Supporting Information

for

Highly effective synthesis of mercapto-functionalized cubic silsesquioxanes as the first step in designing advanced nano delivery systems

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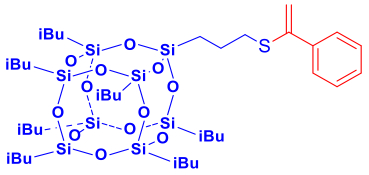
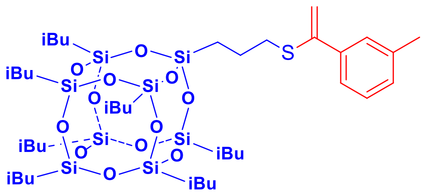
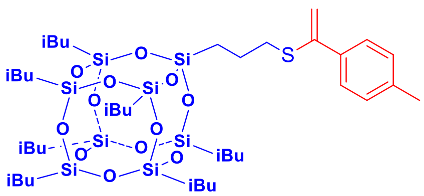
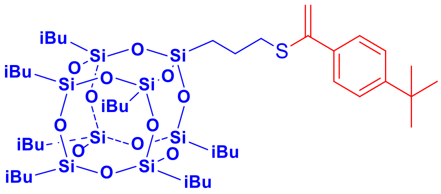
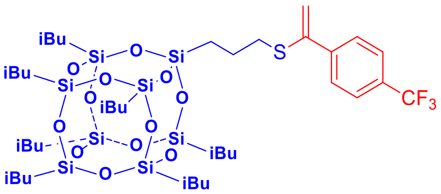
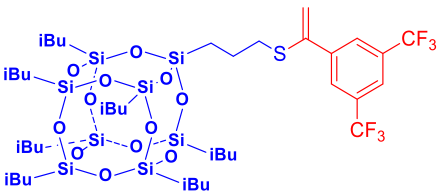
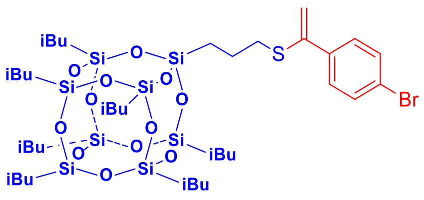
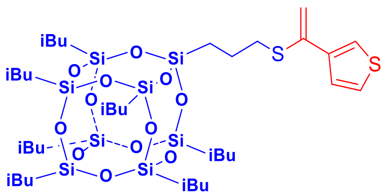
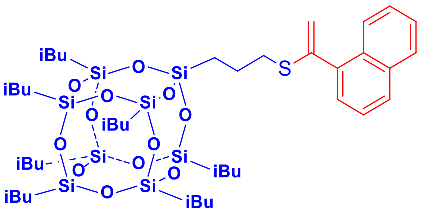
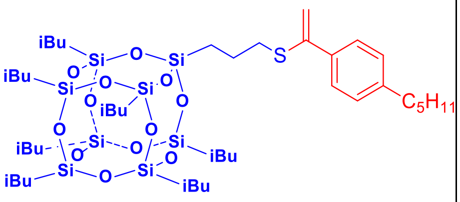
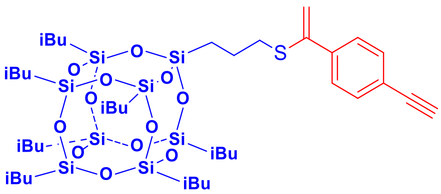
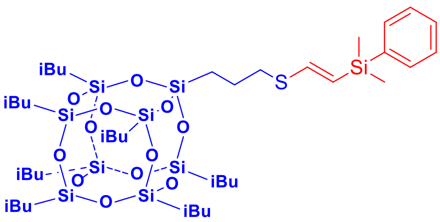
1. Analytical data of isolated products P1-P12

 **Product P1**	White solid, isolated yield: 81%, 99.05 mg (9.99×10^{-5} mmol); ^{1}H NMR (400 MHz, $CDCl_3$, 296K): δ (ppm) 0.57-0.63 (m, 14H, C*H*), 0.70-0.75 (m, 2H, CH_2), 0.93-0.99 (m, 42H, CH_3), 1.67 - 1.77 (m, 2H, CH_2), 1.81-1.90 (m, 7H, C*H*), 2.65-2.75 (m, 2H, SCH_2), 5.15 (s, 1H, =CH_2), 5.44 (s, 1H, =CH_2), 7.27-7.41 (m, 3H, -C_6H_5), 7.48-7.60 (m, 2H, -C_6H_5); ^{13}C NMR (100 MHz, $CDCl_3$, 296K): δ (ppm) 11.73 (CH_2), 22.42 (CH_2), 22.47 (CH_2), 23.83 (*C*H), 23.88 (*C*H), 25.68 (CH_3), 110.22 (=*C*H), 127.07, 128.27, 139.80, 144.90 (=CH_2); ^{29}Si NMR (79 MHz, $CDCl_3$, 296K): δ (ppm) -67.64, -67.89 (core), -68.06 (*Si*CH_2); MS (ESI+): m/z 1032 $[M+K]^+$.
 **Product P2**	White solid, isolated yield: 85%, 95.94 mg (9.53×10^{-5} mmol); ^{1}H NMR (400 MHz, $CDCl_3$, 296K): δ (ppm) 0.57-0.62 (m, 14H, C*H*), 0.71-0.76 (m, 2H, CH_2), 0.94-0.97 (m, 42H, CH_3), 1.69 - 1.77 (m, 2H, CH_2), 1.82-1.89 (m, 7H, C*H*), 2.36 (s, 3H, -C_6H_4-CH_3), 2.33-2.40 (m, 2H, SCH_2), 5.12 (s, 1H, =CH_2), 5.43 (s, 1H, =CH_2), 7.10-7.14 (m, 1H, -C_6H_4-CH_3), 7.20-7.24 (m, 1H, -C_6H_4-CH_3), 7.31-7.38 (m, 2H, -C_6H_4-CH_3); ^{13}C NMR (100 MHz, $CDCl_3$, 296K): δ (ppm) 11.74 (CH_2), 22.42 (CH_2), 22.47 (CH_2), 23.83 (*C*H), 23.87 (*C*H), 25.68 (CH_3), 27.39 (CH_2), 27.65 (CH_2), 34.77 (CH_3), 109.79 (=*C*H), 124.19, 127.71, 128.16, 129.08, 137.87, 139.87, 144.99 (=CH_2); ^{29}Si NMR (79 MHz, $CDCl_3$, 296K): δ (ppm) -67.60, -67.86 (core), -68.03 (*Si*CH_2); MS (ESI+): m/z 1045 $[M+K]^+$.
 **Product P3**	White solid, isolated yield: 90%, 101.58 mg (1.00×10^{-4} mmol); ^{1}H NMR (400 MHz, $CDCl_3$, 296K): δ (ppm) 0.57-0.62 (m, 14H, C*H*), 0.70-0.75 (m, 2H, CH_2), 0.93-0.99 (m, 42H, CH_3), 1.70 - 1.77 (m, 2H, CH_2), 1.82-1.91 (m, 7H, C*H*), 2.35 (s, 3H, -C_6H_4-CH_3), 2.66-2.74 (m, 2H, SCH_2), 5.11 (s, 1H, =CH_2), 5.41 (s, 1H, =CH_2), 7.14 (d, J_{HH} = 8.0 Hz, 2H, -C_6H_4-CH_3), 7.43 (d, J_{HH} = 8.0 Hz, 2H, -C_6H_4-CH_3); ^{13}C NMR (100 MHz, $CDCl_3$, 296K): δ (ppm) 11.73 (CH_2), 21.16 (CH_2), 22.10 (CH_2), 22.42 (CH_2), 22.47 (CH_2), 23.84 (*C*H), 23.88 (*C*H), 25.67 (CH_3), 25.69 (CH_3), 34.77 (CH_3), 109.59 (=*C*H), 126.93, 128.95, 136.92, 138.18, 137.87, 144.75 (=CH_2); ^{29}Si NMR (79 MHz, $CDCl_3$, 296K): δ (ppm) -67.65, -67.90 (core), -68.04 (*Si*CH_2); MS (ESI+): m/z 1045 $[M+K]^+$.

 **Product P4**	White solid, isolated yield: 87%, 102.29 mg (9.81×10^{-5} mmol); ^{1}H NMR (400 MHz, $CDCl_3$, 296K): δ (ppm) 0.57-0.62 (m, 14H, C*H*), 0.72-0.76 (m, 2H, C*H*$_2$), 0.94-0.97 (m, 42H, C*H*$_3$), 1.36 (s, 9H, C(C*H*$_3$)$_3$), 1.71-1.78 (m, 2H, C*H*$_2$), 1.82-1.89 (m, 7H, C*H*), 2.69-2.76 (m, 2H, SC*H*$_2$), 5.10 (s, 1H, =C*H*$_2$), 5.44 (s, 1H, =C*H*$_2$), 7.36 (d, 2H, J_{HH} = 8.3 Hz, -C_6*H*$_4$-*t*Bu), 7.48 (d, 2H, J_{HH} = 8.3 Hz, -C_6*H*$_4$-*t*Bu); ^{13}C NMR (100 MHz, $CDCl_3$, 296K): δ (ppm) 11.76 (*C*H$_2$), 22.04 (*C*H$_3$), 22.44 (*C*H$_2$), 22.48 (*C*H$_2$), 23.84 (*C*H), 23.88 (*C*H), 25.69 (*C*H$_3$), 31.28 (*C*H$_2$), 34.56 (*C*H$_2$), 34.79 (*C*H$_2$), 109.25 (=*C*H), 125.19, 126.65, 136.91, 144.66, 151.38 (=*C*H$_2$); ^{29}Si NMR (79 MHz, $CDCl_3$, 296K): δ (ppm) -67.64, -67.90 (core), -68.02 (*Si*CH$_2$); MS (ESI+): m/z 1087 $[M+K]^+$.
 **Product P5**	White solid, isolated yield: 88%, 105.94 mg (9.99×10^{-5} mmol); ^{1}H NMR (400 MHz, $CDCl_3$, 296K): δ (ppm) 0.59-0.61 (m, 14H, C*H*), 0.71-0.75 (m, 2H, C*H*$_2$), 0.94-0.96 (m, 42H, C*H*$_3$), 1.71-1.77 (m, 2H, C*H*$_2$), 1.83-1.90 (m, 7H, C*H*), 2.72 (t, 2H, J_{HH} = 7.3 Hz, SC*H*$_2$), 5.24 (s, 1H, =C*H*$_2$), 5.50 (s, 1H, =C*H*$_2$), 7.59 (d, 2H, J_{HH} = 8.3 Hz, -C_6*H*$_4$-CF_3), 7.65 (d, 2H, J_{HH} = 8.3 Hz, -C_6*H*$_4$-CF_3); ^{13}C NMR (100 MHz, $CDCl_3$, 296K): δ (ppm) 11.70 (*C*H$_2$), 22.04 (*C*H$_2$), 22.43 (*C*H$_2$), 22.46 (*C*H$_2$), 23.84 (*C*H), 23.88 (*C*H), 25.68 (*C*H$_3$), 25.68 (*C*H$_3$), 34.83 (*C*H$_2$), 111.92 (=*C*H), 122.69, 125.28 (dd, *J* = 7.6, 3.8 Hz), 127.39, 127.65, 130.12, 130.45, 143.40, 143.84 (=*C*H$_2$); ^{29}Si NMR (79 MHz, $CDCl_3$, 296K): δ (ppm) -67.61, -67.86 (core), -68.16 (*Si*CH$_2$); MS (ESI+): m/z 1100 $[M+K]^+$.
 **Product P6**	White solid, isolated yield: 86%, 108.83 mg (9.64×10^{-5} mmol); ^{1}H NMR (400 MHz, $CDCl_3$, 296K): δ (ppm) 0.59-0.63 (m, 14H, C*H*), 0.73-0.78 (m, 2H, C*H*$_2$), 0.94-0.97 (m, 42H, C*H*$_3$), 1.77-1.88 (m, 9H, C*H*$_2$ and C*H*), 2.76 (t, 2H, J_{HH} = 7.3 Hz, SC*H*$_2$), 5.29 (s, 1H, =C*H*$_2$), 5.56 (s, 1H, =C*H*$_2$), 7.82 – 7.84 (m, 2H, -C_6*H*$_3$-CF_3), 7.96 – 8.00 (m, 2H,-C_6*H*$_3$-CF_3); ^{13}C NMR (100 MHz, $CDCl_3$, 296K): δ (ppm) 11.71 (*C*H$_2$), 21.92 (*C*H$_2$), 22.42 (*C*H$_2$), 22.46 (*C*H$_2$), 23.84 (*C*H), 23.88 (*C*H), 25.64 (*C*H$_3$), 25.68 (*C*H$_3$), 35.01 (*C*H$_2$), 112.62 (=*C*H), 121.83, 122.01 (dd, *J* = 7.4, 3.6 Hz), 124.55, 127.18 (d, *J* = 2.6 Hz), 131.23, 131.56, 131.89, 132.22, 142.09, 142.79 (=*C*H$_2$); ^{29}Si NMR (79 MHz, $CDCl_3$, 296K): δ (ppm) -67.60, -67.87 (core), -68.30 (*Si*CH$_2$); MS (ESI+): m/z 1167 $[M+K]^+$.

 **Product P7**	White solid, isolated yield: 92%, 110.43 mg (1.03×10^{-4} mmol); ^{1}H NMR (400 MHz, $CDCl_3$, 296K): δ (ppm) 0.59-0.62 (m, 14H, C*H*), 0.70-0.76 (m, 2H, C*H*$_2$), 0.94-0.97 (m, 42H, C*H*$_3$), 1.76-1.81 (m, 2H, C*H*$_2$), 1.82 – 1.89 (m, 7H, C*H*), 2.68 – 2.72 (m, 2H, SC*H*$_2$), 5.17 (s, 1H, =C*H*$_2$), 5.43 (s, 1H, =C*H*$_2$), 7.39 – 7.43 (m, 2H, -C_6H_4-Br), 7.44 – 7.48 (m, 2H, -C_6H_4-Br); ^{13}C NMR (100 MHz, $CDCl_3$, 296K): δ (ppm) 11.71 (*C*H$_2$), 22.08 (*C*H$_2$), 22.44 (*C*H$_2$), 22.47 (*C*H$_2$), 23.84 (*C*H), 23.88 (*C*H), 25.67 (*C*H$_3$), 25.69 (*C*H$_3$), 34.81 (*C*H$_2$), 110.88 (=*C*H), 122.33, 128.68, 131.41, 138.76, 143.91 (=*C*H$_2$); ^{29}Si NMR (79 MHz, $CDCl_3$, 296K): δ (ppm) -67.64, -67.88 (core), -68.12 (*Si*CH$_2$); MS (ESI+): m/z 1111 $[M+K]^+$.
 **Product P8**	White solid, isolated yield: 83%, 92.93 mg (9.31×10^{-5} mmol); ^{1}H NMR (400 MHz, $CDCl_3$, 296K): δ (ppm) 0.58-0.61 (m, 14H, C*H*), 0.72-0.77 (m, 2H, C*H*$_2$), 0.94-0.97 (m, 42H, C*H*$_3$), 1.79-1.88 (m, 9H, C*H*$_2$ and C*H*), 2.75 – 2.80 (m, 2H, SC*H*$_2$), 5.07 (s, 1H, =C*H*$_2$), 5.53 (s, 1H, =C*H*$_2$), 7.24 – 7.25 and 7.27 - 7.31 (m, 2H, -C_4H_3S), 7.44 – 7.50 (dd, 1H, J_{HH} = 2.9, 1.4 Hz, -C_4H_3S); ^{13}C NMR (100 MHz, $CDCl_3$, 296K): δ (ppm) 11.78 (*C*H$_2$), 22.06 (*C*H$_2$), 22.43 (*C*H$_2$), 22.47 (*C*H$_2$), 23.83 (*C*H), 23.87 (*C*H), 25.67 (*C*H$_3$), 25.68 (*C*H$_3$), 34.65 (*C*H$_2$), 108.57 (=*C*H), 122.19, 125.60, 126.03, 138.89 (=*C*H$_2$); ^{29}Si NMR (79 MHz, $CDCl_3$, 296K): δ (ppm) -67.61, -67.87 (core), -68.04 (*Si*CH$_2$); MS (ESI+): m/z 1037 $[M+K]^+$.
 **Product P9**	White solid, isolated yield: 91%, 106.38 mg (1.02×10^{-4} mmol); ^{1}H NMR (400 MHz, $CDCl_3$, 296K): δ (ppm) 0.59-0.63 (m, 14H, C*H*), 0.71-0.74 (m, 2H, C*H*$_2$), 0.94-0.98 (m, 42H, C*H*$_3$), 1.76-1.81 (m, 2H, C*H*$_2$), 1.83 – 1.91 (m, 7H, C*H*), 2.69 – 2.74 (m, 2H, SC*H*$_2$), 5.32 (s, 1H, =C*H*$_2$), 5.43 (s, 1H, =C*H*$_2$), 7.42 – 7.46 (m, 2H, -C_6H_3-C_6H_4), 7.47 – 7.50 (m, 2H, -C_6H_3-C_6H_4), 7.79 – 7.82 (m, 1H, -C_6H_3-C_6H_4), 7.83 – 7.76 (m, 1H, -C_6H_3-C_6H_4), 8.23 – 8.26 (m, 1H, -C_6H_3-C_6H_4); ^{13}C NMR (100 MHz, $CDCl_3$, 296K): δ (ppm) 11.84 (*C*H$_2$), 22.18 (*C*H$_2$), 22.45 (*C*H$_2$), 22.48 (*C*H$_2$), 23.84 (*C*H), 23.89 (*C*H), 25.68 (*C*H$_3$), 34.89 (*C*H$_2$), 111.82 (=*C*H), 121.83, 125.05, 125.68, 125.86, 126.04, 126.49, 128.14, 128.34, 131.21, 133.60, 138.04, 143.54 (=*C*H$_2$); ^{29}Si NMR (79 MHz, $CDCl_3$, 296K): δ (ppm) -67.63, -67.89 (core), -68.09 (*Si*CH$_2$); MS (ESI+): m/z 1083 $[M+K]^+$.

 **Product P10**	White solid, isolated yield: 85%, 95.32 mg (8.97×10^{-5} mmol); ^{1}H NMR (400 MHz, $CDCl_3$, 296K): δ (ppm) 0.57-0.62 (m, 14H, CH), 0.71-0.75 (m, 2H, CH_2), 0.94-0.97 (m, 42H, CH_3), 1.25 – 1.36 (m, 7H, CH_2 and CH_3), 1.59 - 1.64 (m, 2H, CH_2), 1.71 – 1.76 (m, 2H, CH_2), 1.81 – 1.88 (m, 7H, CH), 2.57 – 2.62 (m, 2H, CH_2), 2.68 – 2.75 (m, 2H, SCH_2), 5.10 (s, 1H, $=CH_2$), 5.42 (s, 1H, $=CH_2$), 7.14 (d, 2H, J_{HH} = 8.4 Hz, $-C_6H_5-C_5H_{11}$), 7.45 (d, 2H, J_{HH} = 8.4 Hz, $-C_6H_5-C_5H_{11}$); ^{13}C NMR (100 MHz, $CDCl_3$, 296K): δ (ppm) 11.74 (CH_2), 14.01 (CH_3), 22.07 (CH_2), 22.43 (CH_2), 22.47 (CH_2), 22.52 (CH_2), 23.83 (CH), 23.87 (CH), 25.67 (CH_3), 25.68 (CH_3), 31.05 (CH_2), 31.49 (CH_2), 34.78 (CH_2), 35.61 (CH_2), 109.34 ($=CH$), 126.88, 128.29, 137.10, 143.26 ($=CH_2$); ^{29}Si NMR (79 MHz, $CDCl_3$, 296K): -67.63, -67.89 (core), -68.06 ($SiCH_2$); MS (ESI+): m/z 1102 $[M+K]^+$.
 **Product P11**	White solid, isolated yield: 91%, 103.73 mg (1.02×10^{-4} mmol); ^{1}H NMR (400 MHz, $CDCl_3$, 296K): δ (ppm) 0.57-0.61 (m, 14H, CH), 0.70-0.74 (m, 2H, CH_2), 0.94-0.97 (m, 42H, CH_3), .70-1.75 (m, 2H, CH_2), 1.82-1.88 (m, 7H, CH), 2.68-2.72 (m, 2H, SCH_2), 3.11 (s, 1H, $C{\equiv}CH$), 5.20 (s, 1H, $=CH_2$), 5.47 (s, 1H, $=CH_2$), 7.45-7.48 (m, 2H, $-C_6H_4$), 7.49-7.52 (m, 2H, $-C_6H_4$); ^{13}C NMR (100 MHz, $CDCl_3$, 296K): δ (ppm) 11.70 (CH_2), 22.09 (CH_2), 22.43 (CH_2), 22.47 (CH_2), 23.84 (CH), 23.88 (CH), 25.68 (CH_3), 24.80 (CH_2), 77.90 (CH), 83.36 ($C{\equiv}$), 111.22 ($=CH_2$), 122.00, 126.99, 132.07, 140.18, 144.90 ($=CH_2$); ^{29}Si NMR (79 MHz, $CDCl_3$, 296K): δ (ppm) -67.64, -67.88 (core), -68.11 ($SiCH_2$); MS (ESI+): m/z 1056 $[M+K]^+$.
 **Product P12**	White solid, isolated yield: 84%, 98.95 mg (9.42×10^{-5} mmol); ^{1}H NMR (400 MHz, $CDCl_3$, 296K): δ (ppm) 0.34 (s, 6H, $Si(CH_3)_2$), 0.58-0.61 (m, 14H, CH), 0.71-0.75 (m, 2H, CH_2), 0.94-0.96 (m, 42H, CH_3), 1.72-1.77 (m, 2H, CH_2), 1.83-1.88 (m, 7H, CH), 2.75 (t, 2H, J_{HH} = 7.4 Hz, SCH_2), 5.80 (d, 1H, J_{HH} = 18.2 Hz, $=CH$), 6.59 (d, 1H, J_{HH} = 18.2 Hz, $=CH$), 7.34-7.36 (m, 3H, $-C_6H_5$), 7.50-7.52 (m, 2H, $-C_6H_5$); ^{13}C NMR (100 MHz, $CDCl_3$, 296K): δ (ppm) -2.32 ($SiCH_3$), 11.80 (CH_2), 22.09 (CH_2), 22.48 (CH_2), 22.70 (CH_2), 23.84 (CH), 23.87 (CH), 25.68 (CH_3), 34.02 (CH_2), 121.80 ($=CH$), 127.76, 126.99, 128.98, 133.82, 141.06 ($=CH$); ^{29}Si NMR (79 MHz, $CDCl_3$, 296K): δ (ppm) -21.99 ($SiCH_3$), -67.61, -67.86 (core), -68.15 ($SiCH_2$); MS (ESI+): m/z 1090 $[M+K]^+$.

