

## Electronic Supplementary Information

Nitrogen-Doped Graphene with High Nitrogen Level via a One-Step  
Hydrothermal Reaction of Graphene Oxide with Urea for Superior  
Capacitive Energy Storage

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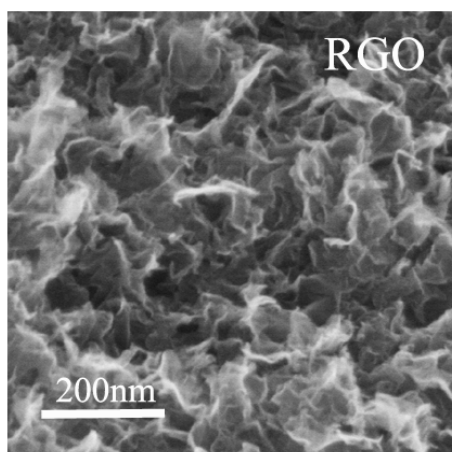
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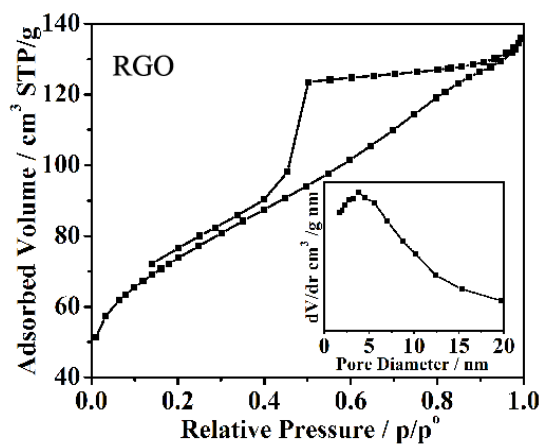
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**Table S1.** Samples and their detailed experimental conditions

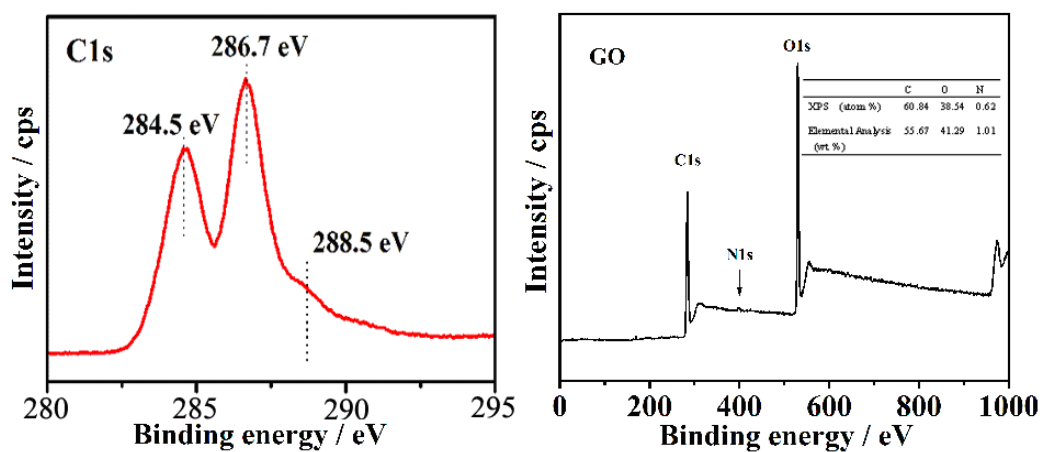
Sample	Hydrothermal Temperature	Hydrothermal Time	Mass ratio of the urea and GO
RGO	180 °C	12h	0:1
NGS-1	180 °C	12h	300:1
NGS-2	180 °C	12h	100:1
NGS-3	180 °C	12h	200:1
NGS-4	180 °C	12h	400:1
NGS-5	180 °C	12h	500:1
NGS-6	160 °C	12h	300:1
NGS-7	170 °C	12h	300:1
NGS-8	190 °C	12h	300:1
NGS-9	180 °C	4h	300:1
NGS-10	180 °C	8h	300:1
NGS-11	180 °C	16h	300:1



