Electronic Supplementary Material (ESI) for CrystEngComm.

Supporting Information

The synthesis of ZnS@MoS_2 hollow polyhedrons for an enhanced lithium storage performance

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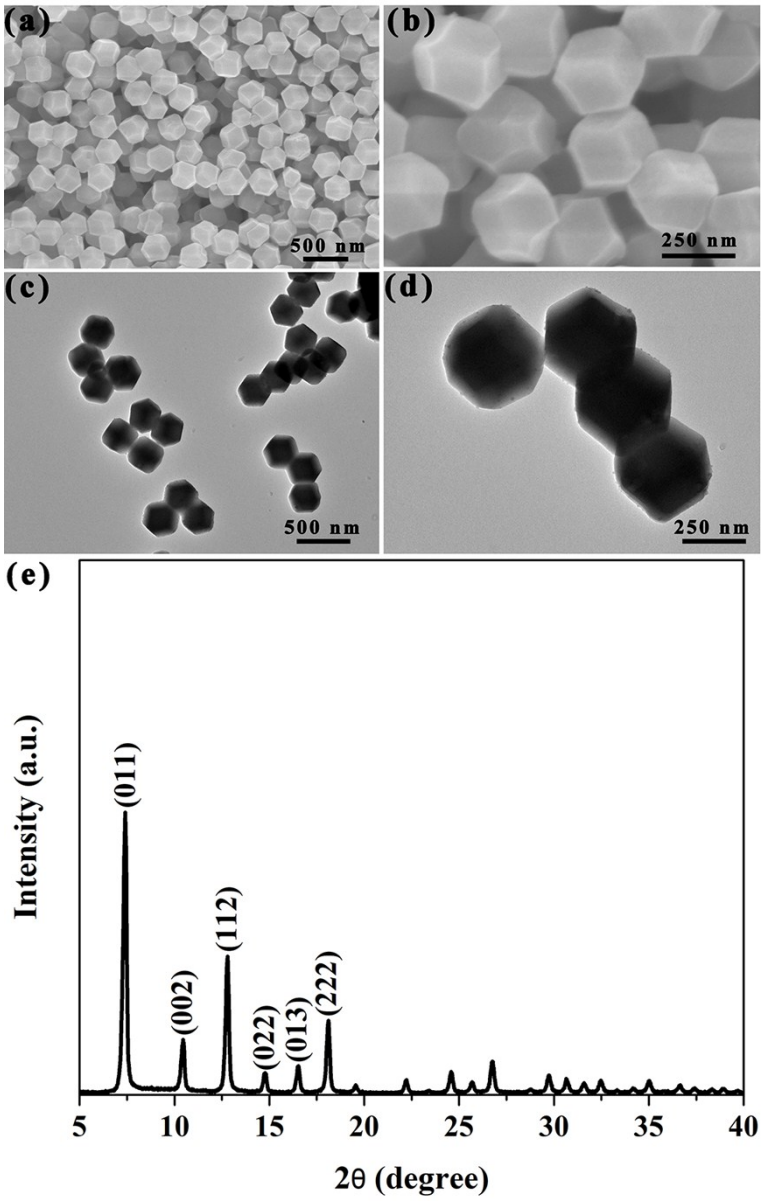

Figure S1. (a-b) SEM images and (c-d) TEM image of ZIF-8. (e) XRD pattern of ZIF-8.

