Facile room temperature solution phase synthesis of ZIF-67/Ni hybrid-MOF battery-type material for supercapacitor applications.

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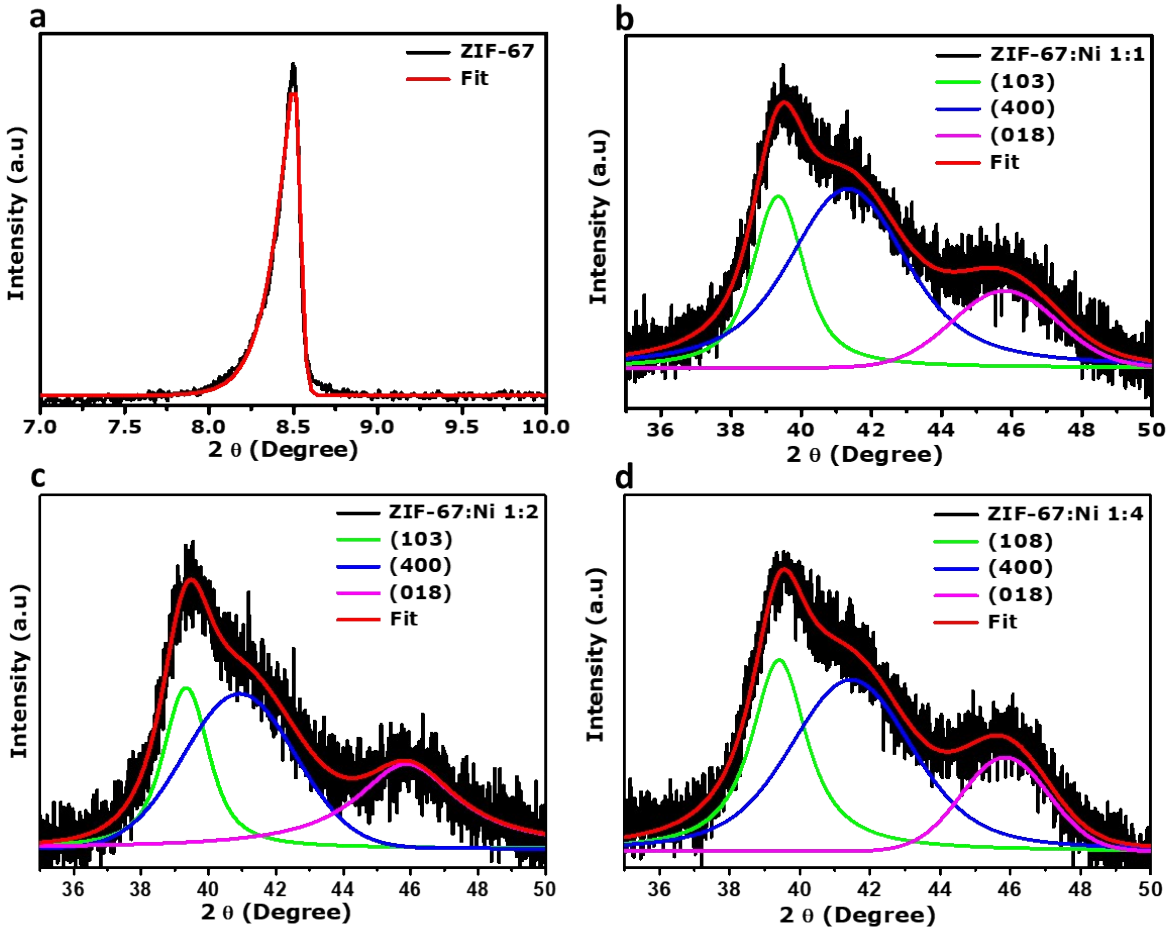
Supplementary information

Fig. S1 XRD peak of (a) ZIF-67, (b) ZIF-67: Ni (1:1), (c) ZIF-67: Ni (1:2), and (d) ZIF-67: Ni (1:4) fitting of the most intense reflections using pseudo-Voigt profiles



