Electronic Supplementary Material (ESI) for Dalton Transactions.

Supporting Information

Synthesis of Divalent Ytterbium Terphenylamide and Catalytic Application for Regioselective Hydrosilylation of Alkenes

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X-ray Crystallography

Table S1. Crystallographic detail for **1*C_7H_8**.

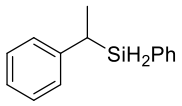
Empirical formula	$C_{63}H_{88}N_4Si_4Yb_2$
Formula weight	1359.81
temperature	113(2)
wavelength	0.71075Å
Crystal system, space group	Monoclinic, P 21/n
Unit cell dimensions	a=14.368(3) Å alpha= 90.00 °
	b=23.236(4)Å beta = 106.498(3) °
	c=19.877(4) gamma=90.00 °
volume	6363(2) $Å^3$
Z, Calculated density	4, 1.420 Mg/m^3
F(000)	2760
Absorption coefficient	3.036 mm^{-1}
Crystal size	0.32×0.24×0.20 mm
Theta range for data collection	2.66 to 27.88 deg
Limiting indices	-14<=h<=13, -15<=K<=13, -18<=l<=18
Reflections collected / unique	14713 / 7126 [R(int) = 0.0304]
Completeness to theta = 27.88	97.1 %
Absorption correction	Semi-empirical from equivalents
Max. and min. transmission	0.4736 and 0.3979
Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	7126 / 92 / 357
Goodness-of-fit on F^2	1.075
Final R indices [I>2sigma(I)]	R1 = 0.0243, wR2 = 0.0596
R indices (all data)	R1 = 0.0264, wR2 = 0.0603
Largest diff. Peak and hole	0.991 and -1.374e.A^{-3}
CCDC number	1545004

Table S2. Crystallographic detail for **2*C_7H_8.**

Empirical formula	C61 H66 N2O2 Si Yb
Formula weight	1060.29
Temperature	113(2)K
Wavelength	0.71075Å
Crystal system，space group	Triclinic，P-1
Unit cell dimensions	a=17.100(2)Å α=71.668(6) deg.
	b=17.5072(17)Å β=85.793(6) deg.
	c=19.438(2)Å γ=71.566(5) deg.
Volume	5238.3(11)$Å^3$
Z，Calculated density	4，1.344 Mg/m^3
Absorption coefficient	1.852 mm^{-1}
F(000)	2184
Crystal size	0.26 ×0.24 ×0.22 mm
Them range for data collection	1.26 to 27.88 deg.
Limiting indices	-22<=h<=22，-23<=k<=20，-25<=l<=25
Reflections collected/unique	58425/24765 [R(int)= 0.0409]
Completeness to them=27.88	99/1%
Absorption correction	Semi-empirical from equivalents
Max. and min. transmission	0.6861 and 0.6445
Refinement method	Full-matrix least-squares on F^2
CCDC number	1545003

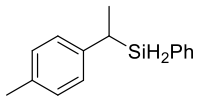
General Procedures for the Catalytic Hydrosilylation Reactions. In an Ar glove box, a Schlenk tube (10 ml) was charged with catalyst **1** (0.005-0.01 mmol) and toluene (0.2 mL). And then silane (1.0 mmol) and the appropriate alkene or diene (1.0 mmol) were added by microsyringe. The Schlenk tube was quickly removed from the glovebox. The reaction mixture was stirred 4-8 h at 60-90 ℃ using oil bath, and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent.

Phenyl(1-phenylethyl)silane **(4a)**[1]



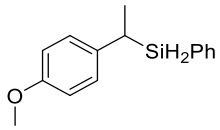
The reaction was carried out according to general method by using catalyst A (6.4 mg, 0.005 mmol), Styrene (104 mg, 1.0 mmol) and $PhSiH_3$ (108 mg, 1.0 mmol) at 60 ℃ for 4 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (201 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.66 (m, 2H, Ar-*H*), 7.63 – 7.56 (m, 2H, Ar-*H*), 7.50 (m, 4H, Ar-*H*), 7.35 (m, 2H, Ar-*H*), 4.62 (s, 2H, Si*H*$_2$), 2.86 (m, 1H, C-*H*), 1.71 (d, $^3J_{H\text{-}H}$ = 7.4 Hz, 3H, Me). ^{13}C NMR (101 MHz, $CDCl_3$): δ 144.7, 135.9, 131.6, 130.0, 128.6, 128.1, 127.4, 125.3 (Ar-*C*), 25.6 (Me), 16.6 (*C*HSi). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -20.6 (SiH_2). GC-MS (EI): Calcd for $C_{14}H_{16}Si$: 212.10, found: 212.21. This compound was known.

Phenyl(1-(p-tolyl)ethyl)silane **(4b)**[2]



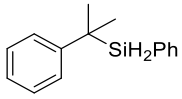
The reaction was carried out according to general method by using catalyst A (6.4 mg, 0.005 mmol), 4-Methylstyrene (118 mg, 1.0 mmol) and $PhSiH_3$ (108 mg, 1.0 mmol) at 60 ℃ for 4 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (215 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.53 (m, 2H, Ar-*H*), 7.44 (m, 2H, Ar-*H*), 7.41–7.36 (m, 2H, Ar-*H*), 7.16–7.11 (m, 3H, Ar-*H*), 4.47 (s, 2H, Si*H*$_2$), 2.68 (m, 1H, C*H*), 2.40 (s, 3H, Ar-Me), 1.55 (d, $^3J_{H\text{-}H}$ = 7.4 Hz, 3H, CH-Me). ^{13}C NMR (101 MHz, $CDCl_3$): δ 141.7, 136.0, 130.0, 129.4, 128.1, 127.3 (Ar-*C*), 25.1 (CH-Me), 21.2 (Ar-Me), 16.9 (*C*HSi). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -20.8 (SiH_2). GC-MS (EI): Calcd for $C_{15}H_{18}Si$: 226.12, found: 226.24. This compound was known.

(1-(4-Methoxyphenyl)ethyl)(phenyl)silane **(4c)**[3]



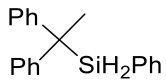
The reaction was carried out according to general method by using catalyst A (6.4 mg, 0.005 mmol), 4-Methoxystyrene (134 mg, 1.0 mmol) and $PhSiH_3$ (108 mg, 1.0 mmol) at 60 ℃ for 6 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (230 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.60 (m, 2H, Ar-*H*), 7.52 (m, 3H, Ar-*H*), 7.21 (m, 2H, Ar-*H*), 7.00 (m, 2H, Ar-*H*), 4.54 (s, 2H, Si*H*$_2$), 3.92 (s, 3H, ArO-Me), 2.75 (m, 1H, C*H*), 1.63 (d, $^3J_{H\text{-}H}$ = 7.3 Hz, 3H, Me). ^{13}C NMR (101 MHz, $CDCl_3$): δ 158.1, 137.3, 136.6, 132.4, 130.6, 129.0, 128.9, 128.8 (Ar-*C*), 56.0 (ArO-Me), 25.1 (Me), 17.7 (*C*HSi). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -21.2 (SiH_2). GC-MS (EI): Calcd for $C_{15}H_{18}OSi$: 242.11, found: 242.23. This compound was known.

$PhCH_3C(SiH_2Ph)CH_3$ **(4d)**[3]



The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 2-Phenyl-1-propene (118 mg, 1.0 mmol) and $PhSiH_3$ (108 mg, 1.0 mmol) at 70 ℃ for 6 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (208 mg, 92 %) as a colorless oil. ^{1}H NMR (400 MHz, C_6D_6): δ 7.53–7.05 (m, 10H, Ar-*H*), 4.44 (s, 2H, Si*H*$_2$), 1.36 (s, 6H, Me). ^{13}C NMR (101 MHz, C_6D_6): δ 136.2, 135.9, 129.9, 128.4, 127.9, 126.3, 125.7, 125.2 (Ar-*C*), 26.5 (Me), 25.3 (Me$_2$-*C*). ^{29}Si NMR (79 MHz, C_6D_6): δ -13.3 (SiH_2). GC-MS (EI): Calcd for $C_{15}H_{18}Si$: 226.12, found: 226.17. This compound was known.

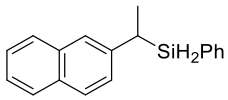
$Ph_2C(CH_3)SiH_2Ph$ **(4e)**[3]



The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 1,1-Diphenylethylene (180 mg, 1.0 mmol) and $PhSiH_3$ (108 mg, 1.0 mmol) at 70 ℃ for 8 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (268 mg, 93 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.61–7.39 (m, 15H, Ar-*H*), 5.04 (s, 2H, Si*H*$_2$), 2.09 (s, 3H, Me). ^{13}C

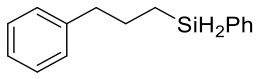
NMR (101 MHz, $CDCl_3$): δ 146.3, 135.2, 134.6, 129.8, 128.7, 127.2, 126.5, 124.5 (Ar-*C*), 36.5 (Ph_2-*C*), 24.5 (Me). ^{29}Si NMR (79 MHz, C_6D_6): δ -19.3 (SiH_2). GC-MS (EI): Calcd for $C_{20}H_{20}Si$: 228.13, found: 228.20. This compound was known.

[1-(2-Napthyl)-l-ethyl](phenyl)silane **(4f)**[3]



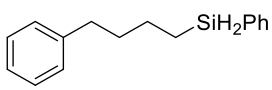
The reaction was carried out according to general method by using catalyst A (6.4 mg, 0.005 mmol), 2-Vinylnaphthalene (154 mg, 1.0 mmol) and $PhSiH_3$ (108 mg, 1.0 mmol) at 70 ℃ for 6 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (250 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.09–8.01 (m, 3H, Ar-*H*), 7.85 (s, 1H, Ar-*H*), 7.76–7.71 (m, 3H, Ar-*H*), 7.67 (m, 2H, Ar-*H*), 7.62–7.55 (m, 3H, Ar-*H*), 4.78 (m, 2H, SiH_2), 3.16–3.04 (m, 1H, C*H*), 1.89 (d, $^3J_{H\text{-}H}$ = 7.4 Hz, 3H, Me). ^{13}C NMR (101 MHz, $CDCl_3$): δ 141.0, 134.5, 132.7, 130.5, 130.1, 128.7, 126.8, 126.7, 126.5, 126.2, 125.5, 124.8, 123.7, 123.4 (Ar-*C*), 24.5 (Me), 15.3 (*C*H). ^{29}Si NMR (79 MHz, C_6D_6): δ -21.4 (SiH_2). GC-MS (EI): Calcd for $C_{18}H_{18}Si$: 262.12, found: 262.18. This compound was known.

phenyl(3-phenylpropyl)silane **(4g)**[3]



The reaction was carried out according to general method by using catalyst A (6.4 mg, 0.005 mmol), Allylbenzene (118 mg, 1.0 mmol) and $PhSiH_3$ (108 mg, 1.0 mmol) at 70 ℃ for 6 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (204 mg, 90 %) as a colorless oil. ^{1}H NMR (400 MHz, C_6D_6): δ 7.46 (m, 2H, Ar-*H*), 7.13 (m, 5H, Ar-*H*), 7.08–7.04 (m, 1H, Ar-*H*), 6.99 (m, 2H, Ar-*H*), 4.43 (m, 2H, SiH_2), 2.46 (m, 2H, Ar-CH_2), 1.65 (m, 2H, CH_2), 0.79 (m, 2H, CH_2Si). ^{13}C NMR (101 MHz, C_6D_6): δ 141.9, 135.2, 132.2, 129.5, 128.5, 128.3, 128.0, 125.8 (Ar-*C*), 39.0 (Ar-*C*H_2), 27.0 (*C*H_2), 9.7 (*C*H_2Si). ^{29}Si NMR (79 MHz, C_6D_6): δ -31.0 (SiH_2). GC-MS (EI): Calcd for $C_{15}H_{18}Si$: 226.12, found: 226.20.

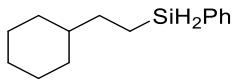
Phenyl(4-phenylbutyl)silane **(4h)**[4]



The reaction was carried out according to general method by using catalyst A (6.4 mg, 0.005 mmol), 4-Phenyl-1-butene (132 mg, 1.0 mmol) and $PhSiH_3$ (108 mg, 1.0 mmol) at 70 ℃ for 6 h and then the

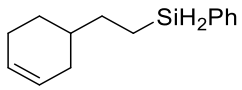
reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (215 mg, 90 %) as a colorless oil. ^{1}H NMR (400 MHz, C_6D_6): δ 7.50–7.45 (m, 2H, Ar-*H*), 7.16 (m, 2H, Ar-*H*), 7.14 (m, 3H, Ar-*H*), 7.07 (m, 1H, Ar-*H*), 7.02 (m, 2H, Ar-*H*), 4.50–4.39 (m, 2H, SiH_2), 2.43–2.37 (m, 2H, Ar-CH_2), 1.58–1.48 (m, 2H, CH_2), 1.44–1.30 (m, 2H, CH_2), 0.78 (m, 2H, CH_2Si). ^{13}C NMR (101 MHz, C_6D_6): δ 142.3, 135.2, 132.3, 129.5, 128.4, 128.3, 128.0, 125.7 (Ar-*C*), 35.6 (Ar-*C*H_2), 34.6 (*C*H_2), 24.7 (*C*H_2), 9.9 (*C*H_2Si). ^{29}Si NMR (79 MHz, C_6D_6): δ -31.1 (SiH_2). GC-MS (EI): Calcd for $C_{16}H_{20}Si$: 240.13, found: 240.22.

