Supporting Information

Salt sealing strategy to prepare N, O-codoped porous bio-carbon derived from Ephedra Herb for supercapacitor

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Electrochemical Measurements

1. Fabrication of three-electrode system

In a three-electrode system, the tested sample was loaded onto a normal the glassy carbon electrode (5 mm diameter). Generally, accurately weighed (4.0 mg) sample was ultrasonically dispersed in 0.400 mL Nafion solution (0.25%, DuPont, USA). 8.0 μL of above suspension was dropped onto the working electrode surface and dried at room-temperature (about 0.4 mg cm^{-2}). All of the electrodes were immersed in 6 mol L^{-1} KOH electrolyte. The electrochemical performances were investigated by cyclic voltammetry (CV) and galvanostatic charge/discharge measurements from CHI 660E electrochemical workstation. The charge-discharge cycle stability was employed on a LAND CT2001A (Wuhan Land Instrument Company, China).

2. Fabrication of two-electrode supercapacitor

During the two-electrodes test, the electrodes were made by mixing S_{12} (80 wt%), polyvinylidene fluoride (PVDF, 10 wt%) and commercial carbon black (10 wt%). The mixture was coated on nickel foam and then pressed at 15 MPa followed by drying at 393 K for 12 h. A button-type supercapacitor was assembled with two similar carbon electrodes (about 2.6 mg cm^{-2}) separated by a polypropylene membrane in 6 M KOH electrolyte and 1 M Li_2SO_4. The charge-discharge performance was measured using a CHI 760E electrochemical workstation (CH Instrument, Shanghai, China). The specific capacitance of the S_{122} material (C, in F g^{-1}) was calculated based on the discharge curve according to equation (1).

$$C = \frac{2I}{m\frac{\Delta V}{\Delta t}}$$
(1)

Where I is the discharge current (A), $\frac{\Delta V}{\Delta t}$ (V s^{-1}) is the slope obtained by fitting a straight line to the discharge voltage, and m is the mass (g) of active material in a single electrode.

The energy density (E, in W h kg^{-1}) and average power density (P, in W kg^{-1}) were calculated according to equation (2) and (3).

$$E = \frac{1}{2*4*3.6}CV^2 \tag{2}$$

$$P = \frac{E}{\Delta td} \tag{3}$$

Where C is the specific capacitance of a single electrode in a two electrode supercapacitor (F g^{-1}), and V is the usable voltage after IR drop (V), and Δtd is the discharge time (h). [S1-S5]
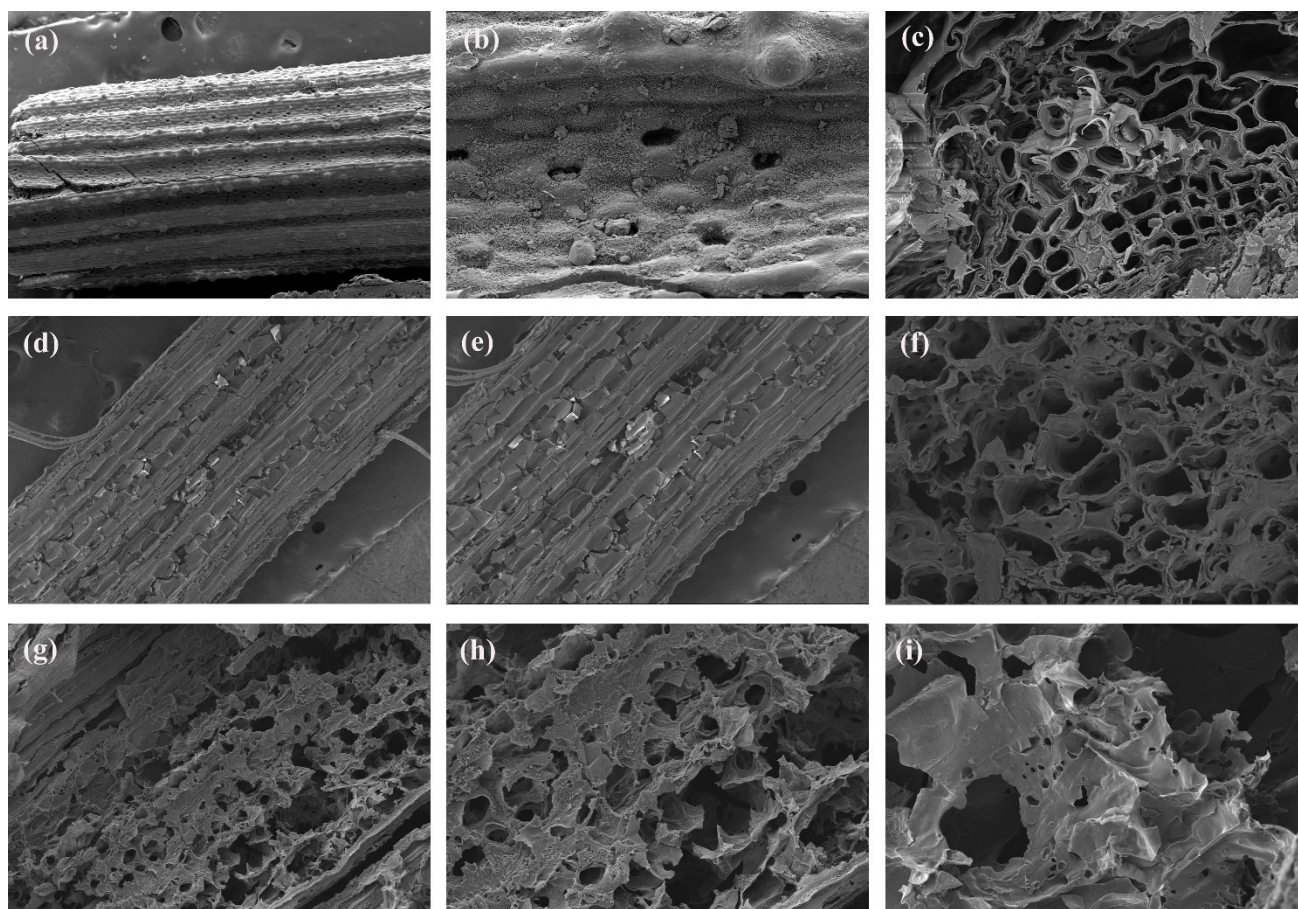
3. Materials Characterization

