Supplemental Material

1,3-Bis-(4-bromophenyl)propan-2-one (24): Dichloromethane (450 mL) was added to a solution of 32.80 g of sodium hydroxide in 18 mL of water under argon followed by 1.44 g of the phase transfer catalyst, benzyltriethylammonium chloride and 50.00 g (0.19 mol) of 4-bromobenzyl bromide. After that, 13.2 ml (19.60 g, 0.10 mol) of ironpentacarbonyl were carefully injected and the reaction mixture stirred over night at 40 ° - 50 °C. It was then acidified with 400 mL of 6 M hydrochloric acid and the organic phase was washed in turn with another 400 mL of 6 M hydrochloric acid and 400 mL of distilled water. After drying over magnesium sulfate, the solvents were removed under reduced pressure and the crude product was purified by column chromatography (silica gel, low boiling petroleum ether / dichloromethane 2:1) to yield 18.5 g (53 %) of **24** as a white solid: M.p.: 116 C; ^{1}H NMR-spectrum (300 MHz, $CDCl_3$) δ_H: 7.47 (d, ^{3}J = 8.4, 4 H), 7.04 (d, ^{3}J = 8.4, 4 H), 3.69 (s, 4 H); ^{13}C NMR-spectrum (75 MHz, $CDCl_3$) δ_c: 205.1 (**C**=O), 133.0, 132.3, 131.6, 121.7 (arom.), 48.9 (aliph.). FD-MS *m/z* 367.7 (100 %, M^+, calcd. 368.1). Elem. anal. calcd. for $C_{15}H_{12}Br_2O$: C, 48.94; H, 3.26; Found: C, 48.71; H, 3.05.

1,3-Bis-[4-(tri-*iso*-propylsilylethynyl)phenyl]propan-2-one (23): This compound was prepared according to the general procedure for the aryl - ethynyl coupling to aromatic bromo compounds using 30.00 g (81.50 mmol) of **24**. The product was purified by column chromatography (silica gel, low boiling petroleum ether / dichloromethane 2 : 1) giving a yield of 29.32 g (63 %) of **23**: m. p. 67°C; ^{1}H NMR-spectrum (200 MHz, $CDCl_3$, 303 K): δ_H: 7.46 (d, ^{3}J = 8.1, 4 H, arom.); 7.10 (d, ^{3}J = 8.0, 4 H, arom.); 3.71 (s, 4 H, $H_{-\alpha\text{-Keto}}$); 1.17 (s, 42 H, CH, CH_3). ^{13}C NMR-spectrum (50 MHz, $CDCl_3$, 303 K) δ_c: 204.8 (**C**=O); 134.6, 132.9, 129.9, 123.0 (arom.); 107.3 (C≡C); 91.4 (C≡C); 19.2 ($CH(\mathbf{C}H_3)_2$); 11.9 ($\mathbf{C}H(CH_3)_2$). FD-

mass-spectrum: *m/e*: 570.9 (100 %, M^+, calcd. 571.0). Elem. anal. calcd. for $C_{37}H_{54}OSi_2$: C, 77.83; H, 9.53; Found: C, 77.75; H, 9.54

2,3,4,5-Tetrakis-[4-(tri-*iso*-propylsilylethynyl)phenyl]cyclopenta-2,4-dienone (2): A solution of 2.00 g (3.502 mmol) of **23** and 2.24 g (3.92 mmol) of benzil **21** in 5 mL of ethanol was heated at reflux and 125 mg of KOH in 1 mL of hot ethanol were carefully added in two portions. The solution turned dark red almost immediately and the product, being less soluble than the starting materials, precipitated. The reaction was followed by TLC (silica gel, low boiling petroleum ether / dichloromethane 2 : 1) and took about 15 min. After that, the product was filtered, washed with distilled water followed by ethanol and dried in vacuo, giving 3.20 g (83 %) of **2** as red crystals: m. p. > 300° C; ^{1}H NMR-spectrum (200 MHz, CD_2Cl_2, 303 K): δ_H: 7.37-7.27 (m, 8 H, arom.); 7.17 (d, ^3J = 8.0, 4 H, arom.); 6.89 (d, ^3J = 8.0, 4 H, arom.); 1.13 (s, 84 H, CH, CH_3). ^{13}C NMR-spectrum (50 MHz, CD_2Cl_2, 303 K) δ_c: 200.0 (C=O); 157.8; 133.5; 132.5; 132.4; 131.4; 130.7; 130.1; 126.2; 124.8; 123.5 (arom.); 107.7; 107.3; 93.4; 92.7 (C≡C); 19.2 ($CH(\mathbf{C}H_3)_2$); 12.1 ($\mathbf{C}H(CH_3)_2$). FD-mass-spectrum: *m/e*: 1105.2 (100 %, M^+, calcd. 1105.9). Elem. anal. calcd. for $C_{73}H_{100}OSi_4$: C, 79.28; H, 9.11; Found: C, 78.97; H, 9.15.

