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Local electrical investigations of graphene oxide and its reduction process with atomic force microscopy JI-YONG PARK, HUISEONG JEONG, KYUNG MOON LEE, SOONIL LEE, Y.H. AHN, Department of Physics and Energy Systems Research, Ajou University — Graphene oxide (GO) has been foci of active researches as a promising nanomaterial. GO is typically reduced thermally or chemically, resulting in electrical and optical properties similar to those of pristine graphene. Local microscopic investigations of GO and its reduction may complement bulk measurements for better understanding of GO and its reduction process. In this study, we utilized electrostatic force microscopy (EFM) to investigate local electrical properties of GO and its reduction process. Individual GO flakes are deposited onto Silicon oxide/Si substrates. With EFM with high spatial resolution, we could probe local electrical properties to monitor local conductance changes in the individual GO flakes at its pristine state and various stages of reduction process. We can monitor the changes of local conductance inside each GO flake as it reduces with EFM. We found significant inhomogeneities in original GO flakes and investigated evolution in local electrical characteristics of GO with different kinds of reduction processes with EFM. We also correlated the EFM results with electrical transport measurements.

Ji-Yong Park
Ajou Univ

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