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Electron Spin Resonance of VO_2 thin films K.C. MAYNES, P.H. BUNTON, D.B. BAKER, KENNETH HARTMAN, William Jewell College, R.F. HAGLUND, JR., R. LOPEZ, A. HABALICA, Vanderbilt University — The metal-insulator transition present in chromium doped VO_2 nanoscale film has been observed by electron spin resonance (ESR) spectroscopy. VO_2 is a highly correlated electron system with numerous practical applications pertaining to this transition, including ultra-fast optical switching and smart windows. We use Cr^{3+} transition metal ions with concentration of order one percent as a probe in a 140 nm film to detect this transition. The film exhibited a four-fold decrease in chromium intensity as temperature increased through the transition temperature ($\sim 67^\circ$ C). ESR signal intensities were also used to characterize the hysteretic behavior of this particular transition; these results are in agreement with hysteresis observed through optical means. A discussion of how changes in ESR relaxation times affect signal intensities, as monitored through the transition, will be presented.

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