Supplementary Information

Interaction between Nitrogen and Sulfur in Co-Doped Graphene and Synergetic Effect in Supercapacitor

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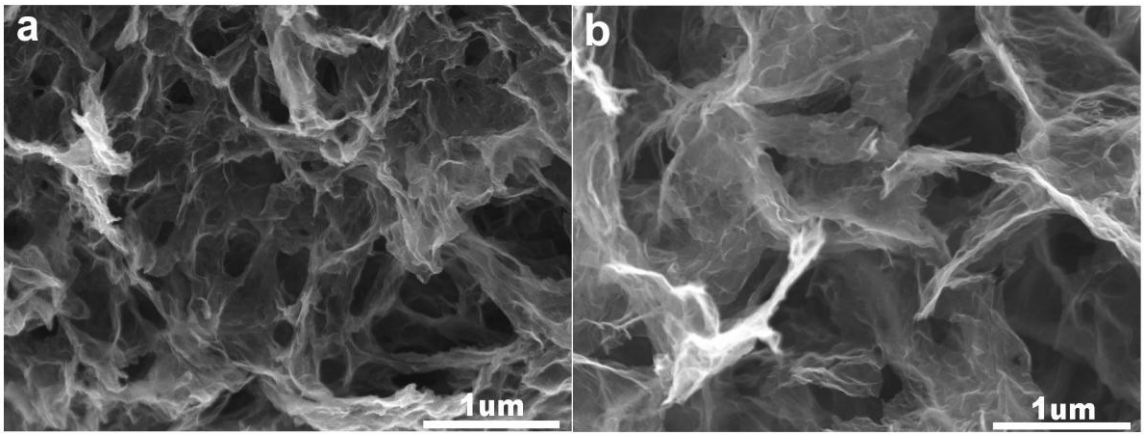

Figure S1 SEM images of the as-prepared (a) NS-G005 and (b) NS-G1.

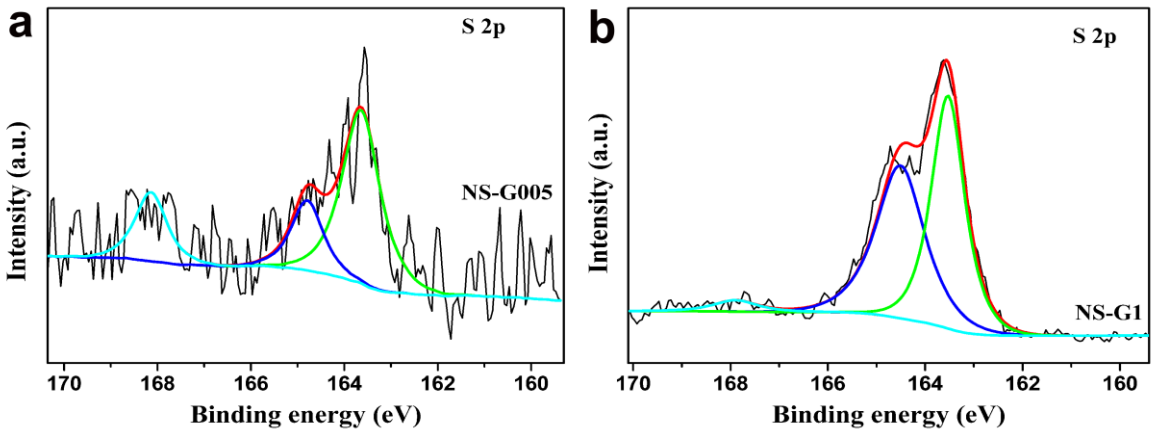

Figure S2 S 2p region spectra of (a) NS-G005 and (b) NS-G1.

