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Reduced-defect growth of large area graphene by CVD on Au and Cu foils K.J. YOO, CNU and KRISS, E.K. SEO, W.D. KIM, J.Y. KOO, S.S. LEE, KRISS, C.Y. HWANG[1], Korea Research Institute of Standards and Science (KRISS), C.G. KIM, Chungnam National Univ. (CNU), D.H. YOON, H.S. CHEONG, Sogang Univ. — A single layer or few-layers graphene can be formed by dissolving hydrocarbon gas on the metal surfaces at high temperatures. So called, this chemical vapor deposition (CVD) method has several advantages in graphene production such as large area, controlled layers, and low cost growth. However, it is known that the quality of CVD grown graphene is not so good compared to that of a detached graphene sample from HOPG. Especially, defects were detected at 1350 (1/cm) of Raman spectroscopy in the graphene samples grown on Au and Cu surfaces, which directly might be related to the electron mobility. As a matter of fact, there are many factors for graphene quality determination in the CVD growth process. Those are growth temperature, gas composition and flow rate, and cooling rate, etc. Surprisingly we found that defects can be reduced significantly by rapid and prompt pumping hydrogen gas after the growth under the optimum growth conditions. We believe that residue atomic hydrogen after the growth might be attached on a graphene surface and leads to deformation of honeycomb graphene structure. Recent experiments have confirmed that this kind of hydrogen absorption tilts graphene structure and makes graphene insulating.

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