

Abstract Submitted
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Magneto-infrared **investiga-**
tions of $[\text{Mo}_{12}^{\text{V}}\text{O}_{30}(\mu_2\text{-OH})_{10}\text{H}_2\{\text{Ni}^{\text{II}}(\text{H}_2\text{O})_3\}_4]$ J. CAO, J.L. MUSFELDT,
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University of Central Florida, P. KOGERLER, Ames Laboratory — We measured
the magneto-infrared spectrum of $[\text{Mo}_{12}^{\text{V}}\text{O}_{30}(\mu_2\text{-OH})_{10}\text{H}_2\{\text{Ni}^{\text{II}}(\text{H}_2\text{O})_3\}_4]$ in order to
test the suggestion that molecular structure (and thus interactions between spins)
may be changing with applied magnetic field. Although this low-noise magneto-
infrared work was done in a superconducting magnet (which limits the field range
to only 18 T), these experiments do provide direct evidence for small field-induced
local distortions of the lattice. The field-induced change in the localized H_2O wag-
ging mode on the O attached to the Ni sites is particularly evident. This result is
consistent with previous magneto-optics work indicating a small change in the Ni^{2+}
crystal field environment at 30 T. We also consider whether the magneto-infrared
results and the consequent small implied changes in local structure with magnetic
field are enough to account for the observed magnetization data, and we discuss
complementary mechanisms based on more extended spin Hamiltonians that may
also account for large changes in J and D in molecule-based magnets.

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