Magnetic Nanostructures Fabricated by Thermal Nanoimprint Lithography

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Recently, nanoimprint lithography (NIL) has received great attention due to their potential applications in devices for electrical, optical, photonic and biological applications. We have successfully fabricated the various magnetic nanostructures using thermal NIL. To fabricate the magnetic nanopatterns, a thin layer of PMMA was coated onto the Si substrate and the PDMS mould was pressed. The sample was heated above the glass transition temperature to transfer the patterns. After the pattern transfer, residual layer was removed using reactive ion etching (RIE). Then ferromagnetic materials such as Fe, Ni, Co were coated by thermal evaporation. In this work, we have investigated the effect of the residual layer on the fabrication of the magnetic nanopatterns and variation of the magnetic properties by changing the geometric shape of the magnetic nanopatterns.

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