



Invited Speaker

Porphyrin-Based Molecular Wires

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Abstract: The synthesis and properties of π -conjugated porphyrin oligomers will be discussed, including charge transport in linear and cyclic porphyrin arrays.

Porphyrins are extremely versatile redox-active π -systems and they are excellent building blocks for the construction of molecular wires.^[1-5] This talk will summarize recent work on transport and charge delocalization in porphyrin arrays, such as the butadiyne-linked 12-porphyrin nanoring and the linear edge-fused porphyrin tape shown in Figure 1. The 12-porphyrin ring exhibits global aromatic ring currents in the 6+ and 10+ oxidation states.^[3] Charge transport through the linear fused trimer was tested as a function of gate potential, by connecting it across a graphene nanogap.^[5]

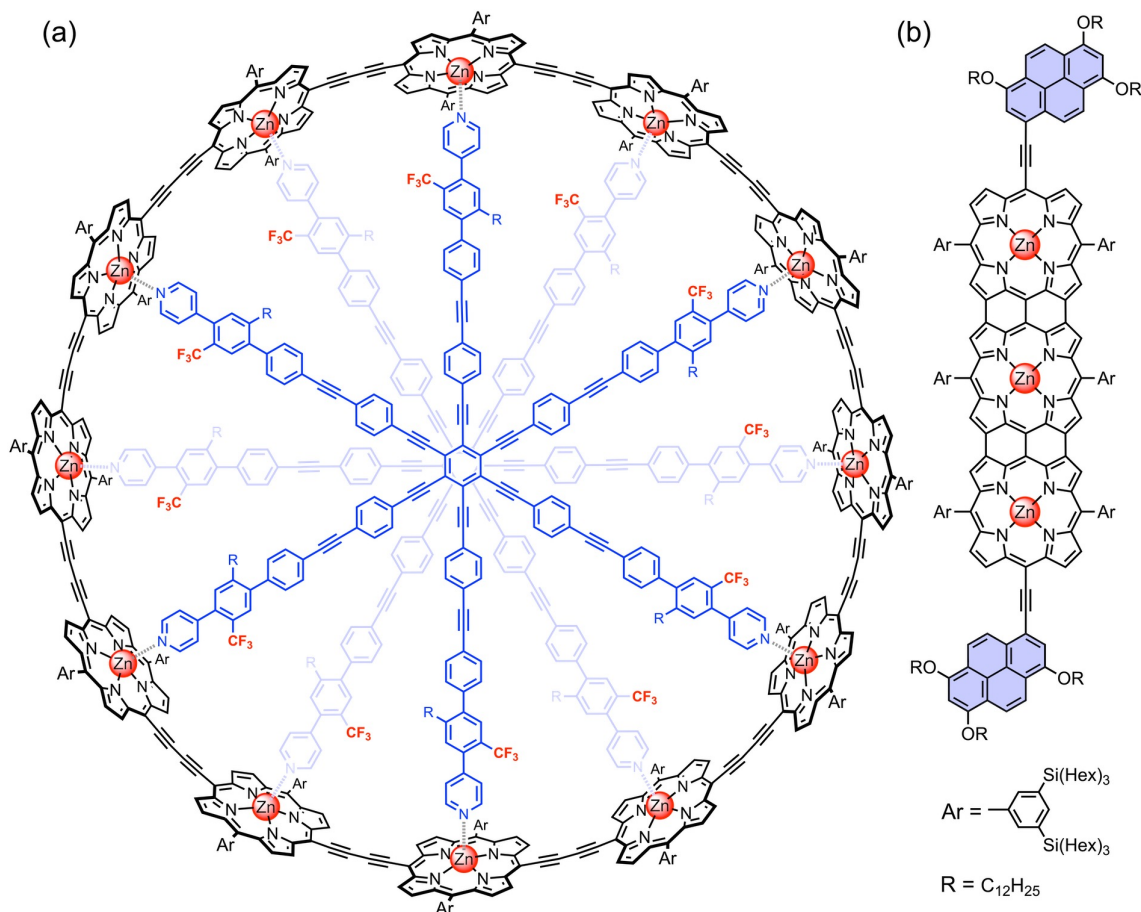


Figure 1. (a) A cyclic porphyrin dodecamer bound to two molecules of a T6 template.^[3] (b) A fused porphyrin trimer with alkoxyphenylene anchor groups.^[5]

References:

- [1] M. D. Peeks et al. *J. Am. Chem. Soc.* **2017**, *139*, 10463. [2] E. Leary et al. *J. Am. Chem. Soc.* **2018**, *140*, 12877.
 [3] M. Rickhaus et al. *Nature Chem.* **2020**, *12*, 236. [4] E. Leary et al. *Nanoscale Horiz.* **2021**, *6*, 49. [5] J. O. Thomas et al. *submitted*; <https://arxiv.org/abs/2105.00487>