(2-Cyclohexylethyl)(phenyl)silane **(4i)**[5]



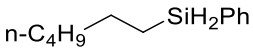
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), Vinylcyclohexane (110 mg, 1.0 mmol) and $PhSiH_3$ (108 mg, 1.0 mmol) at 70 ℃ for 6 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (160 mg, 70 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.71 (m, 2H, Ar-*H*), 7.48 (m, 3H, Ar-*H*), 4.44 (s, 2H, SiH_2), 1.83 (m, 6H, CH_2, C*H*), 1.46–1.31 (m, 5H, CH_2), 1.05–0.85 (m, 4H, CH_2, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 135.9, 135.4, 129.6, 128.3 (Ar-*C*), 40.5 (*C*H), 33.1, 32.7, 27.0, 26.6 (*C*H_2), 7.3 (*C*H_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -29.9 (SiH_2). GC-MS (EI): Calcd for $C_{14}H_{22}Si$: 218.15, found: 218.27.

4-[2-(Phenylsilyl)ethyl]cyclohex-1-ene **(4j)**[6]



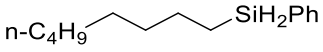
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 4-Vinylcyclohexene (108 mg, 1.0 mmol) and $PhSiH_3$ (108 mg, 1.0 mmol) at 70 ℃ for 6 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (195 mg, 90 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.73 (m, 2H, Ar-*H*), 7.51 (m, 3H, Ar-*H*), 5.82 (s, 2H, C*H*=C*H*), 4.48 (s, 2H, SiH_2), 2.19 (s, 2H, CH_2), 1.88–1.76 (m, 2H, CH_2), 1.59–1.35 (m, 3H, CH_2), 1.12 (s, 2H, CH_2), 0.92 (m, 2H, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 135.4, 132.7, 129.7, 128.1 (Ar-*C*), 127.2, 126.7 (*C*H=*C*H), 36.3 (*C*H), 32.0, 31.6, 28.6, 25.5 (*C*H_2), 7.4 (*C*H_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -29.9 (SiH_2). GC-MS (EI): Calcd for $C_{14}H_{20}Si$: 216.13, found: 216.21.

(1-Hexyl)(phenyl)silane **(4k)**[3]



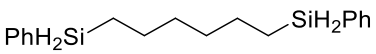
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 1-Hexene (84 mg, 1.0 mmol) and $PhSiH_3$ (108 mg, 1.0 mmol) at 70 ℃ for 6 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (145 mg, 75 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.71 (m, 2H, Ar-*H*), 7.49 (m, 3H, Ar-*H*), 4.46 (s, 2H, SiH_2), 1.4–1.08 (m, 8H, CH_2), 0.9–0.75 (m, 5H, Me, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 134.6, 134.2, 128.4, 126.9 (Ar-C), 31.5, 30.5, 24.0, 21.5 (*C*H_2), 13.1 (Me), 9.0 (*C*H_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -31.3 (SiH_2). GC-MS (EI): Calcd for $C_{12}H_{20}Si$: 192.13, found: 192.24.

(1-Octyl)(phenyl)silane **(4l)**[7]



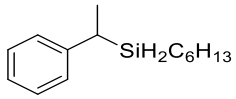
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 1-Octene (112 mg, 1.0 mmol) and $PhSiH_3$ (108 mg, 1.0 mmol) at 70 ℃ for 6 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (175 mg, 80 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.69 (m, 2H, Ar-*H*), 7.44 (m, 3H, Ar-*H*), 4.45 (s, 2H, SiH_2), 1.48–1.35 (m, 12H, CH_2), 1.08–0.97 (m, 5H, Me, SiH_2). ^{13}C NMR (101 MHz, $CDCl_3$): δ 134.6, 134.1, 128.4, 126.9 (Ar-*C*), 32.0, 30.9, 28.3, 24.5, 24.1, 21.6 (*C*H_2), 13.1 (Me), 9.0 (*C*H_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -30.6 (SiH_2). GC-MS (EI): Calcd for $C_{14}H_{24}Si$: 220.16, found: 220.26.

1,6-bis(phenylsilyl)hexane **(4m)**[8]



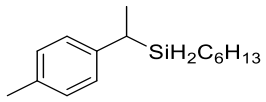
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 1,5-Hexadiene (82 mg, 1.0 mmol) and $PhSiH_3$ (216 mg, 2.0 mmol) at 70 ℃ for 6 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (210 mg, 70 %) as a colorless oil. ^{1}H NMR (400 MHz, C_6D_6): δ 7.53 (m, 4H, Ar-*H*), 7.21 (m, 6H, Ar-*H*), 4.50 (s, 4H, SiH_2), 1.39 (m, 4H, CH_2), 1.25 (m, 4H, CH_2), 0.84 (s, 4H, SiH_2). ^{13}C NMR (101 MHz, C_6D_6): δ 135.9, 135.4, 129.7, 128.2 (Ar-*C*), 32.6 (*C*H_2), 25.2 (*C*H_2), 10.3 (*C*H_2Si). ^{29}Si NMR (79 MHz, C_6D_6): δ -31.0 (SiH_2). GC-MS (EI): Calcd for $C_{18}H_{26}Si$: 298.16, found: 298.18.

Hexyl(1-phenylethyl)silane **(5a)**



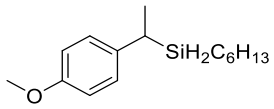
The reaction was carried out according to general method by using catalyst A (6.4 mg, 0.005 mmol), Styrene (104 mg, 1.0 mmol) and hexylsilane (116 mg, 1.0 mmol) at 60 ℃ for 4 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (213 mg, 97 %) as a colorless oil. ^{1}H NMR (400 MHz, C_6D_6): δ 7.14 (m, 2H, Ar-*H*), 7.07–6.97 (m, 3H, Ar-*H*), 3.95–3.82 (m, 2H, Si*H*$_2$), 2.31–2.20 (m, 1H, C*H*), 1.35 (d, $^{3}J_{H\text{-}H}$ = 7.5 Hz, 3H, CH-Me), 1.27–1.11 (m, 8H, C*H*$_2$), 0.86 (t, $^{3}J_{H\text{-}H}$ = 6.9 Hz, 3H, CH_2-Me), 0.52 (s, 2H, CH_2Si). ^{13}C NMR (101 MHz, C_6D_6): δ 145.4, 128.6, 127.0, 125.1 (Ar-*C*), 32.8 (*C*H$_2$), 31.7 (*C*H$_2$), 25.4 (*C*H$_2$), 24.6 (CH-Me), 22.8 (*C*H$_2$), 16.9(*C*HSi), 14.2 (CH_2-Me), 8.4 (*C*H$_2$Si). ^{29}Si NMR (79 MHz, C_6D_6): δ -18.5 (SiH_2). GC-MS (EI): Calcd for $C_{14}H_{24}Si$: 220.16, found: 220.25.

Hexyl(1-(p-tolyl)ethyl)silane **(5b)**



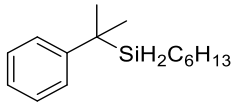
The reaction was carried out according to general method by using catalyst A (6.4 mg, 0.005 mmol), 4-Methylstyrene (118 mg, 1.0 mmol) and hexylsilane (116 mg, 1.0 mmol) at 60 ℃ for 4 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (227 mg, 97 %) as a colorless oil. ^{1}H NMR (400 MHz, C_6D_6): δ 6.97 (m, 4H, Ar-*H*), 3.88 (m, 2H, Ar-*H*), 2.32–2.22 (m, 1H, C*H*), 2.15 (s, 3H, Ar-Me), 1.36 (t, $^{3}J_{H\text{-}H}$ = 9.5 Hz, 3H, CH-Me), 1.30–1.12 (m, 8H, C*H*$_2$), 0.86 (t, $^{3}J_{H\text{-}H}$ = 6.9 Hz, 3H, CH_2-Me), 0.54 (m, 2H, C*H*$_2$Si). ^{13}C NMR (101 MHz, C_6D_6): δ 142.2, 134.1, 129.3, 126.9 (Ar-*C*), 32.8 (*C*H$_2$), 31.7 (*C*H$_2$), 25.6 (*C*H$_2$), 24.1 (CH-Me), 22.8 (*C*H$_2$), 20.8 (Ar-Me), 17.1 (*C*HSi), 14.2 (CH_2-Me), 8.4 (*C*H$_2$Si). ^{29}Si NMR (79 MHz, C_6D_6): δ -18.7 (SiH_2). GC-MS (EI): Calcd for $C_{15}H_{26}Si$: 234.18, found: 234.32.

(1-(4-Methoxyphenyl)ethyl)(hexyl)silane **(5c)**



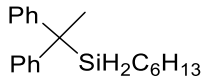
The reaction was carried out according to general method by using catalyst A (6.4 mg, 0.005 mmol), 4-Methoxystyrene (134 mg, 1.0 mmol) and hexylsilane (116 mg, 1.0 mmol) at 60 ℃ for 6 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (237 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, C_6D_6): δ 6.96 (m, 2H, Ar-*H*), 6.74 (m, 2H, Ar-*H*), 3.93–3.81 (m, 2H, SiH_2), 3.38 (s, 3H, ArO-Me), 2.24 (m, 1H, C*H*), 1.35 (d, $^{3}J_{H\text{-}H}$ = 7.5 Hz, 3H, CH-Me), 1.28–1.10 (m, 8H, CH_2), 0.84 (t, $^{3}J_{H\text{-}H}$ = 6.6 Hz, 3H, CH_2-Me), 0.55 (d, $^{3}J_{H\text{-}H}$ = 2.4 Hz, 2H, CH_2Si). ^{13}C NMR (101 MHz, C_6D_6): δ 157.7, 137.1, 127.8, 114.2 (Ar-*C*), 54.6 (ArO-Me), 32.8 (*C*H_2), 31.7 (*C*H_2), 25.4 (*C*H_2), 23.5 (CH-Me), 22.8 (*C*H_2), 17.3 (*C*HSi), 14.2 (CH_2-Me), 8.4 (*C*H_2Si) . ^{29}Si NMR (79 MHz, C_6D_6): δ -19.0 (SiH_2). GC-MS (EI): Calcd for $C_{15}H_{26}OSi$: 250.18, found: 250.37.

$PhCH_3C(SiH_2C_6H_{13})CH_3$ **(5d)**



The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 2-Phenyl-1-propene (118 mg, 1.0 mmol) and hexylsilane (116 mg, 1.0 mmol) at 70 ℃ for 6 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (215 mg, 92 %) as a colorless oil. ^{1}H NMR (400 MHz, C_6D_6): δ 7.21 (m, 2H, Ar-*H*), 7.16 (m, 2H, Ar-*H*), 7.00 (m, 1H, Ar-*H*), 3.86 (m, 2H, SiH_2), 1.38 (s, 6H, Me), 1.22–1.09 (m, 8H, CH_2), 0.84 (m, 3H, CH_2-Me), 0.49 (m, 2H, CH_2Si). ^{13}C NMR (101 MHz, C_6D_6): δ 148.3, 128.4, 125.8, 124.9 (Ar-*C*), 32.8 (*C*H_2), 31.7 (*C*H_2), 25.9 (*C*H_2), 25.4 (Me), 25.3 (Me_2-*C*), 22.8 (*C*H_2), 14.2 (CH_2-Me), 8.1 (*C*H_2Si). ^{29}Si NMR (79 MHz, C_6D_6): δ -10.21 (SiH_2). GC-MS (EI): Calcd for $C_{15}H_{26}Si$: 234.18, found: 234.27.

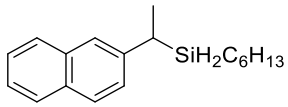
$Ph_2C(CH_3)SiH_2C_6H_{13}$ **(5e)**



The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 1,1-Diphenylethylene (180 mg, 1.0 mmol) and hexylsilane (116 mg, 1.0 mmol) at 70 ℃ for 8 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (276 mg, 93 %) as a colorless oil. ^{1}H NMR (400 MHz, C_6D_6): δ 7.28–7.19 (m, 4H, Ar-*H*), 7.14–7.09 (m, 4H, Ar-*H*), 7.01 (m, 2H, Ar-*H*), 4.24 (m, 2H, SiH_2), 1.70 (s, 3H, Ph_2C-Me), 1.24–1.08 (m, 8H, CH_2), 0.89–0.79 (m, 3H, CH_2-Me), 0.54

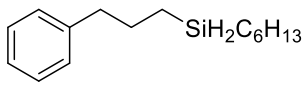
(d, $^{3}J_{H\text{-}H}$ = 8.4 Hz, 2H, CH_2Si). ^{13}C NMR (101 MHz, C_6D_6): δ 148.30, 128.52, 128.17, 125.61 (Ar-*C*), 37.2 (Ph_2-*C*), 32.7 (*C*H_2), 31.7 (*C*H_2), 26.3 (*C*H_2) , 25.5 (Ph_2C-Me), 22.8 (*C*H_2), 14.3 (CH_2-Me), 8.6 (*C*H_2Si). ^{29}Si NMR (79 MHz, C_6D_6): δ -15.3 (SiH_2). GC-MS (EI): Calcd for $C_{20}H_{28}Si$: 296.20, found: 296.24.

