

Supplementary Materials

Carbon Dioxide Tornado-Type Atmospheric-Pressure-Plasma-Jet-Processed rGO-SnO₂ Nanocomposites for Symmetric Supercapacitors

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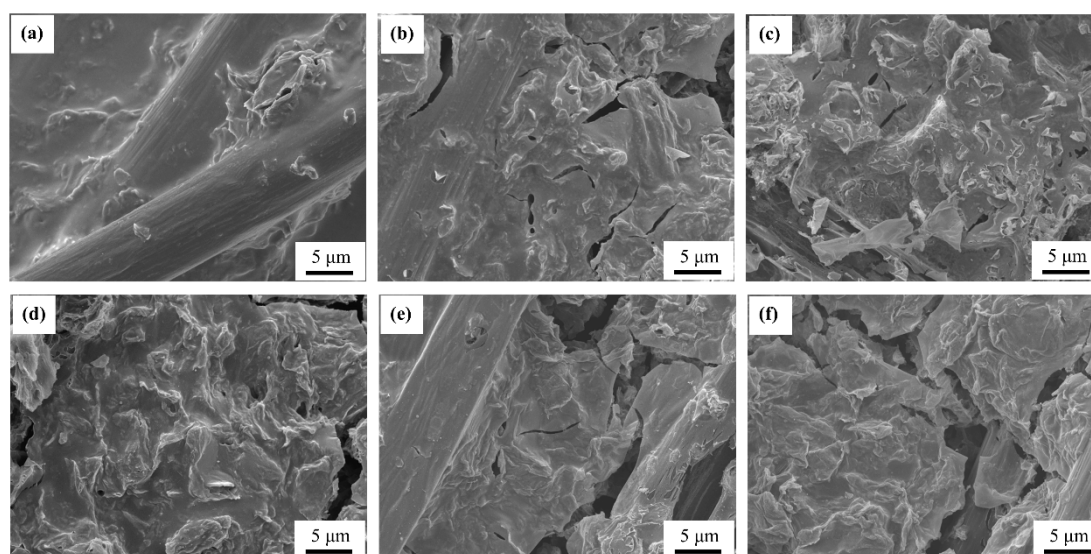


Figure S1. SEM images (3,000×) of rGO–SnO₂ electrodes scanned (a) zero, (b) one, (c) three, (d) five, (e) seven, and (f) nine times using CO₂ APPJ.

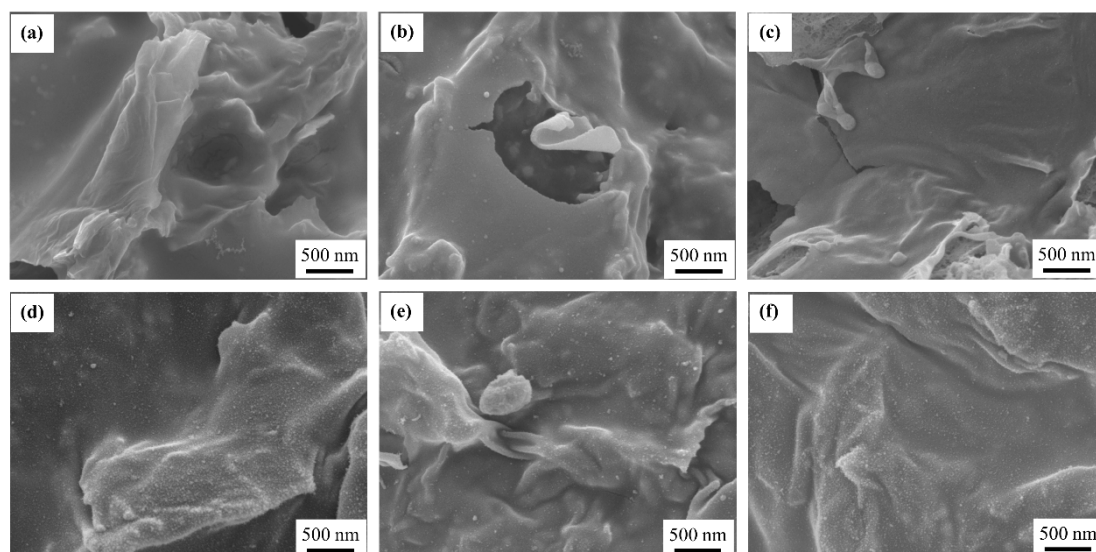


Figure S2. SEM images (30,000 \times) of rGO-SnO₂ electrodes scanned (a) zero, (b) one, (c) three, (d) five, (e) seven, and (f) nine times using CO₂ APPJ.