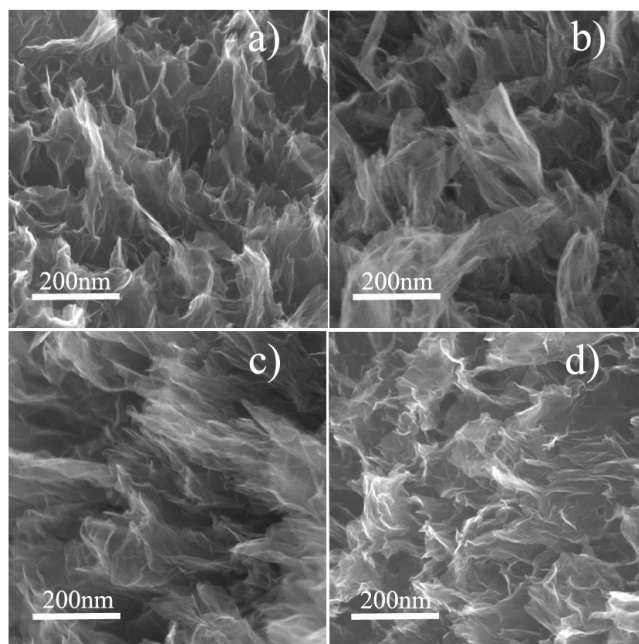
**Fig. S1** SEM image of the RGO (hydrothermal reduction at 180 °C for 12 h).



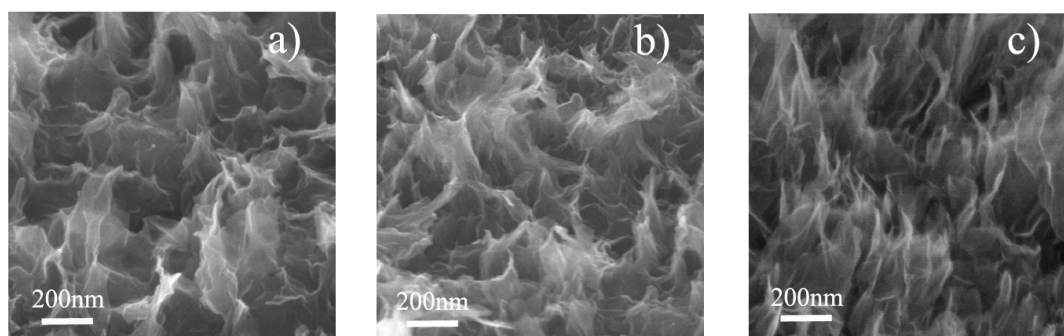
**Fig. S2** Nitrogen adsorption/desorption isotherm and pore size distribution (inset) of the RGO.



**Fig. S3** XPS C1s spectra and XPS wide spectra of the GO.



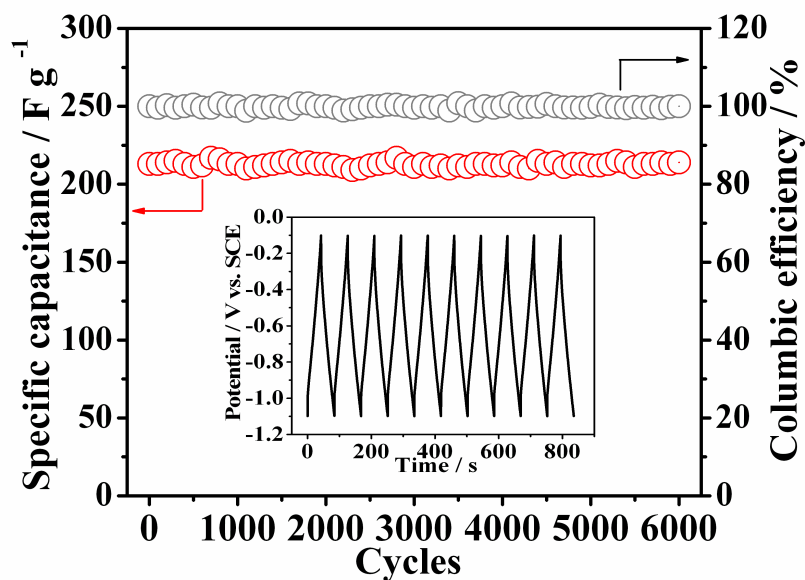
**Fig. S4** SEM images of the NGS prepared with different mass ratio between urea and GO a) NGS-2 (100:1), b) NGS-3 (200:1), c) NGS-4 (400:1) and d) NGS-5 (500:1).



