

Abstract Submitted  
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**Synthesis and spectroscopic characterization of the single molecule magnet Mn<sub>12</sub>-acetate**<sup>1</sup> SHI YUAN, YEWON GIM, S.L. COOPER, Department of Physics and Frederick Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign — The single molecule magnet [Mn<sub>12</sub>O<sub>12</sub>(CH<sub>3</sub>COO)<sub>16</sub>(H<sub>2</sub>O)<sub>4</sub>]·2CH<sub>3</sub>COOH·4H<sub>2</sub>O (abbreviated as Mn<sub>12</sub>-acetate) system is currently of great interest because it exhibits a number of fascinating properties, such as quantum tunneling of magnetization and unusual relaxation behavior. High-quality single crystals of Mn<sub>12</sub>-acetate were grown and characterized by X-ray diffraction and magnetization measurements. Room temperature micro-Raman (inelastic light) scattering results on these crystals show phonon spectra consistent with earlier measurements. The frequencies of several Mn-O phonon modes exhibit anomalous behavior as a function of temperature. Studies of the Raman active phonons as functions of magnetic field and pressure are being conducted to better understand the role of different phonons in magnetic quantum tunneling in this system.

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