Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Robust Nanopatterns from Self-Assembly of a Diblock Copolymer and an Inorganic Precursor HO-CHEOL KIM, LINNEA SUNDSTROM, LESLIE KRUPP, EUGENE DELENIA, CHARLES RETTNER, MARTHA SANCHEZ, MARK HART, YING ZHANG, IBM Watson Research Center — Nanoscopic patterns from self-assembled block copolymer thin films have been recognized as a promising route to sub-lithographic patterns on substrates. Line patterns from lamellar phase of block copolymers are particularly attractive as they can be used as an etch mask for transferring patterns into substrates. A few organic block copolymers have been studied for generating line patterns by controlling the orientation of lamellar microdomains. The organic nature of the block copolymers, however, often gives poor thermal stability and etching contrast, which limits potential applications. Indeed robust nanostructures of sub-lithographic length scales are highly desirable to comply with common nanofabrication processes. Here we report a simple method to create robust nanoscopic line patterns on surfaces from self-assembly of mixtures of a diblock copolymer and an inorganic precursor. The organic diblock copolymer directs the structure of the inorganic precursor and can be removed by thermal treatment. By tuning the interfacial energy at two interfaces, normally oriented lamellar patterns of approximately 20nm half-pitch and 40nm thick were obtained. Results on transferring patterns to substrate will be reported as well.

Ho-Cheol Kim
IBM Almaden Research Center

Date submitted: 03 Dec 2005

Electronic form version 1.4