

Abstract Submitted
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Tetrairon(III) Single Molecule Magnet Studied by Scanning Tunneling Microscopy and Spectroscopy YOUNGTEK OH, HOGYUN JEONG, MINJUN LEE, JEONGHOON KWON, JAEJUN YU, Department of Physics and Astronomy, Seoul National University, Seoul 151-747, Korea, SHARIFUL ISLAM MAMUN, GAJENDRA GUPTA, JINKWON KIM, Department of Chemistry, Kongju National University, Chungnam 314-701, Korea, YOUNG KUK, Department of Physics and Astronomy, Seoul National University, Seoul 151-747, Korea — Tetrairon(III) single-molecule magnet (SMM) on a clean Au(111) has studied using scanning tunneling microscopy (STM) and spectroscopy (STS) to understand quantum mechanical tunneling of magnetization and hysteresis of pure molecular origin. Before the STM studies, elemental analysis, proton nuclear magnetic resonance (NMR) measurement and Energy Dispersive X-ray Spectroscopy (EDS) were carried out to check the robustness of the sample. The STM image of this molecule shows a hexagonal shape, with a phenyl ring at the center and surrounding six dipivaloylmethane ligands. Two peaks are observed at 0.5 eV, 1.5 eV in the STS results, agreeing well with the first principles calculations. Spin-polarized scanning tunneling microscopy (SPSTM) measurements have been performed with a magnetic tip to get the magnetization image of the SMM. We could observe the antiferromagnetic coupling and a centered- triangular topology with six alkoxo bridges inside the molecule while applying external magnetic fields.

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