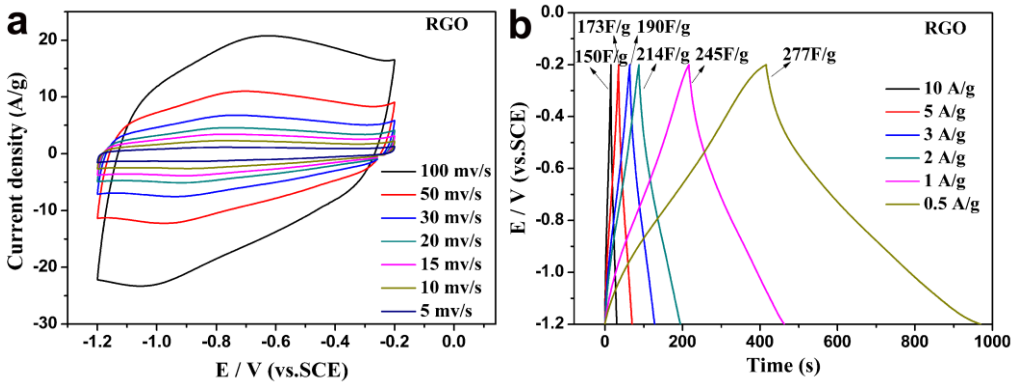

Figure S3 (a) CV curves for rGO measured at different scan rates, (b) GCD curves for rGO at different currents

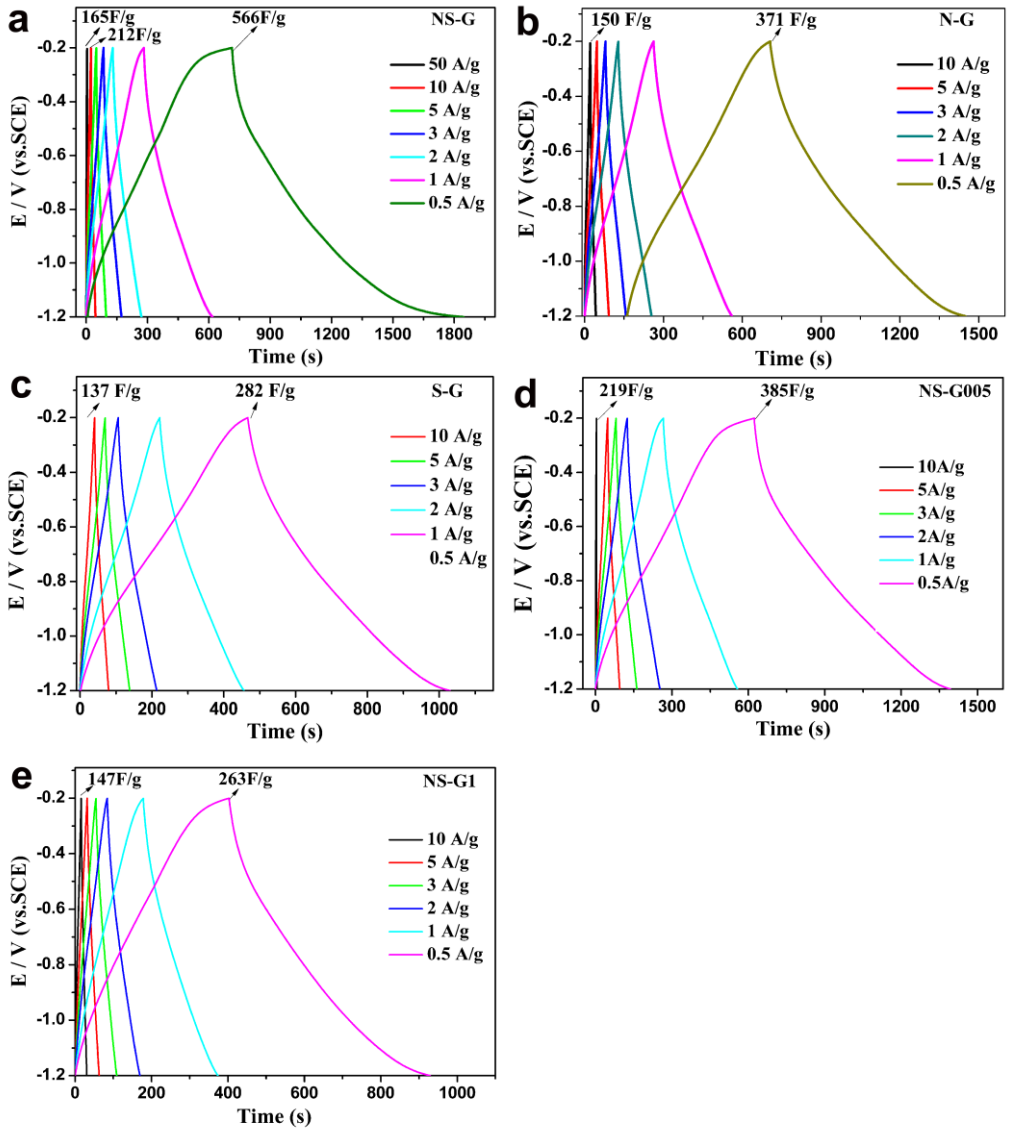

Figure S4 GCD curves for (a) NS-G, (b) N-G, (c) S-G, (d) NS-G005 (e) and NS-G1 obtained at current densities of 0.5-10 A g^{-1}.

