Supporting Information

Room Temperature Liquid Fullerenes: An Uncommon Morphology of C₆₀ Derivatives

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I. General.

Chemicals were purchased as reagent grade and used without further purification. All reactions were carried out under an inert atmosphere by applying a positive pressure of dry N₂. Column chromatography and plug filtrations were carried out using silica gel 60 (Kanto). Size exclusion chromatography (GPC) was carried out using Bio-beads S-X3 (Bio-Rad) and stabilizer free, dry THF. Melting points (M.p.) were determined using an AS ONE ATM-01 apparatus. ¹H NMR and ¹³C NMR spectra were measured on a JEOL model AL300 spectrometer at 20 °C. Chemical shifts are reported in ppm downfield from SiMe₄, using the solvent's residual signal as an internal reference. Coupling constants (*J*) are given in Hz. The resonance multiplicity is described as *s* (singlet), *d* (doublet), *t* (triplet), and *m* (multiplet). Infrared spectra (IR) were recorded on a NICOLET NEXUS 670FT-IR spectrometer. UV/Vis spectra were recorded on a JASCO model V-570 UV/VIS/NIR spectrophotometer. The spectra were measured in a quartz cuvette of 1 cm. The absorption wavelengths are reported in nm with the extinction coefficient in M⁻¹ cm⁻¹ in brackets. MALDI-TOF-MS spectra were measured on an Applied Biosystems model Voyager-DE STR in reflector mode with 2-(4-hydroxyphenylazo)benzoic acid (HABA) as matrix. The most important signal is reported in *m/z* units with *M* as the molecular ion. Elemental analyses were performed on a Yanaco model CHN corder MT-6.

II. Synthesis.

Scheme 1SI. Synthesis of fullerene monoadducts **1-4**. a) C_{*n*}H_{2*n*+1}Br, K₂CO₃, KI, DMF, 70 °C, 20-24 h; b) C₆₀, *N*-methylglycine, toluene, 110 °C, 20-25 h.

2,4,6-Tris(octyloxy)benzaldehyde (1a). A mixture of 2,4,6-trihydroxybenzaldehyde (305 mg, 1.77 mmol), 1-bromooctane (2.03 g, 10.5 mmol), K₂CO₃ (732 mg, 5.30 mmol), and KI (50 mg, 0.30 mmol) in DMF (15 mL) was stirred for 24 h at 70 °C. After the

reaction mixture was cooled to 20 °C, CHCl₃ (50 mL) was added. The organic phase was washed with brine (2 × 100 mL), dried (NaSO₄), and evaporated. Column chromatography (silica gel, hexane/CH₂Cl₂ 1:1) afforded **1a** (700 mg, 81%) as a yellow oil. ¹H NMR (300 MHz, CDCl₃): δ = 0.86–0.90 (*m*, 9 H), 1.26–1.31 (*m*, 24 H), 1.43–1.46 (*m*, 6 H), 1.74–1.87 (*m*, 6 H), 3.96–4.01 (*m*, 6 H), 6.03 (*s*, 2 H), 10.38 ppm (*s*, 1 H).

2,4,6-Tris(dodecyloxy)benzaldehyde (2a). A mixture of 2,4,6-trihydroxybenzaldehyde (250 mg, 1.45 mmol), 1-bromododecane (2.15 g, 8.63 mmol), K₂CO₃ (600 mg, 4.34 mmol), and KI (40 mg, 0.24 mmol) in DMF (10 mL) was stirred for 20 h at 70 °C. After the reaction mixture was cooled to 20 °C, CHCl₃ (50 mL) was added. The organic phase was washed with brine (2 × 100 mL), dried (NaSO₄), and evaporated. Column chromatography (silica gel, hexane/CH₂Cl₂ 1:1) afforded **2a** (460 mg, 48%) as a yellow oil. ¹H NMR (300 MHz, CDCl₃): δ = 0.80 (*t*, *J* = 6 Hz, 9 H), 1.18 (*s*, 48 H), 1.34–1.37 (*m*, 6 H), 1.70–1.75 (*m*, 6 H), 3.88 (*t*, *J* = 6 Hz, 6 H), 5.93 (*s*, 2 H), 10.30 ppm (*s*, 1 H).