2. Photophysical spectra

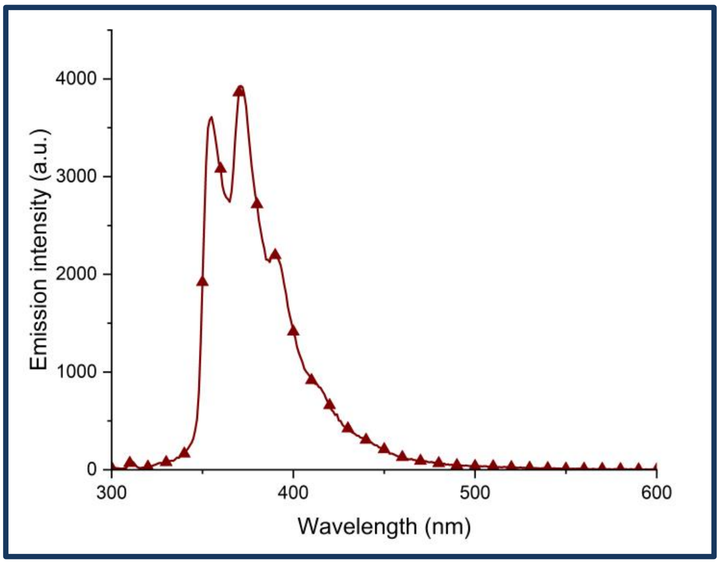


Figure S1. Emission spectra of compound **P9** ($\lambda_{ex.}$ = 285 nm).

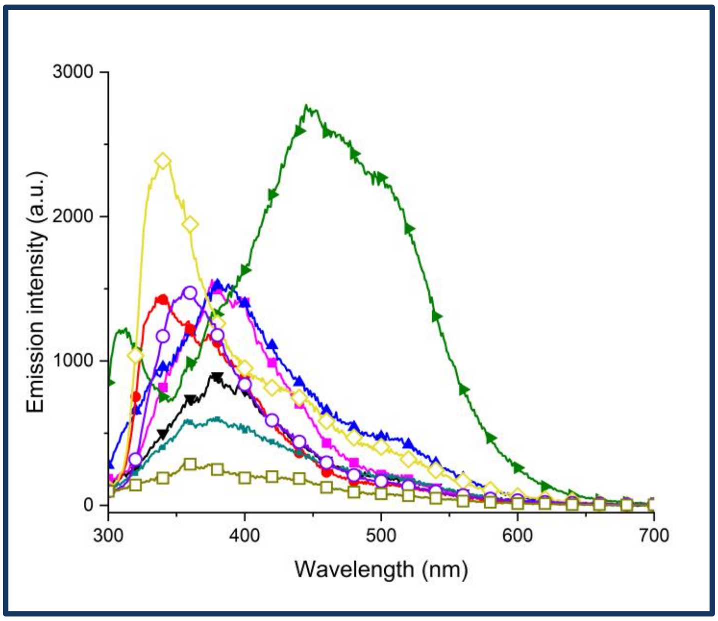


Figure S2. Emission spectra of compounds excited at the absorption maxima: **P1** (●) ($\lambda_{ex.}$ = 245 nm), **P2** (▲) ($\lambda_{ex.}$ = 250 nm), **P3** (■) ($\lambda_{ex.}$ = 245 nm), **P4** (▼) ($\lambda_{ex.}$ = 255 nm), **P7** (▪) ($\lambda_{ex.}$ = 250 nm), **P8** (◊) ($\lambda_{ex.}$ = 252 nm), **P10** (○) ($\lambda_{ex.}$ = 245 nm), **P11** (▶) ($\lambda_{ex.}$ = 261 nm) and **P12** (□) ($\lambda_{ex.}$ = 255 nm).

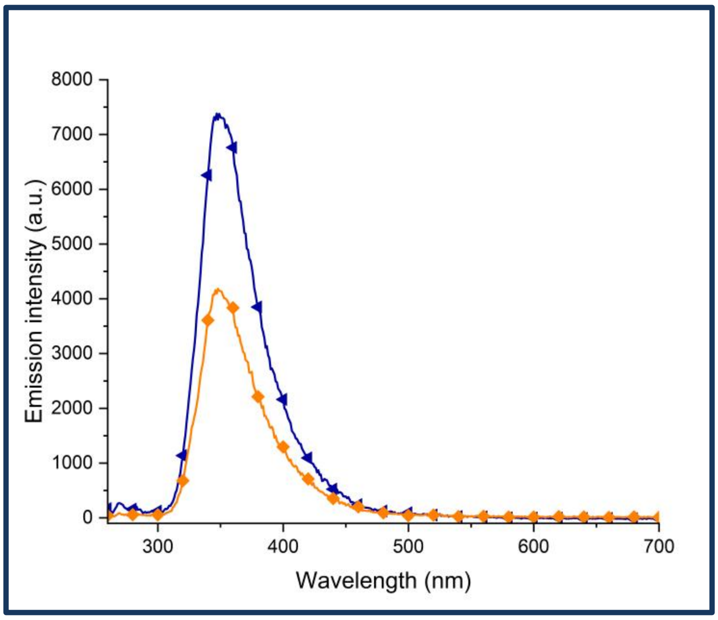


Figure S3. Emission spectra of compounds excited at the absorption maxima: **P5** (◄) ($\lambda_{ex.}$ = 242 nm) and **P6** (♦) ($\lambda_{ex.}$ = 242 nm).

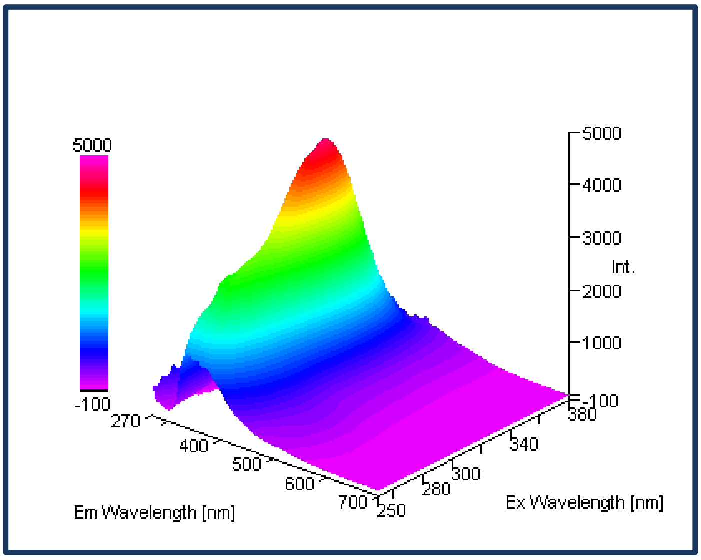


Figure S4. The dependence of the photoluminescence spectra on the excitation wavelength for compound **P1**.

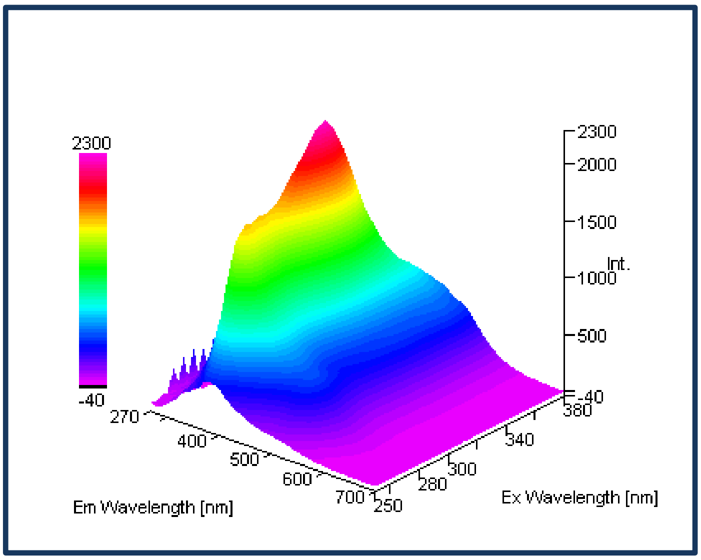


Figure S5. The dependence of the photoluminescence spectra on the excitation wavelength for compound **P2**.

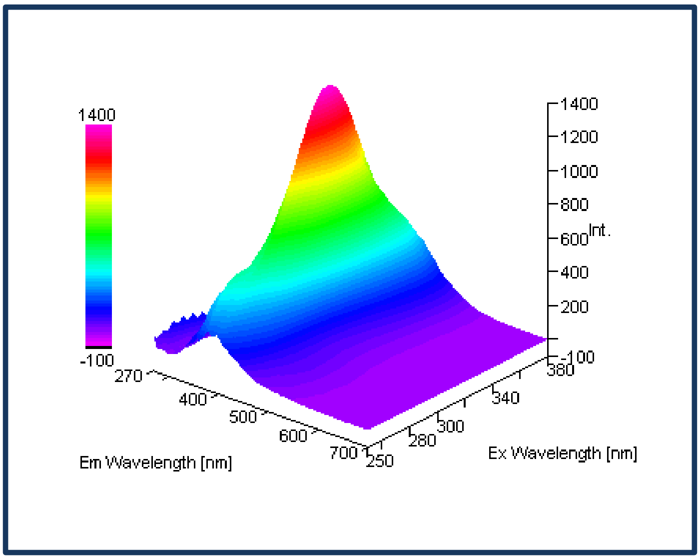


Figure S6. The dependence of the photoluminescence spectra on the excitation wavelength for compound **P3**.

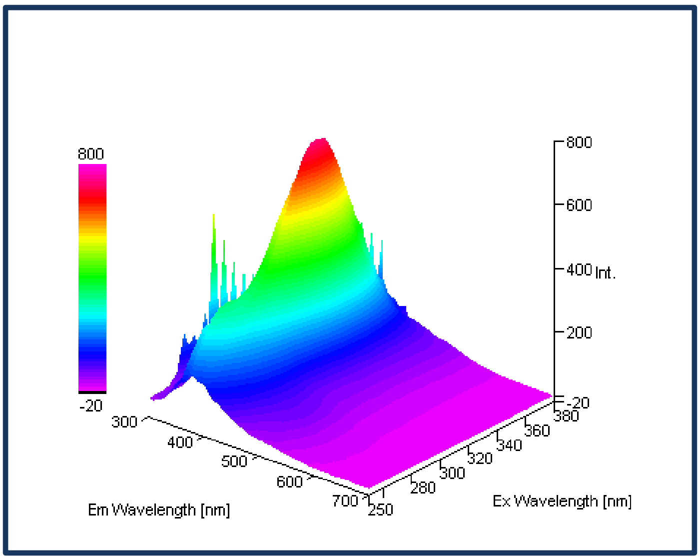


Figure S7. The dependence of the photoluminescence spectra on the excitation wavelength for compound **P4**.

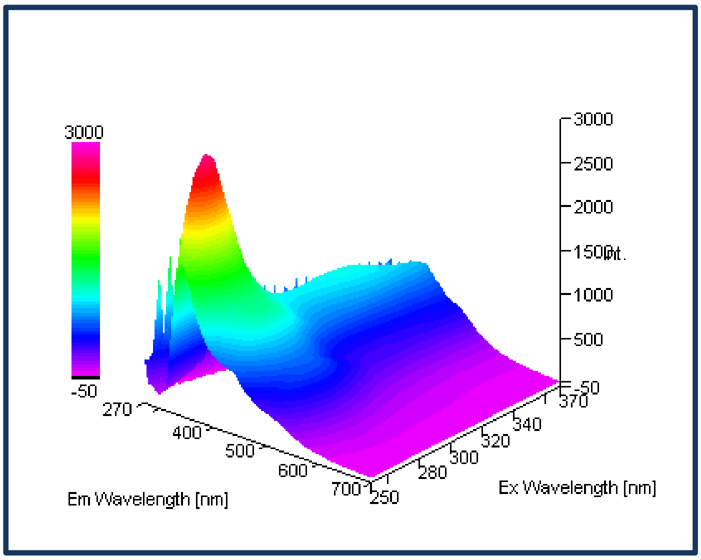


Figure S8. The dependence of the photoluminescence spectra on the excitation wavelength for compound **P8**.

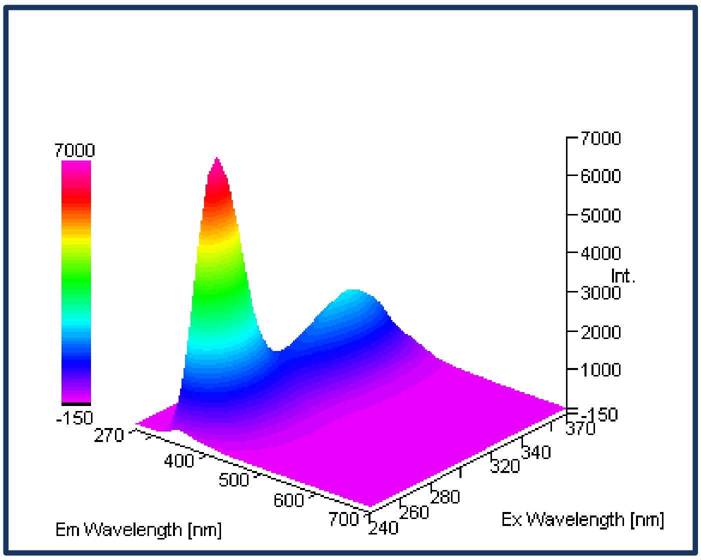


Figure S9. The dependence of the photoluminescence spectra on the excitation wavelength for compound **P5**.

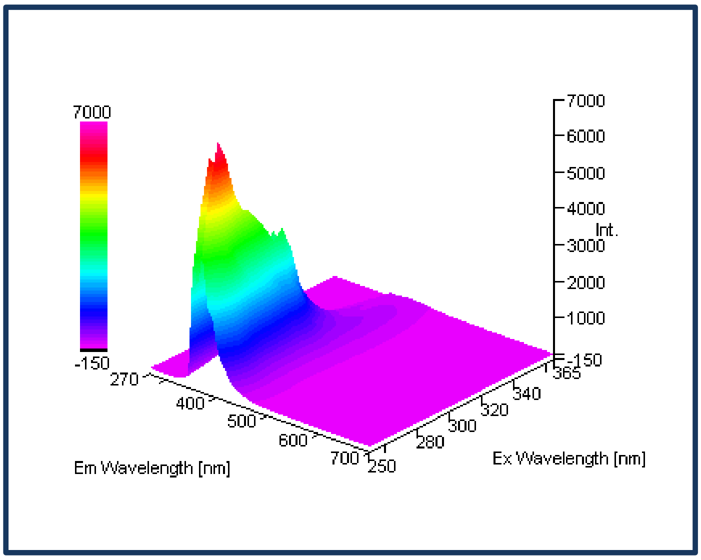


Figure S010. The dependence of the photoluminescence spectra on the excitation wavelength for compound **P9**.

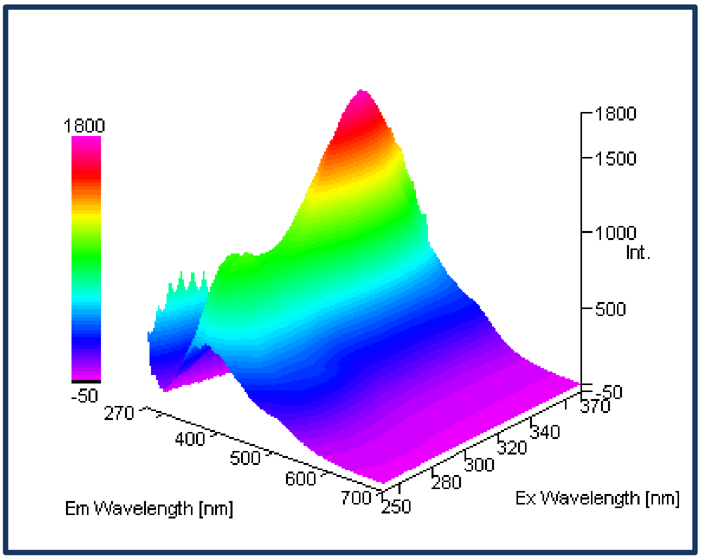


Figure S11. The dependence of the photoluminescence spectra on the excitation wavelength for compound **P7**.

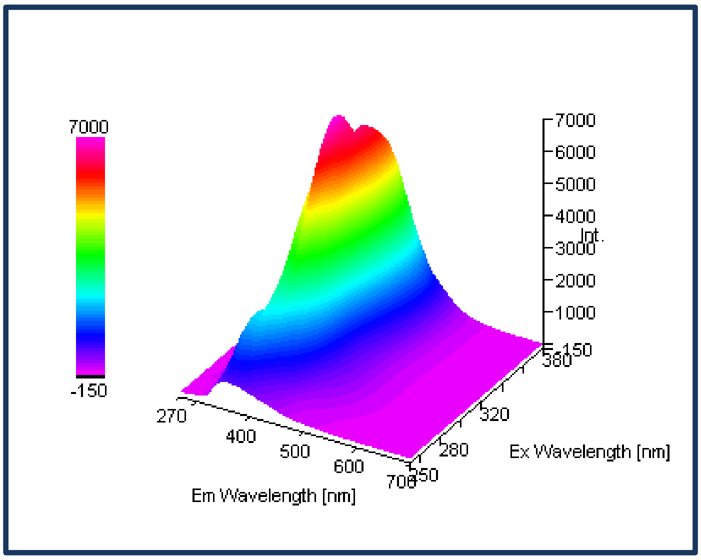


Figure S12. The dependence of the photoluminescence spectra on the excitation wavelength for compound **P10**.