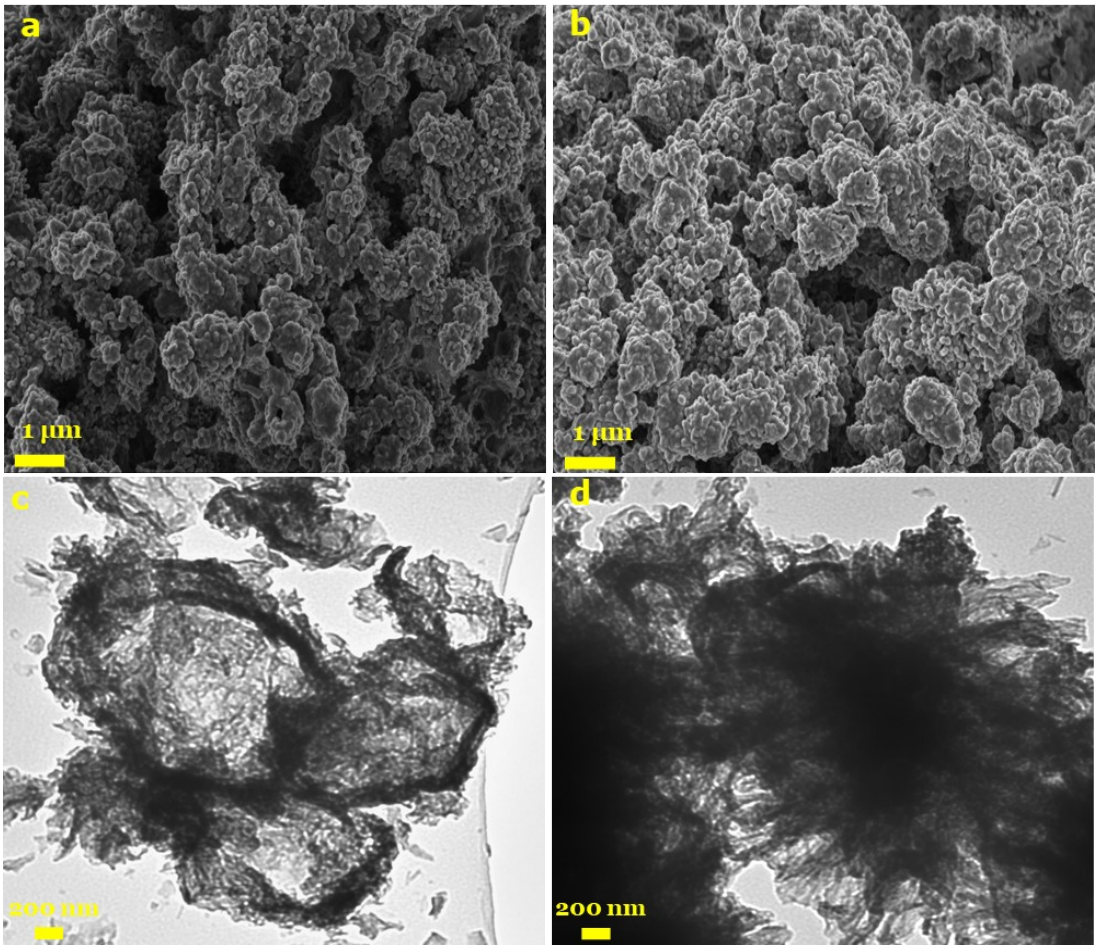


Fig. S2: (a-b) SEM of ZIF-67: Ni (1:1) and ZIF-67: Ni (1:4) and (c-d) TEM of ZIF-67: Ni (1:1) and ZIF-67: Ni (1:4).