[1-(2-Napthyl)-l-ethyl](hexyl)silane **(5f)**



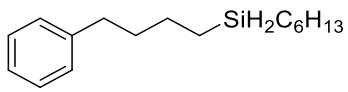
The reaction was carried out according to general method by using catalyst A (6.4 mg, 0.005 mmol), 2-Vinylnaphthalene (154 mg, 1.0 mmol) and hexylsilane (116 mg, 1.0 mmol) at 70 ℃ for 6 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (251 mg, 93 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.70 (m, 3H, Ar-*H*), 7.51 (m, 1H, Ar-*H*), 7.39–7.33 (m, 2H, Ar-*H*), 7.25 (m, 1H, Ar-*H*), 3.81–3.71 (m, 2H, SiH_2), 2.59–2.48 (m, 1H, C*H*), 1.50 (m, 3H, CH-Me), 1.27–1.16 (m, 8H, CH_2), 0.83 (t, $^{3}J_{H\text{-}H}$ = 6.9 Hz, 3H, CH_2-Me), 0.60 (m, 2H, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 142.08, 132.78, 130.45, 126.75, 126.50, 126.20, 125.41, 124.78, 123.66, 123.03 (Ar-*C*), 31.4 (*C*H_2), 30.4 (*C*H_2), 24.0 (*C*H_2), 23.6 (CH-Me), 21.5 (*C*H_2), 15.7 (*C*H), 13.0 (CH_2-Me), 7.2 (*C*H_2Si). ^{29}Si NMR (79 MHz, C_6D_6): δ -21.4 (SiH_2). GC-MS (EI): Calcd for $C_{18}H_{26}Si$: 270.18, found: 270.24.

Hexyl(3-phenylpropyl)silane **(5g)**



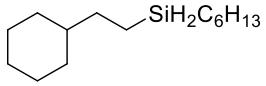
The reaction was carried out according to general method by using catalyst A (6.4 mg, 0.005 mmol), Allylbenzene (118 mg, 1.0 mmol) and hexylsilane (116 mg, 1.0 mmol) at 70 ℃ for 8 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (223 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, C_6D_6): δ 7.14 (m, 2H, Ar-*H*), 7.04 (m, 3H, Ar-*H*), 3.90–3.78 (m, 2H, SiH_2), 2.51 (m, 2H, Ar-CH_2), 1.63 (m, 2H, ArCH_2-CH_2), 1.26 (m, 8H, CH_2), 0.88 (t, $^{3}J_{H\text{-}H}$ = 6.9 Hz, 3H, CH_2-Me), 0.65–0.53 (m, 4H, CH_2Si). ^{13}C NMR (101 MHz, C_6D_6): δ 142.1, 128.6, 128.4, 125.9 (Ar-*C*), 39.3 (Ar-*C*H_2), 32.8 (*C*H_2), 31.8 (*C*H_2), 27.7 (*C*H_2), 25.6 (*C*H_2), 22.8 (*C*H_2), 14.2 (CH_2-Me), 9.3 (*C*H_2Si), 9.0 (*C*H_2Si). ^{29}Si NMR (79 MHz, C_6D_6): δ -28.8 (SiH_2). GC-MS (EI): Calcd for $C_{15}H_{26}Si$: 234.18, found: 234.28.

Hexyl(4-phenylbutyl)silane **(5h)**



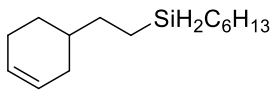
The reaction was carried out according to general method by using catalyst A (6.4 mg, 0.005 mmol), 4-Phenyl-1-butene (132 mg, 1.0 mmol) and hexylsilane (116 mg, 1.0 mmol) at 70 ℃ for 8 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (236 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, C_6D_6): δ 7.18–7.10 (m, 2H, Ar-*H*), 7.04 (m, 3H, Ar-*H*), 3.86–3.78 (m, 2H, Si*H*$_2$), 2.54–2.39 (m, 2H, Ar-C*H*$_2$), 1.63–1.50 (m, 2H, C*H*$_2$), 1.32 (m, 10H, C*H*$_2$), 0.87 (m, 3H, CH_2-Me), 0.61 (d, $^{3}J_{H\text{-}H}$ = 7.6 Hz, 4H, C*H*$_2$Si). ^{13}C NMR (101 MHz, C_6D_6): δ 142.4, 128.5, 128.3, 125.8 (Ar-*C*), 35.8 (*C*H_2), 34.9 (*C*H_2), 32.9 (*C*H_2), 31.8 (*C*H_2), 25.7 (*C*H_2), 25.3 (*C*H_2), 22.8 (*C*H_2), 14.2 (CH_2-Me), 9.3 (*C*H_2Si), 9.2 (*C*H_2Si). ^{29}Si NMR (79 MHz, C_6D_6): δ -28.9 (SiH_2). GC-MS (EI): Calcd for $C_{16}H_{28}Si$: 248.20, found: 248.29.

(2-Cyclohexylethyl)(hexyl)silane **(5i)**



The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), Vinylcyclohexane (110 mg, 1.0 mmol) and hexylsilane (116 mg, 1.0 mmol) at 70 ℃ for 8 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (208 mg, 92 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 3.72 (s, 2H, Si*H*$_2$), 1.77 (m, 5H, C*H*$_2$, C*H*), 1.32 (m, 14H, C*H*$_2$), 0.96 (m, 5H, C*H*$_2$, CH_2-Me), 0.74 (m, 4H, C*H*$_2$Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 40.4 (*C*H), 33.1 (*C*H_2), 33.0 (*C*H_2), 32.7 (*C*H_2), 31.6 (*C*H_2), 26.8 (*C*H_2), 26.5 (*C*H_2), 25.5 (*C*H_2), 22.7 (*C*H_2), 14.1 (CH_2-Me) , 9.2 (*C*H_2Si), 6.3 (*C*H_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -27.8 (SiH_2). GC-MS (EI): Calcd for $C_{14}H_{30}Si$: 226.21, found: 226.29.

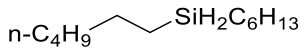
4-[2-(Hexylsilyl)ethyl]cyclohex-1-ene **(5j)**



The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 4-Vinylcyclohexene (108 mg, 1.0 mmol) and hexylsilane (116 mg, 1.0 mmol) at 70 ℃ for 8 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (213 mg, 95 %) as a

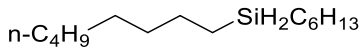
colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 5.70 (s, 2H, C*H*=C*H*), 3.72 (s, 2H, SiH_2), 2.25–2.02 (m, 4H, CH_2), 1.74 (m, 1H, C*H*), 1.52–1.26 (m, 12H, CH_2), 0.94 (s, 3H, CH_2-Me), 0.74 (s, 4H, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 127.0, 126.5 (*C*H=*C*H), 36.2 (*C*H), 32.7 (*C*H_2), 32.3 (*C*H_2), 31.6 (*C*H_2), 28.5 (*C*H_2), 25.5 (*C*H_2), 25.3 (*C*H_2), 22.6 (*C*H_2), 14.1 (Me), 9.2 (*C*H_2Si), 6.3 (*C*H_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -27.8 (SiH_2). GC-MS (EI): Calcd for $C_{14}H_{28}Si$: 224.20, found: 224.28.

(1-Hexyl)(hexyl)silane **(5k)**



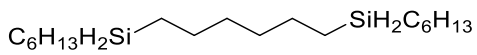
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 1-Hexene (84 mg, 1.0 mmol) and hexylsilane (116 mg, 1.0 mmol) at 70 ℃ for 8 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (191 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 3.71 (s, 2H, SiH_2), 1.38 (m, 16H, CH_2), 0.95 (m, 6H, CH_2-Me), 0.73 (m, 4H, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 32.7 (*C*H_2), 31.6 (*C*H_2), 25.5 (*C*H_2), 22.6 (*C*H_2), 14.1 (Me), 9.20 (*C*H_2Si). ^{29}Si NMR (79 MHz, C_6D_6): δ -28.9 (SiH_2). GC-MS (EI): Calcd for $C_{12}H_{28}Si$: 200.20, found: 200.29.

(1-Octyl)(hexyl)silane **(5l)**



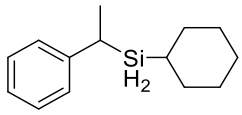
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 1-Octene (112 mg, 1.0 mmol) and hexylsilane (116 mg, 1.0 mmol) at 70 ℃ for 8 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (217 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 3.70 (s, 2H, SiH_2), 1.32 (m, 20H, CH_2), 0.93 (m, 6H, CH_2-Me), 0.72 (m, 4H, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 33.0 (*C*H_2), 32.6 (*C*H_2), 31.9 (*C*H_2), 31.6 (*C*H_2), 29.3 (*C*H_2), 29.3 (*C*H_2), 25.5 (*C*H_2), 22.7 (*C*H_2), 22.6 (*C*H_2), 14.1 (CH_2-Me), 9.2 (*C*H_2Si) . ^{29}Si NMR (79 MHz, C_6D_6): δ -28.9 (SiH_2). GC-MS (EI): Calcd for $C_{14}H_{32}Si$: 228.23, found: 228.33.

1,6-Bis(hexylsilyl)hexane **(5m)**



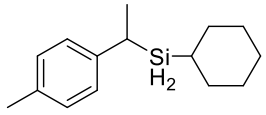
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 1,5-Hexadiene (82 mg, 1.0 mmol) and hexylsilane (232 mg, 2.0 mmol) at 70 ℃ for 8 h and then the reaction mixture was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (285 mg, 90 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 3.71 (s, 4H, SiH_2), 1.40 (m, 24H, CH_2), 0.94 (s, 6H, CH_2-Me), 0.73 (s, 8H, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 32.7 (*C*H_2), 32.6 (*C*H_2), 31.6 (*C*H_2), 25.5 (*C*H_2), 25.4 (*C*H_2), 22.6 (*C*H_2), 14.1 (CH_2-Me), 9.2 (*C*H_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -28.6 (SiH_2). GC-MS (EI): Calcd for $C_{18}H_{42}Si$: 314.28, found: 314.37.

Cyclohexyl(1-phenylethyl)silane **(6a)**



The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), styrene (104 mg, 1.0 mmol) and cyclohexylsilane (114 mg, 1.0 mmol) at 70 ℃ for 5 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (207 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.40 (m, 2H, Ar-*H*), 7.30–7.21 (m, 3H, Ar-*H*), 3.77 (m, 1H, SiH*H*), 3.72 (m, 1H, Si*H*H), 2.63–2.53 (m, 1H, Ar-C*H*), 1.86–1.72 (m, 5H, CH_2), 1.63–1.54 (m, 3H, CH-Me), 1.40–1.27 (m, 5H, CH_2), 1.04–0.92 (m, 1H, C*H*Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 145.8, 128.5, 127.0, 124.9 (Ar-*C*), 29.3 (*C*H_2), 27.8 (*C*H_2), 26.7 (*C*H_2), 23.7 (CH_2-Me), 20.9 (*C*HSi), 17.5 (Ar-*C*H). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -11.4 (SiH_2). GC-MS (EI): Calcd for $C_{14}H_{22}Si$: 218.15, found: 218.24.

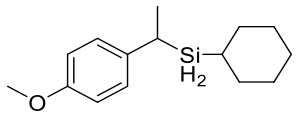
Cyclohexyl(1-(p-tolyl)ethyl)silane **(6b)**



The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 4-methylstyrene (118 mg, 1.0 mmol) and cyclohexylsilane (114 mg, 1.0 mmol) at 70 ℃ for 5 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (220 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.34–7.11 (m, 4H, Ar-*H*), 3.78 (m, 2H, SiH_2), 2.65–2.54 (m, 1H, Ar-C*H*), 2.48 (s, 3H, Ar-Me), 1.84 (s, 5H, CH_2), 1.60 (d, $^{3}J_{H\text{-}H}$ = 7.3 Hz, CH-Me), 1.38 (s, 5H, CH_2), 1.03 (s, 1H, C*H*Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 142.7, 134.2, 129.2, 126.9 (Ar-*C*), 29.3 (*C*H_2), 27.8 (*C*H_2), 26.8 (*C*H_2),

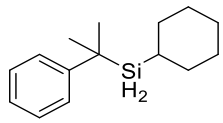
23.1 (Ar-Me), 21.1 (Me), 21.0 (*C*HSi), 17.7 (Ar-*C*H). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -11.5 (SiH_2). GC-MS (EI): Calcd for $C_{15}H_{24}Si$: 232.16, found: 232.22.

