

Tuning of magnetic properties on CaFeO_{2.5}/SrCoO_{2.5+ δ} heterostructures

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CaFeO_{2.5} and SrCoO_{2.5} show an ordered deficient Perovskite structure and more specifically with a Brownmillerite type framework. Both are electronically insulating and antiferromagnetically ordered (G-type) with a Néel temperature of about 400°C. SrCoO₃ can be obtained from SrCoO_{2.5} by electrochemical oxidation at ambient temperature, which itself shows metallic behaviour and it becomes ferromagnetic. CaFeO_{2.5} is chemically inert and has been reported to get oxidized only under extreme conditions, i.e. 1100°C and several GPa oxygen partial pressure (P_{O2}).

The present work aims to fabricate heterostructures based on alternating epitaxial thin films of CaFeO_{2.5} and SrCoO_{2.5} and to investigate the evolution of their magnetic properties during the selective oxidation of SrCoO_{2.5} to SrCoO₃. The oxidation will be controlled electrochemically.

Magnetic characterization will be investigated by SQUID and neutron reflectivity measurements. We expect interesting magnetic coupling as a function of δ , the orientation of the epitaxial films and temperature.

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