

## Supporting Information

### Preparation of Carbosilane Dendrimers with Perfluorosilane Branches

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Received October 22, 2011, Accepted November 23, 2011

#### Characterization of dendrimers

$F_3C(CF_2)_7(CH_2)_2OH$  Heptadecafluoro-1,1,2,2-tetrahydro-1-decanol (HDFD) and  $F_3C(CF_2)_5(CH_2)_2OH$  Tridecafluoro-1,1,2,2-tetrahydro-1-octanol (TDFO)

**1G[4,2]-8OC<sub>10</sub>H<sub>4</sub>F<sub>17</sub>** ( $C_{96}H_{72}F_{136}O_{12}Si_8$ ), yield 1.50 g (0.355 mmol, 92%). difficult flowing light jelly type material. GPC, PDI (Mw/Mn): 1.008 (42337/41962), Retention time: 16.61 min. <sup>1</sup>H-NMR (ppm, CDCl<sub>3</sub>):  $\delta$  0.0-0.2 (s, 24H, SiMe, (G0-G1)), 0.45-0.72 (m, 16H, CH<sub>2</sub>(G0)), 2.29-2.45 (m, 16H, CH<sub>2</sub>(G1)), 3.88-4.05 (m, 16H, OCH<sub>2</sub>(G1))

**2G[4,2,2]-16OC<sub>10</sub>H<sub>4</sub>F<sub>17</sub>** ( $C_{188}H_{206}F_{202}O_{28}Si_{16}$ ), yield: 1.241 g (0.142 mmol, 89%), difficult flowing light jelly type material. GPC: PDI (Mw/Mn) = 1.005 (44084/43826), Rt = 16.43 min. <sup>1</sup>H-NMR (ppm, CDCl<sub>3</sub>):  $\delta$  0.0-0.15 (s, 48H, SiMe (G0-G2)), 0.5-0.65 (m, 16H, CH<sub>2</sub>(G0)), 1.78-1.92 (m, 16H, CH<sub>2</sub>(G1)), 2.27-2.41 (m, 16H, CH<sub>2</sub>(G1)), 3.53-3.71 (m, 32H, CH<sub>2</sub>(G2)), 3.86-4.02 (m, 48H, OCH<sub>2</sub>(G2))

**3G[4,2,2,2]-32OC<sub>10</sub>H<sub>4</sub>F<sub>17</sub>** ( $C_{432}H_{384}F_{544}O_{60}Si_{32}$ ), yield: 1.362 g (0.077 mmol, 88%), difficult flowing light jelly type material. GPC: PDI (Mw/Mn) = 1.007 (45169/44853), Rt = 16.250 min. <sup>1</sup>H-NMR (200 MHz, CDCl<sub>3</sub>):  $\delta$  0.0-0.15 (s, 96H, SiMe (G0-G3)), 0.48-0.63 (m, 16H, CH<sub>2</sub>(G0)), 1.32-1.48 (m, 48H, CH<sub>2</sub>(G1-G2)), 1.48-1.63 (m, 48H, CH<sub>2</sub>(G1-G2)), 2.27-2.4 (m, 64H, CH<sub>2</sub>(G3)), 3.58-3.7 (m, 48H, OCH<sub>2</sub>(G1-G2)), 3.91-4.08 (m, 64H, OCH<sub>2</sub>(G3))

**4G[4,2,2,2,2]-64OC<sub>10</sub>H<sub>4</sub>F<sub>17</sub>** ( $C_{880}H_{801}F_{1087}O_{124}Si_{64}$ ), yield: 1.128 g (0.031 mmol, 85%), difficult flowing light jelly type material. GPC: PDI (Mw/Mn) = 1.006 (58063/57120), Rt = 15.98 min. <sup>1</sup>H-NMR (200 MHz, CDCl<sub>3</sub>):  $\delta$  0.02-0.17 (s, 192H, SiMe (G0-G4)), 0.51-0.65 (m, 16H, CH<sub>2</sub>(G0)), 0.94-1.1 (m, 112H, CH<sub>2</sub>(G1-G3)), 1.58-1.73 (m, 112H, CH<sub>2</sub>(G1-G3)), 2.28-2.42 (m, 128H, CH<sub>2</sub>(G4)), 3.53-

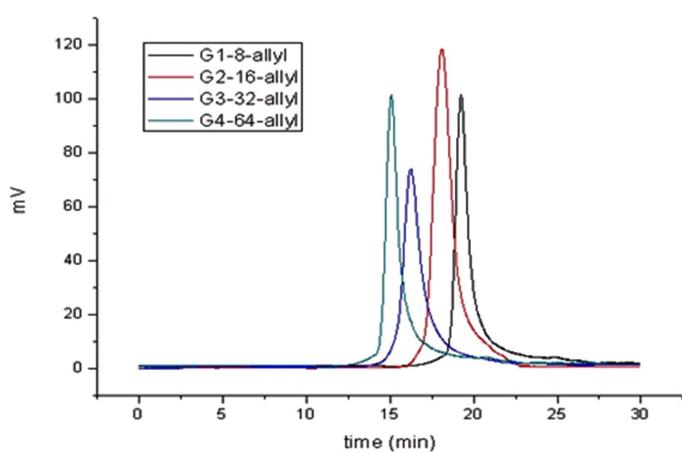
3.69 (m, 112H, OCH<sub>2</sub>(G1-G3)), 3.94-4.08 (m, 128H, OCH<sub>2</sub>(G4)).

