

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Two-Dimensional Molecular Crystals of Phosphonic Acids on Graphene MARIANA PRADO, BERNARDO NEVES, REGIANE NASCIMENTO, LUCIANO MOURA, MATHEUS MATOS, MARIO MAZZONI, LUIZ CANCELO, HELIO CHACHAM, Universidade Federal de Minas Gerais — The synthesis and characterization of two-dimensional (2D) molecular crystals comprised of long and linear phosphonic acids atop graphene is reported. Using scanning probe microscopy in combination with first-principles calculations, we show that these true 2D crystals are oriented along graphene armchair direction only, thereby enabling an easy determination of graphene flake orientation. We have also compared the doping level of graphene flakes via Raman spectroscopy. The presence of the molecular crystal atop graphene induces a well-defined shift in the Fermi level, corresponding to hole doping, which is in agreement with our ab initio calculations.

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Date submitted: 11 Feb 2011

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