Supplementary Material (ESI) for Soft Matter

Chain length dependence of the helix orientation in Langmuir-Blodgett monolayers of α-helical diblock copolypeptides

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SUPPLEMENTARY INFORMATION

Transmission FT-IR spectra

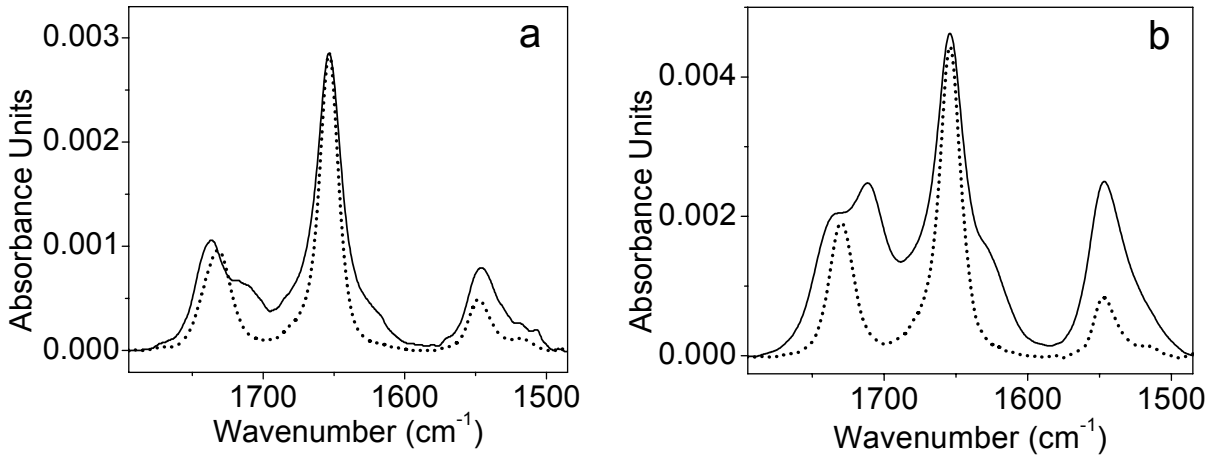

Figure 1. (a) Transmission FT-IR spectra of the LB monolayer of CoPo_63_39 deposited at 40 mN/m (solid line) and the LB film of $(tBuLG)_{63}$-*b*-$(MLGSLG)_{39}$ deposited at 20 mN/m (2 layers on each side of the silicon substrate, dotted line); (b) transmission FT-IR spectra of the LB monolayer of CoPo_50_11 deposited at 40 mN/m (solid line) and the LB film of $(tBuLG)_{50}$-*b*-$(MLGSLG)_{11}$ deposited at 20 mN/m (4 layers on each side of the silicon substrate, dotted line).

