

Electronic Supplementary Information

Electronic Supplementary Information is attached in this section to further support research findings.

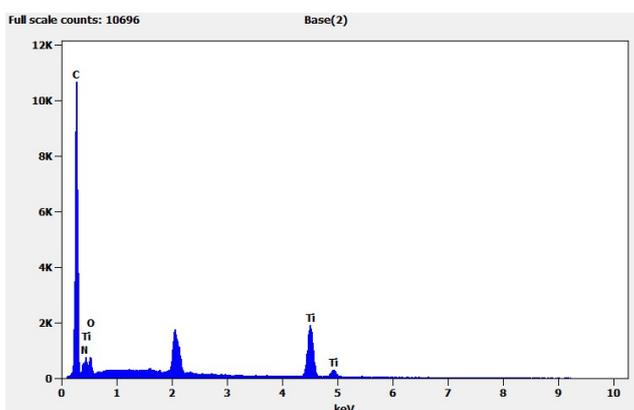


Fig. S1 Corresponding element content of enlarged area

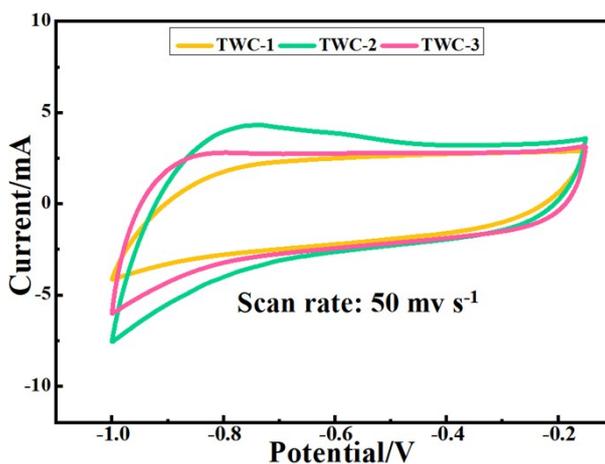


Fig. S2 CV Comparison of TWC-1, 2 and 3 at 50 mV s^{-1}

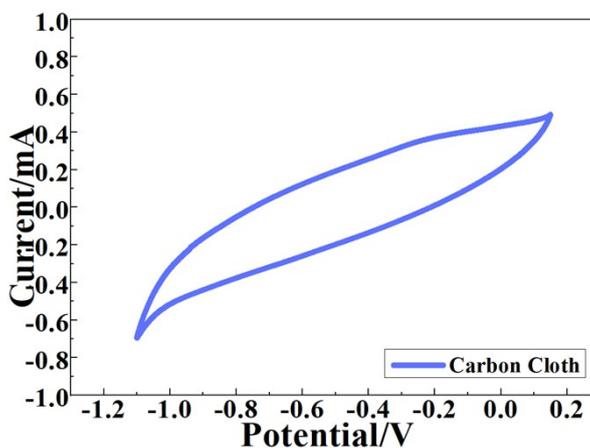


Fig. S3 CV of carbon cloth substrate at 25 mV s^{-1}

Table S1 load mass of active material and specific capacitance measured by mass ratio

Sample Num.	Load mass (mg)	Capacitance (F)	Current density (A g ⁻¹)	Specific Capacitance (F g ⁻¹)
TWC-1	1.76	0.575	0.5	326.6
TWC-2	1.87	0.194	0.5	363.5
TWC-3	1.53	0.523	0.5	342.1

Table S2 Fitting parameters for TWC-x

TWC-1	Name	Parameter	Error
1	Rs	5.41E+00	1.679
2	Q-Yo1	3.28E-03	50.37
3	Q-n1	6.15E-01	10.68
4	R1	2.53E+00	8.099
5	Q-Yo2	2.28E-02	1.132
6	Q-n2	8.59E-01	1.052
7	R2	9.84E+02	19.97
TWC-2	Name	Parameter	Error
1	Rs	4.15E+00	2.319
2	Q-Yo1	2.28E-02	1.325
3	Q-n1	8.68E-01	1.038
4	R1	1.15E+18	1.43E+16
5	Q-Yo2	6.94E-03	76.01
6	Q-n2	5.92E-01	17.3
7	R2	1.77E+00	13.56
TWC-3	Name	Parameter	Error
1	Rs	4.77E+00	2.305
2	Q-Yo1	6.94E-03	55.65
3	Q-n1	5.46E-01	13.85
4	R1	2.56E+00	10.8
5	Q-Yo2	2.18E-02	1.189

6	Q-n2	8.90E-01	0.924
7	R2	4.79E+04	474.3

Table S3 Consumption of zinc in full cell

Sample Num.	Zin consumption (mg)	Cathode mass (mg)	Total mass (mg)
TWC-1	0.37	1.98	2.35
TWC-2	0.43	2.01	2.44
TWC-3	0.62	1.95	2.57

Table S4 Technical parameters of carbon cloth

Specific Capacitance (F/g) at 1.0 mA/g	37.8
Thickness (mm)	0.36
Basic mass (g/m²)	130
Resistivity (mΩ*cm²)	<5
Tensile strength (N/cm)	10
Air permeability (sec)	<10