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A. BEDI, L. J. W. SHIMON, O. GIDRON* (THE HEBREW UNIVERSITY OF JERUSALEM AND WEIZMANN INSTITUTE OF SCIENCE, REHOVOT, ISRAEL)

Helically Locked Tethered Twistacenes

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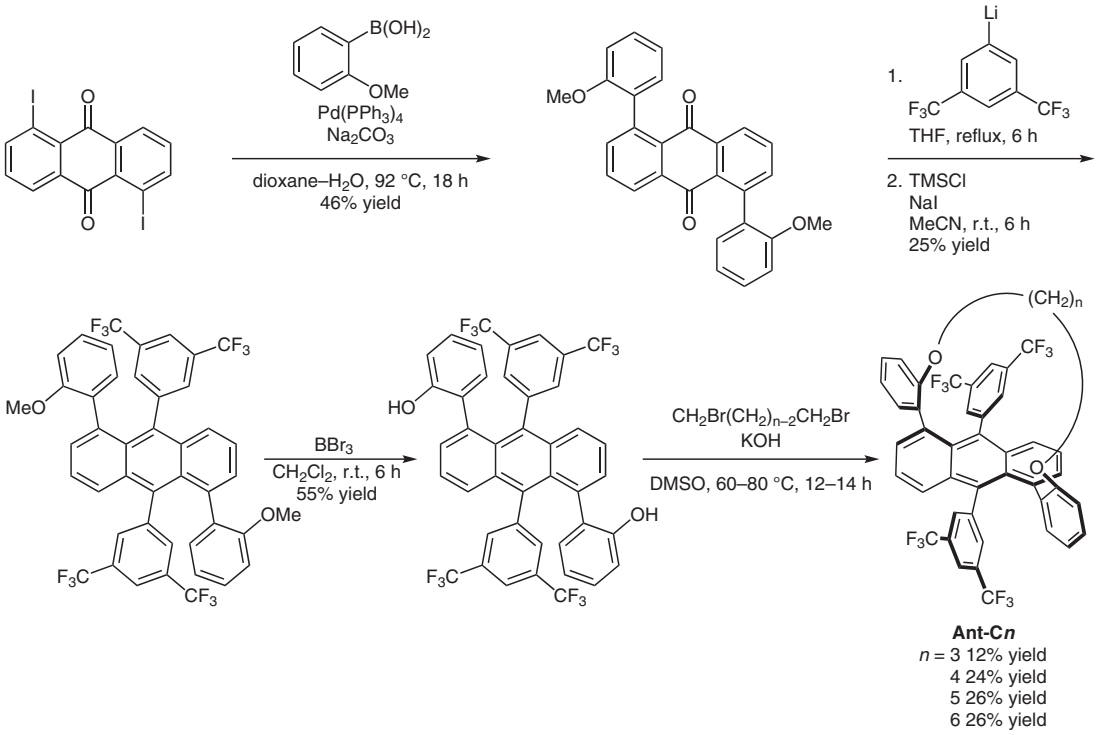
The Consequences of Adding a Twist to Acenes



Significance: Acenes are a unique class of polycyclic aromatic hydrocarbons often employed in organic electronics. The parent acenes are planar, but they are readily twisted out of planarity upon substitution. It was previously assumed that twisting may affect the optical and electronic properties of acenes. However, the effect of twisting could not be directly studied because the substituents were also involved in inducing different twisting angles. Here, Gidron and co-workers synthesize a series of tethered acenes with a twist of various angles to embark on studies on the effect of the twist on their properties.

Comment: **Ant-C*n*** were conformationally as well as photochemically stable. X-ray crystal structures of the **Ant-C*n*** series showed that the twisting angle of the anthracene varied from 23° to 38°. Photophysical measurements suggest that, upon twisting, the *p*-band absorption increases in intensity, as well as showing a bathochromic shift. In addition, the fluorescence quantum efficiency and the rate of radiative decay decreases, while the rate of nonradiative decay increases. Interestingly, the isolated *M* and *P* enantiomers of **Ant-C5** showed an anisotropy factor (g factor) of 2×10^{-2}, which is higher than those measured for [6]helicene and [5]helicene ($4–9 \times 10^{-3}$).

SYNFACTS Contributors: Timothy M. Swager, Kosuke Yoshinaga
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