Abstract Submitted
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Angle-resolved Ultra-violet Photoelectron Spectroscopy Study of Epitaxial CrO_2 films grown on TiO_2 Substrates DANIEL BORST, University of New Orleans, CARL VENTRICE, Unversity of New Orleans, G. MIAO, University of Alabama, ARUN GUPTA, University of Alabama — Chromium dioxide is predicted to be a half-metallic oxide. Although there is experimental evidence that CrO_2 is half-metallic at low temperature, attempts to make devices based on CrO_2 have yielded very low efficiencies. To study the electronic properties of the surface region of CrO_2, we have performed ARUPS measurements on epitaxial CrO_2 films. The CrO_2 thin films have been deposited on (100) and (110)-oriented TiO2 substrates by chemical vapor deposition, using CrO_3 as a precursor. The effects of sputtering of the CrO_2 films to remove the outer layer of Cr_2O_3 and of annealing the films in oxygen to heal surface defects has been studied. Sputtering results in shifts in the onset of valence emission away from the Fermi edge by as much as 0.5 eV, which is opposite of what would be expected for a half-metallic system. Annealing of the films above 450 ^{o}C results in spectra similar to Cr_2O_3.

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