Electronic Supplementary Information

Synergistic Effect of Cobalt, Nitrogen-Codoped Hollow Carbon Sphere Hosts for High Performance Lithium Sulfur Batteries

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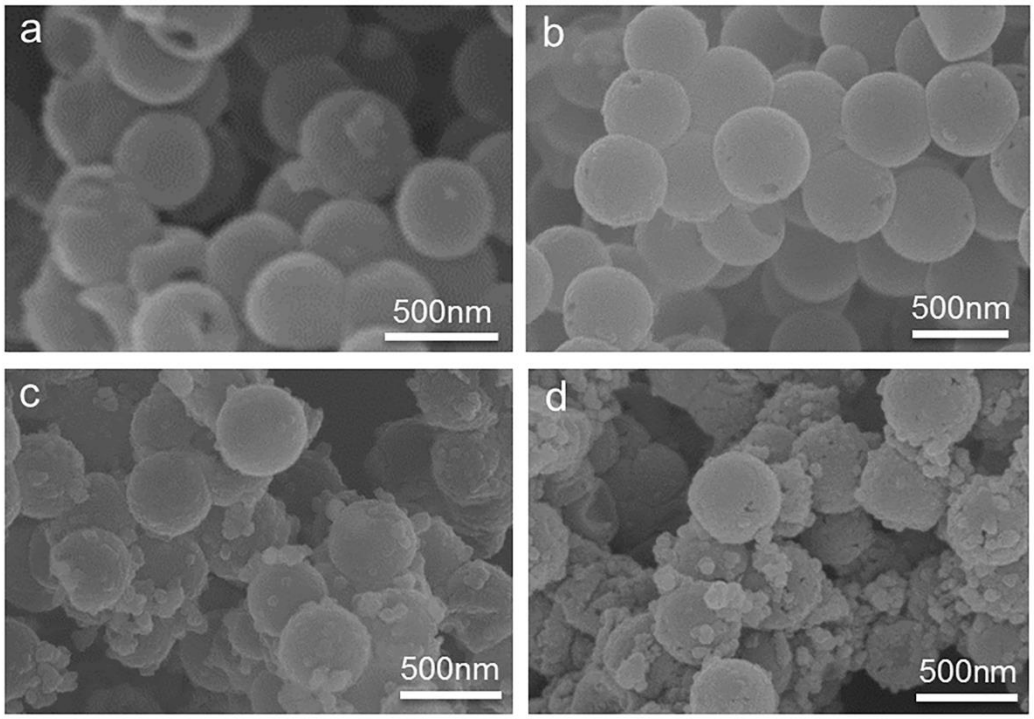

Fig. S1 SEM images of (a) Co-0.6, N@CPDA-HCS, (b) Co, N @CPDA-HCS, (c) Co-2.4, N@CPDA-HCS and (d) Co-3, N@CPDA-HCS.

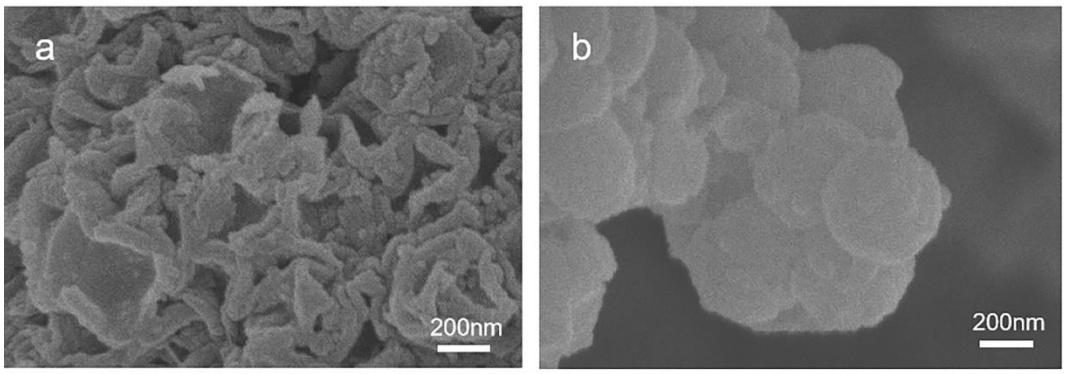

Fig. S2 SEM images of (a) the S/N@CPDA and (b) S/Co, N@CPDA-HCS.

