Electronic Supporting Information

Achiral flexible liquid crystal trimers exhibiting gyroid-like surfaces in chiral conglomerate phases

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Characterization of trimer I–(9,11).

2-{4-[9-(4-(4-Octyloxyphenyl)phenyloxy)undecyloxy]phenyl}-5-{7-[4-(5-octyloxypyrindin-2-yl)phenyloxy]nonyloxy}pyrimidine (I–(9,11)).

$^1$H NMR (500 MHz, CDCl$_3$, TMS): $\delta$=8.40 (s, 4H, Ar-H), 8.25 (d, 4H, Ar-H, $J = 9.2$ Hz), 7.45 (d, 4H, Ar-H, $J = 8.6$ Hz), 6.96 (d, 4H, Ar-H, $J = 8.6$ Hz), 6.93 (d, 4H, Ar-H, $J = 8.6$ Hz), 4.07 (t, 4H, -OCH$_2$-, $J = 6.6$ Hz), 4.02 (t, 2H, -OCH$_2$-, $J = 6.6$ Hz), 4.01 (t, 2H, -OCH$_2$-, $J = 6.6$ Hz), 3.97 (t, 4H, -OCH$_2$-, $J = 6.6$ Hz), 1.82 (quin, 6H, aliphatic-H, $J = 6.9$ Hz), 1.79 (quin, 6H, aliphatic-H, $J = 7.0$ Hz), 1.47–1.29 (m, 44H, aliphatic-H), 0.89 (t, 6H, -CH$_3$, $J = 7.2$ Hz) ; IR(KBr): v= 2923, 2851 cm$^{-1}$ (C-H), 1608 (Ar-H), 1274 (C-O). Elemental analysis (%): C, 76.8; H, 8.91; N, 5.27 calc. for C$_{72}$H$_{102}$O$_6$N$_4$: Found C, 76.9; H, 8.98; N, 5.15.
Fig. S-1 Polarized optical texture of trimer I–(9,9) on a glass slide with a cover glass in the DC phase at 120 °C under crossed and uncrossed polarizers.
Fig. S-2 AFM images of the surface structures of I–(9,9) without a top cover on (a) silicon wafer, (b) glass coated with a homeotropically aligning agent, or (c) glass coated with a unidirectionally buffed polyimide aligning agent at room temperature.
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Fig. S-5 Polarized optical textures of trimer I–(9,11) in the DC phase at 124 °C and those in the DC’ phase at 90 °C.
Fig. S-6 SEM image of the surface pattern of trimer \textbf{I–(9,9)} in the thinner part of the LC droplet. The sample on an untreated glass substrate without a top cover was cooled to the DC phase. It was coated with platinum before being analyzed on a JEOL JSM-7000 FE-SEM using accelerating voltages of 10 keV.
Fig. S-7 (a) Polarized optical texture of I-(7,7) on a glass plate without a cover glass in the N phase. (b) Polarized optical texture in the N phase just above the DC phase. The circle indicates the appearance of the transient state.