

Supporting Information

MoS<sub>2</sub> Quantum Dots-Decorated CNTs Networks as Sulfur Host Enhanced Electrochemical  
Kinetics for Advanced Lithium–Sulfur Batteries

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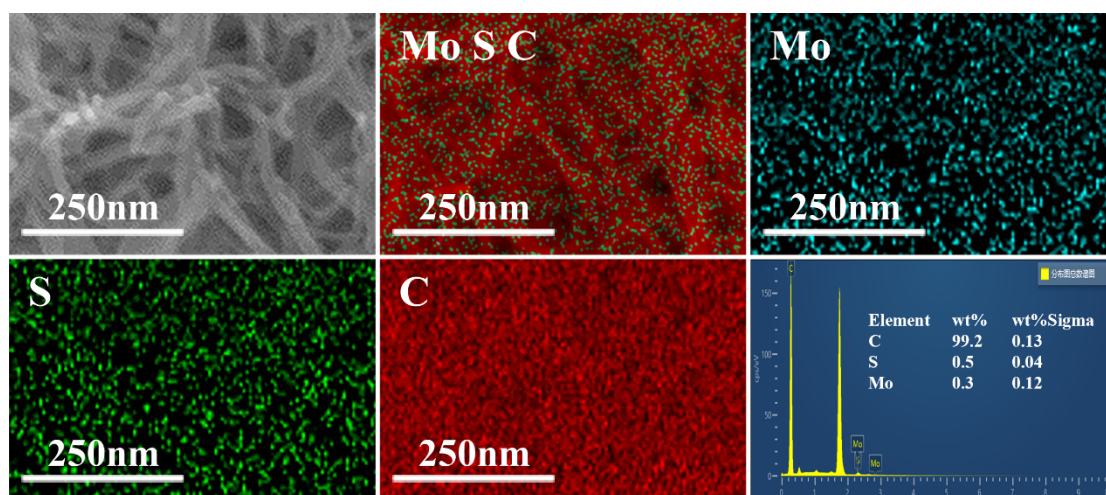


Figure S1 SEM image and corresponding EDS mappings of MoS<sub>2</sub> QDs-CNTs/S.

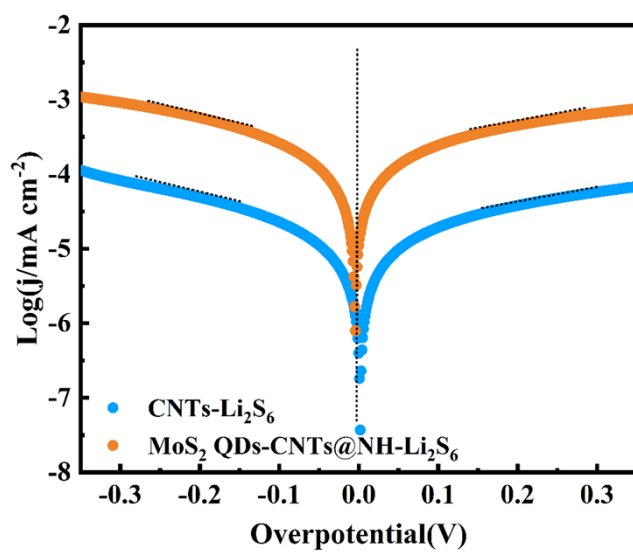


Figure S2 Tafel plots of the  $\text{Li}_2\text{S}_6$  electrolyte on CNTs and  $\text{MoS}_2$  QDs-CNTs@NH surfaces