Fig. S1 SEM and HR-SEM images of the S_{10} (a, b, c), S_{11} (d, e, f) and S_{12} (g, h, i).
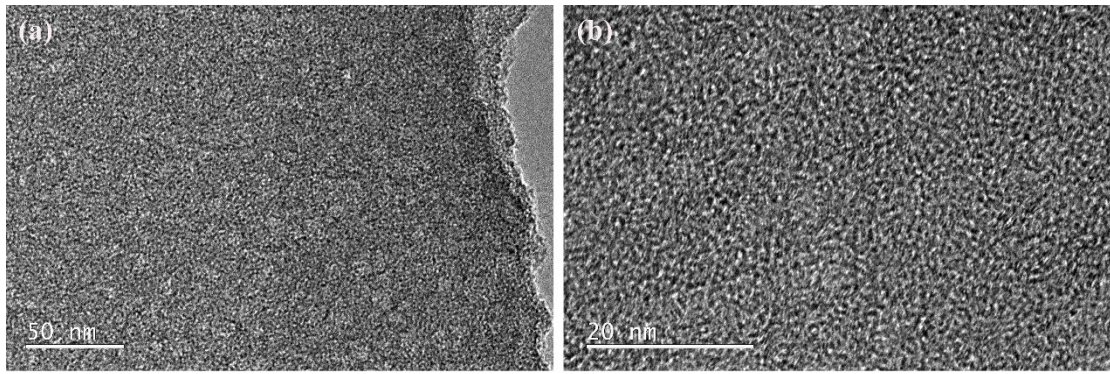
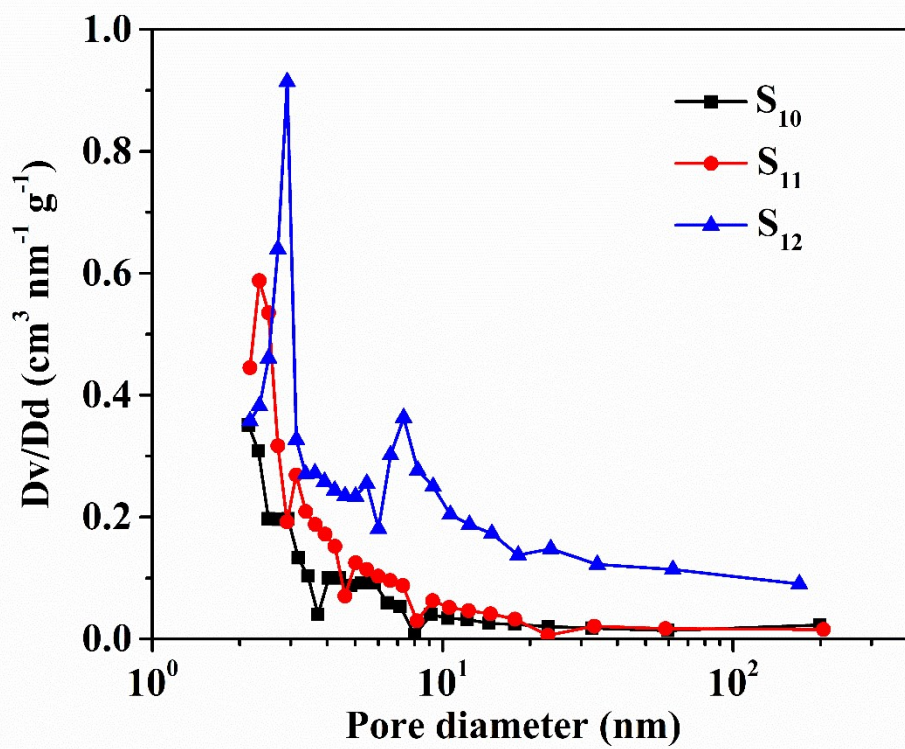**Fig. S2** TEM and HR-TEM images of the S_{12} (a, b).

