

PO1005

**Elaboration and characterisations of NdCoO<sub>3</sub> thin films prepared by DC magnetron co-sputtering**Fabien Capon<sup>1</sup>, Alexis Boileau<sup>1</sup>, David Horwat<sup>1</sup>, Jean-François Pierson<sup>1</sup><sup>1</sup>Institut Jean Lamour, Nancy, France

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NdCoO<sub>3</sub> and NdNiO<sub>3</sub> crystallise in the orthorhombic RMO<sub>3</sub> family of rare-earth (R) transition-metal (M) perovskites structure with Pbnm space group. For instance, structural data obtained show that the octahedral MO<sub>6</sub> units undergo not only a cooperative rotation, but also an intrinsic site distortion that progressively varies with R<sup>3+</sup> ionic radius (IR). The octahedral can distort in two ways: the (M–O) bond lengths may differ between the three major site axes (and consisting of an orthorhombic component) and the O–M–O bond angle a may be reduced from 90° to a much smaller angle that subtends the octahedral site edges parallel to the orthorhombic b axis. Some similarities are reported in the case of M = Co and Ni, in which the (M–O) bond length changes with the IR and in the case of NdNiO<sub>3</sub> and NdCoO<sub>3</sub>, they exhibit a semiconductor behaviour which is correlated with a thermochromic effect in NdNiO<sub>3</sub>. In this work, we investigate the thermochromic properties of new NdCoO<sub>3</sub> thin films. The constitutive elements of the perovskite are deposited at room temperature from two metallic targets Nd and Co onto (100) undoped Si single-crystal substrate. The Nd and Co contents were controlled by the current applied to the targets. The chemical stoichiometry of the deposited material was checked by energy dispersive X-ray analyses. We performed a subsequent annealing in air at 600°C to form crystalline films. X-ray diffraction was performed before and after annealing. DC electrical resistance and infrared transmittance were measured with the four-probe method scanning temperature from -180°C to 600°C using a Linkam Examina Probe equipment.

**Keywords**NdCoO<sub>3</sub>

Thermochromic

Perovskite

Four-Point-Probes

Cobaltites