2,4,6-Tris(hexadecyloxy)benzaldehyde (3a). A mixture of 2,4,6-trihydroxybenzaldehyde (435 mg, 2.53 mmol), 1-bromohexadecane (4.58 g, 15.0 mmol), K₂CO₃ (1.04 g, 7.52 mmol), and KI (70 mg, 0.42 mmol) in DMF (15 mL) was stirred for 20 h at 70 °C. After the reaction mixture was cooled to 20 °C, CHCl₃ (100 mL) was added. The organic phase was washed with brine (2 × 100 mL), dried (NaSO₄), and evaporated. Column chromatography (silica gel, hexane/CH₂Cl₂ 1:1) afforded **3a** (1.04 g, 50%) as a white solid. ¹H NMR (300 MHz, CDCl₃): δ = 0.88 (*t*, *J* = 6 Hz, 9 H), 1.26–1.46 (*s*, 78 H), 1.80–1.85 (*m*, 6 H), 3.96–4.01 (*m*, 6 H), 6.03 (*s*, 2 H), 10.39 ppm (*s*, 1 H); IR (KBr): ν = 2918, 2850, 1684, 1653, 1597, 1576, 1472, 1163, 1131 cm⁻¹.

2,4,6-Tris(eicosyloxy)benzaldehyde (4a). A mixture of 2,4,6-trihydroxybenzaldehyde (250 mg, 1.45 mmol), 1-bromoeicosane (3.11 g, 8.63 mmol), K₂CO₃ (600 mg, 4.34 mmol), and KI (40 mg, 0.24 mmol) in DMF (10 mL) was stirred for 20 h at 70 °C. After the reaction mixture was cooled to 20 °C, CHCl₃ (50 mL) was added. The organic phase was washed with brine (2 × 100 mL), dried (NaSO₄), and evaporated. Column chromatography (silica gel, hexane/CH₂Cl₂ 1:1) afforded **4a** (445 mg, 31%) as a white solid. ¹H NMR (300 MHz, CDCl₃): δ = 0.88 (*t*, *J* = 6 Hz, 9 H), 1.26–1.46 (*m*, 102 H), 1.79–1.84 (*m*, 6 H), 3.96–4.01 (*m*, 6 H), 6.03 (*s*, 2

H), 10.38 ppm (s, 1 H).

***N*-Methyl-2-[2,4,6-tris(octyloxy)phenyl]fulleropyrrolidine (1).** A mixture of **1a** (311 mg, 0.634 mmol), C₆₀ (456 mg, 0.633 mmol), and *N*-methylglycine (524 mg, 5.88 mmol) in dry toluene (400 mL) was refluxed for 20 h. After the reaction mixture was cooled to 20 °C and evaporated, the crude product was filtered through a plug twice (toluene and CHCl₃). Removal of the solvent in vacuo and the preparative GPC (Bio-beads S-X3, THF) followed by column chromatography (silica gel, hexane/CHCl₃ 1:2) afforded **1** (236 mg, 30%) as a brown solid. M.p. 147–148 °C; ¹H NMR (300 MHz, CDCl₃): δ = 0.87–0.88 (*m*, 9 H), 1.26–2.00 (*m*, 36 H), 2.72 (*s*, 3 H), 3.88–3.99 (*m*, 6 H), 4.10 (*d*, *J* = 9 Hz, 1 H), 4.89 (*d*, *J* = 9 Hz, 1 H), 5.62 (*s*, 1 H), 6.12 ppm (*s*, 2 H); ¹³C NMR (75 MHz, CDCl₃): δ = 14.09, 14.17, 22.64, 22.71, 22.74, 26.11, 26.23, 26.29, 29.21, 29.33, 29.36, 29.39, 29.47, 29.49, 29.54, 29.62, 29.69, 31.79, 31.91, 39.70, 67.82, 67.87, 68.68, 69.93, 69.99, 75.63, 76.75, 91.35, 91.87, 104.57, 134.42, 135.93, 137.23, 137.27, 139.24, 139.72, 139.88, 139.91, 141.37, 141.43, 141.57, 141.81, 141.98, 142.03, 142.06, 142.10, 142.12, 142.26, 142.30, 142.31, 142.41, 142.46, 142.50, 142.54, 142.97, 143.04, 144.37, 144.46, 144.61, 144.71, 144.98, 145.01, 145.03, 145.09, 145.20, 145.22, 145.26, 145.43, 145.65, 145.77, 145.81, 145.86, 145.91, 145.96, 145.97, 146.02, 146.10, 146.13, 146.25, 146.74, 146.83, 147.15, 147.25, 147.30, 154.98, 155.23, 156.25, 157.62, 160.01, 160.66 ppm; IR (KBr): ν = 2922, 2851, 2765, 1604, 1580, 1462, 1440, 1376, 1328, 1218, 1165, 1112, 810, 766, 722 cm⁻¹; UV/Vis (hexane): λ (ε) = 212 (150900), 255 (96200), 314 nm (33600); MALDI-TOF-MS (HABA): *m/z*: calcd for C₉₃H₆₀NO₃⁺: 1238.46; found 1238.46 [*MH*]⁺; elemental analysis calcd (%) for C₉₃H₅₉NO₃ (1238.47): C 90.19, H 4.80, N 1.13; found: C 90.40, H 5.55, N 1.17.

