Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C

High density poly(hexyl methacrylate) brushes offering near-zero azimuthal anchoring surface to LC molecules at room temperature

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Supporting Information

1. Grafting of PHMA brushes on glass substrate

The initiator of (2-bromo-2-methyl) propionyloxyhexyltriethoxysilane (BHE) was synthesized by the method described in the literature.[1] BHE (0.4 g) dissolved in ethanol (17.6 g) was added to a mixture of ammonia solution (28% NH_3 aqueous solution, 2 g) and ethanol (20 g), and then stirred. In the resulting solution, the glass substrates cleaned by UV/ozone treatment were immersed for 12 h at ambient temperature to bond BHE to the surface. The modified glass substrates were cleaned by sonication in chloroform, rinsed in acetone, and then dried. Polymerization was performed by dipping the BHE-immobilized substrate in a degassed solution of hexyl methacrylate (17.2g, 0.10mol), CuBr (0.096g, 0.67mmol), N,N,N',N'',N''-pentamethyldiethylenetriamine (0.167g, 0.96mmol), anisole (17.5g, 0.16mol) and ethyl-bromo-iso-butyrate (0.045g, 0.23mmol) as a free initiator at 90°C for 14h.

2. XRR of PHMA-grafted substrate

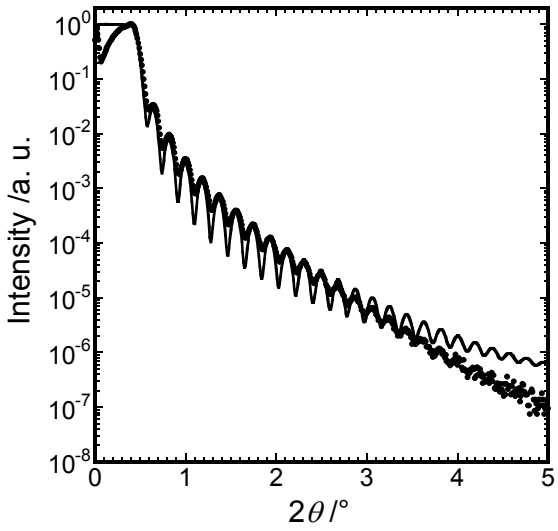

Fig. S1 X-ray reflectivity curve of PHMA brushes on glass substrate. The experimental data was fitted by setting the brush and BHE layer thicknesses to 45.53 and 0.90 nm, respectively. The densities (ρ) of the layers are assumed to be 1.01 (equal to ρ of the bulk PHMA) and 1.301 g cm^{-3}, respectively.

References

1 K. Ohno, T. Morinaga, K. Koh, Y. Tsujii, and T. Fukuda, *Macromolecules*, 2005, **38**, 2137–2142.