

## Supporting Information

### **Makeup cotton derived hierarchically porous carbon fibers for constructing a free-standing carbon/sulfur hybrid cathode**

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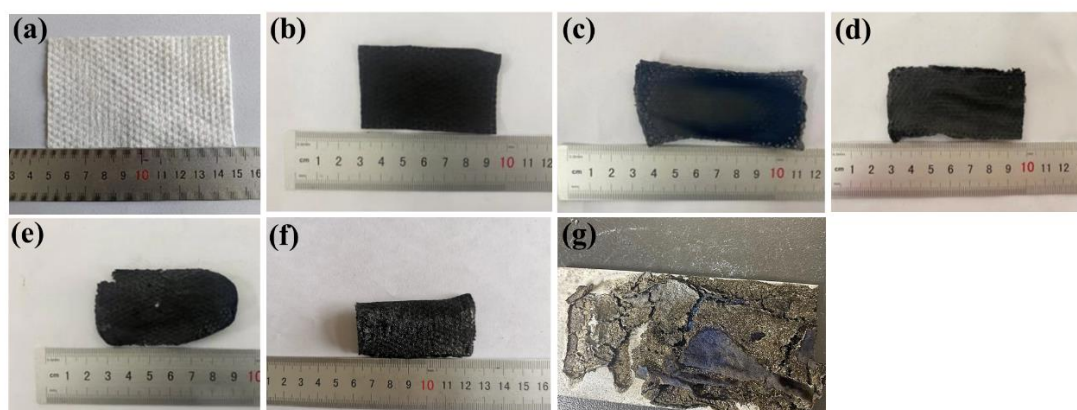
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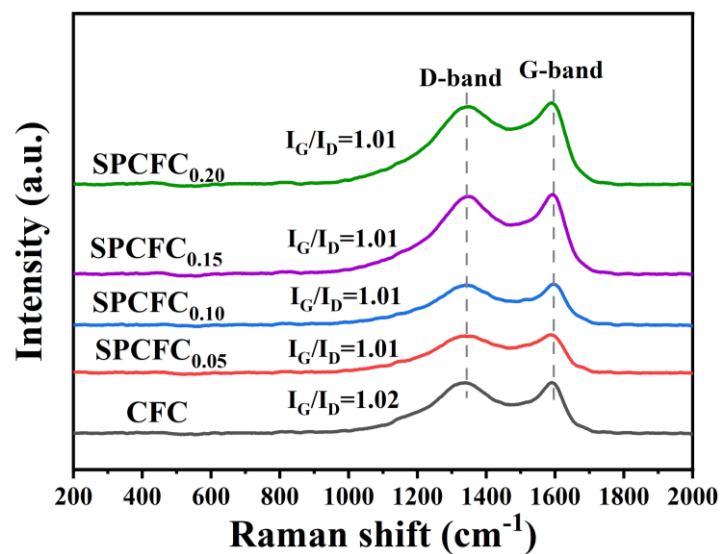
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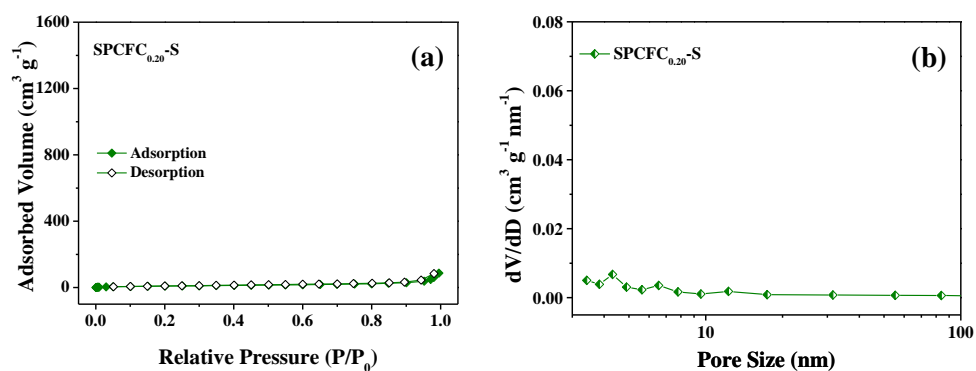
**Fig.S1** Flexibility of the pristine MC sample.



**Fig.S2** Digital pictures of (a) MC, (b) CFC, (c) SPCFC<sub>0.05</sub>, (d) SPCFC<sub>0.10</sub>, (e) SPCFC<sub>0.15</sub>, (f) SPCFC<sub>0.20</sub> and (g) SPCFC<sub>0.30</sub> samples.



