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Spin-lattice interactions as revealed by the pressure-temperature phase diagram of Co[N(CN)2]2[1] JANICE MUSFELDT, Univ of Tennessee, Knoxville, T. V. BRINZARI, K. R. O'NEAL, P. CHEN, University of Tennessee, J. A. SCHLEUTER, Argonne National Laboratory, J. L. MANSON, Eastern Washington University, A. P. LITVINCHUK, University of Houston, Z. LIU, Carnegie Institute — We combined diamond anvil cell techniques, synchrotron-based infrared and Raman spectroscopies, and complementary lattice dynamics calculations to investigate spin-lattice coupling and the magnetic crossover mechanism in the molecule-based quantum magnet Co[N(CN)2]2. These findings along with prior magnetic properties work were brought together to create a pressure-temperature phase diagram in which the second-order structural boundaries converge on key areas of activity involving the spin state, exposing how the pressure-induced local lattice distortions trigger the ferromagnetic to antiferromagnetic crossover transition. Similar triggering events may take place in other materials.

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