Table. S1: Composition of the elements in atomic percentage contained in ZIF-67: Ni (1:2)

Elements atomic	Percentage
Ni 2p	17.41
Co 2p	9.26
C 1s	16.05
O 1s	56.8
N 1s	0.48

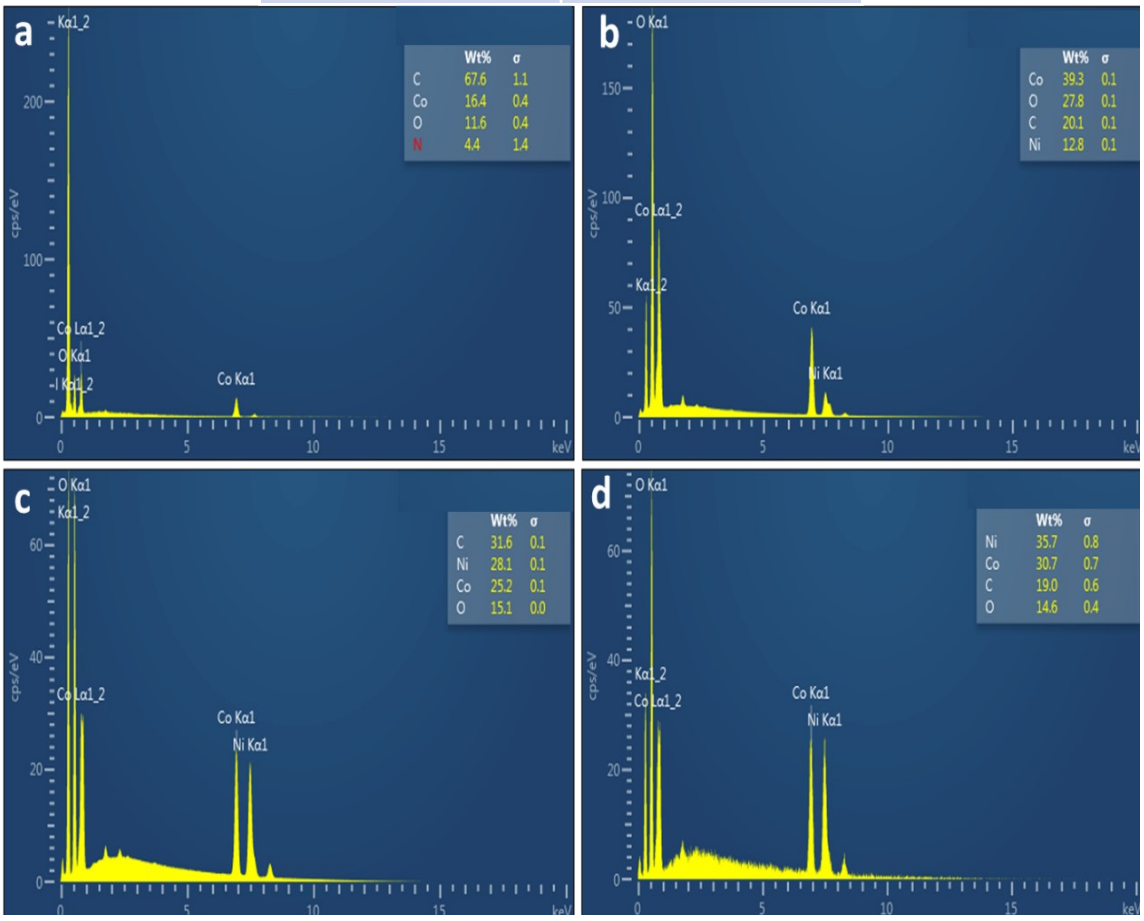


Fig. S3: EDX of (a) ZIF-67, (b) ZIF-67: Ni (1:1), (c) ZIF-67: Ni (1:2) and (d) ZIF-67: Ni (1:4).

