Facile preparation of Au(111)/MICA substrates for high-quality graphene nanoribbon synthesis

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Motivation The present work establishes the in-situ preparation of Au(111)/MICA as an inexpensive and simple method to prepare substrates of desired shape and thickness for surface polymerization reactions which are of interest to a growing community of researchers working on graphene nanoribbons.

Sample preparation
- Degassing of freshly cleaved MICA sheet in UHV (<10⁻⁶ mbar) at 300°C
- Deposition of Au with a minimum rate of 0.5 Å/s
- Annealing at 600°C to get Au(111) structure

Graphene nanoribbons grown on MICA substrate using Au(111) as catalytic surface.

Summary We show an inexpensive and simple method to prepare high quality disposable Au(111)/MICA substrates for the surface polymerization of graphene nanoribbons using a molecular precursor. The spectroscopic investigation of GNRs samples grown on this substrate indicates that the GNRs have spectra identical to those obtained from single crystal substrates. This has been checked using Raman spectroscopy, XPS and NEXAFS. The method introduced here is important for the growing GNR community which wishes to synthesize GNRs on purpose made substrates.

Acknowledgements M.H., B.S. and A.G. acknowledge the ERC grant no. 648569 “SUPER-2D”, funding from Quantum Matter and Materials and DFG project GR 3708/2-1. A.N. and C.W. acknowledge funding from the Science and Technology of Nanosystems program. Research supported by the U.S. Department of Energy (DOE), Office of Science, Basic Energy Sciences (BES), under Award no. DE-SC0010409 (design, synthesis and characterization of molecular building blocks) and the Center for Energy Efficient Electronics Science NSF Award 0939514 (SPM imaging and spectroscopy). We also thank Helmholtz Zentrum Berlin for the beamtime allocation.