Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information:

1. Electrochemical measurements employed in present work.

➢ **Measurements conducted in a three-electrode system using 6 mol L^{-1} KOH as electrolyte:**

A mixture of 80 wt% the carbon sample (~ 4 mg), 15 wt% acetylene black and 5 wt% polytetrafluoroethylene (PTFE) binder was fabricated using ethanol as a solvent. Slurry of the above mixture was subsequently pressed onto nickel foam under a pressure of 20 MPa, serving as the current collector. The prepared electrode was placed in a vacuum drying oven at 120 ºC for 24 h. A three electrode experimental setup taking a 6 mol L^{-1} KOH aqueous solution as electrolyte was used in cyclic voltammetry and galvanostatic charge-discharge measurements on an electrochemical working station (CHI660D, ChenHua Instruments Co. Ltd., Shanghai). Here, the prepared electrode, platinum foil (6 cm^2) and saturated calomel electrode (SCE) were used as the working, counter and reference electrodes, respectively.

Specific capacitances derived from galvanostatic tests can be calculated from the equation:

$$C = \frac{I\Delta t}{m\Delta V}$$

where C (F g^{-1}) is the specific capacitance; I (A) is the discharge current; Δt (s) is the discharge time; ΔV (V) is the voltage window; and m (g) is the mass of active materials loaded in working electrode.

Specific capacitances derived from cyclic voltammetry tests can be calculated from the equation:

$$C = \frac{1}{mv(V_{\mathrm{b}} - V_{\mathrm{a}})} \int_{V_{\mathrm{a}}}^{V_{\mathrm{b}}} I \mathrm{d}V$$

where C (F g^{-1}) is the specific capacitance; m (g) is the mass of active materials loaded in working electrode; v (V s^{-1}) is the scan rate; I (A) is the discharge current; V_{b} and V_{a} (V) are high and low voltage limit of the CV tests.

➢ **Measurements conducted in a two-electrode system using $[EMIm]BF_4$/AN as electrolyte:**

In a two-electrode cell, $[EMIm]BF_4$ and acetonitrile (AN) (weight ratio of 1:1) was adopted as electrolyte. A glassy paper separator was sandwiched between two electrodes, and each electrode contains a mixture of 80 wt% the carbon sample (~ 2 mg), 15 wt% acetylene black and 5 wt% polytetrafluoroethylene (PTFE) binder. Nickel foam serves as the current collector. The assembly of the test cell was done in a glove box filled with Ar.

Specific capacitances derived from galvanostatic tests can be calculated from the equation:

$$C = \frac{4I\Delta t}{m\Delta V}$$

where C (F g^{-1}) is the specific capacitance; I (A) is the discharge current; Δt (s) is the discharge time; ΔV (V) is the voltage window; and m (g) is the total mass of two electrodes.

Specific capacitances derived from cyclic voltammetry tests can be calculated from the equation:

$$C = \frac{2}{mv(V_b - V_a)} \int_{V_a}^{V_b} IdV$$

where C (F g^{-1}) is the specific capacitance; m (g) is the mass of active materials loaded in working electrode; v (V s^{-1}) is the scan rate; I (A) is the discharge current; V_b and V_a (V) are high and low voltage limit of the CV tests.

Specific energy density (E) and specific power density (P) derived from galvanostatic tests can be calculated from the equations:

$$E = \frac{1}{8} C \Delta V^2$$

$$P = \frac{E}{\Delta t}$$

where E (Wh kg^{-1}) is the average energy density; C (F g^{-1}) is the specific capacitance; ΔV (V) is the voltage window; P (W kg^{-1}) is the average power density and Δt (s) is the discharge time.

