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Crab shell-derived nitrogen-doped micro-/mesopores carbon as an effective separator coating for high energy lithium-sulfur batteries

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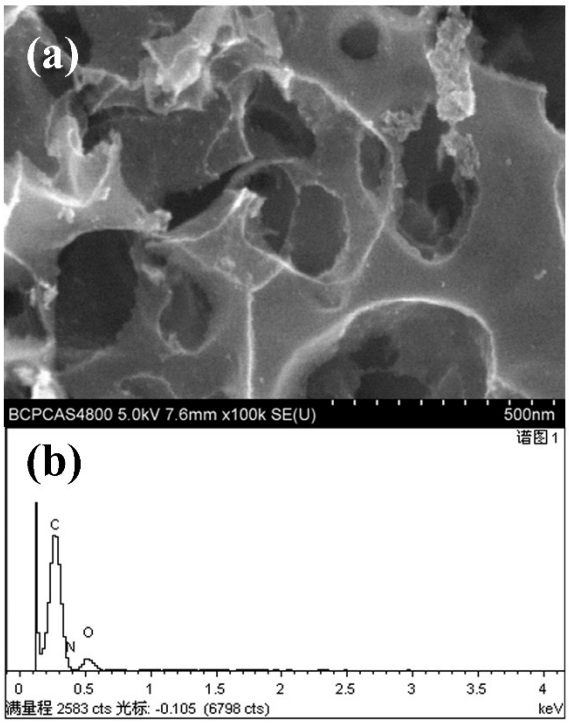

Figure S1. (a) SEM image and (b) EDS spectrum of N-MIMEC.

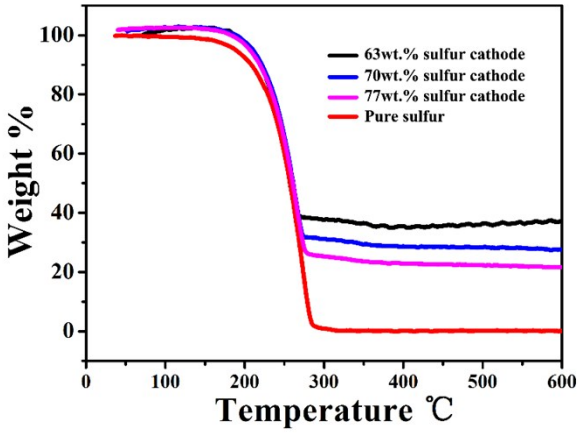

Figure S2. Thermogravimetric analysis (TG) of pure sulfur and cathodes with three different sulfur content under N_2 atmosphere at a heating rate of 10℃ min^{-1}.

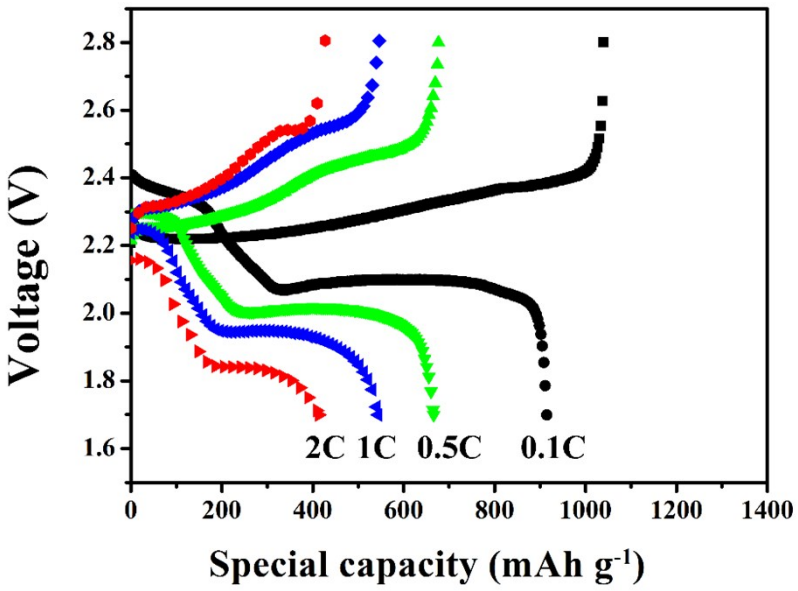

Figure S3. The galvanostatic discharge-charge voltage profiles cycled at different rates for normal battery.

