Supporting Information

Unearth the Understanding of Interfacial Engineering Techniques on Nano Sulfur Cathodes for Steady Li-S Cell Systems

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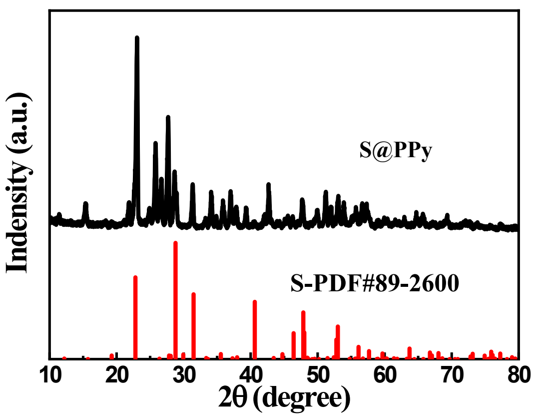

Fig. S1: XRD pattern of S@PPy specimen.

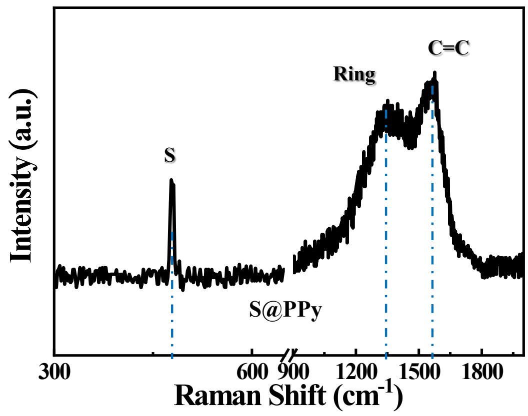

Fig. S2: The Raman spectroscopy of S@PPy.

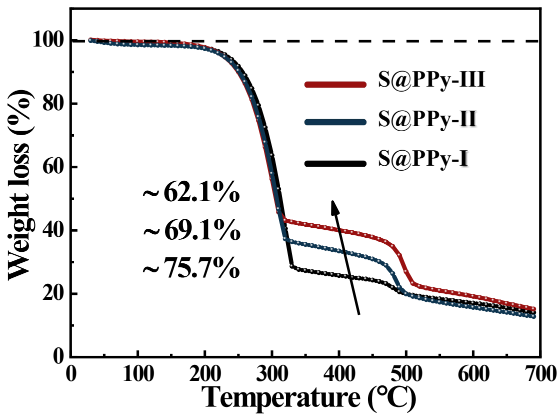

Fig. S3: The TG testing of S@PPy-I, S@PPy-II and S@PPy-III samples.

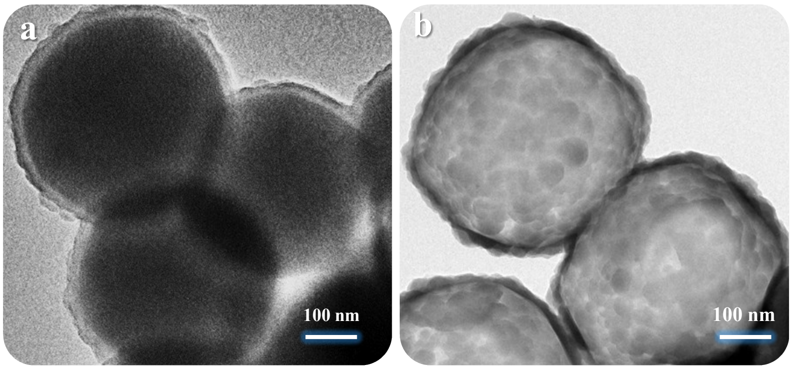

Fig. S4: TEM images of S@PPy-I (a) before and (b) after immersion in $(NH_4)_2S_2O_8$-involved solution.

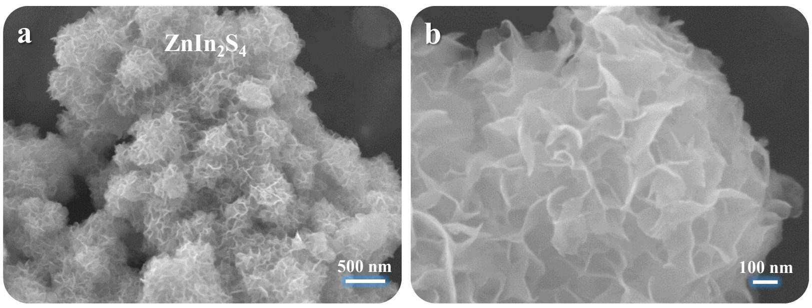

Fig. S5: SEM images of pure $ZnIn_2S_4$ nanoparticles.