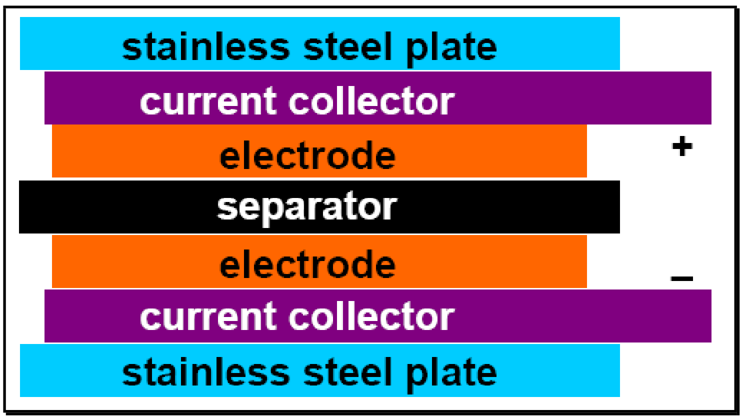


Fig. S1. Schematic illustration of a supercapacitor cell.

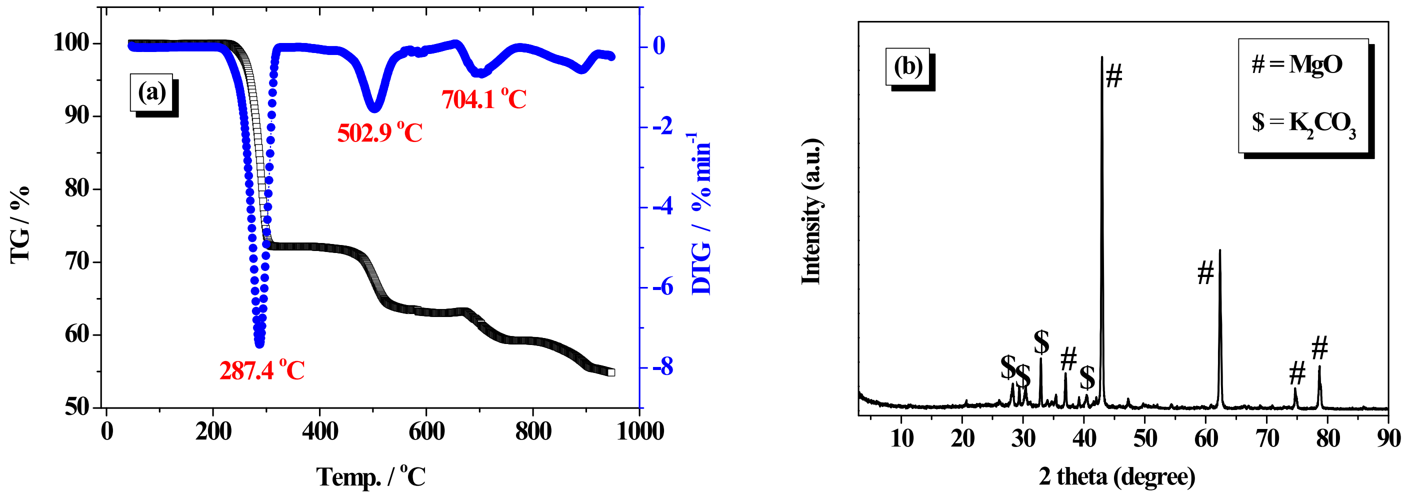


Fig. S2. (a) TG-DTG curve of potassium biphthalate and magnesium powder (the mass ratio of 3:1) and (b) XRD pattern of the **carbon-3:1-800** sample before washing with HCl solution.