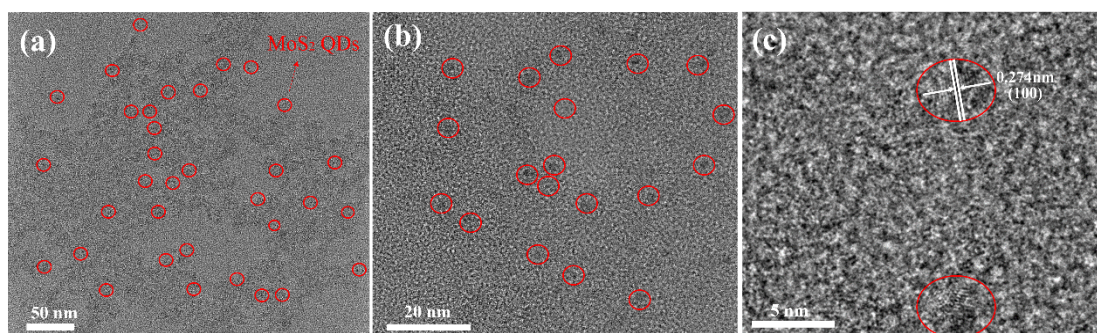


Figure S3 TEM plots of different multiples of  $\text{MoS}_2$  QDs

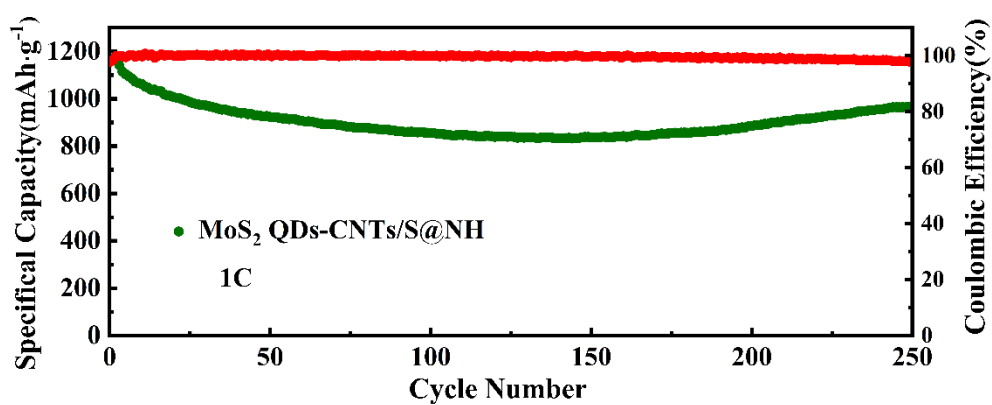


Figure S4 The cycling performance of  $\text{MoS}_2$  QDs-CNTs/S@NH cathode at 1 C.

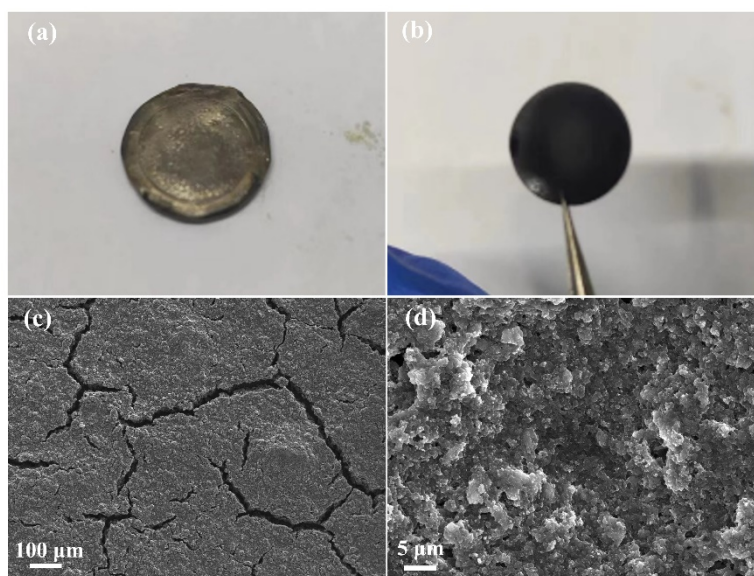


Figure S5. morphology of lithium anode and MoS<sub>2</sub>-CNTs/S@NH composites after 200 cycles at 2 C current density.

