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Relieving Frustration: the Case of Antiferromagnetic Triangular Mn_3 Complexes C. KOO, J. LIU, University of Florida, P.L. FENG, D.N. HENDRICKSON, University of California, San Diego, J.J. HENDERSON, E. DEL BARCO, University of Central Florida, S. HILL, NHMFL and Department of Physics, Florida State University — Recently, various trianglular $[Mn^{III}]_3$ complexes have been extensively studied due to the fact that one can modulate the magnitude and the sign of the inter-ion exchange, thereby giving rise to very simple molecular clusters that constitute some of the cleanest and best examples of so-called single-molecule magnets (SMMs) [Inorg. Chem. **48**, 3480; Phys. Rev. Lett. **103**, 017202; Dalton Trans. **2009**, 9157]. However, magnetic and electron paramagnetic resonance (EPR) characterizations of low-spin antiferromagnetic $[Mn^{III}]_3$ complexes have been problematic due to the significant spin frustration that exists for this topology. We show that this frustration is relieved in the highly distorted $[NEt_4]_3[Mn_3Zn_2(salox)_3O(N_3)_8]\cdot MeOH$ molecule: susceptibility data suggest a well isolated $S = 2$ ground state; EPR measurements support this conclusion and further indicate the presence of a very significant zero-field-splitting (ZFS) separating the lowest-lying $m_S = \pm 2$ states from excited levels. Remarkably, this ZFS is sufficient to give rise to magnetic bistability, as evidenced through the observation of low-temperature hysteresis.

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