Bis-[4-(tri-*iso*-propylsilylethynyl]phenyl]ethyne (18): This compound was prepared according to the general procedure for the aryl - ethynyl coupling to aromatic bromo compounds using 8.00 g (23.8 mmol) of **17**. Column chromatography (silica gel, low boiling petroleum ether) yielded 9.53g (74 %) of **18**: m. p. 108° C; ^{1}H NMR-spectrum (300 MHz, CD_2Cl_2, 303 K): δ_H: 7.46 (s, 8 H, arom.); 1.15 (s, 42 H, aliph.). ^{13}C NMR-spectrum (75.5MHz, CD_2Cl_2, 303 K) δ_c: 135.1; 134.5; 126.7; 125.9; 109.6 (arom.); 96.3; 94.1 (C≡C); 21.8 ($CH(\mathbf{C}H_3)_2$); 14.4 ($\mathbf{C}H(CH_3)_2$). FD-mass-spectrum: *m/e*: 538.0 (100 %, M^+, calcd.

Hexa-[4-(tri-*iso*-propylsilylethynyl)phenyl]benzene (19): A solution of 565 mg (1.05 mmol) of **18** and 1.275g (1.15 mmol) of **2** in 7 mL of diphenylether were heated at 200 °C for eleven days under a gentle stream of nitrogen. After that, the reaction mixture was allowed to cool, diluted with 10 mL of dichloromethane and added dropwise into 500 mL of methanol, left to stand for a few hours and filtered. The residue was rinsed with more methanol and dried *in vacuo*, yielding 1.23g (72 %) of **19** as a white solid: m. p. > 300° C; ^{1}H NMR-spectrum (200 MHz, $CDCl_3$, 303 K): δ_H: 7.05 (d, ^{3}J = 7.9, 12 H, arom.); 6.73 (d, ^{3}J = 8.0, 12 H, arom.); 1.10 (s, 126 H, aliph.). ^{13}C NMR-spectrum (50 MHz, $CDCl_3$, 303 K) δ_c: 140.5; 140.4; 131.4; 121.2 (arom.); 107.8; 90.8 (C≡C); 19.1 ($CH(\mathbf{C}H_3)_2$); 11.8 ($\mathbf{C}H(CH_3)_2$). FD-mass-spectrum: *m/e*: 1617.3 (100 %, M^+, calcd. 1616.9). Elem. anal. calcd. for $C_{108}H_{150}Si_6$: C, 80.23; H, 9.35; Found: C, 80.01; H, 9.42

Hexa-(4-ethynylphenyl)benzene (6): A solution of 400 mg (0.25 mmol) of **19** in THF was treated according to the general procedure for the desilylation of tri-*iso*-propylsilyl derivatives. The product was purified by column chromatography (silica gel, low boiling petroleum ether / dichloromethane 1:1), yielding 150 mg (89 %) of **6** as a white solid: m. p. > 300° C; ^{1}H NMR-spectrum (200 MHz, CD_2Cl_2, 303 K): δ_H: 7.04 (d, ^{3}J = 8.0, 12 H, arom.); 6.73 (d, ^{3}J = 8.0, 12 H, arom.); 3.00 (s, 6 H, C≡C-H). ^{13}C NMR-spectrum (50 MHz, CD_2Cl_2, 303 K) δ_c: 141.3; 140.6; 131.9; 131.5; 120.3 (arom.); 84.0; 77.9 (C≡C). FD-mass-spectrum: *m/e*: 678.3 (100 %, M^+, calcd. 678.8). Elem. anal. calcd. for $C_{54}H_{30}$: C, 95.53; H, 4.45; Found: C, 95.08; H, 4.29.

Biph-$G_3(A_2B)(-H)_{32}$: Yield: 71 %. ^{1}H NMR-spectrum (500 MHz, $C_2D_2Cl_4$, 303 K): δ_H: 7.52-6.43 (m, 570 H, arom.). ^{13}C NMR-spectrum (125 MHz, THF, 306 K, due to the large number

142.8, 142.75, 142.7, 142.2, 141.9, 141.8, 141.7, 141.5, 141.4, 141.3, 141.2, 141.1, 141.05, 141.0, 140.5, 140.2, 140.15, 140.1, 140.0, 139.9, 139.8, 139.5, 139.1, 138.9, 132.6-132.4, 132.1-131.8, 131.0, 130.7, 129.5, 129.2, 128.4, 128.3, 128.0-127.9, 127.7, 127.6, 127.3, 127.0-126.9, 126.7, 126.4-126.2, 126.0 (arom.). MALDI-TOF-mass-spectrum: *m/e*: 10911.5 (100 %, $[M,Ag]^+$, calcd. 10915.8). Elem. anal. calcd. for $C_{852}H_{570}$: C, 94.68; H, 5.32; Found: C, 94.16; H, 5.41.

Biph-G$_3$(A$_2$B)(-Ethynyl)$_{32}$: Yield: 93 %. ^{1}H NMR-spectrum (500 MHz, $C_2D_2Cl_4$, 303 K): δ_H: 7.50-6.40 (m, 538 H, arom.), 3.07-3.04 (m, 32 H, C≡C-H).^{13}C NMR-spectrum (125 MHz, THF, 303 K, due to the large number of aromatic carbon atoms, their signals overlap and could not be resolved) δ_C: 142.6-142.5, 142.0, 1412.7-141.3, 141.2, 140.9-140.6, 140.3, 139.8-139.5, 139.2-138.6, 132.2-132.1, 132.0, 131.9, 131.8, 131.6, 131.1, 130.8, 130.4, 130.3, 130.2, 129.0, 128.7, 128.1, 127.9, 127.5, 127.4-127.3, 126.9, 126.6-126.5, 126.3-126.2, 125.6, 120.6, 120.3 (arom.), 84.0, 83.9, 78.0-77.8 (C≡C). MALDI-TOF-mass-spectrum: *m/e*: 11575 (100 %, M^+, calcd. 11576). Elem. anal. calcd. for $C_{916}H_{570}$: C, 95.04; H, 4.96; Found: C, 95.08; H, 4.93.