(1-(4-Methoxyphenyl)ethyl)(cyclohexyl)silane **(6c)**



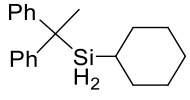
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 4-methoxystyrene (134 mg, 1.0 mmol) and cyclohexylsilane (114 mg, 1.0 mmol) at 80 ℃ for 6 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (235 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 6.98–6.90 (m, 2H, Ar-*H*), 6.75–6.67 (m, 2H, Ar-*H*), 3.64 (s, 3H, ArO-Me), 3.52 (m, 1H, Si*H*H), 3.46 (m, 1H, SiH*H*), 2.27 (m, 1H, ArC*H*), 1.63–1.50 (m, 5H, CH_2), 1.35–1.26 (m, 3H, CH-Me), 1.14–1.01 (m, 5H, CH_2), 0.75 (m, 1H, C*H*Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 156.0, 136.5, 126.7, 112.8 (Ar-*C*), 54.04 (ArO-Me), 28.10 (*C*H_2), 26.6 (*C*H_2), 25.6 (*C*H_2), 21.4 (Me), 19.8 (*C*HSi), 16.7 (Ar-*C*H). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -12.0 (SiH_2). GC-MS (EI): Calcd for $C_{15}H_{24}OSi$: 248.16, found: 248.22.

$PhCH_3C(SiH_2C_6H_{11})CH_3$ **(6d)**



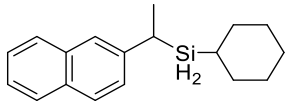
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 2-Phenyl-1-propene (118 mg, 1.0 mmol) and cyclohexylsilane (114 mg, 1.0 mmol) at 90 ℃ for 8 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (210 mg, 90 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.51–7.44 (m, 4H, Ar-*H*), 7.34–7.27 (m, 1H, Ar-*H*), 3.84 (m, 2H, Si*H_2*), 1.80 (m, 3H, Me), 1.74–1.63 (m, 8H, CH_2, Me), 1.32 (m, 5H, CH_2), 1.06–0.97 (m, 1H, C*H*Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 147.4, 127.0, 124.7, 123.6 (Ar-*C*), 28.5 (*C*H_2), 26.5 (*C*H_2), 25.5 (*C*H_2), 25.3 (Me), 24.8 (Me_2-*C*), 19.9 (*C*HSi). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -3.31 (SiH_2). GC-MS (EI): Calcd for $C_{15}H_{24}Si$: 232.16, found: 232.24.

$Ph_2C(CH_3)SiH_2C_6H_{11}$ **(6e)**



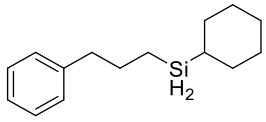
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 1,1-Diphenylethylene(180 mg, 1.0 mmol) and cyclohexylsilane (114 mg, 1.0 mmol) at 90 ℃ for 8 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (265 mg, 90 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.52 (m, 8H, Ar-*H*), 7.41 (m, 2H, Ar-*H*), 4.30 (m, 2H, SiH_2), 2.09 (s, 3H, Me), 1.88–1.75 (m, 5H, CH_2), 1.45 (m, 5H, CH_2), 1.11 (s, 1H, C*H*Si). ^{13}C NMR (101 MHz, $CDCl_3$) δ: 146.9, 127.1, 126.8, 124.2 (Ar-*C*), 43.6 (Ph_2C), 36.1 (*C*H_2), 28.7 (*C*H_2), 26.5 (*C*H_2), 25.2 (Me), 20.0 (*C*HSi). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -7.93 (SiH_2). GC-MS (EI): Calcd for $C_{20}H_{26}Si$: 294.18, found: 294.24.

[1-(2-Napthyl)-l-ethyl](cyclohexyl)silane **(6f)**



The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 2-Vinylnaphthalene (154 mg, 1.0 mmol) and cyclohexylsilane (114 mg, 1.0 mmol) at 90 ℃ for 8 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (241 mg, 90 %) as a colorless oil.^{1}H NMR (400 MHz, $CDCl_3$): δ 7.93–7.87 (m, 3H, Ar-*H*), 7.71 (m, 1H, Ar-*H*), 7.57 (m, 2H, Ar-*H*), 7.45 (m, 1H, Ar-*H*), 3.88–3.76 (m, 2H, SiH_2), 2.76 (m, 1H, C*H*), 1.91–1.76 (m, 5H, CH_2), 1.70 (m, 3H, Me), 1.43–1.36 (m, 5H, CH_2), 1.04 (s, 1H, C*H*Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 142.4, 132.8, 130.4, 126.7, 126.5, 126.2, 125.5, 124.8, 123.7, 123.2 (Ar-C), 28.12 (*C*H_2), 26.51 (*C*H_2), 25.5 (*C*H_2), 22.8 (Me), 19.8 (*C*HSi), 16.36 (Ar-*C*H). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -11.6 (SiH_2). GC-MS (EI): Calcd for $C_{18}H_{24}Si$: 268.16, found: 268.24.

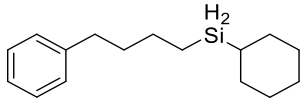
Cyclohexyl(3-phenylpropyl)silane **(5g)**



The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), Allylbenzene (118 mg, 1.0 mmol) and cyclohexylsilane (114 mg, 1.0 mmol) at 90 ℃ for 8 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (210 mg, 90 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.36 (m, 2H, Ar-*H*), 7.30–7.21 (m, 3H, Ar-*H*), 3.63 (s, 2H, SiH_2), 2.73 (m, 2H, CH_2), 1.80 (m, 7H, CH_2), 1.29 (m, 5H, CH_2), 1.00–0.93 (m, 1H, C*H*Si), 0.80 (s, 2H, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 142.4, 128.6, 128.3, 125.7 (Ar-*C*), 39.2 (Ar-CH_2), 29.3 (*C*H_2), 27.8 (*C*H_2), 27.7

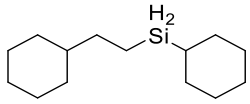
(CH_2), 26.7 (CH_2), 21.2 (*C*HSi), 7.62 (CH_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -22.3 (SiH_2). GC-MS (EI): Calcd for $C_{15}H_{24}Si$: 232.16, found: 232.22.

Cyclohexyl(4-phenylbutyl)silane **(6h)**



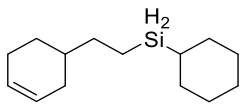
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 4-Phenyl-1-butene (132 mg, 1.0 mmol) and cyclohexylsilane (114 mg, 1.0 mmol) at 90 ℃ for 8 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (222 mg, 90 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.40 (m, 2H, Ar-*H*), 7.31 (m, 3H, Ar-*H*), 3.69 (s, 2H, SiH_2), 2.75 (s, 2H, Ar-CH_2), 1.84 (m, 7H, CH_2), 1.59 (s, 2H, CH_2), 1.38 (s, 5H, CH_2), 1.02 (m, 1H, C*H*Si), 0.85 (s, 2H, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 142.7, 128.5, 128.3, 125.7 (Ar-*C*), 35.8 (Ar-*C*H_2), 34.8 (*C*H_2), 29.4 (*C*H_2), 27.8 (*C*H_2), 26.8 (*C*H_2), 25.5 (*C*H_2), 21.3 (*C*HSi), 7.7 (*C*H_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -22.1 (SiH_2). GC-MS (EI): Calcd for $C_{16}H_{26}Si$: 246.18, found: 246.24.

(2-Cyclohexylethyl)(cyclohexyl)silane **(6i)**



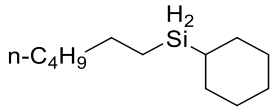
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), Vinylcyclohexane (110 mg, 1.0 mmol) and cyclohexylsilane (114 mg, 1.0 mmol) at 90 ℃ for 8 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (208 mg, 93 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 3.56 (s, 2H, SiH_2), 1.75 (s, 10H, CH_2), 1.26 (m, 11H, CH_2, C*H*), 0.96–0.80 (m, 3H, CH_2, C*H*Si), 0.69 (s, 2H, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 39.4 (*C*H), 32.2 (*C*H_2), 31.9 (*C*H_2), 28.2 (*C*H_2), 26.7 (*C*H_2), 25.8 (*C*H_2), 25.7 (*C*H_2), 25.4 (*C*H_2), 20.2 (*C*HSi), 3.79 (*C*H_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -21.2 (SiH_2). GC-MS (EI): Calcd for $C_{14}H_{28}Si$: 224.20, found: 224.26

4-[2-(Cyclohexylsilyl)ethyl]cyclohex-1-ene **(6j)**



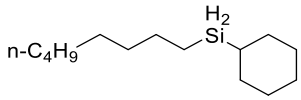
The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 4-Vinylcyclohexene(108 mg, 1.0 mmol) and cyclohexylsilane (114 mg, 1.0 mmol) at 90 ℃ for 8 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (206 mg, 93 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 5.69 (s, 2H, C*H*=C*H*), 3.57 (m, 2H, SiH_2), 2.21–2.02 (m, 3H, CH_2, C*H*), 1.80 (m, 2H, CH_2), 1.77–1.61 (m, 5H, CH_2), 1.57–1.48 (m, 1H, C*H*), 1.43–1.36 (m, 2H, CH_2), 1.31–1.18 (m, 6H, CH_2), 0.94 (m, 1H, C*H*Si), 0.73 (m, 2H, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 126.0, 125.5 (*C*H=*C*H), 35.2 (*C*H), 31.4 (*C*H_2), 30.6 (*C*H_2), 28.2 (*C*H_2), 27.4 (*C*H_2), 26.7 (*C*H_2), 25.7 (*C*H_2), 24.3 (*C*H_2), 20.2 (*C*HSi), 3.8 (*C*H_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -21.3 (SiH_2). GC-MS (EI): Calcd for $C_{14}H_{26}Si$: 222.18, found: 222.30.

(1-Hexyl)(cyclohexyl)silane **(6k)**



The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 1-Hexene (84 mg, 1.0 mmol) and cyclohexylsilane (114 mg, 1.0 mmol) at 90 ℃ for 8 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (188 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 3.57 (m, 2H, SiH_2), 1.77 (m, 5H, CH_2), 1.33 (m, 13H, CH_2), 0.93 (m, 4H, Me, C*H*Si), 0.70 (m, 2H, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 32.7 (*C*H_2), 31.5 (*C*H_2), 29.3 (*C*H_2), 27.8 (*C*H_2), 26.7 (*C*H_2), 25.6 (*C*H_2), 22.6 (*C*H_2), 21.2 (*C*HSi), 14.1 (Me), 7.7 (*C*H_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -22.1 (SiH_2). GC-MS (EI): Calcd for $C_{12}H_{26}Si$: 198.18, found: 198.24.

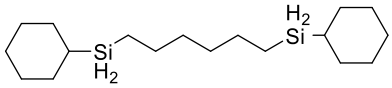
(1-Octyl)(hexyl)silane **(6l)**



The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 1-Octene (112 mg, 1.0 mmol) and cyclohexylsilane (114 mg, 1.0 mmol) at 90 ℃ for 8 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (215 mg, 95 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 3.56 (m, 2H, SiH_2), 1.76 (m, 5H, CH_2), 1.44-1.21 (m, 17H, CH_2), 0.92 (m, 4H, Me, C*H*Si), 0.74-0.66 (m, 2H, CH_2Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 33.0 (*C*H_2), 31.9 (*C*H_2), 29.3

(*C*H_2), 29.2 (*C*H_2), 27.7 (*C*H_2), 26.7 (*C*H_2), 25.6 (*C*H_2), 22.7 (*C*H_2), 21.2 (*C*HSi), 14.1 (Me), 7.7 (*C*H_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -22.1 (SiH_2). GC-MS (EI): Calcd for $C_{14}H_{30}Si$: 226.21, found: 226.28.

1,6-Bis(cyclohexylsilyl)hexane **(6m)**



The reaction was carried out according to general method by using catalyst A (12.7 mg, 0.01 mmol), 1,5-Hexadiene (82 mg, 1.0 mmol) and cyclohexylsilane (228 mg, 2.0 mmol) at 90 ℃ for 8 h and then the resulting solution was concentrated in vacuum. The crude product was purified by column chromatography on silica gel with hexane as eluent. The title compound was isolated (249 mg, 80 %) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 3.56 (s, 4H, Si*H*$_2$), 1.76 (m, 10H, C*H*$_2$), 1.40 (m, 8H, C*H*$_2$), 1.25 (m, 10H, C*H*$_2$), 0.93 (m, 2H, C*H*Si), 0.70 (m, 4H, C*H*$_2$Si). ^{13}C NMR (101 MHz, $CDCl_3$): δ 32.6 (*C*H_2), 29.2 (*C*H_2), 27.7 (*C*H_2) , 26.7 (*C*H_2) , 25.5 (*C*H_2) , 21.2 (*C*HSi), 7.7 (*C*H_2Si). ^{29}Si NMR (79 MHz, $CDCl_3$): δ -22.1 (SiH_2). GC-MS (EI): Calcd for $C_{18}H_{38}Si$: 310.25, found: 310.32.

