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Self-assembly kinetics inSymmetric Diblock Copolymer Thin Films during solvent assisted thermal treatments MICHELE PEREGO, FEDERICO FERRARESE LUPI, MONICA CERESOLI, TOMMASO J. GIAMMARIA, GABRIELE SEGUINI, Laboratorio MDM, IMM-CNR, DIEGO ANTONIOLI, VALENTINA GIANOTTI, KATIA SPARNACCI, MICHELE LAUS, DISIT, Università del Piemonte Orientale "A. Avogadro", LUCA BOARINO, NanoFacility Piemonte, INRIM — Block copolymer (BCP) microphase separation and ordering by thermal annealing is often a challenge because of its slow kinetic. Towards the objective of rapid processing and accessing desired nanostructures, in this study we propose and discuss an alternative approach based on the use of a Rapid Thermal Processing (RTP) system that allows self-organizing symmetric polystyrene-b- poly(methyl methacrylate) (PS-b-PMMA) thin films in few seconds, taking advantage of the residual amount of solvent present in the film after the spinning process. Distinct ordered morphologies, coexisting along the sample thickness, can be obtained in PS-b-PMMA samples with the formation of lamellae laying over a hexagonal pattern of PMMA cylinders embedded in the PS matrix and perpendicularly oriented with respect to the substrate. The thermal evolution of the entrapped solvent and the dynamics and morphological stabilization of the coexisting phases are described and the intimate mechanism of the self-assembly process are discussed and fully elucidated.

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