Supporting Information

MoO_2@Carbon Hollow Microspheres with Tunable Interiors and Improved Lithium-ion Battery Anode Properties

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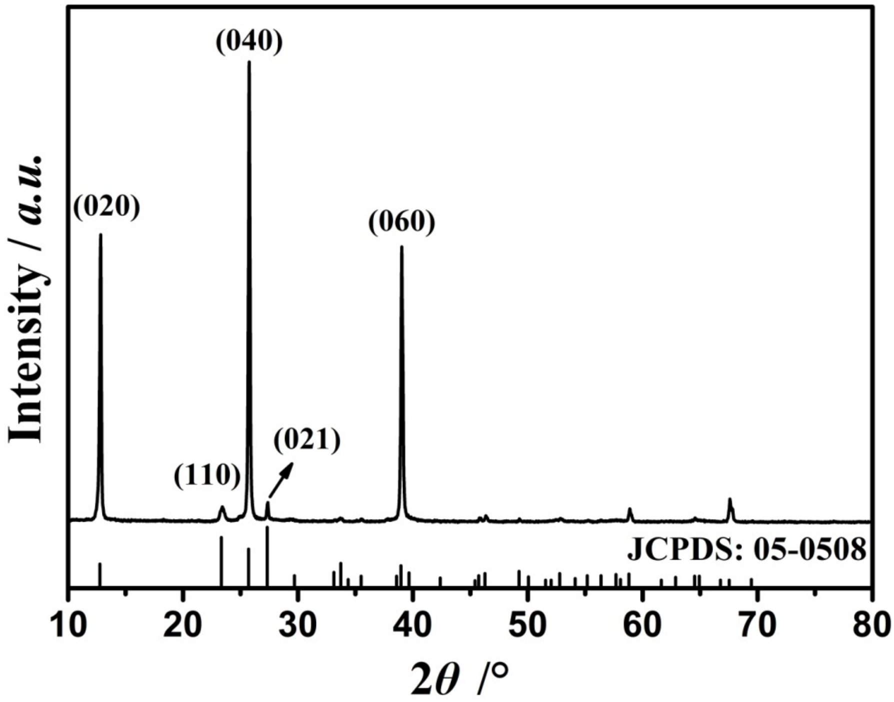


Figure S1. XRD pattern of MoO_3 microbelts (the standard data for orthorhombic MoO_3 (JCPDS card 05-0508) is presented at the bottom for comparison).

