

## Mapping the spin state of spin-crossover molecules

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We present a novel method for determining the spin states of individual molecules and small clusters of surface-deposited Fe(II) spin crossover (SCO) compounds by STM. Here we focus on  $[\text{Fe}^{\text{II}}(\text{L})_2](\text{BF}_4)_2$  (L=2,6-di(1*H*-pyrazol-1-yl)-4-(thiocyanatomethyl)pyridine)<sup>1</sup>. For comparison, a high spin (HS) compound with a similar coordination motif was investigated.  $10^{-8}$  molar solutions of the materials were drop-coated onto HOPG substrates and investigated by STM and CITS. A strong contrast between two distinct states of the SCO compound was found in the conductivity map, whereas the HS reference molecules always showed the same contrast. Therefore, the two different states can be identified with the high spin and low spin states. Switching of the spin state from high- to low-spin and vice versa was observed at room temperature.<sup>2</sup>

<sup>1</sup> M. Haryono, F. W. Heinemann, K. Petukhov, K. Gieb, P. Müller, A. Grohmann, *Eur. J. Inorg. Chem.* **2009**, 2136.

<sup>2</sup> M.S. Alam, M. Stocker, K. Gieb, P. Müller, M. Haryono, K. Student, A. Grohmann, *Angew. Chem. Int. Ed.* **2010**, 49, 1159.