

Distribution of Nanoparticles in Micellar Structured Block Copolymer/Homopolymer Thin Film Hosts

Supporting Information

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The organization of micelles and nanoparticles within the films are shown below. The number density and organization of micelles and the organization of nanoparticles remained constant after 4 hours of annealing; they did not change with further annealing, even after two days. Considering the discussion in the manuscript where the distribution is controlled by the maximization of the entropic effects and minimization of the P2VP/PS contacts, one would be hard pressed to believe that the situation would change after continued annealing. In this regard the conclusions are necessarily based on the actual behavior of the system.

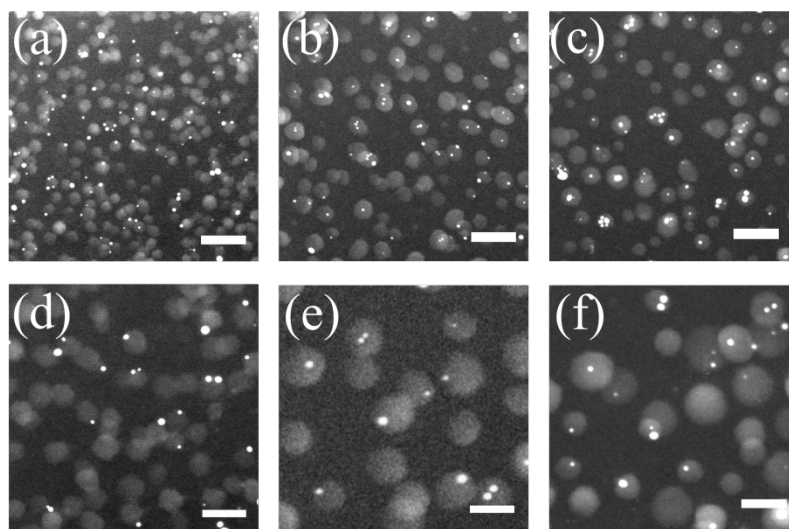


Fig. S1 Scanning transmission electron micrographs (STEM) of AuNPs in thin film PS-b-P2VP/PS mixtures (weight ratio of 1:4) with host PS degrees of polymerization $P=15400$ (a,d) as cast sample (b,e) annealed above T_g for 4 hours and (c,f) annealed above T_g for 48 hours. The scale bar represents a distance of 100nm in (a-c) and it represents 50nm in (d-f).

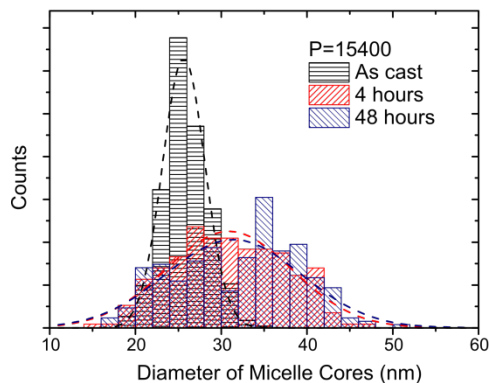


Fig. S2 Histograms of diameter of all micelle cores for as cast sample, samples annealed for 4 hours and 48 hours as determined from STEM images. The size distributions of micelle cores for these three samples are fitted to Gaussian profile.

Table S1. Quantitative comparison of AuNPs in thin film PS-b-P2VP/PS mixture with $P=15400$ among as cast sample and annealed samples (4 hours and 48 hours)

	Diameter of Micelles (nm)	Number Density of Micelles (μm^{-3})	Volume Fraction of Micelles	Fraction of Micelles with AuNPs
As cast	25.8 ± 2.6	$6.0 \pm 0.3 \times 10^3$	0.154 ± 0.009	N.A.
4 hours	30.8 ± 6.4	$2.9 \pm 0.2 \times 10^3$	0.136 ± 0.013	0.46 ± 0.13
48 hours	31.9 ± 7.2	$2.5 \pm 0.2 \times 10^3$	0.139 ± 0.017	0.49 ± 0.05

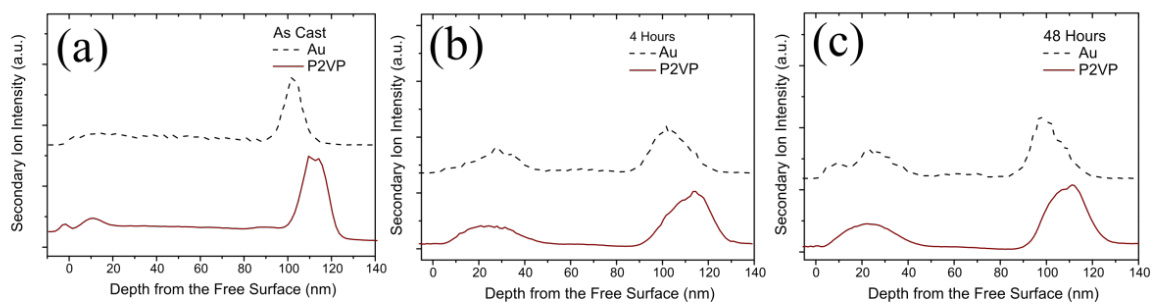


Fig. S3 Depth profiles of AuNPs and of the P2VP in AuNPs/polymer blend with P=154000 (a) as cast (b) annealed for 4 hours and (c) annealed for 48 hours