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Electronic Supplementary Material

Encapsulating sulfur into hybrid porous carbon/CNTs substrate as cathode for lithium-sulfur batteries

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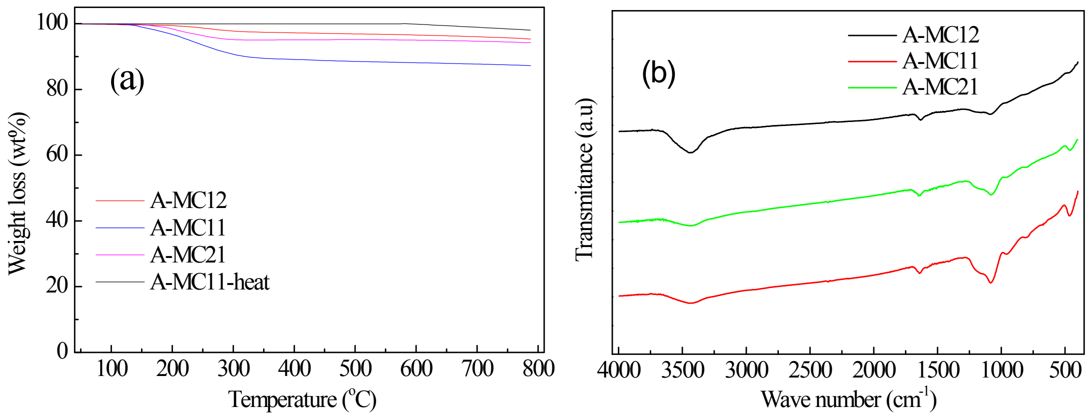

Fig. S1 (a)TG curves of the A-MCxy carbon substrate recorded under an argon atmosphere with the heating rate of 10 ℃ min^{-1}; (b) FTIR spectra of the A-MCxy carbon substrates.

Table S1 Weight loss of the as-prepared carbon substrates and the sulfur/carbon composites.

sample	A-MC12	S/A-MC12	A-MC11	S/A-MC11	A-MC21	S/A-MC21
weight loss/ wt %	2.6	80.5	10.5	81.7	5.0	80.2

