

Supplementary Information

Few-Layer MoSe₂ Possessing High Catalytic Activity towards Iodide/Tri-iodide Redox Shuttles

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Sheet resistance measurement of the counter electrodes mentioned in the main text.

Method:

The sheet resistances were measured by using Van der Pauw method. Briefly, 4 electrodes were connected to the 4 corners of the rectangular CE, then a current i was conducted through one pair of electrodes and the potential difference V was measured from the opposite pair of electrodes. A resistance value can be obtained by dividing V by i . Four such resistance values were obtained for the horizontal (e.g. parallel to the longer side of the rectangle) current flows in four different configurations respectively (i.e. via different current path and direction), and another four were obtained for the vertical (e.g. parallel to the shorter side) current flows. Averaged values R_{hor} and R_{vert} were calculated and plugged into the following equation, from which the sheet resistance R_{sheet} of the CE can be found numerically.

$$e^{-\frac{\pi R_{hor}}{R_{sheet}}} + e^{-\frac{\pi R_{vert}}{R_{sheet}}} = 1$$

Results:

CE	Sheet Resistance (Ω/sq)
MoSe ₂ /Mo/Glass	0.29
MoS ₂ /Mo/Glass	0.37
Pt/FTO/Glass	12.60
FTO/Glass	12.93
Mo/Glass	0.26

Supporting Figures:

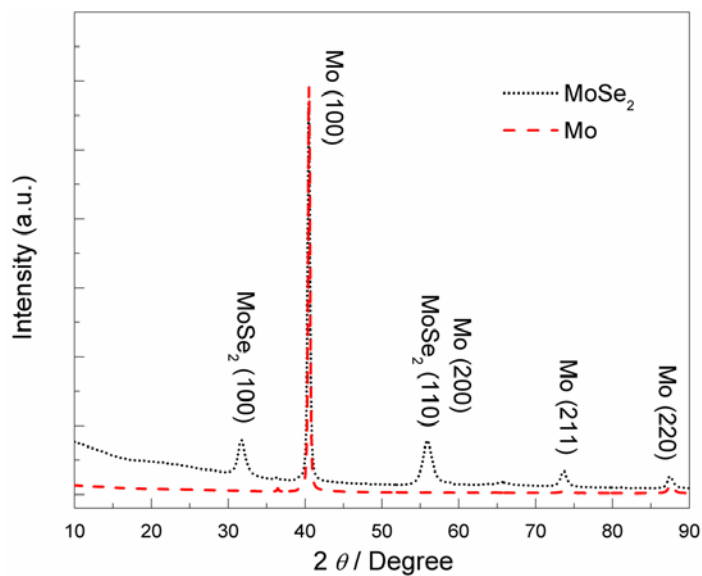


Figure S1| XRD of Mo and few-layer MoSe₂ onto the Mo glass.

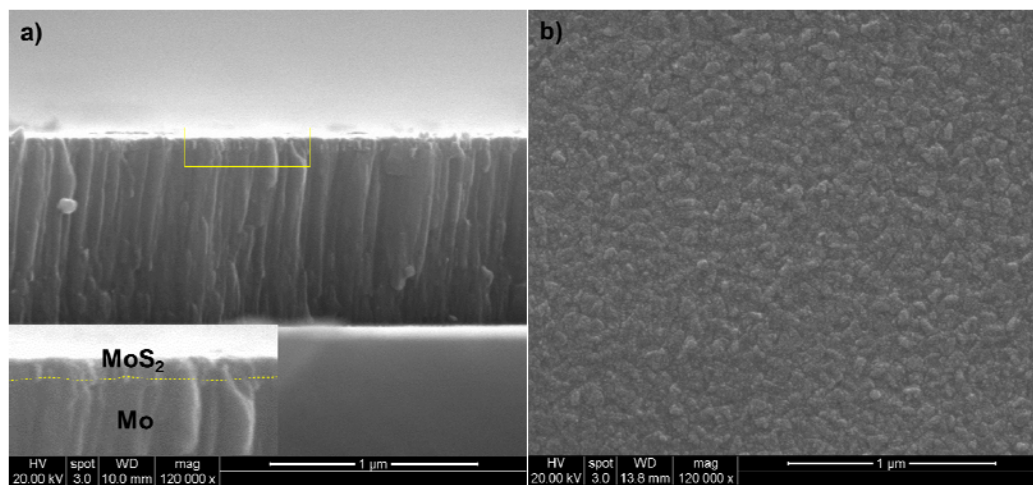


Figure S2| SEM images of the (a) cross-section and (b) surface morphology of the sulfurized Mo-coated soda-lime glass, i.e. MoS₂ on Mo/glass.