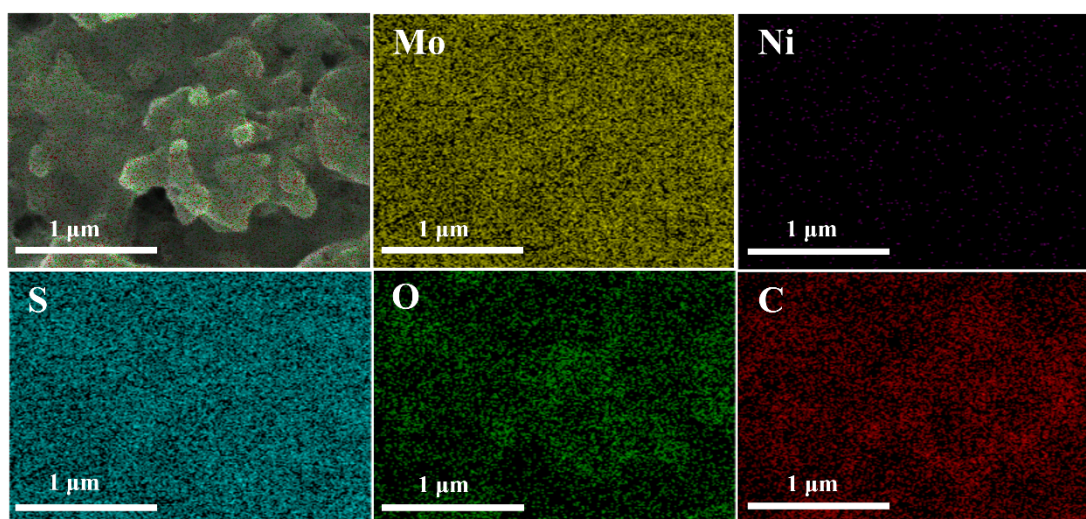


Figure S6. The Surface morphology of MoS<sub>2</sub> QD-CNTs/S@NH in the discharged state after 200 cycles at 2 C, and its EDS mapping results (Fig. 3f).

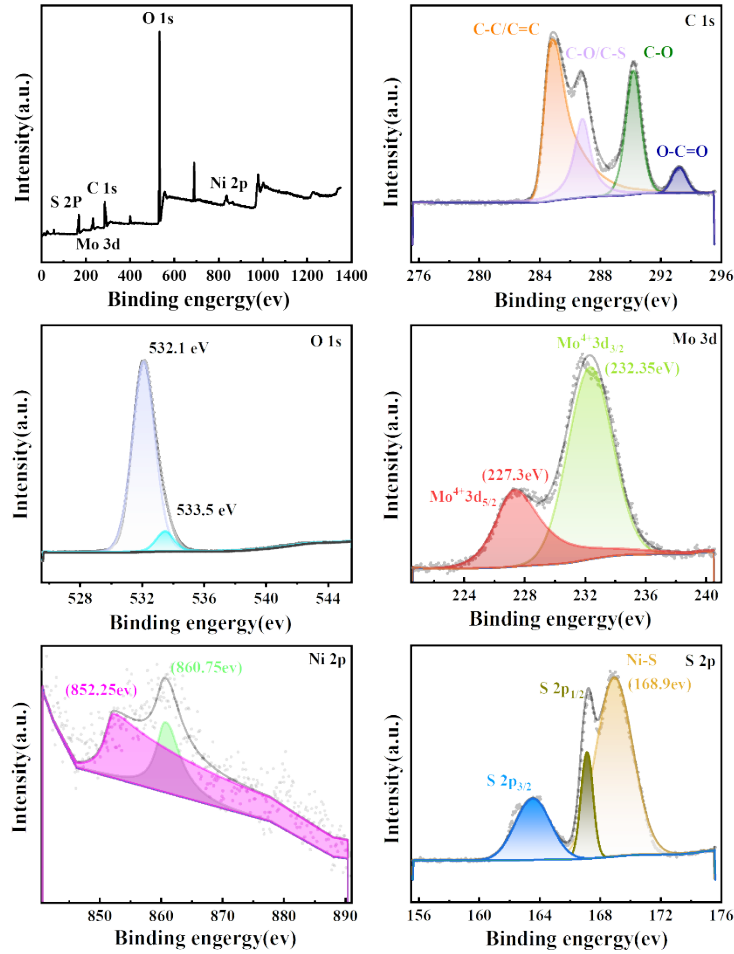


Figure S7. the XPS spectra of the MoS<sub>2</sub> QDs-CNTs/S@NH sample after 200 cycles at 2 C current density: (a) overall XPS spectrum, (b) C 1s, (c) O 1s, (d) Mo 3d, (e) Ni 2p, and (f) S 2p XPS spectra.

Table R1 Electrochemical properties of sulfur-based cathode in this work and literature.

Cathode material	Initial specific capacity /Current density	Capacity after cycling (Cycle number)	Reference
MoS <sub>2</sub> QDs-CNTs/S@Ni(OH) <sub>2</sub>	1141.4/0.5 C	884.6 (200)	This work
MoS <sub>2</sub> /CNTs-S	1271/0.5 C	676.1 (73)	R1
S/MoS <sub>2</sub> @G-PCNFs	820/1 C	594 (500)	R2
HFSMS/S	776/0.5 C	430 (200)	R3
CoP@MoS <sub>2</sub> -0.75	1016.7/0.5 C	759 (250)	R4
S/CN/MoS <sub>2</sub>	930/0.5 C	420 (100)	R5
1T-MoS <sub>2</sub> -CNF	890/0.1 C	820 (100)	R6
MoS@rGO/S	1039.1/0.5 C	848.4 (200)	R7