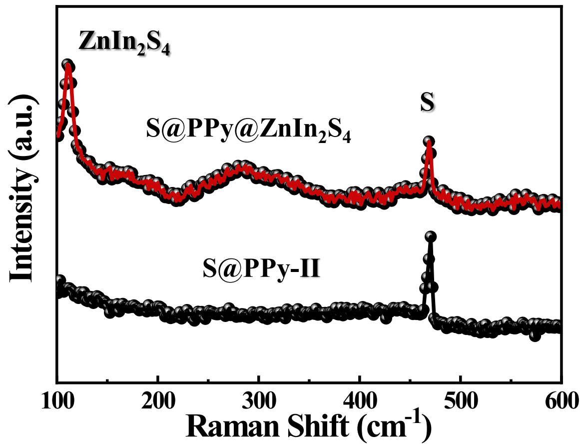

Fig. S6: Raman spectra of S@PPy-II and S@PPy@$ZnIn_2S_4$ samples.

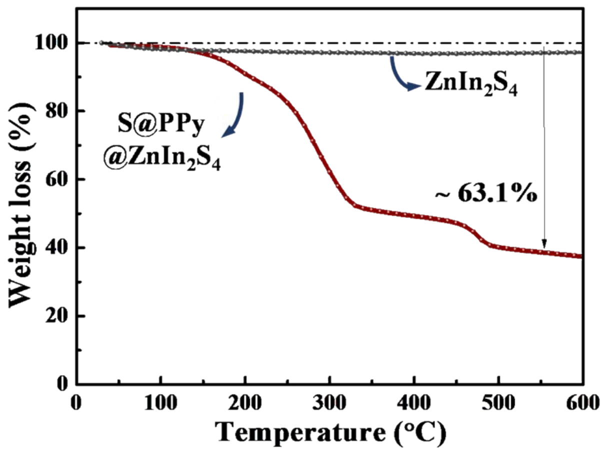

Fig. S7: The TG testing record of S@PPy@$ZnIn_2S_4$.

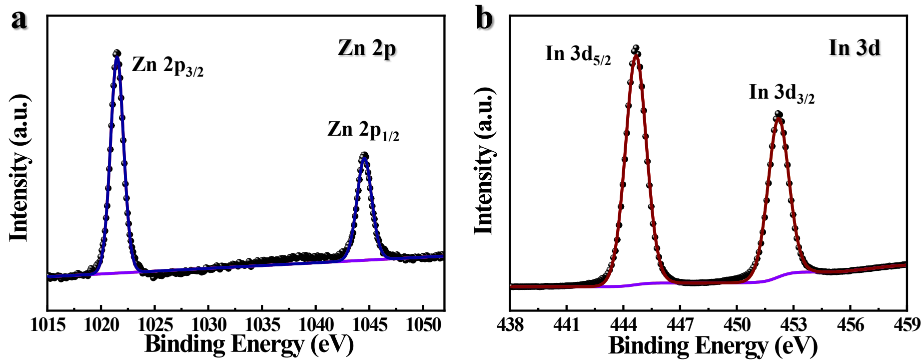

Fig. S8: (a) Zn 2p and (b) In 3d XPS spectra of S@PPy@$ZnIn_2S_4$.

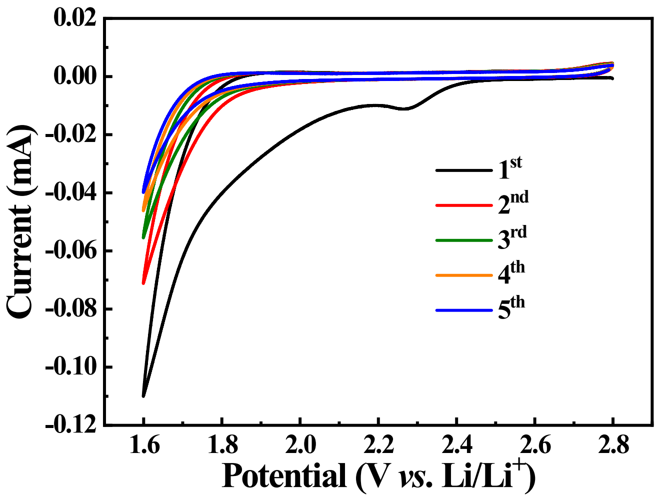

Fig. S9: The CV curve of single-phased $ZnIn_2S_4$.

