

Morphology and Thermal Oxidation Behavior of Graphene Supported on Atomically Flat Mica Substrates

고택영, 심지혜, 류순민

경희대학교 응용화학과

Graphene has many fascinating material properties such as high electron mobility, high optical transparency, excellent thermal conductivity, superior Young's modulus, etc. Several studies have recently found that single-layer graphene is chemically more reactive than few-layer graphene when supported on silicon dioxide substrates with sub-nm roughness. In this study, we have investigated the influence of substrates on chemical reactivity of graphene. Morphology and thermal oxidation behavior of graphene on atomically flat mica substrates were studied by atomic force microscopy (AFM) and Raman spectroscopy compared to graphene on SiO₂/Si substrates. Notably, oxidation of single-layer graphene proceeds more slowly on mica than SiO₂/Si. Detailed analysis led to a conclusion that deformation along the out-of-plane direction enhances reactivity of graphene.

Keywords: Graphene, oxidation, mica, AFM