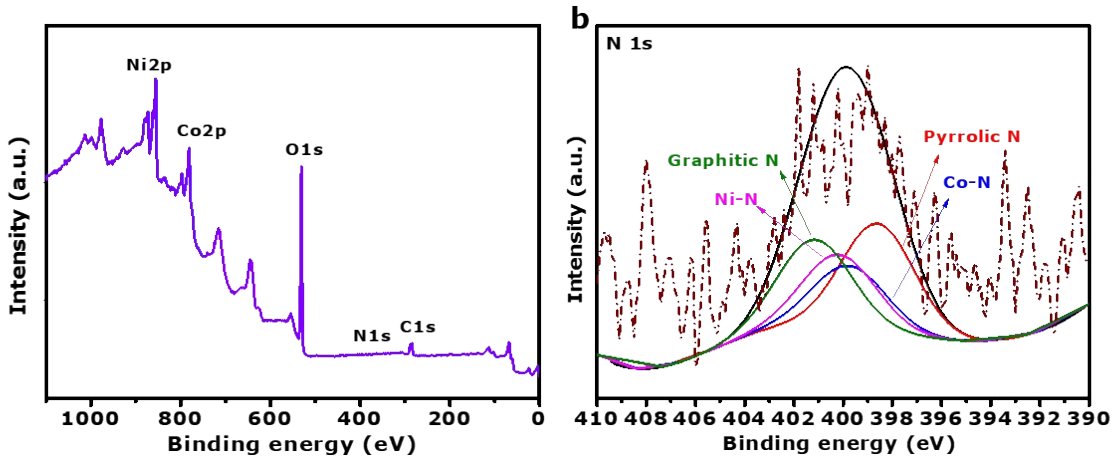


Fig. S4: (a) XPS Survey spectrum, (b) deconvoluted XPS of N 1s spectra of ZIF-67: Ni (1:2)

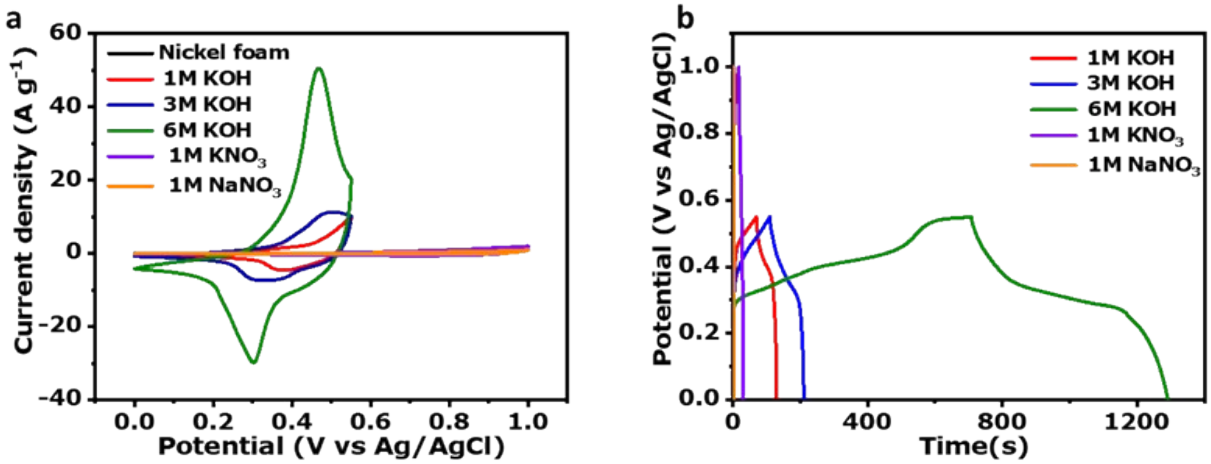


Fig. S5: Comparison of CV curves at 10 mV s^{-1} and (b) CD curves of ZIF-67: Ni (1:2) at different electrolytes