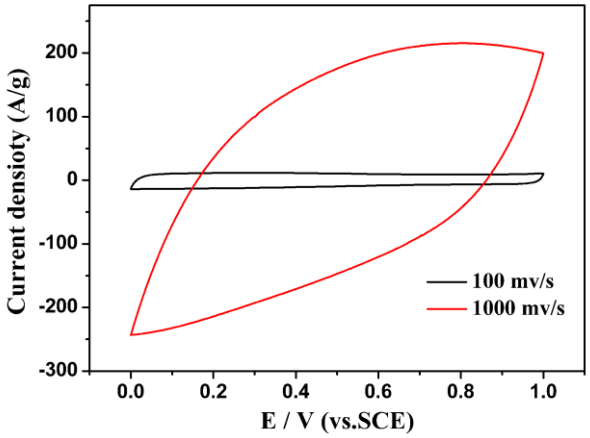

Figure S5 CV curves of NS-G measured at the scan rate of 1000mv/s and 100mv/s respectively.

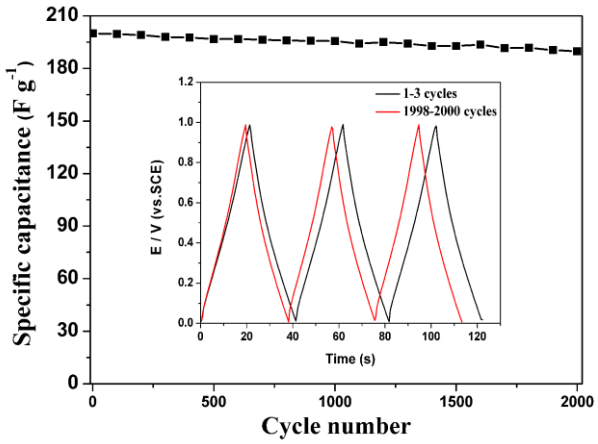

Figure S6 Variations of specific capacitance versus cycle number of NS-G measured at a current density of 5 A g^{-1} within the potential range from 0 to 1.0 V in the symmetrical two-electrode system. The inset shows the charge–discharge curves between 1–3 and 1998–2000 cycles for NS-G.

Table S1 Specific capacitance of N, S co-doped carbon materials.

Materials	Electrolyte	Current density	Electrode system	Capacitance	Ref.
N, S containing carbon	1 M H_2SO_4	0.05 A g^{-1}	Three	138.8 F g^{-1}	S1
N, S co-doped mesoporous carbon	2M KOH	1 A g^{-1}	Three	320 F g^{-1}	S2
N, S doped activated hydrothermal carbons	6M KOH	0.25 A g^{-1}	Three	264 F g^{-1}	S3
N, S co-doped mesoporous carbon	2M KOH	1 A g^{-1}	Three	180 F g^{-1}	S4
N, S co-doped graphene	6M KOH	1A g^{-1}	Three	334 F g^{-1}	Present work
		0.5 A g^{-1}	Three	566 F g^{-1}	

Supplementary References

S1. Tsubota, T., Takenaka, K., Murakami, N. & Ohno, T. Performance of nitrogen- and sulfur-containing carbon material derived from thiourea and formaldehyde as electrochemical capacitor. *J. Power Sources* **196**, 10455-10460 (2011).

S2. Zhang, D. *et al*. Synthesis of nitrogen-and sulfur-codoped 3D cubic-ordered mesoporous carbon with superior performance in supercapacitors. *ACS Appl. Mater. Interfaces* **6**, 2657-2665 (2014).

S3. Si, W. J. *et al*. Tunable N-doped or dual N, S-doped activated hydrothermal carbonsderived from human hair and glucose for supercapacitor applications. *Electrochim. Acta* **107**, 397-405 (2013).

S4. Zhang, D. Y. *et al*. Nitrogen and sulfur co-doped ordered mesoporous carbon with enhanced electrochemical capacitance performance. *J. Mater. Chem. A* **1**, 7584-7591 (2013).