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### Measurement of Grain Size and Its Evolution on the Free Surface of SEBS Triblock Copolymer Film using AFM and Image Processing

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Revealing structure-property relationship has been one of the key issues for development of novel functional or high-performance polymeric materials. We recently keep attention at “grain” of block copolymer microdomains because the grain of which size is several micrometers is considered to affect properties more directly. In this presentation, we focus on a grain in which spherical microdomains of block copolymers are regularly ordered in body-centered cubic (BCC) lattice. Especially, we discuss growth of the grain on a free surface of a thin film where (110) planes of the BCC lattice are spontaneously oriented parallel to the film surface. The sample used is PS-block-PEB-block-PS (SEBS8) triblock copolymer (PS (polystyrene) spherical microdomains embedded in the matrix of PEB (polyethylenebutylene);  $M_n = 6.7 \times 10^4$ ,  $M_w/M_n = 1.04$ ,  $\phi_{PS} = 0.084$  (volume fraction of PS)). The sample was spin-cast on a silicon wafer from a toluene solution with a polymer concentration of 5.0 wt% at room temperature. Then, the as-spin-cast film was further subjected to the thermal annealing at 140°C under the nitrogen atmosphere. The surface morphology was analyzed by atomic force microscopy (AFM), using apparatus Nano Scope IIIa with a cantilever (NANO WORLD) of which length was 125 mm and the spring constant was 42 N/m. The AFM observation was conducted with tapping mode by using J-Scanner (5654V).