

Electronic Supplementary Information

Porous Metallic MoO₂-Supported MoS₂ Nanosheets for Enhanced Electrocatalytic Activities in Hydrogen Evolution Reaction

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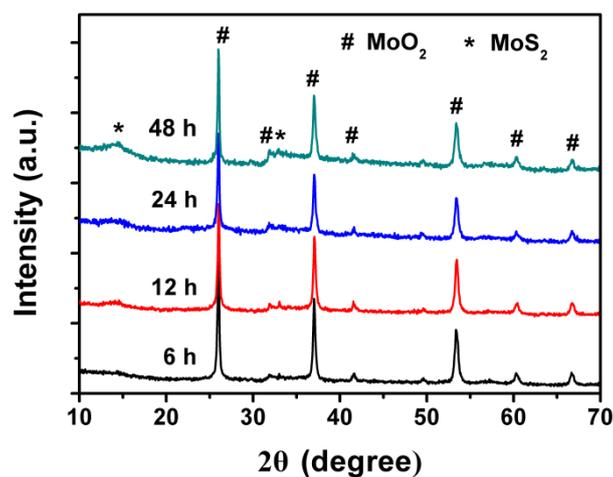


Figure S1. XRD of MoS₂/MoO₂ obtained by different hydrothermal time (6 h, 12 h, 24 h and 48 h).

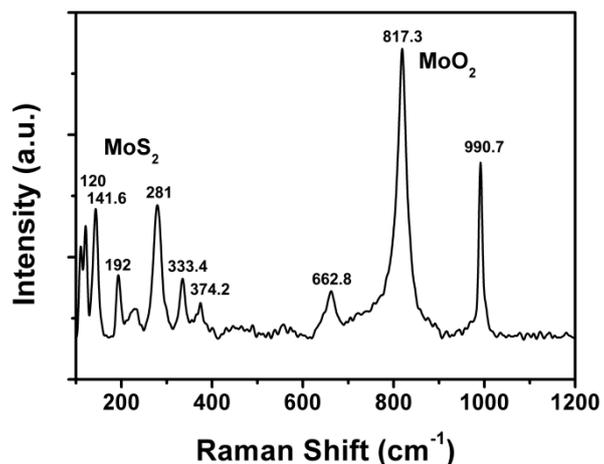


Figure S2. Raman spectroscopic studies of MoS₂/MoO₂-6h.

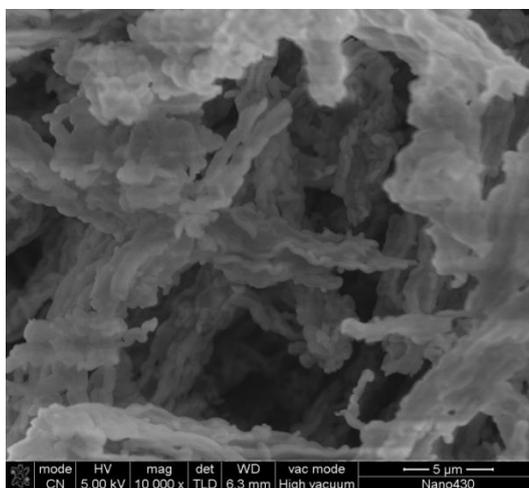


Figure S3. SEM image of mesoporous silicon (SBA-15).

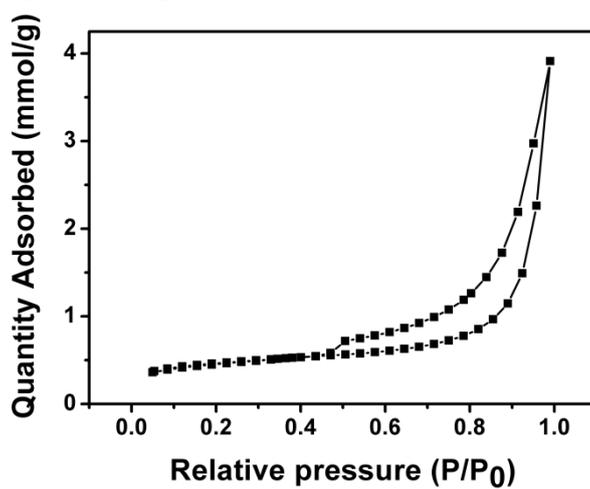


Figure S4. Nitrogen adsorption/desorption isotherms porous MoS₂/MoO₂-6h.

