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Magnetic anisotropy of $\text{Co}_x\text{Pd}_{100-x}$ thin films on amorphous SiO_2

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Abstract

Cobalt – palladium thin films with different Co:Pd ratios, $\text{Co}_x\text{Pd}_{100-x}$ ($x=23, 36, 42$), have been deposited on fused silica (amorphous SiO_2) by pulsed laser deposition (PLD). For the structural characterization of the thin films, X-ray reflectivity (XRR) and X-ray diffraction (XRD) are used; as for the investigation of the magnetic characteristics of the films, physical properties measurement system (PPMS) is used. The results show that the thickness of the thin films is in the range of 16-20 nm, and the crystal structure of the films is FCC. Also, the films have a [111] preferred growth direction. The study of the magnetic properties also shows that the magnetic anisotropy tends to align in the perpendicular direction by the increase of Pd:Co ratio, which can be attributed to the enhancement of the spin-orbit interaction. Also, in this work, the effect of thickness on the magnetic anisotropy is investigated.

Keywords: thin film, pulsed laser deposition (PLD), CoPd, magnetic anisotropy

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