

Abstract Submitted
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Structure determination of CoPt nanoparticles: Chemical ordering and its effect on magnetic properties NILS BLANC, LAURENT BARDOTTI, MATTHIAS HILLENKAMP, ALEXANDRE TAMION, FLORENT TOURNUS, JULIETTE TUAILLON-COMBES, VERONIQUE DUPUIS, LPMCN, EDGAR BONET, HELIO TOLENTINO, ALINE RAMOS, MAURIZIO DE SANTIS, Institut Neel, PHILIPPE OHRESSER, Synchrotron SOLEIL, THIERRY EPICIER, Laboratoire MATEIS — Due to the huge magnetocrystalline anisotropy of bulk CoPt crystallized in the L1₀ phase, CoPt nanoparticles have been widely studied during the last decade. In order to determine the intrinsic magnetic properties of CoPt clusters, we synthesize benchmark samples: 3 nm diameter CoPt clusters, pre-formed in the gas phase, are embedded in an amorphous carbon matrix under UHV conditions. The transition from the chemically disordered A1 to the ordered L1₀ phase is then obtained by annealing. Chemical ordering has clearly been evidenced by different techniques (HRTEM, GIXRD). In the case of nanoparticles, this phase transition goes with a magnetic anisotropy increase much lower than for the bulk. Besides, XMCD measurements have revealed a $\mu\text{L}/\mu\text{S}$ increase for Co and Pt atoms and a strong μS enhancement for Co upon L1₀ ordering. F. Tournus et al. Phys. Rev. B 77, 144411 (2008) Thanks are due to the CLYM (Centre Lyonnais de Microscope) for the access to the transmission electron microscope

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