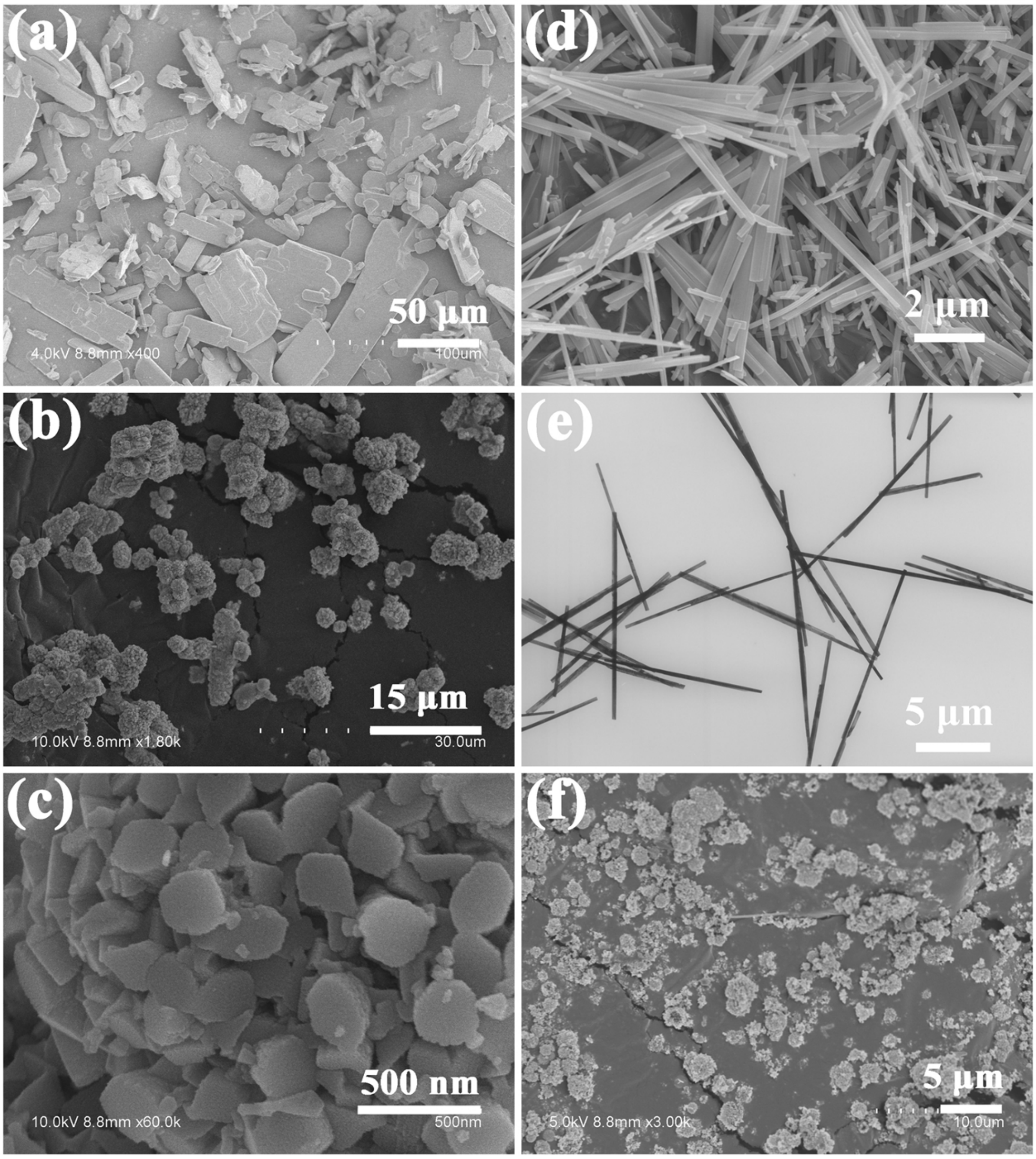


Figure S2. (a) SEM image of bulk MoO_3; (b, c) SEM images of MoO_2-AMS; (d, e) SEM and TEM images of MoO_3 microbelts; (f) SEM image of MoO_2 hollow quasi-microspheres when no NaOH aqueous solution was added.

