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SP-STM Study of Single-Crystallized Nano-magnet Arrays Fabricated with an Alumina Shadow Mask

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We have developed a method to grow patterned Fe-dot arrays by *in situ* deposition. Self-sustained porous alumina layer was fabricated from aluminum-coated Si substrate. Using the alumina layer with perfectly ordered pores, we fabricated the alumina shadow mask.[1] Fe nano-dot arrays with 0.2-10 nm thicknesses, 50-100 nm diameters, and 100-200 nm periods were successfully grown on W(110) in an UHV system. Single-crystallized, Fe nano-dot arrays were obtained by mild heating.

Spin-polarized scanning tunneling microscopy (SP-STM), the most powerful technique to study magnetic nanostructures, can detect the local spin density of the magnetic sample with atomic resolution.[2] The difference between randomly distributed Fe islands and regularly patterned Fe nano-dot arrays has been studied with SP-STM.

[참고문헌]

1. J. H. Choi, T.-H. Kim, J. Seo, and Y. Kuk (to be published).
2. S. Heinze, M. Bode, A. Kubetzka, O. Pietzsch, X. Nie, S. Blügel, and R. Wiesendanger, Science 288, 1805 (2000).