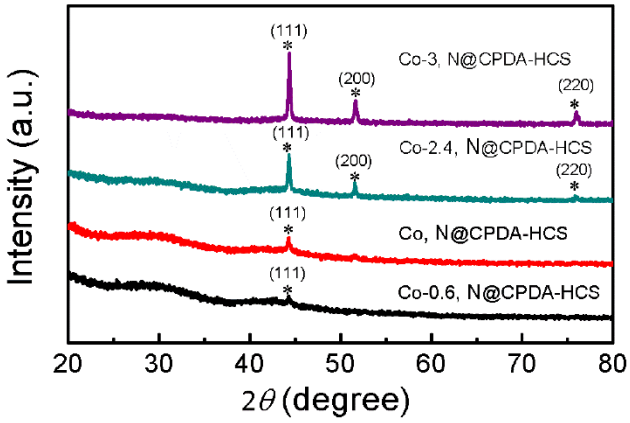

Fig. S3 XRD patterns of Co-0.6, N@CPDA-HCS, Co, N@CPDA-HCS, Co-2.4, N@CPDA-HCS and Co-3, N@CPDA-HCS.

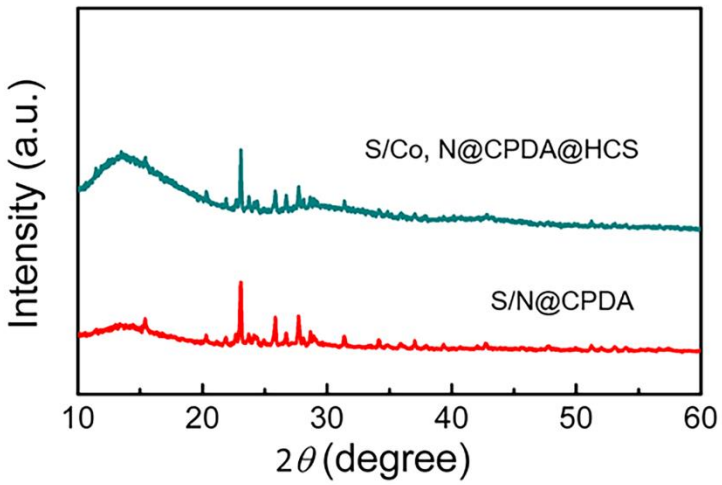

Fig. S4 XRD patterns of S/N@CPDA and S/Co, N@CPDA-HCS.

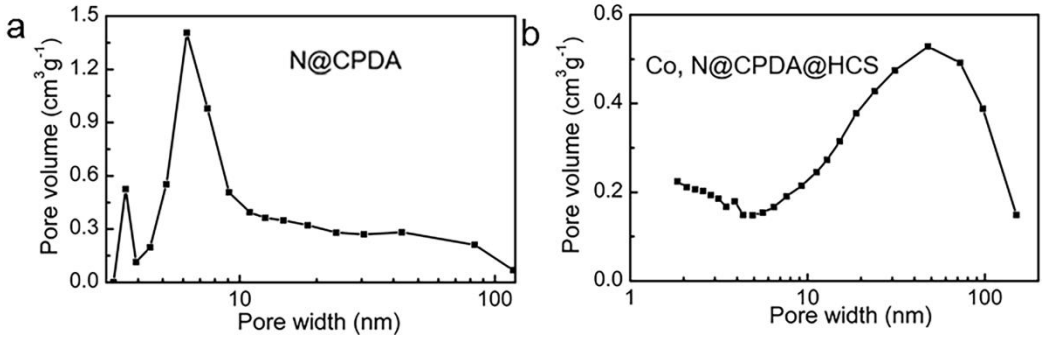

Fig. S5 Aperture distribution curve of (a) N@CPDA and (b) Co, N@CPDA-HCS.