Biph-G$_4$(A$_2$B)(-H)$_{64}$: Yield: 88 % ^{1}H NMR-spectrum (500 MHz, CD_2Cl_2, 303 K): δ_H: 7.49-6.47 (m, 1210 H, arom.). ^{13}C NMR-spectrum (125 MHz, THF, 303 K, due to the large number of aromatic carbon atoms, their signals overlap and could not be resolved) δ_C: 142.0-141.8, 141.3-141.1, 140.7-139.9, 139.2-139.1, 138.7-138.7, 138.4-138.2, 138.0-137.9, 131.7-131.4, 131.2-130.9, 130.1-129.8, 127.6-127.4, 126.9-126.7, 126.6-126.4, 126.2-126.1, 125.5-125.0 (arom.). MALDI-TOF-mass-spectrum: *m/e*: 23091 (100 %, $[M,Ag]^+$, calcd. 23092). Elem. anal. calcd. for $C_{1812}H_{1210}$: C, 94.69; H, 5.31; Found: C, 94.02; H, 5.38.

Td-G$_1$(A$_2$B)(-EthynylTips)$_8$ Yield: 93 %; ^{1}H NMR-spectrum (500 MHz, CD_2Cl_2, 303 K): δ_H: 7.53 (s, 4 H, arom.), 7.18-7.11 (br., 20 H, arom.), 7.07 (d, ^{3}J = 8.0, 8 H, arom.), 7.01 (d, ^{3}J = 8.6, 8 H, arom.), 6.93-6.90 (br., 20 H, arom.), 6.85 (d, ^{3}J = 8.6, 8 H, arom.), 6.82-6.79 (br., 16 H, arom.), 6.67 (d, ^{3}J = 8.6, 8 H, arom.), 1.11-1.10 (br., 168 H, CH, CH_3). ^{13}C NMR-spectrum (125 MHz, CD_2Cl_2, 303 K,) δ_C: 144.9, 141.9, 141.5, 141.3, 141.1, 141.0, 140.7, 140.2, 140.0, 139.7, 138.8, 131.9, 131.8, 131.8, 131.5, 131.1, 130.8, 130.7, 130.2, 129.1, 128.1, 127.3, 126.9, 126.1, 121.3, 121.1, 108.2, 107.4 (arom.), 91.0, 90.9(C≡C), 18.8 ($CH(\mathbf{C}H_3)_2$); 11.7 ($\mathbf{C}H(CH_3)_2$); FD-mass-spectrum: *m/e* 3,286.3 (100 %, M^+); 1,641.6 (20 %, M^{2+}). Elem. anal. Calcd for $C_{233}H_{260}Si_8$: C, 85.18; H 7.98. Found: C, 85.07, H, 8.00.

Td-G$_1$(A$_2$B)(-Ethynyl)$_8$ Yield: 97 %; ^{1}H NMR-spectrum (500 MHz, CD_2Cl_2, 373 K): δ_H 7.56 (s, 4 H, arom.), 7.44-6.51 (br, 88 H, arom.), 2.93, 2.91 (2s, 8 H, C≡C.); ^{13}C NMR-spectrum (125 MHz, CD_2Cl_2, 373 K,) δ_C: 145.1, 141.6, 141.2, 141.1, 141.0, 140.1, 140.0, 139.5, 138.7, 131.9, 131.8, 131.4, 131.3, 131.0, 130.7, 130.3, 129.1, 128.1, 127.3, 126.9, 127.3, 126.9, 126.1, 119.8, 119.6 (arom.), 84.6, 77.6, 77.4 (C≡C); MALDI-TOF-mass-spectrum: *m/e* 2,053 (100 %, $[M,Na]^+$, calc. 2,056). Elem. anal. Calcd for $C_{161}H_{100}$: C, 95.05; H 4.95. Found: C, 94.06, H, 5.28.

Td-G$_2$(A$_2$B)(-H)$_{16}$ Yield: 95 %; ^{1}H NMR-spectrum (500 MHz, $C_2D_2Cl_4$, 306 K): δ_H 7.49, 7.43, 7.39 (3s, 12 H, arom.), 7.17-7.02 (br., 64 H, arom.), 6.91-6.58 (br., 168 H, arom.), 6.50 (d, ^{3}J = 7.95, 8 H, arom.); 6.45 (d, ^{3}J = 7.95, 8 H, arom.); ^{13}C NMR-spectrum (125 MHz, $C_2D_2Cl_4$, 306 K) δ_C: 141.9, 141.7, 140.9, 140.7, 140.5, 140.3, 140.1, 139.5, 139.4, 139.1, 139.0, 139.0, 138.6, 138.1, 137.8, 131.7, 131.6, 131.2, 130.2, 130.0, 128.7, 128.4, 127.6, 126.9, 126.6, 126.2, 125.5, 125.2, 102.9 (arom.); MALDI-TOF-mass-spectrum: *m/e* 4,919 (100 %, $[M,K]^+$, calc. 4,921). Elem. anal. Calcd for $C_{385}H_{260}$: C, 94.64; H 5.36. Found: C,

