

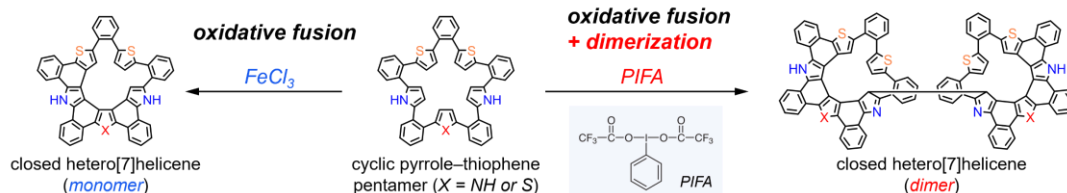
Synthesis of Novel Closed Heterohelicenes Interconvertible between Its Monomer and Dimer

(¹Graduate School of Engineering, Kyoto University) ○Yusuke Matsuo,¹ Takayuki Tanaka¹

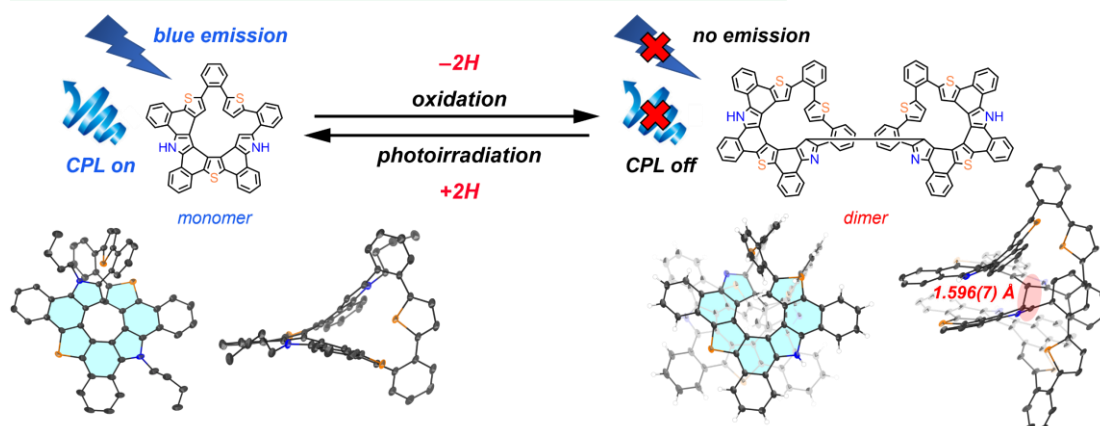
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Oxidative fusion reaction is an effective method for the synthesis of nanographenes. Recently, we have reported the “Fold-in” synthesis of tetraaza[8]circulene and pentaaza[10]circulene as novel N-doped nanographenes by the oxidative fusion reaction of cyclic pyrrole oligomers.^{1,2} Herein, we examined an oxidative fusion reaction with *ortho*-phenylene-bridged cyclic pyrrole–thiophene hybrid pentamers, which afforded partially fused closed-hetero[7]helicenes exclusively. These helicenes dimerized upon addition of PIFA to make a new C–C bond with nearly 1.6 Å length. Photoirradiation to the obtained helicene-dimer reverted the monomer quantitatively, thus demonstrating a reversible dimerization process in novel closed-heterohelicenes. An enantiomer of the monomeric closed-helicene shows circularly polarized luminescence, while the dimer does not show it, thus demonstrating a stimuli-responsive ability. We will disclose their detailed structures, optical properties, and mechanisms of monomer–dimer interconversion.

• Oxidative fusion reaction of cyclic pyrrole–thiophene hybrid pentamer



• Interconversion between helicene monomer and dimer (X = S)



1) F. Chen, Y. S. Hong, S. Shimizu, D. Kim, T. Tanaka, A. Osuka, *Angew. Chem. Int. Ed.* **2015**, 54, 10639. 2) Y. Matsuo, K. Kise, Y. Morimoto, A. Osuka, T. Tanaka, *Angew. Chem. Int. Ed.* **2022**. DOI: 10.1002/anie.202116789.