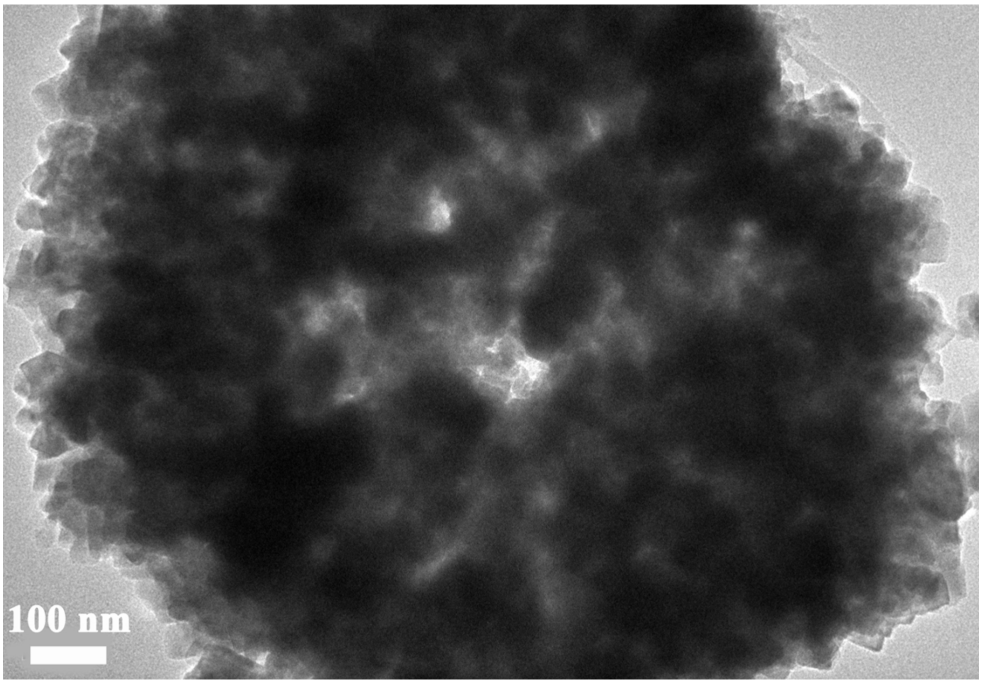
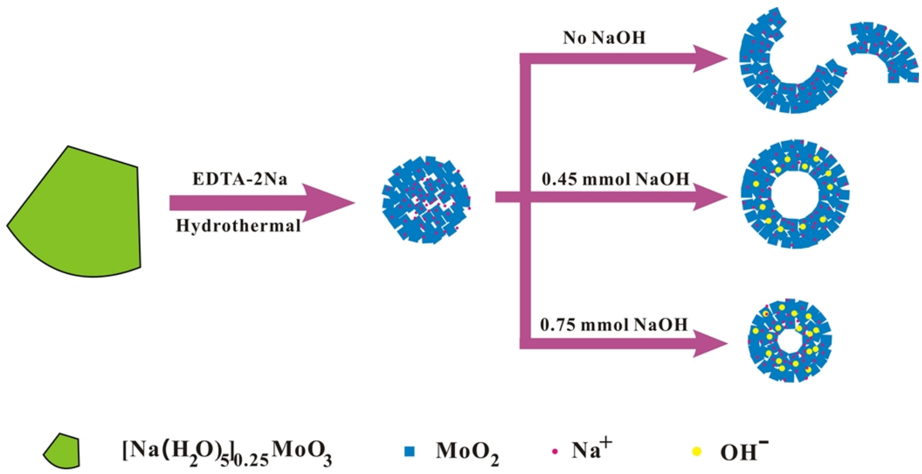
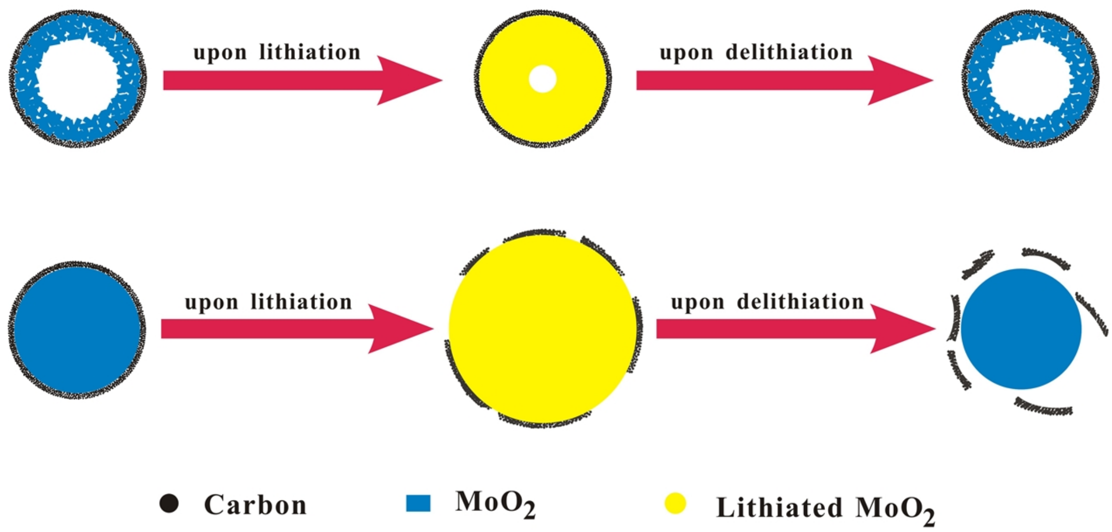


Figure S3. TEM image of MoO_2@C-HMS with a high magnification.



Scheme S1. The possible formation mechanism of MoO_2-HMS.



Scheme S2. An illustration for the lithiation and delithiation processes of MoO_2@C-HMS and MoO_2 solid sphere.

