

Facile Synthesis of Oligo[n]rotaxanes

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Mechanically interlocked molecules, such as rotaxanes, have received increasing attention over the last three decades, primarily due to the development of high yielding synthetic methodologies.¹ Polymeric and oligomeric rotaxanes are of potential interest for materials, biomedical applications and as molecular wires. Despite some reports of the iterative addition of components to rotaxanes, these tend to suffer from low yields or pre-formed components that limit the number of units that can be added.² We report an active template³ iterative elongation method whereby each iteration of the reaction concomitantly extends the thread with addition of a single macrocycle. Furthermore, we observe high yields (>90%) at each step, allowing facile access to well defined oligo[n]rotaxanes. We have used this approach in the synthesis of both homo- and hetero-circuit oligorotaxanes.

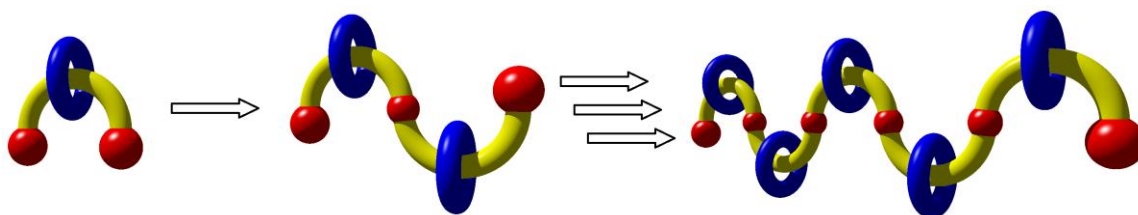


Figure 1 Step-wise iterative addition of rotaxane units to generate well-defined oligorotaxanes.

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