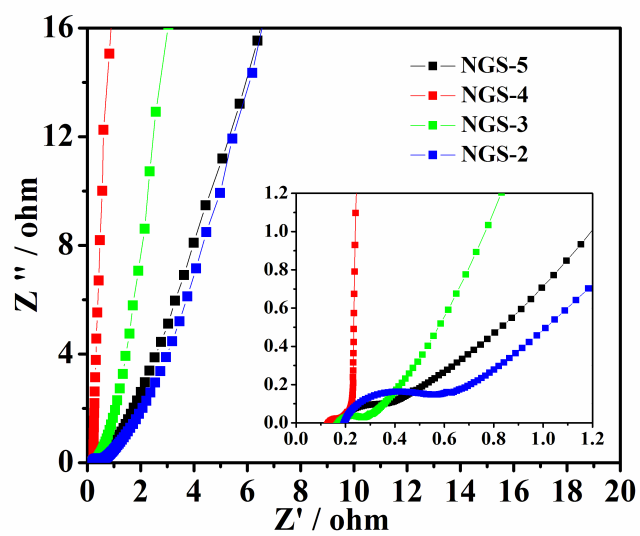
**Fig. S5** SEM images of the NGS prepared with different hydrothermal temperature: a) NGS-6 (160 °C), b) NGS-7 (170 °C) and c) NGS-8 (190 °C).

**Table. S2** Special capacitances of the studied samples under different experimental conditions calculated from charge/discharge curves measured at different current densities.

Samples	Mass ratio of urea and GO	Hydrothermal temperature	$S_{\text{BET}}$ ( $\text{m}^2\text{g}^{-1}$ )	$N_{\text{CHN}}$ wt %	$N_{\text{XPS}}$ atom %	N1 398.1 eV	N2 399.5 eV	N3 401.6 eV	$C_g$ ( $\text{F g}^{-1}$ )	
									0.2 $\text{A g}^{-1}$	1 $\text{A g}^{-1}$
RGO	0:1	180 °C	260	0.99	0.62	--	--	--	203	169
NGS-1	300:1	180 °C	593	11.36	10.13	2.21	5.11	2.77	326	269
NGS-2	100:1	180 °C	502	6.87	4.96	1.76	2.38	0.82	238	210
NGS-3	200:1	180 °C	527	7.35	6.01	1.93	2.62	1.38	251	216
NGS-4	400:1	180 °C	571	9.86	8.94	2.74	4.35	2.41	276	239
NGS-5	500:1	180 °C	544	9.79	8.45	2.91	4.59	0.97	289	250
NGS-6	300:1	160 °C	373	8.00	6.37	1.84	3.47	1.05	254	193
NGS-7	300:1	170 °C	460	9.29	7.85	2.88	3.87	1.09	286	222
NGS-8	300:1	190 °C	413	8.83	7.29	2.36	4.09	0.85	281	207



**Fig. S6** Variations of specific capacitance and the columbic efficiency versus the cycle number of NGS-1 measured at a current density of 5  $\text{A g}^{-1}$  within the potential range from -1.1 to -0.1 V.



**Fig. S7** Nyquist plots of the NGS-2, NGS-3, NGS-4, and NGS-5. The inset shows the expanded high-frequency region of the plots. (10 mHz to 100 kHz, ac amplitude, 5 mV)