

Abstract Submitted  
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**From carbon nanotubes to carbon atomic chains<sup>1</sup>** GILBERTO CASILLAS GARCÍA, University of Texas at San Antonio, WEIJIA ZHANG, MIGUEL JOSÉ-YACAMÁN — Carbyne is a linear allotrope of carbon. It is formed by a linear arrangement of carbon atoms with sp-hybridization. We present a reliable and reproducible experiment to obtain these carbon atomic chains using few-layer-graphene (FLG) sheets and a HRTEM. First the FLG sheets were synthesized from worm-like exfoliated graphite and then drop-casted on a lacey-carbon copper grid. Once in the TEM, two holes are opened near each other in a FLG sheet by focusing the electron beam into a small spot. Due to the radiation, the carbon atoms rearrange themselves between the two holes and form carbon fibers. The beam is concentrated on the carbon fibers in order excite the atoms and induce a tension until multi wall carbon nanotube (MWCNT) is formed. As the radiation continues the MWCNT breaks down until there is only a single wall carbon nanotube (SWCNT). Then, when the SWCNT breaks, an atomic carbon chain is formed, lasts for several seconds under the radiation and finally breaks. This demonstrates the stability of this carbon structure.

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