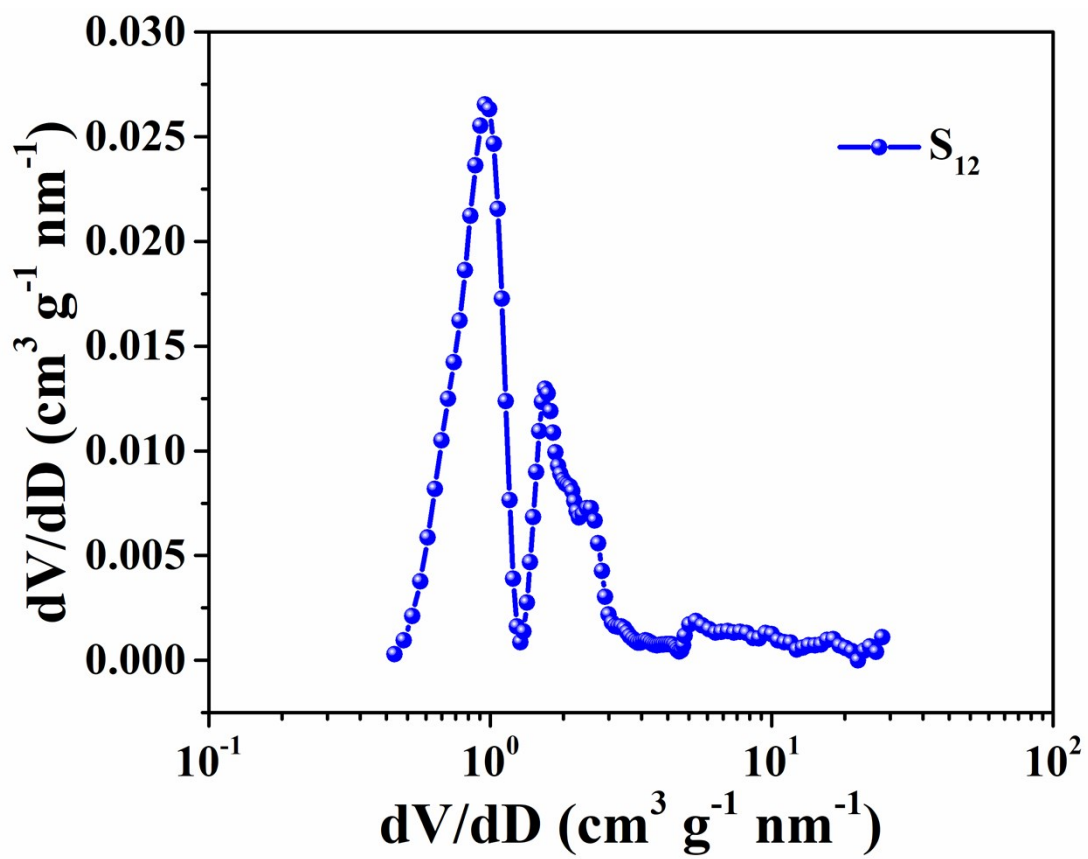Fig. S3 Pore size distribution of S_{10}, S_{11} and S_{12}.

