Electronic Supplementary Information (ESI)

Chemically tailoring the nanostructure of graphene nanosheets to confine sulfur for high-performance lithium-sulfur battery

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[a] College of Material Science & Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, 210016, P.R. China   E-mail:azhangxg@nuaa.edu.cn
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Table S1. Summaries of the physical characteristics of AGNs materials.

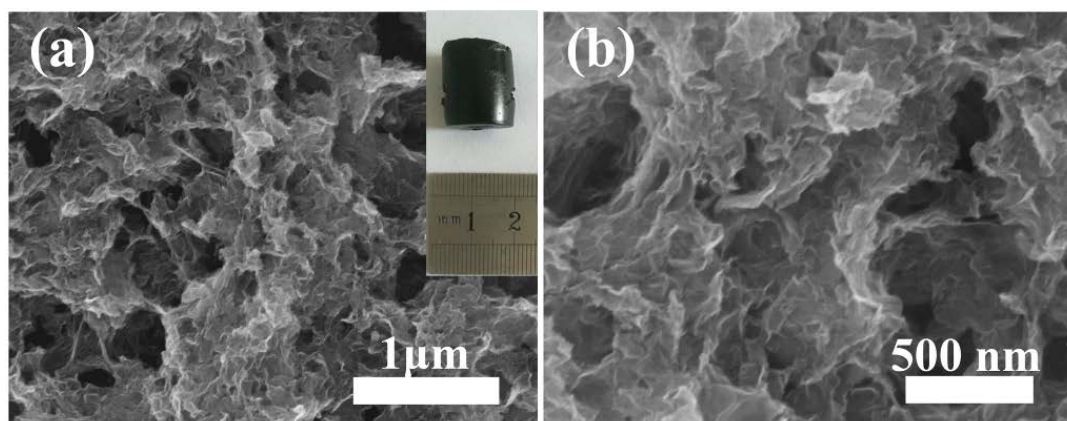| Samples	SSA ($m^2\ g^{-1}$)	Pore Volume ($cm^3\ g^{-1}$)	Electric Conductivity (S cm^{-1})
AGNs7	1616	1.1	4.5
AGNs10	2313	1.8	4.0