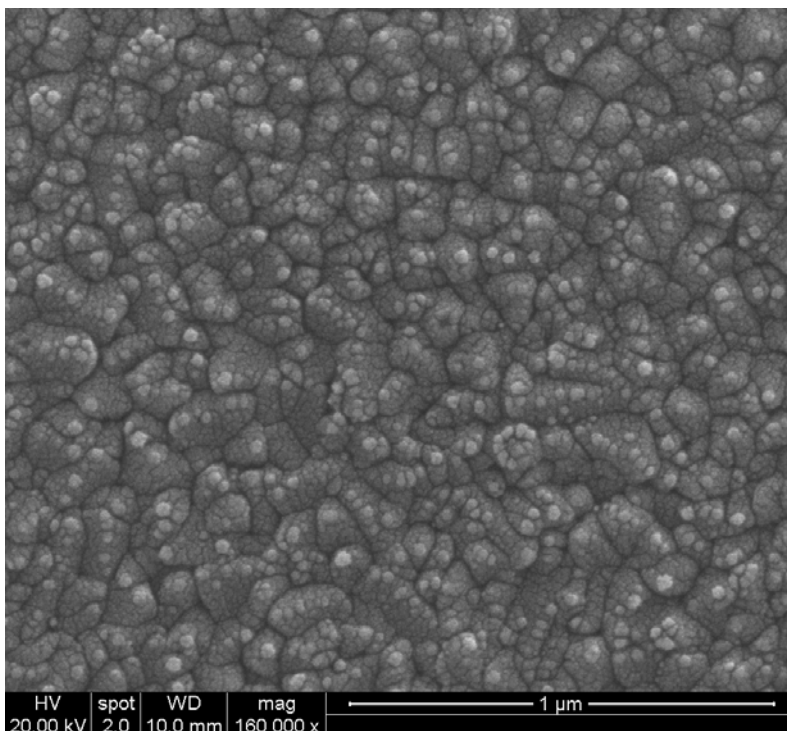


Figure S3| SEM image of Pt sputtered FTO/glass surface.

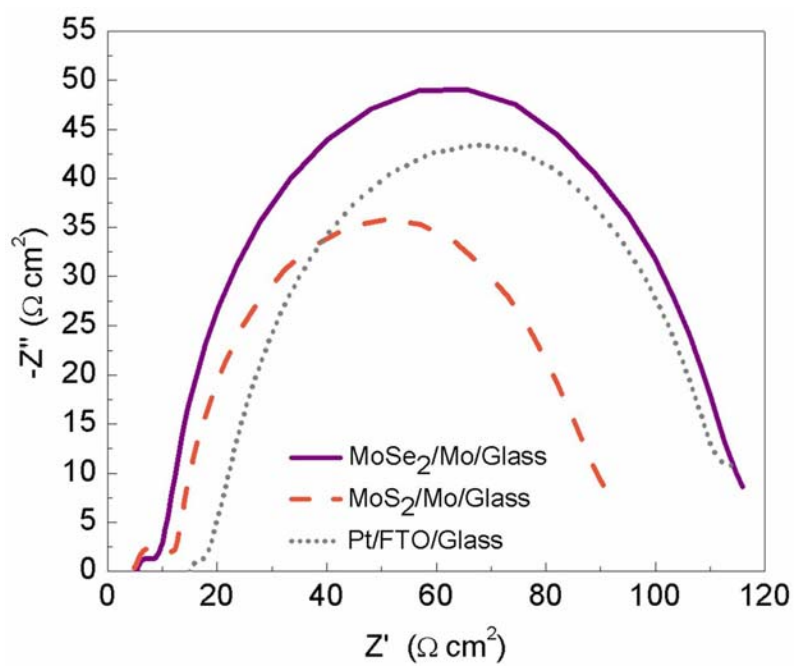


Figure S4| Nyquist plot of DSSC devices using MoSe₂ and MoS₂ on Mo/glass and Pt on FTO as counter electrodes.

