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Increase of Structural Phase Transition Temperature with Cr doping in Cr:VO_2 Thin Films B.L. BROWN, MARK LEE, University of Texas at Dallas, P. CLEM, C.D. NORDQUIST, T.S. JORDAN, S.L. WOLFLEY, D. LEONHARDT, Sandia, J.A. CUSTER, SSA — Bulk crystal VO_2 has a well-known structural phase transition near $T_c = 68$ °C that separates a low-temperature insulating phase from a high-temperature metallic phase with several orders-of-magnitude resistance contrast between the two phases. We report electrical and optical studies of the effect of Cr doping on the T_c in Cr:VO_2 thin films. Resistivity, Hall effect, and infrared reflectivity all show that Cr doping systematically increases T_c from 50 °C up to $\sim$ 75 °C at 11% Cr with similar transition width and hysteresis from DC to infrared, but the effect appears to saturate. At the same time, there is a modest decrease in resistance contrast. We will discuss possible effects of both carrier density and scattering changes across T_c on the resistance. Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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