Fig. S4 The S_{12} samples was further verified by the density functional theory (DFT) method.
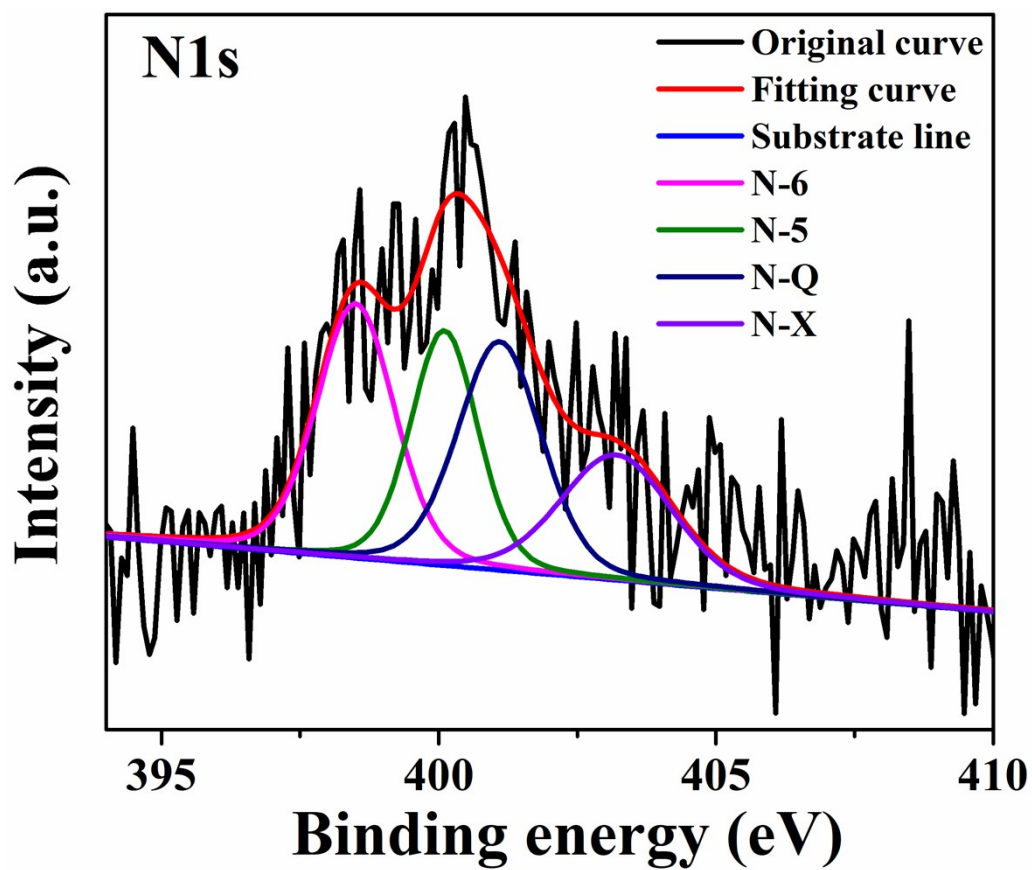
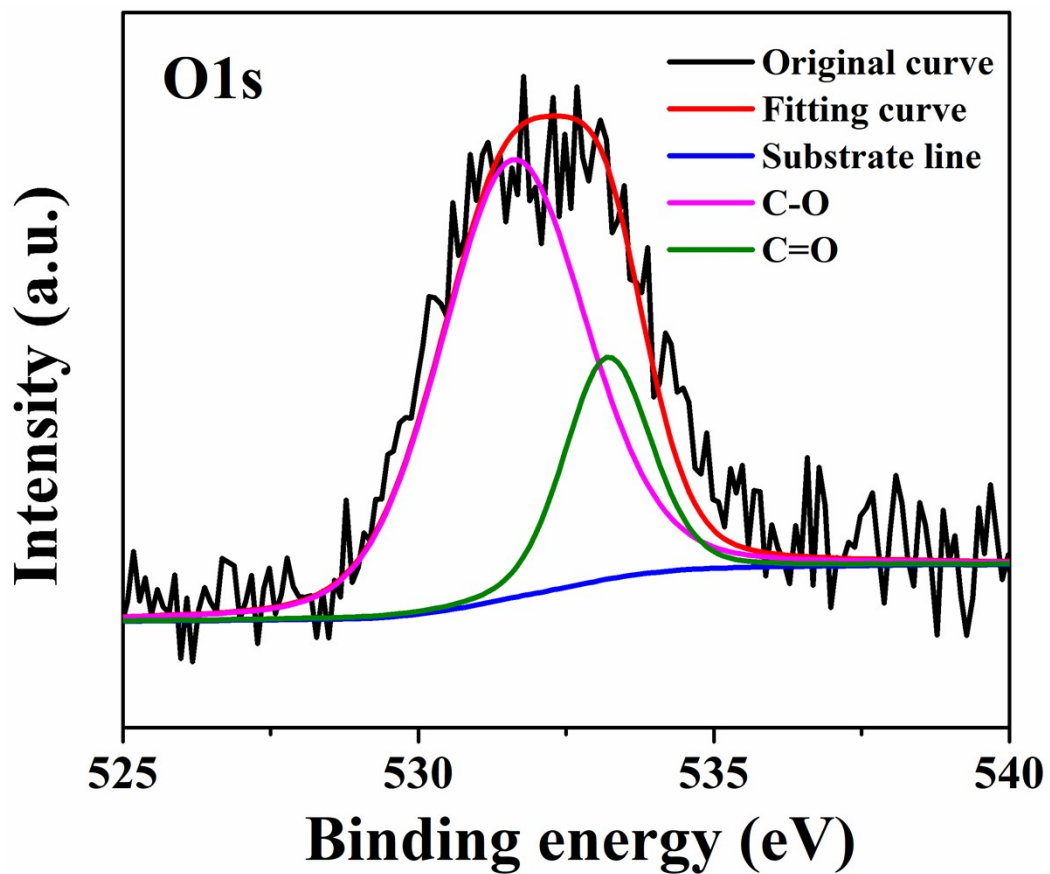**Fig. S5** High-resolution X-ray photoelectron spectroscopy (XPS) of N1s region for S$_{12}$ sample.

