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Anisotropic exchange in tetranuclear Co^{II}complexes SAITI DATTA, JUNJIE LIU, JON LAWRENCE, Department of Physics, University of Florida, Gainesville, FL 32611, CHRISTOPHER C. BEEDLE, DAVID N. HENDRICKSON, Department of Chemistry and Biochemistry, University of California at San Diego, La Jolla, CA 92093, STEPHEN HILL, Department of Physics, University of Florida, Gainesville, FL 32611, NHMFL and Department of Physics, FSU, Tallahassee, FL 32310 — High-frequency electron paramagnetic resonance (HFEPR) studies of the tetranuclear Co^{II} complex $[Co(hmp)(dmb)Cl]_4$ (**1**) reveal the presence of significant zero-field-splitting (ZFS) within the ground state spin multiplet. Meanwhile, low-temperature hysteresis measurements of **1** provide evidence for slow magnetization relaxation, suggesting that it could be a single-molecule magnet (SMM). However, HFEPR studies of a Zn analog of **1**, doped with a small quantity of Co^{II}, show the ground state of the Co^{II} ions to be an effective spin $S\prime = 1/2$ Kramers doublet with a highly anisotropic g-tensor.To understand the origin of the ZFS within the ground state spin multiplet of **1**, as well as the slow magnetization relaxation, we consider the effect of anisotropic and antisymmetric exchange interactions between the ions within the tetranuclear complex. Our model provides an explanation for the ZFS in the ground state observed via HFEPR, and can also account for qualitative features observed through magnetic measurements.

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