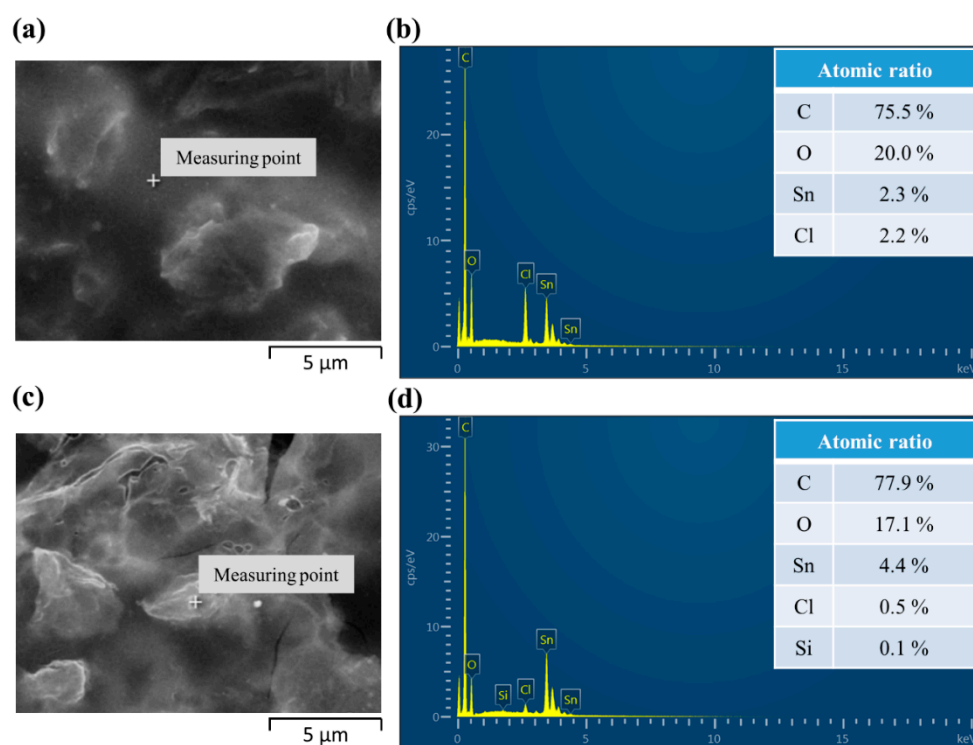


Figure S3. Energy-dispersive spectroscopy (EDS) analysis of the electrodes: (a) The measuring points of as-deposited electrode. (b) EDS analysis of as-deposited electrode. (c) The measuring points of seven-times APPJ-scanned electrode. (d) EDS analysis of seven-times APPJ scanned electrode.

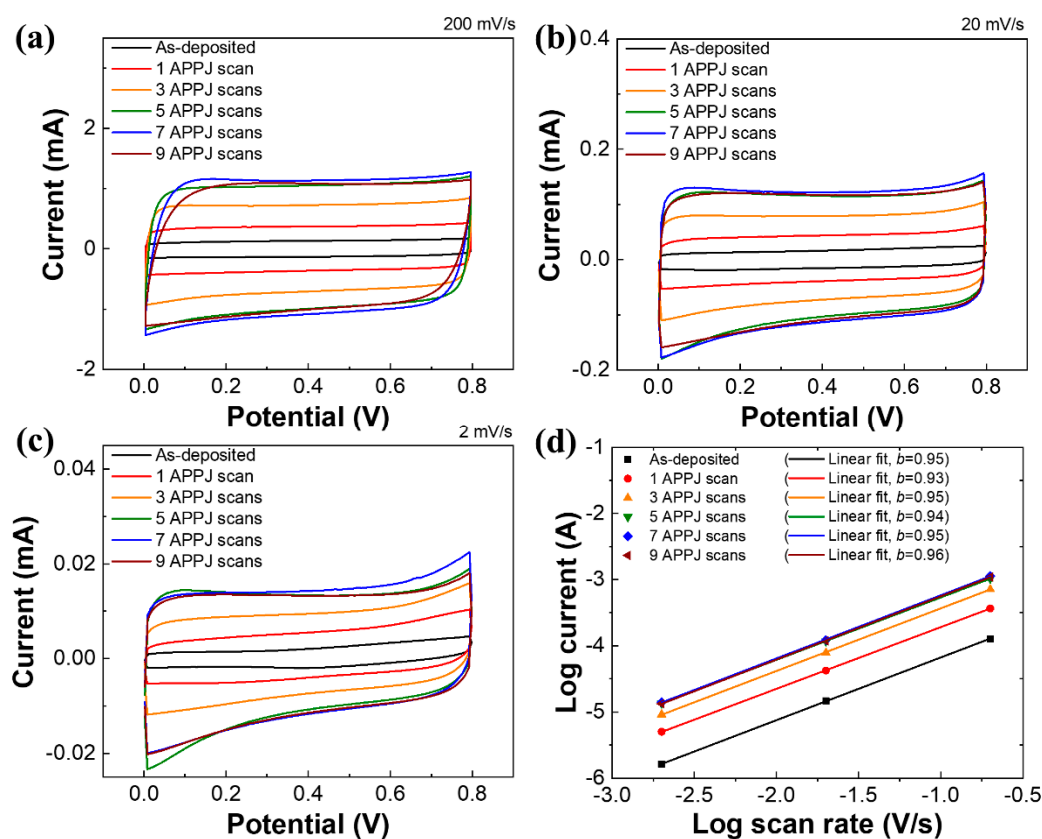


Figure S4. CV of bare carbon cloth SCs (without rGO–SnO₂) under potential scan rates of (a) 200 mV, (b) 20 mV, and (c) 2 mV. (d) Logarithm of currents and scan rates.