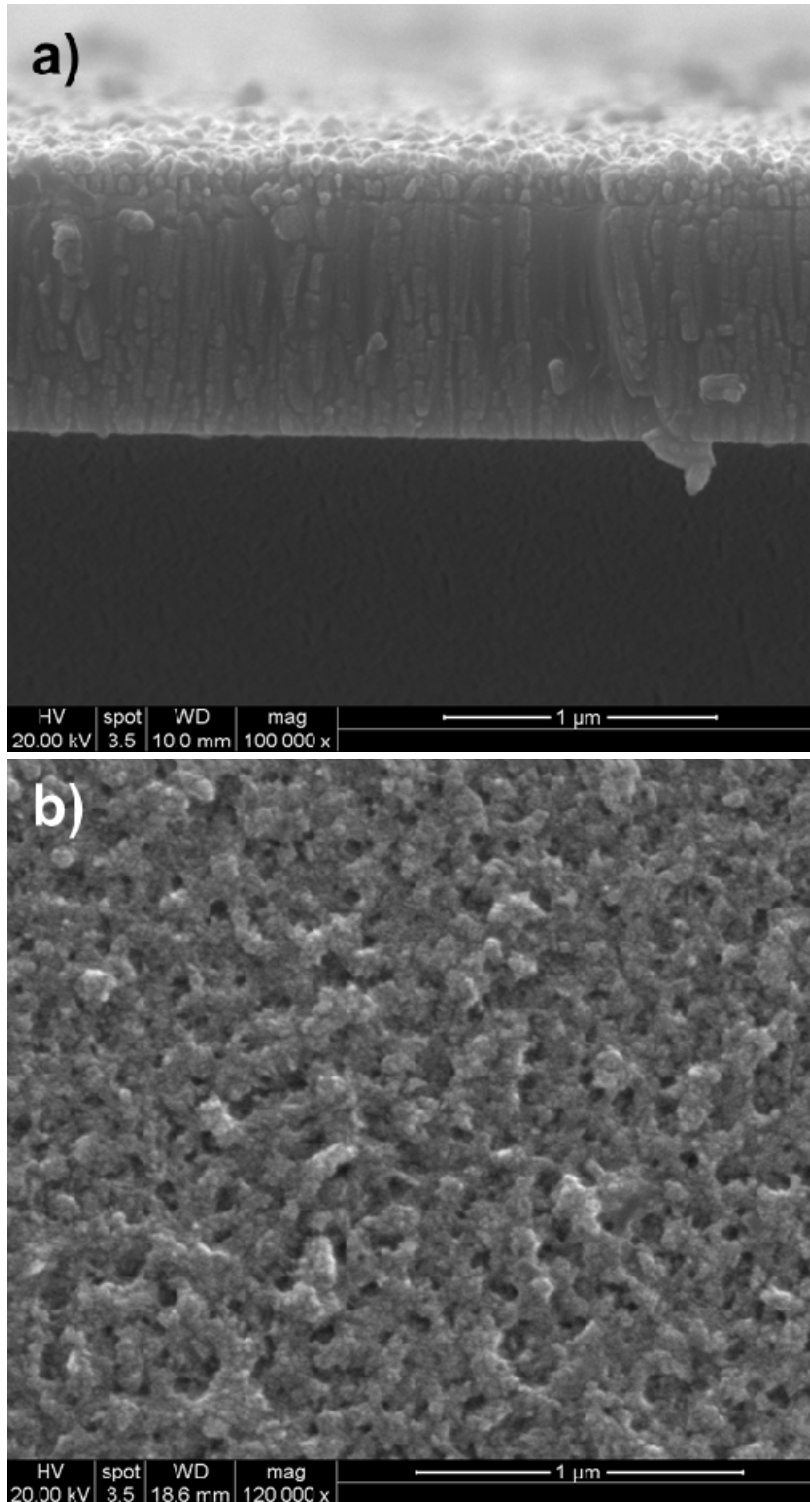


Figure S5| SEM images of (a) cross-section and (b) surface morphology of the heavily selenized Mo/glass (580 °C for 120 min), i.e. a thick layer of MoSe₂ on the surface of Mo-coated glass.

