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Controlled CVD growth of graphene and it electronic properties

Graphene is a perfect two-dimensional atomic crystal. It has attracted considerable attention due to its unusual mechanical, optical, and electronic properties. Chemical vapor deposition (CVD) is an effective way to prepare large-area and high-quality graphene becaunse of its ultra-low cost, high controllability, and high scalability. In order to enhance electronic properties of graphene-based devices, we fabricated graphene single crystals with a variety of shapes using CVD method. The twelve-pointed graphene grains were controllably synthesized. Self-aligned single-crystal graphene grains were precisely controllable grown on liquid Cu surface by ambient pressure CVD. Meanwhile, we used an in situ etching method to fabricate large-scale graphene arrays with control over the size, shape, and location. On the other hand, hierarchical graphene architectures with a layer-stacking growth were also fabricated by CVD method. The growth mechanism of graphene and it electrical properties were investigated.

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