

Supporting Information

Variable Texture of Few-Layer Ordered Macroporous Carbon for High-performance Electrochemical Capacitor Application

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Capacitance calculation and analysis

To deconvolute the capacitance into capacitive component and diffusion-limited component, we follow Ref. 27-28 to first deconvolute the current.

Analogous to Equation (1), we write

$$i = k_1^* v + k_2^* v^{1/2} \quad (\text{S1})$$

where the two terms arise from the rate-independent capacitive component and the diffusion limited component, respectively. If the coefficients for the

two terms are independent of potential, then they are proportional to the coefficients in Equation (1). This, however, is not the case in general. Therefore, k_1^* and k_2^* must be determined for each potential by plotting i/v against $v^{1/2}$, or $i/v^{1/2}$ against $v^{1/2}$, using the current i at different scan rates at the same potential (**Supplementary Figure S8**). From the resulting $k_1^*(V)$, we can calculate the capacitive current k_1^*v at a given potential V , which traces out the shaded loops in the CV curves in Figure. 4f and **Supplementary Figure. S9a-c**. This loop is also used to estimate the fraction of capacitive capacitance C_c (the shaded loop) in the total capacitance C_t (the entire loop) in the CV curve.

We follow Ref. 29 to calculate capacitance for all the electrodes, we write:

$$E_d = \int I U(t) dt \quad (S2)$$

$$C_d = 2E_d/U \quad (S3)$$

$$\eta_E = E_d / E_c \quad (S4)$$

Considering non-linearity appears in the GC/GD curves, the results obtained by this method will be more accurate. In addition, we have reduced the capacitance of the blank electrode from our results.

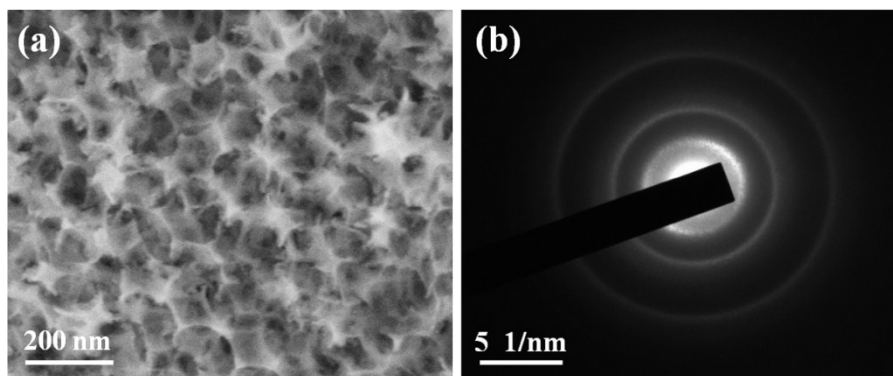


Figure S1. Scanning electron microscopy (SEM, a) of FOMC-0.5 sample, selected area electron diffraction (SAED, b) images of FOMC-2 sample.

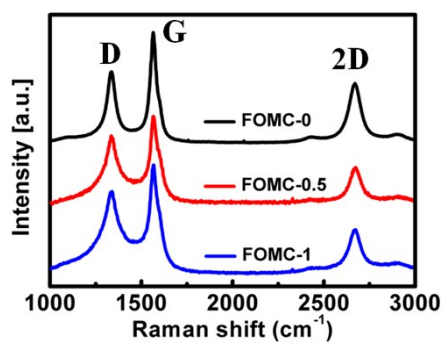


Figure S2. Raman spectra of the FOMC-0, FOMC-0.5 and FOMC-1 sample.

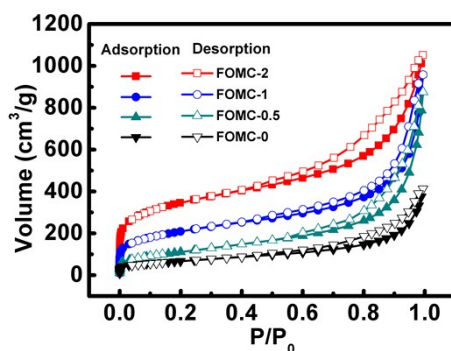


Figure S3. Nitrogen adsorption-desorption isotherms of FOMC-0, FOMC-0.5, FOMC-1 and FOMC-2 sample.

