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Composition dependent magnetic properties of Co/Pt nanodot arrays

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Regularly patterned nanodot arrays have many potential applications in the field of optoelectronics, sensors, and magnetic recording devices. Diblock copolymer thin films can be used useful templates for fabrication nanodot arrays. They have the advantages of low cost, easy size control, simple systems, and the fabrication of nanometer scale structures over large areas. We have fabricated hexagonal array of Co/Pt nanodots on Si surfaces by pulsed laser deposition using cylindrically phase separated (PS-*b*-PMMA) diblock copolymer thin films after removal of PMMA as templates. The size and the separation of the nanodots were 20 and 40 nm, respectively, and the density of the nanodots was estimated to be 1.5×10^{11} /cm^2. The magnetization of the Co/Pt*X* nanodots measured by vibrating sample magnetometer increased with the Pt composition.The easy magnetization in the direction parallel to the substrate was observed for the nanodots with a coercivity of 200 Oe for Co/Pt ratio of 3.