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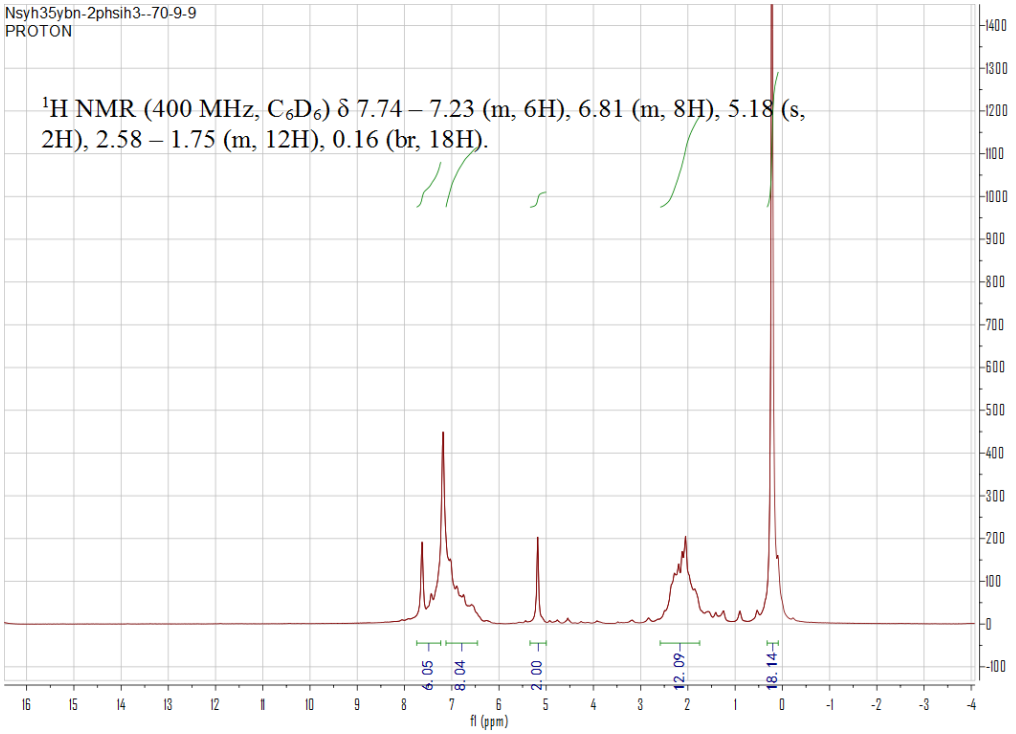
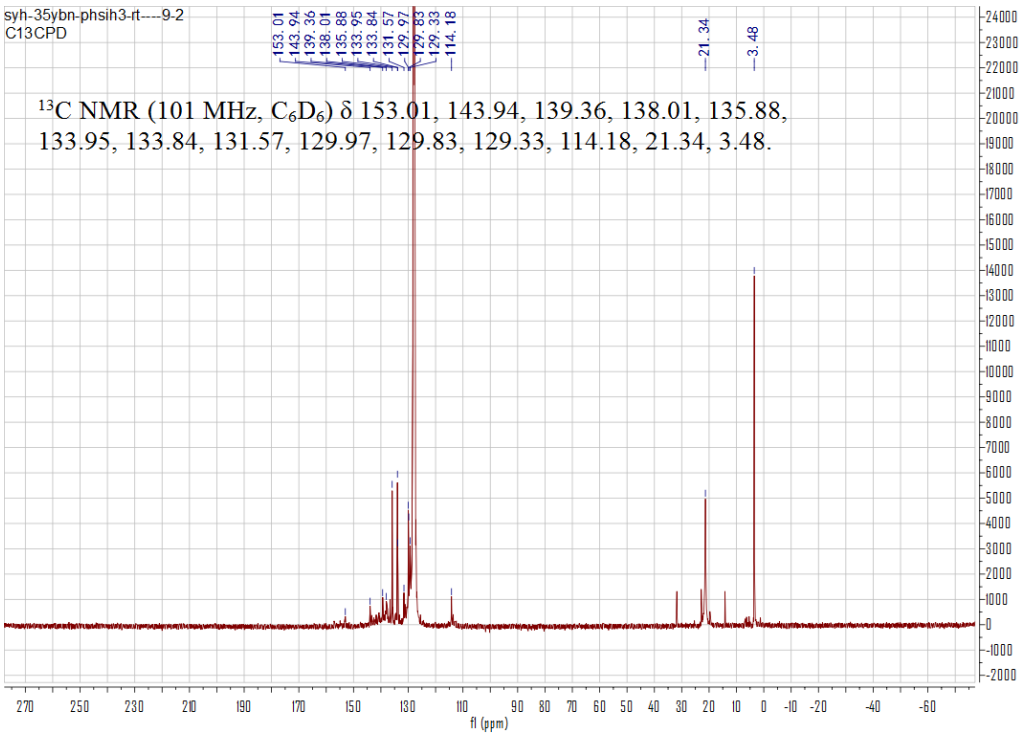
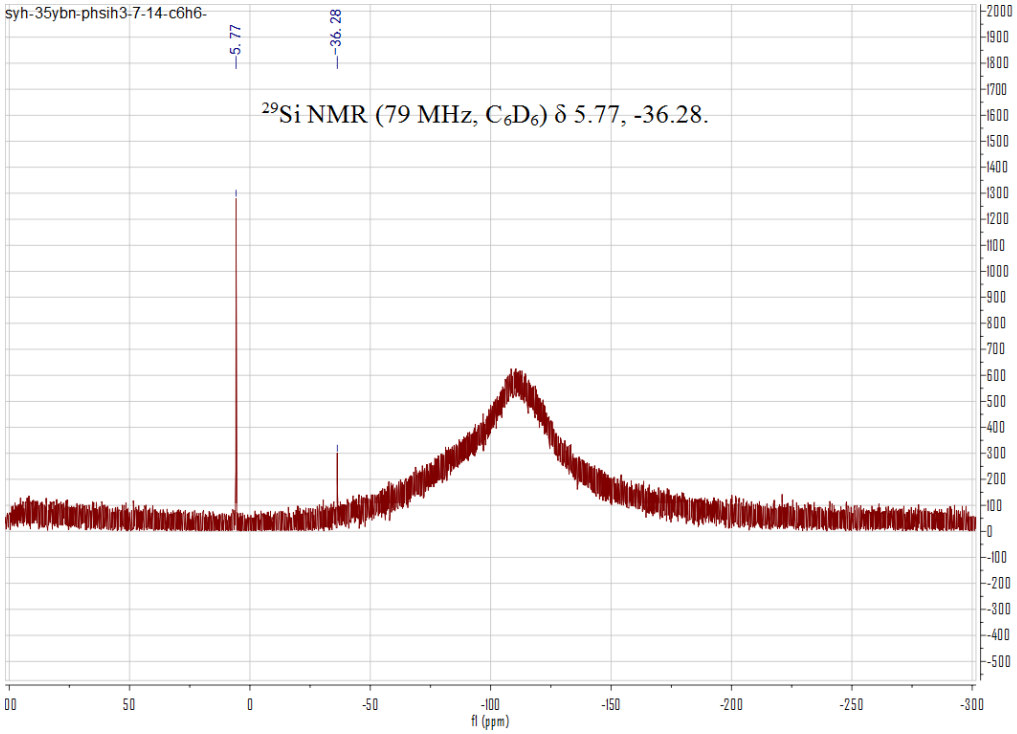
^{1}H NMR Spectrum of A



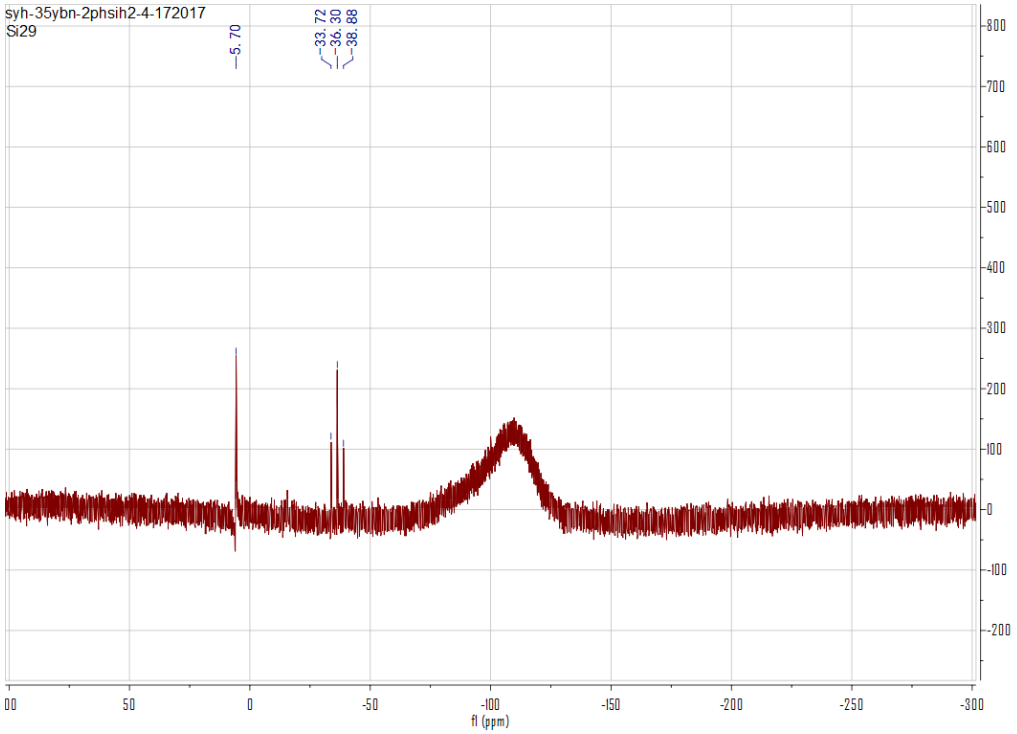
^{13}C NMR Spectrum of A



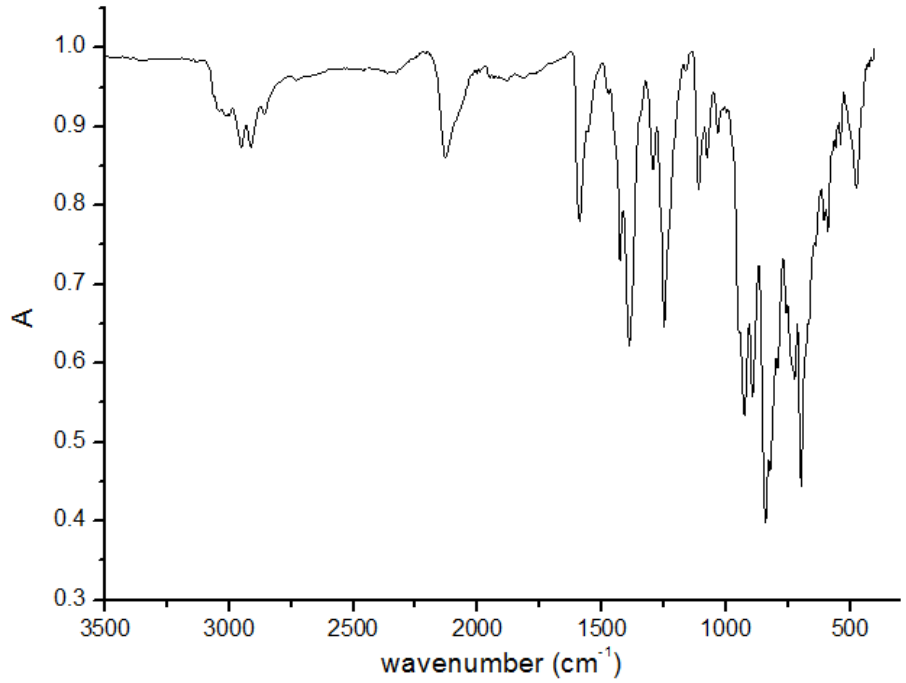
Proton-decoupled ^{29}Si NMR Spectrum of A