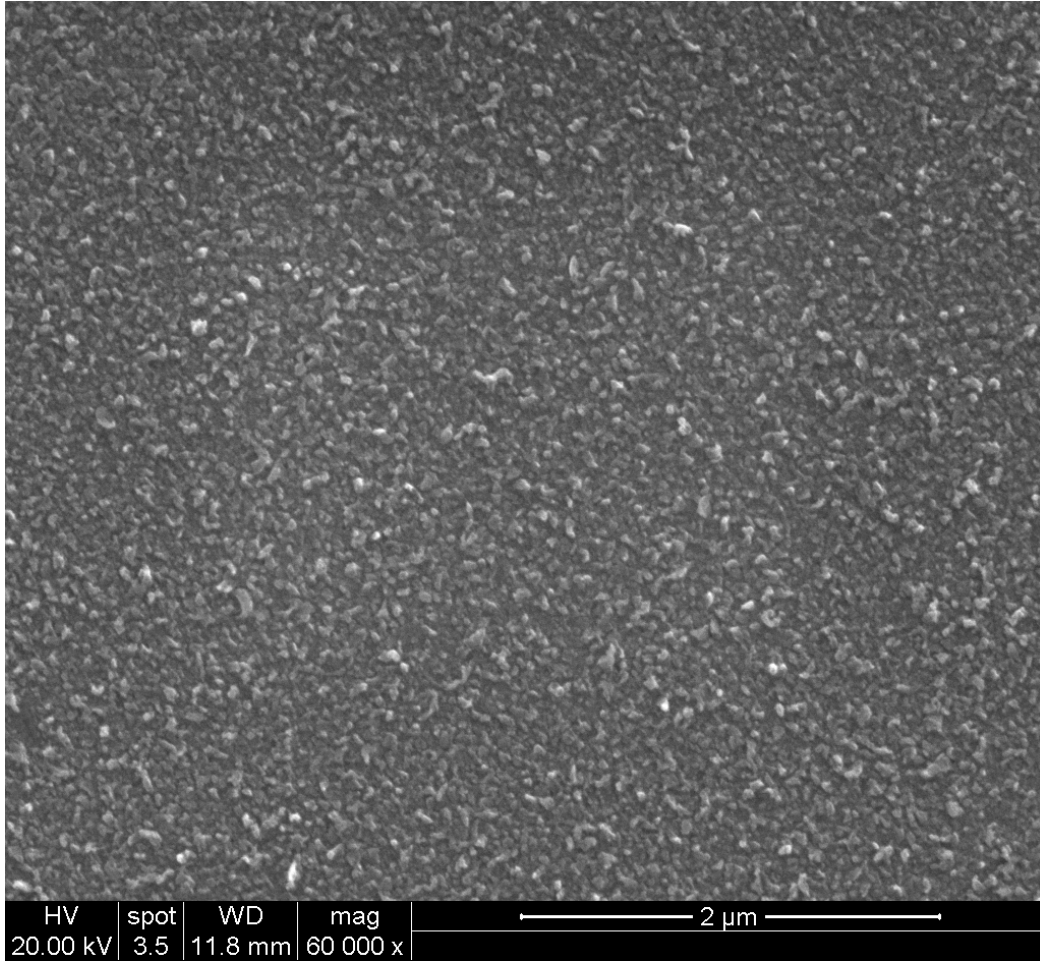


Figure S6| Large view SEM image of surface morphology of selenized Mo/glass.

