

Multilayer Helical Nanographenes with Layer-Dependent Chiroptical Properties

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Helical nanographenes (NGs) have emerged as a captivating class, distinguished by their inherent chirality and exotic chiroptical properties. With the incorporation of [n]helicene units into NGs, a variety of helical NGs with diverse multilayer topologies have been reported and considered to be the impetus for the development of novel tailor-made chiroptical materials with high circularly polarized luminescence (CPL) brightness.

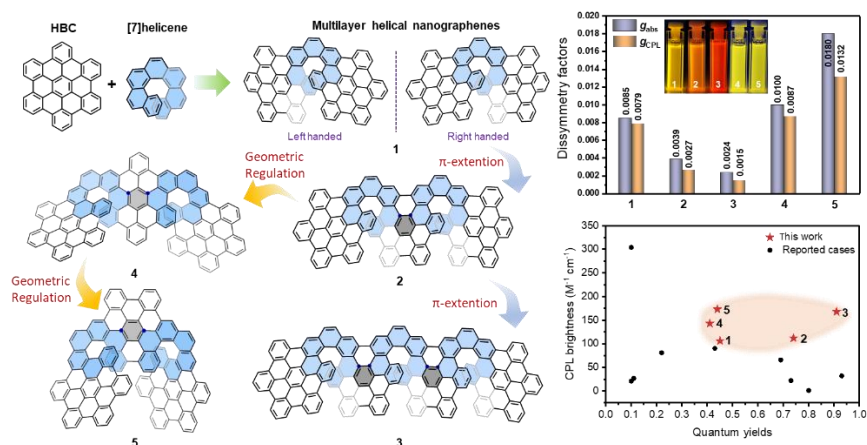


Figure 1: Helical nanographenes 1-5 with multilayer topologies and layer-dependent chiroptical properties.

Herein, we demonstrated the modular synthetic strategy to construct a series of novel helical NGs (1-5) with bilayer, trilayer, and tetralayer structures. The resultant NGs exhibit excellent circular dichroism (CD) and CPL responses with high dissymmetry factors and CPL brightness, rendering them promising candidates for CPL emitters. In addition, we tried to understand the intricate interplay between the multilayer chiral structure and chiroptical properties, rendering the development of chiral materials with modulated CPL properties.

References:

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- [2] W. Niu,* et al., Angew. Chem. Int. Ed. 2024, e202319874.