

From molecule gated nanowires toward electron transport with single redox molecules

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Building a functional electronic device using molecules requires a reliable method to wire a single or small number of molecules into an electrical circuit as well as a flexible control of the electrical current through the molecules. The project will investigate the topological concept of nanometer scale metal/molecule/metal-junctions at electrified solid liquid and solid state interfaces. Custom-designed redox-active molecules will be anchored onto and between nanoelectrodes, fabricated by combining electron beam lithography and electrochemical deposition/etching techniques (device-compatible horizontal configuration). Alternatively, individual molecular junctions will be formed in an SPM set-up (locally addressable vertical configuration). The proposed research comprises an international and interdisciplinary experimental approach of four complementary teams representing expertise in molecular and supramolecular synthetic chemistry, electrical engineering, bioelectronics and molecular scale surface electrochemistry.

Projektbeteiligte

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