3. NMR spectra of isolated products P1-P12

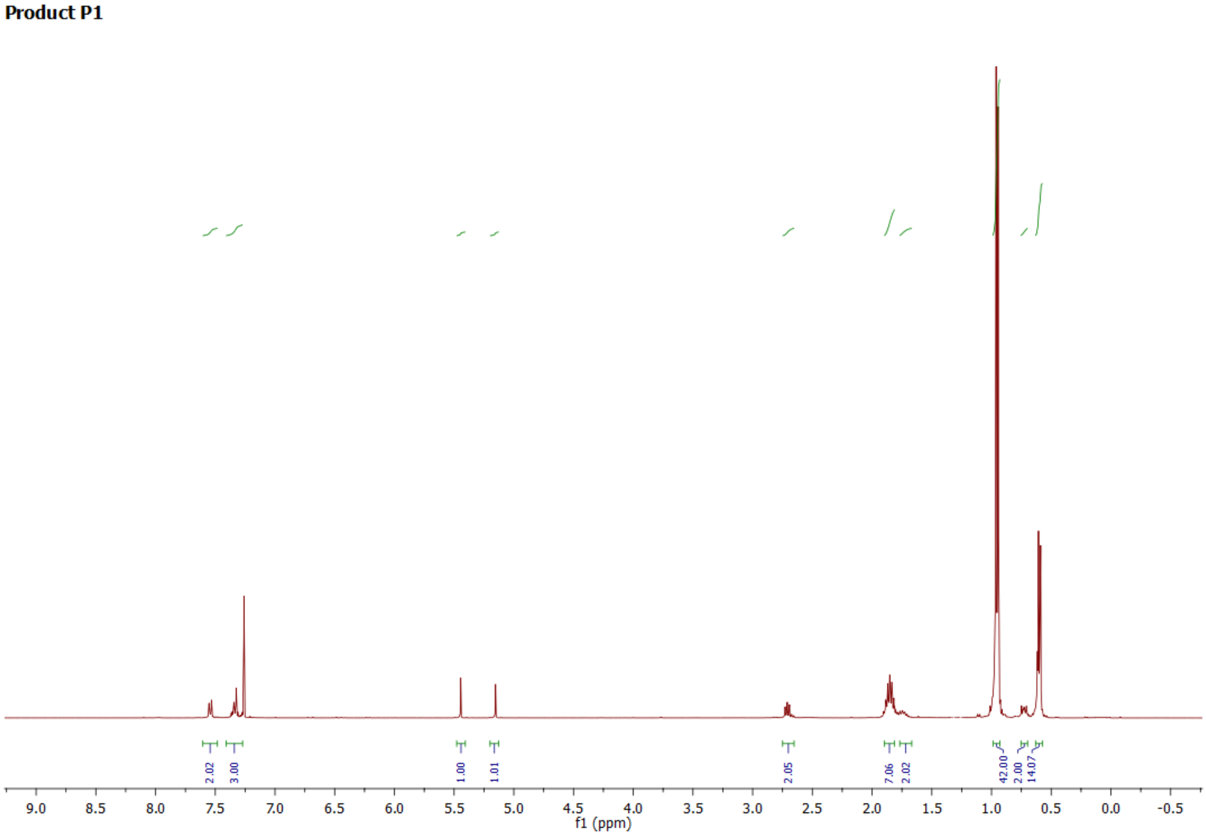


Figure S13. ^1H NMR (400 MHz, $CDCl_3$) of product **P1**

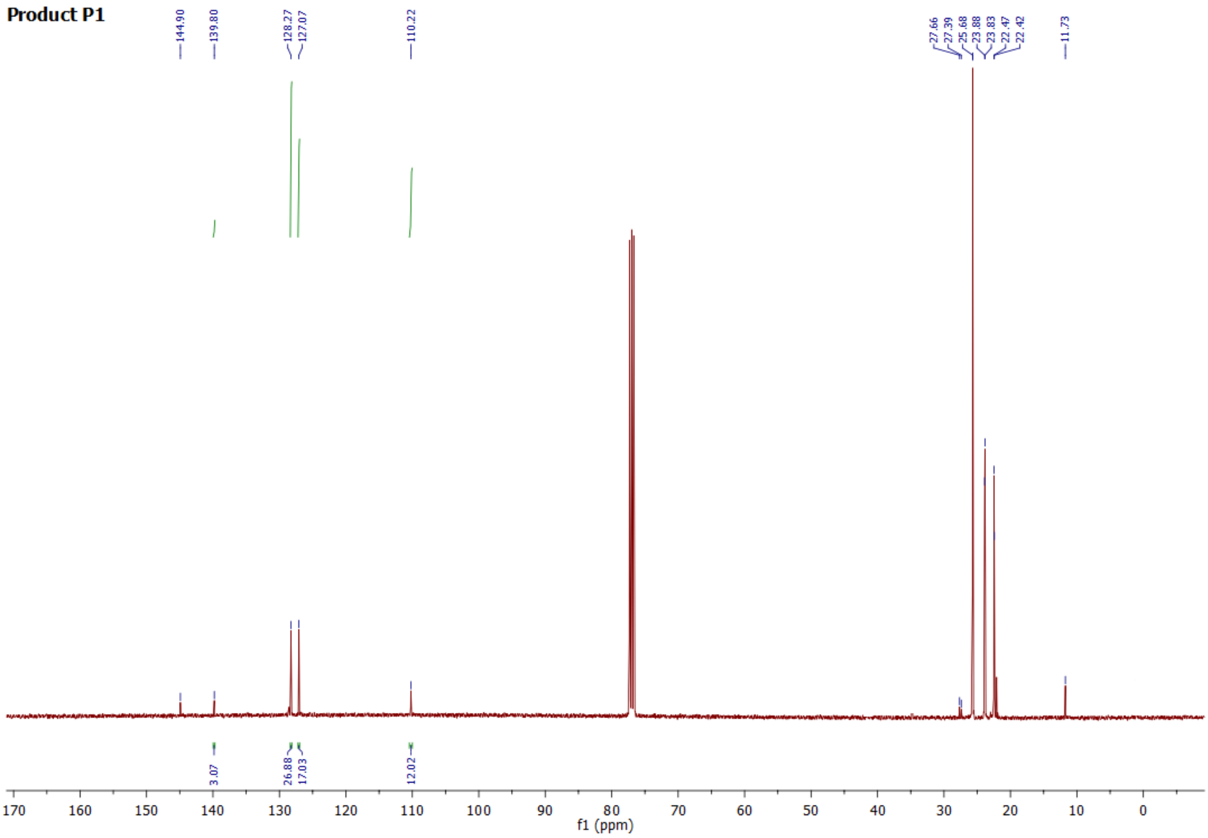


Figure S14. ^{13}C NMR (101 MHz, $CDCl_3$) of product **P1**

Product P1

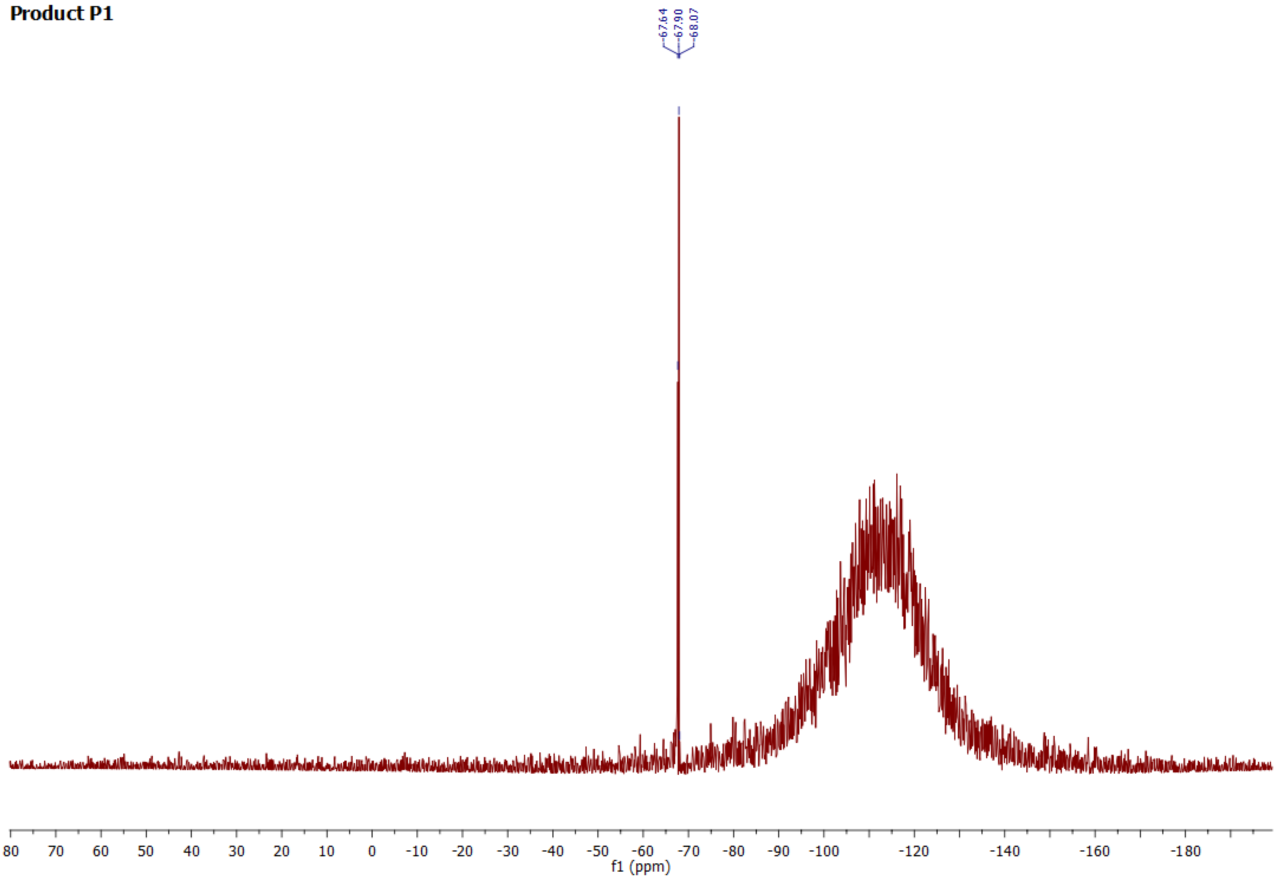


Figure S15. ^{29}Si NMR (79 MHz, $CDCl_3$) of product **P1**

Product 2

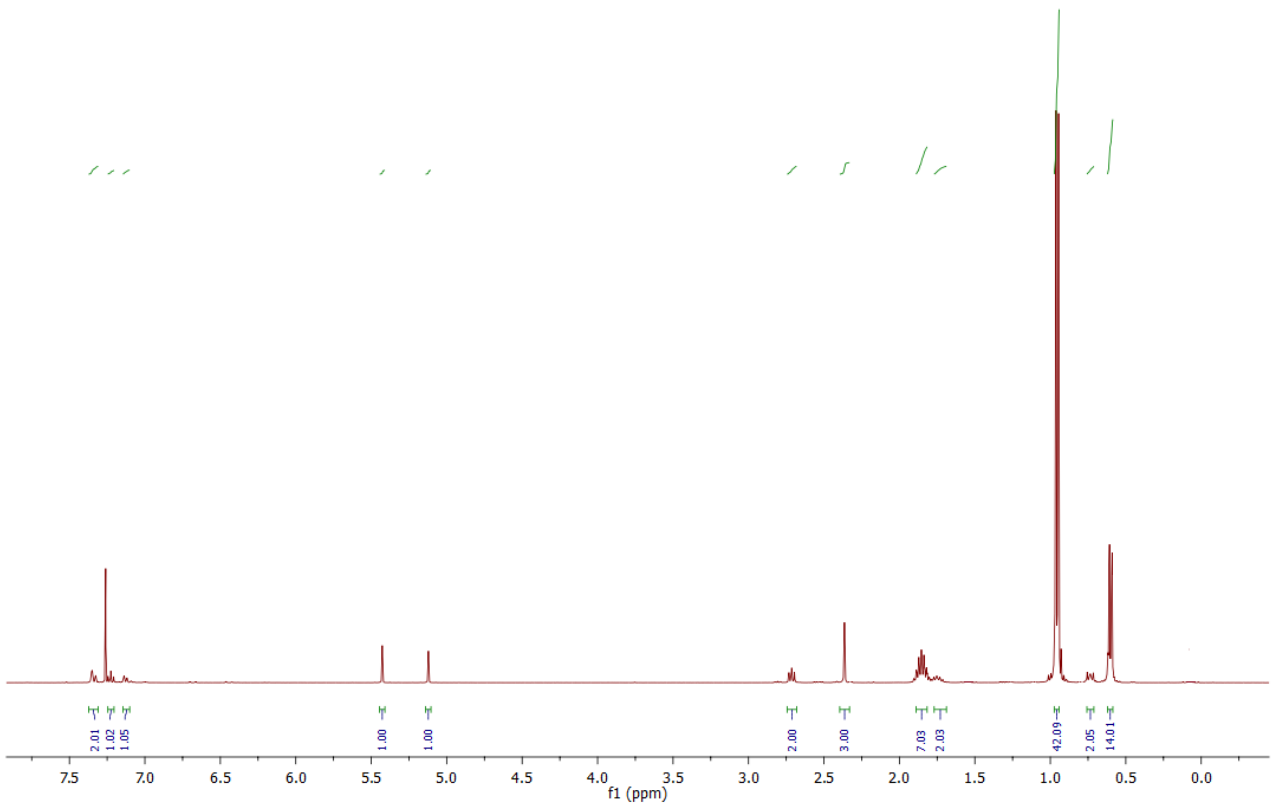


Figure S16. ^{1}H NMR (400 MHz, $CDCl_3$) of product **P2**

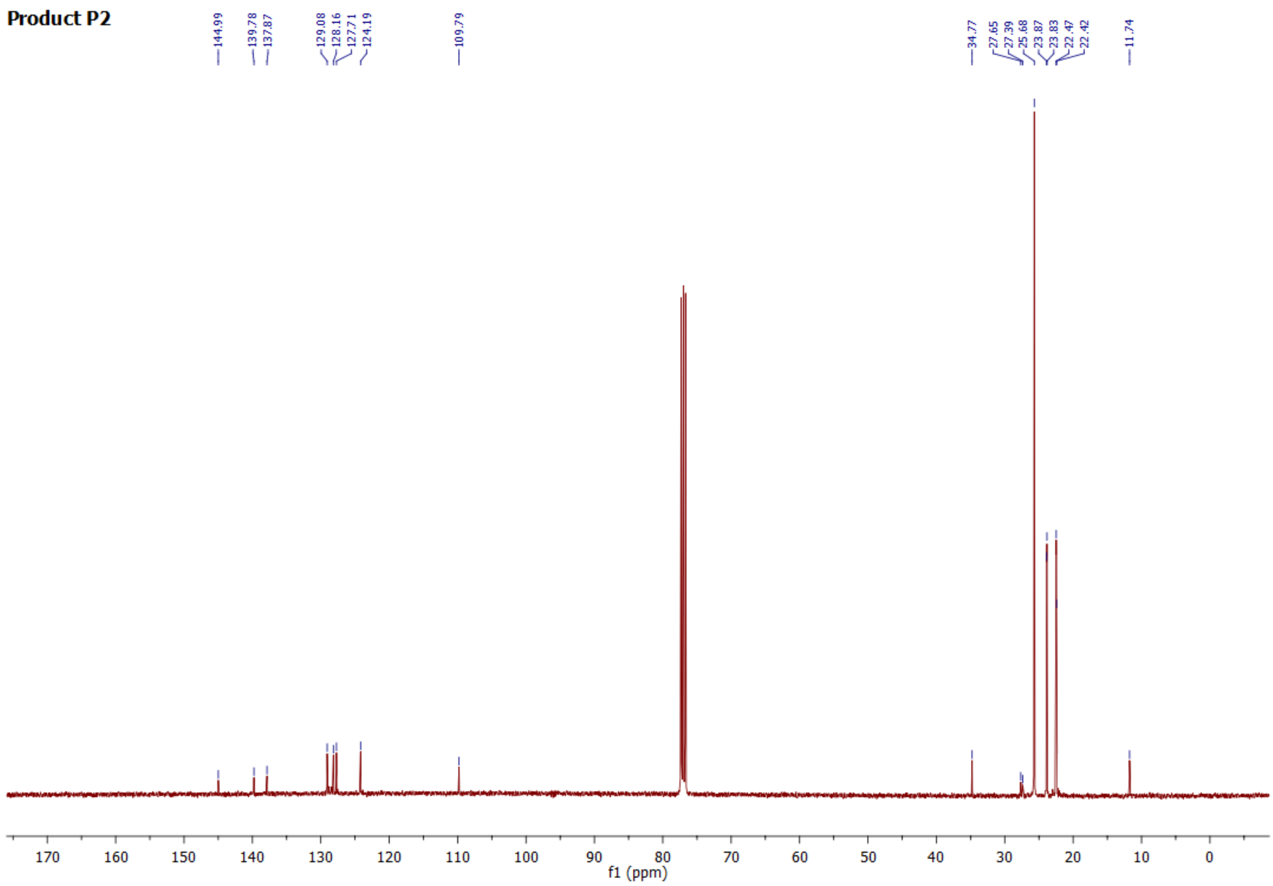


Figure S17. ^{13}C NMR (101 MHz, $CDCl_3$) of product **P2**

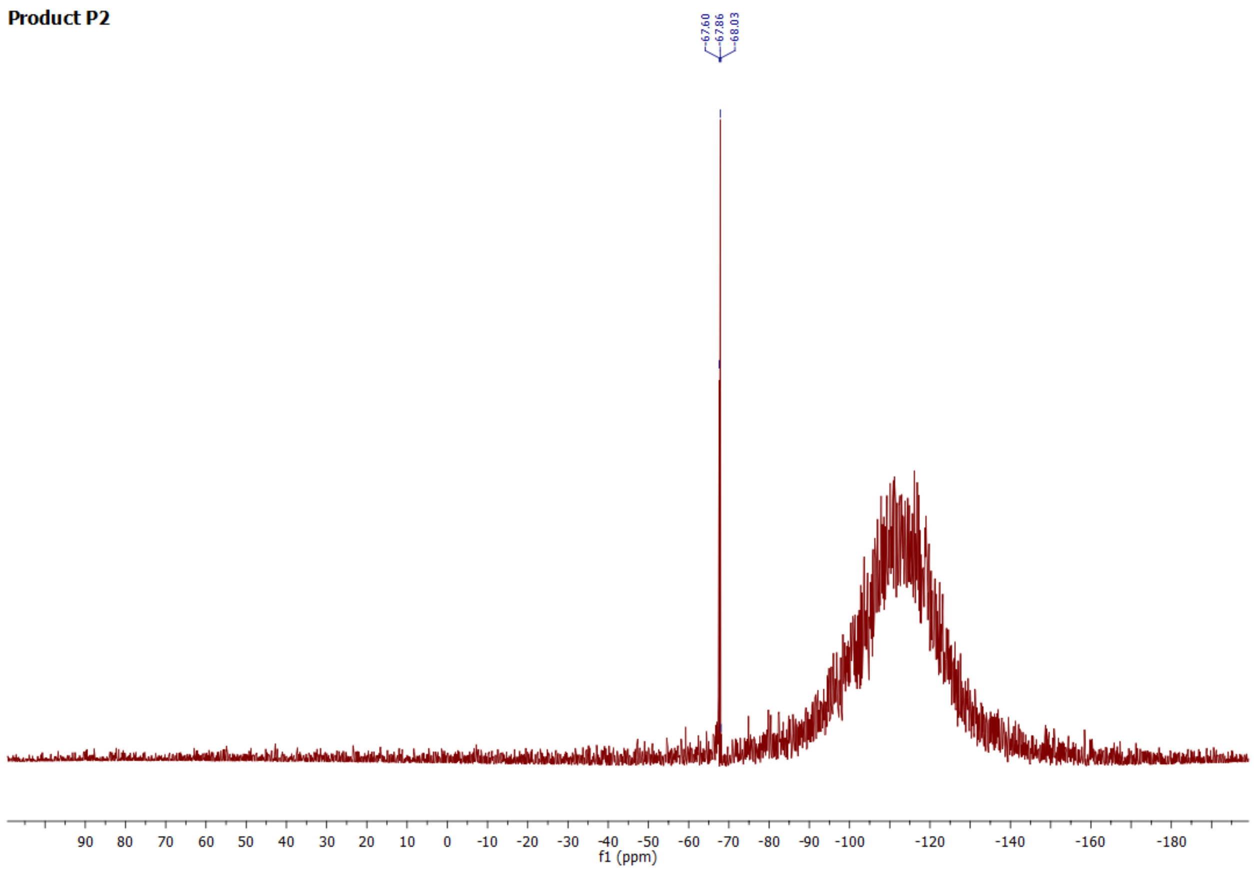


Figure S18. ^{29}Si NMR (79 MHz, $CDCl_3$) of product **P2**