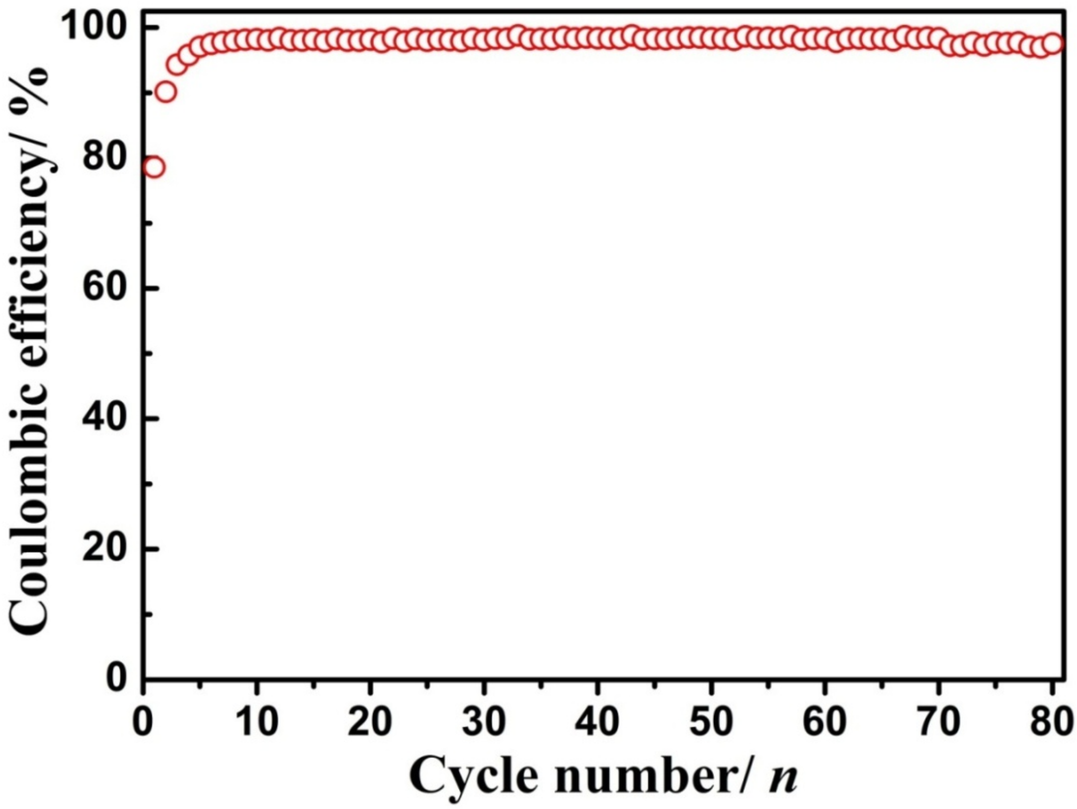


Figure S4. Coulombic efficiency of MoO_2@C-HMS electrode at a current density of 100 $mA \cdot g^{-1}$.

