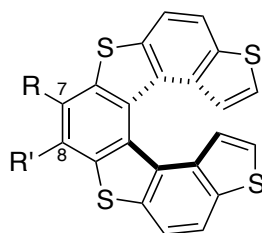


Non photochemical route to functionalized thiophene-based [7]helicenes

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Helicenes are an intriguing class of *ortho*-annulated polycyclic aromatic or heteroaromatic compounds endowed with inherent chirality owing to the helical shape of their π -conjugated system. These curved organic molecules provide unique opportunities for applications in manifold fields, including materials sciences, chiroptical devices, and asymmetric synthesis.¹ Among helicenes, thiahelicenes are emerging as one of the most popular class of heterohelicenes thanks to their unique characteristics combining the electronic properties of oligothiophenes, with the chiroptical properties of helical shape molecules.² For several years, we have been interested in the study of the synthesis and functionalization of thiahelicenes, such as tetrathiahelicene (7-TH) derivatives (Figure), that are configurationally stable and potentially very interesting for applications in optoelectronics,³ catalysis,⁴ and biology.⁵



R, R: aryl, heteroaryl

Figure: general structure of 7-TH derivatives

Recently, we have developed a versatile non-photochemical procedure to prepare functionalized thiahelicenes, including a novel class of 7,8-diaryl substituted 7-TH compounds. This strategy involves the synthesis of chiral heterobiaryl derivatives as key intermediates, whose configurational stability have been elucidated in order to design an asymmetric version for the synthesis of enantioenriched thiahelicenes.

References:

- [1] Y. Shen, C.F. Chen, Chem. Rev. 2012, 112, 1463–1535.
- [2] S. Cauteruccio, D. Dova, E. Licandro, Adv. Heterocycl. Chem. 2016, 118, 1–46.
- [3] A. Bossi, E. Licandro, B. Champagne, et al, J. Phys. Chem. C 2008, 112, 7900–7907.
- [4] S. Cauteruccio, E. Licandro, A. S. K. Hashmi, et al, Inorg. Chem. 2013, 52, 7995–8004.
- [5] S. Cauteruccio, E. Licandro, F. Chiellini et al, ChemPlusChem. 2015, 80, 490–493.