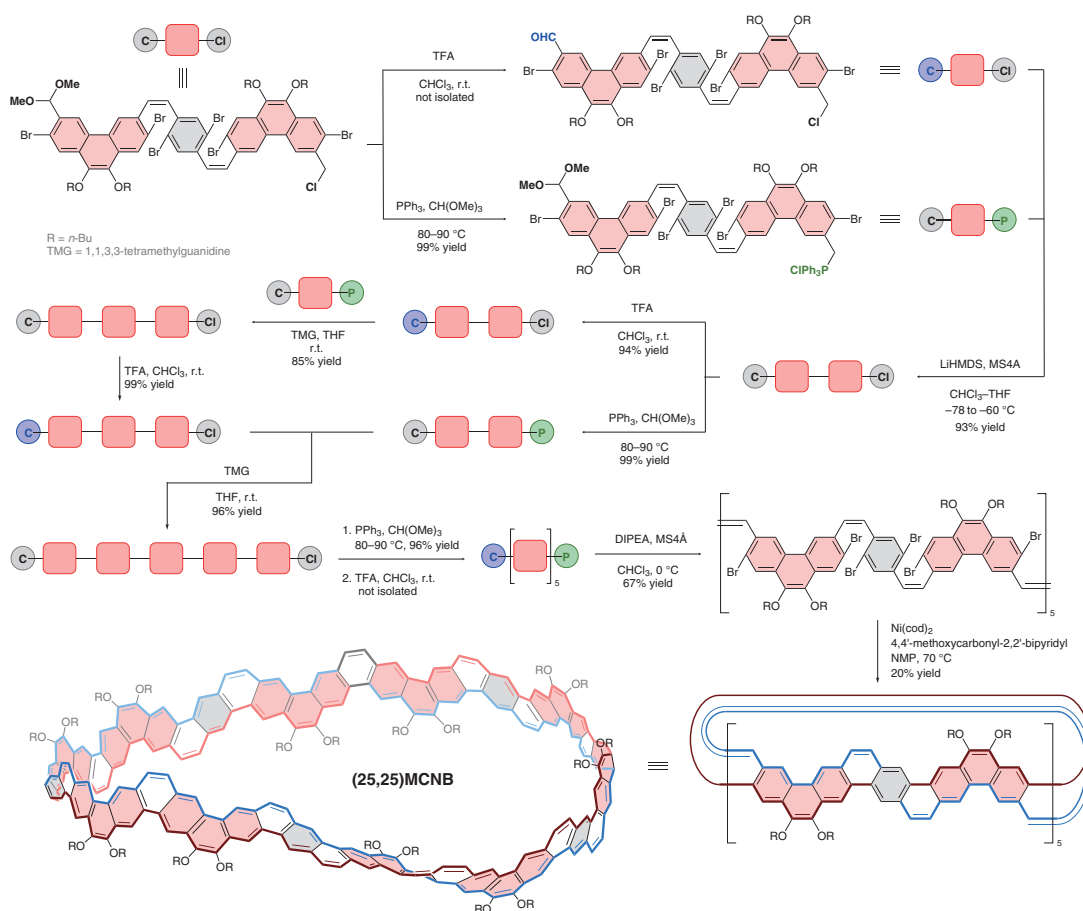


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Synthesis of a Möbius Carbon Nanobelt

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A Möbius Carbon Nanobelt Accomplished



Significance: Molecular structures with novel topological features are appealing targets to both synthetic and materials chemistry researchers. For the first time, a fully conjugated, all-sp²-carbon nanobelt with the topology of a Möbius band is accomplished. The achievement relies on a smart design of incorporating and stitching an odd number of all Z-configured stilbene moieties into continually fused phenanthrene groups. The topological chirality manifested by the Möbius nanobelt is proven by circular dichroism spectroscopy after resolving the enantiomers with chiral HPLC.

Comment: Using a stepwise chain-extension strategy, a large macrocycle comprising five repeated units of hexabromo-substituted bis(phenanthrenylvinyl)benzene is synthesized. By virtue of the Z-selective Wittig protocol facilitated stereochemistry control, the Möbius topology is realized in the ring-closure step. Upon subsequent nickel-catalyzed intramolecular aryl coupling to avail ring fusion, (25,25)MCNB (Möbius carbon nanobelt) is successfully obtained.

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