Product P3

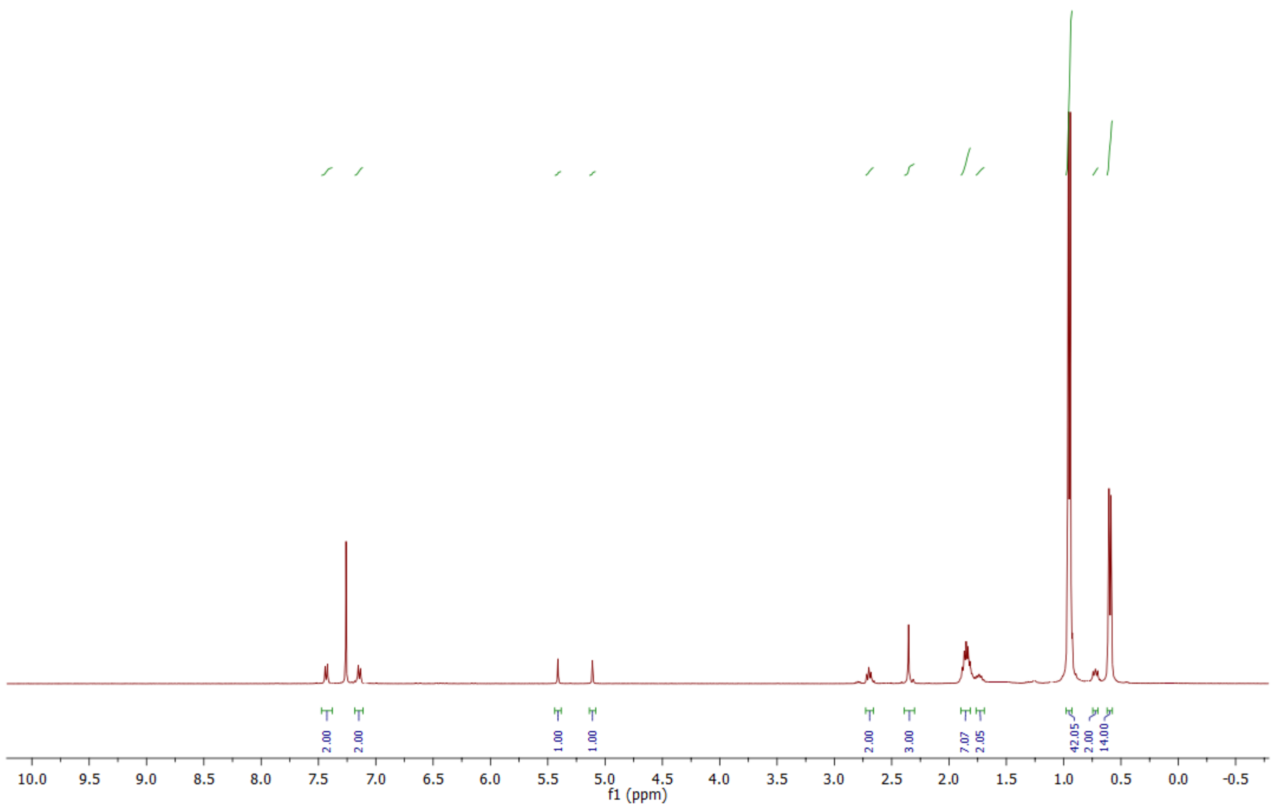


Figure S19. ^{1}H NMR (400 MHz, $CDCl_3$) of product **P3**

Product P3

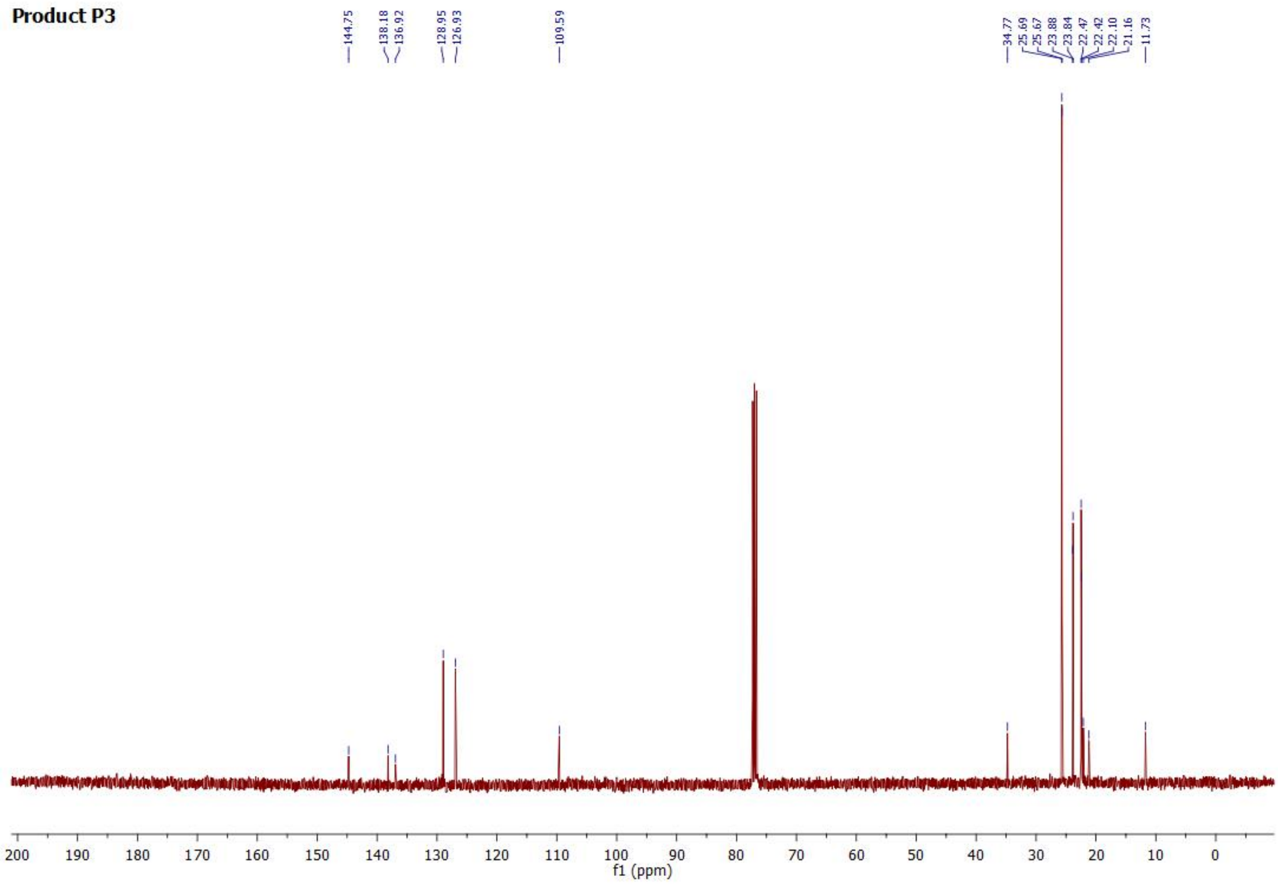


Figure S20. ^{13}C NMR (101 MHz, $CDCl_3$) of product **P3**

Product P3

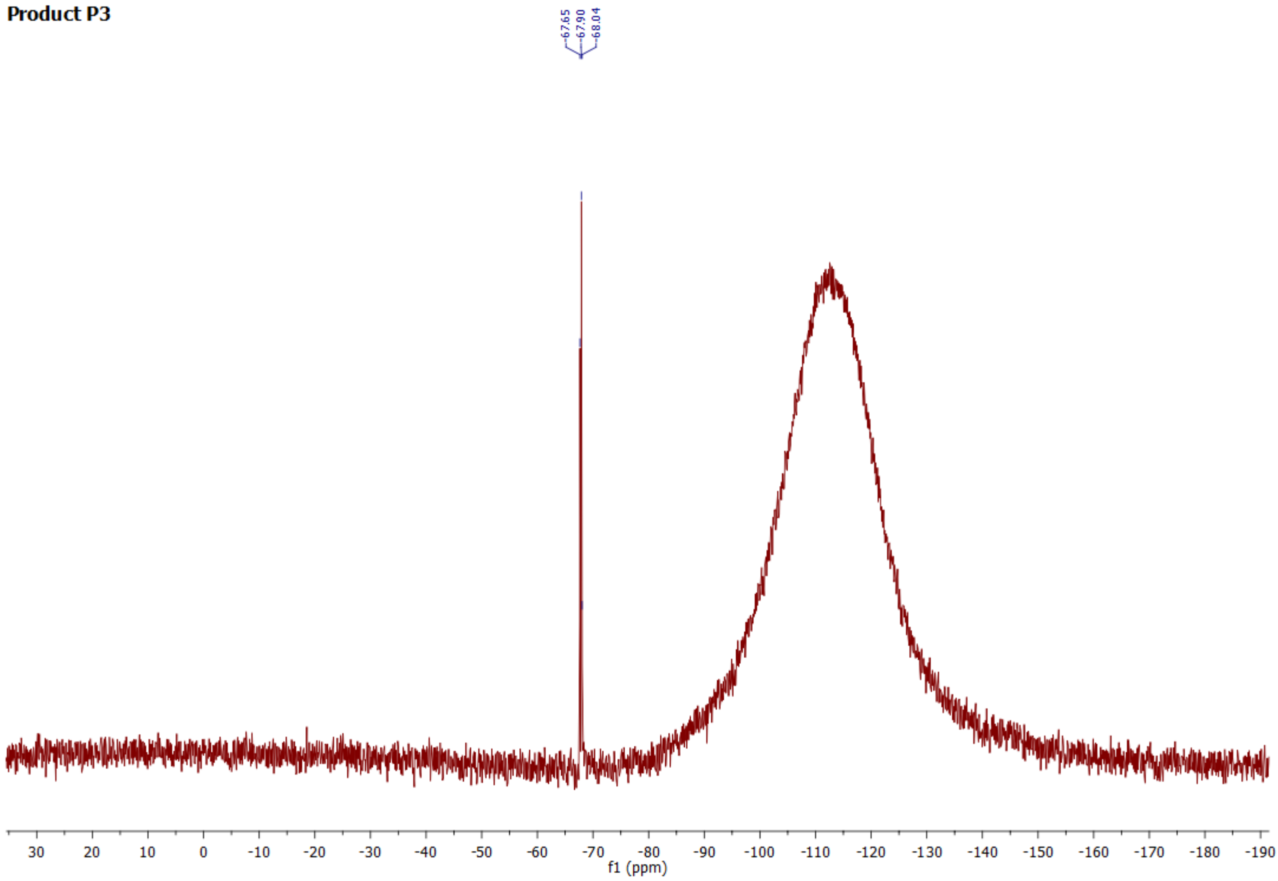


Figure S21. ^{29}Si NMR (79 MHz, $CDCl_3$) of product **P3**

Product P4

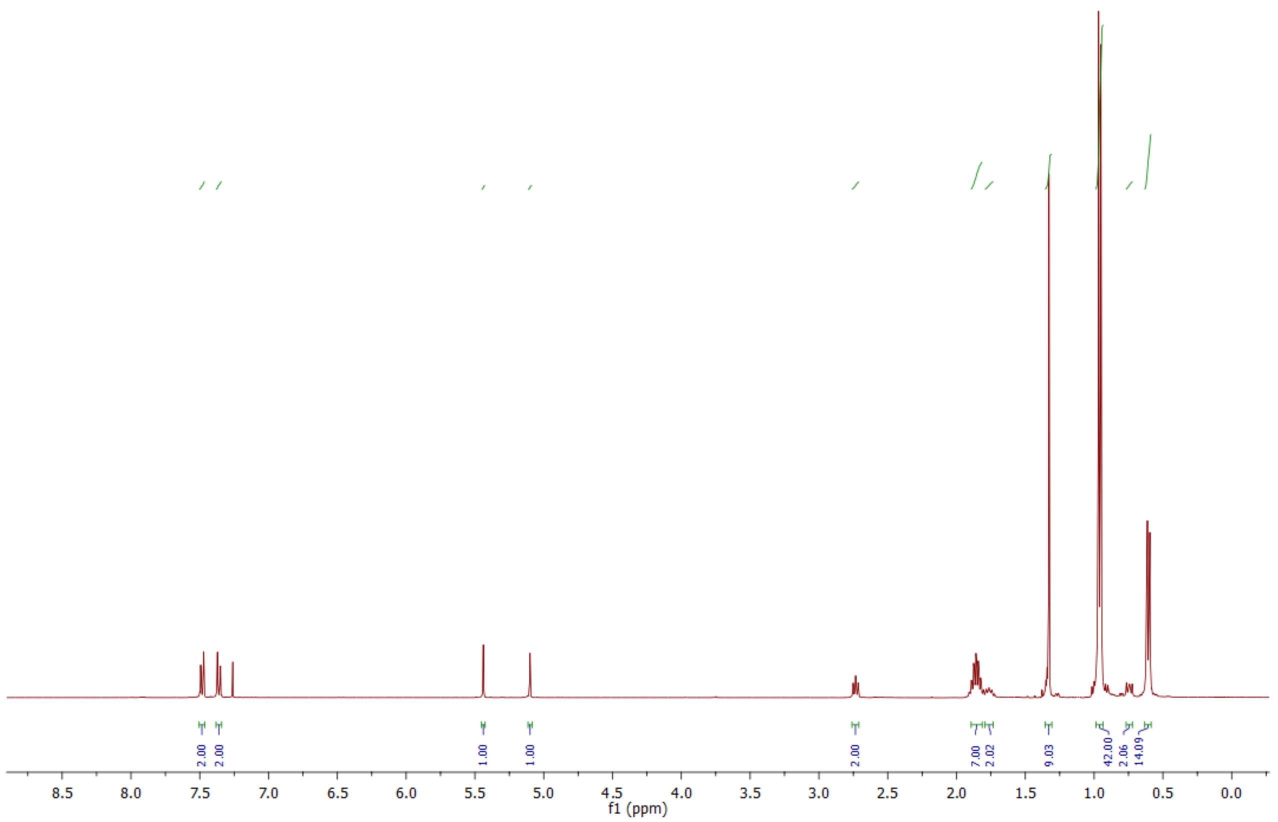


Figure S22. ^{1}H NMR (400 MHz, $CDCl_3$) of product **P4**

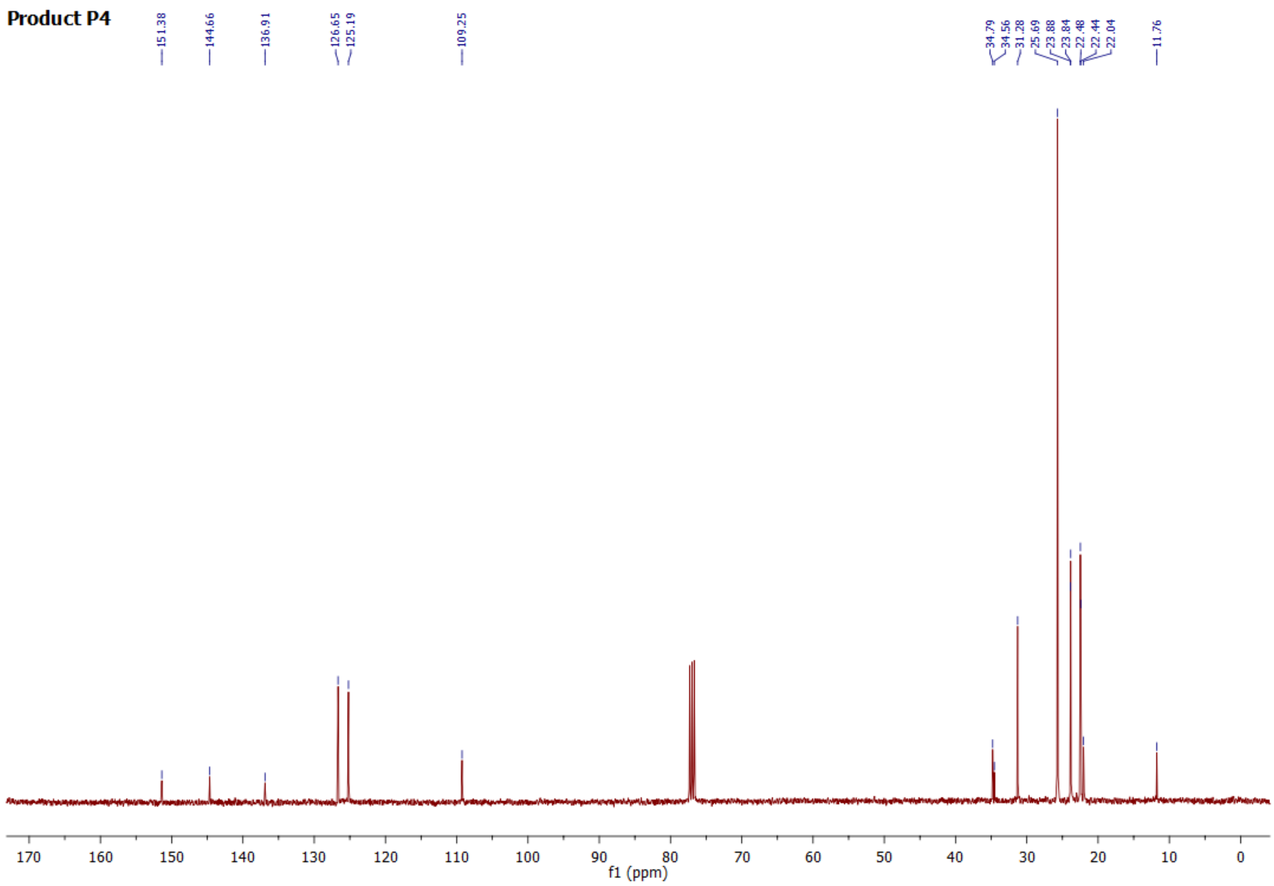


Figure S23. [13]C NMR (101 MHz, $CDCl_3$) of product **P4**

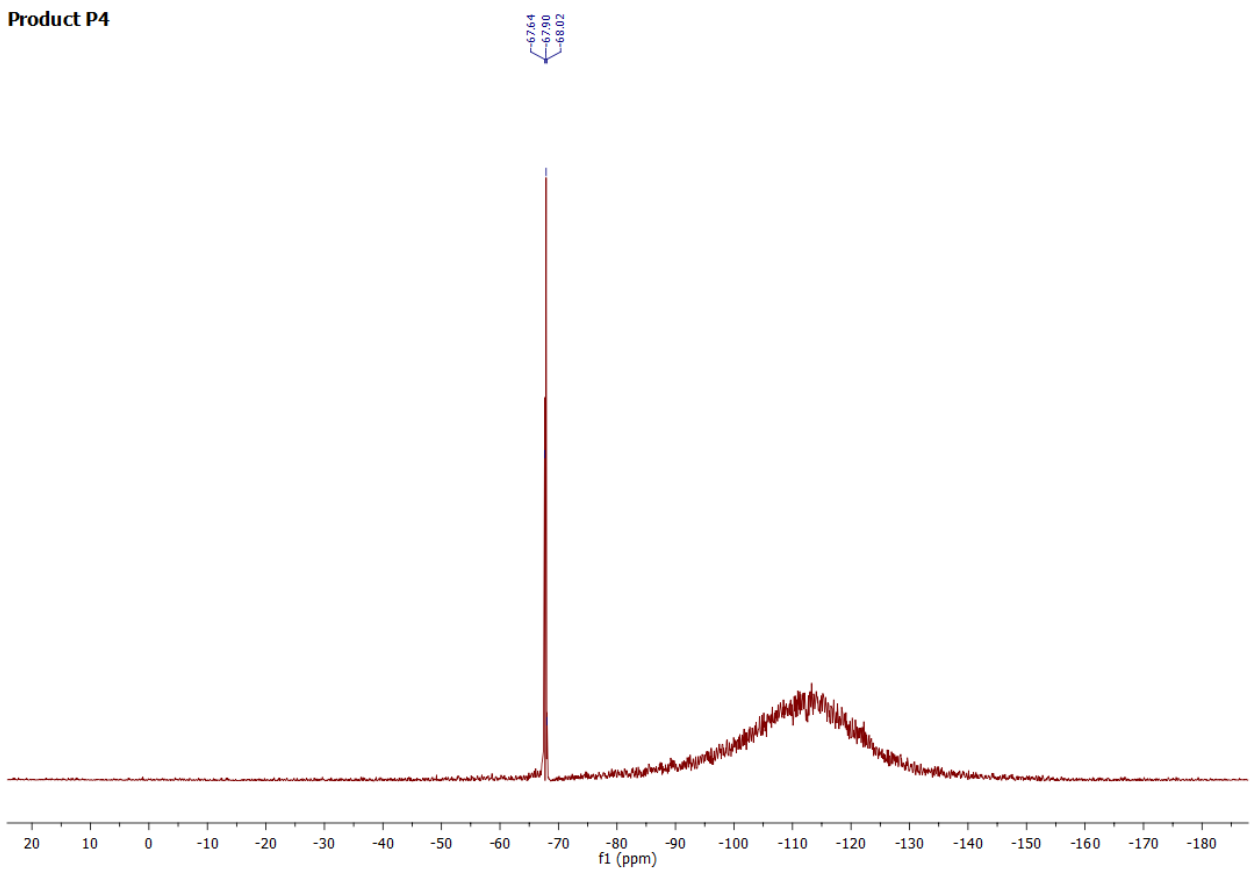


Figure S24. [29]Si NMR (79 MHz, $CDCl_3$) of product **P4**

