

Synthesis of diverse classes of thiahelicenes by transition metal-catalysed cross coupling reactions

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Tetrathia[7]helicenes (**7-THs**) are an attractive class of polyconjugated *ortho*-fused heteroaromatic compounds, endowed with inherent chirality due to the helical shape of their π -conjugated system.¹ Their unique structural and chiroptical properties have stimulated manifold studies in optoelectronics,² catalysis,³ and biology.⁴ In our ongoing studies on the synthesis and functionalization of **7-TH** systems, we have recently developed an innovative *diversity-oriented synthesis* of **7-THs** exploiting transition metal-catalysed cross coupling reactions as key steps (Figure 1).⁵

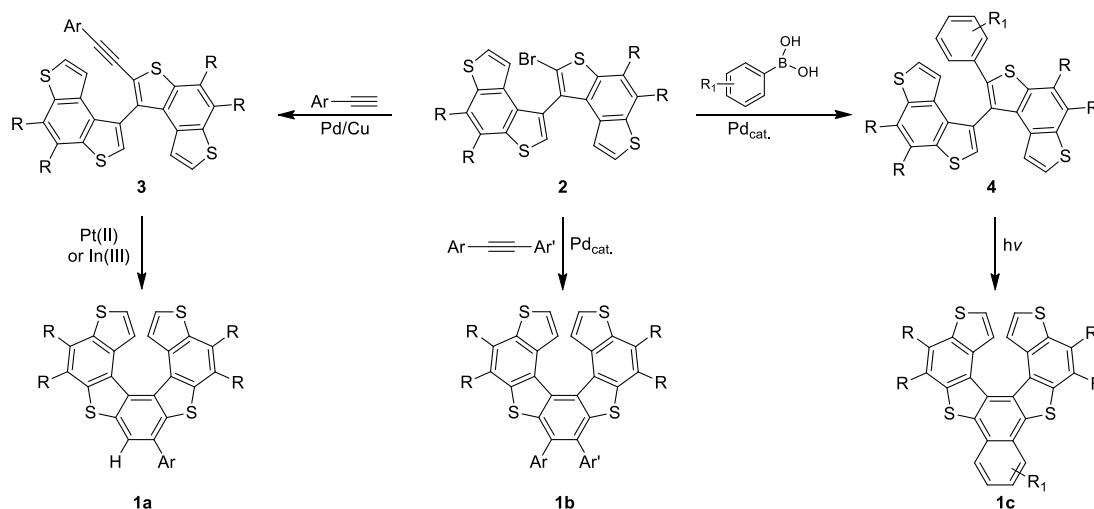


Figure 1

In this communication we report the synthesis of novel classes of thiahelicenes **1a–c** starting from the key intermediates **2**, from which we can obtain: *i*) helicenes **1a** through Sonogashira coupling with terminal alkynes, followed by In- or Pt-catalysed intramolecular hydroarylation of alkynes **3**; *ii*) helicenes **1b** through palladium-catalysed annulation of **2** with internal alkynes; *iii*) helicenes **1c** through Suzuki coupling with (hetero)aryl boronic esters, followed by oxidative photochemical cyclization of intermediates **4**.

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