Td-G$_2$(A$_2$B)(-EthynylTips)$_{16}$ Yield: 87 %; ^{1}H NMR-spectrum (500 MHz, CD_2Cl_2, 408 K): δ_H: 7.44, 7.37, 7.33 (3s, 12 H, arom.), 7.11-6.50 (br., 232 H, arom.), 1.09-1.08 (br., 336 H, CH, CH_3).^{13}C NMR-spectrum (125 MHz, THF, 303 K) δ_C: 141.8, 141.3, 141.1, 141.1, 141.0, 140.8, 140.5, 139.9, 139.8, 139.8, 139.4, 139.4, 139.3, 138.6, 138.5, 138.5, 138.2, 131.7, 131.2, 130.9, 130.2, 128.2, 128.1, 120.9, 120.6 , 107.5, 103.2 (arom.), 99.9, 90.5, 90.4, 80.2, 80.0, 79.8 (C≡C), 19.4 ($CH(CH_3)_2$); 11.8 ($CH(CH_3)_2$); MALDI-TOF-mass-spectrum: *m/e* 7,790 (100 %, $[M,K]^+$, calc. 7,803). Elem. anal. Calcd for $C_{561}H_{580}Si_{16}$: C, 86.70; H 7.52. Found: C, 86.60, H, 7.61.

Td-G$_2$(A$_2$B)(-Ethynyl)$_{16}$ Yield: 97 % ^{1}H NMR-spectrum (500 MHz, $C_2D_2Cl_4$, 306 K): δ_H 7.48, 7.43, 7.39 (3s, 12 H, arom.), 7.12-6.44 (br, 232 H, arom.) 2.99, 2.98, 2.97 (4s, 16 H, HC≡C.); ^{13}C NMR-spectrum (125 MHz, $C_2D_2Cl_4$, 303 K) δ_C: 142.0, 141.5, 141.0, 140.8, 140.7, 140.2, 139.6, 139.2, 138.7, 138.5, 138.3, 131.4, 131.2, 130.9, 130.6, 130.3, 130.1, 128.9, 128.6, 128.0, 127.8, 127.3, 127.0, 126.7, 126.1, 119.2, 118.9, 103.1 (arom.), 84.5, 77.4, (C≡C); MALDI-TOF-mass-spectrum: *m/e* 5,293 (100 %, $[M,Na]^+$, calc. 5,289). Elem. anal. Calcd for $C_{417}H_{260}$: C, 95.03; H 4.97. Found: C, 94.31, H, 5.40.

Td-G$_3$(A$_2$B)(-H)$_{32}$ Yield: 94 % ^{1}H NMR-spectrum (500 MHz, $C_2D_2Cl_4$, 403 K): δ_H 7.45, 7.40, 7.39. 7.36, 7.35, 7.33, 7.28 (7s, 28 H, arom.), 7.18-7.00 (br, 148 H, arom.), 6.96-6.45 (br, 404 H, aromatics; ^{13}C NMR-spectrum (125 MHz, $C_2D_2Cl_4$, 298 K) δ_C: 142.1, 141.9, 141.1, 140.7, 140.3, 139.3, 139.2, 138.8, 138.4, 131.8, 131.4, 130.2, 129.0, 128.6, 127.1, 126.8, 126.4, 125.7, 103.1, (arom.); MALDI-TOF-mass-spectrum: *m/e* 11,113 (100 %, $[M,Ag]^+$, calc. 11,072). Elem. anal. Calcd for $C_{865}H_{580}$: C, 94.67; H 5.33. Found: C, 93.27, H, 5.55.

Td-G$_3$(A$_2$B)(-EthynylTips)$_{32}$ Yield: 93 % ^{1}H NMR-spectrum (500 MHz, $C_2D_2Cl_4$, 408 K): δ_H: 7.44, 7.37, 7.33 (3s, 12 H, arom.), 7.11-6.50 (br., 232 H, arom.), 1.09-1.08 (br., 336 H, CH, CH_3); ^{13}C NMR-spectrum (125 MHz, $C_2D_2Cl_4$, 303 K) δ_C: 140.8, 138.5, 133.3, 131.6, 131.1, 130.8, 130.1, 120.8, 120.6(arom.), 99.2, 90.3 (C≡C), 19.0 ($CH(CH_3)_2$), 11.6 ($CH(CH_3)_2$); MALDI-TOF-mass-spectrum: *m/e* 16,773 (100 %, $[M,Na]^+$, calc. 16,752). Elem. anal. Calcd for $C_{1217}H_{1220}Si_{32}$: C, 87.29; H 7.34. Found: C, 87.27, H, 7.35.

