

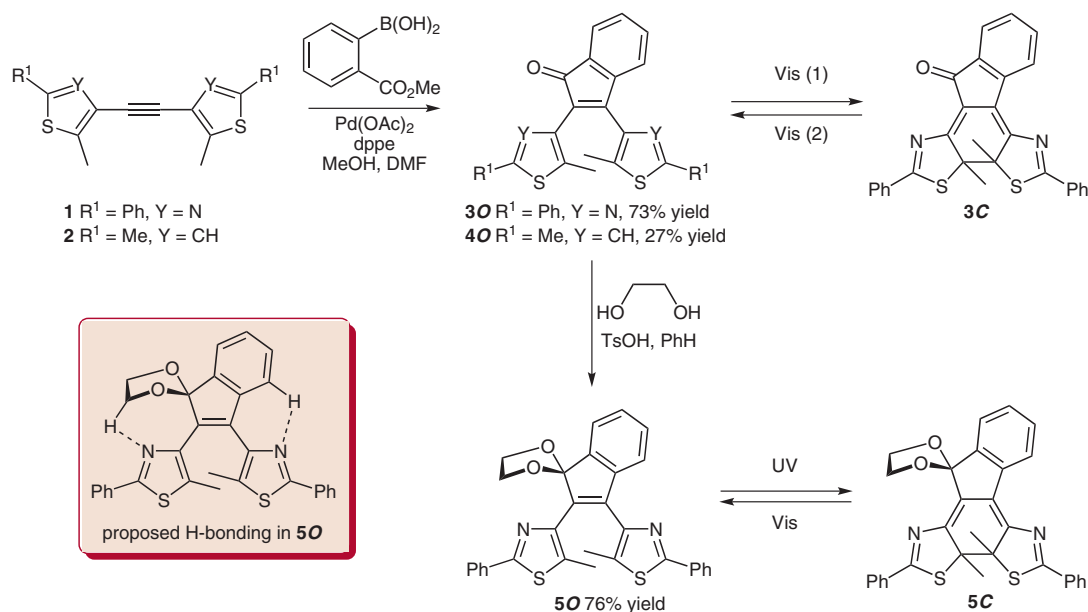
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K. MORINAKA, T. UBUKATA, Y. YOKOYAMA\* (YOKOHAMA NATIONAL UNIVERSITY, JAPAN)

Structurally Versatile Novel Photochromic Bisarylindenone and Its Acetal: Achievement of Large Cyclization Quantum Yield

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# Synthesis and Cyclization of Photochromic Bisarylindenones



**Significance:** Diarylethenes are an important and well-established class of thermally irreversible photochromic compounds. The authors show that they can diversify the properties of a photochrome by annulating the central double bond to an easily modifiable functional group. Open photochromes **30** and **40** were synthesized in one step from the corresponding symmetrical diarylacetylenes through a Pd-catalyzed ring-closing reaction with 2-methoxycarbonylphenylboronic acid. A third photochrome, **50**, was generated by acetalization of **30** with 1,2-ethanediol.

**Comment:** Acetalization of **30** to **50** blue-shifted the absorption spectrum. For conversion of **50** into **5C**, the authors obtained a photocyclization quantum yield of 0.81, which they believe to be the largest reported for a 6 $\pi$ -system. They propose that hydrogen bonding in **50** may be constraining the system in a conformation that favors cyclization. Acetalization has been reported previously to realize photochromic properties in otherwise inert compounds (J. Kuhn, B. Belser *Org. Lett.* **2007**, *9*, 1915). However, in this case it is used to modify and expand the properties of an existing photochrome.

**SYNFACTS Contributors:** Timothy M. Swager, Rebecca R. Parkhurst  
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