**Fig.S3** Raman spectra of CFC, SPCFC<sub>0.05</sub>, SPCFC<sub>0.10</sub>, SPCFC<sub>0.15</sub> and SPCFC<sub>0.20</sub> samples.



**Fig.S4** (a) N<sub>2</sub> adsorption/desorption isotherms and (b) Pore size distribution of SPCFC<sub>0.20</sub>-S cathode.

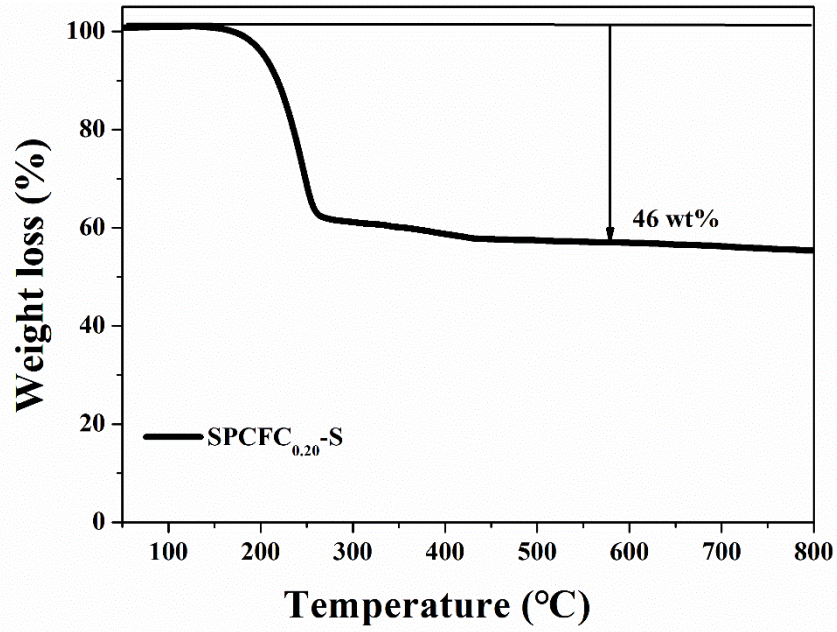


Fig.S5 TGA curve of SPCFC<sub>0.20</sub>-S composite.

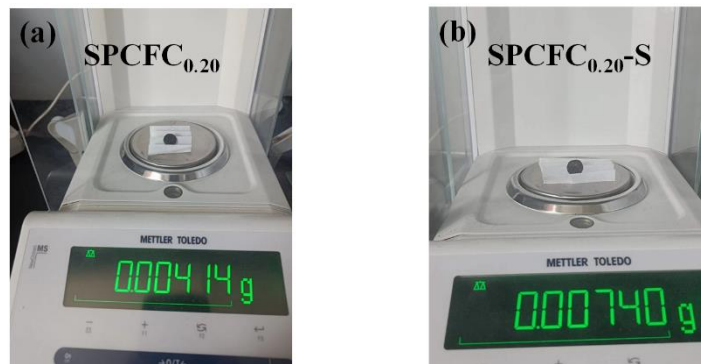
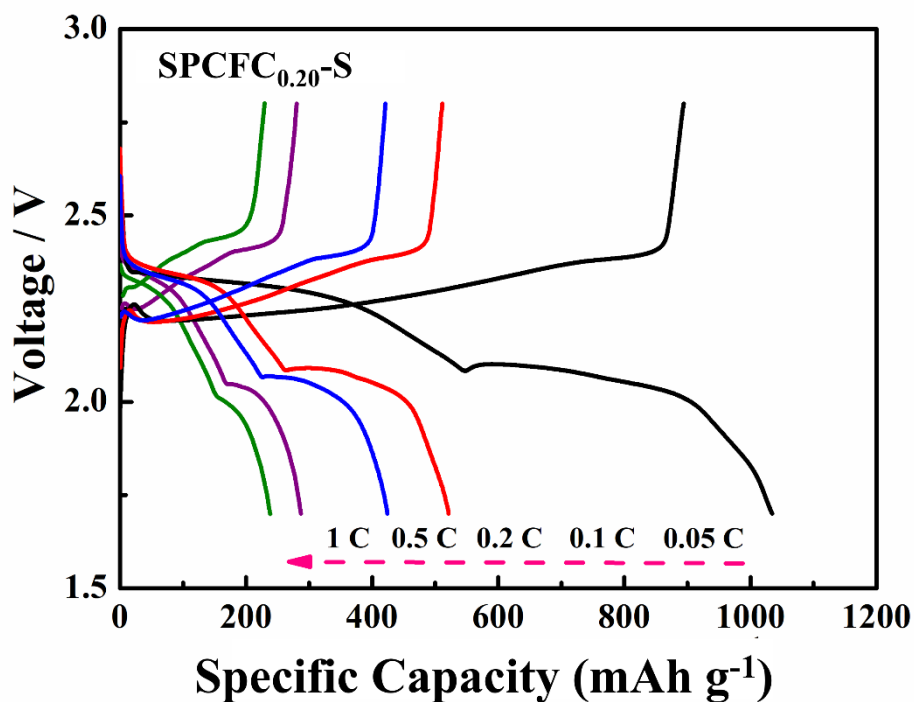
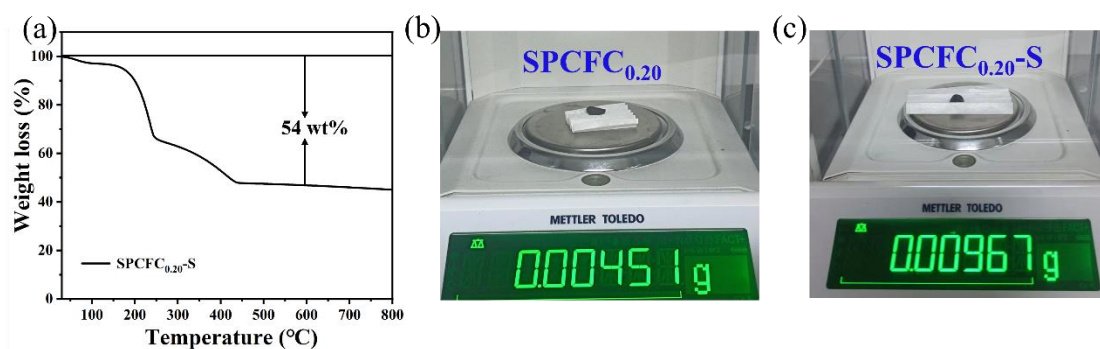