Fig. S1 SEM images of RGO hydrogel prepared by hydrothermal reduced. The inset shows the photograph of hydrogel.
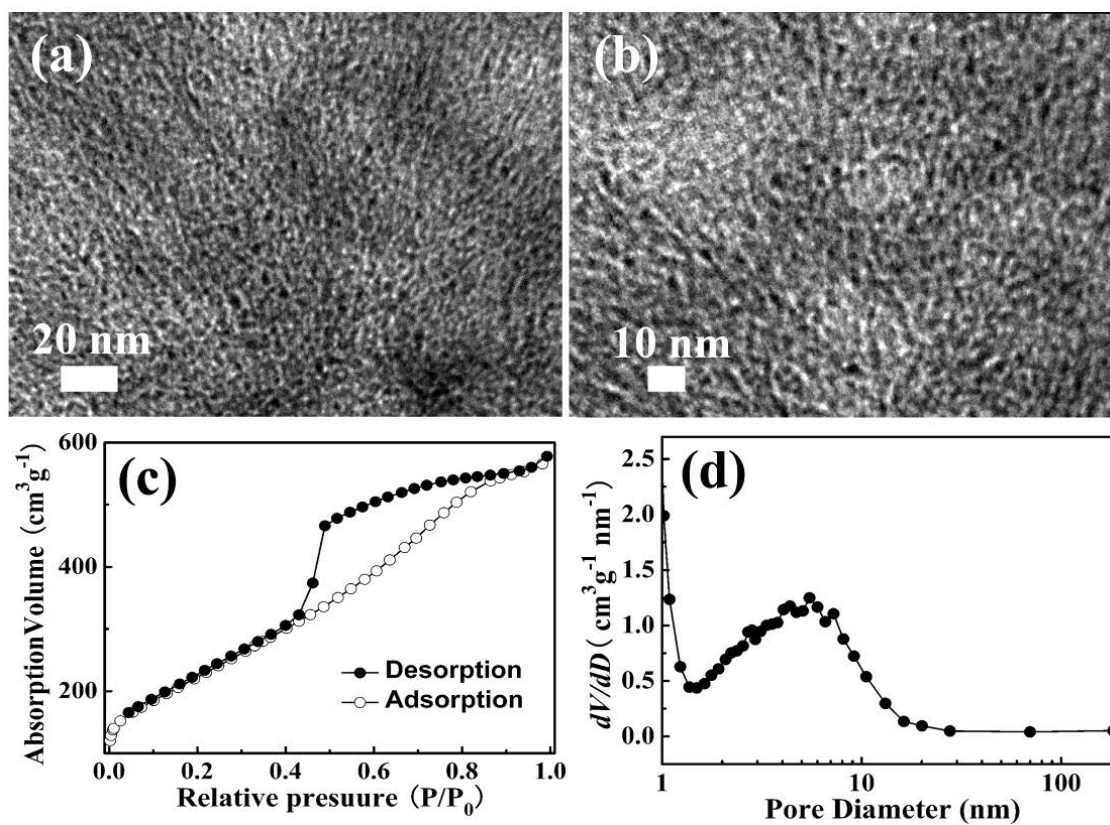
Fig. S2 (a, b) HRTEM images, (c) N_2 adsorption-desorption isotherms, and (d) the corresponding distribution of the sizes of AGNs7.
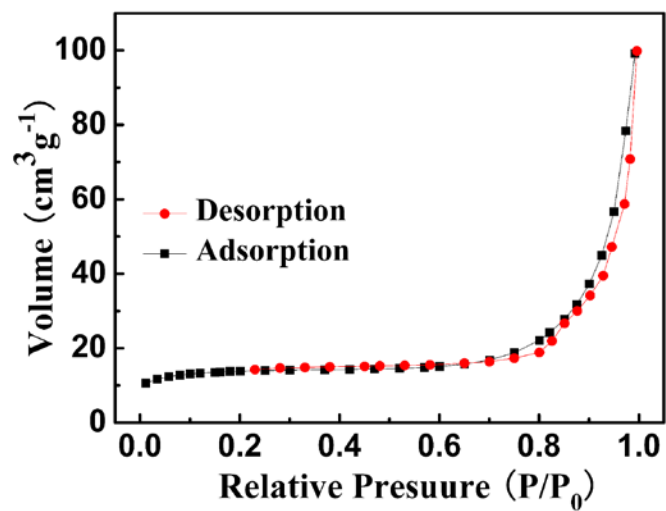
Figure S3 N_2 adsorption-desorption isotherms.
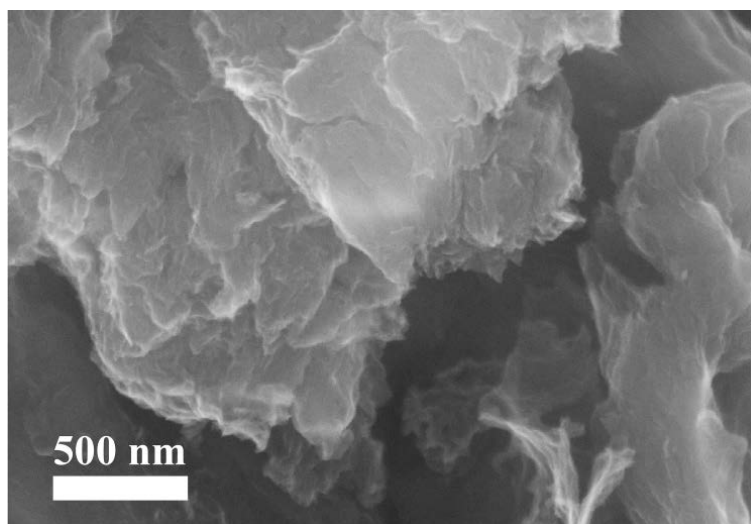
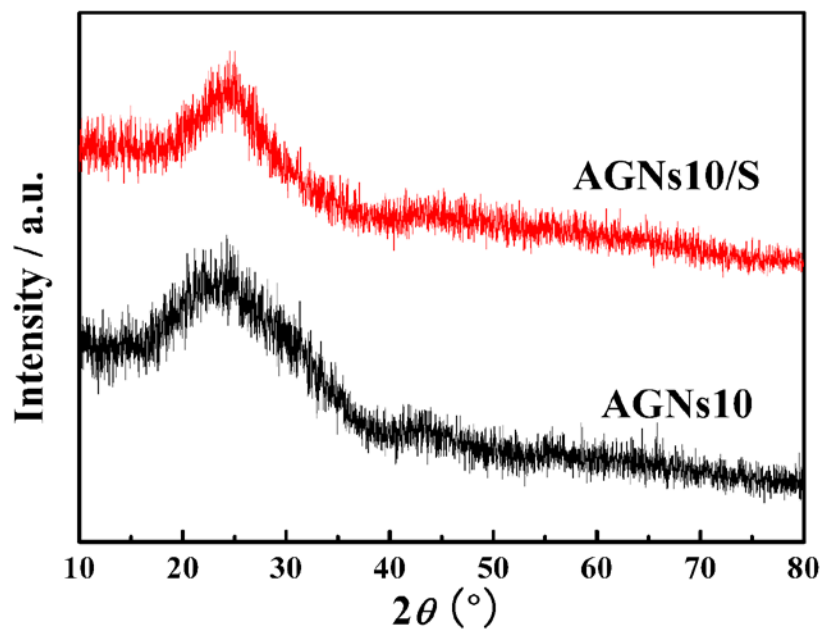**Fig. S4** SEM image of AGNs10/S composite.