Td-G$_3$(A$_2$B)(-Ethynyl)$_{32}$ Yield: 96 %; ^{1}H NMR-spectrum (500 MHz, $C_2D_2Cl_4$, 306 K): δ_H 7.46, 7.40, 7.39. 7.37, 7.36, 7.31 (6s, 28 H, arom.), 7.20-6.38 (br, 520 H, arom.) 2.98, 2.97, 2.96, 2.95, 2.94 (5s, 32 H, HC≡C.); ^{13}C NMR-spectrum (125 MHz, $C_2D_2Cl_4$, 353 K) δ_C: 141.6, 141.5, 140.9, 139.4, 138.4, 131.6, 131.1, 130.8, 130.1, 127.9, 127.7, 127.2, 126.7, 123.0, 119.5, 119.2, 103.1 (arom.). MALDI-TOF-mass-spectrum: *m/e* 11.729 (100 %, $[M,K]^+$, calc. 11.772). Elem. anal. Calcd for $C_{929}H_{580}$: C, 95.02; H 4.98. Found: C, 94.97, H, 4.86.

Td-G$_4$(A$_2$B)(-H)$_{64}$ Yield: 92 % ^{1}H NMR-spectrum (500 MHz, $C_2D_2Cl_4$, 403 K): δ_H 7.43, 7.39, 7.35, 7.32, 7.27, 7.25, 7.23 (7s, 60 H, arom.), 7.18-6.38 (br., 1160 H, arom.); ^{13}C NMR-spectrum (125 MHz, $C_2D_2Cl_4$, 306 K) δ_C: 142.1, 142.0, 140.7, 140.3, 139.4, 132.5, 131.8, 131.5, 130.2, 129.0, 128.6, 127.8, 127.7, 127.1, 126.8, 125.7, 120.3, 103.1 (arom.); MALDI-TOF-mass-spectrum: *m/e* 23,325 (100 %, $[M,Ag]^+$, calc. 23,237). Elem. anal. Calcd for $C_{1825}H_{1220}$: C, 94.72; H 5.27. Found: C, 94.69, H, 5.31.

Hex-G$_1$(A$_2$B)(-EthynylTips)$_{12}$: Yield: 66 %. ^{1}H NMR-spectrum (500 MHz, THF, 303 K): δ_H: 7.42 (s, 6 H, arom.), 7.13-6.64 (m, 120 H, arom.), 6.36 (d, ^3J = 8.0, 12 H, arom.), 1.11-1.10 (m, 252 H, aliph.). ^{13}C NMR-spectrum (125 MHz, CD_2Cl_2, 303 K) δ_c: 142.5, 142.0,

131.3, 131.0, 130.7, 130.4, 129.2, 128.8, 128.5, 127.9, 127.3, 126.7, 121.6, 121.4 (arom.), 108.6, 108.5, 90.3, 90.1 (C≡C), 19.0 ($CH(\mathbf{C}H_3)_2$), 12.3 ($\mathbf{C}H(CH_3)_2$). MALDI-TOF-mass-spectrum: *m/e*: 5,084.8 (100 %, $[M,Ag]^+$, calcd. 5,089.9). Elem. anal. calcd. for $C_{354}H_{390}Si_{12}$: C, 85.34; H, 7.89; Found: C, 85.31; H, 7.85.

Hex-$G_1(A_2B)$(-Ethynyl)$_{12}$: Yield: 94 %. ^{1}H NMR-spectrum (500 MHz, THF, 303 K): 7.44 (s, 6 H, arom.), 7.13-7.08 (m, 30 H, arom.), 7.03 (d, ^3J = 7.6, 12 H, arom.), 6.96 (d, ^3J = 7.6, 12 H, arom.), 6.88-6.85 (m, 12 H, arom.), 6.82-6.78 (m, 18 H, arom.), 6.74-6.71 (m, 24 H, arom.), 6.66 (d, ^3J = 7.6, 12 H, arom.), 3.37 (s, 6 H, C≡C-H), 3.34 (s, 6 H, C≡C-H). ^{13}C NMR-spectrum (125 MHz, THF, 303 K) δ_c: 140.7, 140.3, 140.2, 140.1, 139.8, 139.2, 139.0, 138.4, 138.0, 137.6, 137.5, 130.8, 130.7, 130.6, 130.5, 129.9, 129.6, 129.0, 127.5, 126.8, 126.2, 125.6, 125.0, 119.3, 119.0 (arom.), 82.6, 82.5, 76.9, 76.8 (C≡C). MALDI-TOF-mass-spectrum: *m/e*: 3,125.74 (100 %, $[M,Na]^+$, calcd. 3,128.9). Elem. anal. calcd. for $C_{246}H_{150}$: C, 95.10; H, 4.87; Found: C, 94.98; H, 4.94.

Hex-$G_2(A_2B)$(-EthynylTips)$_{24}$: Yield: 85 %. ^{1}H NMR-spectrum (500 MHz, CD_2Cl_2, 303 K): δ_H: 7.41-7.36 (m, 18 H, arom.), 7.11-6.34 (m, 348 H, arom.), 1.13-1.08 (m, 504 H, aliph.). ^{13}C NMR-spectrum (125 MHz, CD_2Cl_2, 303 K, due to the large number of aromatic carbon atoms, their signals overlap and could not be resolved) δ_c: 142.8, 142.5, 142.0-141.7, 141.4, 141.1-140.9, 140.7-140.5, 140.2-139.9, 139.6-139.1, 132.6-132.1, 131.6, 131.3, 130.8-130.6, 129.6-129.1, 128.5, 128.4-128.3, 128.0-127.5, 127.3-127.2, 126.8-126.7, 121.7, 121.4 (arom.), 108.7-106.5, 90.2, 90.1 (C≡C), 19.1 ($CH(\mathbf{C}H_3)_2$), 12.3 ($\mathbf{C}H(CH_3)_2$). MALDI-TOF-mass-spectrum: *m/e*: 11,717.9 (100 %, M^+, calcd. 11,712.3). Elem. anal. calcd. for $C_{846}H_{870}Si_{24}$: C, 86.76; H, 7.49; Found: C, 86.52; H, 7.36.

