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Novel cold-wall CVD synthesis of highly uniform MoS_2 thin films
CHAD LUNCEFORD, JEFF DRUCKER, Arizona State University — We present results from a novel cold-wall chemical vapor deposition method for growing MoS_2. This method affords independent control over all deposition parameters. Ar carrier gas flow rate and pressure, substrate temperature and the temperatures of the individual solid-source precursors can all be independently varied during growth onto 100 nm-thick SiO_2 films on Si substrates. Individually optimizing each deposition parameter enables the formation of islanded, single-layer MoS_2 films. At the optimal growth parameters, we were able to repeatably grow samples with a Mo coverage that corresponds to 0.3 0.03 ML of MoS_2. Mo coverage, feature size and feature density on these samples exhibited uniformity over the central 32 mm^2 of the sample.

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