

Abstract Submitted
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Fabrication of contamination-free CVD Graphene devices using soak and peel method ABHILASH SEBASTIAN, ANIKET KAKATKAR, ROBERTO DE ALBA, NIKOLAY ZHELEV, PAUL MCEUEN, HAROLD CRAIG-HEAD, JEEVAK PARPIA, Center for Materials Research, Cornell University — Large area graphene-based devices are commonly fabricated by transferring the CVD grown graphene from metal foils to semiconductor substrates. However, during device fabrication, the transfer process involves chemical etching of metal that leads to the degradation of electrical properties of graphene. Recently, a clean transfer of graphene to devices with improved electrical properties, by delamination of graphene from metal substrates by soak and peel using DI-water has been demonstrated [1]. We employed the soak and peel scheme to fabricate graphene transistor arrays on a SiO₂/Si substrate with a back gate configuration. The source-drain contacts are patterned using Ti/Pt with graphene channel length varying from 2-50um. The graphene is transferred subsequently to the substrate and yields a high quality junction between metal electrodes and graphene. The contact resistance is low and the Dirac peak is observed across the array. The suitability of the graphene transistors for chemical functionalization will be presented. Possible application of this transfer technique for fabricating large area suspended nano-electro mechanical systems will be discussed.

[1] Priti Gupta, et al., arXiv: 1308.1587 [cond-mat.mtrl-sci]

Abhilash Sebastian
Center for Materials Research, Cornell University

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