

Axially chiral benzo[1,2-*b*:4,3-*b'*]dithiophene derivatives as key intermediates for enantiopure tetrathia[7]helicenes

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Thiophene-containing fused aromatic compounds are an interesting class of π -conjugated systems with applications in functional organic materials.¹ Among them, benzo[1,2-*b*:4,3-*b'*]dithiophene (**BDT**) and its derivatives are widely studied, for instance as units in mono and polydisperse oligomers in the field of materials science,² and as π -spacers in push-pull organic chromophores for photovoltaic applications.³ Furthermore, **BDT** is a key intermediate for the synthesis of inherently chiral helical systems such as tetrathia[7]helicenes.⁴ Thus, **BDT** can be identified as a key starting molecule, which can allow access to more complex and interesting systems through a judicious functionalization of the α -position of the thiophene rings. In our ongoing studies on the synthesis and functionalization of **BDTs**,⁵ we have developed a novel synthesis to prepare systems **2**, starting from bromides **1** (Figure 1).

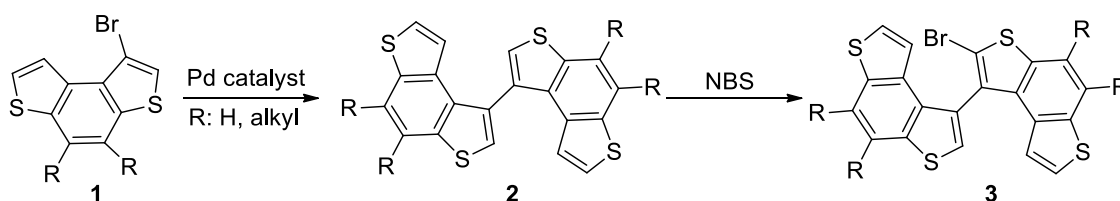


Figure 1: scheme of synthesis.

Compounds **2** are an interesting class of chiral atropisomeric heterobiaryl derivatives with C_2 -symmetry, which can be selectively functionalized into bromides **3**, starting reagents for an innovative non-photochemical synthesis of tetrathiahelicenes through Pd-catalyzed annulation with internal alkynes as key step. Asymmetric versions of this synthesis is under study thanks to the chiroptical properties of **3**, which represent useful intermediates for the enantioselective synthesis of the corresponding tetrathiahelicene derivatives.

References:

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