High-voltage aqueous symmetric supercapacitor based on 3D bicontinuous, highly-wrinkled, N-doped porous graphene-like ultrathin carbon sheets

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Fig. S1. Photographs of 3D BWGC sample

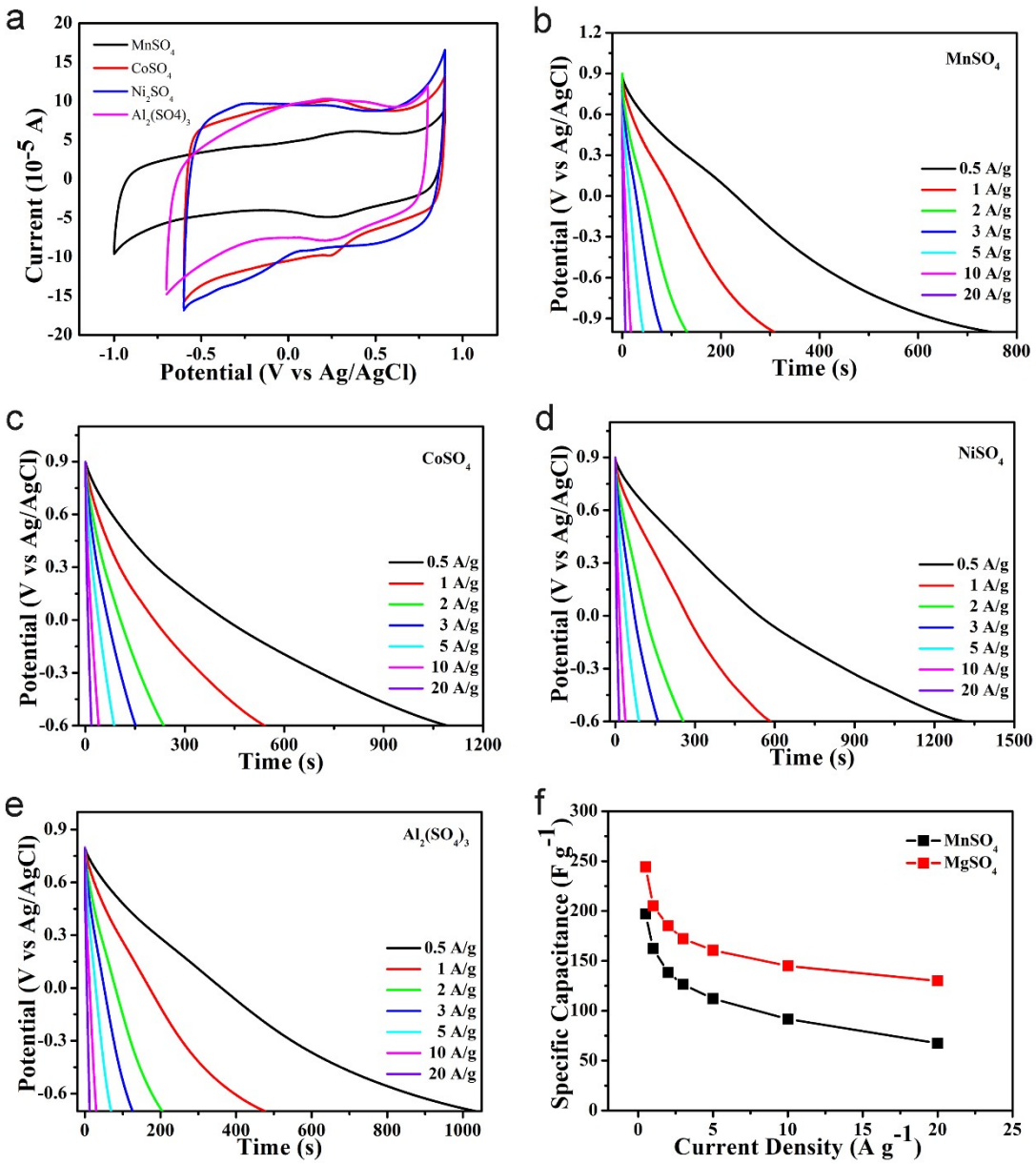

Fig. S2. (a) CV curves of 3D BWGC SCs in different electrolytes at scan rate of 5 mV/s. Galvanostatic discharge curve at different current density in the aqueous electrolytes of (b) 4 M $MnSO_4$, (c) 1.3 M $CoSO_4$, (d) 1.7 M Ni_2SO_4, and (e) 1 M $Al_2(SO_4)_3$. (f) Specific capacitances at different current densities.