Product P5

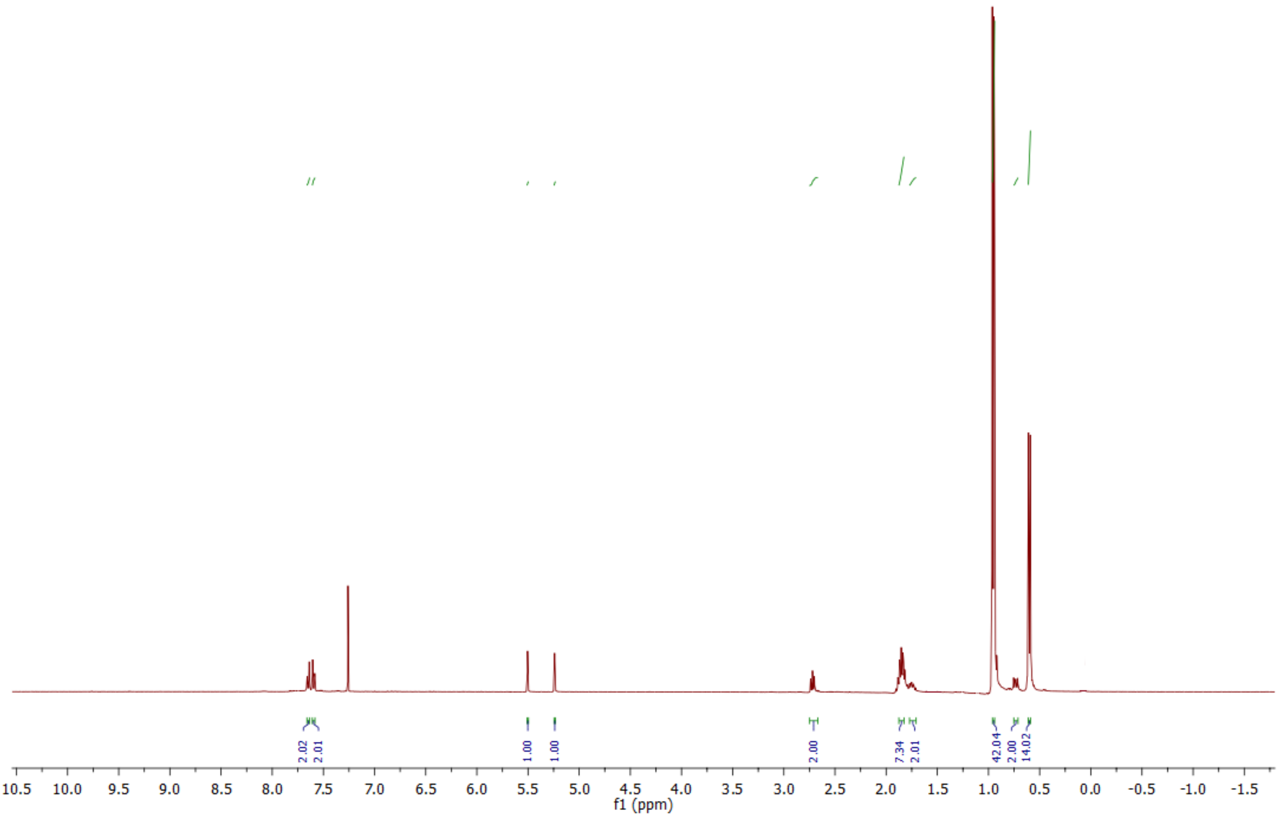


Figure S25. ^{1}H NMR (400 MHz, $CDCl_3$) of product **P5**

Product P5

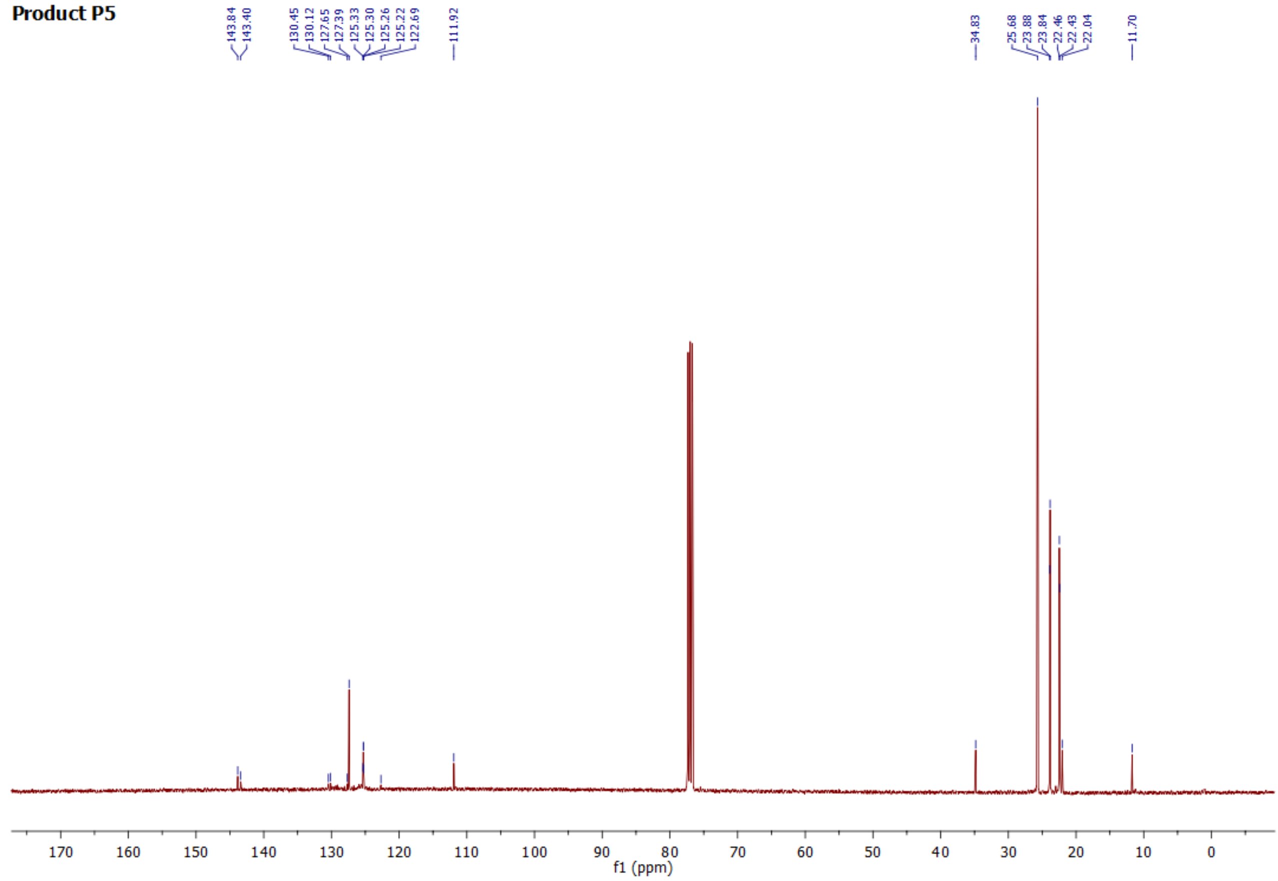


Figure S26. ^{13}C NMR (101 MHz, $CDCl_3$) of product **P5**

Product P5

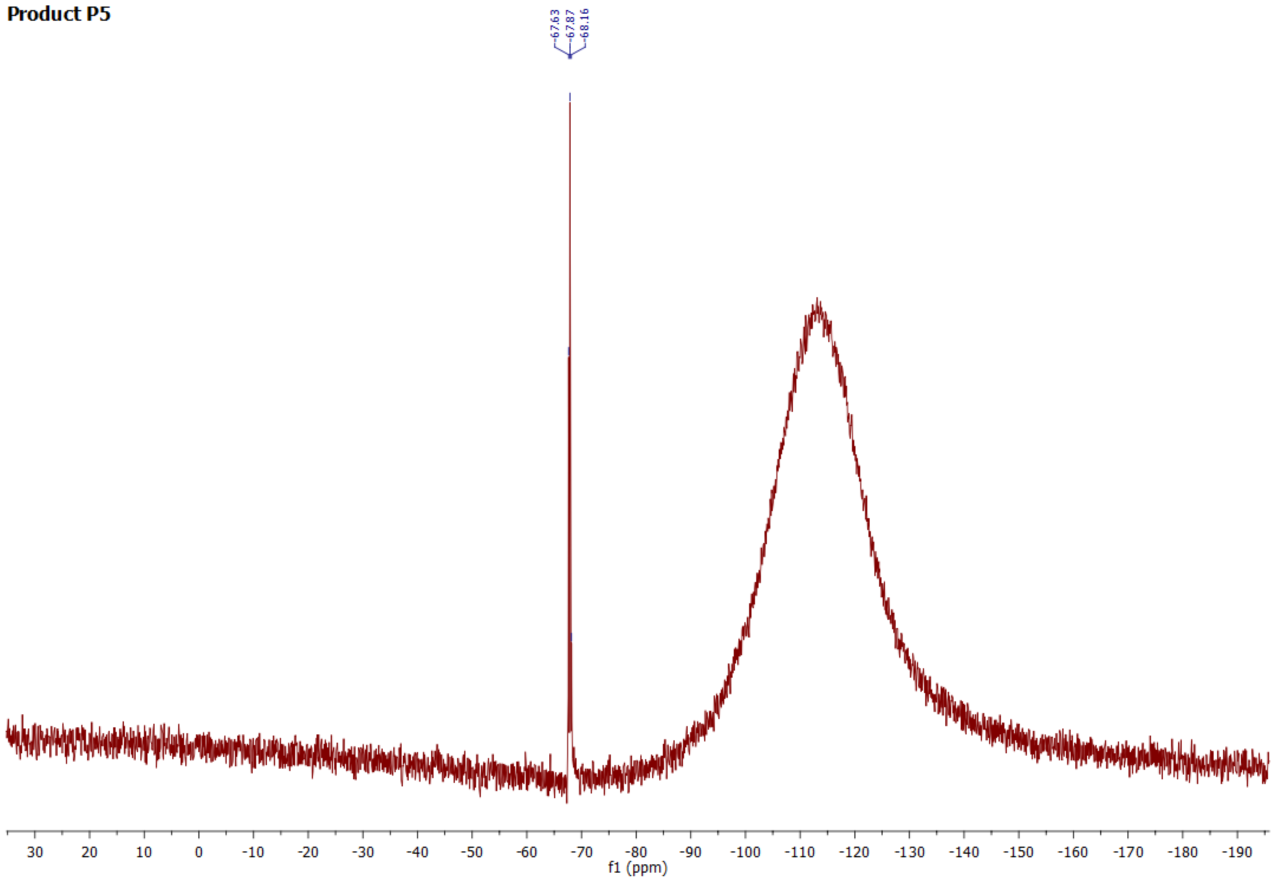


Figure S27. ^{29}Si NMR (79 MHz, $CDCl_3$) of product **P5**

Product P6

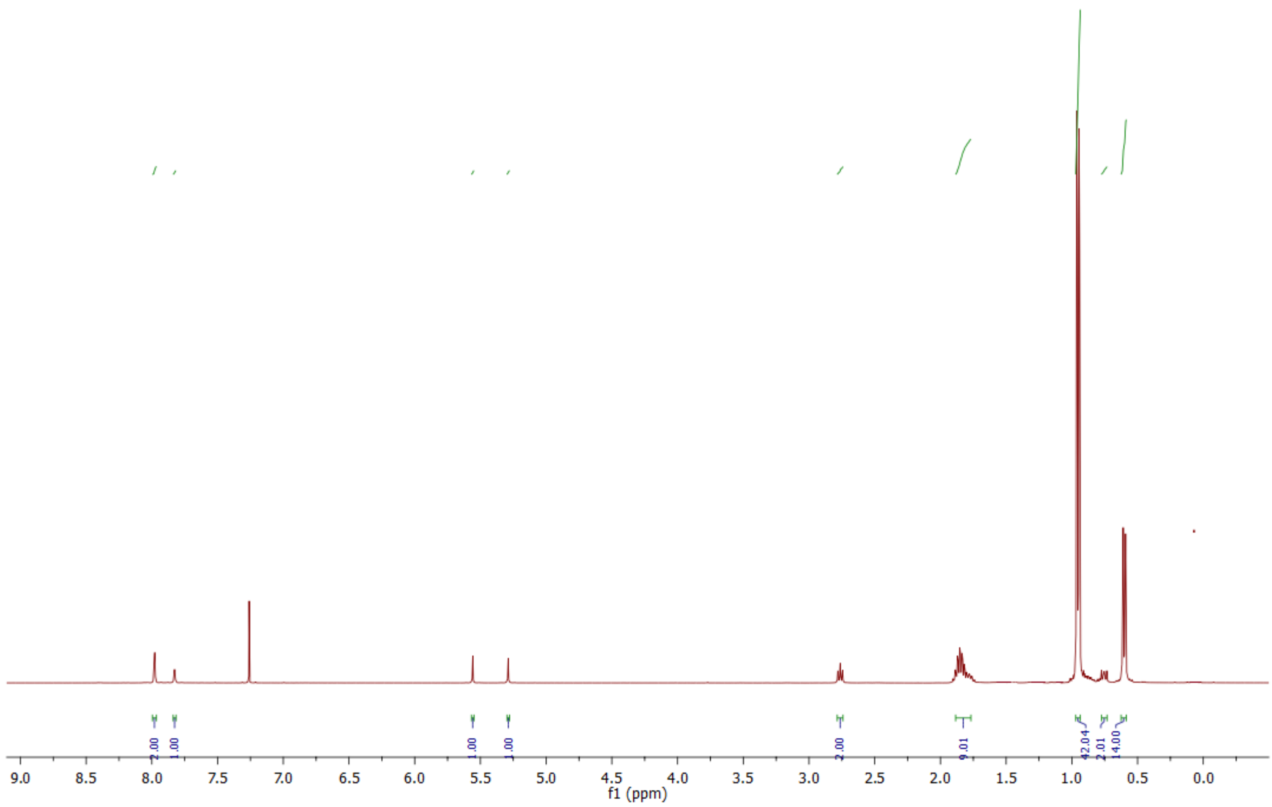


Figure S28. ^{1}H NMR (400 MHz, $CDCl_3$) of product **P6**

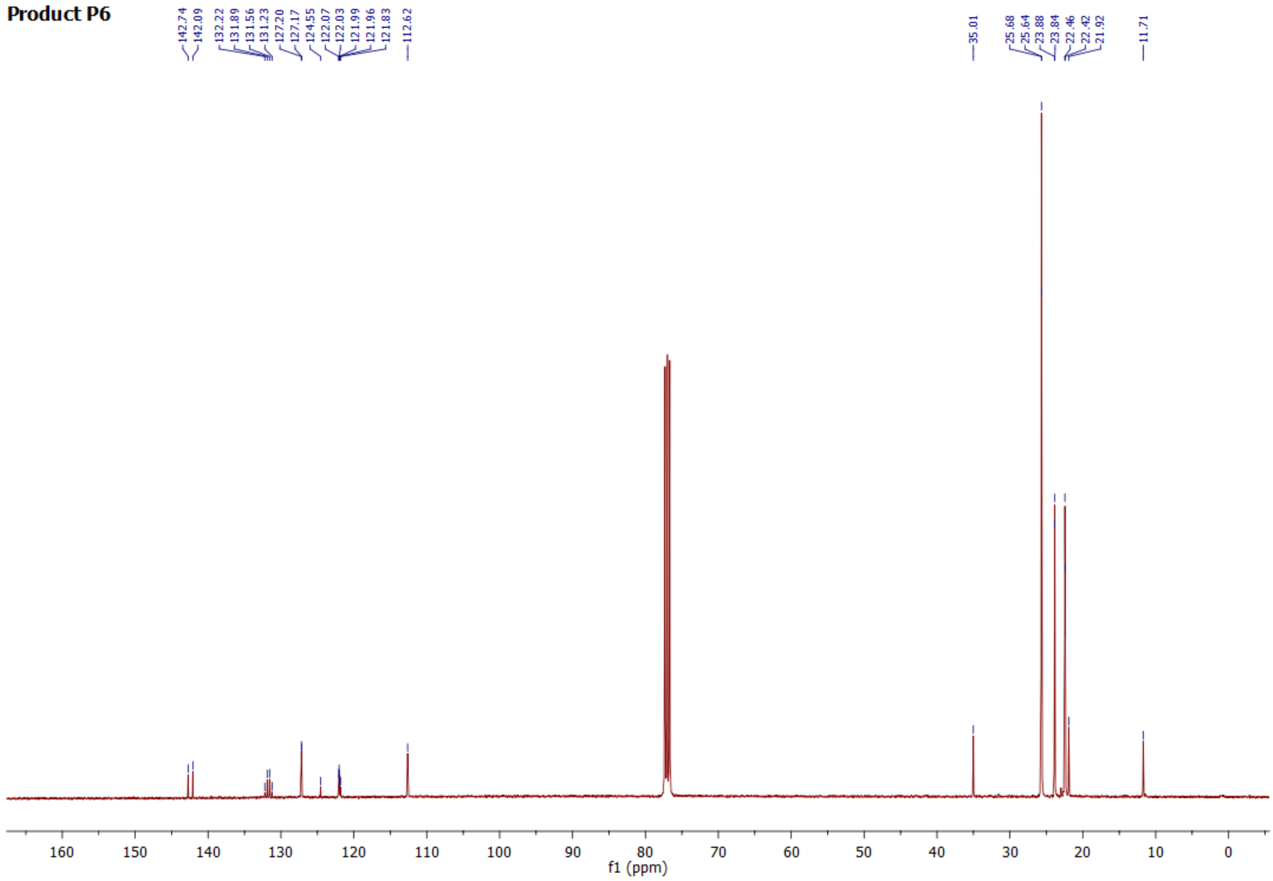


Figure S29. ^{13}C NMR (101 MHz, $CDCl_3$) of product **P6**

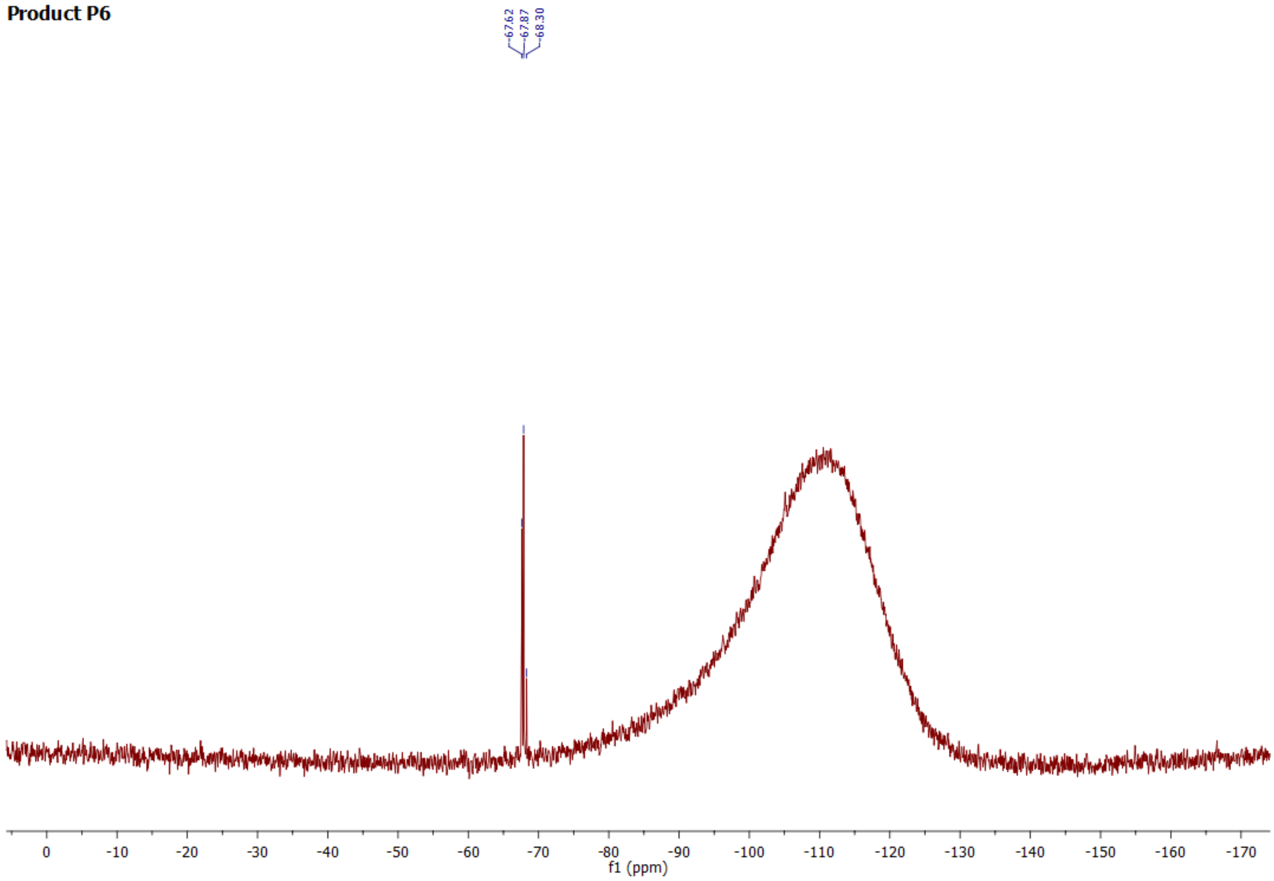


Figure S30. ^{29}Si NMR (79 MHz, $CDCl_3$) of product **P6**