Table S1 BET parameters of N@CPDA and Co, N@CPDA-HCS.

Material	BET surface area(m^2g^{-1})	Total pore volume(cm^3g^{-1})	Average pore diameter(nm)
N@CPDA	190	0.61	16.42
Co, N@CPDA-HCS	456	0.64	13.36

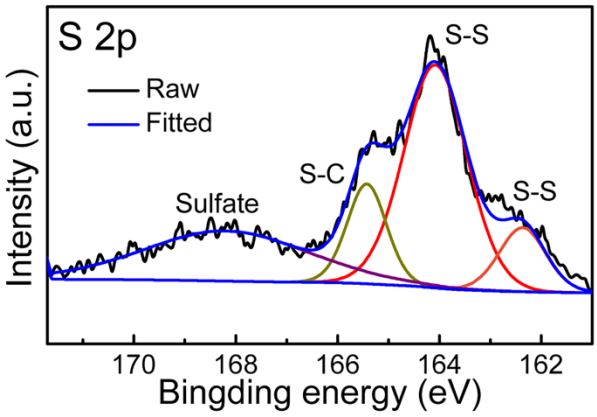

Fig. S6 High-resolution XPS spectra of S 2p in S/Co, N@CPDA-HCS.

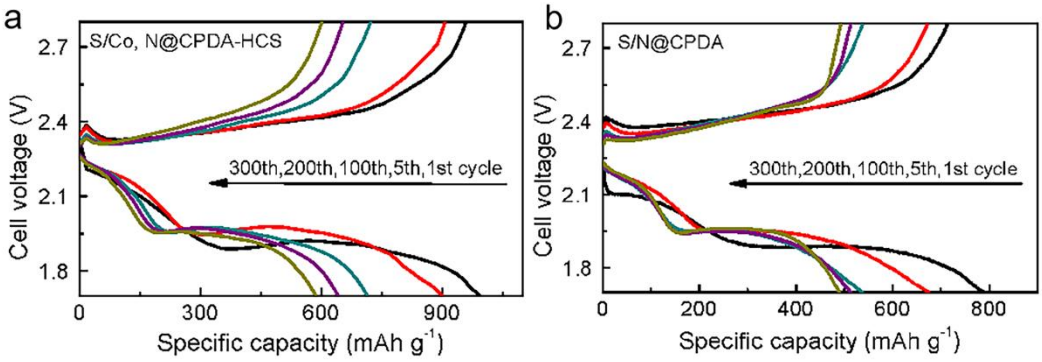

Fig. S7 Charge and discharge voltage profiles of (a) S/Co, N@CPDA-HCS and (b) S/N@CPDA.

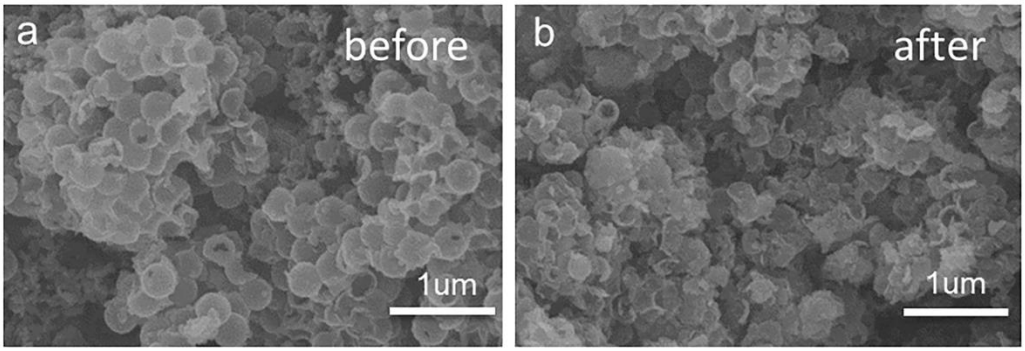

Fig. S8 SEM imagines of S/Co, N@CPDA-HCS before (a) and after (b) cycling.

