

Magnetic properties of EuNiO_3 thin films

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RNiO_3 (R-rare earth) is a family of compounds that in certain temperatures undergo antiferromagnetic-paramagnetic and metal-insulator phase transitions. Their properties are not yet fully understood. Correlated electron EuNiO_3 thin films of various thicknesses and deposited on different substrates by RF magnetron sputtering were studied. Magnetic measurements were performed with SQUID magnetometer. Curves of magnetization versus temperature and versus applied magnetic field were obtained. Results indicate that surprisingly EuNiO_3 thin films are not antiferromagnetic in the studied temperature regime. Instead, they turn out to have a ferro- or ferrimagnetic character and show hysteretic behaviour with the change of external field. This can be presumably a result of surface effects or charge disproportionation of nickel in those compounds which assumes the existence of nickel in two nonequivalent states- weakly magnetic $\text{Ni}^{3+\delta}$ and strongly magnetic $\text{Ni}^{3-\delta}$. Surface sensitive studies and calculations are on the way to confirm obtained experimental results.

13.4 cm

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9.7 cm