Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Synthesis and characterization of nitrogen-doped graphitic nanoribbons JOSUE ORTIZ, M. LUISA GARCIA, IPICYT, Mexico, XIAOTING JIA, Massachusetts Institute of Technology, U.S.A., RAFAEL MARTINEZ, Universidad Autonoma de Barcelona, Spain, MIGUEL A. PELAGIO, Universidad Federal de Pernambuco, Brazil, DAVID SWANSON, Augustana College, U.S.A., A. LAURA ELIAS, HUMBERTO GUTIERREZ, The Pennsylvania State University, U.S.A., FERNANDO RODRIGUEZ, EMILIO MUNOZ, IPICYT, Mexico, MILDRED DRESSELHAUS, Massachusetts Institute of Technology, U.S.A., HUMBERTO TERRONES, MAURICIO TERRONES, The Pennsylvania State University, U.S.A. — Nitrogen doping of carbon nanostructures such as nanotubes and graphene is a practical approach for tailoring their electronic and chemical properties. However, the doping of graphene nanoribbons still remains to be a challenge. Here we discuss a novel synthetic route to N-doped graphitic nanoribbons using chemical vapor deposition. The morphology of the new nanomaterial resembles the observed for the undoped graphitic nanoribbons, with particular differences specially at the ribbons' edges. We performed scanning and transmission electron microscopy as well as Raman and X-ray photoelectron spectroscopies in order to confirm the nitrogen presence within the nanoribbons. In addition, the electrical response for individual nanoribbons was obtained. We observed that N-doped nanoribbons exhibit a clear semiconductor-like behavior depending on the amount of nitrogen embedded in the hexagonal carbon network (undoped nanoribbons always showed a metallic response). These doped nanostructures could find applications in the fabrication of electronic devices.

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Date submitted: 23 Nov 2011 Electronic form version 1.4