Understanding the chemistry of patterned graphene edge using electrochemistry and Raman spectroscopy

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Abstract

The chemistries of the graphene basal plane and the edge are key for the modification of graphene, which is important for the realization of functional devices for electronics and sensing. Although there are a number of studies involving graphene edge (Gr-edge) domains and their functionalization [1,2], the fundamental aspects about the chemistry and electrochemical properties of the edge domains remain relatively unexplored. For this purpose, we have realized Gr-edge electrodes by using the reactive plasma etching method. Subsequently we have systematically investigated the chemical properties using electroanalysis and Raman spectroscopy. As in the case of the basal plane, [3] we observe that metal impurities introduced during transfer have an effect on the electrochemistry of the Gr-edge. Subsequently we have evaluated the chemical structure of the graphene edge using Raman spectroscopy and its effect on the chemical functionalization of the structure.

References