

## Supplemental Information

### The Effect of the Precursors and Chemical Vapor Deposition Process on the Synthesis of Two-Dimensional Molybdenum Nitride Nanomaterials

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This study utilizes the MoS<sub>2</sub> thin film that was grown on the Si/SiO<sub>2</sub> substrate in our laboratory. We manipulate the replacement temperature and temperature holding time and carry out high-temperature nitridation. As a result, we effectively substitute the sulfur element with the nitrogen element, leading to the synthesis of the MoN thin film material. The AFM analysis revealed a significant reduction in film thickness after the replacement. The XPS analysis revealed the absence of any detectable Mo and S bonding energy signals after the completion of the nitridation process. The experiment effectively replaced MoS<sub>2</sub> with a MoN film.

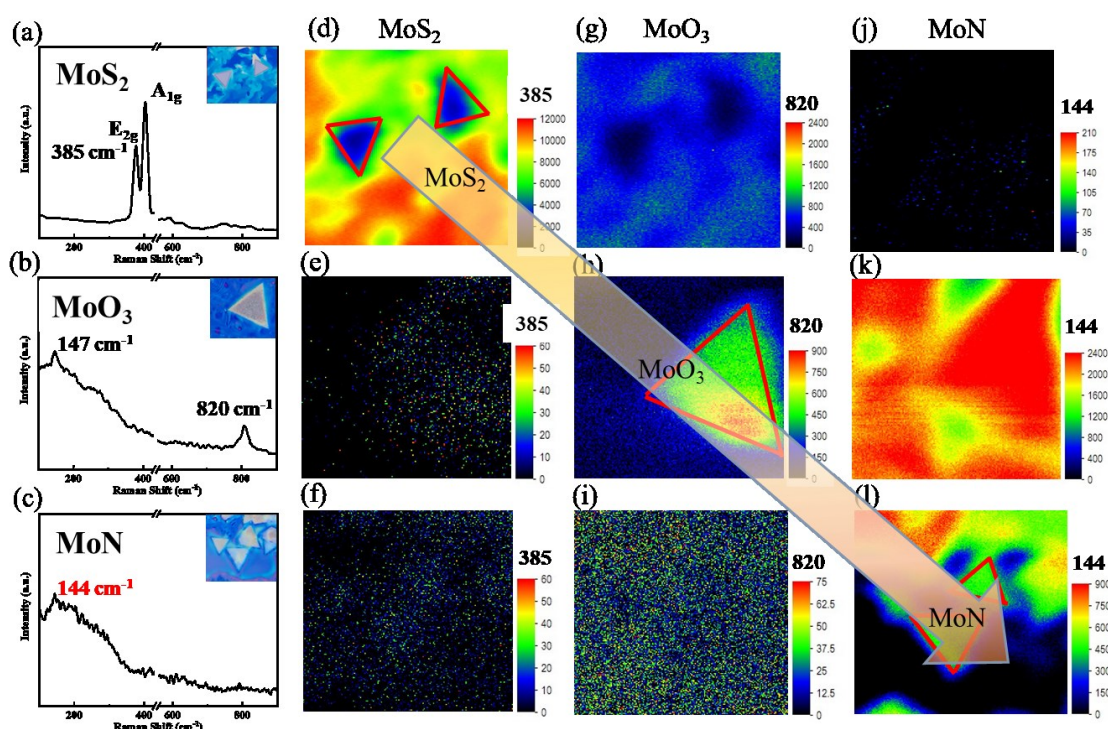


Fig. S1. Raman spectrum of (a) MoS<sub>2</sub>, (b) MoO<sub>3</sub> and (c) Conv. MoN, Raman mapping at (d-f) MoS<sub>2</sub> characteristic peak E<sub>2g</sub> (385 cm<sup>-1</sup>), (g-i) MoO<sub>3</sub> 820 cm<sup>-1</sup> and (j-l) MoN 144 cm<sup>-1</sup>, respectively. (// is SiO<sub>2</sub>/Si substrate).