Table S1. Areal capacitance of bare carbon cloth SCs (without rGO–SnO₂).

Number of APPJ scans	Areal capacitance (mF/cm ²)		
	Potential scan rate (mV/s)		
	2	20	200
0	0.61	0.52	0.43
1	1.57	1.37	1.20
3	2.87	2.57	2.35
5	4.28	3.76	3.31
7	4.48	4.02	3.48
9	4.24	3.80	3.18

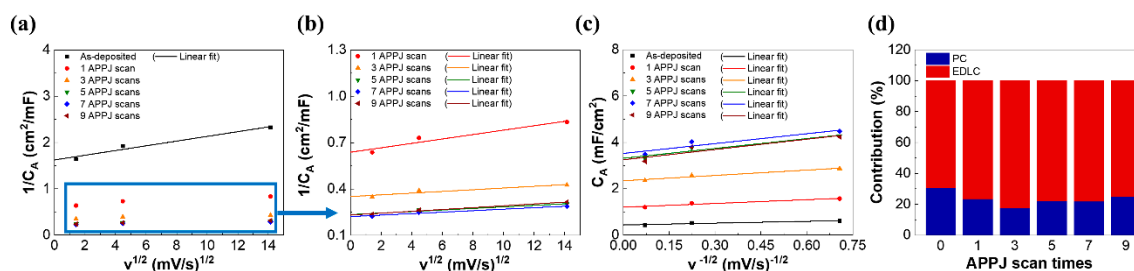


Figure S5. Trasatti plots of bare carbon cloth electrode SCs: (a,b) $1/C_A$ vs. $v^{1/2}$, (c) C_A vs. $v^{-1/2}$, and (d) capacitive contribution.

Table S2. Capacitive contribution of carbon cloth SCs.

Number of APPJ scans	C_{total} (mF/cm ²)	C_{in} (mF/cm ²)	C_{out} (mF/cm ²)	Capacitive contribution (PC:EDLC) (%)
0	0.62	0.19	0.43	30.6:69.4
1	1.57	0.37	1.20	23.6:76.4
3	2.85	0.51	2.34	17.9:82.1
5	4.27	0.96	3.31	22.5:77.5
7	4.52	1.00	3.52	22.1:77.9
9	4.32	1.08	3.24	25.0:75.0

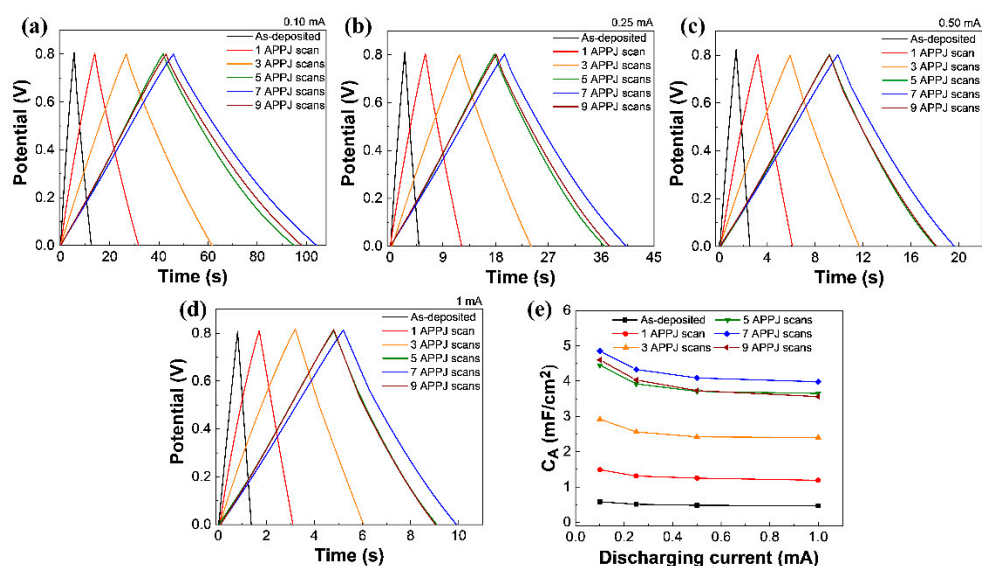


Figure S6. GCD of carbon cloth SC under constant current of (a) 0.10 mA, (b) 0.25 mA, (c) 0.50 mA, and (d) 1 mA. (e) Areal capacitances calculated based on GCD results.

Table S3. Areal capacitance of carbon cloth SCs calculated by GCD.

Number of APPJ scans	Areal capacitance (mF/cm ²)			
	Discharging current (mA)			
	0.10	0.25	0.50	1
0	0.58	0.51	0.48	0.47
1	1.49	1.31	1.25	1.19
3	2.92	2.56	2.42	2.40
5	4.45	3.92	3.71	3.65
7	4.85	4.33	4.09	3.98
9	4.60	4.03	3.73	3.56