

Simple and Clean Transfer Method for Intrinsic Property of Graphene

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Recently, graphene has been intensively studied due to the fascinating physical, chemical and electrical properties. It shows high carrier mobility, high current density, and high thermal conductivity compare with conventional semiconductor materials even it has single atomic thickness. Especially, since graphene has fantastic electrical properties many researchers are believed that graphene will be replacing Si based technology. In order to realize it, we need to prepare the large and uniform graphene. Chemical vapor deposition (CVD) method is the most promising technique for synthesizing large and uniform graphene. Unfortunately, CVD method requires transfer process from metal catalyst. In transfer process, supporting polymer film (Such as poly (methyl methacrylate)) is widely used for protecting graphene. After transfer process, polymer layer is removed by organic solvents. However, it is impossible to remove it completely. These organic residues on graphene surface induce quality degradation of graphene since it disturbs movement of electrons. Thus, in order to get an intrinsic property of graphene completely remove of the organic residues is the most important. Here, we introduce modified wet graphene transfer method without PMMA. First of all, we grow the graphene from Cu foil using CVD method. And then, we deposited several metal films on graphene for transfer layer instead of PMMA. Finally, we fabricate graphene FET devices. Our approaches show low defect density and non-organic residues in comparison with PMMA coated graphene through Raman spectroscopy, SEM and AFM. In addition, clean graphene FET shows intrinsic electrical characteristic and high carrier mobility.

Keywords: Graphene, Chemical vapor deposition (CVD), PMMA