

# Perpendicular magnetic anisotropy of nanoporous Co/Pd multilayers

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The present work is focused on the magnetism of nanoporous films produced by deposition of Co/Pd multilayers with high perpendicular magnetic anisotropy (PMA) on porous TiO<sub>2</sub> templates with almost flat interpore surface morphology, and on Al<sub>2</sub>O<sub>3</sub> where the pores are located in the middle of 3D hexagonal packed hemispherical deepenings. The pore diameters and interpore distances were varied in the range 10–180 nm and 20–420 nm, respectively. All nanoporous films conserve PMA with effective magnetic anisotropy constant ( $K_{eff}$ ) around  $2 \cdot 10^6 \frac{erg}{cc}$  despite of their microstructure and morphology changes. The isotropic growth of crystallites in films on porous templates was determined in contrast to highly (111) textured continuous film. The transition of magnetization reversal mechanism from domain wall motion for the continuous film to coherent rotation mode, described by Stoner-Wolharth model (SW), was found for nanostructured films. The effective anisotropy constant  $K_{eff}$  for nanoporous films was determined using SW model and the obtained values correlate well with values determined directly from the hysteresis loops.

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