

## Role of Starting Chemical for Growth of MoS<sub>2</sub> Monolayer and Multilayers

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The rise of two-dimensional (2D) material is one of the results of the successful efforts of researchers. One of the most exciting materials is MoS<sub>2</sub>. Synthesis has been always a major issue as electronic devices need reproducibility. Chemical vapor deposition (CVD) is one of the successful methods for 2D materials including graphene. Furthermore, there are various starting materials available for Mo and S source. The different source chemicals has different effects on the layers and morphology of MoS<sub>2</sub> films. In this work, we have extensively studied the CVD technique to grow few layers of MoS<sub>2</sub> with different starting chemicals and compare their results. We compare the results of two precursors namely MoO<sub>3</sub> and MoCl<sub>5</sub>, show remarkable changes. The MoO<sub>3</sub> source gives a triangular shaped MoS<sub>2</sub> monolayer while that of MoCl<sub>5</sub> can achieve uniform and controlled MoS<sub>2</sub> monolayer without triangle. Eventually, we tried to explain the formation of continuous monolayer of MoS<sub>2</sub> without any triangle on the basis of chemical reaction formalism mostly like due to one step reaction process and formation of MoS<sub>2</sub> from gas phase to the solid phase.