

Magnetic and transport properties of half-metallic CrO₂ films on TiO₂ substrates

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We have investigated the magnetic and transport properties of half-metallic CrO₂ films on TiO₂ substrates prepared by chemical vapor deposition method. The magnetic hysteresis loops of epitaxial CrO₂ films shows a large variation with the direction of the applied magnetic field. This was explained by a competition between various magnetic anisotropy fields, such as crystallographic magnetic anisotropy, strain-induced magnetic anisotropy, and shape magnetic anisotropy. The resistivity of epitaxial CrO₂ films shows a clear metallic behavior with the temperature and it is a very small value of $10^{-3} \sim 10^{-5}$ ohm/cm below room temperature. The resistivity of epitaxial CrO₂ shows a weak dependence on the measurement direction.