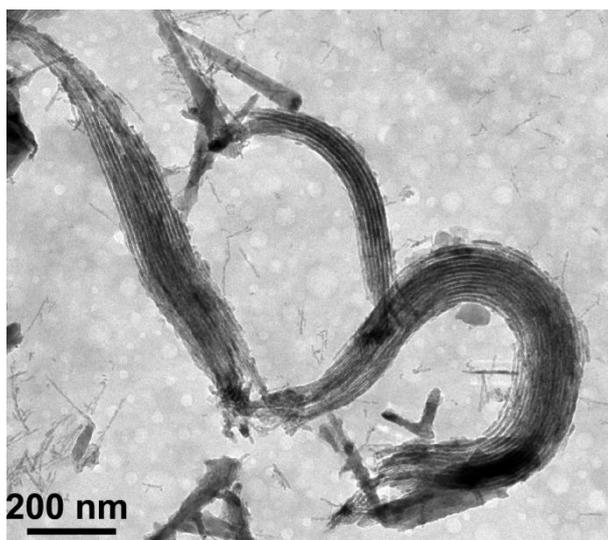


Figure S5. TEM image of porous MoO₂ with one-dimensional channels.

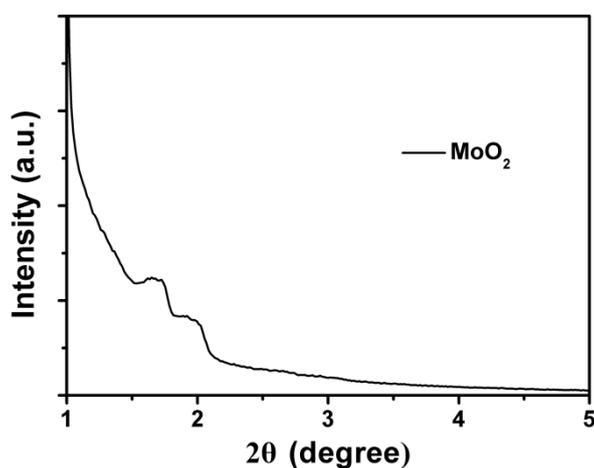


Figure S6. Small-angle XRD pattern of MoO₂. On the basis of Bragg equation ($2d \sin \theta = n\lambda$), where $\lambda = 0.15406$ nm, the size of the periodic structure is 5.3 nm and 4.4 nm from $\theta = 0.98^\circ$ and $\theta = 1.99^\circ$, respectively.

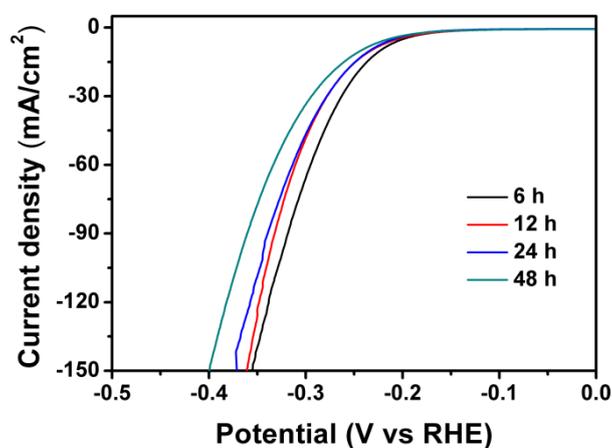


Figure S7. Polarization curves of MoS₂/MoO₂ sample obtained by different hydrothermal time (6 h, 12 h, 24 h and 48 h).

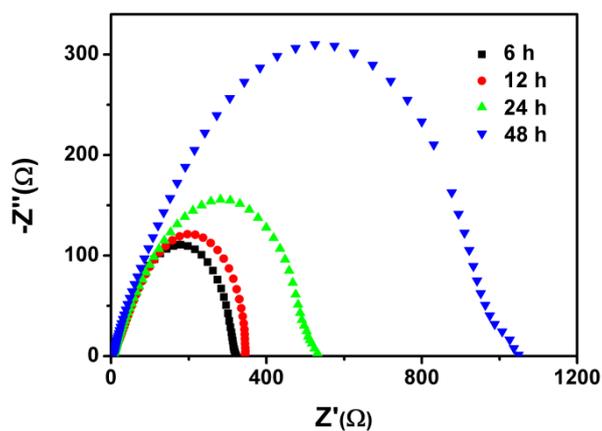


Figure S8. Nyquist plots of MoS₂/MoO₂ sample obtained by different hydrothermal time (6 h, 12 h, 24 h and 48 h) at overpotential of 200 mV.

