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Transition from short-range to long-range antiferromagnetic order in single-crystalline CoSb_2O_6 ¹ AARON B. CHRISTIAN, A. REBELLO, M.G. SMITH, J.J. NEUMEIER, Montana State Univ — Single-crystalline CoSb_2O_6 has been grown via chemical vapor transport. A broad peak in the magnetic susceptibility indicates short-range antiferromagnetic order. Anisotropy among the peak positions suggests a ratio of interchain coupling constants along the a - and c -axes of $J_a/J_c \sim 1.4$. A second order phase transition to long-range antiferromagnetic order is observed at 13.4 K as an abrupt change in slope. Heat capacity measurements suggest that local 1D magnetic order begins upon cooling below ~ 70 K. Thermal expansion measurements also exhibit anisotropic behavior that is affected by the short-range order. Unlike that of the a -axis, the thermal expansion coefficient, μ , for the c -axis becomes negative below ~ 70 K due to anharmonic lattice vibrations resulting from the formation of short-range 1D antiferromagnetic order.

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