



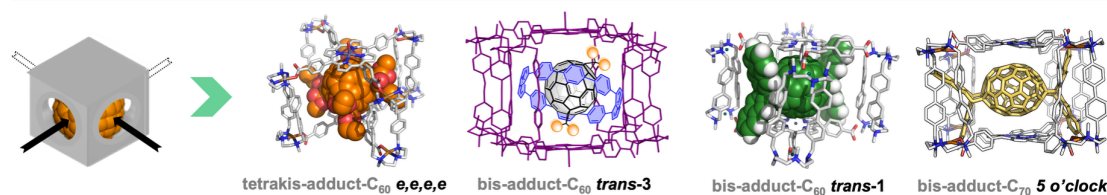
Supramolecular Nanocages as Masks for Fullerene Regiofunctionalization and Beyond

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The design of a confined cavity dictates the type of guest to be encapsulated, and supramolecular cages are tunable scaffolds that allow the rational design of their cavities. Nowadays, easily accessible C₆₀ and C₇₀ fullerene mono-adducts are mainly used in any application¹ due to the hampered accessibility to pure alternative fullerene poly-adduct derivatives. In general, multi-adduct mixtures with uncontrolled regioselectivity (multi-isomers) are obtained, and chromatographic purification is too costly and time-consuming. Herein, porphyrin-based supramolecular nanocapsules^{2,3} are used as supramolecular shadow masks to tame the over-reactivity of Bingel-type cyclopropanation reactions and to have full control over the equatorial regioselectivity and the number of additions. Furthermore, the regioselectivity control is finely tuned using a three-shell Matryoshka-like assembly towards synthesizing a single trans-3 bis-Bingel-C₆₀ for the first time.⁴ Also, the mask strategy is extended to C₆₀ and C₇₀ for Bingel and Diels-Alder.^{5,6} We envision that the described protocol will produce a plethora of derivatives for applications such as solar cells. We will also discuss our recent selective purification of fullertube mixtures and beyond.^{7,8}

Supramolecular Masks



References

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