Boron nitride nanoribbons from in-situ unzipping during nanotube growth

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Boron nitride nanoribbons (BNNRs) have many interesting properties. They have been produced previously from unzipping boron nitride nanotubes (BNNTs) via two separate steps: BNNT growth and post-synthesis unzipping treatments. Here, we introduce an in-situ unzipping concept that simplifies the two steps into one. That is, unzipping happens during BNNT synthesis so that BNNRs can be directly harvested without the need for post-synthesis treatment. The resultant BNNRs are of high chemical purity and crystallinity according to near edge x-ray absorption fine structure (NEXAFS) spectroscopy, and prefer a zig-zag orientation.