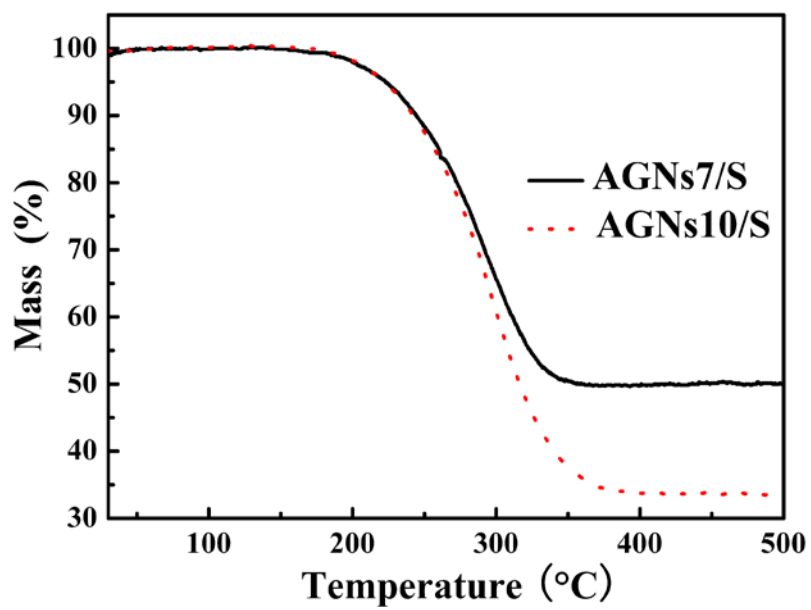**Fig. S5** XRD pattern of AGNs10 and AGNs10/S composite.