Hex-$G_2(A_2B)(-H)_{24}$: Yield: 75 %. ^{1}H NMR-spectrum (500 MHz, THF, 303 K): δ_H: 7.44 (s, 6 H, arom.), 7.40 (s, 6 H, arom.), 7.38 (s, 6 H, arom.), 7.12-7.01 (m, 96 H, arom.), 6.87-6.73 (m, 210 H, arom.), 6.67-6.63 (m, 36 H, arom.), 6.54 (d, ^{3}J = 8.2, 12 H, arom.), 6.44 (d, ^{3}J = 7.9, 12 H, arom.), 6.38 (d, ^{3}J = 7.9, 12 H, arom.). ^{13}C NMR-spectrum (125 MHz, CD_2Cl_2, 303 K) δ_c: 142.9, 142.8, 142.0, 141.9, 141.8, 141.7, 141.6, 141.5, 141.4, 141.3, 141.2, 141.1, 140.9, 140.3, 140.2, 140.1, 140.0, 139.8, 139.6, 139.5, 139.4, 139.2, 139.0, 132.7, 132.5, 132.4, 132.2, 132.1, 132.0, 131.9, 130.8, 130.7, 129.5, 129.2, 128.3, 127.7, 127.6, 127.3, 126.9, 126.4, 126.3, 126.0 (arom.). MALDI-TOF-mass-spectrum: *m/e*: 7,490.4 (100 %, $[M,Ag]^+$, calcd. 7,491.4). Elem. anal. calcd. for $C_{582}H_{390}$: C, 94.68; H, 5.32; Found: C, 94.20; H 5.31.

Tri-$G_1(A_2B)$(-EthynylTips)$_6$: Yield 77 %. ^{1}H NMR-spectrum (500 MHz, THF, 306 K) δ_H: 7.12-7.07 (m, 9 H, arom.), 7.01-6.93 (m, 18 H, arom.), 6.86-6.75 (m, 18 H, arom.), 6.72-6.68 (m, 9 H, arom.), 6.64-6.60 (m, 6 H, arom.), 1.09-1.07 (m, 126 H, aliph.). ^{13}C NMR-spectrum (125 MHz, THF, 306 K) δ_C: 142.2, 141.8, 141.75, 141.7, 141.6, 141.4, 141.3, 140.7, 140.0, 139.0, 132.8, 132.5, 132.4, 132.3, 131.7, 131.3, 130.8, 130.6, 130.5, 129.6, 128.3, 128.1, 127.2, 126.8, 121.6, 121.4 (arom.), 108.6, 108.5, 90.2, 90.07 (C≡C), 19.0 ($CH(CH_3)_2$), 12.2 ($CH(CH_3)_2$). FD-mass-spectrum: *m/e*: 2,301.7 (100 %, M^+, 2,301.8). Elem. anal. calcd. for $C_{162}H_{186}Si_6$: C, 84.53; H, 8.14; Found: C, 84.23; H, 8.14.

Tri-$G_1(A_2B)$(-Ethynyl)$_6$: Yield 69 %.^{1}H NMR-spectrum (500 MHz, THF, 306 K) δ_H: 7.19-7.14 (m, 9 H, arom.), 7.05 (d, ^{3}J = 7.7, 6 H, arom.), 7.00 (d, ^{3}J = 7.7, 6 H, arom.), 6.94-6.92 (m, 9 H, arom.), 6.89-6.86 (m, 9 H, arom.), 6.83-6.77 (m, 12 H, arom.), 6.68 (d, ^{3}J = 7.7, 6 H, arom.), 6.60 (d, ^{3}J = 7.7, 6 H, arom.), 3.35 (s, 3 H, C≡C-H), 3.33 (s, 3 H, C≡C-H). ^{13}C NMR-spectrum (125 MHz, THF, 306 K) δ_C: 141.8, 141.4, 141.3, 141.2, 141.1, 141.0, 140.2, 139.6,

120.5, 120.2, 83.9, 83.8, 78.3, 78.1 (C≡C). MALDI-TOF-mass-spectrum: *m/e*: 1,401.3 (100 %, $[M,K]^+$, calcd. 1,402.7). Elem. anal. calcd. for $C_{108}H_{66}$: C, 95.12; H, 4.88; Found: C, 94.26; H, 4.96.

