



Plasma-Assisted Nanofabrication of Two-dimensional Metal Chalcogenide Layers

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Summary: Low-temperature plasma-assisted methods to produce two-dimensional metal dichalcogenide layers

Description: Two dimensional (2D) metal dichalcogenides (e.g., WS_2 , MoS_2 , etc.) are molecularly thin sheets that have extraordinary optical properties, catalytic performance, and electronic structure. The synthesis of 2D dichalcogenides commonly employs exposure of transition metal precursors, typically oxides, to elemental chalcogen vapor at extremely high temperatures ($>800^\circ C$). Because of the high temperature requirement, the number of viable substrates is limited and the cost is prohibitive for large scale production. This invention relates to two plasma-assisted methods for producing metal chalcogen at lower temperatures. Furthermore, one of the methods allows for the metal chalcogen layers to be applied to substrates such that the thickness of the layers is controlled. The methods accelerate the fabrication and deployment of 2D metal dichalcogenides and related devices.

Main Advantages of this Invention

- Lower production costs
- Amenable to high volume manufacturing
- Manufactured at lower temperatures
- Self-limiting deposition

Potential Areas of Application

- Optoelectronics
- Semiconductors

ID number: 14008

Intellectual Property Status: US utility patent pending (application #14/524,649)

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Opportunity: We are seeking an exclusive or non-exclusive licensee for the implementation of this technology.

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