

Abstract Submitted
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V, C, and N soft x-ray absorption and MCD of molecular magnet V[TCNE]_{x~2} films¹ JEFF KORTRIGHT, LBNL, R. SHIMA EDELSTEIN, D.M. LINCOLN, J.W. YOO, A.J. EPSTEIN, The Ohio State University — CVD films of V[TCNE]_{x~2} are magnetic room temperature and of interest as prototypes in functional organic magnetic systems. In addition to potential technological interest, fundamental questions regarding the electronic structure and spin distribution in V[TCNE]_{x~2} films remain, and motivate these measurements of x-ray absorption (XAS) and magnetic circular dichroism (MCD) spectra at the vanadium L, carbon K, and nitrogen K edges. XAS spectra reveal strong multiplet splitting at the V edge and strong π^* features at the C and N edges. The registry of these features at different edges indicates a distinct molecular orbital structure involving all constituents. That this molecular orbital structure supports magnetism is indicated by vanadium MCD spectrum and by the loss of specific XAS and MCD features for oxidized samples. Results are interpreted in the context of prior neutron scattering [1] and EXAFS [2] studies, multiplet calculations of V XAS and MCD, and established C and N XAS features.

[1] A. Zheludev, et al., J. Am. Chem. Soc. 116, 7243 (1994).

[2] D. Haskel, et al., Phys. Rev. B 70, 054422 (2004).

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