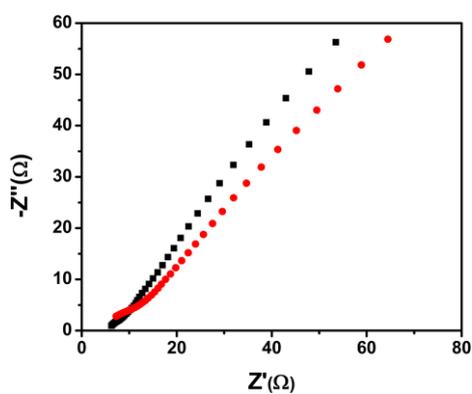


Figure S9. Zoom-in section of the high-frequency region of the Nyquist plots in Figure 5c, where it can be seen that R_s was reduced from 7.26 Ω for MoS₂ to 6.23 Ω for MoS₂/MoO₂-6h.

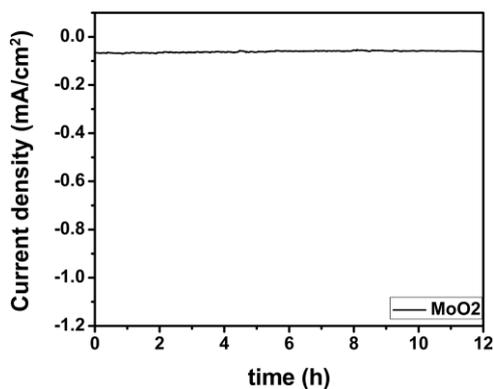


Figure S10. Current–time plots of the MoO₂ electrode at the applied potential of -0.23 V (vs. RHE)

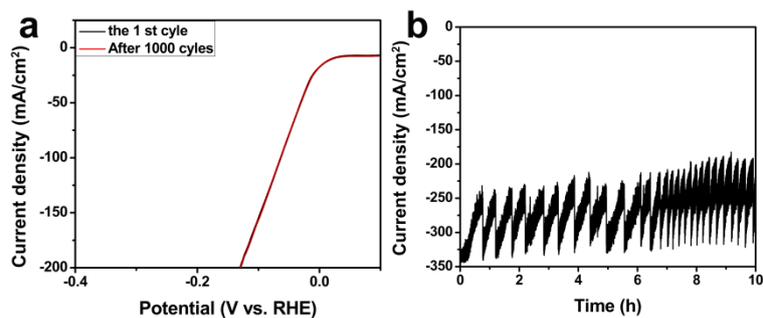


Figure S11. (a) HER polarization curves for the commercial 20 wt% Pt/C before and after 1000 cycles of potential sweeps. (b) Current–time plots of the commercial 20 wt% Pt/C electrode at the applied potential of -0.23 V (vs. RHE).

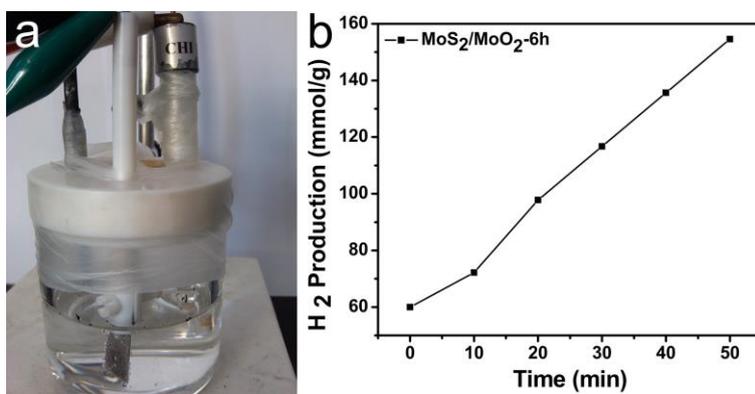


Figure S12. (a) Bubble formation on the MoS₂/MoO₂-6h modified electrode at the applied potential of -0.23 V (vs. RHE). (b) Production of hydrogen gas normalized by the weight of the MoS₂/MoO₂-6h catalysts at different reaction times.