A Diels–Alder Approach to Graphene Nanoribbon Precursors

**Significance:** Bottom-up approaches to graphene nanoribbons (GNRs) have been limited by the short length of nanoribbons produced (<50 nm) or the requirement for metal surfaces. The authors report a bottom-up approach to the synthesis of longer (>100 nm), structurally defined GNRs using an AB-type Diels–Alder polymerization to form nanoribbon precursors that can be planarized to GNRs by oxidative cyclodehydrogenation with FeCl₃.

**Comment:** Despite the formation of multiple regioisomers after the Diels–Alder polymerization of asymmetrical monomer, upon planarization, all isomers of yielded an identical GNR structure. Polymerization of was carried out both in solution and melt, with melt yielding GNR precursors of significantly higher Mₘ (230,000–550,000 g/mol versus 42,000–78,000 g/mol for solution polymerization).

**Key words**
- graphene nanoribbons
- cyclodehydrogenation
- Diels–Alder reaction
- near-infrared absorption

**Category**
- Synthesis of Materials and Unnatural Products

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