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Magnetic Properties of Electrically Contacted Fe_4 Molecular Magnets JACOB BURGESS, MPSD and MPI FKF, Germany, LUIGI MALAVOLTI, VALERIA LANZILOTTO, MATTEO MANNINI, FREDERICO TOTTI, SILVIYA NINOVA, Dept of Chem, UniFi and INSTM, Florence, Italy, SHICHAO YAN, DEUNG-JANG CHOI, STEFFEN ROLF-PISSARCZYK, MPSD and MPI FKF, Germany, ANDREA CORNIA, Dept of Chem and Geo Sciences, UniMoRE and INSTM, Italy, ROBERTA SESSOLI, Dept of Chem, UniFi and INSTM, Florence, Italy, SEBASTIAN LOTH, Max Planck Institute for the Structure and Dynamics of Matter (MPSD), Hamburg and Max Planck Institute for Solid State Research (MPI FKF), Stuttgart — Single molecule magnets (SMMs) are often large and fragile molecules. This poses challenges for the construction of SMM based spintronics. Device geometries with two electronic leads contacting a molecule may be explored via scanning tunneling microscopy (STM). The Fe_4 molecule [1] stands out as a robust, thermally evaporable SMM, making it ideal for such an experiment. Here we present the first STM investigations of individual Fe_4 molecules thermally evaporated onto a monolayer of Cu_2N on a Cu (100) crystal. Using inelastic electron tunneling spectroscopy (IETS), spin excitations in single Fe_4 molecules can be detected at meV energies. Analysis using a Spin Hamiltonian [2] allows extraction of magnetic properties of individual Fe_4 molecules, and investigation of the influence of the electronic leads. The tip and sample induce small changes in the magnetic properties of Fe_4 molecules, making Fe_4 a promising candidate for the development of spintronics devices based on SMMs.

[1] Nature 468, 417 (2010). [2] Nano Letters 12, 518 (2012).

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