

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Flash Grafting of Functional Random Copolymers for Surface Neutralization MICHELE PEREGO, FEDERICO FERRARESE LUPI, TOMMASO J. GIAMMARIA, GABRIELE SEGUINI, MONICA CERESOLI, Laboratorio MDM, IMM-CNR, DIEGO ANTONIOLI, VALENTINA GIANOTTI, KATIA SPARNACCI, MICHELE LAUS, DISIT, Università del Piemonte Orientale “A. Avogadro” — Tailoring surface energies is the key factor to control the orientation of nanoscopic structures in thin block copolymer (BCP) films in view of the possible integration into next generation lithographic processes. In the general frame of the “grafting to” approach, this paper reports on the use of Rapid Thermal Processing (RTP) technology to perform flash grafting reactions of a hydroxyl terminated polystyrene-*r*-methylmethacrylate random copolymer to the activated silicon wafer surface. The perpendicular orientation of the cylinder morphology of an asymmetric PS-*b*-PMMA block copolymer is achieved when the thickness of the random copolymer layer is higher than 6.0 nm. The grafting time to achieve this thickness reduces from about 750 s, when the RTP grafting process is performed at 230 °C, to 15 s at 310 °C. In addition, TGA-GC-MS analysis indicates that the chain structural reorganization, which occurs during the RTP treatments, affords a more stable film structure without changing its surface characteristics. In this work we investigate the early stages and on the dynamic of the grafting processes on time scales and in temperature ranges that have never been explored before.

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Date submitted: 15 Nov 2013

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