

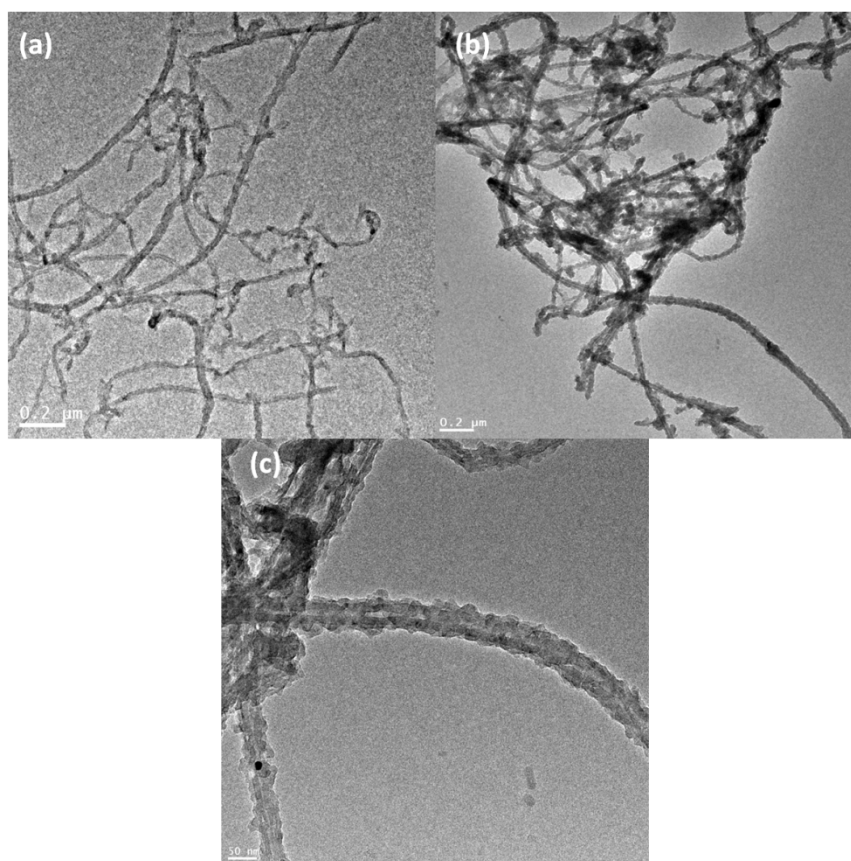
## Supporting Information

### Dual core-shell structured sulfur cathode composite synthesized by one-pot route for lithium sulfur battery

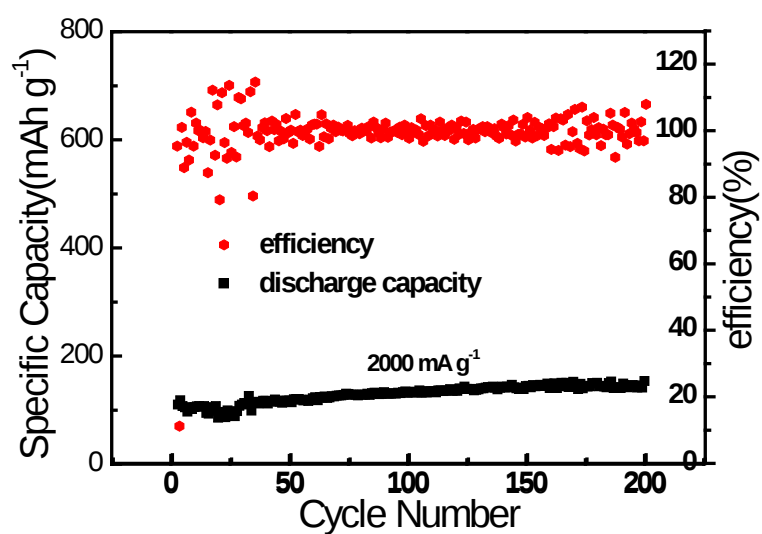
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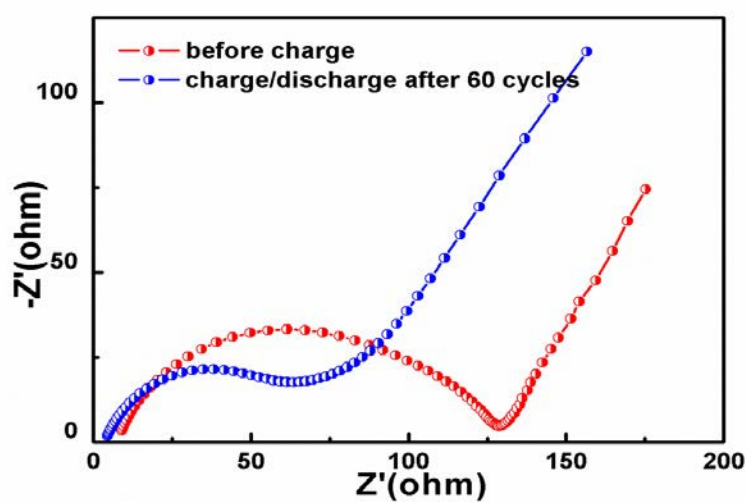
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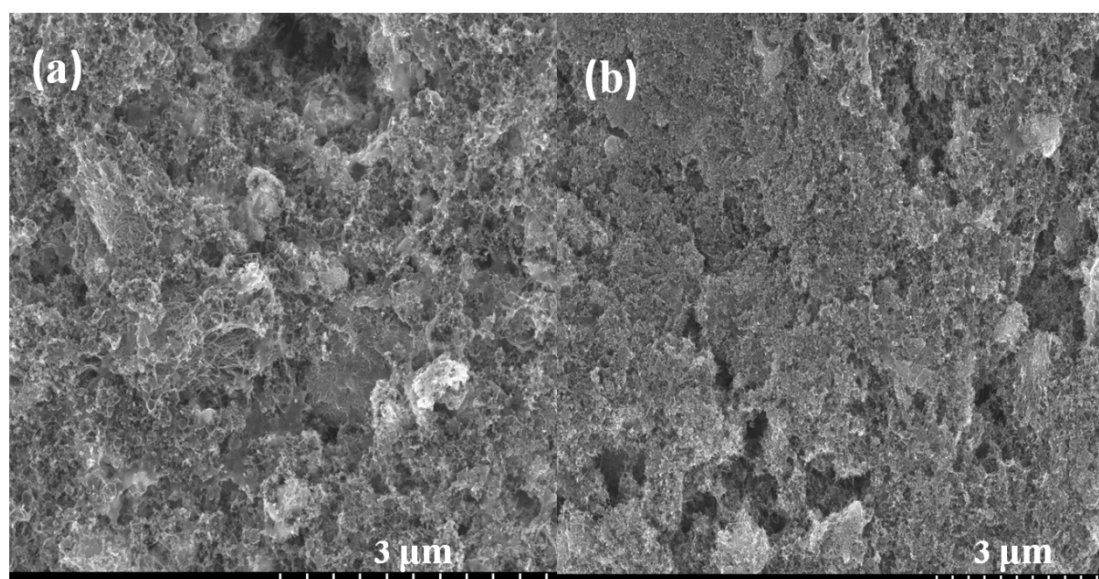
**Fig. 1S** TEM images of (a) MWCNT, (b, c) MWCNTs@S composite.



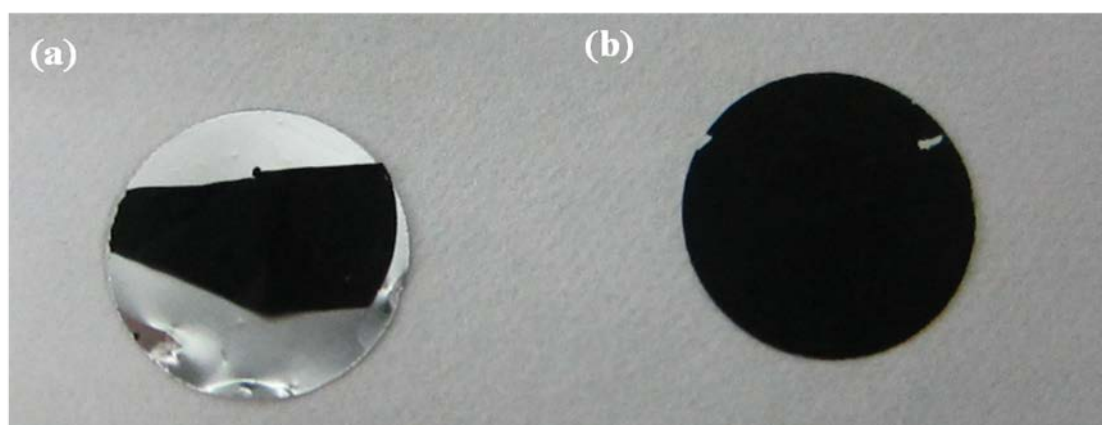
**Fig. 2S** Efficiency and discharge performance of MWCNTs@S at a current density of 2000  $\text{mA g}^{-1}$ .



**Fig. 3S** Electrochemical impedance spectroscopies of the MWCNTs@S@PPy before and after 60 cycles at 200  $\text{mA g}^{-1}$ .



**Fig. 4S** SEM image of the MWCNTs@S@PPy composite electrode (a) before and (b) after 200 charge and discharge cycles at a constant current density of  $2000 \text{ mA g}^{-1}$ .



**Fig. 5S** Photos of the MWCNTs@S and MWCNTs@S@PPy composites electrode after 200 charge and discharge cycles at a constant current density of  $2000 \text{ mA g}^{-1}$  by regular camera.