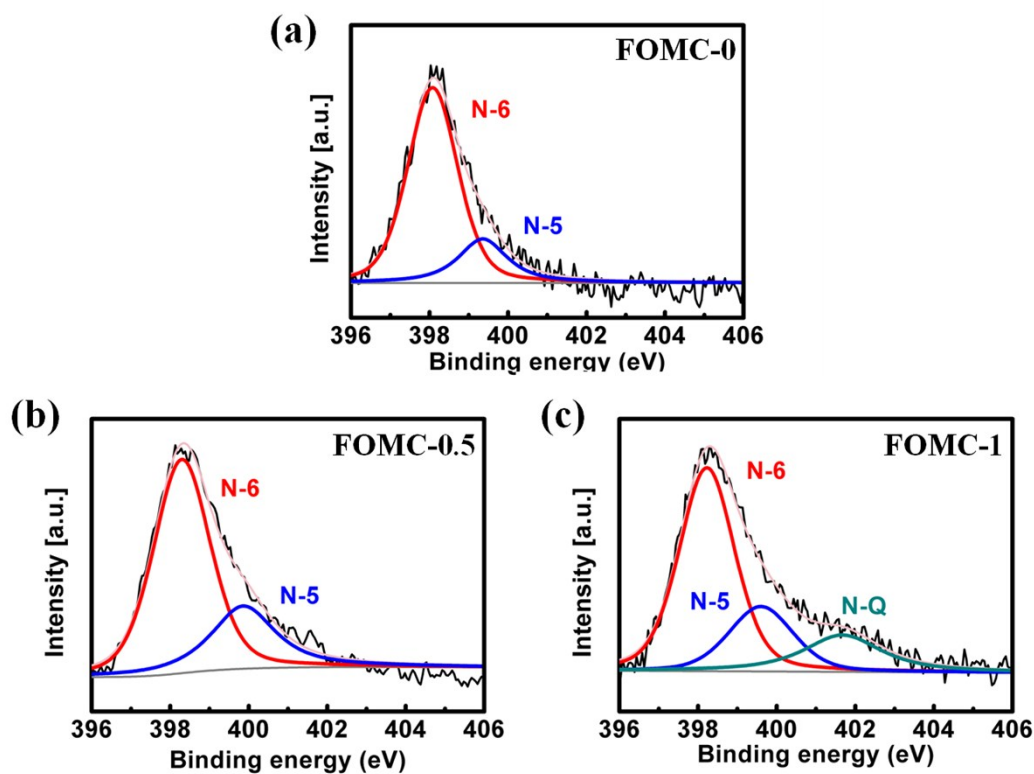


Figure S4. High-resolution XPS spectra of N 1s of (a) FOMC-0 sample, (b) FOMC-0.5 sample and (c) FOMC-1 sample.

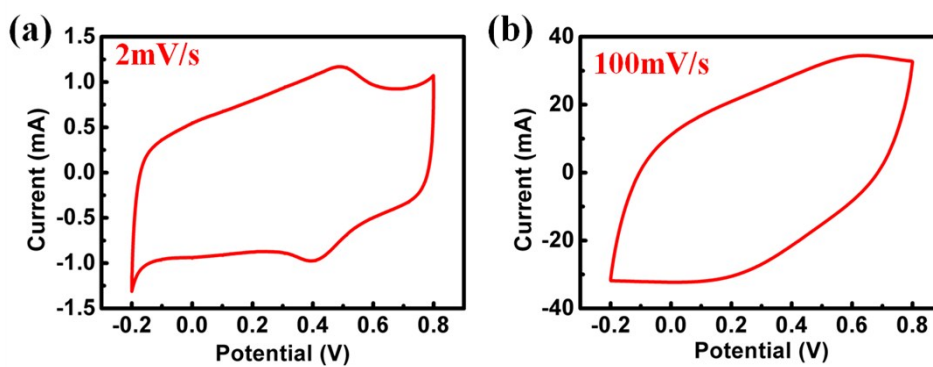


Figure S5. CV loop of FOMC-2 sample of three-electrode electrochemical cell. (a) at a scan rate of 2 mV/s, (b) at a scan rate of 100 mV/s.

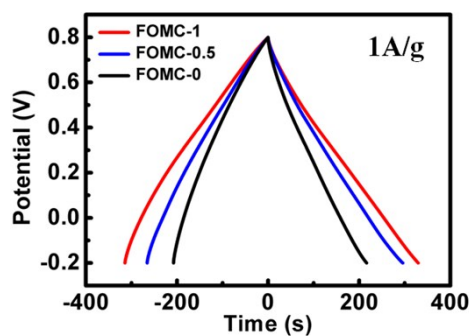


Figure S6. Galvanostatic charge/discharge curve of FOMC-0, FOMC-0.5 and FOMC-1 sample of three-electrode electrochemical cell.