***N*-Methyl-2-[2,4,6-tris(dodecyloxy)phenyl]fulleropyrrolidine (2).** A mixture of **2a** (300 mg, 0.455 mmol), C₆₀ (328 mg, 0.455 mmol), and *N*-methylglycine (377 mg, 4.23 mmol) in dry toluene (400 mL) was refluxed for 25 h. After the reaction mixture was cooled to 20 °C and evaporated, the crude product was filtered through a plug twice (toluene and CHCl₃). Removal of the solvent in vacuo and the preparative GPC (Bio-beads S-X3, THF) afforded **2** (319 mg, 50%) as brown oil. ¹H NMR (300 MHz, CDCl₃): δ = 0.85–0.88 (*m*, 9 H), 1.24–2.06 (*m*, 60 H), 2.72 (*s*, 3 H), 3.90–3.98 (*m*, 6 H), 4.10 (*d*, *J* = 9 Hz, 1 H), 4.90 (*d*, *J* = 9 Hz, 1 H), 5.63 (*s*, 1 H), 6.11 ppm (*s*, 2 H); ¹³C NMR (75 MHz, CDCl₃): δ = 14.09, 14.13, 22.65, 22.69, 23.91, 25.58, 26.09, 26.22, 26.26, 29.13, 29.17, 29.31, 29.34, 29.39, 29.42, 29.51, 29.55, 29.58, 29.61, 29.64, 29.67, 29.71, 29.72, 29.76, 29.83, 31.88, 31.91, 39.70, 67.67, 67.80, 67.83, 67.93, 68.65, 69.90,

69.96, 75.61, 76.70, 91.29, 91.81, 104.48, 107.92, 134.40, 135.90, 137.22, 137.26, 139.21, 139.69, 139.86, 139.89, 141.34, 141.41, 141.54, 141.79, 141.95, 142.00, 142.03, 142.07, 142.10, 142.22, 142.28, 142.38, 142.44, 142.47, 142.51, 142.94, 143.02, 144.34, 144.43, 144.58, 144.67, 144.96, 144.98, 145.01, 145.07, 145.17, 145.18, 145.24, 145.40, 145.63, 145.74, 145.78, 145.82, 145.89, 145.93, 145.95, 145.99, 146.07, 146.09, 146.22, 146.70, 146.79, 147.12, 147.22, 147.28, 154.96, 155.18, 156.21, 157.55, 159.96, 159.99, 160.62 ppm; IR (KBr): ν = 2922, 2851, 2766, 1605, 1585, 1463, 1440, 1377, 1329, 1217, 1165, 1113, 811 cm^{-1} ; UV/Vis (hexane): λ (ϵ) = 212 (182600), 255 (119800), 311 nm (43100); MALDI-TOF-MS (HABA): m/z : calcd for $\text{C}_{105}\text{H}_{83}\text{NO}_3^+$: 1405.64; found 1405.64 $[M]^+$; elemental analysis calcd (%) for $\text{C}_{105}\text{H}_{83}\text{NO}_3$ (1406.79): C 89.65, H 5.95, N 1.00; found: C 89.58, H 6.00, N 1.00.

