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Grain size control for CVD-grown single crystal mono- and bi-layer graphene[1] ZHENGTANG LUO, The Hong Kong University of Science and Technology — By suppressing the nucleation density during Chemical Vapor Deposition (CVD) growth, we demonstrate that the large-size single crystal monolayer and bilayer graphene can be synthesized by this method. For single layer, single crystals with diameter up to 5.9 mm, have been successfully obtained by adjusting degree of oxidation during surface treatment step and hydrogen annealing duration during growth, thereby allow us to control nucleation density and consequently to control graphene grains sizes. For bilayer growth, our main strategy is to maximize the duration that is controlled by the absorption-diffusion mechanism. With this method, sub-millimeter size single crystal bilayer graphene is also obtained. Electron transport measurement on those produced graphene has shown carrier mobility that is comparable with that of mechanical exfoliated graphene, indicating the high quality of our graphene sample.

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Zhengtang Luo
The Hong Kong University of Science and Technology

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