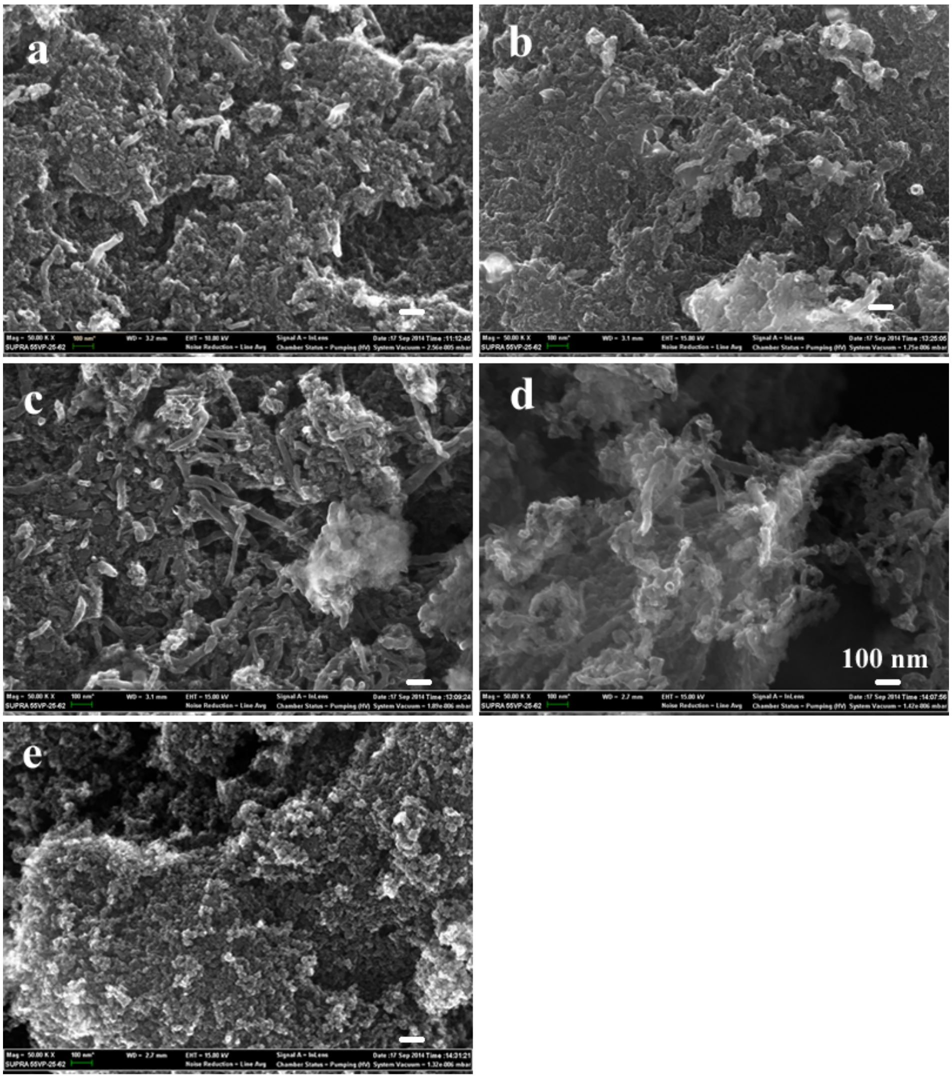

Fig. S2 SEM images: (a) the A-MC12 carbon substrate and (b) the S/A-MC12 composite; (c) the A-MC21 carbon substrate and (d) the S/A-MC21composite; (e) commercial carbon black. (The white scale bar is 100 nm.)

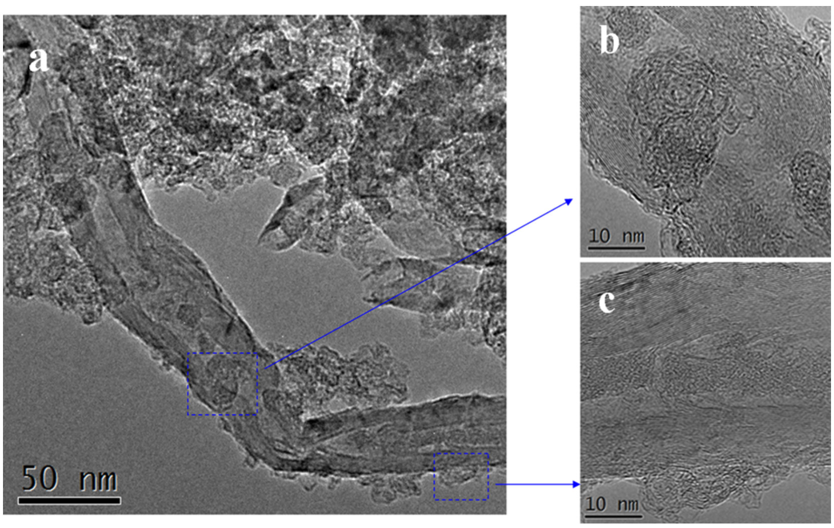

Fig. S3 Low and high-magnification TEM observations of the A-MC11 carbon substrate.

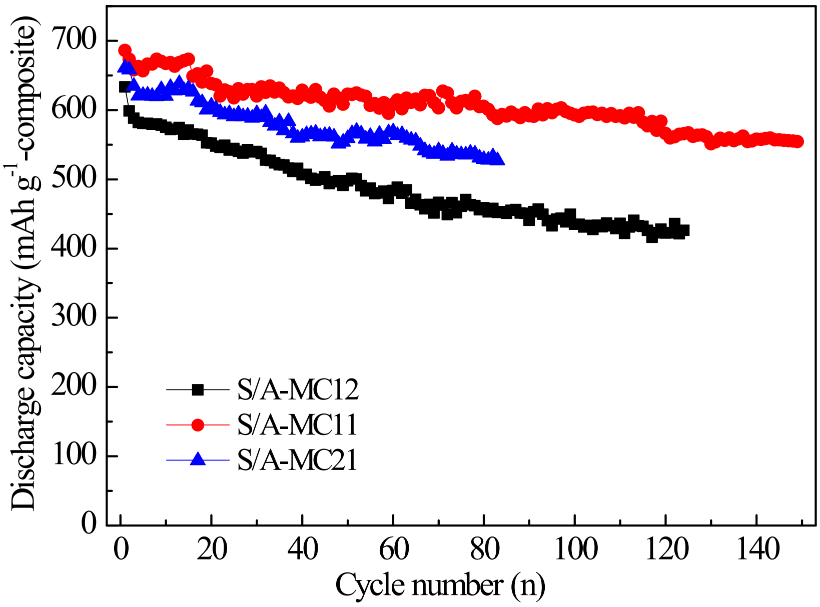

Fig. S4. Cycle performance of the as-prepared S/A-MCxy composites with the sulfur loading of 1.2–1.5 mg cm^{-2} at the current density of 160 mA g^{-1} (composite).

