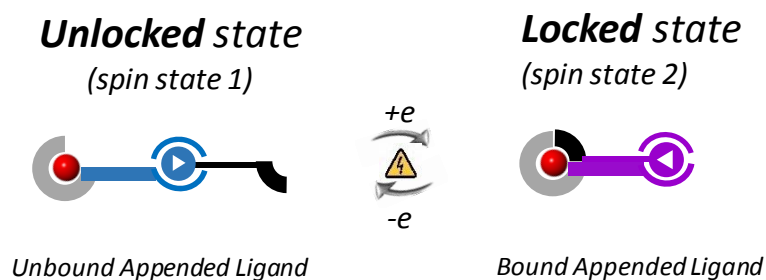


Electron-Triggered Spin State Switching in a Viologen-Substituted Nickel Porphyrin

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In recent years, controlling molecular motions has emerged as a promising approach for the development of molecules exhibiting switchable magnetic states, the underlying idea being that modifying the structure of a molecular system could induce drastic modifications of its magnetic properties. From a practical standpoint, these ambitious objectives have so far mainly been addressed with coordination complexes using light as an input signal [1, 2] In contrast, far less progress has been made in these directions with electron-responsive systems even though electrochemistry stands as a particularly attractive trigger in the perspective of applications in solid-state devices or to avoid risks of bleaching associated to high energy light irradiations. In this context, our recent efforts have focused on the development of molecular systems for which large amplitude movements actuated by electron transfer can be used to control the magnetic state of magnetically active metalloporphyrin centers. Following our previous works on porphyrin-based redox-responsive mechanoreactive (supra)molecular architectures [3-5], we will detail in this presentation one recent strategy wherein the local environment and the electronic configuration (High Spin versus Low Spin states) of a nickel porphyrin can be determined with an electric trigger enabling to control the nature and number of coordinated ligands. In more specific terms, we will show, on the ground of electrochemical, spectro-electrochemical and magnetic measurements supported by DFT data, that a coordination induced spin state switching process can be actuated in solution by the mechanical folding and unfolding of isolated molecules triggered by application of suitable potential values [6].



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