

STRUCTURE AND MAGNETIC ANISOTROPY EVOLUTION IN Au/Co/Au SANDWICHES UPON THERMAL TREATMENT

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Co ultra-thin films sandwiched between Au layers are one of the most intensively studied magnetic systems due to the existence of perpendicular anisotropy. Despite large lattice mismatch of 14% between the constituent layers the structure of Au/Co/Au sandwiches is coherent. As a consequence the induced tensile strains in Co layer contribute to a magnetoelastic component of magnetic anisotropy in this system. The aim of this study is the investigation of thermal treatment influence on crystalline structure and magnetic properties of Au(111)/Co(0001)/Au(111) sandwiches MBE grown on sapphire substrate covered with Mo buffer. After annealing at 250°C the RHEED pattern of Co layer reveals the loss of lattice coherence and additionally the results of synchrotron radiation reflectometry studies suggest breaking of Co layers continuity. These structural observations are correlated with magnetic properties examined by magneto-optical Kerr effect. Annealing at 150°C does not affect substantially the perpendicular anisotropy. Treatment at 250°C switches the magnetisation vector from perpendicular to in-plane orientation. Achieved results are supported by theoretical considerations in terms of magnetoelastic and diffusion contributions.

9.7 cm

13.4 cm

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