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Recent Progress on CVD Growth of Graphene from a Liquid Carbon Precursor

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Abstract:

Graphene has become a remarkable highlight of advanced material research because of its far superior properties compared to other materials. Chemical vapor deposition (CVD) has emerged as an essential method for scalable production and large area graphene for various applications. Various carbon precursors have been reported for graphene production as they can dramatically impact the graphene growth yield. In the early years of graphene CVD growth, hydrocarbon gases such as methane and acetylene have become favorable carbon precursors because of their stability at elevated temperature and controllable growth. However, hydrocarbon gases are known as explosives and toxic, therefore require a growth system with a high degree of safety and handling precautions. With the limitations mentioned above, liquid carbon source may change the graphene growth landscape as it is relatively inexpensive, nonexplosive compared to the conventional gaseous precursor. This article aims to review a detailed synthesis of large-area graphene using liquid carbon precursors via the CVD technique. Challenges and future perspectives are highlights.