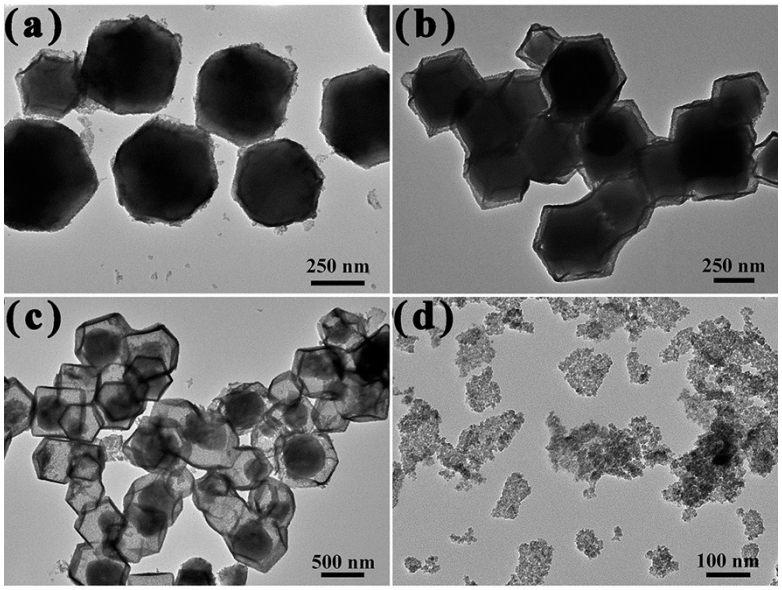

Figure S2. TEM images of the products obtained at different reflow times, (a) 1 h (b) 2 h (c) 4 h (d) 6 h.

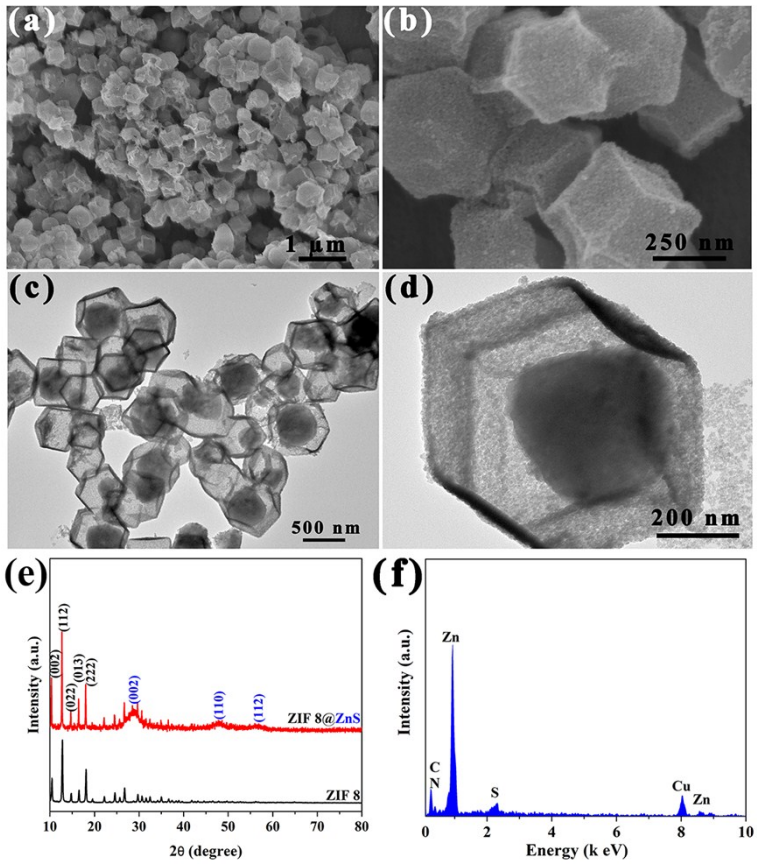

Figure S3. (a-b) SEM, (c-d) TEM of ZIF-8@ZnS core-shell (e) XRD patterns

of ZIF-8@ZnS; (f) EDX of ZIF-8@ZnS.