Tri-$G_2(A_2B)(-H)_{12}$: Yield 71 %. ^{1}H NMR-spectrum (300 MHz, THF, 306 K) δ_H: 7.43 (s, 3 H, arom.), 7.41 (s, 3 H, arom.), 7.19-7.04 (m, 42 H, arom.), 7.03-6.67 (m, 114 H, arom.), 6.63 (d, ^{3}J = 8.3, 6 H, arom.), 6.48 (d, ^{3}J = 7.7, 6 H, arom.), 6.37 (d, ^{3}J = 8.0, 6 H, arom.). ^{13}C NMR-spectrum (75.5 MHz, THF, 306 K) δ_C: 142.9, 142.8, 142.7, 142.0, 141.8, 141.75, 141.7, 141.6, 141.5, 141.45, 141.4, 141.3, 141.2, 141.15, 141.1, 140.3, 140.2, 140.1, 140.0, 139.9, 139.8, 139.3, 139.1, 138.8, 132.8-132.4, 132.2-131.8, 131.0, 130.7, 130.5-130.4, 129.5-129.2, 128.3, 128.2, 128.0-127.8, 127.7, 127.6, 127.3, 1267.0-126.8, 126.5-126.3, 126.0. MALDI-TOF-mass-spectrum: *m/e*: 3,501.4 (100 %, M^+, calcd. 3,502.5). Elem. anal. calcd. for $C_{276}H_{186}$: C, 94.65; H, 5.35; Found: C, 95.26; H, 5.31.

Tri-$G_2(A_2B)$(-EthynylTips)$_{12}$: Yield 81 %. ^{1}H NMR-spectrum (500 MHz, THF, 306 K) δ_H: 7.40 (s, 3 H, arom.), 7.37 (s, 3 H, arom.), 7.18-6.67 (m, 144 H, arom.), 6.59 (d, ^{3}J = 7.9, 6 H, arom.), 6.48-6.46 (m, 12 H, arom.), 6.36 (d, ^{3}J = 7.9, 6 H, arom.), 1.10-1.09 (m, 252 H, aliph.). ^{13}C NMR-spectrum (125 MHz, THF, 306 K) δ_C: 142.8, 142.5, 142.0, 141.8, 141.7, 141.65, 141.6, 141.5, 141.0, 140.6, 140.2, 140.1, 139.9, 139.5, 139.3, 139.2, 139.1, 139.0, 132.7, 132.6, 132.4, 132.2, 132.1, 131.9, 131.5, 131.0, 130.6, 129.4, 129.2, 128.5, 128.2, 128.0, 127.9, 127.2, 126.9, 126.8, 126.7, 126.4, 121.6, 121.4 (arom.), 108.6, 108.5, 90.2, 90.0 (C≡C), 19.0 ($CH(\mathbf{C}H_3)_2$), 12.2 ($\mathbf{C}H(CH_3)_2$). MALDI-TOF-mass-spectrum: *m/e*: 5,694.1 (100 %, $[M,Na]^+$, calcd. 5,689.9). Elem. anal. calcd. for $C_{408}H_{426}Si_{12}$: C, 86.48; H, 7.58; Found: C, 86.35; H, 7.46.

Biph-$G_1(A_4B)$(-EthynylTiPS)$_{16}$: Yield: 77 %. ^{1}H NMR-spectrum (300 MHz, THF, 333 K): δ_H: 7.34 (s, 4 H, arom.), 7.29-7.28 (m, 8 H, arom.), 7.13-7.11 (m, 8 H, arom.), 7.08-7.06 (m, 20 H, arom.), 7.04-7.03 (m, 8 H, arom.), 6.81-7.90 (m, 10 H, arom.), 6.70-6.65 (m, 16 H, arom.), 1.14-1.10 (m, 358 H, aliph.). ^{13}C NMR-spectrum (75.5 MHz, THF, 333 K) δ_C: 147.1, 147.0, 146.5, 146.4, 145.8, 145.6, 145.3, 145.1, 144.3, 143.9, 137.2, 136.9, 136.7, 136.6, 136.3, 136.2, 135.9, 135.1, 127.2, 126.6, 126.5, 126.3 (arom.), 113.1, 113.0, 112.9, 112.8, 95.81, 95.4, 95.2, 95.1 (C≡C), 23.7, 23.6, 23.5 ($CH(\mathbf{C}H_3)_2$), 16.9, 16.8 ($\mathbf{C}H(CH_3)_2$). MALDI-TOF-mass-spectrum: *m/e*: 4,597.9 (100 %, $[M,K]^+$, calcd. 4,601.1). Elem. anal. calcd. for $C_{308}H_{410}Si_{16}$: C, 81.09; H, 9.06; Found: C, 80.84; H, 9.40.

Biph-$G_1(A_4B)$(-Ethynyl)$_{16}$: Yield: 79 %. ^{1}H NMR-spectrum (500 MHz, THF, 303 K): δ_H: 7.33-7.29 (m, 12 H, arom.), 7.12-7.01 (m, 32 H, arom.), 6.89-6.88 (m, 6 H, arom.), 6.83-6.80 (m, 8 H, arom.), 6.75-6.69 (m, 16 H, arom.), 3.53 (s, 4 H, C≡C-H), 3.43 (s, 4 H, C≡C-H), 3.42 (s, 4 H, C≡C-H), 3.41 (s, 4 H, C≡C-H). ^{13}C NMR-spectrum (125 MHz, $CDCl_3$, 303 K) δ_C: 142.6, 142.3, 142.0, 141.8, 141.2, 141.0, 140.2, 139.8, 139.4, 132.5, 132.4, 132.3, 132.2, 131.7, 131.5, 131.1, 130.8, 127.8, 1218, 121.3, 121.0 (arom.), 84.3, 84.2, 84.15, 84.1, 79.2, 79.0, 78.8, 78.7 (C≡C). MALDI-TOF-mass-spectrum: *m/e*: 2,099.8 (100 %, $[M,K]^+$, calcd. 2,099.6). Elem. anal. calcd. for $C_{164}H_{90}$: C, 95.60; H, 4.40; Found: C, 94.74; H, 5.03.

