Cascade Cycloadditions for the Synthesis of Perylenes

**Significance:** Perylene derivatives were prepared by cascade [4+2] cycloadditions between 1,8-difurylnaphthalene and arynes. The double Diels–Alder reaction proceeds in a highly stereoselective fashion and only the exo,exo-diestereomer (3a–c) is formed as confirmed by X-ray crystallographic studies.

**Comment:** The synthetic method allows facile preparation of extended perylenes, which are potential molecular electronic materials. Further study on substituted derivatives with better solubility and stability is desirable.

**Equation:**

\[
\text{1} + \text{2a–c} \xrightarrow{\text{CsF, MeCN, r.t.}} \text{3a–c} \xrightarrow{\text{HCl, EtOH, 78 °C, dark}} \text{4a, 4b, 4c} \xrightarrow{\text{O}_2, \text{sunlight, CDCl}^2, \text{r.t.}} \text{5a}
\]

**Results:**

- Overall yield: 46%
- 4a: 46%
- 4b: 29%
- 4c: 71%

**References:**

A. Criado, D. Peña, A. Cobas, E. Guitián (Universidade de Santiago de Compostela, Spain)

Domino Diels–Alder Cycloadditions of Arynes: New Approach to Elusive Perylene Derivatives