***N*-Methyl-2-[2,4,6-tris(hexadecyloxy)phenyl]fulleropyrrolidine (3).** A mixture of **3a** (414 mg, 0.500 mmol), C_{60} (360 mg, 0.500 mmol), and *N*-methylglycine (414 mg, 4.65 mmol) in dry toluene (450 mL) was refluxed for 20 h. After the reaction mixture was cooled to 20 °C and evaporated, the crude product was filtered through a plug twice (toluene and CHCl_3). Removal of the solvent in vacuo and the preparative GPC (Bio-beads S-X3, THF) afforded **3** (391 mg, 50%) as brown oil. ^1H NMR (300 MHz, CDCl_3): δ = 0.85–0.89 (*m*, 9 H), 1.23–2.00 (*m*, 84 H), 2.71 (*s*, 3 H), 3.90–3.98 (*m*, 6 H), 4.09 (*d*, J = 9 Hz, 1 H), 4.88 (*d*, J = 9 Hz, 1 H), 5.62 (*s*, 1 H), 6.10 ppm (*s*, 2 H); ^{13}C NMR (75 MHz, CDCl_3): δ = 14.15, 22.69, 25.60, 26.12, 26.24, 26.29, 29.20, 29.38, 29.45, 29.53, 29.61, 29.69, 29.75, 29.85, 31.93, 39.69, 67.79, 67.91, 68.64, 69.96, 75.61, 76.71, 91.30, 91.81, 104.49, 134.40, 135.90, 137.21, 137.24, 139.21, 139.68, 139.86, 139.89, 141.34, 141.39, 141.52, 141.77, 141.94, 141.99, 142.01, 142.05, 142.08, 142.22, 142.26, 142.37, 142.41, 142.46, 142.50, 142.93, 143.01, 144.33, 144.43, 144.57, 144.66, 144.94, 145.00, 145.05, 145.17, 145.24, 145.39, 145.60, 145.73, 145.77, 145.81, 145.87, 145.93, 145.98, 146.05, 146.09, 146.21, 146.70, 146.77, 147.11, 147.21, 147.26, 154.92, 155.19, 156.21, 157.56, 159.97, 160.64 ppm; IR (KBr): ν = 2922, 2851, 2766, 1606, 1584, 1464, 1437, 1377, 1329, 1260, 1217, 1166, 1114, 1033, 810 cm^{-1} ; UV/Vis (hexane): λ (ϵ) = 212 (177300), 255 (112000), 316 nm (39200); MALDI-TOF-MS (HABA): m/z : calcd for $\text{C}_{117}\text{H}_{107}\text{NO}_3^+$: 1573.83; found 1573.45 $[M]^+$; elemental analysis calcd (%) for $\text{C}_{117}\text{H}_{107}\text{NO}_3$ (1575.11): C 89.22, H 6.85, N 0.89; found: C 88.95, H 6.83, N 0.99.

***N*-Methyl-2-[2,4,6-tris(eicosyloxy)phenyl]fulleropyrrolidine (4).** A mixture of **4a** (445 mg, 0.447 mmol), C_{60} (322 mg, 0.447 mmol), and *N*-methylglycine (370 mg, 4.15

mmol) in dry toluene (300 mL) was refluxed for 20 h. After the reaction mixture was cooled to 20 °C and evaporated, the crude product was filtered through a plug twice (toluene and CHCl₃). Removal of the solvent in vacuo and the preparative GPC (Bio-beads S-X3, THF) followed by column chromatography (silica gel, hexane/CHCl₃ 1:2) afforded **4** (498 mg, 64%) as brown oil. ¹H NMR (300 MHz, CDCl₃): δ = 0.78–0.83 (*m*, 9 H), 1.16–1.90 (*m*, 108 H), 2.65 (*s*, 3 H), 3.82–3.91 (*m*, 6 H), 4.02 (*d*, *J* = 9 Hz, 1 H), 4.82 (*d*, *J* = 9 Hz, 1 H), 5.55 (*s*, 1 H), 6.04 ppm (*s*, 2 H); ¹³C NMR (75 MHz, CDCl₃): δ = 14.13, 14.16, 22.70, 22.72, 25.60, 26.14, 26.26, 26.31, 29.22, 29.38, 29.40, 29.48, 29.55, 29.60, 29.64, 29.68, 29.73, 29.78, 29.88, 31.93, 31.95, 39.70, 67.80, 67.92, 68.65, 69.94, 69.98, 75.62, 76.74, 77.21, 91.30, 91.80, 104.49, 134.42, 135.92, 137.22, 137.26, 139.22, 139.70, 139.88, 139.91, 141.35, 141.40, 141.54, 141.79, 141.96, 142.00, 142.03, 142.07, 142.10, 142.24, 142.28, 142.39, 142.43, 142.48, 142.51, 142.95, 143.03, 144.34, 144.44, 144.59, 144.68, 144.96, 145.00, 145.02, 145.08, 145.17, 145.26, 145.41, 145.62, 145.74, 145.78, 145.83, 145.89, 145.93, 145.95, 146.00, 146.07, 146.11, 146.23, 146.72, 146.78, 147.13, 147.22, 147.28, 154.94, 155.20, 156.22, 157.58, 159.99, 160.65 ppm; IR (KBr): ν = 2922, 2851, 2768, 1606, 1464, 1377, 1329, 1218, 1166, 1115, 811, 721 cm⁻¹; UV/Vis (hexane): λ (ϵ) = 212 (184600), 255 (122500), 316 nm (43800); MALDI-TOF-MS (HABA): *m/z*: calcd for C₁₂₉H₁₃₁NO₃⁺: 1742.01; found 1742.02 [*M*]⁺; elemental analysis calcd (%) for C₁₂₉H₁₃₁NO₃ (1743.43): C 88.87, H 7.57, N 0.80; found: C 87.81, H 7.79, N 0.86.

