

Fabrication of Ultrahigh-Density Array of Nanopatterns by Baro-Lithography at Room Temperature

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We report the fabrication of an ultrahigh density array of nanopatterns by using baroplastic block copolymers. Because of baroplastic properties that enable the microphase transition of block copolymers at relatively lower pressure and temperature, nanopatterns are fabricated by the indentation of the atomic force microscope (AFM) tip on the thin film at room temperature. This method, referred to as baro-lithography, does not require the heating of either AFM tip or polymer substrate, compared with thermomechanical methods such as the Millipede introduced by IBM. In addition, the write-read-erase-rewrite process is achieved without thermal degradation of polymeric film. The array of nanopatterns presented in this study could be used for ultrahigh density data storage media.