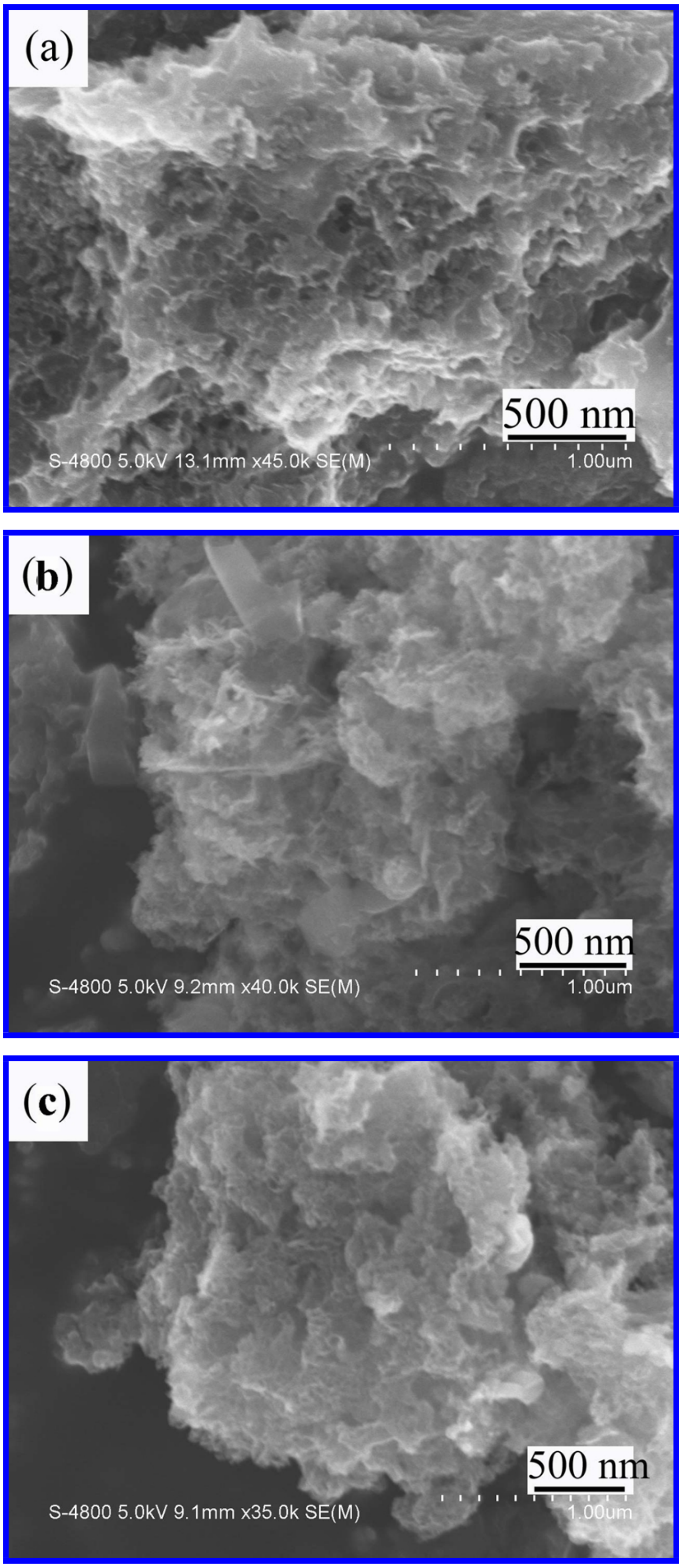