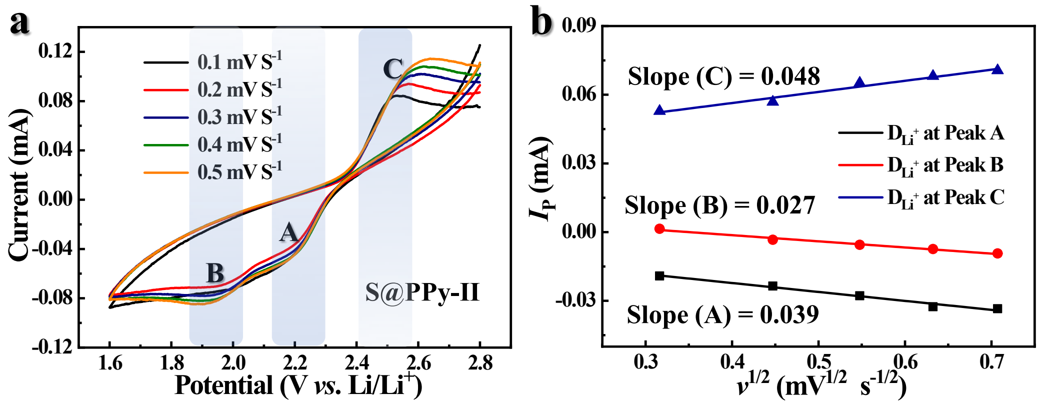

Fig. S10: (a) CV curves at various scan rates and (b) corresponding linear fitting toward peak currents of S@PPy-II cathodes.

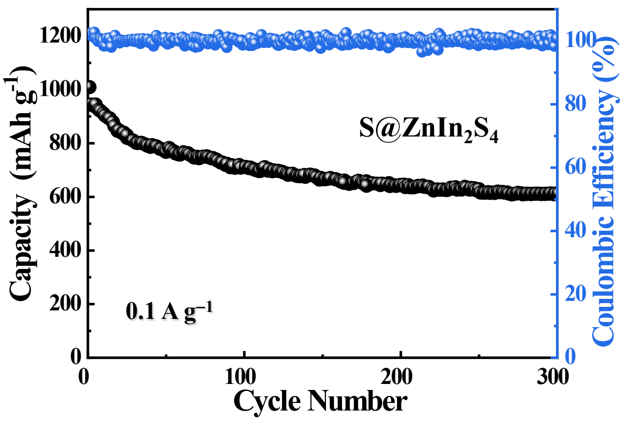

Fig. S11: The long-term cyclic record of S@$ZnIn_2S_4$ cathode.

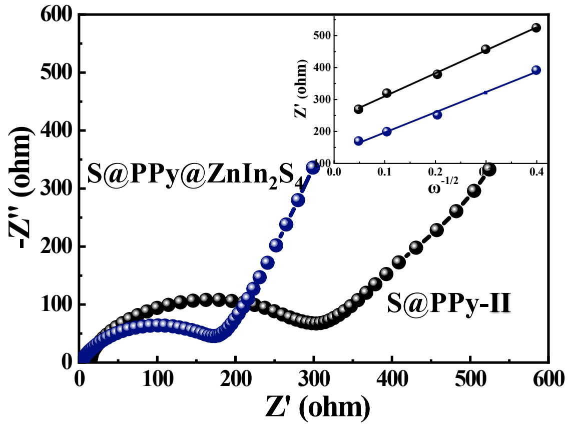

Fig. S12: EIS plots of S@PPy@ZnIn$_2$S$_4$ (inset: the relationship between Z' and $\omega^{-1/2}$).

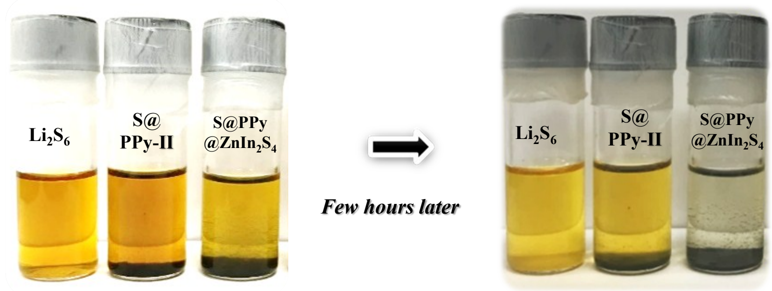

Fig. S13: The adsorption ability of S@PPy-II and S@PPy@ZnIn$_2$S$_4$ in a Li$_2$S$_6$ solution.

Table S1. The electrochemical performances comparison of the studies with PPy-S hybrid electrodes. [1-9]

Cathode material	Sulfur content	Initial discharge capacity (mAh g^{-1})	Reversible discharge capacity (mAh g^{-1})	Current rate	Total cycle number	Ref
Core-shell S@PPy	32.0%	163	138	100 mA g^{-1}	100	1
MWCNTs@S/NPC@PEG	56.7%	1078	791	0.5C	50	2
PPy/TiO_2@S	64.7%	997.1	1150	0.1C	100	3
PPy@S@PPy	65.6%	801	554	50 mA g^{-1}	50	4
S@PPy/GS	49.0%	908.7	537.8	0.2C	200	5
S@PHNS	65.0%	1074.2	781.5	0.5 C	100	6
Nano-S/PPy/GNS	52.0%	1415.7	641.5	0.1 C	40	7
PPy@CMK-8/S	57.2%	1099	880	0.2C	100	8
GCS@PPy	64.0%	830	740	0.5C	50	9
S@PPy@$ZnIn_2S_4$	63.1%	1200	891	100 mA g^{-1}	500	

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