

Toward large-area 2D materials by chemical vapor deposition

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Two dimensional (2D) materials including transition metal dichalcogenides (TMdCs) and hexagonal boron nitride (hBN) have been highlighted due to their unique physical, chemical, and optical properties. However, it is still challenge to obtain large-area and high-quality 2D materials with controlling number of layers. Here, we present recent progress of the synthesis of large-area and high-quality 2D materials. First, we introduce the catalytic metal substrate and new precursors for the growth of TMdCs with full coverage. Second, we discuss how to control their thickness with maintaining high quality. Lastly, we propose new approaches for the synthesis of large area single crystal monolayer hBN with millimeter scale and extremely high-quality thick hBN film with large area. Our strategies will not only pave the way to synthesize large-area and high-quality 2D, but also promote their real applications.