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Preparing Large Scale Magnetic Nanodot Arrays using Block Copolymer Thin Films and Spin-On Glass as a Template

The ultimate goal of this research is to create large arrays of patterned magnetic nanodot arrays that may be used for extremely high density recording (EHDR) hard drives. Block copolymer thin films are ideal templates for assembling large areas of nanoscale features due to their self-assembly properties and ease of processing. The challenge, however, is to create magnetic nanodot arrays from the patterned copolymer template. Once the holes of the copolymer have been removed by degradation, spin-on glass may be cast to fill the resulting holes. The underlying magnetic films may then be patterned using ion milling with the spin-on glass acting as a mask. Previous research using this method has produced patterned magnetic dots with a 40nm diameter. The goal of this immediate research is to create an efficient process for making magnetic nanodot arrays using spin-on glass as an intermediate. By using this process with spin-on glass as an intermediate, it is possible that one will be able to lower the molecular weight of the block copolymer and create smaller magnetic nanodot arrays.



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