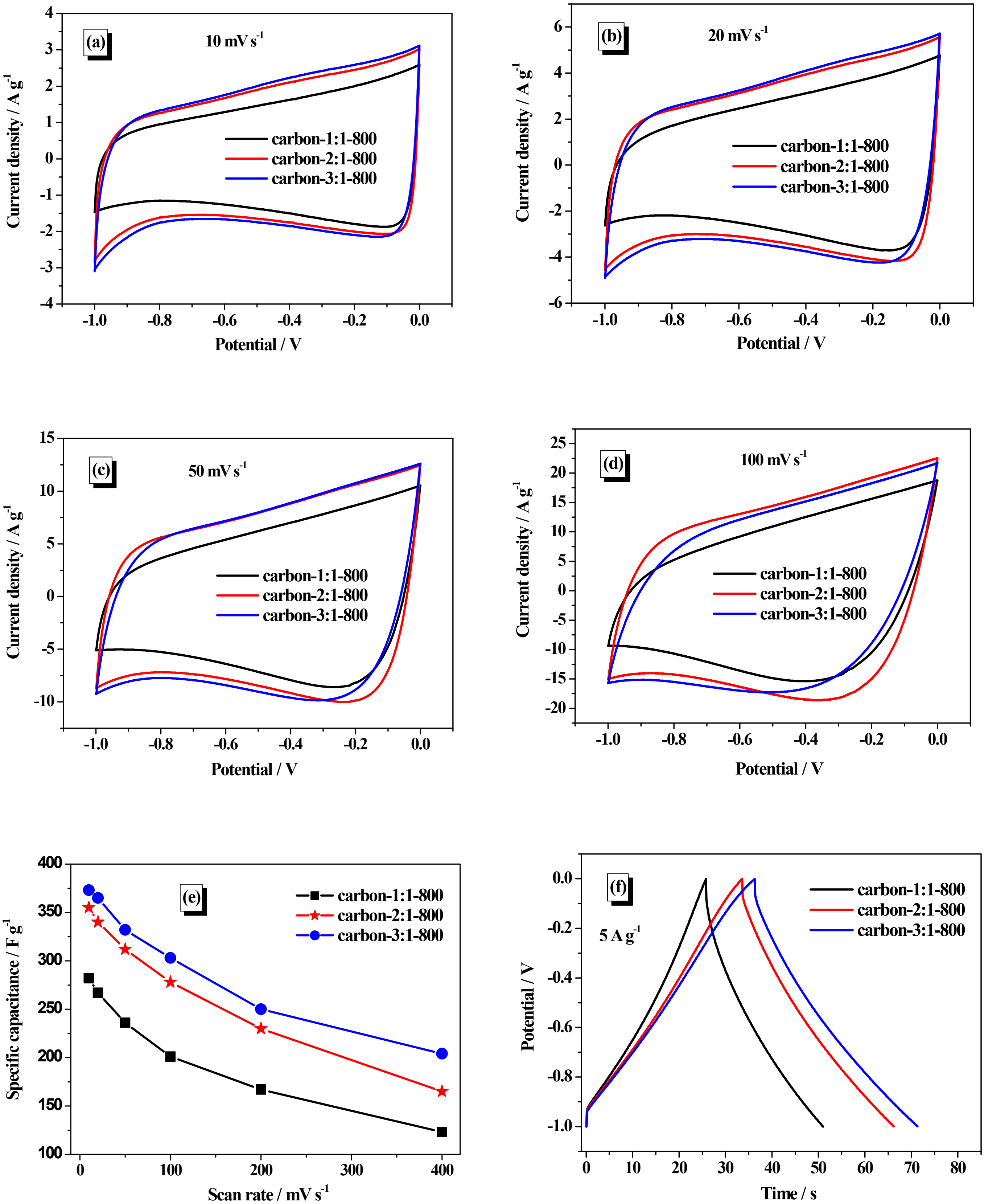