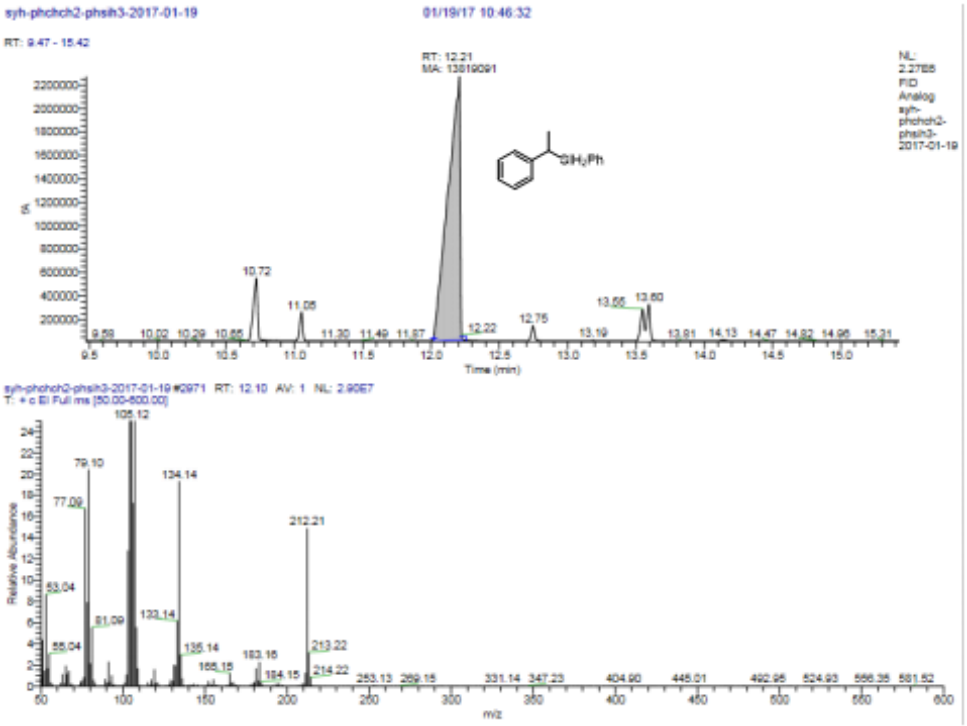


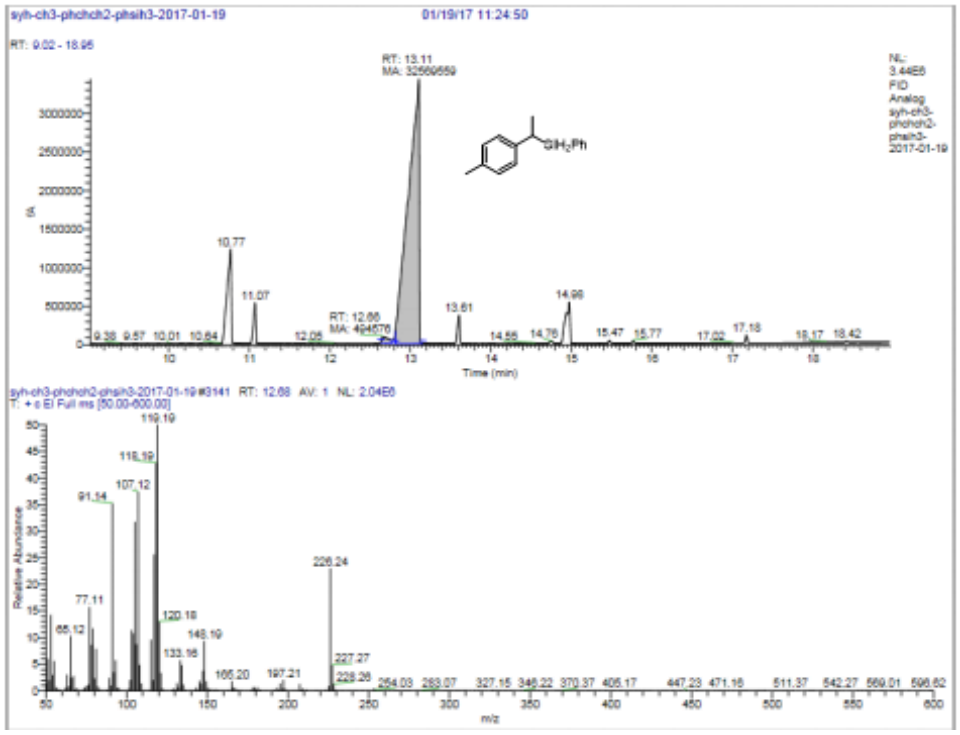
Proton-coupled ^{29}Si NMR Spectrum of A

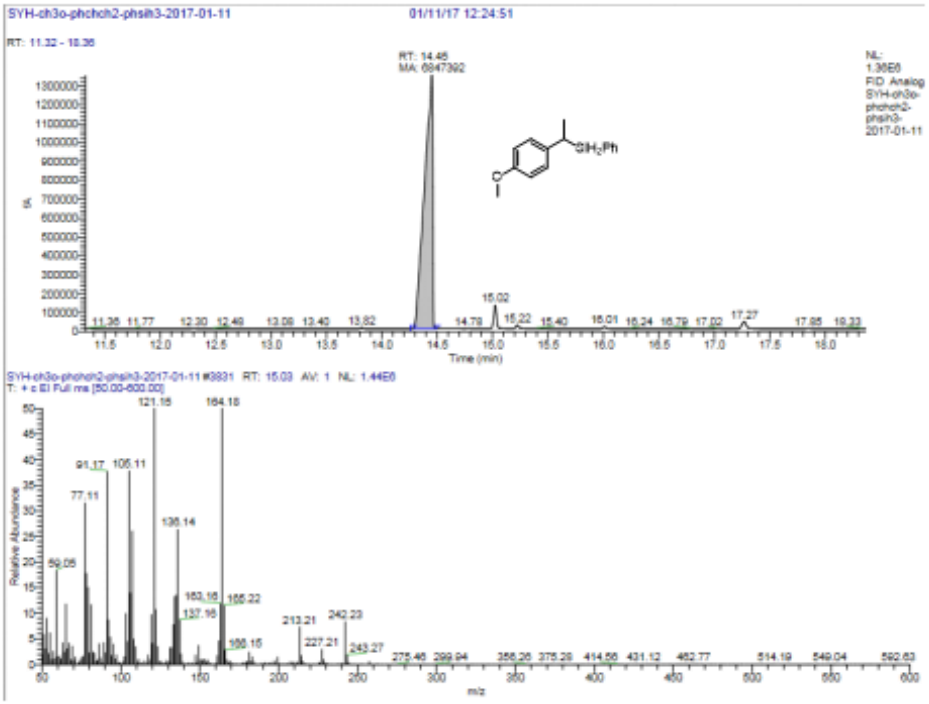


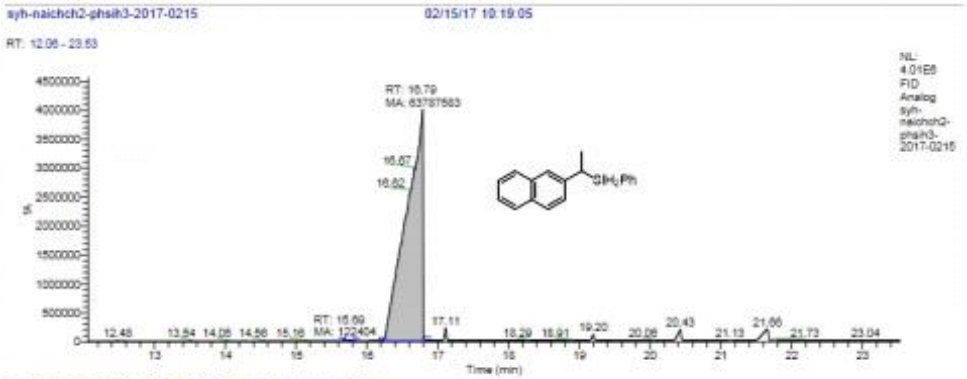
IR Spectrum of A

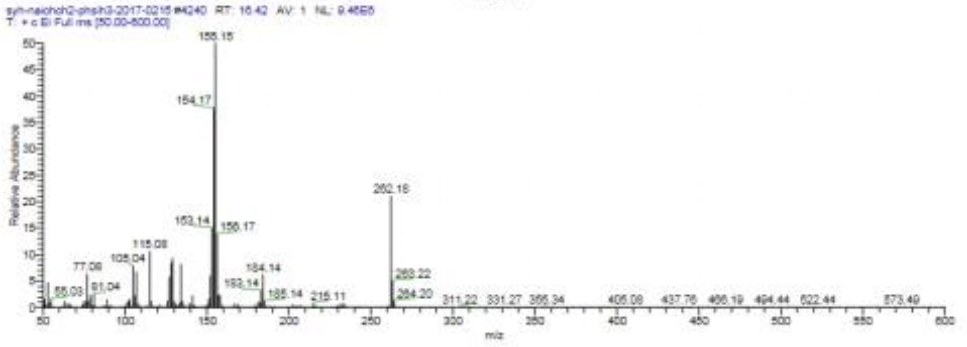


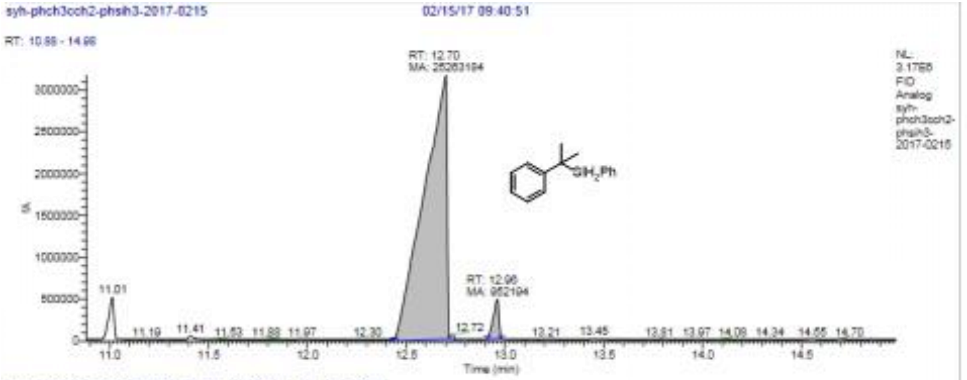


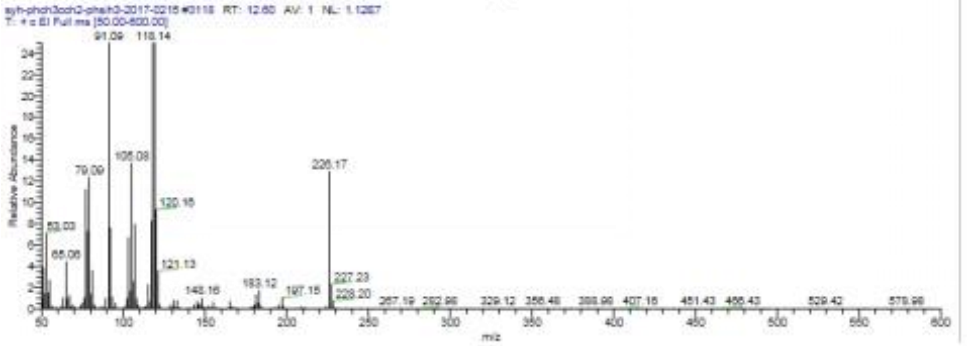

syh-ch3-phchch2-phsih3-2017-01-19
01/19/17 11:24:50
RT: 9.02 - 18.96
RT: 13.11
MA: 32569659
NL:
3.44E6
FID
Analog
syh-ch3-
phchch2-
phsih3-
2017-01-19
SiH2Ph
10.77
11.07
RT: 12.66
MA: 494576
13.61
14.96
17.18
Time (min)
syh-ch3-phchch2-phsih3-2017-01-19 #3141 RT: 12.68 AV: 1 NL: 2.04E6
T: + c EI Full ms [50.00-600.00]
119.19
118.19
107.12
91.14
226.24
77.11
65.12
120.18
148.19
133.16
227.27
165.20
197.21
228.26
264.03
283.07
327.15
346.22
370.37
405.17
447.23
471.16
511.37
542.27
569.01
596.62
Relative Abundance
m/z

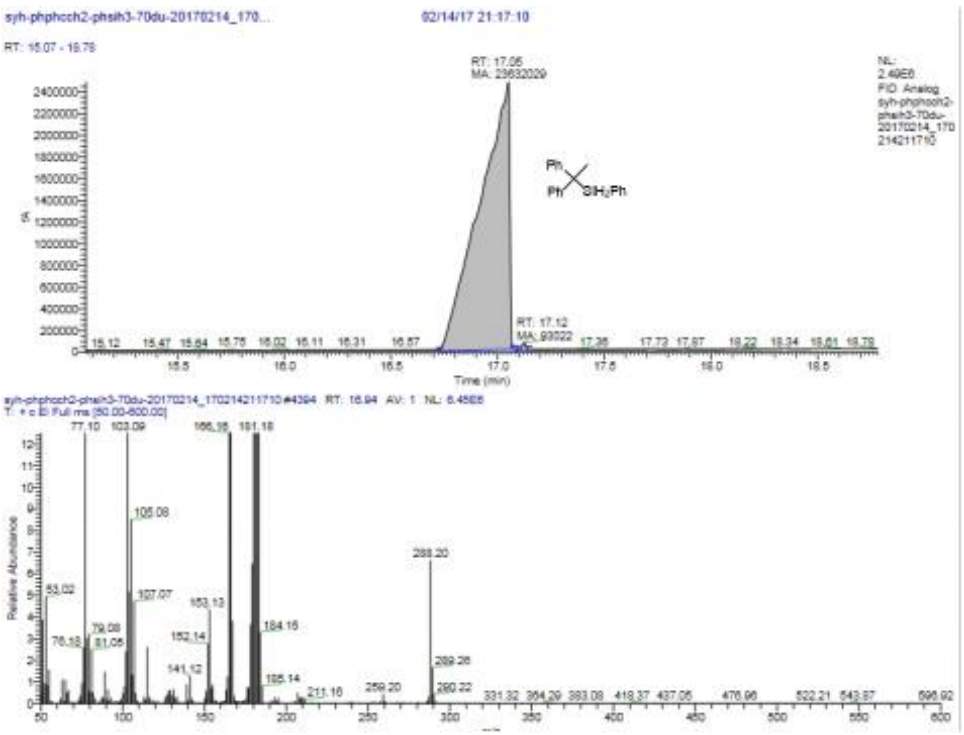

SYH-ch3o-phchch2-phsih3-2017-01-11
01/11/17 12:24:51
RT: 11.32 - 18.36
RT: 14.46
MA: 6947392
NL:
1.36E6
FID Analog
SYH-ch3o-
phchch2-
phsih3-
2017-01-11
SiH2Ph
15.02
15.22
17.27
Time (min)
SYH-ch3o-phchch2-phsih3-2017-01-11 #8831 RT: 15.03 AV: 1 NL: 1.44E6
T: + c EI Full ms [50.00-600.00]
121.16
164.18
91.17
106.11
77.11
136.14
59.05
153.15
155.22
137.16
213.21
242.23
227.21
243.27
Relative Abundance
m/z