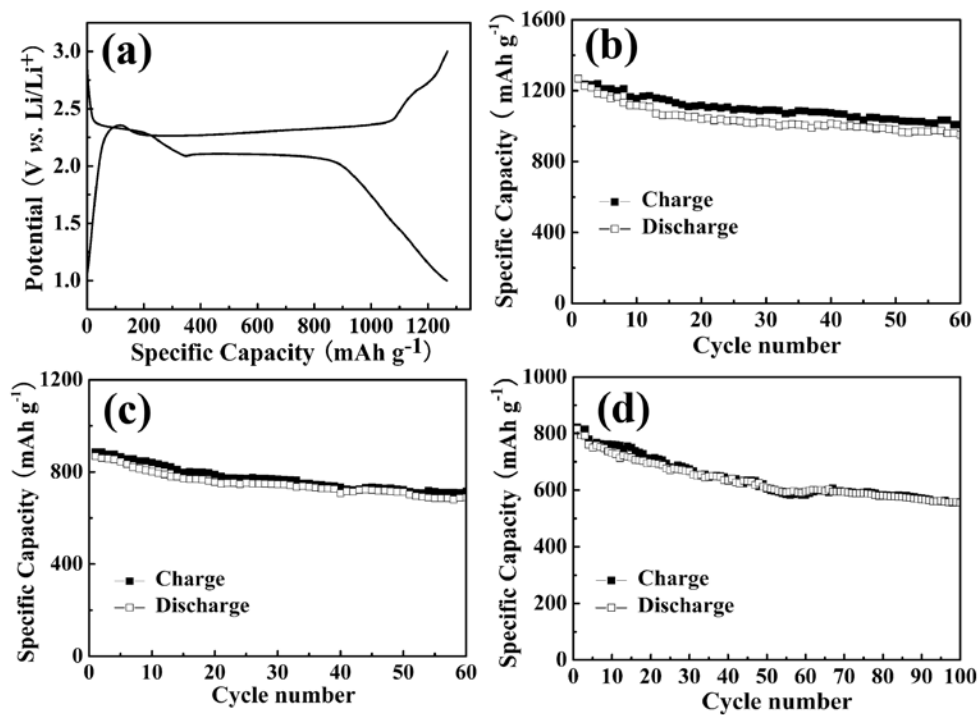**Fig. S6** TGA curves of AGNs7/S and AGNs10/S composites.

Fig. S7 (a) Initial charge/discharge profiles at 0.2 C of AGNs7/S composite electrode; Cycling performance of AGNs7/S composite electrode at (b) 0.2 C, (c) 0.5 C, and (d) 1 C, respectively.
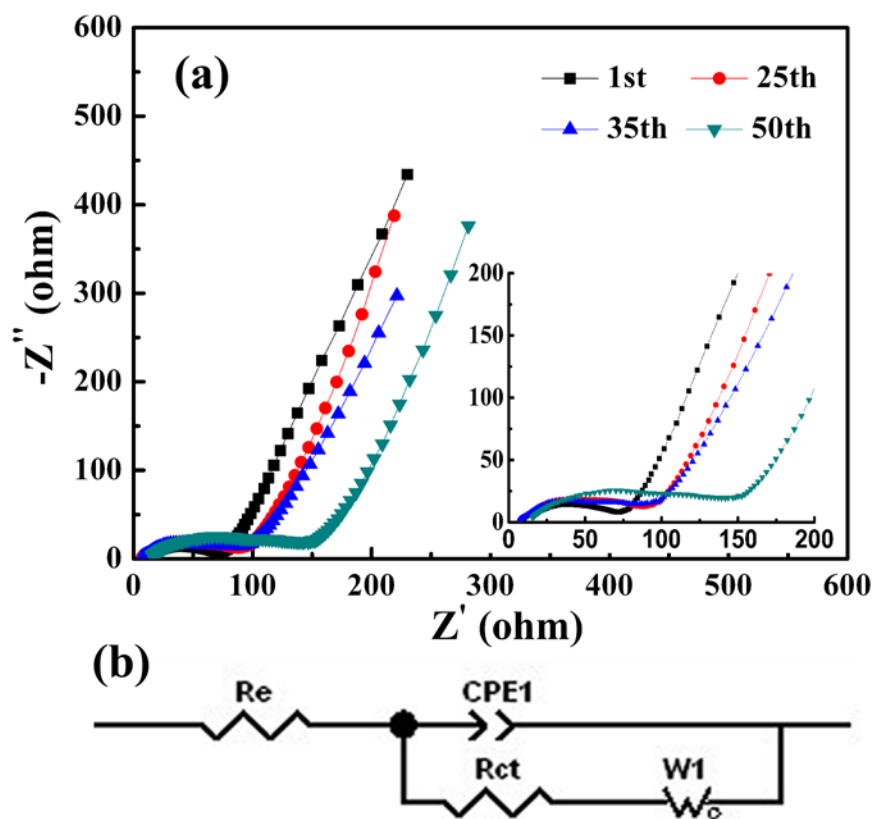
Fig. S8 (a) EIS spectra of the RGO/S composite electrode in different cycles after fully charging to 3 V. The inset shows the spectra at high-frequency region. (b) The equivalent circuits used to fit the impedance spectra.