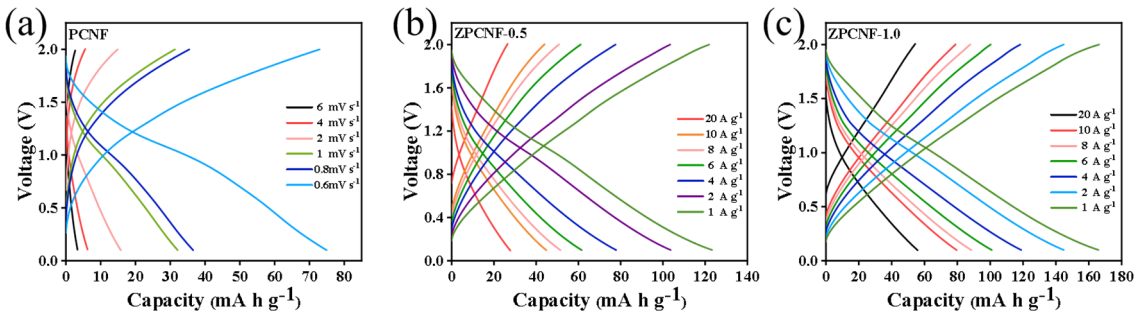

Figure S5. The GCD curves of PCNF (a), ZPCNF-0.5 (b), ZPCNF-1.0 (c).

Sample	*Specific surface area (m^2 g^{-1})*	*Pore Volume (cm^3g^{-1})*	*C/ %*	*N / %*	*O/ %*
PCNF	**2.9**	**0.0029**	**91.04**	**4.51**	**4.45**
ZPCNF-0.5	**268.4**	**0.27**	**86.23**	**8.5**	**5.27**
ZPCNF-1.0	**301.9**	**0.29**	**82.8**	**10.13**	**7.07**
ZPCNF-1.5	**418.3**	**0.33**	**79.15**	**12.78**	**8.07**

Table S2. Porosity parameters and Elements analysis of PCNF, ZPCNF-0.5, ZPCNF-1.0 and ZPCNF-1.5.

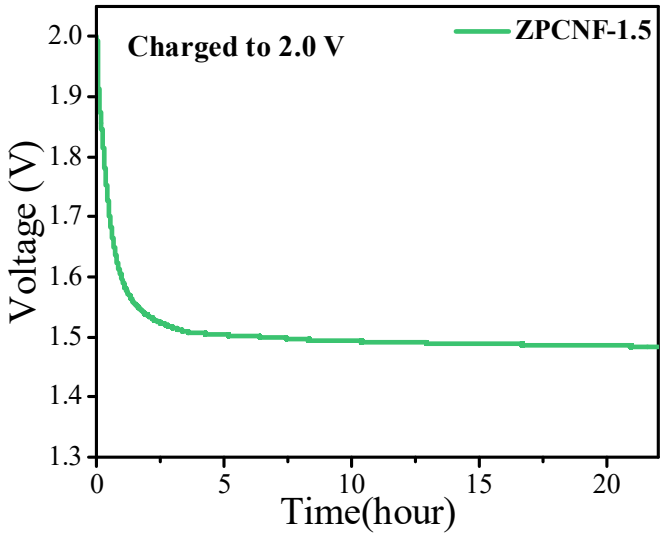

Figure S6. Self-discharge curves of Zn//ZPCNF-1.5 ZHSCs within the potential windows of 0.1–2.0 V.