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Bottom-up Synthesis of N=13 Sulfur-doped Graphene Nanoribbons. TRINITY JOSHI, GIANG NGUYEN, FRANCESCA TOMA, TING CAO, ZAHRA PEDRAMRAZI, CHEN CHEN, DANIEL RIZZO, CHRISTOPHER BRONNER, YEN-CHIA CHEN, STEVEN LOUIE, FELIX FISCHER, MICHAEL CROMMIE, University of California, Berkeley — Substitutional doping of graphene nanoribbons (GNRs) with heteroatoms is a principal strategy to fine-tune the electronic structure of GNRs for future device applications. Up to now, however, edge-doping in bottom-up fabricated GNRs has exclusively relied on the introduction of nitrogen heteroatoms in the form of pyridine and pyrimidine rings along the edges of chevron GNRs. Here we report the bottom-up synthesis and characterization of atomically-precise N=13 armchair graphene nanoribbons (S-13-AGNRs) wherein alternating $(CH)_2$ groups lining the edges of the GNRs have been replaced by sulfur atoms. We study the resultant GNR with scanning tunneling microscopy (STM) and spectroscopy (STS). Our experimental results are consistent with first-principles simulations of the S-13-AGNR electronic structure.

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