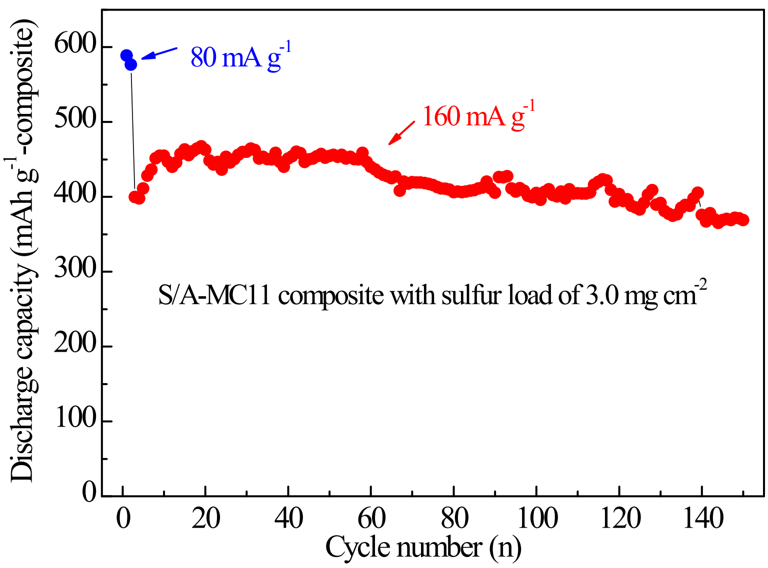

Fig. S5. Cycle performance of the S/A-MC11 composite with a higher sulfur loading at the current density of 160 mA g^{-1} (composite) after first two cycles at 80 mA g^{-1} (composite).

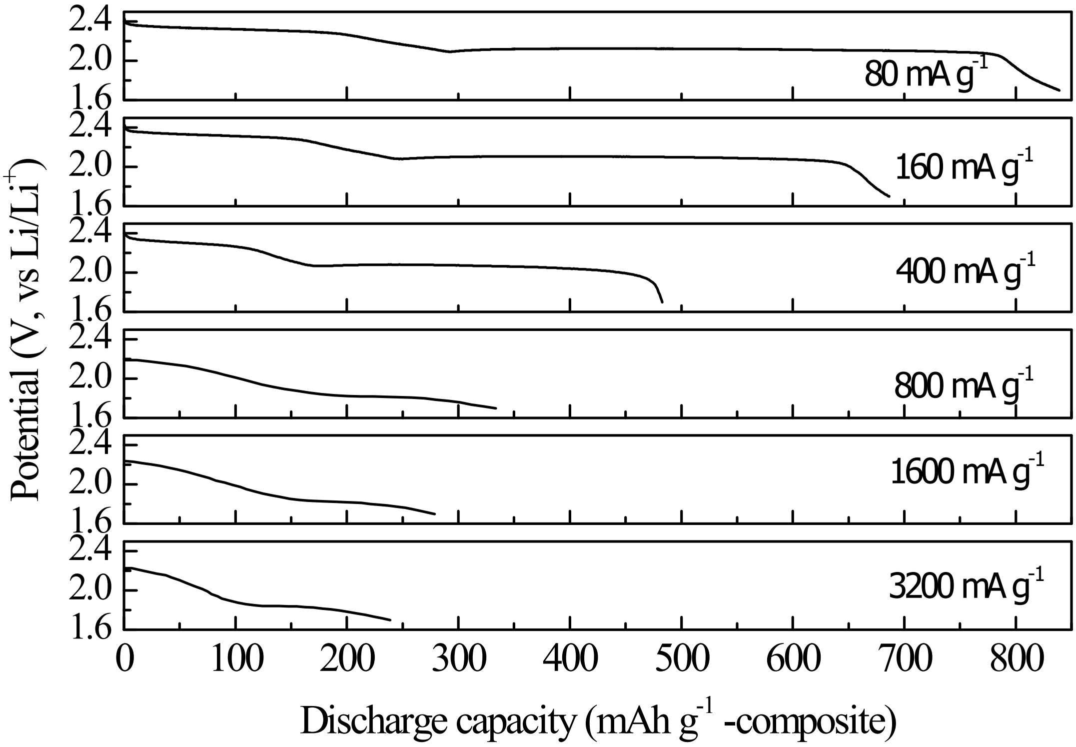

Fig S6. The discharge curves of the S/A-MC11composite at different current densities.

Table S2 The simulated data from EIS spectra of the cathode material at full charged state in the different cycles.

Cycle number	Rct (Ω)	Zw (Ω)
Before discharge	78.2	212.9
1^{st}	26.4	35.63
5^{th}	31.8	81.95
20^{th}	40.2	140.2
50^{th}	49.7	162.1
100^{th}	66.3	191.7