STM/STS study of graphene directly grown on h-BN films on Cu foils

WON-JUN JANG, Department of Physics, Korea University, MIN WANG, SEONG-GYU JANG, MINWOO KIM, SKKU Advanced Institute of Nanotechnology, SEONG-YONG PARK, Graphene Research Center, Samsung Advanced Institute of Technology, SANG-WOO KIM, SKKU Advanced Institute of Nanotechnology, SE-JONG KAHNG, Department of Physics, Korea University, JAE-YOUNG CHOI, Graphene Research Center, Samsung Advanced Institute of Technology, YOUNG JAE SONG¹, SUNGJOO LEE², SKKU Advanced Institute of Nanotechnology, SANIT COLLABORATION, DEPARTMENT OF PHYSICS, KOREA UNIVERSITY COLLABORATION, GRAPHENE RESEARCH CENTER, SAMSUNG ADVANCED INSTITUTE OF TECHNOLOGY COLLABORATION — Graphene-based devices on standard SiO₂ substrate commonly exhibit inferior characteristics relative to the expected intrinsic properties of graphene, due to the disorder existing at graphene-SiO₂ interface. Recently, it has been shown that exfoliated and chemical vapor deposition (CVD) graphene transferred onto hexagonal boron nitride (h-BN) possesses significantly reduced charge inhomogeneity, and yields improved device performance. Here we report the scanning tunneling microscopy (STM) and spectroscopy (STS) results obtained from a graphene layer directly grown on h-BN insulating films on Cu foils. STS measurements illustrate that graphene/h-BN film is charge neutral without electronic perturbation from h-BN/Cu substrate.

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