ST-P005

Scanning Photoelectron Microscopy Study on the Chemical State of Locally Oxidized and Hydrogenized Graphene Layer

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Recently, we have developed the local oxidization and hydrogenization method for graphene layer using atomic force microscope(AFM) tip at room temperature and ambient pressure. With this method we could create locally oxidized or hydrogenized area on the graphene layer with various size from nanometer to micrometer scale, by controlling the amplitude and polarity of the voltage supplied between conducting AFM tip and the graphene layer. We investigated the chemical states of functionalized C atoms in the graphene layer using scanning photoelectron microscopy. By measuring C 1s core level X-ray Photoemission Spectra of the C atoms and suitable fitting process carried on the measured spectra, we could obtain the fraction of oxidization and hydrogenization under various condition, and the evolution of each chemical state during thermal annealing process.

Keywords: graphene, SPEM

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Soft Lithography of Graphene Sheets Via Surface Energy Modification

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With the synthesis of graphene sheets as large-scale and high quality, it is essentially important to develop suitable graphene patterning process for future industrial applications. Especially, transfer or patterning method of CVD-grown graphene has been studied. We report simple soft lithographic process to develop easily applicable patterning method of large-scale graphene sheets by using chemically functionalized polymer stamp. Also important applications, the prototype capacitors with graphene electrode and commercial polymer dielectrics for the electrostatic-type touch panel are fabricated using the developed soft lithographic patterning and transfer process.

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Keywords: Soft lithography, Graphene patterning