Bottom-up fabrication and characterization of boron doped N=7 armchair graphene nanoribbons


— Graphene nanoribbons (GNRs) have recently attracted great interest because of their novel electronic and magnetic properties, as well as the significant potential they have for device applications. Although several top-down techniques exist for fabricating GNRs, only bottom-up synthesis of GNRs from molecular precursors yields nanoribbons with atomic-scale structural control. Here we report the successful bottom-up fabrication boron doped N=7 armchair graphene nanoribbons. Substitutional boron atoms were incorporated into the GNRs’ central backbone, thus placing boron’s empty p-orbital in conjugation with the extended pi system of the GNR. Topographic and local electronic structure characterization was performed via STM and CO-tip-functionalized nc-AFM, and compared to DFT simulations.

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Date submitted: 05 Nov 2015

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