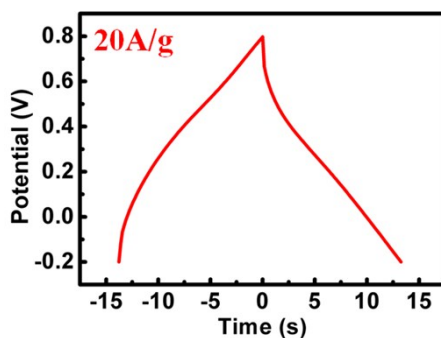


Figure S7. Galvanostatic charge/discharge curve of FOMC-2 sample of three-electrode electrochemical cell measured at 20 A/g.

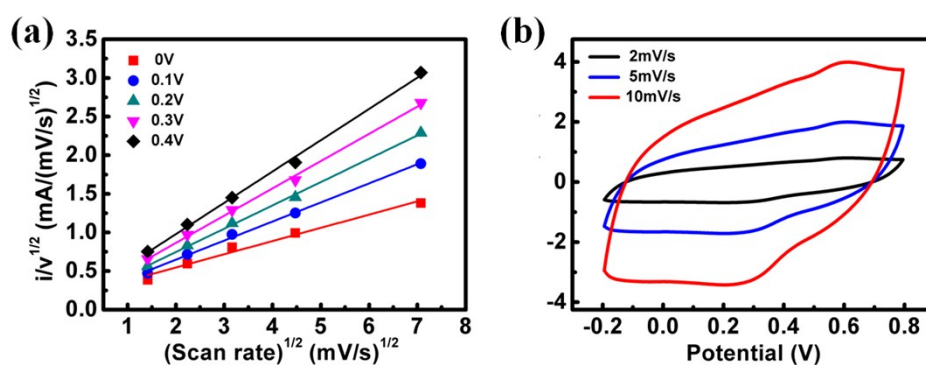


Figure S8. (a) k_1^* analysis (equation (2)), linear relationships obtained from FOMC-2 electrode, the slope is k_1^* and (b) capacitive current k_1^*v .

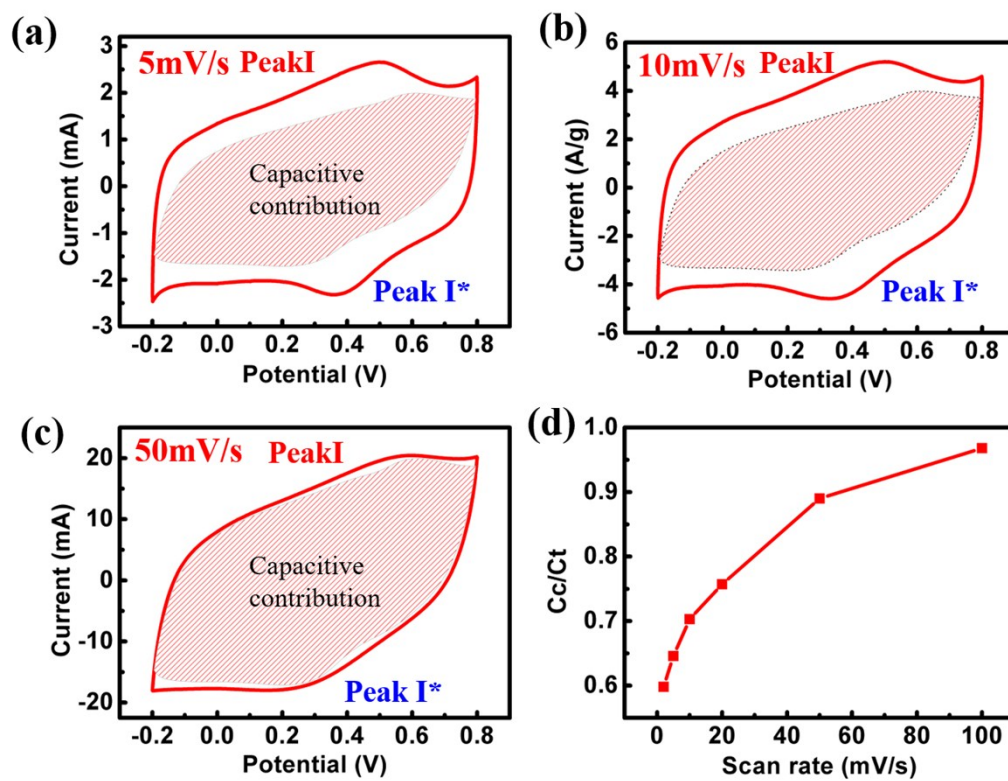


Figure S9. k_1 , k_2 analysis (equation (1)) of FOMC-2 sample at (a) 5 mV/s, (b) 10 mV/s, (c) 50 mV/s and (d) fraction of capacitive capacitance C_c in total capacitance C_t .