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Electrical transport properties of graphene field effect devices due to electron irradiation on PMMA/graphene SUNG OH WOO, Department of Physics and Astronomy, Texas A&M University, College Station 77843, WINFRIED TEIZER, Physics and Astronomy, Texas A&M University, ollege station TX 77843 WPI-Advanced Institute for Materials Research, Tohoku University, Sendai, Japan — We study the change of the transport properties of graphene field effect transistor devices as a result of electron irradiation on a Poly Methyl Methacrylate (PMMA)/graphene bilayer and subsequent removal of PMMA. We observed that PMMA spun on graphene did not substantially degrade the transport properties of graphene. Instead, the PMMA/graphene bilayer showed slightly improved transport properties than a single graphene device. After electron irradiation on a PMMA/graphene bilayer and subsequent removal of the PMMA, the transport properties deteriorated. In addition, we observed the emergence of defects in graphene by Raman spectroscopy. We conclude that changes in the transport properties due to electron irradiation on PMMA on top of graphene stem from adsorption of atoms or molecules during the depolymerization process induced by energetic electrons. Furthermore, we argue that hydrogen, fragmented from PMMA, is the main element adsorbed on graphene.

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