Suspended Graphene Based Devices and Nanomechanical Properties

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Graphene is attracting tremendous interests due to its superb physical properties and future promise in nanoelectronics. In particular, owing to its one atomic thickness and ultra high carrier mobility, grapheme field effect transistors has been proposed as a promising candidate for sensitive and label free detection of chemical and biological species. We have studied on the performance improvement of graphene devices by suspending them in aqueous solution through a novel in situ etching technique. Our results show that, owing to concomitantly increased transconductance and decreased noise level by removal of the oxide, the signal-to-noise ratios of suspended graphene nanodevices were improved in low-frequency regime for both hole and electron carriers compared with those supported on SiO2 substrates. We have also studied the nanomechanical properties of suspended graphene by using atomic force microscopy.

References

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