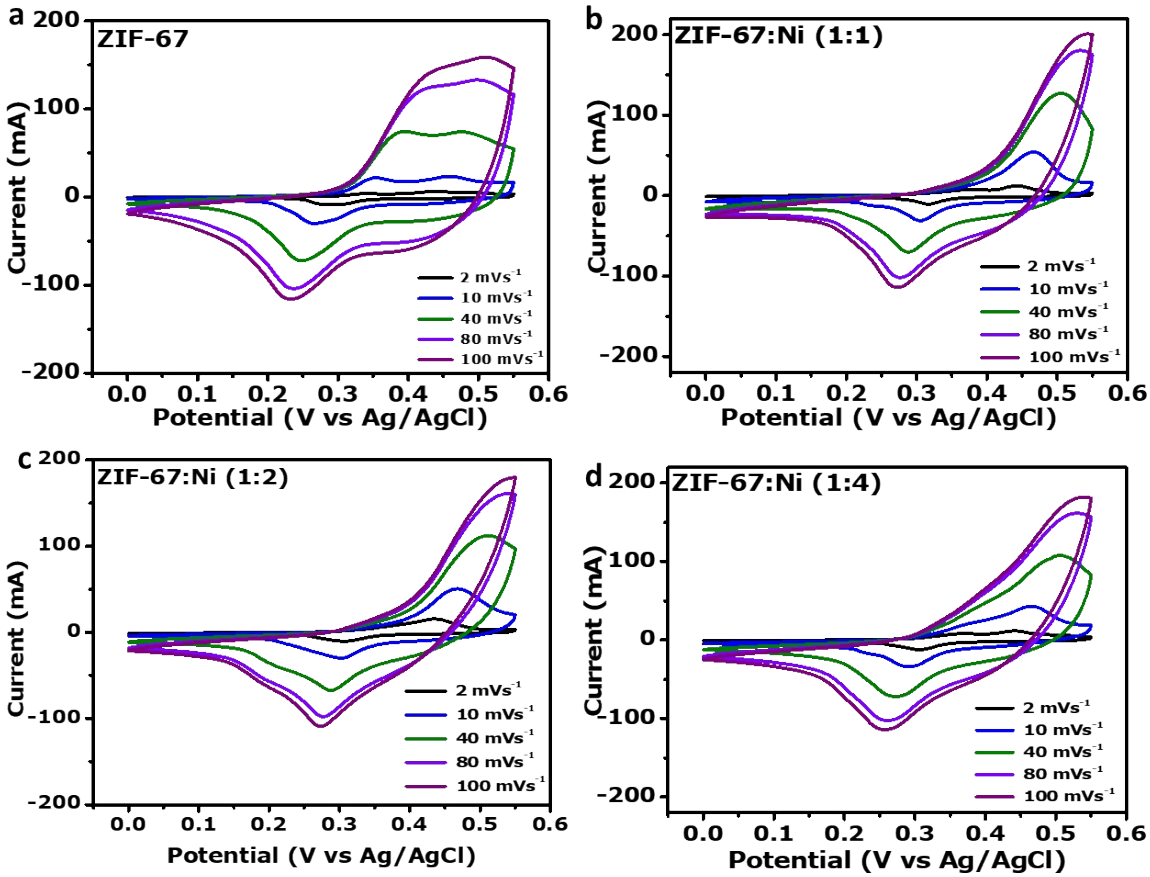


Fig. S6 CV curves at different scan rate of (a) ZIF-67, (b) ZIF-67: Ni (1:1), (c) ZIF-67: Ni (1:2) and (d) ZIF-67: Ni (1:4).