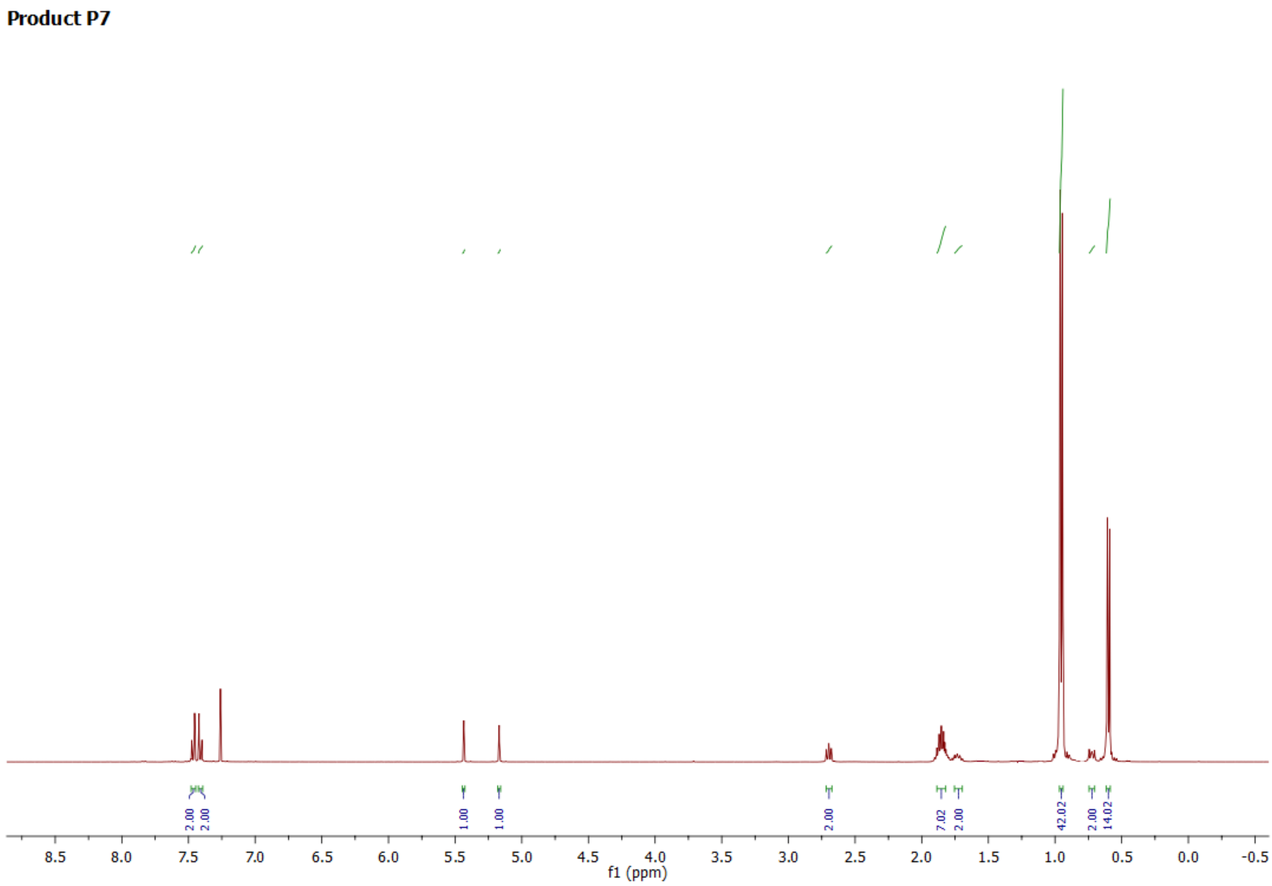


Figure S31. ^{1}H NMR (400 MHz, $CDCl_3$) of product **P7**

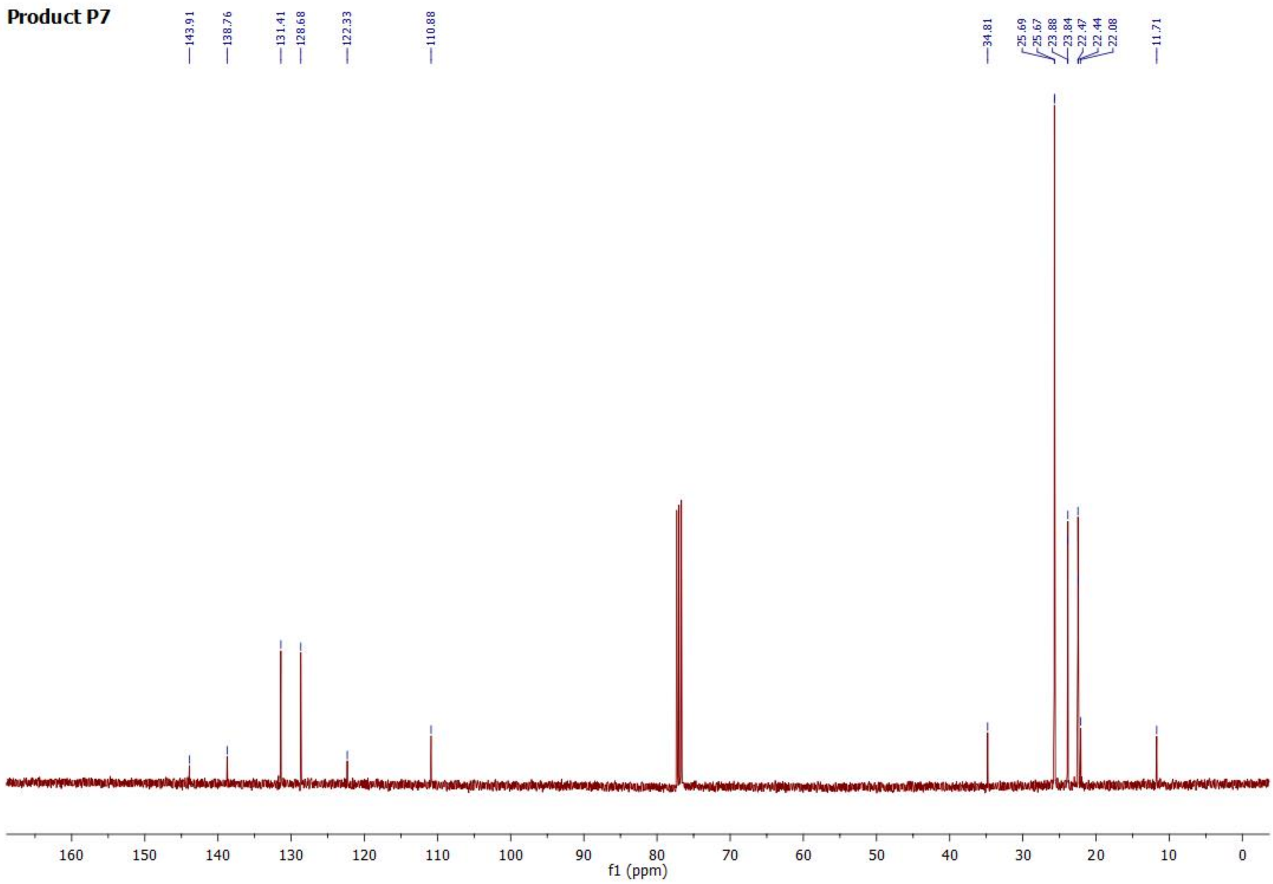


Figure S32. ^{13}C NMR (101 MHz, $CDCl_3$) of product **P7**

Product P7

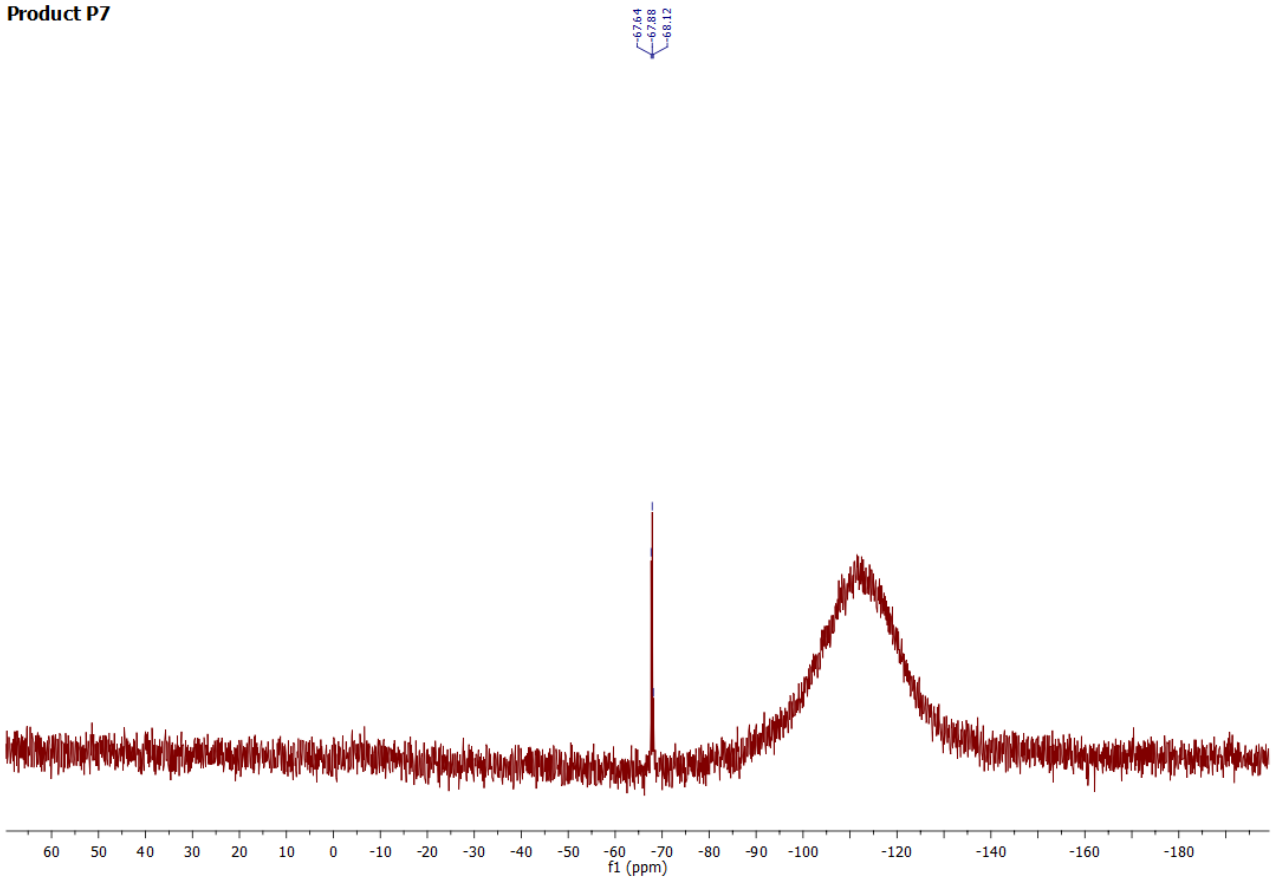


Figure S33. ^{29}Si NMR (79 MHz, $CDCl_3$) of product **P7**

Product P8

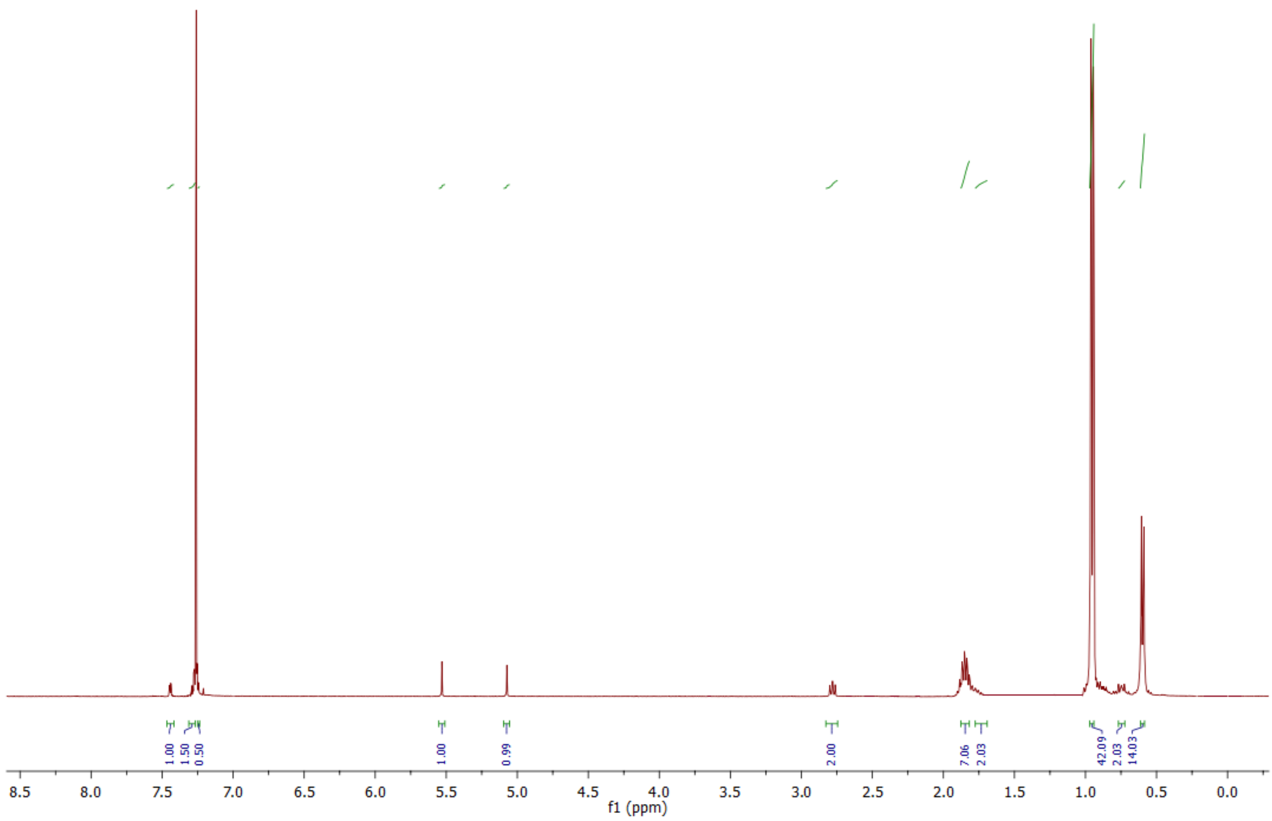


Figure S34. ^{1}H NMR (400 MHz, $CDCl_3$) of product **P8**

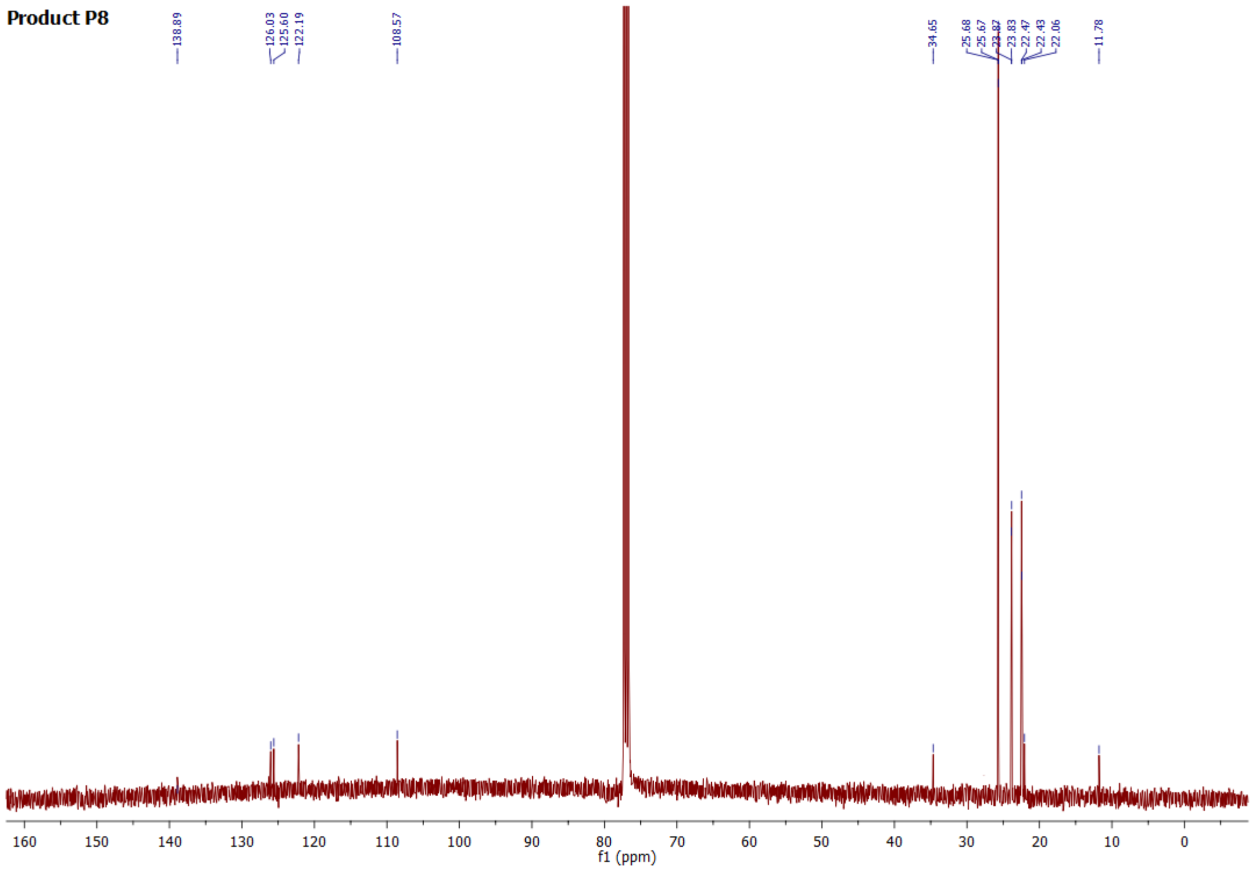


Figure S35. ^{13}C NMR (101 MHz, $CDCl_3$) of product **P8**

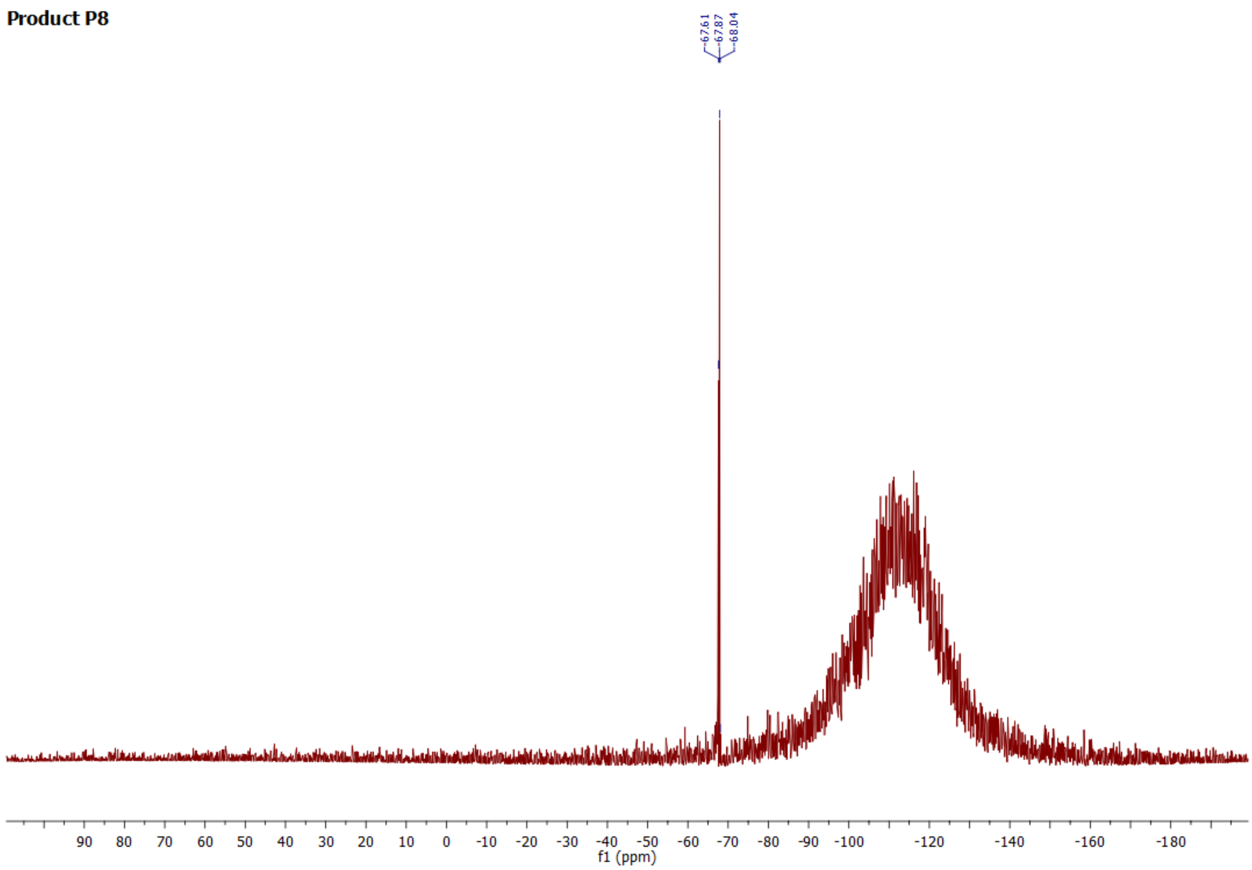


Figure S36. ^{29}Si NMR (79 MHz, $CDCl_3$) of product **P8**

