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A Multi-Step Synthesis Approach to a Functional [2]Rotaxane

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ABSTRACT

Mechanically Interlocked Molecules (MIMs) are characterized by the presence of mechanical bonds,[1] consisting of one or more components interconnected through their intrinsic topology.[2] Rotaxanes, a subclass of MIMs, typically comprise a linear molecule with bulky end groups (thread), and a cyclic molecule (macrocycle), connected by a mechanical bond.[3] The controlled and reversible translational and rotational movements of the macrocycle in relation to the thread can classify these compounds as molecular machines.[4,5] In this context, this study aims to present the synthesis of a [2]rotaxane molecule with two stations on the thread, enabling both rotational and translational movements. The synthesis of the target [2]rotaxane **1** involved several synthetic steps, including nucleophilic additions reactions, SN_2, [3+2] cycloaddition (CuAAC), multi component reactions applying the clipping methodology.

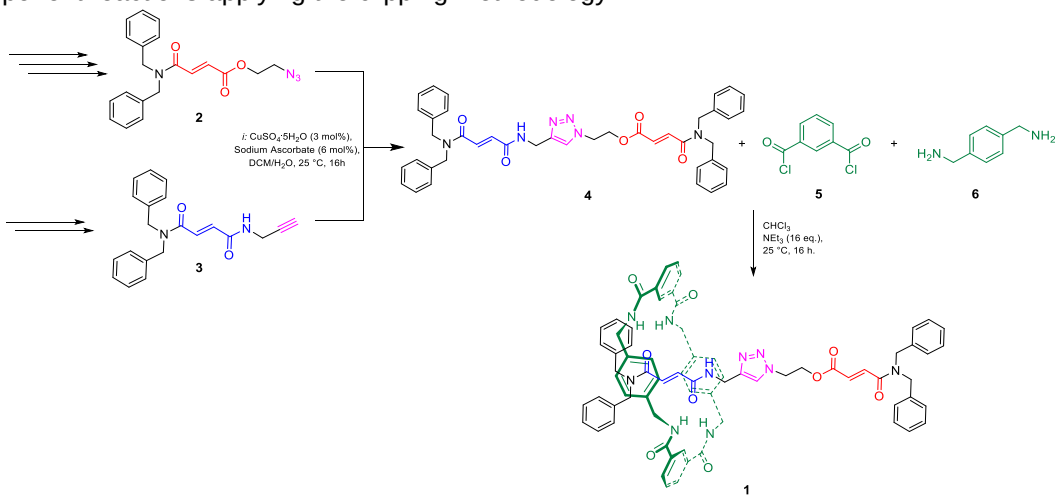

Figure 1. Reaction scheme for the synthesis of [2]rotaxane **1**.

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