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A high-frequency EPR study of a new S = 10 Mn12 single-molecule magnet NORM ANDERSON, ANTHONY WILSON, JON LAWRENCE, SHENG-CHIANG LEE, STEPHEN HILL, MURALEE MURUGESU, GEORGE CHRISTOU, University of Florida, UNIVERSITY OF FLORIDA, PHYSICS DEPT COLLABORATION, UNIVERSITY OF FLORIDA, CHEMISTRY DEPT. COLLABORATION — We will present a detailed angle-resolved high-frequency EPR study of a recently discovered analog of the Mn_{12}-acetate single-molecule magnet (SMM). Like the acetate, the new complex $[Mn_{12}O_{12}(O_2CCH_2Bu^t)_{16}(CH_3OH)_4]\cdot CH_3OH$ (Mn_{12}tBuAc), possesses a spin $S = 10$ ground state and S_4 site symmetry. Magnetic measurements also reveal the usual resonant magnetization tunneling steps in the low temperature hysteresis loops. However, we show that the solvent-disorder-induced anomalies reported in the EPR spectra for Mn_{12}-acetate[1] are absent for Mn_{12}tBuAc. This suggests that Mn_{12}-tBuAc is intrinsically cleaner, and that detailed studies of this compound may reveal important new information concerning the quantum dynamics of large spins. Indeed, our analysis of the EPR line widths suggest that they are close to the intrinsic lifetime broadened limit, which may make it possible to extract information concerning electronic relaxation times (T_1 and T_2). [1]S. Takahashi et al., Phys. Rev. B **70**, 094429 (2004)

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