

Patterned Arrays of Elliptical Rings with Non-Uniform Width and Their Ferromagnetic Behavior

이수연^{1,2}, 김사라^{1,2}, 김신현^{1,2}, 양승만^{1,2,*}

¹한국과학기술원 생명화학공학과;

²광자유체집적소자 창의연구단

(smyang@kaist.ac.kr*)

Ferromagnetic elliptical rings which have a different length between major and minor axis of ellipse have received much attention recently because of their stable magnetization reversal process in data storage. For magnetic patterns, Ni/Fe Permalloy ring arrays with non-uniform width were successfully fabricated by capillary force lithography and following etching process. The ring width of them and the ratio of length in each axis of them could be precisely controlled by mold type, RIE time performed to polymer templates, molecular weight of polymer, and concentration of polymer solution. Magnetic property of patterned arrays was characterized by a magneto-optical Kerr effect (MOKE). As a result, the magnetization reversal process of ferromagnetic elliptical rings was affected by the ratio of length in each axis of ellipse. Consequently, a ferromagnetic ring with non-uniform width which can not only induce a stable magnetization reversal process, but also possess a narrower switching field distribution was satisfactorily fabricated in this work.