

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Effects of hydrogen exposure on monolayer graphene on SiC(0001) CHARIYA VIROJANADARA, Department of Physics, Chemistry and Biology, Linköping University, Sweden, ALEXEI ZAKHAROV, Maxlab, Lund University, Sweden, ROSITZA YAKIMOVA, LEIF JOHANSSON, Department of Physics, Chemistry and Biology, Linköping University, Sweden — The influence of hydrogen exposures on a high quality monolayer graphene grown on SiC(0001) is investigated using photoelectron spectroscopy (PES), low-energy electron microscopy (LEEM) and micro low energy electron diffraction (μ -LEED). We observe significant changes in the C1s core level, electron reflectivity curve, and electron diffraction after hydrogenation. Collected LEEM and μ -LEED data after atomic hydrogen exposures demonstrate unambiguously a transformation from monolayer graphene plus carbon buffer layer to bi-layer graphene with no carbon buffer layer. This is novel since the preparation of either homogenous large area bi-layer graphene or bi-layer graphene without the carbon buffer (interface) layer on SiC(0001) has earlier not been reported. Our findings therefore open up new possibilities and opportunities for graphene-SiC based electronic devices and hydrogen storage.

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Date submitted: 04 Nov 2009

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