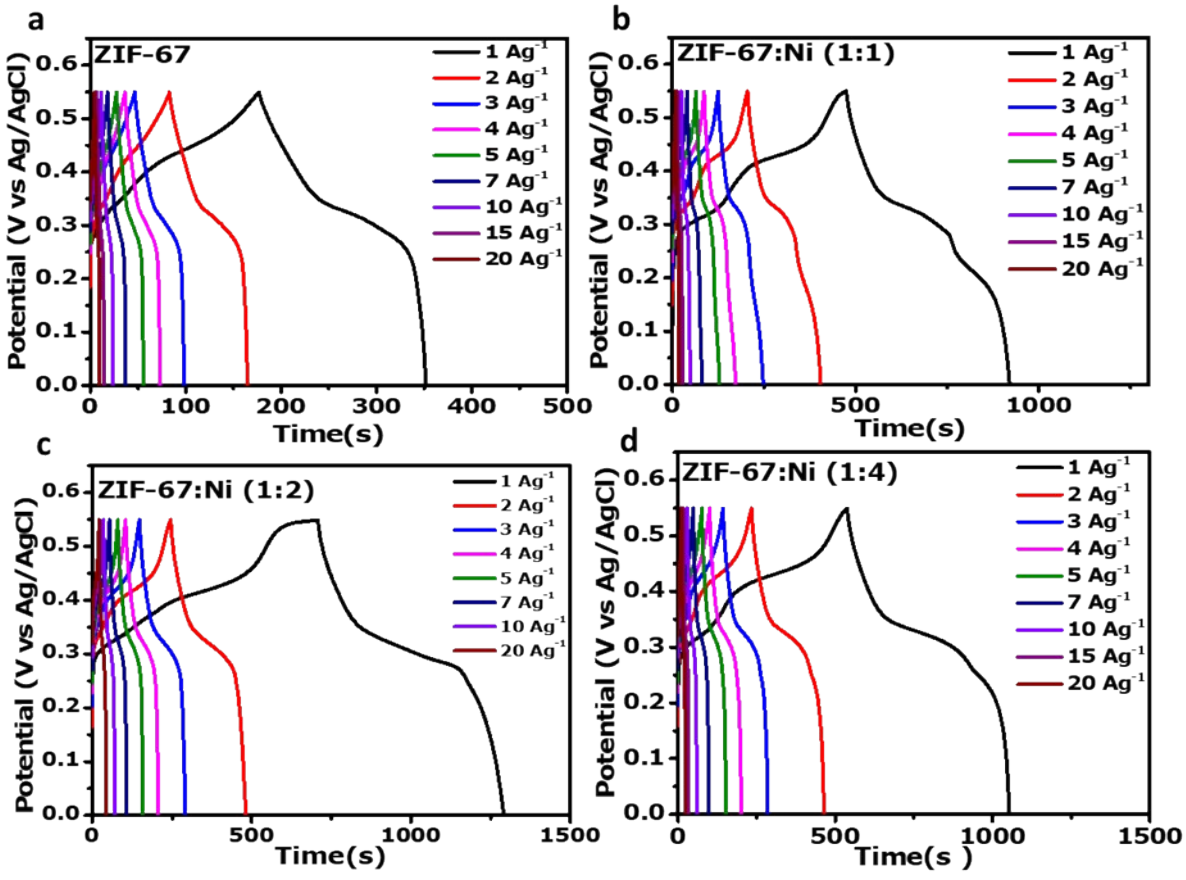


Fig. S7 GCD Curves of (a) ZIF-67, (b) ZIF-67: Ni (1:1), (c) ZIF-67: Ni (1:2) and (d) ZIF-67: Ni (1:4).

$$C(\omega) = C'(\omega) - j\,C''(\omega) \qquad (1)$$

$$C'(\omega) = \frac{Z''(\omega)}{-\omega\,|Z(\omega)|^2} \qquad (2)$$

$$C''(\omega) = \frac{Z'(\omega)}{\omega\,|Z(\omega)|^2} \qquad (3)$$

where Z' (ω) and Z" (ω) represent the real and imaginary impedances (Ω), respectively. ω = 2πf is the angular frequency (rad/s).