III. Thermal analyses.

Thermogravimetric analysis (TGA) was carried out on a Seiko SII TG/DTA 6200, at a heating rate of 10 °C min⁻¹ between 20 °C and 600 °C. Decomposition temperatures of **1-4** range from 340 °C to 420 °C, indicating that all fullerene derivatives retain thermal stability even in a liquid form (Table 1SI). Differential scanning calorimetry (DSC) measurements were carried out on a Seiko SII DSC 6220 with a Seiko SII EXSTAR 6000 PC Station. DSC of **2** and **3** displayed no clear transitions in the temperature range from -150 °C to 100 °C. On the other hand, derivative **4**, containing three eicosyl chains in the 2,4,6-positions of the phenyl group, showed an endothermic peak at 4 °C upon heating and a corresponding exothermic peak at -8 °C upon cooling, ascribed to its melting and glass transitions, respectively (Figure 1SI).

Figure 1SI. DSC of the fullerene **4** in the liquid form, prepared by evaporation of a CHCl_3 solution.

Table 1SI. Thermal analysis of fullerene derivatives.

Compound	M.p. [$^{\circ}\text{C}$]	T_d [$^{\circ}\text{C}$] ^[a]
1	147–148	420
2	[b]	340
3	[b]	370
4	4 ^[c]	395

[a] Decomposition temperature determined by TGA. [b] Could not be determined.

[c] Melting point of the sample prepared from a CHCl_3 solution, determined by DSC thermogram.

IV. XRD measurements.

XRD powder diffraction patterns were measured at 20 $^{\circ}\text{C}$ using a RIGAKU RINT Ultima III X-ray diffractometer. The XRD pattern of **1**, measured at 20 $^{\circ}\text{C}$, exhibited many sharp diffraction peaks, of which the peak at $2\theta = 5.5^{\circ}$ indicates a d spacing of 1.6 nm, which corresponds to the sum of an octyl chain length and C_{60} diameter (Figure 2SI(a)). In contrast, only two broad peaks appeared for the liquid samples **2** and **3** at $2\theta \approx 4.7^{\circ}$ ($d = 1.9$ nm) and 7.9° ($d = 1.1$ nm) and $2\theta \approx 3.8^{\circ}$ ($d = 2.3$ nm) and 7.5° ($d = 1.2$ nm), respectively, (Figure 2SI(b),(c)). The former might be derived from the molecular length, the latter from the spacing of the C_{60} moieties.

Figure 2SI. XRD diffraction patterns of a) **1**, b) **2**, and c) **3** at 20 °C.

V. IR spectra.

The IR spectrum of a solid sample **4** showed a low energy shift of CH₂ stretching vibrations relative to that of the liquid form, indicating a more extended conformation of the alkyl chains (Figure 3SI). This result is consistent with the XRD analysis.

Figure 3SI. IR spectra of **4** in KBr in a) the solid and b) liquid form at 20 °C.

VI. Optical images.

Optical micrographs were taken using an Olympus BX51 microscope equipped with an MP5Mc/OL digital camera. The optical micrograph of a solid sample **4** at 20 °C

shows a crystalline texture, while that taken at 80 °C (above the transition temperature 55 °C) indicates an isotropic fluid phase (Figure 4SI). Polarized optical microscopy revealed optical anisotropy at 20 °C for solid sample **4**, but not for the liquid form (not shown).

Figure 4SI. Optical micrographs of **4**, prepared by slow evaporation of an *n*-hexane solution, at a) 20 °C and b) 80 °C. Scale bar represents 100 μm.

