## **Supporting information**

## Hierarchical Carbon Hollow Nanospheres Coupled with Ultra-small Molybdenum Carbide as Sulfiphilic Sulfur Hosts for Lithium-Sulfur Batteries

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**Figure S1** SEM image (a) and XRD Pattern (b) of Mo-PDA mixture hollow sphere obtained by polymerization reaction.



**Figure S2** (a) STEM image of MoC@N-HCS and corresponding EDS line-scanning of carbon (b) and molybdenum (c) elements across a selected area (red line in a).



Figure S3 SEM images of N-CS.



Figure S4 SEM image of MoC@N-HCS/S.



Figure S5 (a) N<sub>2</sub> adsorption/desorption isotherm of MoC@N-HCS/S. (b) Pore size distribution of MoC@N-HCS and MoC@N-HCS/S.



Figure S6 UV-Vis adsorption spectra of Li<sub>2</sub>S<sub>6</sub> solution with the addition of MoC@N-

HCS, rGO and Super P.