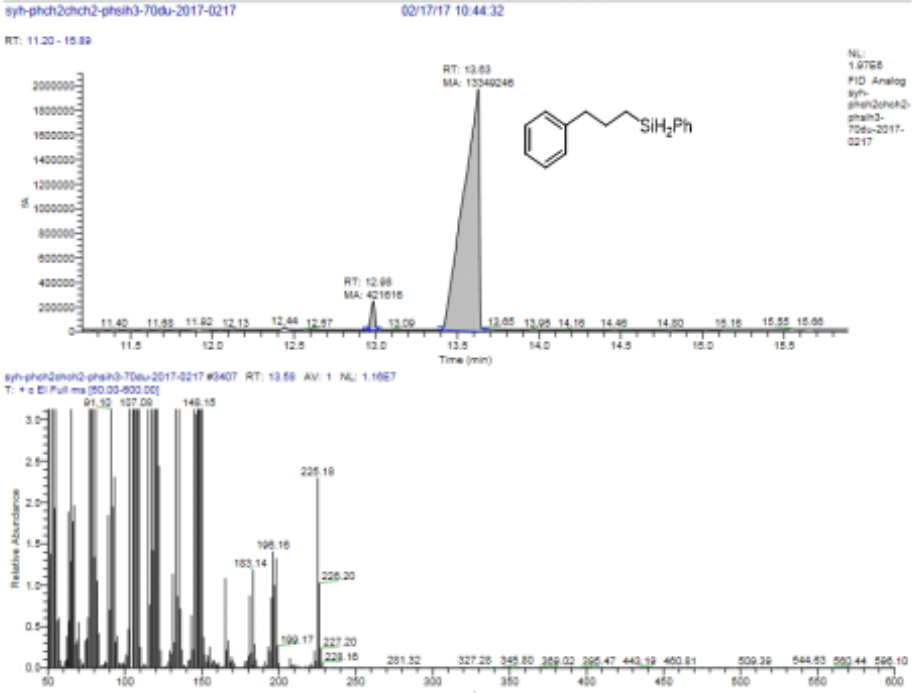

syh-naichch2-phsih3-2017-0215
02/15/17 10:19:05
RT: 12.06 - 23.53
RT: 16.79
MA: 63787583
16.07
16.62
RT: 15.69
MA: 122404
17.11
NL:
4.01E6
FID
Analog
syh-
naichch2-
phsih3-
2017-0215
Time (min)

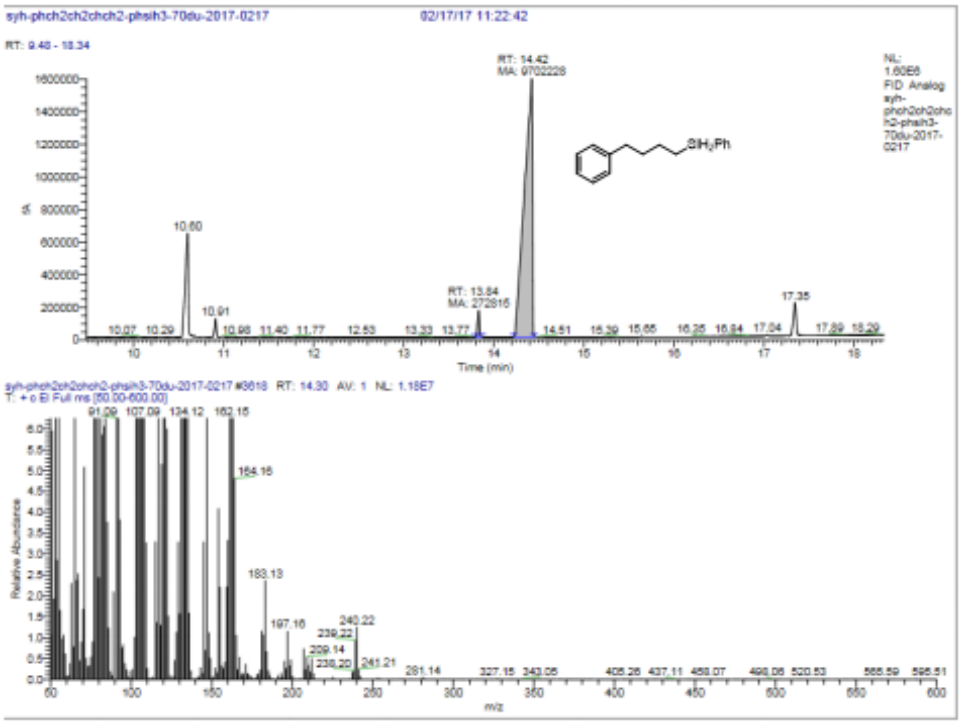

syh-naichch2-phsih3-2017-0215 #4240 RT: 16.42 AV: 1 NL: 9.46E6
T: + c EI Full ms [50.00-600.00]
155.15
154.17
262.16
153.14
156.17
115.08
105.04
77.06
184.14
263.22
264.20
m/z

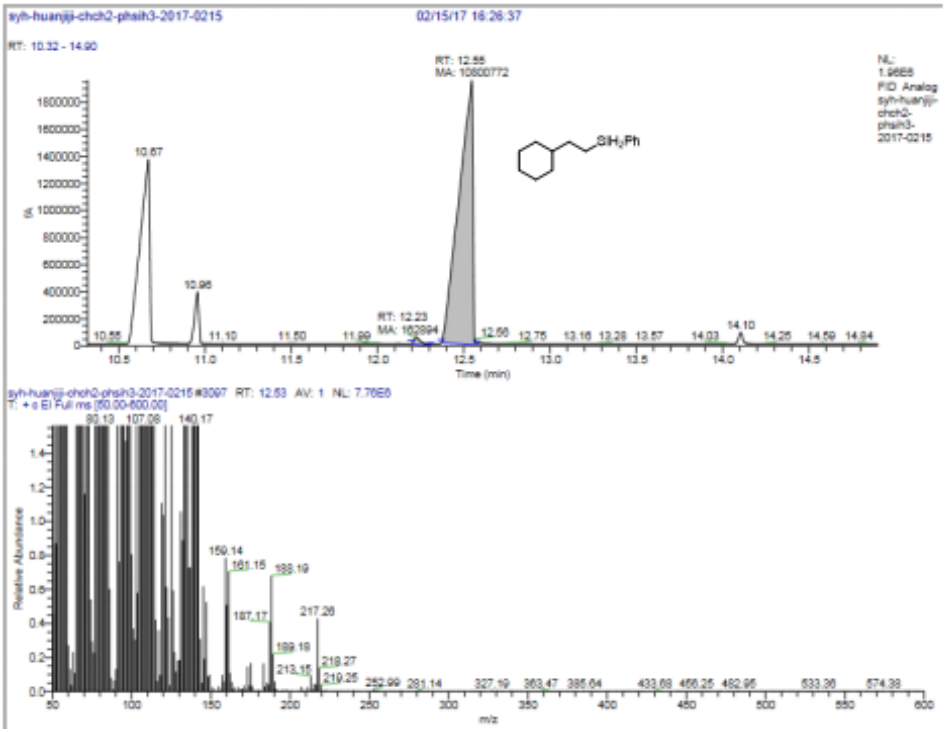

syh-phch3coch2-phsih3-2017-0215
02/15/17 09:40:51
RT: 10.88 - 14.98
RT: 12.70
MA: 25263194
RT: 12.96
MA: 952194
11.01
12.72
NL:
3.17E6
FID
Analog
syh-
phch3coch2-
phsih3-
2017-0215
Time (min)

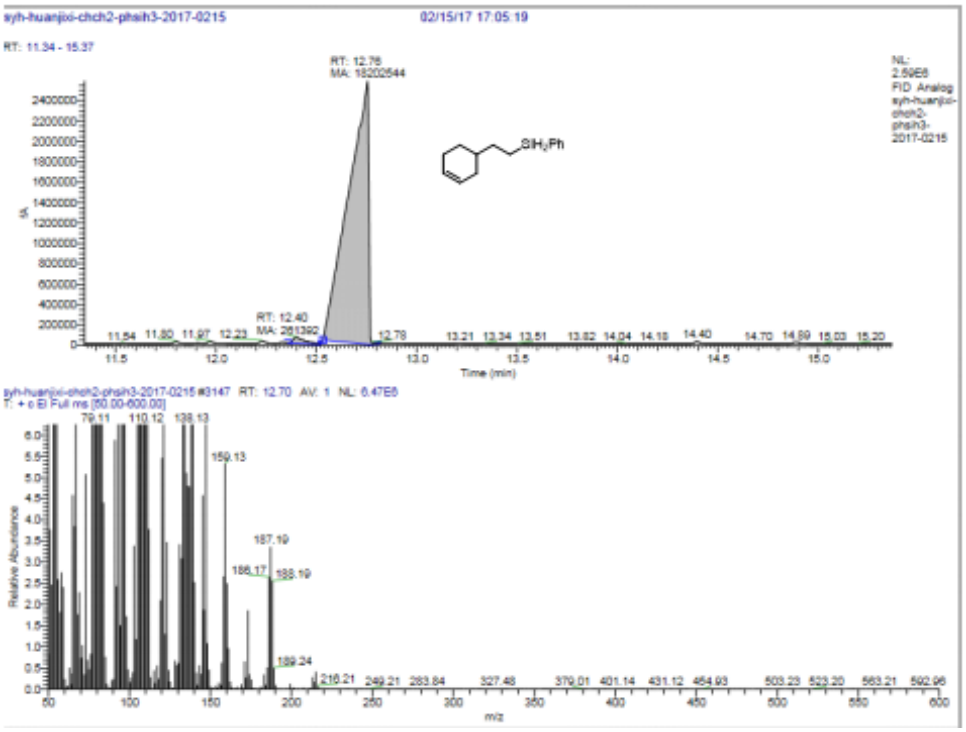

syh-phch3coch2-phsih3-2017-0215 #2118 RT: 12.60 AV: 1 NL: 1.12E7
T: + c EI Full ms [50.00-600.00]
91.09
119.14
79.09
105.08
226.17
120.15
53.03
65.06
121.13
227.23
228.20
m/z

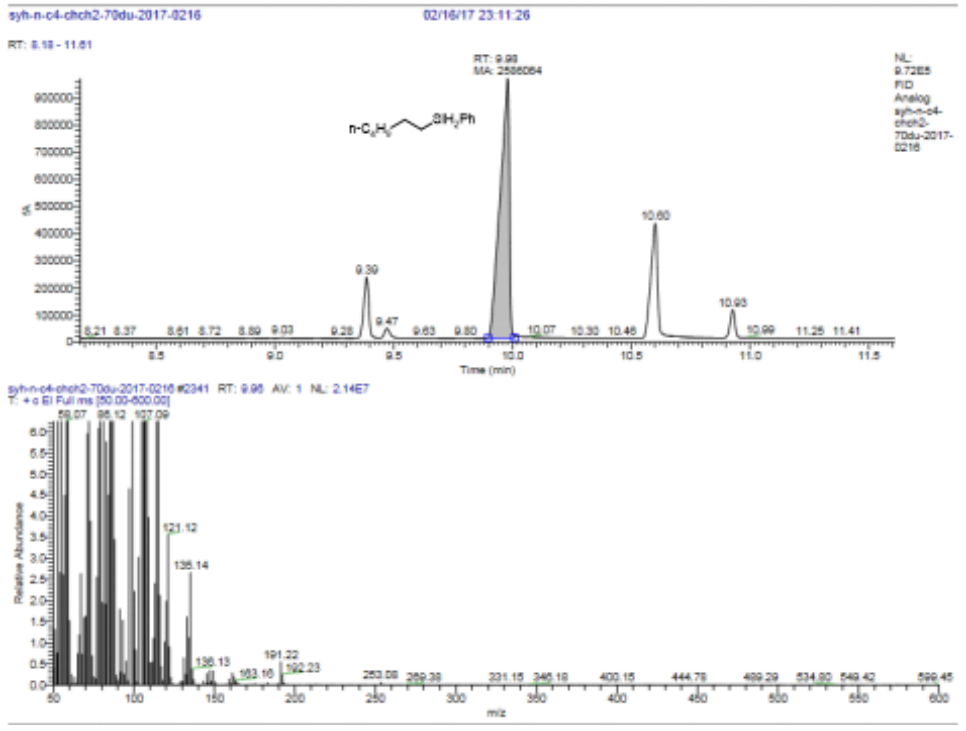

syh-phphcch2-phsih3-70du-20170214_170...
02/14/17 21:17:10
RT: 15.07 - 19.79
RT: 17.05
MA: 23632029
NL:
2.49E6
FID Analog
syh-phphcch2-
phsih3-70du-
20170214_170
214211710
Ph
Ph
SiH2Ph
RT: 17.12
MA: 93022
Time (min)
syh-phphcch2-phsih3-70du-20170214_170214211710#4394 RT: 16.94 AV: 1 NL: 6.45E6
T: + c EI Full ms [50.00-600.00]
Relative Abundance
77.10
103.09
166.95
181.18
105.08
288.20
53.02
107.07
153.13
184.15
79.08
81.05
152.14
289.26
76.18
141.12
185.14
211.16
259.20
290.22
331.32
354.29
393.08
419.37
437.05
476.96
522.21
543.97
596.92