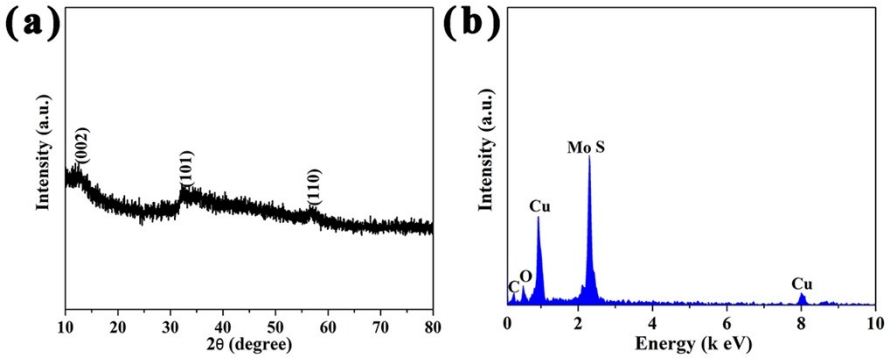

Figure S4. (a) XRD profile and (b) EDX pattern of the obtained MoS_2 without using ZIF-8@ZnS template.

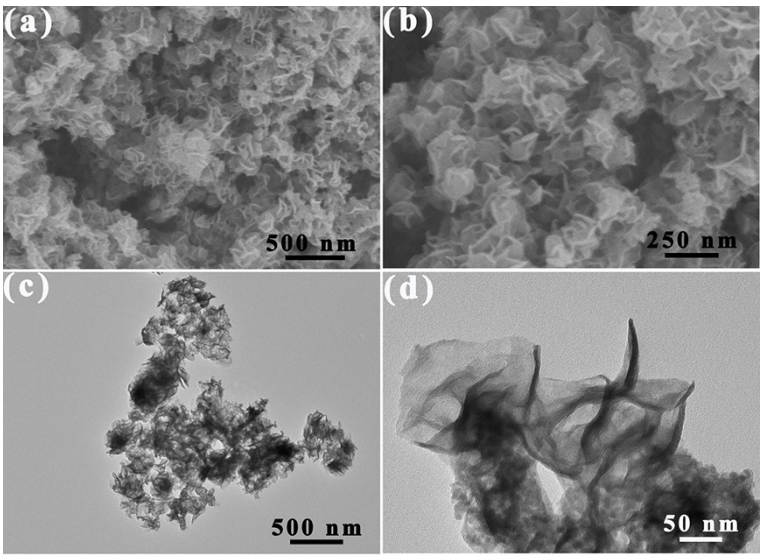

Figure S5. (a-b) SEM images and (c-d) TEM images of MoS_2.

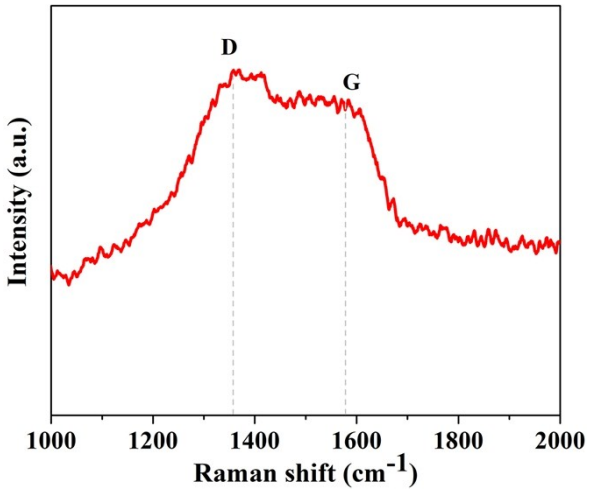

Figure S6. the Raman spectrum of $ZnS@MoS_2$ composites.