Fig. S3 FESEM images: (a) **carbon-3:1-800**; (b) **carbon-3:1-1000**; (c) **carbon-3:1-1200**.



(a)
10 mV s-1
Current density / A g-1
Potential / V
carbon-1:1-800
carbon-2:1-800
carbon-3:1-800
(b)
20 mV s-1
Current density / A g-1
Potential / V
carbon-1:1-800
carbon-2:1-800
carbon-3:1-800
(c)
50 mV s-1
Current density / A g-1
Potential / V
carbon-1:1-800
carbon-2:1-800
carbon-3:1-800
(d)
100 mV s-1
Current density / A g-1
Potential / V
carbon-1:1-800
carbon-2:1-800
carbon-3:1-800
(e)
Specific capacitance / F g-1
Scan rate / mV s-1
carbon-1:1-800
carbon-2:1-800
carbon-3:1-800
(f)
5 A g-1
Potential / V
Time / s
carbon-1:1-800
carbon-2:1-800
carbon-3:1-800

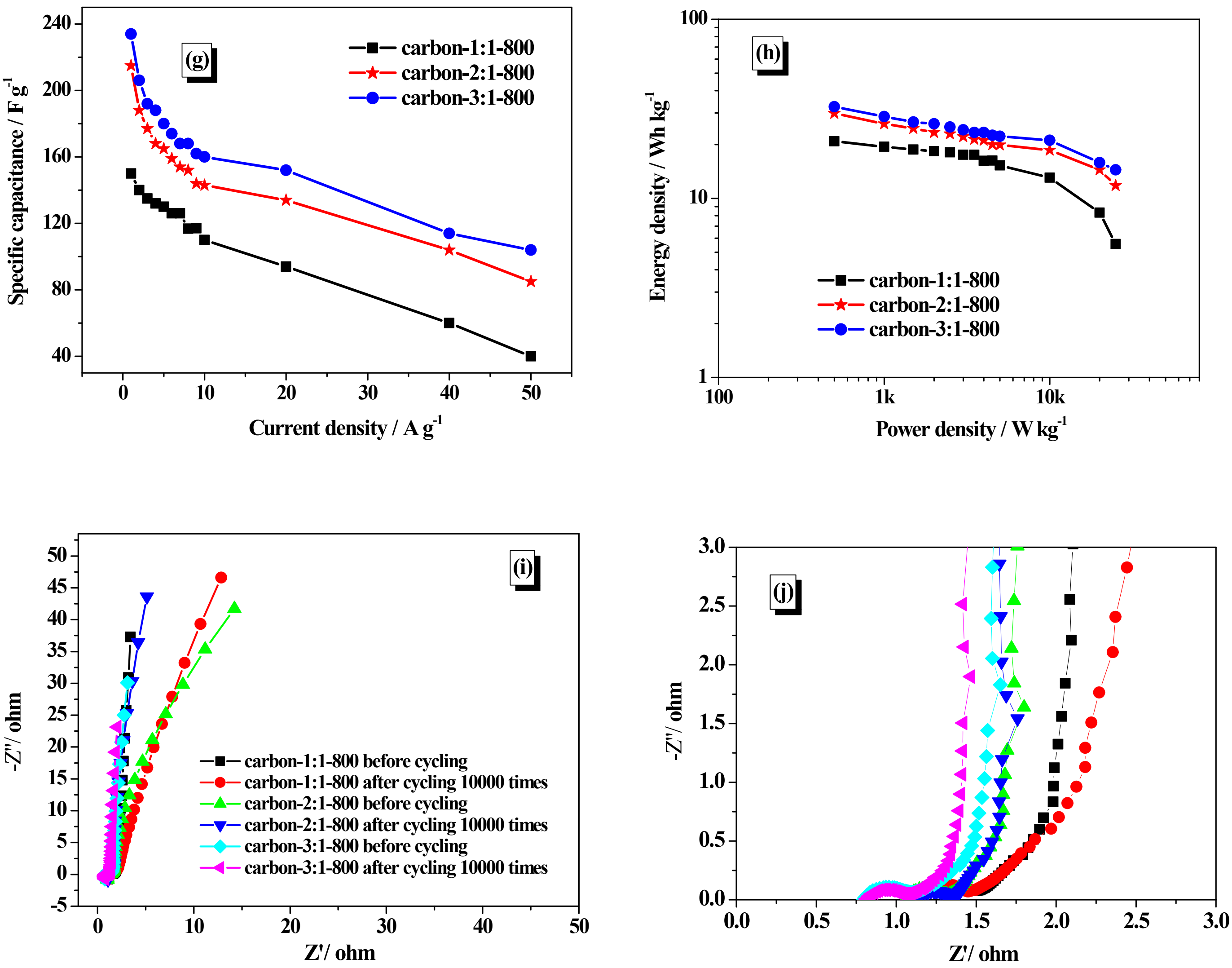


Fig. S4. Carbon-1:1/2:1/3:1-800 samples measured in a three-electrode system using 6 mol L^{-1} KOH as electrolyte: (a) CV curves at a scan rate of 10 mV s^{-1}; (b) CV curves at a scan rate of 20 mV s^{-1}; (c) CV curves at a scan rate of 50 mV s^{-1}; (d) CV curves at a scan rate of 100 mV s^{-1}; (e) specific capacitances calculated from CV curves; (f) GCD curves at a current density of 5 A g^{-1}; (g) specific capacitances calculated from GCD curves; (h) Ragone plots; (i) Nyquist plots before/after 10000 cycles as well as the enlarged ones (j).

