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Dynamics of Defect Annihilation in Directed Self-Assembly of Block Copolymers Using Optical Inspection of Fully Patterned Wafers PAULINA RINCON DELGADILLO, University of Chicago , ROEL GRONHEID, Imec, PAUL NEALEY, University of Chicago, U OF CHICAGO/IMEC COLLABORATION — Research in directed self-assembly (DSA) of block copolymers (BCP) has gained significant interest from the industry due to its potential application as a complimentary lithographic technique. This has led to the implementation of different DSA schemes, the Liu-Nealey (LiNe) chemo-epitaxy flow among others, in a fab environment, with automatic processing and specialized materials. This set-up allows a thorough evaluation of the impact of the boundary conditions on the assembly process that cannot be performed in the laboratory. In addition, the inspection tools allow the characterization of large areas of nano-patterns and provide enough information to perform statistical analysis of the assembly process. Using optical inspection, a high capture rate of dislocation defects has been achieved and fine differences in the chemically nano-patterned substrates have been related to the final defect density. At the same time, multiple time and temperature conditions during BCP anneal have been investigated. With this work, we identified the role of the boundaries (thermodynamics) and kinetics on defect annihilation on DSA of BCP using density multiplication.

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