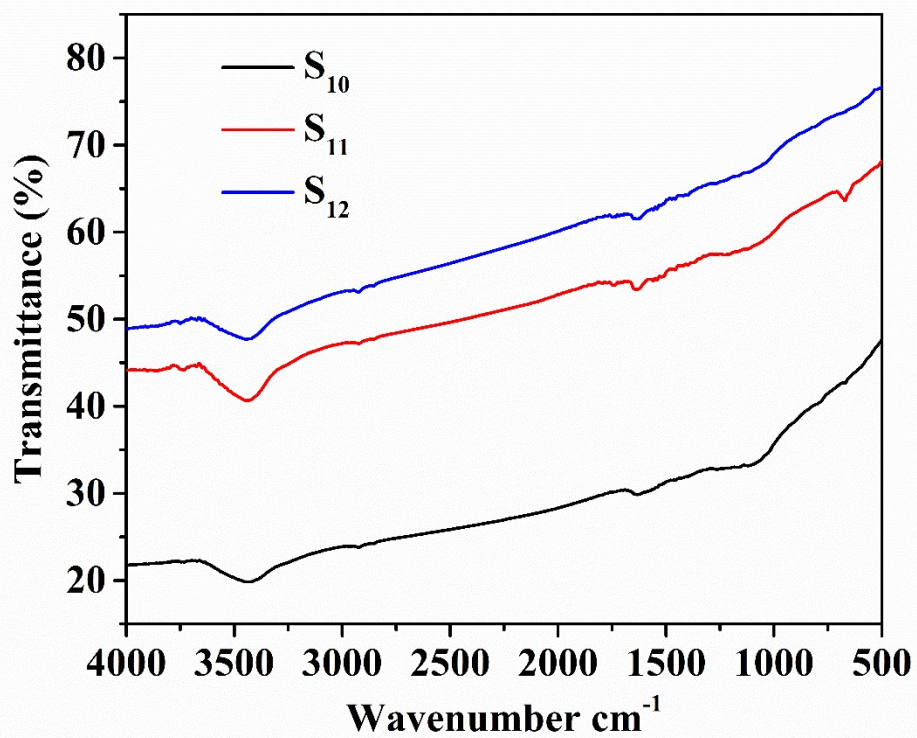**Fig. S6** High-resolution X-ray photoelectron spectroscopy (XPS) of O1s region for S_{12} sample.