VII. Rheological measurements.

Rheological properties were measured on a Thermo Haake model Rheostress 1 at a controlled temperature of 25 °C. The 1.0 mm parallel plate geometry was used. All samples were dried in vacuo overnight at 60 °C before the measurements. The hydrodynamic radius, a , of a presumed cluster was estimated from the Stokes-Einstein equation (Eq. 1).

$$D = \frac{kT}{6\pi\eta a} \quad (1)$$

Here, D is the diffusion coefficient, k is Boltzman constant, T is the temperature, and η is the viscosity. The diffusion coefficient can also be expressed as Eq. 2, which is derived from Fick's law.

$$D = \frac{a^2}{6\tau} \quad (2)$$

Here, τ is the time in which the clusters can traverse a distance a . Combination of Eqs. 1 and 2 leads to Eq. 3, giving the effective hydrodynamic radius, a , of the spherical cluster.

$$a = \left(\frac{\tau k T}{\pi \eta} \right)^{1/3} \quad (3)$$

Furthermore, the frictional coefficient ζ is defined by Eq. 4.

$$\zeta = \frac{kT}{D} \quad (4)$$

From Eqs. 1 and 4, it is apparent that the frictional coefficient is directly proportional to the viscosity.

Figure 5SI. Angular frequency (ω) dependence on storage (G') and loss moduli (G'') of a) **2** and b) **3** at 25 °C at applied strain amplitudes (γ) of 0.01, 0.1, and 1.0. The behavior of **3** is intermediate between those of polymer solutions and gels.

VIII. Electrochemistry.

Electrochemistry measurements were carried out at 20 °C in a classical three-electrode cell. The working and auxiliary electrodes were a glassy carbon disk electrode (0.07 cm²) and Pt, respectively. The reference electrode was Ag/Ag⁺/CH₃CN/*n*Bu₄NClO₄ for a solution and Ag/AgCl for a thin film. Thin films of the fullerene derivatives on a glassy carbon disk electrode were prepared by casting the CH₂Cl₂ or hexane solution (5 μL, 10 mM) followed by drying in vacuo for 24 hrs.

Figure 6SI. Cyclic voltammograms of fullerene derivatives a) **1**, b) **2**, c) **3**, and d) **4** in CH_2Cl_2 (+ 0.1 M $n\text{Bu}_4\text{NClO}_4$) at 20 °C under Ar. Scanning rate = 0.1 V s⁻¹.

Table 2SI. Electrochemical data for fullerene derivatives (0.5 mM) in CH_2Cl_2 (+ 0.1 M $n\text{Bu}_4\text{NClO}_4$) at 20 °C under Ar.^[a]

Compound	$E_{\text{red},1}^{\circ}$ [V]	ΔE_{p} [mV]	$E_{\text{red},2}^{\circ}$ [V]	ΔE_{p} [mV]	$E_{\text{red},3}^{\circ}$ [V]	$\square E_{\text{p}}$ [mV]
C_{60}	-1.032	140	-1.427	140	-1.891	132
1	-1.191	87	-1.590	86	-2.142	125
2	-1.175	76	-1.562	82	-2.093	82
3	-1.196	75	-1.586	76	-2.117	86
4	-1.191	79	-1.582	83	-2.110	89

[a] Potentials versus ferricinium/ferrocene couple. Working electrode: glassy carbon electrode; counter electrode: Pt; reference electrode: Ag/Ag^+ . $E^{\circ} = (E_{\text{pc}} + E_{\text{pa}})/2$, in which E_{pc} and E_{pa} correspond to cathodic and anodic peak potentials, respectively. $\Delta E_{\text{p}} = E_{\text{pc}} - E_{\text{pa}}$. Scanning rate = 0.1 V s⁻¹.

Figure 7SI. Cyclic voltammograms in 0.1 M aqueous $n\text{Bu}_4\text{NCl}$ solution at 20 °C at a scan rate of 0.1 V s^{-1} for a cast film of **4** prepared from CH_2Cl_2 solution (solid line) or n -hexane solution (dotted line) on a glassy carbon electrode.

IX. Carrier mobility.

Transient photocurrent was measured using a conventional time-of-flight setup and stored in a digital oscilloscope. The transient times were estimated from log-log plots.

Figure 8SI. Transient photocurrent curves for holes at 20 °C in the liquid form of **4**. The sample thickness between ITO electrodes was 9 μm , and the wavelength of the excitation pulse was 355 nm.