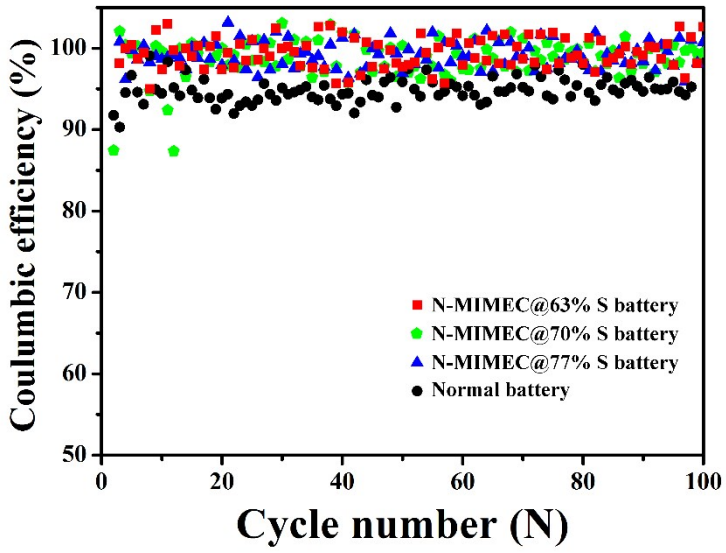

Figure S4. The coulomibc efficiency of different batteries discharged at 0.1C for 100 cycles.

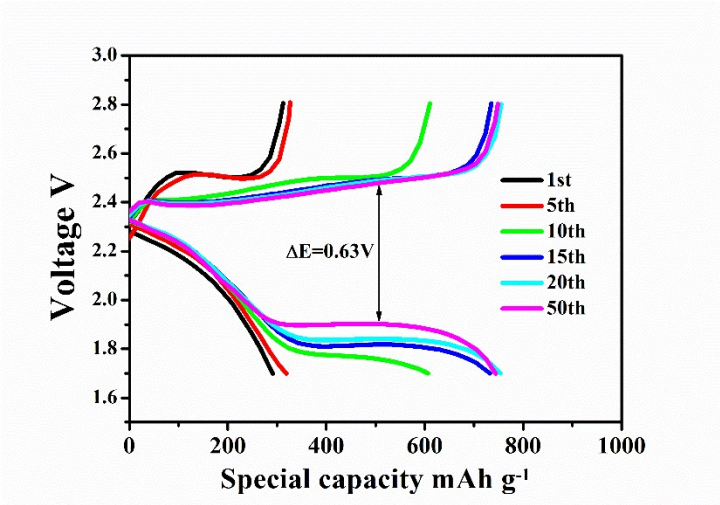

Figure S5. The corresponding charge/discharge plots of N-MIMEC@70% S battery cycled at 2.0C.

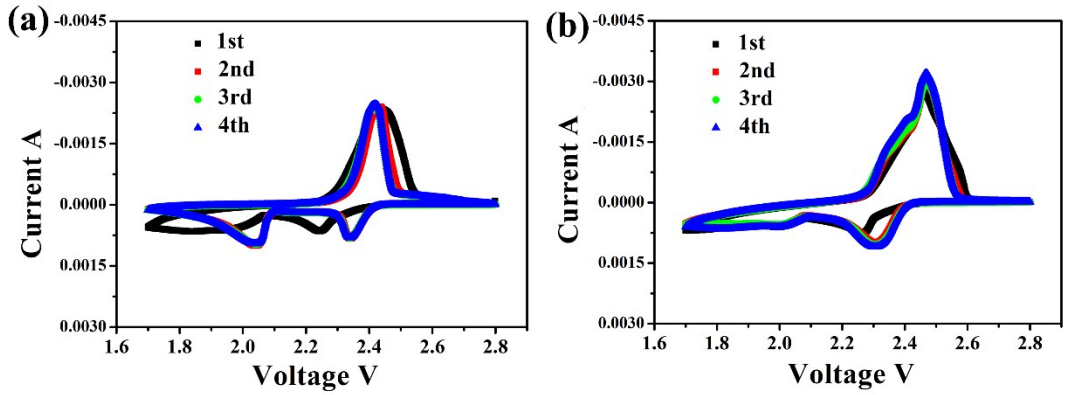

Figure S6. The CV curves of (a) N-MIMEC@70% S battery and (b) N-MIMEC@77% S battery.

Table S1. Comparison of the Li-S batteries with different modified separators, with results from

this work and from the literature.

Modified separator	S loading (mg cm^{-2})	S contant	Coating weight (mg cm^{-2})	Cycle Numbers	Reversible capacity (mAh g^{-1})	Rate	Ref.
Super P	1.2	60	0.2	200	828	0.2C	S1
MWCNT	2.0	70	0.17	300	621	0.2C	S2
GO	1.3	63	0.12	100	708	0.1C	S3
MPC/PEG	2	70	0.15	500	596	0.2C	S4
N-MIMEC	2	63	0.2	100	971	0.1C	This work
N-MIMEC	2	77	0.2	500	578	1.0C	This work

References

S1. S. H. Chung and A. Manthiram, *J Phys Chem Lett*, 2014, **5**, 1978.
S2. J. Q. Huang, T. Z. Zhuang, Q. Zhang, H. J. Peng, C. M. Chen and F. Wei, *Acs Nano*, 2016, **9**, 3002.
S3. Y. S. Su and A. Manthiram, *Nat. Commun.*, 2012, **3**, 1166.
S4. S. H. Chung and A. Manthiram, *Advanced Materials*, 2014, **26**, 7352.