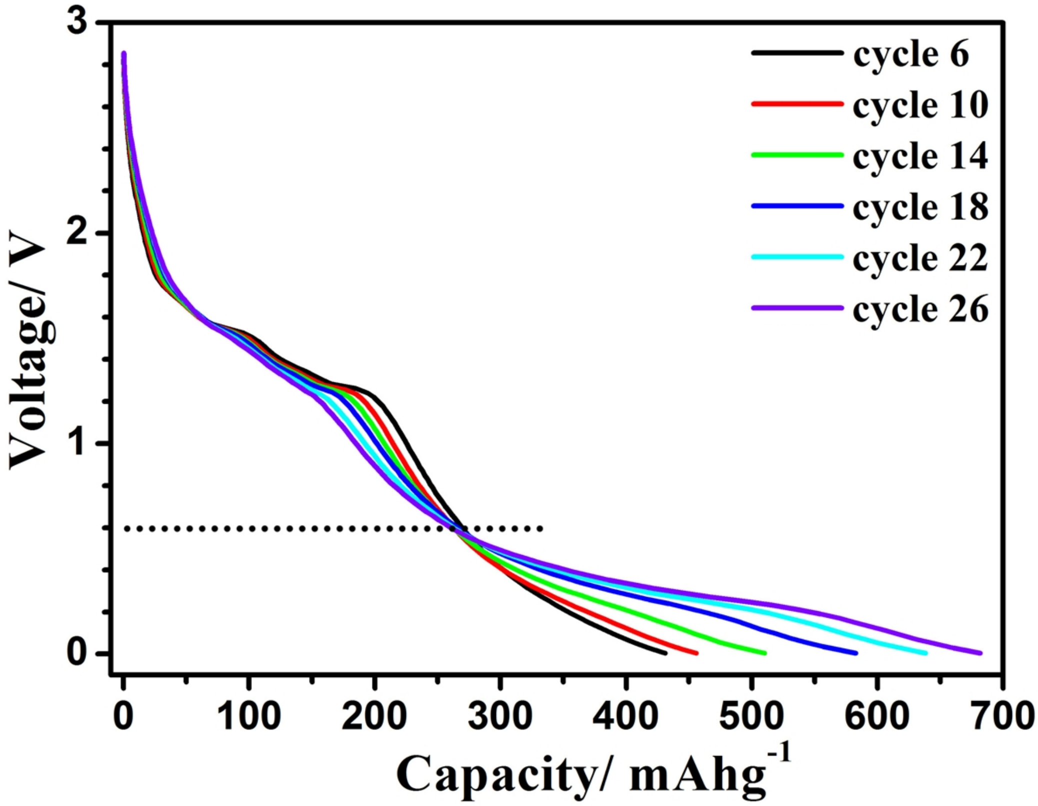


Figure S5. Discharge curves of MoO_2@C-HMS at the 6th, 10th, 14th, 18th, 22th and 26th cycle, respectively.

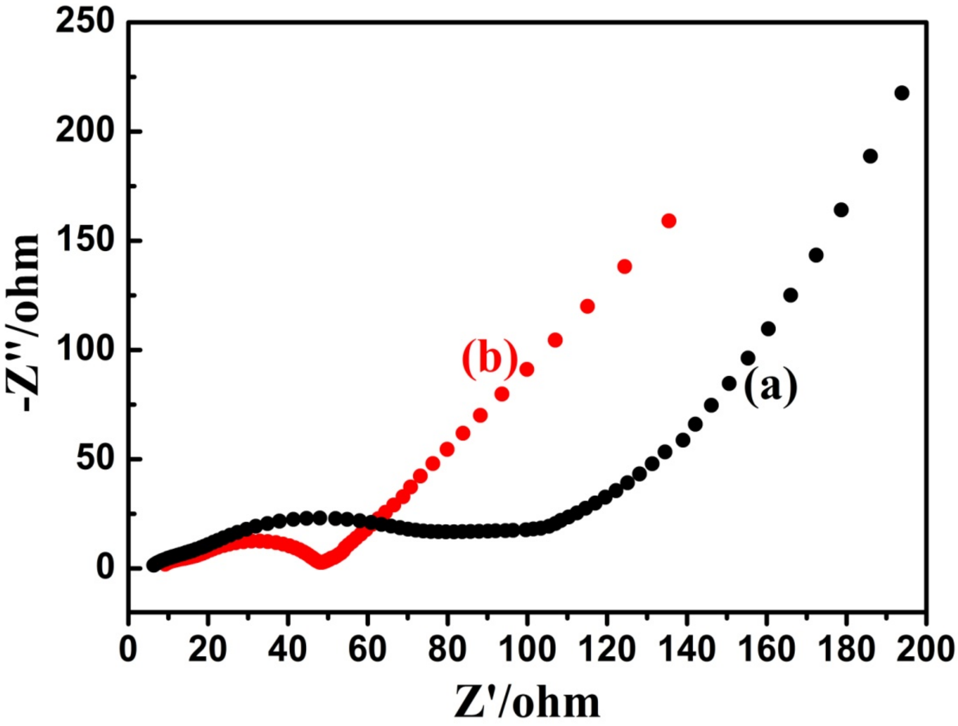


Figure S6. Nyquist plots of (a) MoO_2-HMS and (b) MoO_2@C-HMS electrodes.

In order to understand the influence of carbon coating on the charge-transfer impedance of electrode, electrochemical impedance tests were performed from 10^5 Hz to 0.001 Hz. Both Nyquist plots consist of one semicircle at high frequencies and a straight line at low frequencies. Nyquist plots show that the semicircle for MoO_2@C-HMS electrode in the high frequency region was much smaller than that of MoO_2-HMS electrode, suggesting that the MoO_2@C-HMS electrode possesses lower charge-transfer impedance.