

Antireflection Performance of Graphene Directly Deposited on Silicon Substrate by the Atmospheric Pressure Chemical Vapor Deposition Method

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Abstract : Transfer-free synthesis of graphene on dielectric substrates is highly desirable but remains challenging. Here, by using a thin sacrificial platinum layer as a catalyst, graphene was deposited on a silicon substrate through a simple and transfer-free synthesis method. During graphene growth, the platinum layer evaporated, resulting in direct deposition of graphene on the silicon substrate. In this work, different growth conditions of graphene were optimized. Raman spectra of the produced graphene indicated that the obtained graphene was bilayer. The sheet resistance obtained from four-point probe measurements demonstrated that the deposited graphene had high conductivity. Reflectance spectroscopy of graphene-coated silicon showed a decrease in reflectance across the wavelength range of 200-800 nm, indicating that the graphene coating on the silicon surface had antireflection capabilities.

Keywords : antireflection coating, chemical vapor deposition, graphene, the sheet resistance

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