Biph-$G_2(A_4B)$(-H)$_{64}$: Yield 83 %. ^{1}H NMR-spectrum (500 MHz, THF, 328 K): δ_H: 7.66-7.39 (m, 20 H, arom.), 7.15-6.24 (m, 390 H, arom.). ^{13}C NMR-spectrum (125 MHz, $CDCl_3$, 303 K, due to the large number of aromatic carbon atoms, their signals overlap and could not be resolved) δ_C: 145.5-145.4, 144.6-143.5, 143.0-142.6, 135.6-134.6, 133.5-133.2, 130.9-128.6. 109.7 (arom.). MALDI-TOF-mass-spectrum: *m/e*: 7,767.8 (100 %, M^+, calcd. 7,764.0). Elem. anal. calcd. for $C_{612}H_{410}$: C, 94.69; H, 5.31; Found: C, 94.73; H, 5.33.

Td-$G_1(A_4B)$(-EthynylTiPS)$_{16}$: Yield: 63 %. ^{1}H NMR-spectrum (300 MHz, THF, 303 K): δ_H: 7.56 (s, 4 H, arom.), 7.30 (d, ^3J = 8.0, 8 H, arom.), 7.15-7.11 (m, 16 H, arom.), 7.07-7.02 (m, 16 H, arom.),), 6.97 (d, ^3J = 8.3, 8 H, arom.), 6.87-6.73 (m, 32 H, arom.), 1.14 (s, 84 H, aliph.), 1.11 (s, 84 H, aliph.), 1.10 (s, 84 H, aliph.), 1.01 (s, 84 H, aliph.). ^{13}C NMR-spectrum (75.5 MHz, THF, 333 K) δ_C: 145.8, 142.7, 142.6, 141.5, 141.3, 141.1, 141.0, 140.4, 140.2, 139.3, 132.4, 132.3, 132.0, 131.9, 131.6, 131.3, 130.8, 129.7, 122.6, 122.1, 121.9, 121.6 (arom.), 108.6, 108.5, 108.4, 108.3, 91.05, 90.69, 90.50 (C≡C), 64.69 (central C), 19.2, 19.1 ($CH(\mathbf{C}H_3)_2$), 12.3, 12.2 ($\mathbf{C}H(CH_3)_2$). MALDI-TOF-mass-spectrum: *m/e*: 4,837.5 (100 %, $[M,Ag]^+$, calcd. 4,836.2). Elem. anal. calcd. for $C_{321}H_{420}Si_{16}$: C, 81.54; H, 8.95; Found: C, 81.55; H, 9.02.

Td-$G_1(A_4B)$(-Ethynyl)$_{16}$: Yield: 92 %. ^{1}H NMR-spectrum (300 MHz, $C_2D_2Cl_4$, 303 K) δ_H: 7.63 (s, 4 H, arom.), 7.35 (d, ^3J = 8.0, 8 H, arom.), 7.16-6.97 (m, 40 H, arom.), 6.80-6.72 (m, 32 H, arom.) 3.13 (s, 4 H, C≡C-H), 3.06 (s, 4 H, C≡C-H), 3.04(s, 4 H, C≡C-H), 2.57(s, 4 H, C≡C-H). ^{13}C NMR-spectrum (75 MHz, $C_2D_2Cl_4$, 306 K) δ_C: 144.6, 141.9, 141.3, 140.6, 140.5, 140.4, 140.2, 140.0, 139.0, 138.8, 138.1, 135.8, 131.8, 131.6, 131.4, 131.3, 131.0, 130.9, 130.6, 129.9, 128.8, 120.2, 119.5, 119.3, 119.2 (arom.), 84.2, 84.0, 83.9, 83.8, 78.1, 77.7, 77.6, 77.4 (C≡C), 63.7 (central C). MALDI-TOF-mass-spectrum: *m/e*: 2,226.6 (100 %, M^+, calcd. 2,226.7). Elem. anal. calcd. for $C_{177}H_{100}$: C, 95.47; H, 4.53; Found: C, 94.10; H, 5.15.

Td-$G_2(A_4B)$(-H)$_{34}$: Yield: 71 %. ^{1}H NMR-spectrum (500 MHz, THF, 303 K) δ_H: 7.51 (s, 4 H, arom.), 7.48 (s, 4 H, arom.), 7.45 (s, 4 H, arom.), 7.34 (s, 4 H, arom.), 7.31 (s, 4 H, arom.), 7.18-6.63 (m, 380 H, arom.), 6.46-6.41 (m, 20 H, arom.). ^{13}C NMR-spectrum (125 MHz, THF, 303 K, due to the large number of aromatic carbon atoms, their signals overlap and

139.6, 139.4, 139.2, 139.0, 138.7, 138.6, 132.7-132.0, 130.8-130.5, 130.1-129.9, 129.6-129.3, 128.4-128.3, 127.9-127.4, 127.0, 126.5-126.1 (arom.), 65.0 (central C). MALDI-TOF-mass-spectrum: *m/e*: 8,036.8 (100 %, $[M,Ag]^+$, calcd. 8,038.1). Elem. anal. calcd. for $C_{625}H_{420}$: C, 94.66; H, 5.34; Found: C, 94.50; H, 5.15.