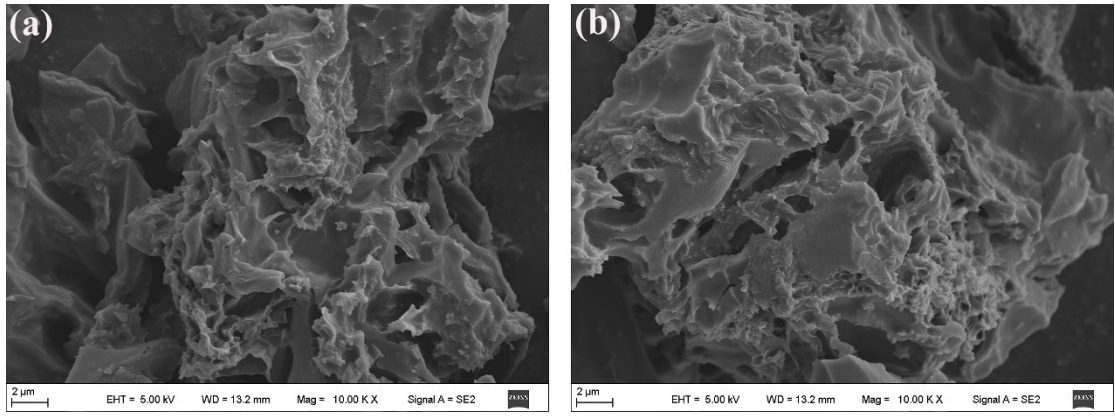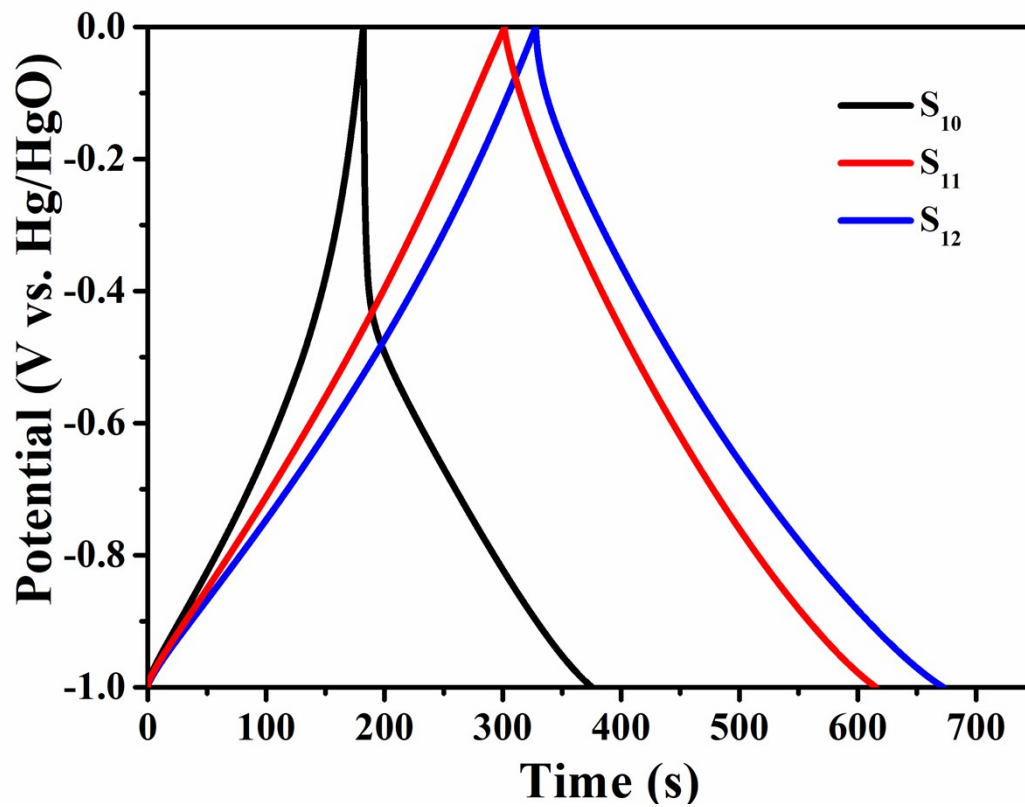**Fig. S7** FT-IR analysis of the obtained materials.[S6, S7]

Fig. S8 The SEM of S_{12} after cycling.

Fig. S9 GCDs patterns of S_{10}, S_{11}, S_{12} electrode at current density of 0.5 A g^{-1}.

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