Product P9

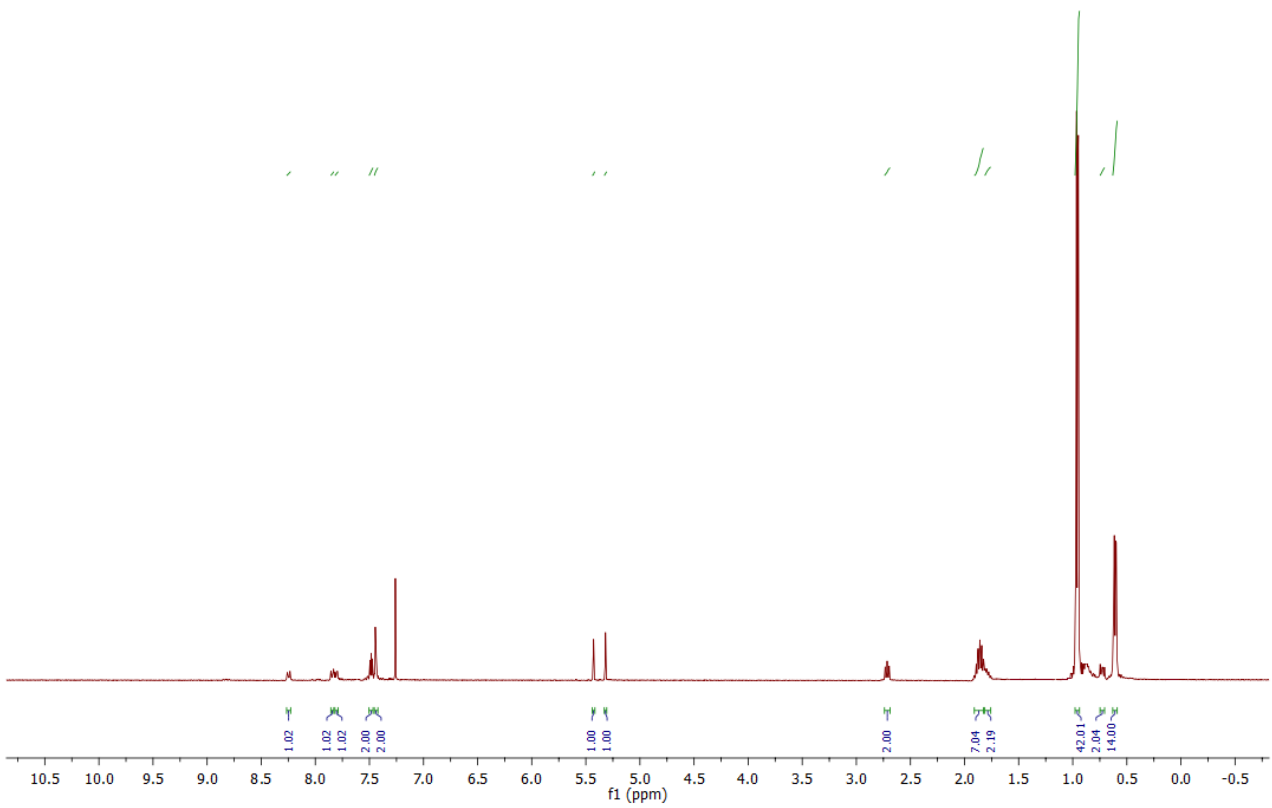


Figure S37. ^{1}H NMR (400 MHz, $CDCl_3$) of product **P9**

Product P9

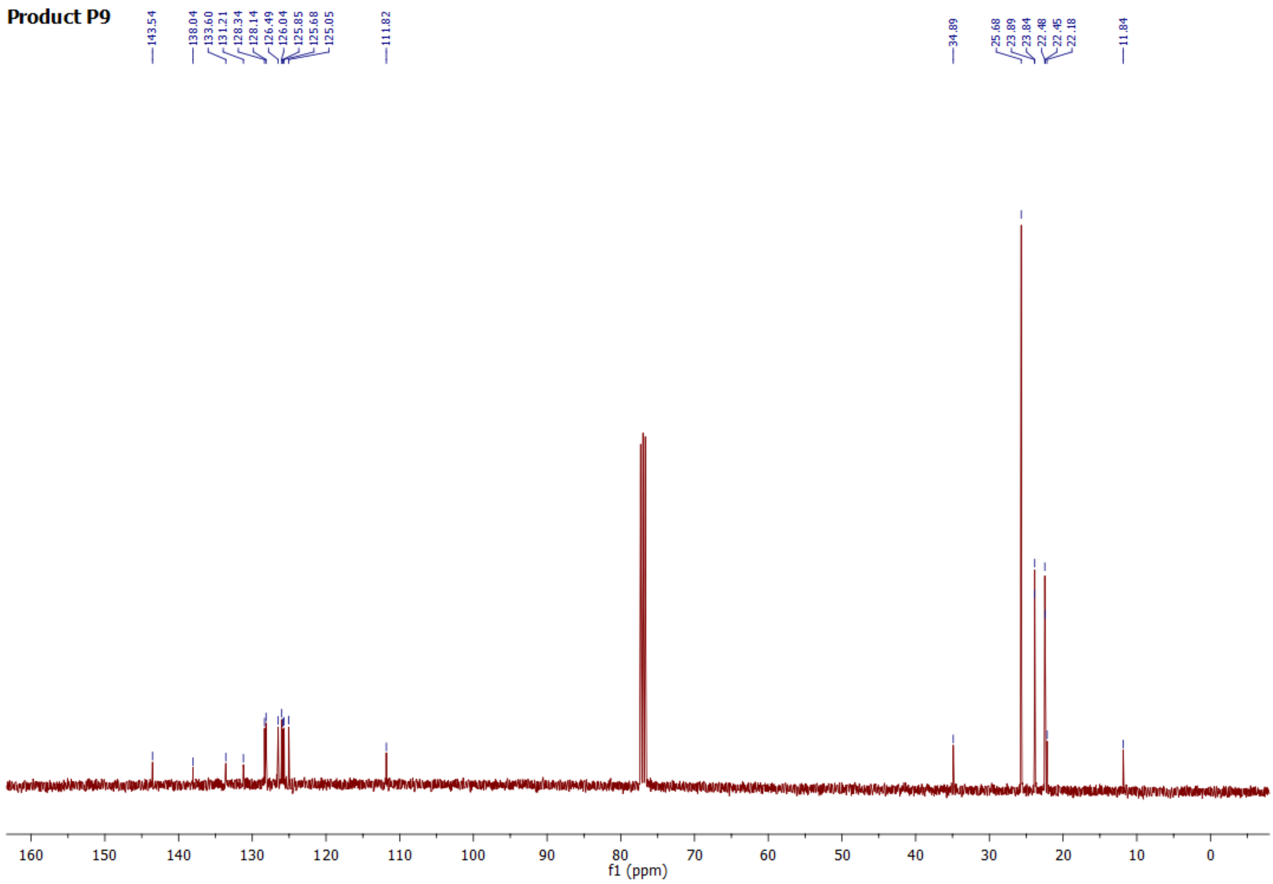


Figure S38. ^{13}C NMR (101 MHz, $CDCl_3$) of product **P9**

Product P9

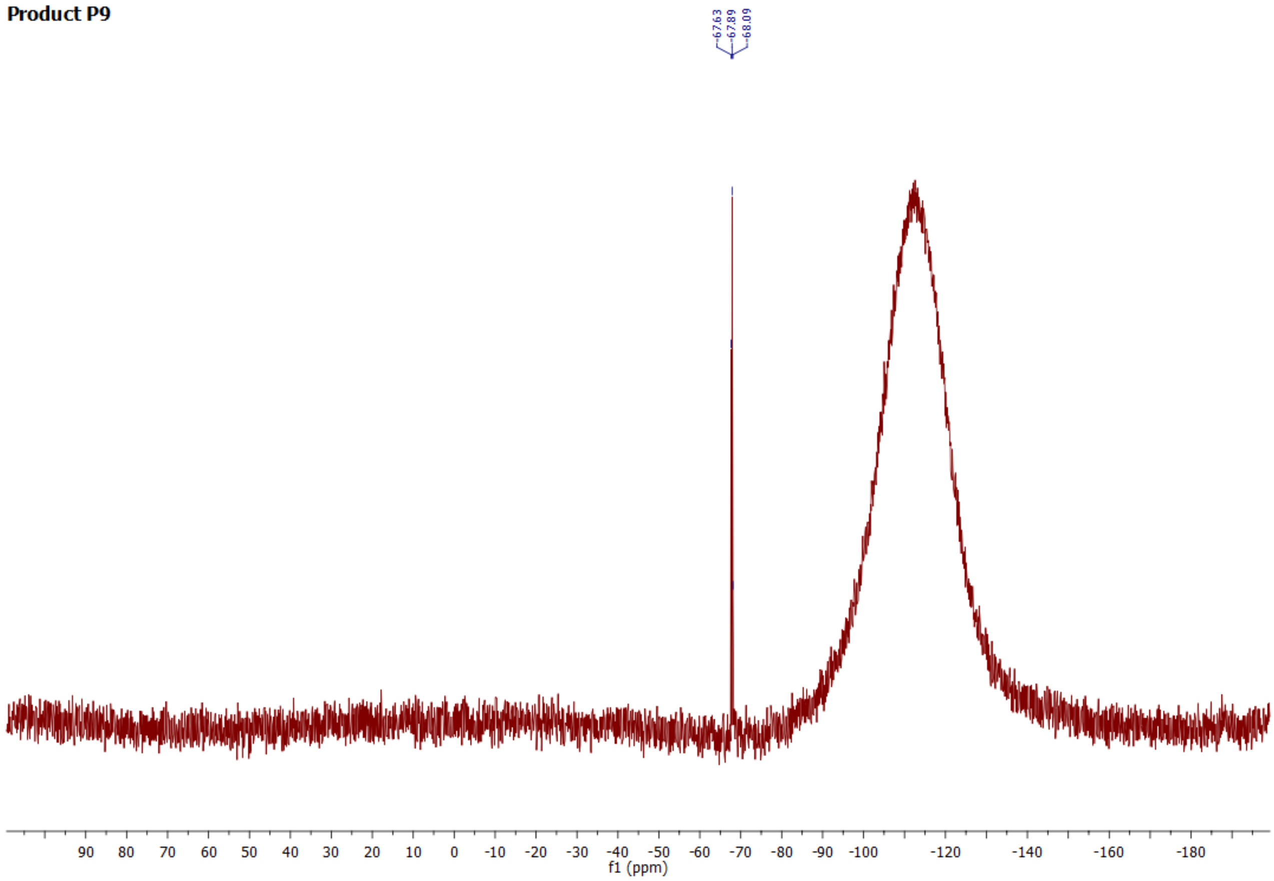


Figure S39. ^{29}Si NMR (79 MHz, $CDCl_3$) of product **P9**

Prodcuct P10

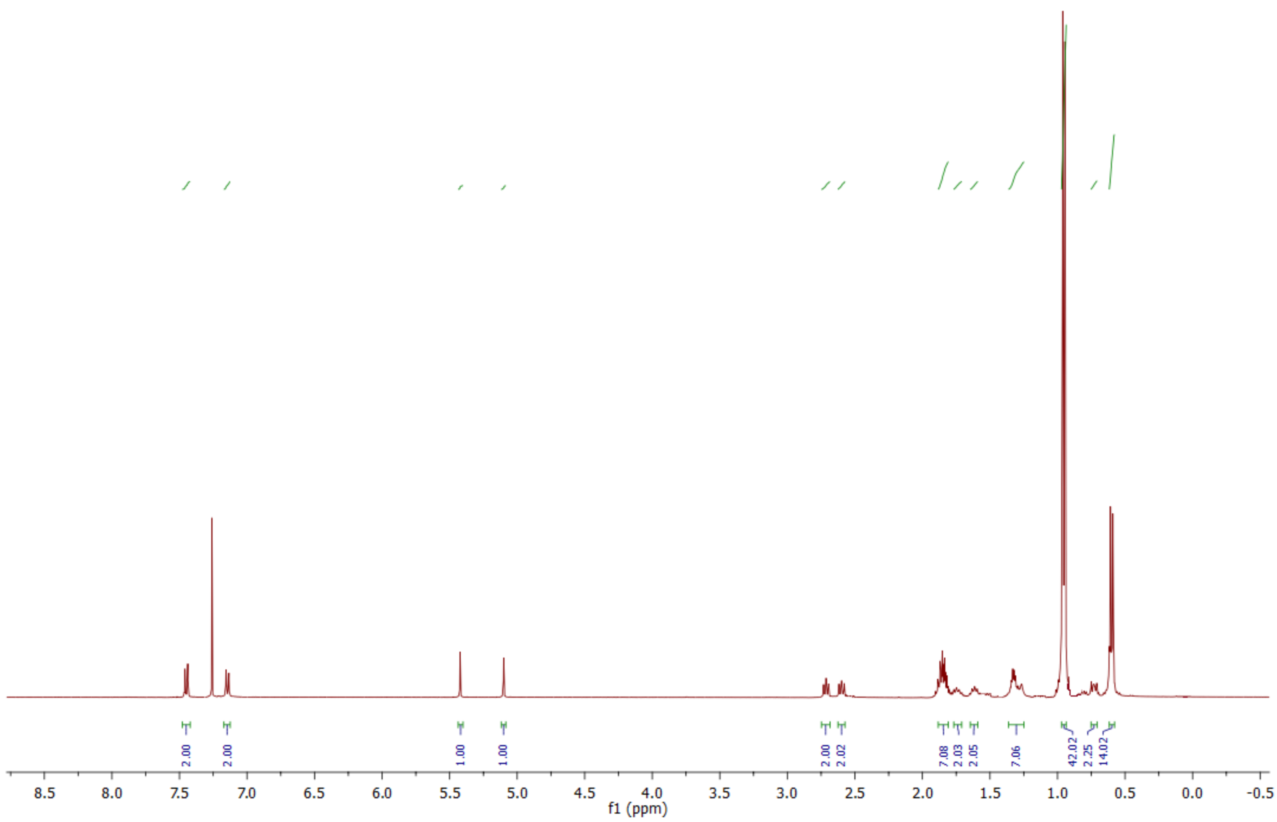


Figure S40. ^{1}H NMR (400 MHz, $CDCl_3$) of product **P10**

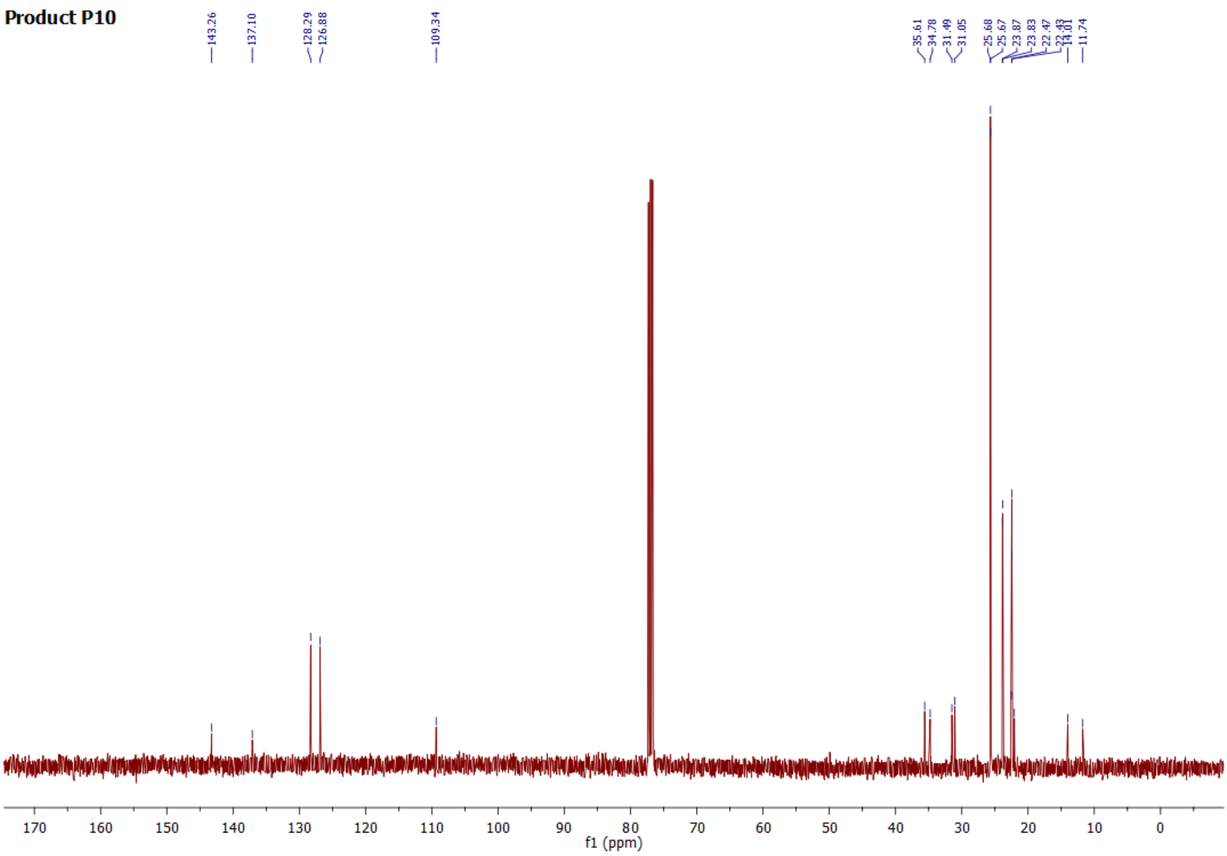


Figure S41. ^{13}C NMR (101 MHz, $CDCl_3$) of product **P10**

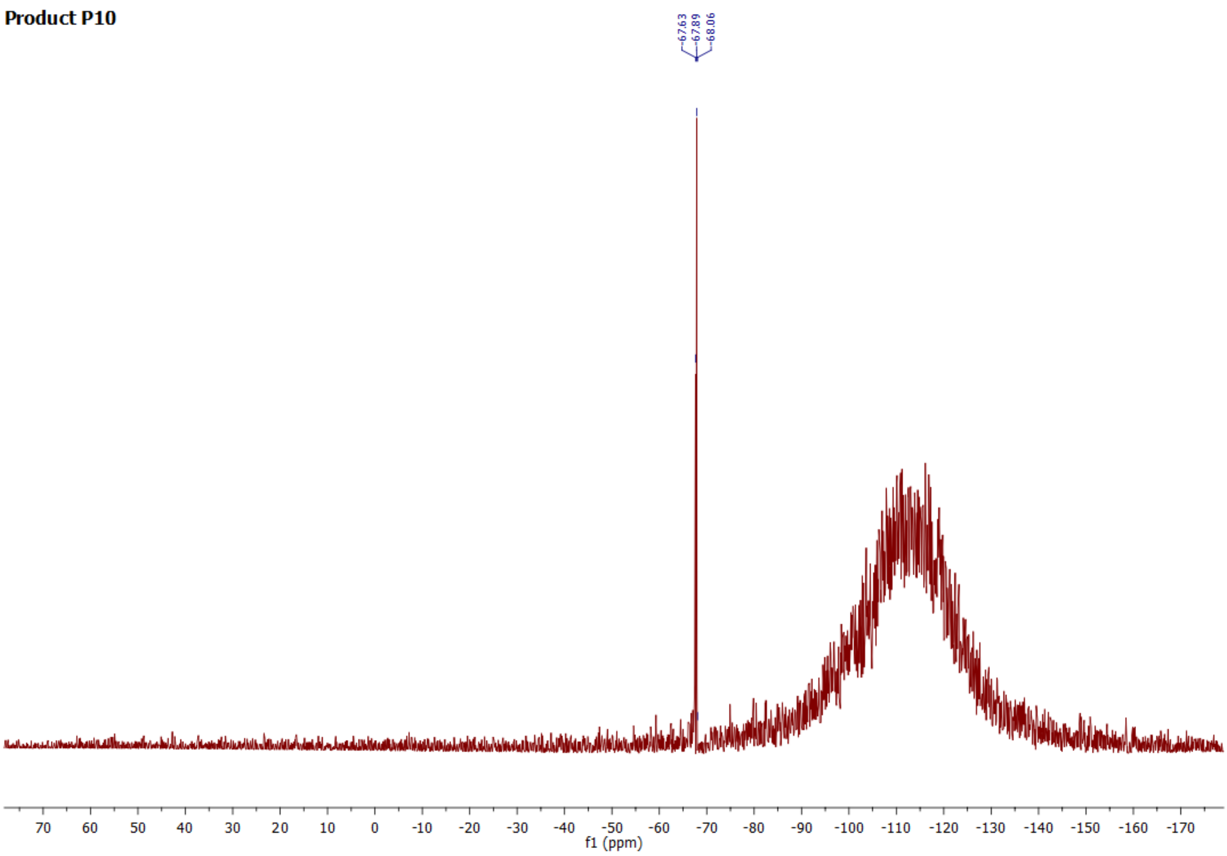


Figure S42. ^{29}Si NMR (79 MHz, $CDCl_3$) of product **P10**

