

Fabrication, structure and magnetic properties of Co/Pd and Fe/Pd multilayered nanorods and antidots arrays on anodic aluminium oxide templates

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A fabrication method of multilayered (ML) Co/Pd and Fe/Pd magnetic nanorods and antidots arrays with carefully engineered pinning on the top of nanoporous anodized aluminum oxide (AAO) templates (pore diameters 30, 40 and 180 nm) is presented. The surface morphology and crystallographic structure of the systems were investigated by SEM and X-ray diffractometry, respectively. TEM cross-sectional confirmed ML structure of nanosized arrays. SQUID-magnetometry indicates enhanced perpendicular anisotropy and more than twofold increase of coercivity of nano-sized arrays in comparing to flat films. Magnetization reversal mechanisms in the systems were investigated by analysing the angular dependence of the remanent coercivity. Presented method of magnetic nano-arrays fabrication can be used as low-cost nanopatterning technique.