

## Large area synthesis of 2-dimensional materials

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I will present synthesis methods of large area molybdenum disulfide. For the synthesis of large area and uniform thin films of MoS<sub>2</sub>, we used chemical vapor deposition with a gas precursor, H<sub>2</sub>S for sulfurization of Mo. We deposited Mo metal first on solid substrates and sulfurized the metal at high temperatures. The synthesized MoS<sub>2</sub> films were almost perfectly uniform over the entire area of 2 inch wafer. We also synthesized MoS<sub>2</sub> films with MoO<sub>3</sub> and H<sub>2</sub>S for high quality films. We could synthesize MoS<sub>2</sub> films up to 15cm with high uniformity and excellent electrical properties. In order to lower the synthesis temperature, we adopted plasma enhanced CVD method. Down to 150C, we could synthesize uniform films of MoS<sub>2</sub>. We characterized the various optical and electrical properties of the synthesized films.

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### References