Growth and magnetic properties of embedded Co nanowires with diameters in the 3-5 nm range.

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In this contribution, we report on the growth of embedded Co nanowires with diameters in the 3-5 nm range and length up to 400 nm. Such nanowires were observed to form spontaneously upon pulsed laser deposition of CoO and CeO_2 on $SrTiO_3$(001) in reducing conditions. The obtained samples consist in Co nanowires embedded in an epitaxial CeO_2/$SrTiO_3$(001) film exhibiting good crystalline quality. The structure of the Co nanowires was characterized by high resolution transmission electron microscopy (HRTEM) and extended x-ray absorption fine structure. The nanowires orientation, diameter and internal structure depend sensitively on the growth conditions. The magnetic properties of these objects will be discussed in connection with their structure with a particular emphasis on the magnetization reversal.

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