

～電気化学的な刺激によりアセン構造を巧みに制御！～

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Communication

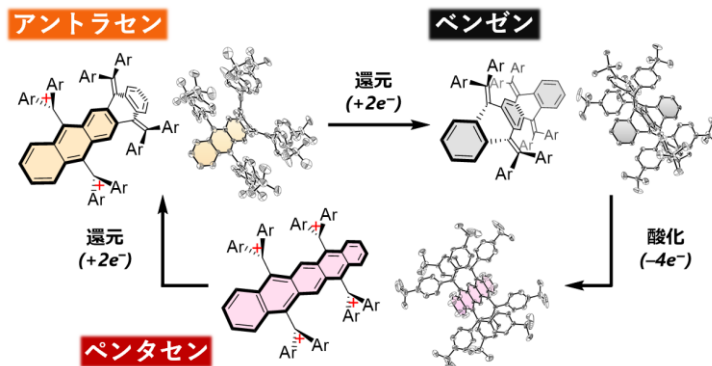
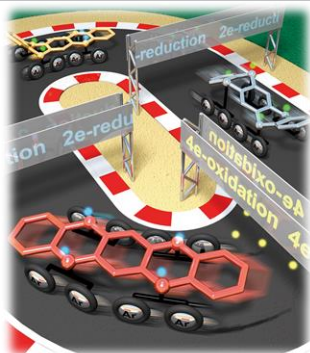
Hysteretic Three-State Redox Interconversion among Zigzag Bisquinodimethanes with Non-fused Benzene Rings and Twisted Tetra-/Dications with [5]/[3]Acenes Exhibiting Near-Infrared Absorptions

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ABSTRACT: Octaaryl-substituted bisquinodimethanes (BQDs) with a zigzag structure were designed as redox-switchable molecules that undergo four-electron oxidation to produce tetracationic pentacenes with a doubly twisted structure. In contrast to one-stage four-electron oxidation of BQDs, stepwise two-electron reduction of tetracationic pentacenes occurs to give dicationic anthracenes and then the original BQDs, step-by-step. Since both tetracations and dicationic anthracenes exhibit near-infrared (NIR) absorptions (–1400 nm) based on an intramolecular charge-transfer interaction, changes in not only their structures but also their UV–vis–NIR spectra can be controlled by redox stimuli. In this Communication, we present an unprecedented one-step π -extension to pentacene from non-fused benzene rings by oxidation, and subsequent two-stage deannulation to benzene rings via anthracene upon reduction. All structures were determined by single-crystal X-ray analyses, and their properties were characterized by spectroscopic and theoretical studies.



- 多電子酸化によってペンタセン骨格を一挙に構築することに成功！
- 段階的な還元によりペンタセン→アントラセン→ベンゼン骨格が形成されることを実証！
- 酸化状態では近赤外（NIR）領域に吸収をもつ → 様々な分野への応用が期待される！！

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化学工業日報やオンラインニュースに取り上げられた他、Chem-Station 第308回スポットライトリサーチにも掲載!!



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