

Co/Pt nanodot arrays formed via pulsed laser deposition by using (PS-*b*-PMMA) & AAO nanotemplate

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We have fabricated Co and Co/Pt nanodot arrays by using phase separated (PS-*b*-PMMA) diblock copolymer thin films and anodic aluminum oxide membranes as templates. Microphase separation of (PS-*b*-PMMA) diblock copolymer thin film and subsequent removal of PMMA resulted in the formation of hexagonal arrays of cylindrical hollows perpendicular to the surface with a diameter of 20 nm and the separation of 40 nm. Alumina membrane of hexagonal arrays of cylindrical hollows with a diameter of 60 nm and the separation of 110 nm was obtained by anodic oxidation of aluminum sheet in oxalic acid. Pulsed laser deposition technique was used to deposit Co and Co/Pt arrays onto Si substrates. The size and the separation of nanodots correspond to those of the templates used. The density of nanodots was estimated to be $6 \times 10^{11}/\text{cm}^2$ and $1 \times 10^{10}/\text{cm}^2$ when the (PS-*b*-PMMA) and AAO templates were used, respectively. The composition of Co/Pt nanodots was varied and the resultant change of magnetization was measured by vibrating sample magnetometer and magnetic force microscope. The magnetization was enhanced with increase of the Pt composition.