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 8 that can be planarized to GNRs 9 by oxidative cyclodehydrogenation with FeCl₃.

**Comment:** Despite the formation of multiple regioisomers after the Diels–Alder polymerization of asymmetrical monomer 7, upon planarization, all isomers of 8 yielded an identical GNR structure (9). Polymerization of 7 was carried out both in solution and melt, with melt yielding GNR precursors of significantly higher Mₙ (230,000–550,000 g/mol versus 42,000–78,000 g/mol for solution polymerization).

**SYNFACTS Contributors:** Timothy M. Swager, Kathleen R. White

*Synfacts* 2015, 11(1), 0036 · Published online: 15.12.2014
DOI: 10.1055/s-0034-1379666; Reg-No.: S12514SF