

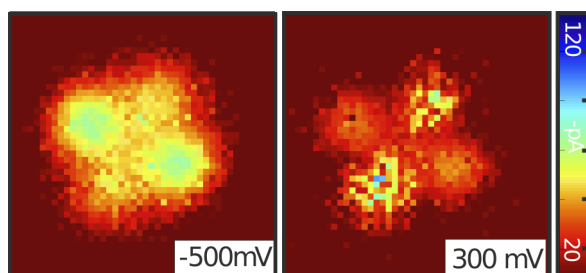
CONTROLLED SWITCHING OF A SINGLE CuPc MOLECULE ON Cu(111) AT LOW TEMPERATURE

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Molecule-substrate interactions inherently influence the performance of organic-based devices. Because molecules of interest are extended objects possessing several vibrational, conformational, and orientational degrees of freedom, tip-induced adsorption rearrangements can be rather complex. The adsorption geometry is a crucial factor not only in molecular diffusion and self-assembly, but can also significantly influence the electronic properties of the combined system.

We present low-temperature tuning fork based measurements of the tunneling current and the frequency shift as a function of distance or lateral position and the applied bias voltage of individual copper phthalocyanine (CuPc) molecules on a bare Cu(111) surface. Outside the range where telegraph current noise is detected, a bias dependent hysteretic contrast transition between different configurations was observed for the CuPc molecules. Supported by first principles calculations, this transition can be attributed to a rotation of the molecules around its center from a twofold symmetric to one of two equivalent distorted configurations.



Constant height STM images taken on a CuPc molecule on Cu(111) using different bias voltages.