X-ray reflectivity electron density profiles and fit parameters

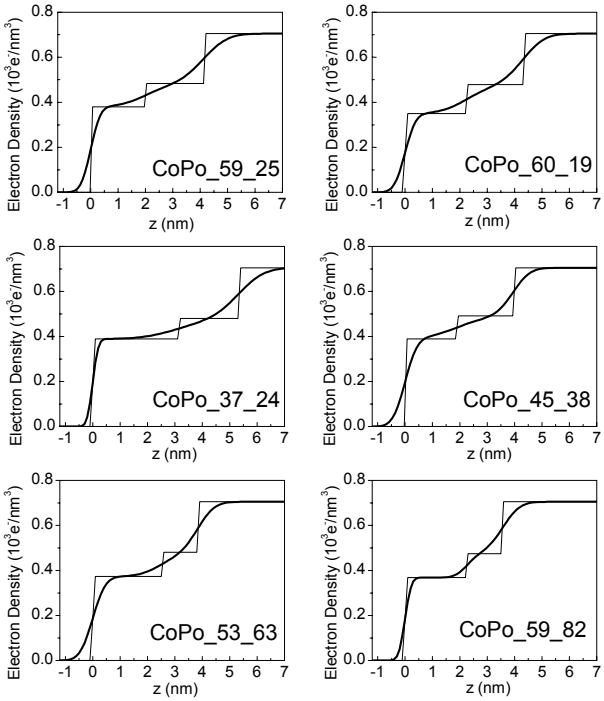

Figure 2. Electron density profiles corresponding to the two-slab fits for the LB monolayers of PLGA-*b*-PMLGSLGs transferred at 35-45 mN/m on silicon substrates. The smooth curves depict the electron density profiles corresponding to the curve fits, while the step-like curves show the same electron density profiles assuming all interface roughnesses to be equal to zero.

Table 1. Two-slab fit parameters for the X-ray reflectivity curves of the PLGA-*b*-PMLGSLG LB monolayers transferred onto silicon substrates

	CoPo_63_39 π = 20 mN/m	CoPo_63_39 π = 40 mN/m	CoPo_59_25 π = 45 mN/m	CoPo_60_19 π = 40 mN/m	CoPo_37_24 π = 45 mN/m	CoPo_45_38 π = 40 mN/m	CoPo_53_63 π = 40 mN/m	CoPo_59_82 π = 35 mN/m
Layer thickness (nm)								
L_1 (PLGA)	1.38	1.51	2.11	2.04	2.20	2.03	1.33	1.30
L_2 (PMLGSLG)	1.88	2.80	2.02	2.27	3.14	1.92	2.53	2.26
Total thickness	3.26	4.31	4.13	4.31	5.34	3.95	3.86	3.56
Electron density ρ_i (10^3 e^-/nm^3)								
ρ_0 (silicon)	0.705[a]	0.705[a]	0.705[a]	0.705[a]	0.705[a]	0.705[a]	0.705[a]	0.705[a]
ρ_1 (PLGA)	0.491	0.496	0.483	0.478	0.480	0.492	0.481	0.474
ρ_2 (PMLGSLG)	0.383	0.387	0.380	0.350	0.389	0.389	0.373	0.368
Interface roughness (nm)								
σ_{01} (silicon/PLGA)	0.48 ± 0.04[a]	0.48 ± 0.04[a]	0.69[b]	0.63[b]	0.74[b]	0.48 ± 0.04[a]	0.48 ± 0.04[a]	0.48 ± 0.04[a]
σ_{12} (PLGA/PMLGSLG)	0.32	0.82	0.76	0.76	0.98	0.89	0.65	0.35
σ_{23} (PMLGSLG/air)	0.49	0.29	0.28	0.31	0.16	0.35	0.37	0.18

[a] Values kept fixed for the curve fits.

[b] σ was first fixed at 0.48 ± 0.04 nm, the average roughness of bare silicon wafers, and the other parameters were varied. Finally σ was varied to obtain the best curve fit.

Table 2 Three-slab fit parameters for the X-ray reflectivity curve of the LB monolayer of CoPo_50_11 transferred onto a silicon substrate at 40 mN/m

Layer thickness (nm)	
L_1 (PLGA)	5.83
L_2 (PMLGSLG)	1.56
L_3 (alkyl chains)	1.37
Total thickness	8.76
Electron density ρ_i (10^3 e^-/nm^3)	
ρ_0 (silicon)	0.705
ρ_1 (PLGA)	0.460
ρ_2 (PMLGSLG)	0.370
ρ_3 (alkyl chains)	0.284
Interface roughness (nm)	
σ_{01} (silicon/PLGA)[a]	1.00
σ_{12} (PLGA/PMLGSLG)	1.65
σ_{23} (PMLGSLG/alkyl chains)	0.95
σ_{34} (alkyl chains/air)	0.28

[a] σ was first fixed at 0.48 ± 0.04 nm, the average roughness of bare silicon wafers, and the other parameters were varied, and finally σ was varied to obtain the best curve fit.