

Title: Fabrication and properties of CrO₂-based spintronic devices.
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CrO₂ is a well-established half-metallic oxide with near perfect spin polarization - known to have the highest spin-polarization among all known materials theoretically as well as experimentally. Magnetic tunnel junctions (MTJ) were fabricated with CrO₂, Cr₂O₃ [natural oxide of Cr] as the thin insulating barrier and Co as the other ferromagnetic electrode using photolithography. I-V characteristics of these spin-electronic devices are reported here. Tunnel magnetoresistance (TMR) observed in this junction was -2% at 78 K – similar to previously reported results [1]. Barrier height in this junction was found to be about 0.4 eV using Simmons model and Brinkman model. Inelastic tunneling spectroscopy (IETS) of this MTJ showed spectra close to Cr₂O₃ vibrational modes.

[1] Titus Leo, Christian Kaiser, Hyunsoo Yang, Stuart S. P. Parkin, Martin Sperlich, Gernot Güntherodt, David J. Smith, Appl. Phys. Lett. **91**, 252506 (2007)