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Low Temperature Scanning Tunneling Spectroscopy of isolated Mn_{12}-Ph Single Molecule Magnets[1] K. REAVES, Depts Materials Science and Engineering and Physics and Astronomy, Texas A&M University; WPI-AIMR, Tohoku University, Sendai, Japan, P. HAN, K. IWAYA, T. HITOSUGI, D. PACKWOOD, WPI-AIMR, Tohoku University, Sendai, Japan, H.G. KATZGRABER, Depts Materials Science and Engineering and Physics and Astronomy, Texas A&M University; Santa Fe Institute, H. ZHAO, K.R. DUNBAR, Dept of Chemistry, Texas A&M University, K. KIM, W. TEIZER, Depts Materials Science and Engineering and Physics and Astronomy, Texas A&M University; WPI-AIMR, Tohoku University, Sendai, Japan — We study $Mn_{12}O_{12}(C_6H_5COO)_{16}(H_2O)_4$ (Mn_{12}-Ph) single-molecule magnets on a Cu(111) surface using scanning tunneling microscopy and scanning tunneling spectroscopy at cryogenic temperatures (T < 6K). We report the observation of Mn_{12}-Ph in isolation and in thin films, deposited through *in situ* vacuum spray deposition onto clean Cu(111). The tunneling current of isolated Mn_{12}-Ph, normalized with respect to the Cu background, shows a strong bias voltage dependence within the molecular interior. The qualitative features of these I vs.V curves differ by spatial location in several intriguing ways (e.g. fixed junction impedance with increasing bias voltages). We explore these normalized I vs. V curves and present a phenomenological explanation for the observed behaviors, corresponding to the physical and electronic structure within the molecule.

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