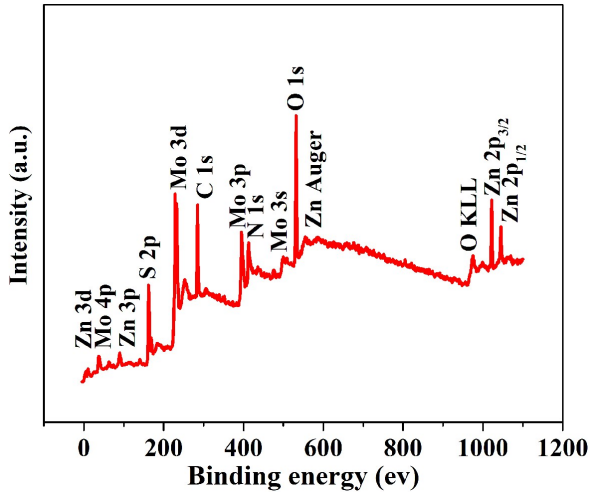

Figure S7. XPS survey spectrum of $ZnS@MoS_2$ hollow polyhedrons.

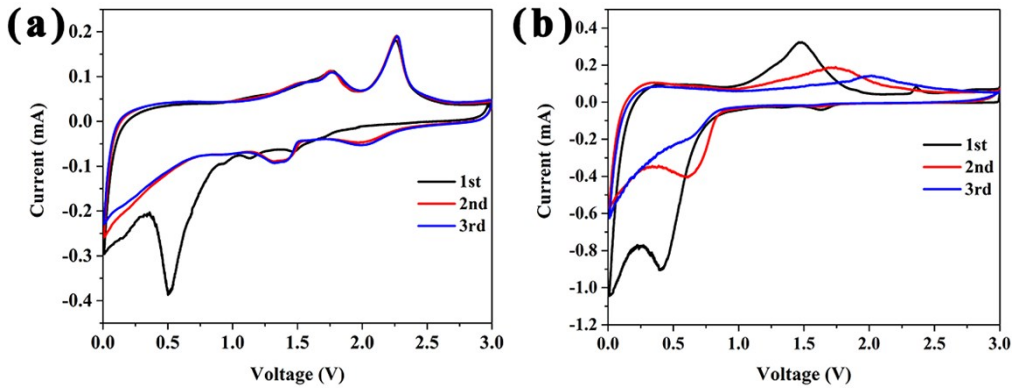

Figure S8. The initial three CV curves of (a) MoS_2 and (b) ZnS electrodes in the potential range of 0.01-3.0 V (vs. Li/Li^+) at a scan rate of 0.1 mV s^{-1}.

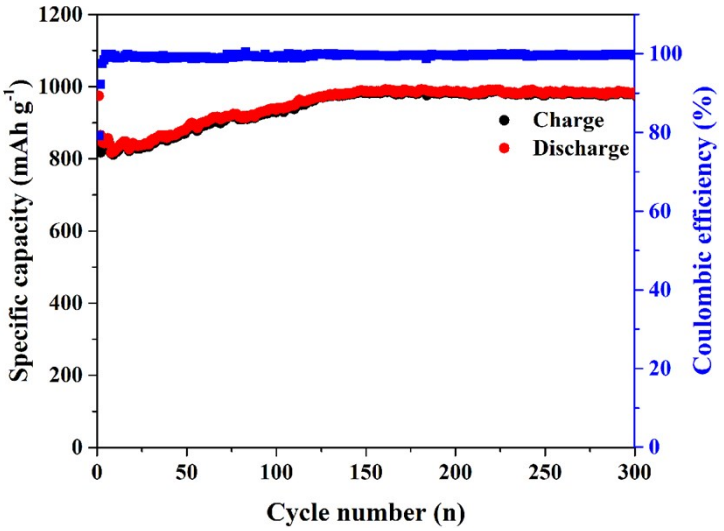

Figure S9. Long-term cycling performance and CE of the ZnS@MoS_2 hollow polyhedron at a current density of 500 mA g^{-1}.

