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Structure and dynamics of block copolymer films by XPCS[1]
HYUNJUNG KIM, HEEJU LEE, YOUNG JOO LEE, SANGHOON SONG, Dept. of Physics & Interdisciplinary Program of Intergrated Biotechnology, Sogang University, Korea, ZHANG JIANG, SUNIL K. SINHA, Dept. of Physics, University of California San Diego, A. RUEHM, Max Planck Institute for Metals Research, Stuttgart, Germany — We have measured the structure and the dynamics of block copolymer films in the melt using X-ray Photon Correlation Spectroscopy. Block-copolymers films used in this study have an internal structure of spherical micelles. This ought to have a strong influence on the physical properties of the thin films. The results from the surface dynamics are compared with the theory of overdamped thermal capillary waves on thin films. By changing the incident angle, the surface dynamics and the micelle dynamics were selectively measured. The obtained viscosity will be compared with the value from the mechanical measurement of the bulk material. The surface tension obtained from static grazing incidence scattering data shows that a PDMS layer segregates to the free surface of the film.

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Hyunjung Kim
Dept. of Physics & Interdisciplinary Program of Intergrated Biotechnology, Sogang University, Korea

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