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Fabrication of well aligned magnetic nano-dots using anodic aluminum oxide template

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There are many processes for metal film deposition, including sputtering, evaporation, chemical-vapor depotion, electrolytic deposition, and electroless deposition. Of these, electrolytic depostion is particularly attractive in manufacturing because it offers low-temperature processes. By this method Ni, Co, Fe were deposited in alumina-nano pores. These pores are fabricated by anodizing method. Between them Co, as soft magnetic materials, has been studied extensively for their excellent soft magnetic properties, such as high saturation magnetization and low coercivity. Its magnetic properties are associated with the nanoscale features in its morphology, such as the strain anisotropies of Co-based crystallities. In this work, we try to fabricate well-aligned magnetic nano-dots and study on the magnetic properties of Co, Ni, Fe nano dots. The arrangement and the shape of the dots were observed using a scanning electron microscope (SEM), structural defects were observed by high resolution transmission electron microscope (HRTEM).