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Concurrent structural and magnetic phase transition in nanopowder V_2O_3 J. P. CARLO, Y. J. UEMURA, Department of Physics, Columbia University, New York, NY, V. BLAGOJEVIC, M. L. STEIGERWALD, L. E. BRUS, Department of Chemistry, Columbia University, New York, NY, S. J. L. BILLINGE, Department of Applied Physics and Applied Mathematics, Columbia University, New York, NY, W. ZHOU, Department of Physics, Michigan State University, Lansing, MI, G. M. LUKE, A. A. ACZEL, G. J. MACDOUGALL, Department of Physics and Astronomy, McMaster University, Hamilton, ON, P. W. STEPHENS, Department of Physics, SUNY at Stony Brook, Stony Brook, NY — V_2O_3, which has been the subject of investigations for well over 30 years, is a classic example of a Mott-Hubbard transition system. This first-order metal-insulator transition, near 160K, is accompanied by a rhombohedral-monoclinic structural as well as a paramagnetic-antiferromagnetic magnetic transition. We report on structural synchrotron x-ray characterization of V_2O_3 nanopowder (dia $\approx$ 10-50 nm) at NSLS, and magnetic characterization via muon spin relaxation at TRIUMF. We find that, just as in bulk V_2O_3, the structural and magnetic transitions are concurrent, and that in contrast to the abrupt and hysteretic transition witnessed in the bulk, in the nanopowder sample the transition occurs with phase separation over a broad temperature range.

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