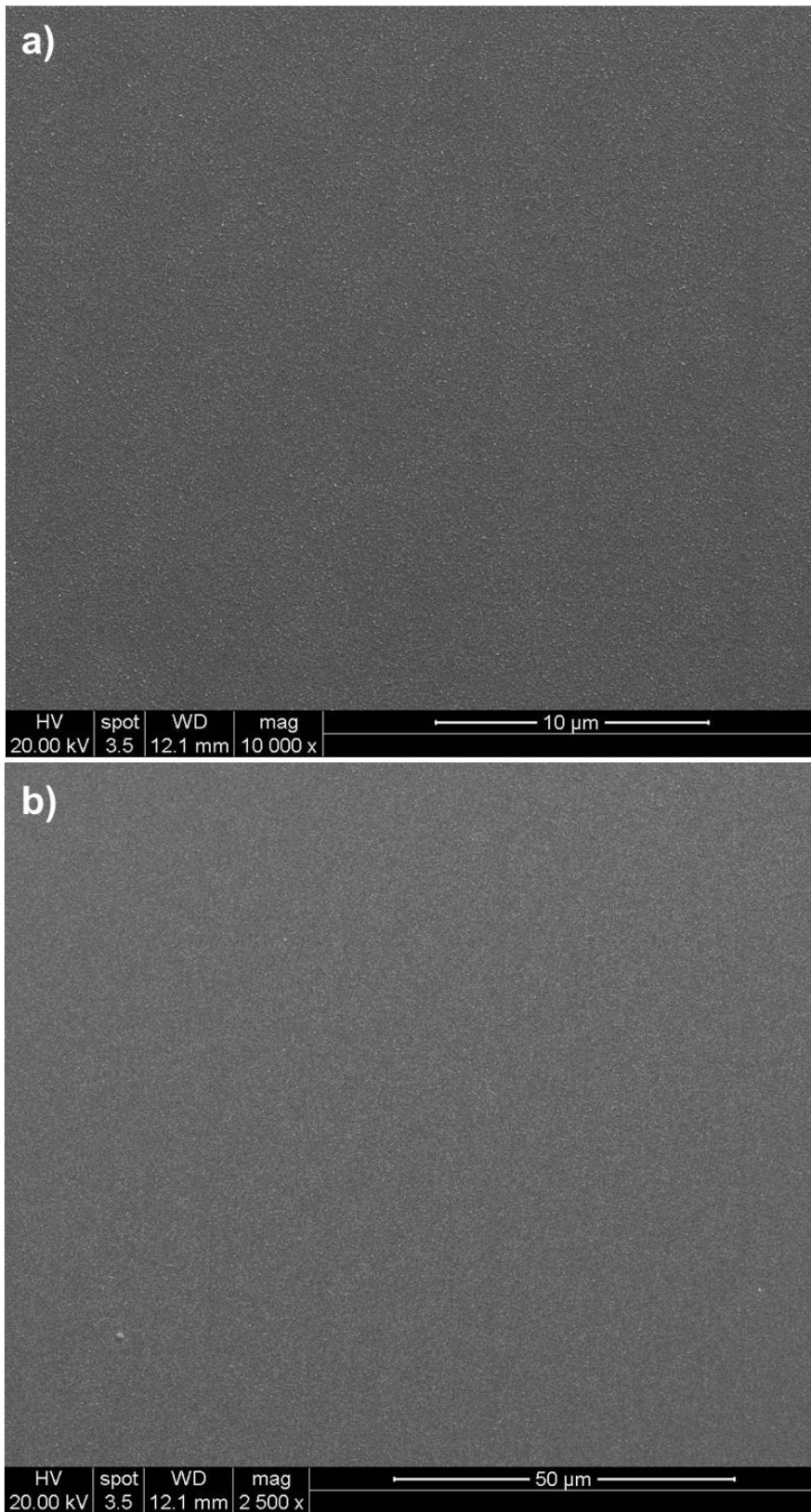


Figure S7| Low-magnification SEM images of surface morphology of selenized Mo/glass.

