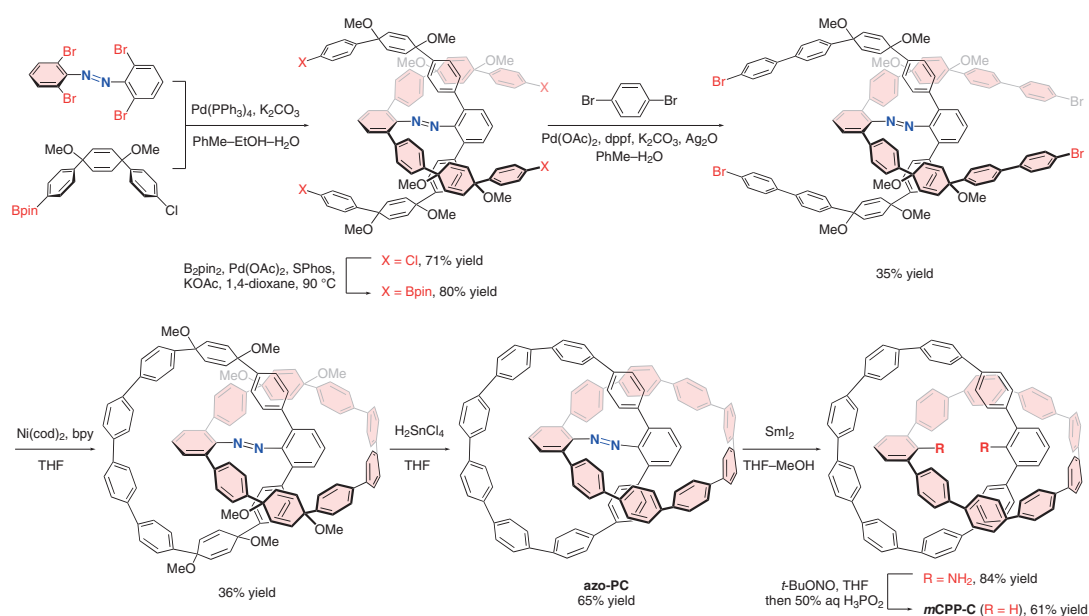


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Conjugated Covalent Template Strategy for All-Benzene Catenane Synthesis
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Traceless Template for All-benzene Catenane



Significance: Syntheses and explorations of new nanocarbons with novel topology and properties have brought new vitality to physical and chemical research. Mechanically interlocked molecules, such as catenanes and molecular knots, are among the most challenging targets. So far, the syntheses of these molecules mostly rely on the utilization of various covalent and noncovalent templating motifs. In this work, the azo-group is devised to serve as a cleavable covalent linker to facilitate the formation of two interlocked nanorings. The most impressive achievement is the successful removal of the linker upon construction of the catenane scaffold, rendering a traceless covalent template.

Comment: Template-assisted synthetic strategies have been demonstrated to be more effective than the statistical threading method in attaining interlocked molecular structures. The cleavage conditions involving Sml₂ is shown to effectively overcome the steric hindrance in removing the azo-group located in the crowded center of the catenane. The achieved all-benzene catenane **mCPP-C** exhibits strong blue fluorescence with a quantum yield of 56%.

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