

Supplementary Materials

## Direct Transformation of Crystalline MoO<sub>3</sub> into Few-Layers MoS<sub>2</sub>

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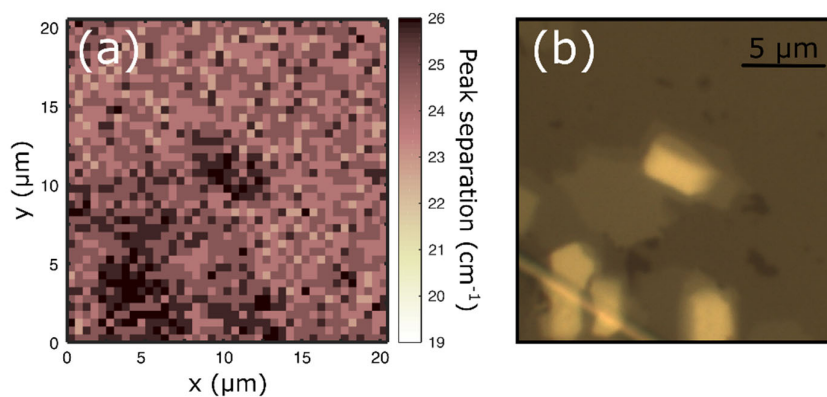
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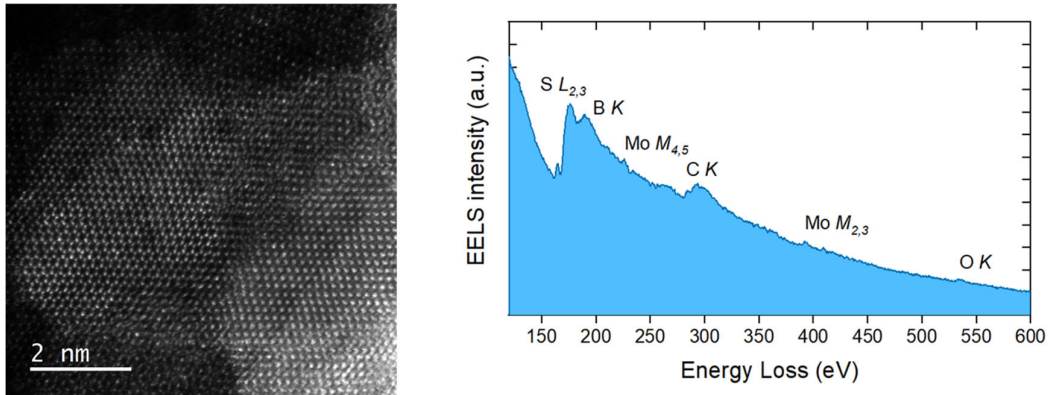
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**Figure S1.** (a) Raman map showing the difference between the E<sub>12g</sub> and A<sub>1g</sub> peaks. The map shows a large region of ~4 layers, according to the peak difference value, and a thicker region in the bottom left corner. (b) Optical image of the same region studied in (a).



**Figure 2.** (a) High magnification HAADF image of a MoS<sub>2</sub> thin film transferred over a holey Si<sub>3</sub>N<sub>4</sub> membrane support. (b) Electron energy loss spectra (EELS) acquired while scanning over the area in (a) for a total time of 20 s.



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