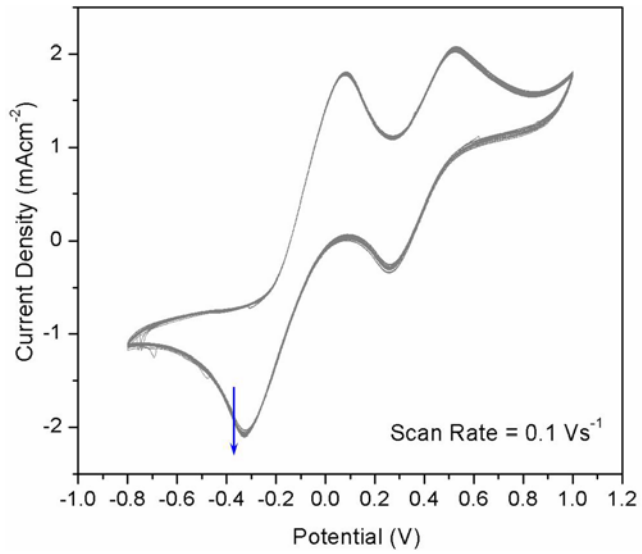


Figure S8| Consecutive CV scanning of the MoSe₂/Mo electrode for 20 cycles, the small alternations in some position is due to the perturbation of the equipment upon long time operation.

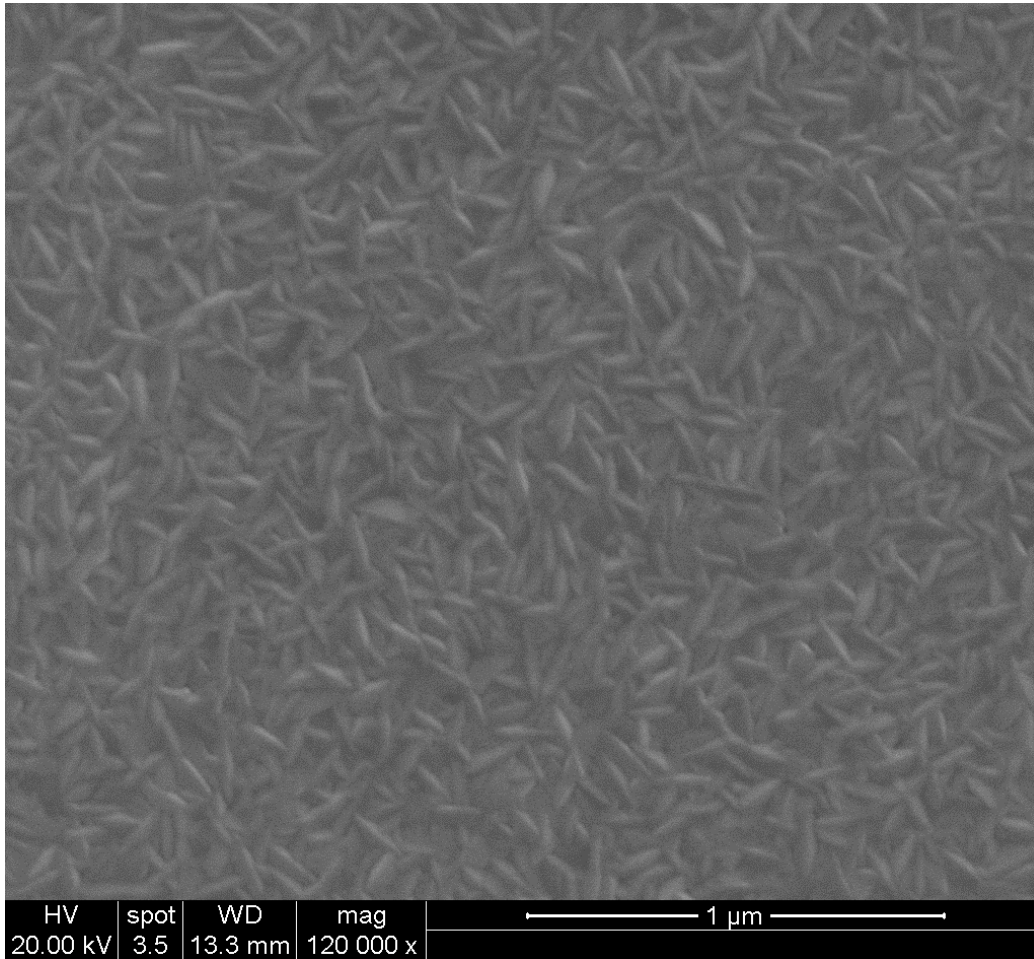


Figure S9| SEM image of the as-prepared Mo substrate.