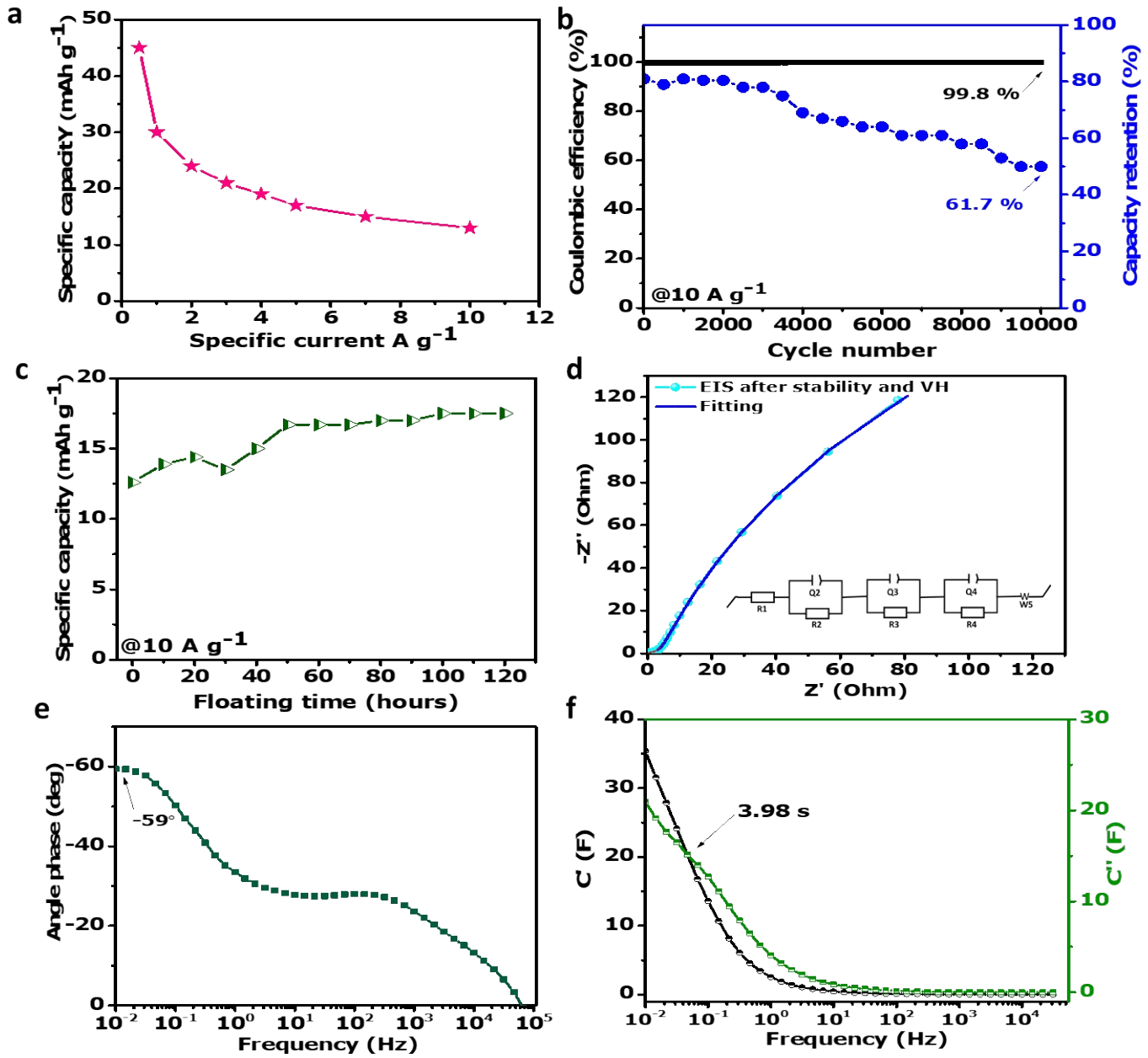


Fig. S8 (a) Cell capacity at different specific current, (b) Columbic efficiency and specific capacity retention vs. cycle number, (c) specific capacity as function of voltage holding time for a period of 120 h, (d)

EIS fitting equivalent circuit after stability and after voltage holding, (e) Bode plot of the device and (f) capacity C’ and C” variation as a function of frequency.