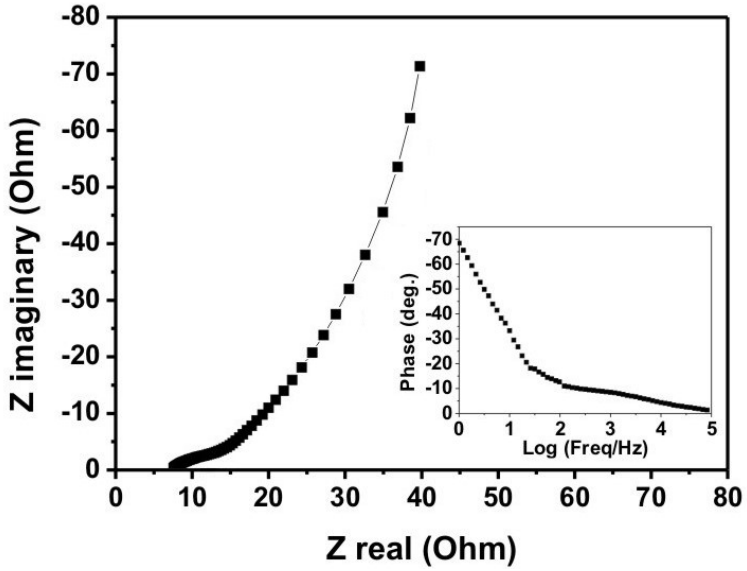

Fig. S3. The Nyquist plots of 3D BWGC in 0.5 M $MgSO_4$ electrolytes.