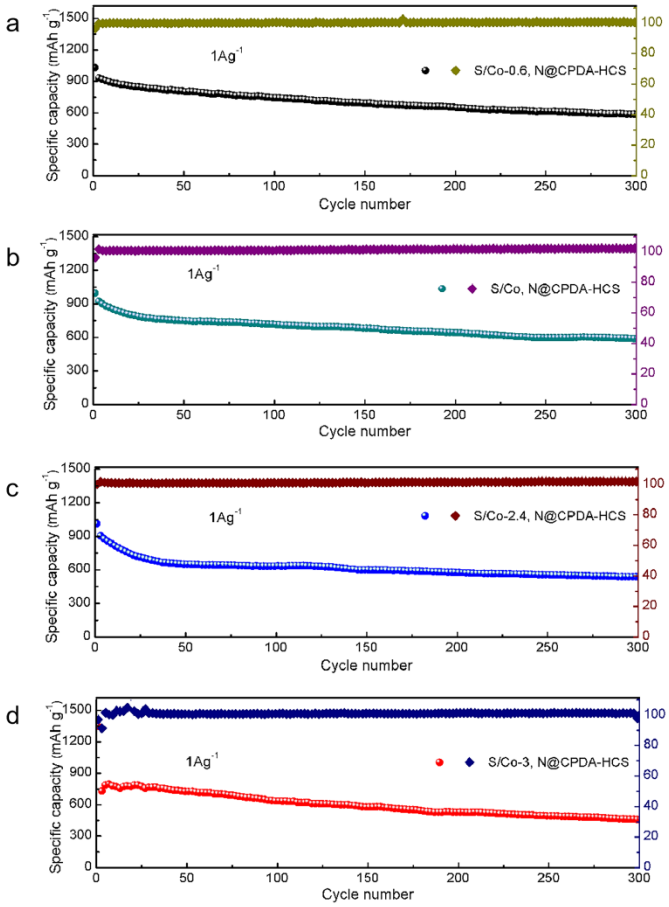

Fig. S9 Cycling performances of (a) S/Co-0.6, N@CPDA-HCS, (b) S/Co, N@CPDA-HCS, (c) S/Co-2.4, N@CPDA-HCS and (d) S/Co-3, N@CPDA-HCS tested at a current density of 1A g^{-1}.

Table S2 Component parameters of the equivalent circuit corresponding to EIS.

Electrodes	$R_s(\Omega)$	$R_{ct}(\Omega)$
S/N@CPDA	4.616	174.5
S/Co, N@CPDA-HCS	2.523	99.31

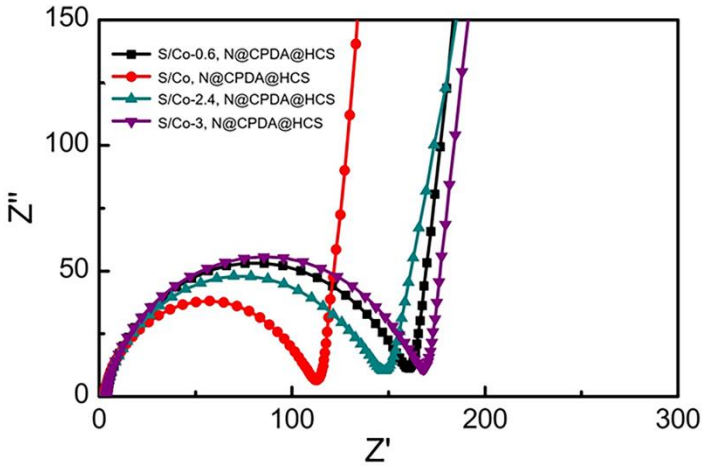

Fig. S10 EIS plots of the S/Co-0.6, N@CPDA-HCS, S/Co, N@CPDA-HCS, S/Co-2.4, N@CPDA-HCS and S/Co-3, N@CPDA-HCS.