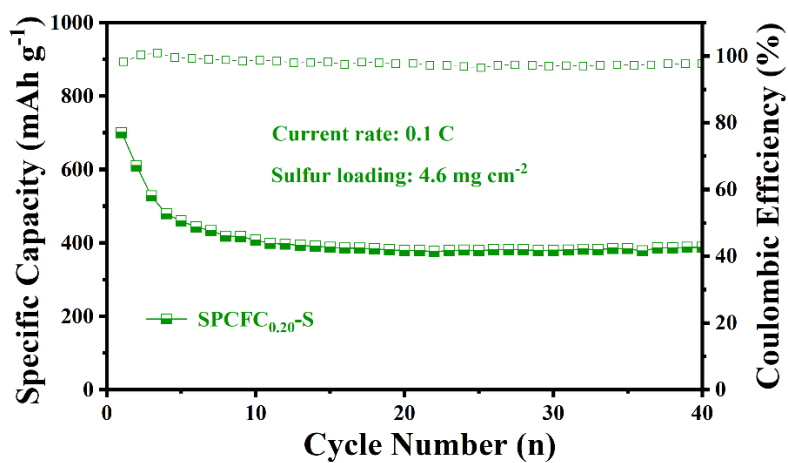
Fig.S6 Weight change of (a) SPCFC<sub>0.20</sub> and (b) SPCFC<sub>0.20</sub>-S samples before and after loading active sulfur.



**Fig.S7** The corresponding first charge/discharge curves of the SPCFC<sub>0.20</sub>-S electrode at different current rates from 0.05 C to 1 C.



**Fig.S8** (a) TGA curve of SPCFC<sub>0.20</sub>-S composite, the weight change of (b) SPCFC<sub>0.20</sub> and (c) SPCFC<sub>0.20</sub>-S samples before and after loading active sulfur.



**Fig.S9** Cycle performance of the SPCFC<sub>0.20</sub>-S cathode at 0.1 C after two cycles activation at 0.05 C.

**Table S1** Specific surface area and pore volume of CFC, SPCFC<sub>0.05</sub>, SPCFC<sub>0.10</sub>, SPCFC<sub>0.15</sub> and SPCFC<sub>0.20</sub> samples.

samples	$S_{\text{BET}}$ ( $\text{m}^2 \text{g}^{-1}$ )	$V_{\text{total}}$ ( $\text{cm}^3 \text{g}^{-1}$ )
CFC	613	0.25
SPCFC <sub>0.05</sub>	1083	0.56
SPCFC <sub>0.10</sub>	1463	0.78
SPCFC <sub>0.15</sub>	1744	0.88
SPCFC <sub>0.20</sub>	2080	1.45

$S_{\text{BET}}$  specific surface area by BET method,  $V_{\text{total}}$  total pore volume by the DFT method.