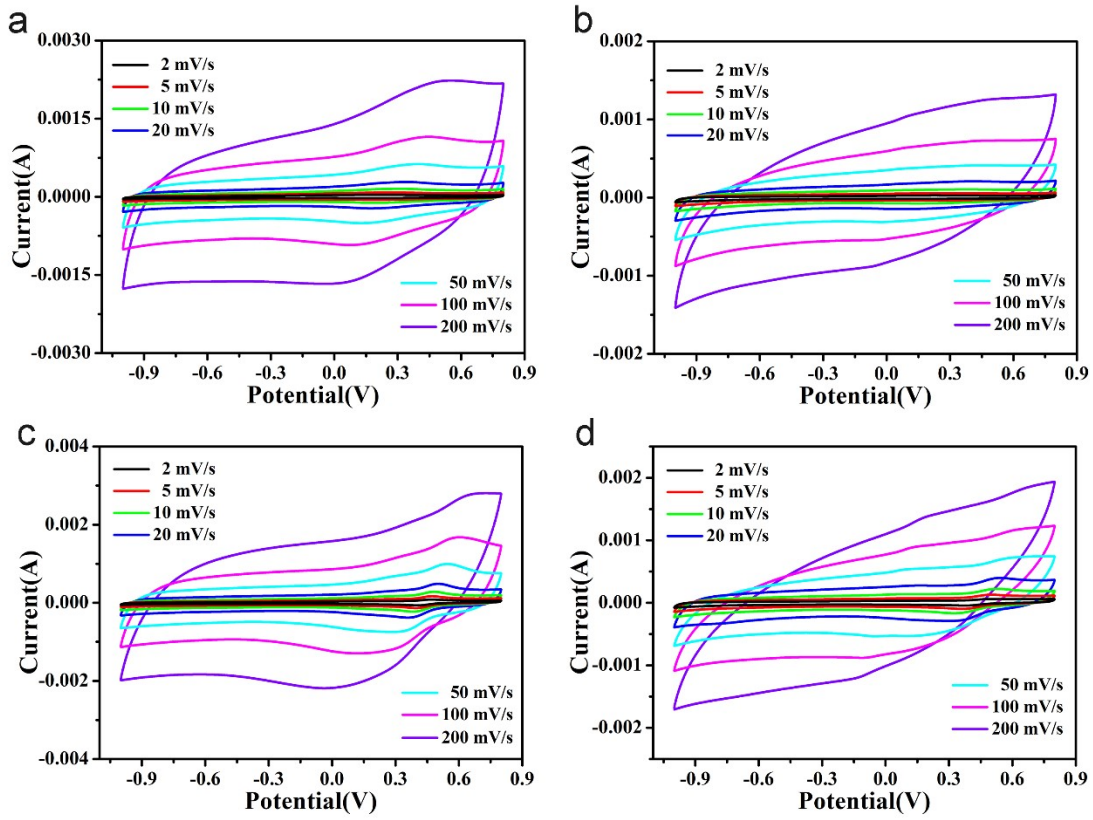

Fig. S4. CV curves of 3D BWGC SCs in the aqueous electrolytes of: (a) 2 M $MgSO_4$, (b) 2 M $MgSO_4$ + 0.1 M Cr^{3+}, (c) 2 M $MgSO_4$ + 0.05 M Fe^{2+} and (d) 2 M $MgSO_4$ + 0.1 M Cr^{3+} 0.05 M Fe^{2+}.

Table S1. BET specific surface area, pore volume and pore size of 3D BWGC.

Surface Area	
Single point surface area at P/Po =0.203237847:	2283.8366 m^2/g
BET Surface Area:	2300.2504 m^2/g
t-Plot Micropore Area:	680.0004 m^2/g
t-Plot External Surface Area:	1620.2500 m^2/g
BJH Adsorption cumulative surface area of pores between 1.7000 nm and 300.0000 nm diameter:	476.621 m^2/g
BJH Desorption cumulative surface area of pores between 1.7000 nm and 300.0000 nm diameter:	1473.6203 m^2/g
Pore Volume	
Single point adsorption total pore volume of pores less than 388.5776 nm diameter at P/Po = 0.995016548:	1.632877 cm^2/g
BJH Adsorption cumulative volume of pores between 1.7000 nm and 300.0000 nm diameter：	0.726599 cm^2/g
BJH Desorption cumulative volume of pores between 1.7000 nm and 300.0000 nm diameter:	1.294348 cm^2/g
Pore Size	
Adsorption average pore width (4V/A by BET):	2.83948 nm
BJH Adsorption average pore diameter (4V/A):	6.0979 nm
BJH Desorption average pore diameter (4V/A):	3.5134 nm

Table S2. Properties of 3D BWGC in different nature aqueous

Electrolyte	Operating voltage (V)	Capacitance (F g^{-1}) at different current density (A g^{-1})						
		0.5	1	2	3	5	10	20
$MnSO_4$	1.9	197.5	163.4	138.3	127.4	112.4	92.2	67.2
$MgSO_4$	1.8	244.2	205.1	185.1	172.2	161.2	145.1	130.2
$CoSO_4$	1.5	364.3	361.4	316.2	303.3	289.3	268.1	240.2
Ni_2SO_4	1.5	439.4	390.4	342.3	322.3	296.2	254.4	199.2
$Al_2(SO4)_3$	1.5	345.6	318.5	273.5	252.3	230.5	200.3	168.3

Table S3. Comparison of specific capacitance (C_s), energy density (E) and power density (P) of SCs with different electrolytes.

Electrolyte	CC test at 0.5 A g^{-1}			CC test at 10 A g^{-1}		
	C_s(F/g)	E(Wh/kg)	P(W/kg)	C_s(F/g)	E(Wh/kg)	P(W/kg)
$MgSO_4$	244.2	109.9	450	145	62.3	9000
$MgSO_4$+Cr^{3+}	215.8	97.1	450	102.8	46.2	9000
$MgSO_4$+Fe^{2+}	317.2	142.8	450	**183.9**	**82.8**	**9000**
$MgSO_4$+Cr^{3+}+ Fe^{2+}	**347.8**	**156.5**	**450**	158.9	71.5	9000