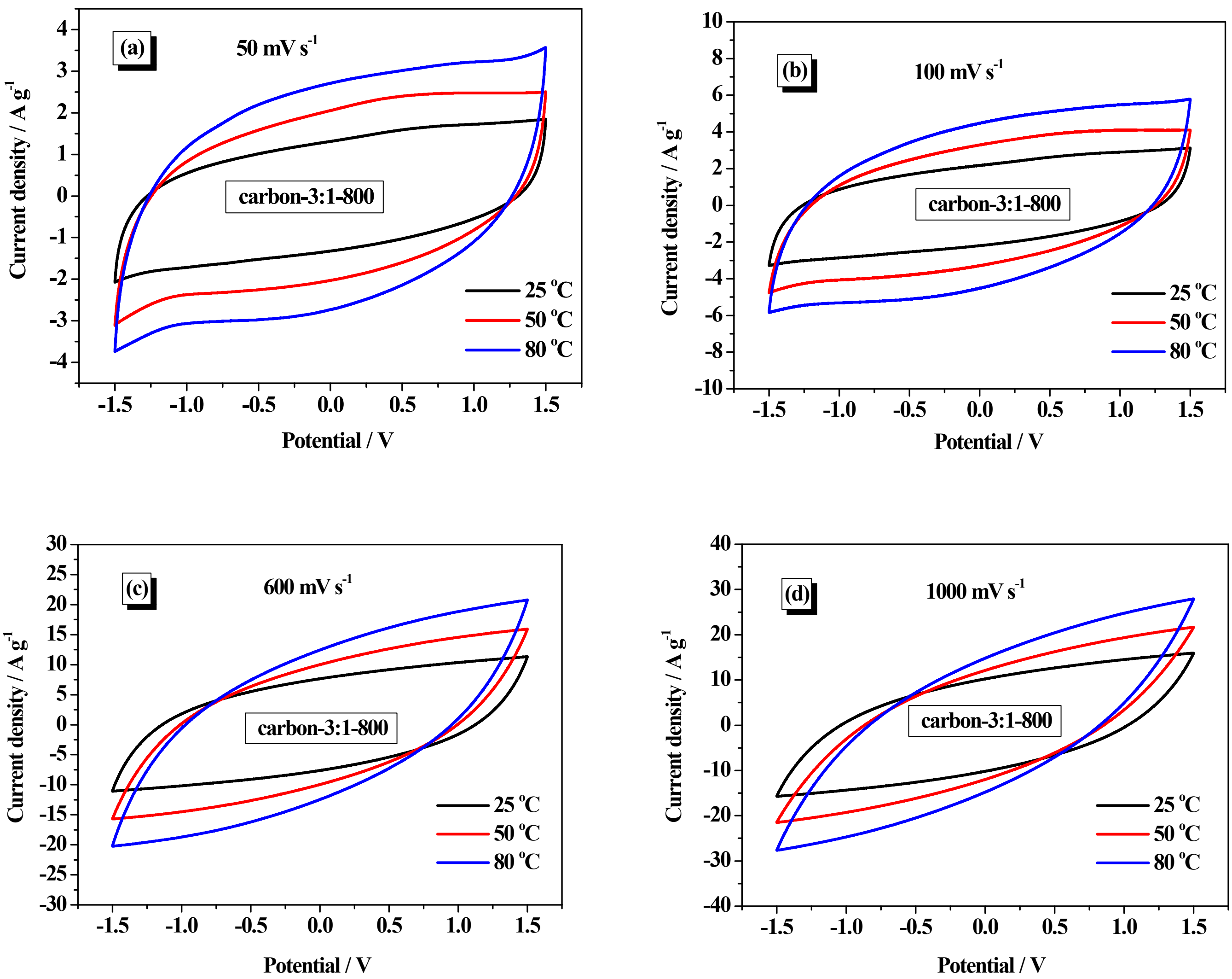


Fig. S5. Carbon-3:1-800 sample measured in a two-electrode system using $[EMIm]BF_4$/AN as electrolyte at the operation temperatures of 25/50/80 °C: CV curves at different scan rates.