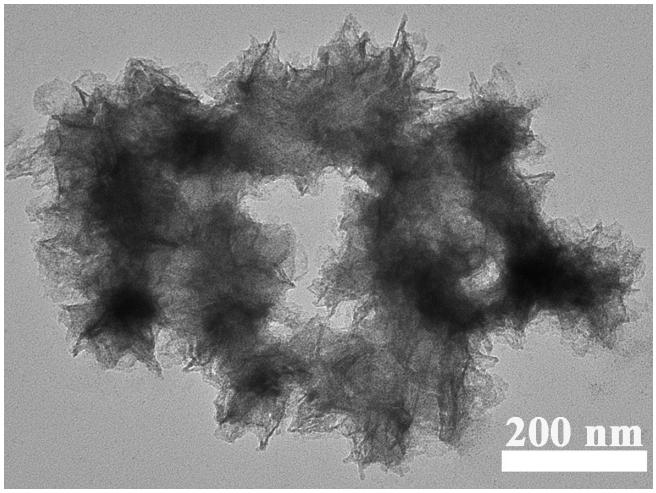

Figure S10. TEM image of the ZnS@MoS_2 hollow polyhedron after cycling.

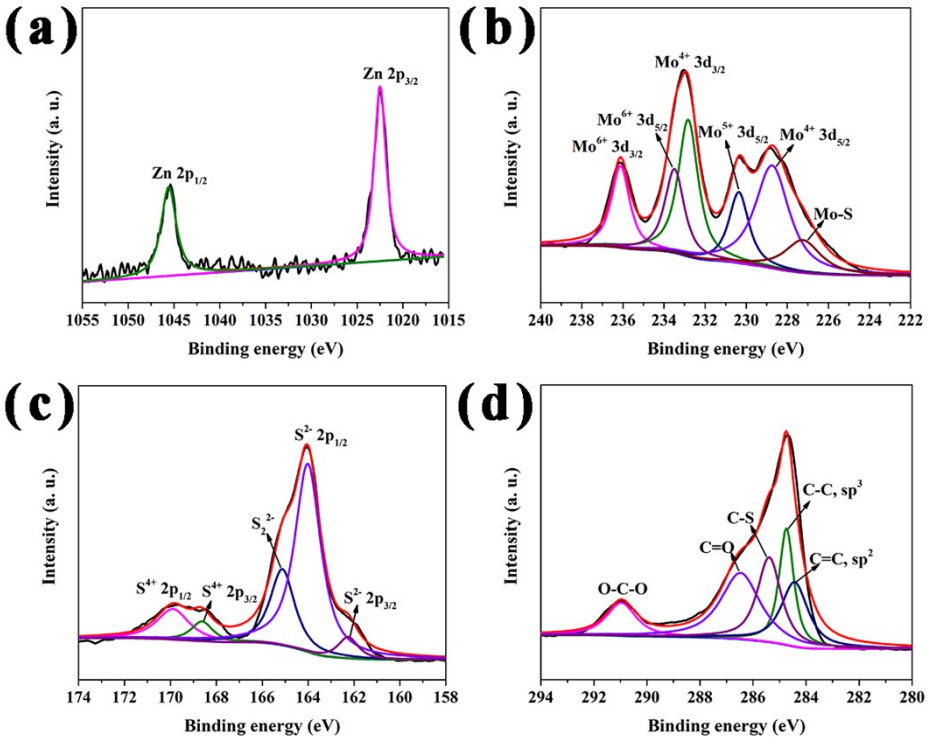

Figure S11. High-resolution XPS spectra of the (a) Zn 2p, (b)Mo 3d, (c)S 2p, and (d) C 1s after cycling.

Table S1. Impedance parameters derived using equivalent circuit model for electrodes before and after 200 cycles at 0.2 A g^{-1}.

Electrode	**R_s (Ω)**	**R_{ct} (Ω)**
ZnS@MoS_2 (before cycle)	5.698	51.401
ZnS@MoS_2 (after 200 cycles)	4.712	25.701

ZnS (before cycle)	11.569	168.182
ZnS (after 200 cycles)	7.464	95.981
MoS_2 (before cycle)	6.825	98.332
MoS_2 (after 200 cycles)	4.046	69.597