

Abstract Submitted
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Growth, structure and magnetism of self-organized epitaxial nano-alloys on a metallic substrate S. ROUSSET, N. MOREAU, V. REPAIN, C. CHACON, Y. GIRARD, J. KLEIN, J. LAGOUE, MPQ, University Paris-Diderot Paris 7, UMR CNRS 7162, H. BULOUE, F. SCHEURER, C. GOYHENEX, IPCMS, University of Strasbourg UMR CNRS 7504, PH. OHRESSER, SOLEIL, Saint-Aubin, France — The CoPt alloy is one of the most studied bimetallic compounds, due to its potential application for magnetic recording. We report here on $\text{Co}_x\text{Pt}_{1-x}$ nano-alloys deposited on the well-known Au(111) reconstructed surface since it has been recognized as a powerful substrate in order to investigate the magnetic properties of metallic nano-clusters [1,2]. The growth of $\text{Co}_x\text{Pt}_{1-x}$ clusters on the Au(111) surface observed by STM revealed a morphological transition from single layer to bilayer islands with the Co concentration x . Using molecular dynamics calculations, we show that this transition is driven by the local strain due to Co atoms. These results are interpreted by a competition between the interface energy, the mixing energy and the elastic energy. Using X-ray Magnetic Circular Dichroism, we have studied the magnetic properties of these nano-alloys. The out-of-plane anisotropy of pure Co clusters strongly decreases, until it goes in-plane for 40% of Pt. This spin reorientation transition is interpreted by a phenomenological pair model for magnetic anisotropy. **References** [1] N. Weiss et al., Phys. Rev. Lett. 95, 157204 (2005) [2] S. Rohart et al., Phys. Rev Lett. 104, 104, 137202 (2010).

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