

Deposition and selective switching of a cationic Fe(III) compound on Au(111) and Cu₂N

Manuel Gruber^{a*}, Torben Jasper-Tönnies^a, Sujoy Karan^{a,b}, Hanna Jacob^c, Felix Tuzcek^c and Richard Berndt^a

- a. Institute of Experimental and Applied Physics, Christian-Albrechts-University Kiel, Germany
- b. Institute of Experimental and Applied Physics, University of Regensburg, Germany
- c. Institute of Inorganic Chemistry, Christian-Albrechts-University Kiel, Germany

* gruber@physik.uni-kiel.de

Spin-crossover (SCO) complexes contain a transition metal ion that can be switched between a low-spin and a high-spin state by external stimuli. Investigations of single SCO molecules is challenging as the interaction with the substrate often leads to fragmentation or loss of functionality. So far, the focus was on Fe(II) based molecules, while SCO complexes with different metal ions (different oxidation states) would be desirable.

Using scanning tunneling microscopy, we evidence the first successful deposition of a cationic Fe(III) SCO complex, [Fe(pap)₂]⁺ (pap = N-2-pyridylmethylidene-2-hydroxyphenylaminato), on Au(111) and Cu₂N/Cu(100). The deposited Fe(III) SCO compound is controllably switched between three different states, each of them exhibiting a characteristic tunneling conductance. The conductance is therefore employed to readily read the state of the molecules [1,2].

[1] Jasper-Toennies et al., J. Phys. Chem. Lett. **8**, 1569 (2017)

[2] Jasper-Toennies et al., Nano Lett. **17**, 6613 (2017)