

Abstract Submitted  
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**Reversible switching of charge states of single TCNE molecules on Cu(111)**<sup>1</sup> TAEYOUNG CHOI, JAY GUPTA, Ohio state university — The interplay of electronic structure and magnetic properties is of interest in various organic materials. TCNE (TCNE = tetracyanoethylene) is one component of well-known organic magnets with ferromagnetism up to room temperature. TCNE has a strong electron affinity that facilitates chemical bond formation and charge transfer with metals. We use scanning tunneling microscopy and spectroscopy to study single TCNE molecules on Cu(111) and Cu(100) surfaces. On Cu(111), we find that TCNE can be reversibly switched among three configurations via a controlled voltage pulse. We determine the adsorption sites for these configurations by co-adsorbing CO molecules, which are well known to adsorb atop Cu atoms. We believe these states represent different adsorption configurations and charge states. One of the configurations shows a strong Kondo resonance at low temperature; spectroscopic imaging indicates that this state is strongly localized at the corners of the TCNE molecule. Several features symmetric about  $V=0$  suggest a convolution of the Kondo density of states with inelastic electron tunneling spectroscopy of vibrational modes. <http://www.physics.ohio-state.edu/~jgupta>

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