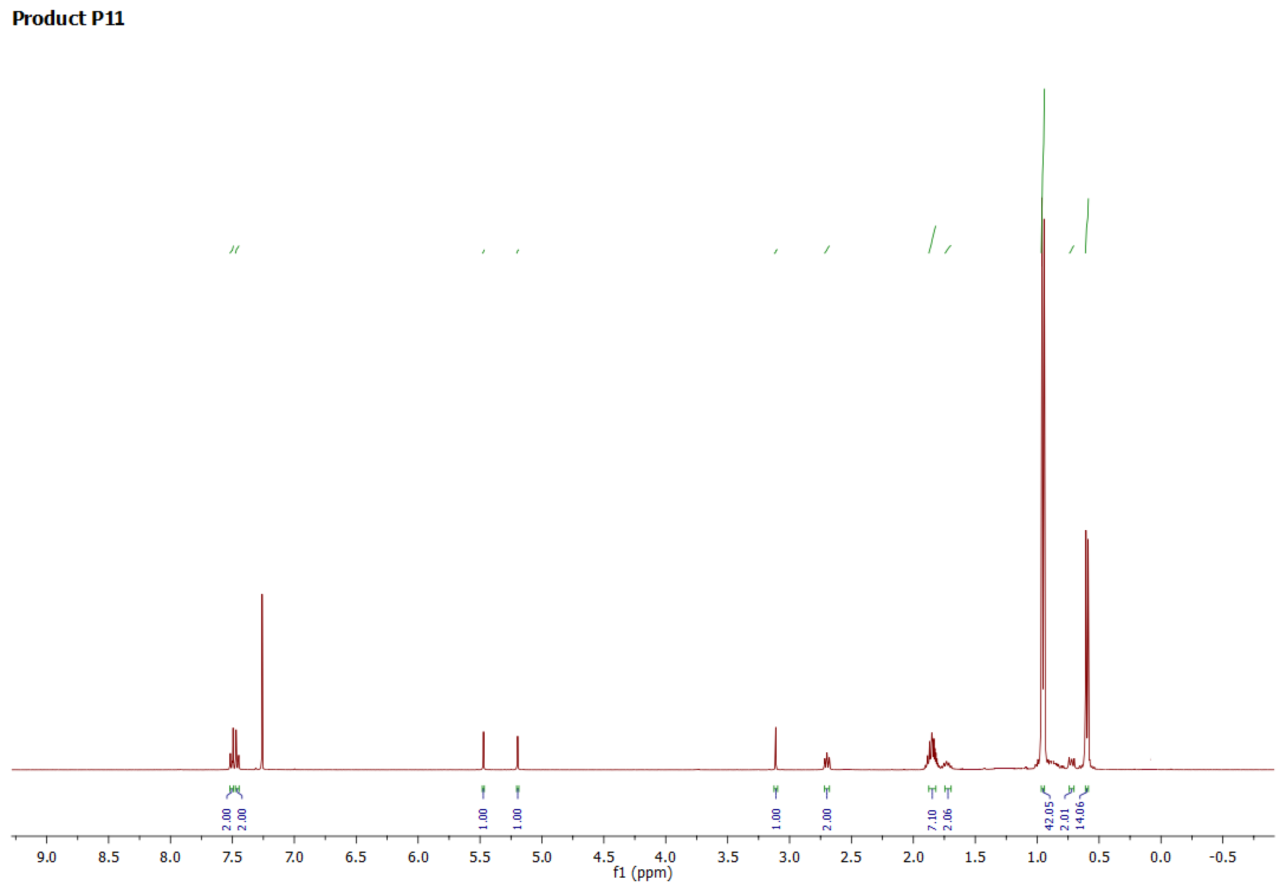


Figure S43. ^{1}H NMR (400 MHz, $CDCl_3$) of product **P11**

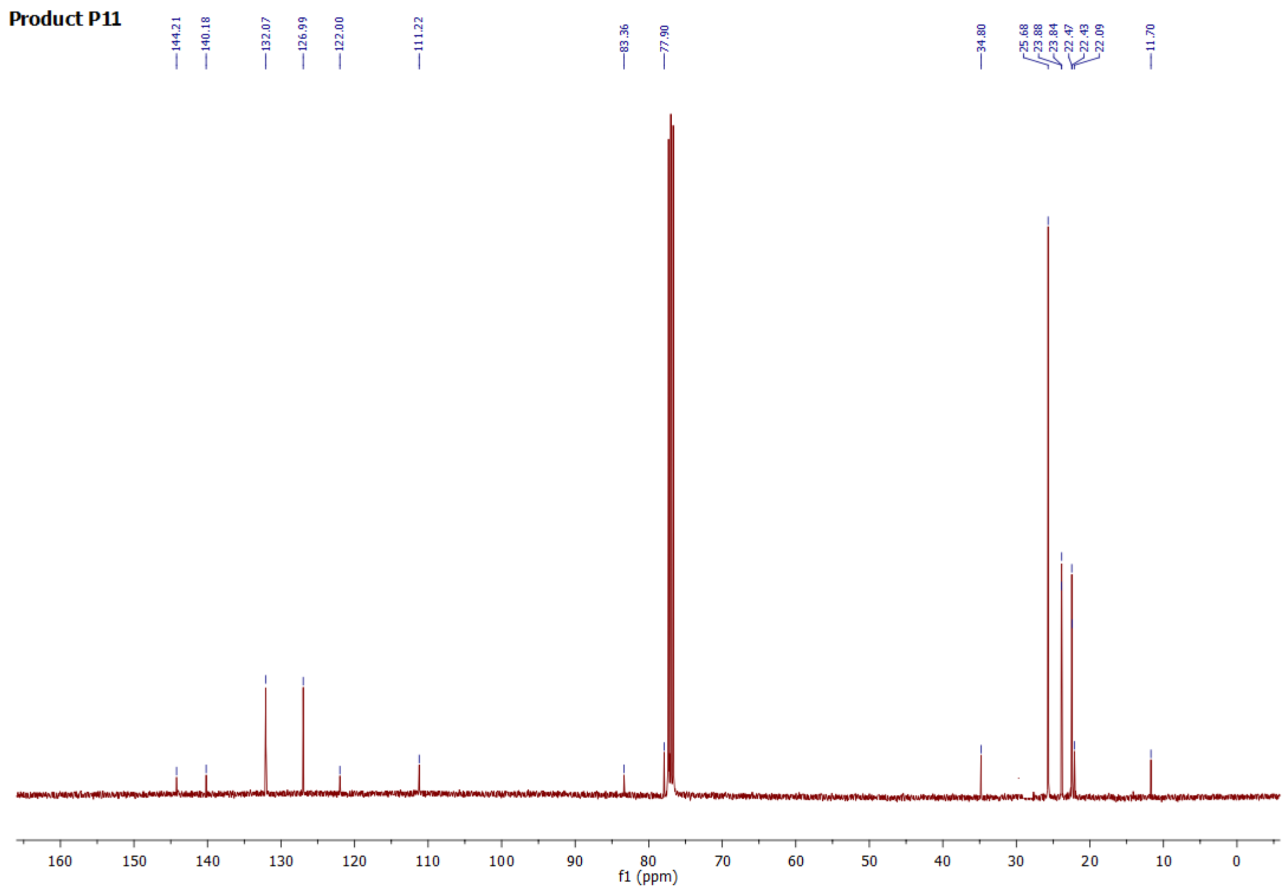


Figure S44. ^{13}C NMR (101 MHz, $CDCl_3$) of product **P11**

Product P11

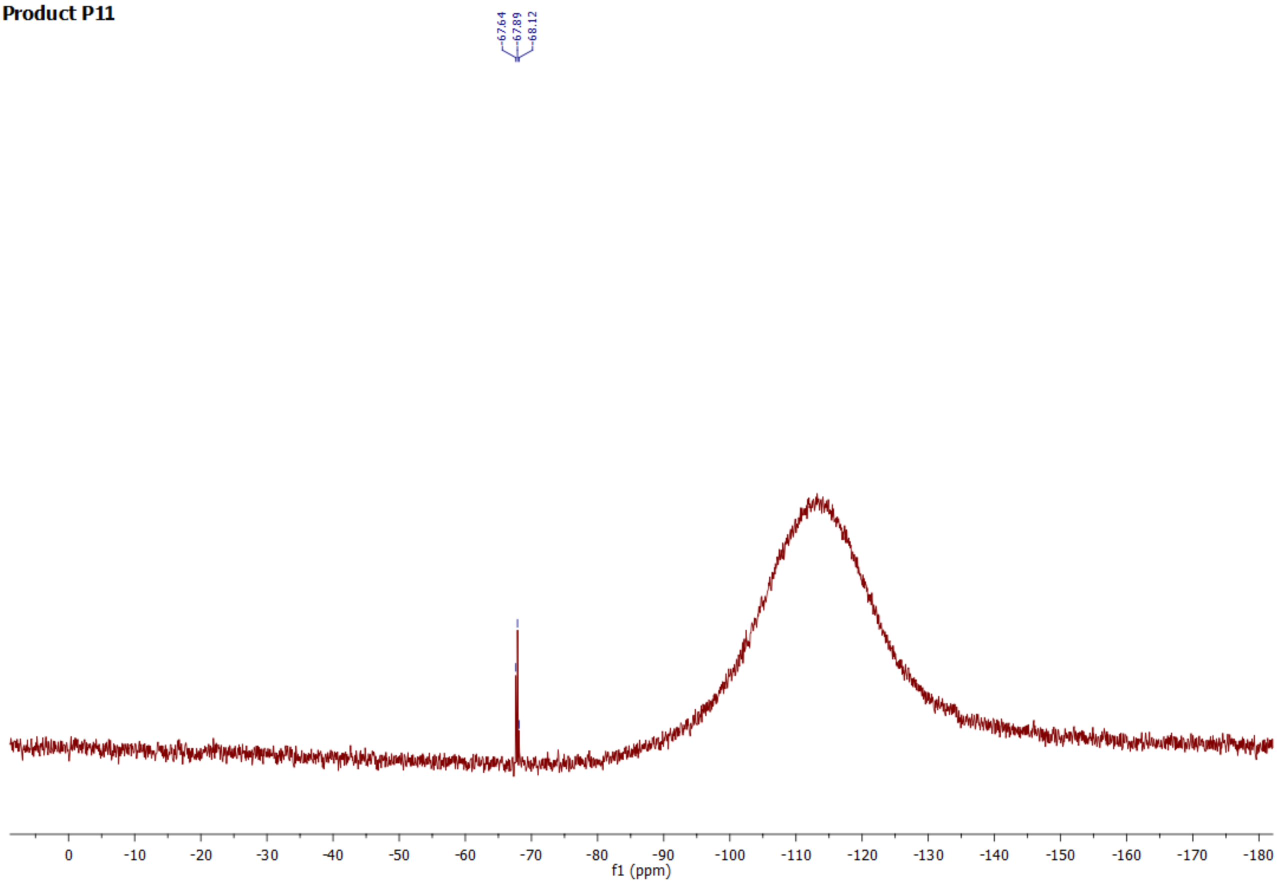


Figure S45. ^{29}Si NMR (79 MHz, $CDCl_3$) of product **P11**

Product P12

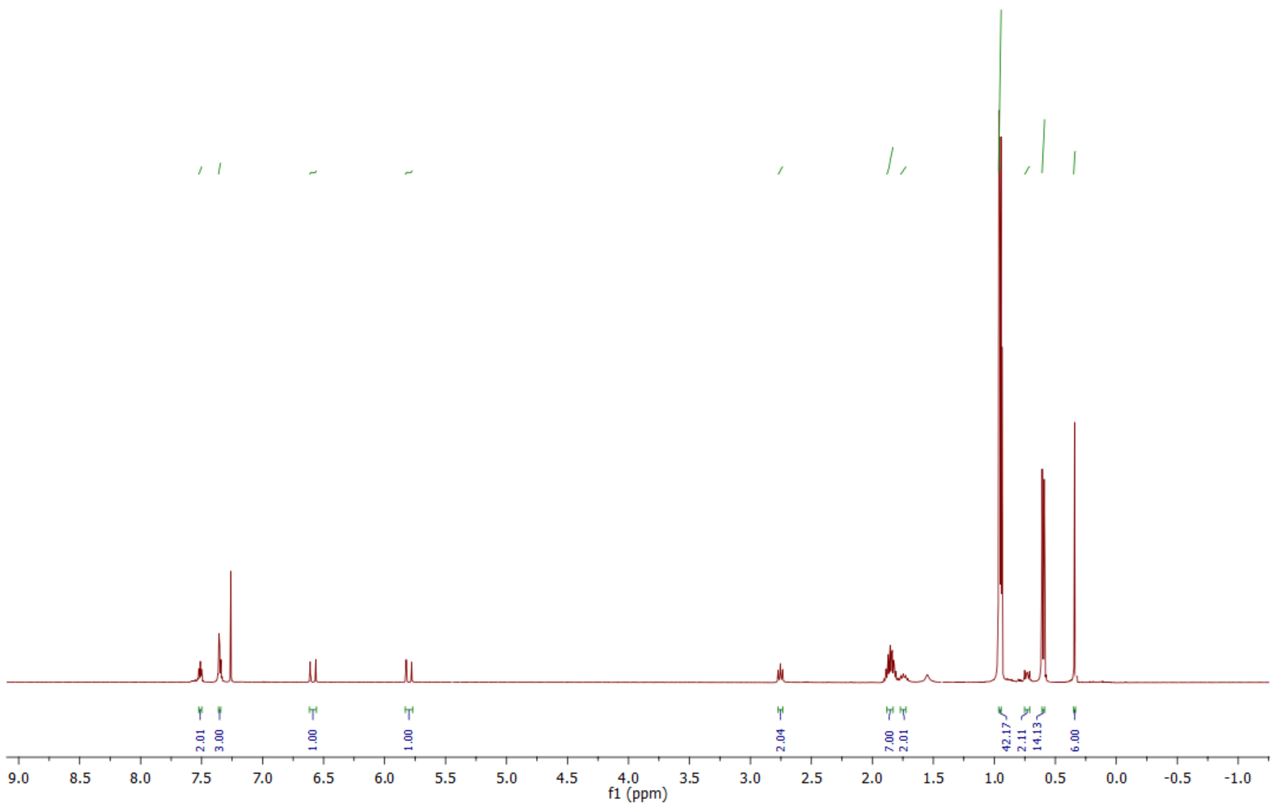


Figure S46. ^{1}H NMR (400 MHz, $CDCl_3$) of product **P12**

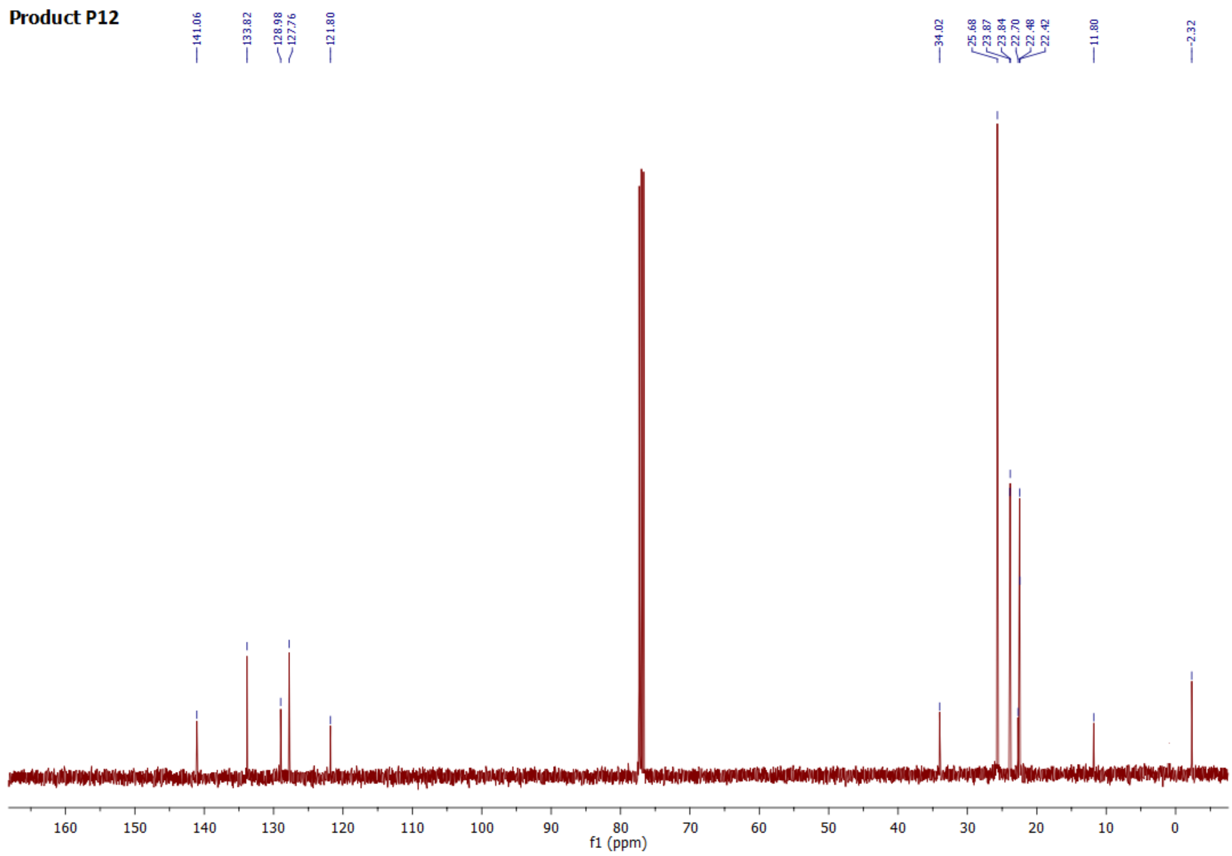


Figure S47. ^{13}C NMR (101 MHz, $CDCl_3$) of product **P12**

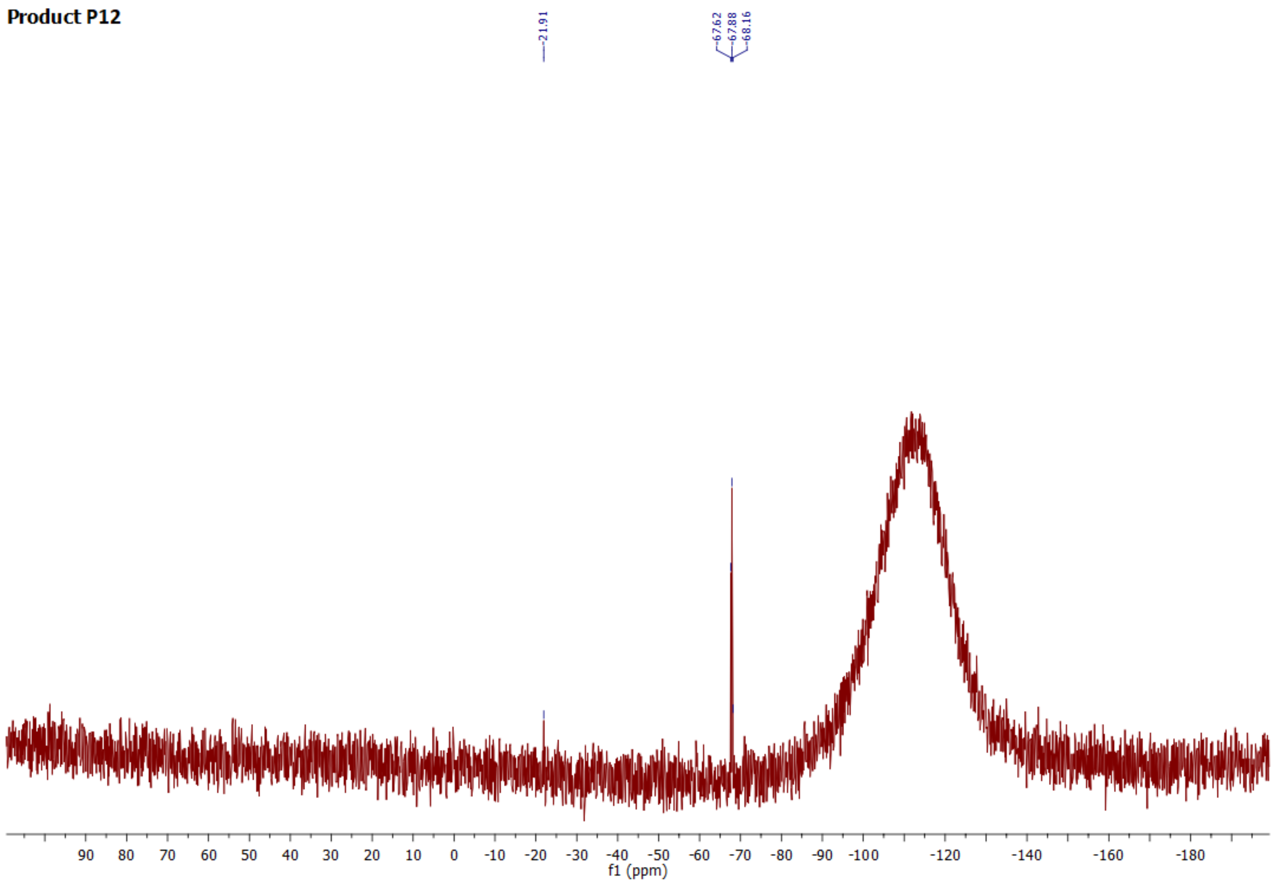


Figure S48. ^{29}Si NMR (79 MHz, $CDCl_3$) of product **P12**