**1G[4,2]-8OCF<sub>13</sub>** Mw ( $C_{80}H_{72}F_{104}O_{12}Si_8$ ) = 3425.94, yield = 0.881 g (0.257 mmol, 89%). White gel type difficult flowing liquid. GPC: PDI (Mw/Mn) = 1.02 (39350/38334), Rt = 16.767 min. Elem. Anal.: C, 28.05; H, 2.12; F, 57.67; O, 5.60; Si, 6.56. <sup>1</sup>H-NMR (ppm, CDCl<sub>3</sub>):  $\delta$  0.14 (s, 12H, SiMe (G0)), 0.14-0.8 (m, 16H, CH<sub>2</sub>(G0)), 1.4 (s, 12H, SiMe (G1)), 1.80 (m, 16H, CH<sub>2</sub>(G1)), 3.79 (m, 16H, OCH<sub>2</sub>(G1))

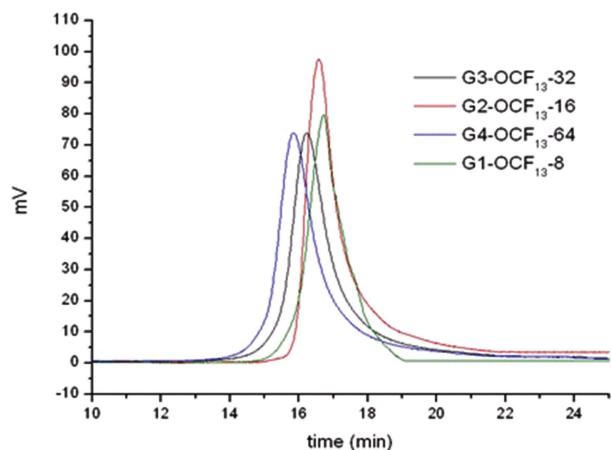
**2G[4,2,2]-16F<sub>13</sub>**: Mw ( $C_{176}H_{176}F_{208}O_{28}Si_{16}$ ) = 7140.30, yield = 1.174 g (0.164 mmol, 81%), light yellow gel type difficult flowing liquid. GPC: PDI (Mw/Mn) = 1.008 (43236/42893), Rt = 16.560 min. Elem. <sup>1</sup>H-NMR (ppm, CDCl<sub>3</sub>):  $\delta$  0.0-0.36 (s, 36H, SiMe (G0-G2)), 0.36-0.8 (m, 16H, CH<sub>2</sub>(G0)), 1.78-1.87 (m, 16H, CH<sub>2</sub>(G1)), 2.26-2.48 (m, 16H, CH<sub>2</sub>(G1)), 3.6-3.82 (m, 32H, CH<sub>2</sub>(G2)), 3.82-4.2 (m, 32H, OCH<sub>2</sub>(G2))

**3G[4,2,2,2]-32OCF<sub>13</sub>**: Mw ( $C_{368}H_{384}F_{416}O_{60}Si_{32}$ ) = 14569.02, yield = 0.989 g (0.068 mmol, 82%), gel type difficult flowing liquid. GPC: PDI (Mw/Mn) = 1.01 (43706/43181), Rt = 16.333 min. <sup>1</sup>H-NMR (200 MHz, CDCl<sub>3</sub>):  $\delta$  0.14 (s, 96H, SiMe (G0-G3)), 0.4-0.8 (m, 16H, CH<sub>2</sub>(G0)), 1.64-1.8 (m, 48H, CH<sub>2</sub>(G1-G2)), 2.18-2.57 (m, 48H, CH<sub>2</sub>(G1-G2)), 3.6-3.8 (m, 64H, CH<sub>2</sub>(G3)), 3.8-4.0 (m, 64H, OCH<sub>2</sub>(G3))

**4G[4,2,2,2,2]-OCF<sub>13</sub>-64**: Mw ( $C_{752}H_{800}F_{832}O_{124}Si_{64}$ ) = 29460.074, yield = 1.184 g (0.040 mmol, 91%), light yellow gel type difficult flowing liquid. GPC: PDI (Mw/Mn) = 1.006 (49648/48760), Rt = 16.124 min. <sup>1</sup>H-NMR (200 MHz, CDCl<sub>3</sub>):  $\delta$  0.0-0.4 (s, 48H, SiMe (G0-G4)), 0.4-0.74 (m, 16H, CH<sub>2</sub>(G0)), 0.9-1.14 (m, 64H, CH<sub>2</sub>(G1-G3)), 1.5-1.68



**Figure 1.** GPC diagram of allylic dendrimer.



**Figure 2.** GPC diagrams of nG[4..]-mOCF13.