

Atypical polycyclic aromatic structures by Perkin synthetic strategy

During the last decade, our research group has developed a synthetic strategy for the formation of large carboxy-substituted polycyclic aromatic compounds.¹ It relies on the Perkin reaction of arylglyoxylic acids with arylacetic acids to form, in a first step, flexible conjugated intermediates composed of aromatic fragments linked by maleic bridges. In a second step these molecules are rigidified, generally by intramolecular photochemical dehydrocyclisation, to yield fully condensed carboxy-substituted polycyclic aromatic compounds. This strategy is now mature and turns out to be a versatile method giving access to large aromatic species with a wide structural diversity, spanning from planar arenes via helicenes to conjugated macrocycles.

Cyclo-poly-helicenes are rigid conjugated macrocycles containing helicenic fragments and therefore having non planar structures. Even though their topologies are trivial due to an incompletely condensed carbon backbone, their orbital geometries are topologically non trivial and lead to unusual electronic properties.^{2,3}

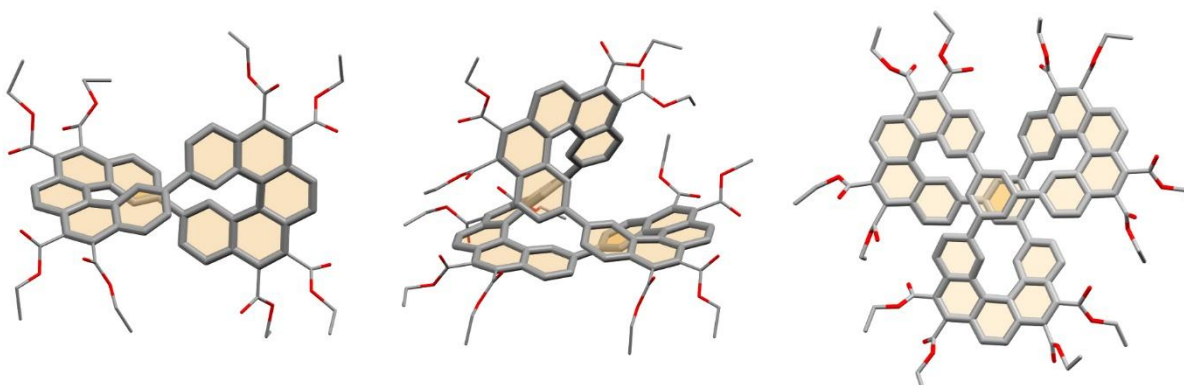


Figure 1. Cyclo-bis[5]helicene, cyclo-tris[5]helicene and triply helicene-bridged cyclophane.

References:

- ¹ L. Sturm, F. Aribot, L. Soliman, H. Bock, F. Durola, *Eur. J. Org. Chem.* **2022**, e202200196.
- ² G. Naulet, L. Sturm, A. Robert, P. Dechambenoit, F. Röhricht, R. Herges, H. Bock, F. Durola, *Chem. Sci.* **2018**, 9, 8930.
- ³ F. Aribot, A. Merle, P. Dechambenoit, H. Bock, A. Artigas, N. Vanthuyne, Y. Carissan, D. Hagebaum-Reignier, Y. Coquerel, F. Durola, *Angew. Chem. Int. Ed.* **2023**, e202304058.

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Diplomas, formations, positions

- now - 2009:** **CNRS Researcher** (French National Center for Scientific Research, permanent position) at the Centre de Recherche Paul Pascal, Univ. of Bordeaux, Pessac (France). M₃ team.
Controlled organic synthesis of polycyclic aromatic compounds with atypical structures.
HDR (Habilitation to direct research) obtained in 2018.
- 2009 - 2008:** **Postdoctoral position** at The Scripps Research Institute, La Jolla (CA, USA) supervised by Prof. Julius Rebek.
Design, synthesis and studies of dynamic cavitands.
- 2008 - 2007:** **Postdoctoral position** at the University Louis Pasteur, Strasbourg (France) supervised by Prof. Valérie Heitz and Prof. Jean-Pierre Sauvage.
Synthesis and studies of a molecular press.
- 2007 - 2004:** **PhD-thesis** in chemistry at the University Louis Pasteur in Strasbourg (France) supervised by Prof. Jean-Pierre Sauvage.
About new chelates of the 8,8'-diphenyl-3,3'-biisoquinoline family. Fast-moving molecular machines and new chemical topologies. Date of defense: November 23rd, 2007.

Teaching of chemistry (192 h over 3 years) at the Univ. Louis Pasteur, Strasbourg.
- 2004 - 2003:** DEA (equivalent of **Master of Science**) "transition metal chemistry and molecular engineering" at the Univ. Louis Pasteur in Strasbourg, with Prof. Jean-Pierre Sauvage.
- 2003 - 2002:** Preparation, at the ENS* in Lyon, and passing the **Agrégation of chemistry**, the French nationwide competitive exam for state teachers (rank: 13th). Qualified to teach chemistry in French public high-schools and universities.
- 2002 - 2000:** License and Maîtrise (equivalent of **Bachelor's Degree**) in chemistry at the Univ. Claude Bernard and ENS* in Lyon, France.
- 2000 - 1997:** *Classe Préparatoire aux Grandes Ecoles* in Lyon, France: undergraduate studies in physics, chemistry and mathematics, preparation for nationwide competitive exams for admission to french selective graduate schools. Admission (rank: 3rd) at the Ecole Normale Supérieure* (ENS) of Lyon.

* ENS: The Ecole Normale Supérieure is one of the most competitive French "Grandes Ecoles", which allows the best students to follow a high-level, teaching- and research-oriented scientific education.