Universität Basel

Research Project

Assembly and investigation of electrochemically triggered molecular muscles

Third-party funded project

Project title Assembly and investigation of electrochemically triggered molecular muscles
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Mechanically interlinked supramolecular systems are of interest for the design of systems displaying shape alteration/adaption.1 Particular appealing are systems reacting on an external trigger and thus, catenanes and rotaxanes comprising electrochemically addressable subunits have been assembled and displayed redox state dependant mechanical motions.2 Immobilization of the macrocyclic subunits of rotaxanes comprsing two rings on flexible cantilevers even allowed translating the electrochemically triggered molecular motion into the macroscopic bending of the substrate.3 In order to assemble a molecular muscle, Sauvage presented the design concept of a pseudo-rotaxane.4 By attaching the rotaxane axis at the macrocycle's periphery he obtained a system forming a supramolecular dimer in which the axis of one molecule is penetrating the macrocycle of the other. Functionalization of the subunits with different coordination sites allowed altering the expansion of the structure by varying the coordinating ion.

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