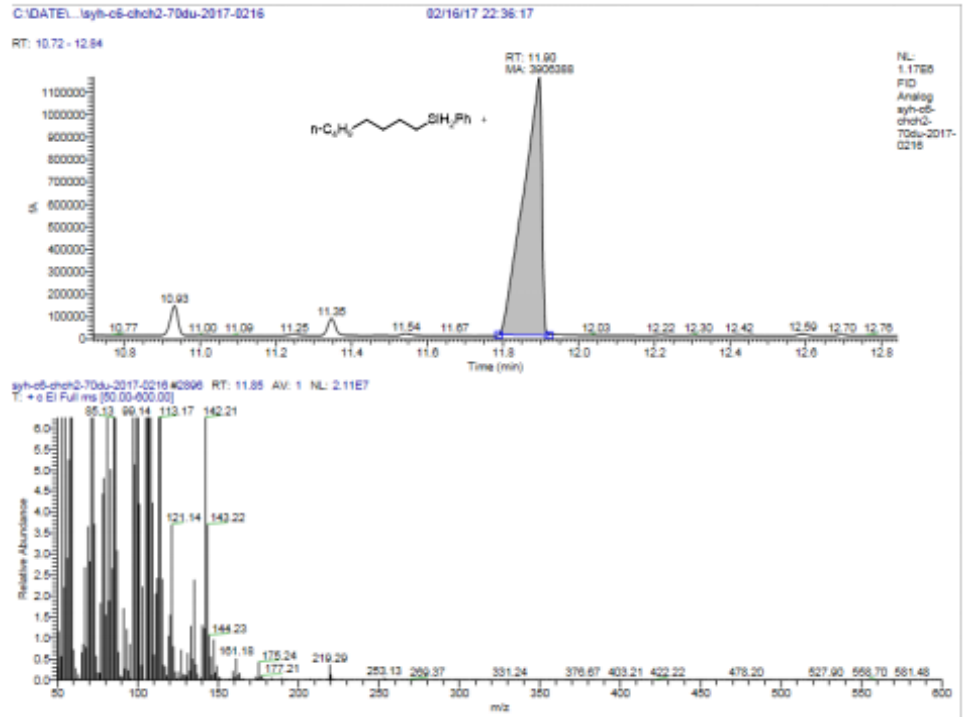

syh-phch2chch2-phsih3-70du-2017-0217
02/17/17 10:44:32
RT: 11.20 - 15.89
RT: 13.63
MA: 13349246
NL:
1.97E6
FID Analog
syh-
phch2chch2-
phsih3-
70du-2017-
0217
SiH2Ph
RT: 12.98
MA: 421616
Time (min)
syh-phch2chch2-phsih3-70du-2017-0217 #3407 RT: 13.58 AV: 1 NL: 1.16E7
T: + c EI Full ms [50.00-600.00]
Relative Abundance
91.12
107.09
146.15
225.19
196.16
183.14
226.20
199.17
227.20
228.16
281.32
327.28
345.80
369.02
395.47
443.19
460.91
509.39
544.53
580.44
596.10

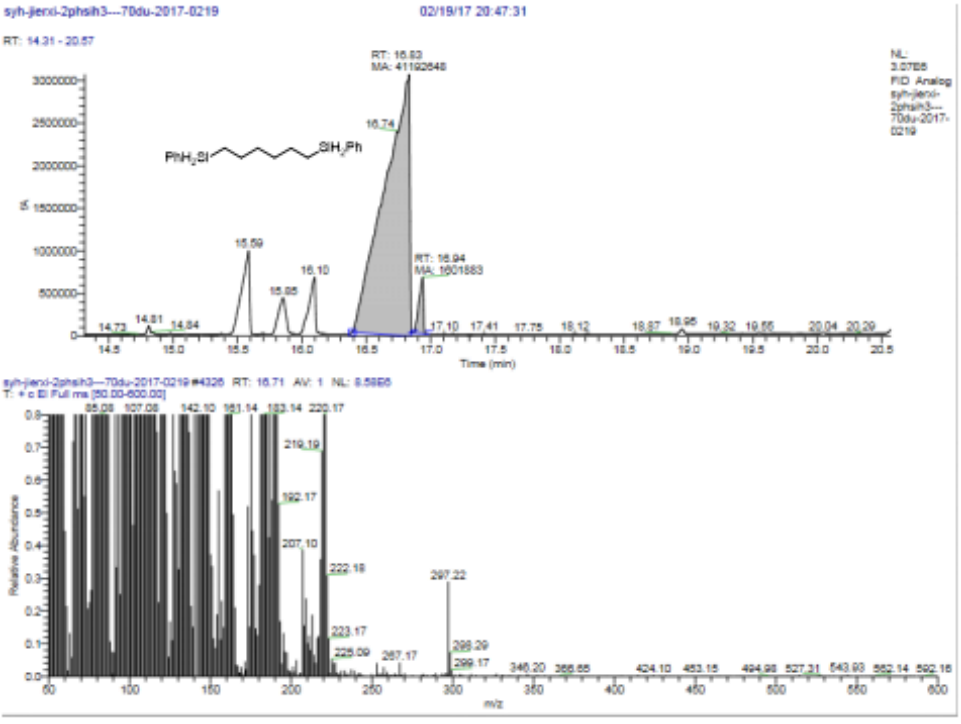

syh-phch2ch2chch2-phsih3-70du-2017-0217
02/17/17 11:22:42
RT: 9.48 - 18.34
RT: 14.42
MA: 9702228
NL:
1.60E6
FID Analog
syh-phch2ch2chch2-phsih3-70du-2017-0217
SiH2Ph
10.60
10.91
RT: 13.84
MA: 272816
17.35
Time (min)
syh-phch2ch2chch2-phsih3-70du-2017-0217 #3618 RT: 14.30 AV: 1 NL: 1.18E7
T: + c EI Full ms [50.00-600.00]
91.09
107.09
134.12
152.15
154.16
183.13
197.16
240.22
239.22
209.14
241.21
Relative Abundance
m/z

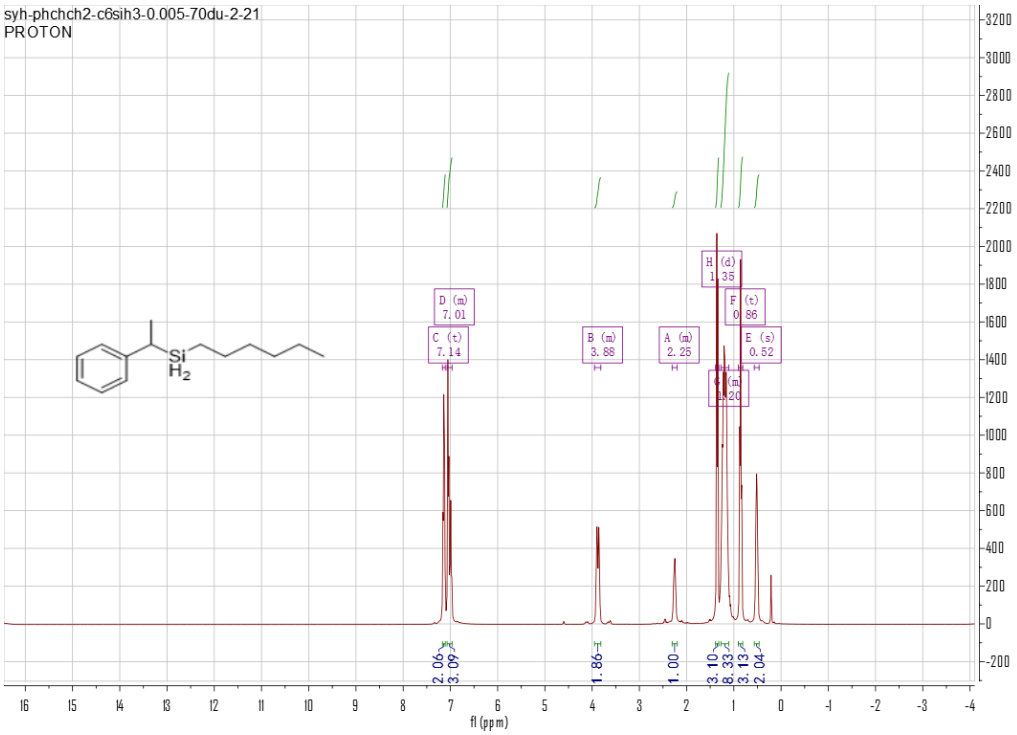

syh-huanjiji-chch2-phsih3-2017-0215
02/15/17 16:26:37
RT: 10.32 - 14.90
RT: 12.55
MA: 10600772
NL:
1.98E6
FID Analog
syh-huanjiji-chch2-phsih3-2017-0215
SiH2Ph
10.67
10.96
RT: 12.23
MA: 162894
14.10
Time (min)
syh-huanjiji-chch2-phsih3-2017-0215 #3097 RT: 12.53 AV: 1 NL: 7.76E6
T: + c EI Full ms [50.00-600.00]
90.13
107.08
140.17
159.14
161.15
188.19
187.17
217.26
199.19
213.15
219.27
219.25
Relative Abundance
m/z

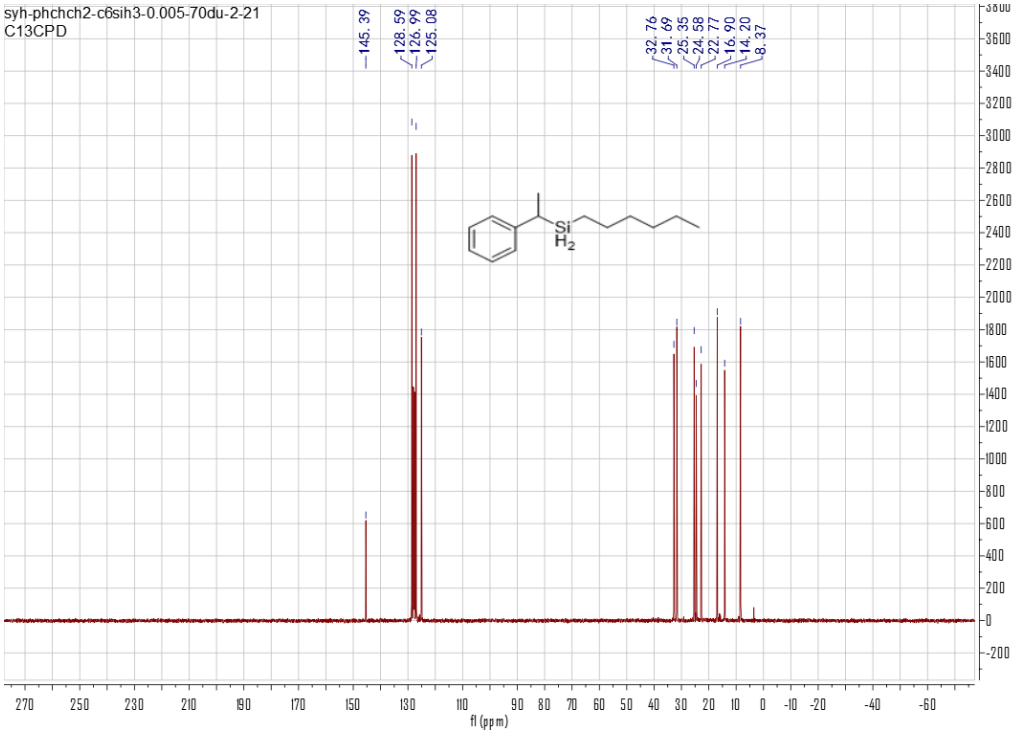

syh-huanjixi-chch2-phsih3-2017-0215
02/15/17 17:05:19
RT: 11.34 - 15.37
RT: 12.76
MA: 18202544
NL:
2.59E6
FID Analog
syh-huanjixi-chch2-phsih3-2017-0215
SiH2Ph
RT: 12.40
MA: 261392
Time (min)
Relative Abundance
m/z

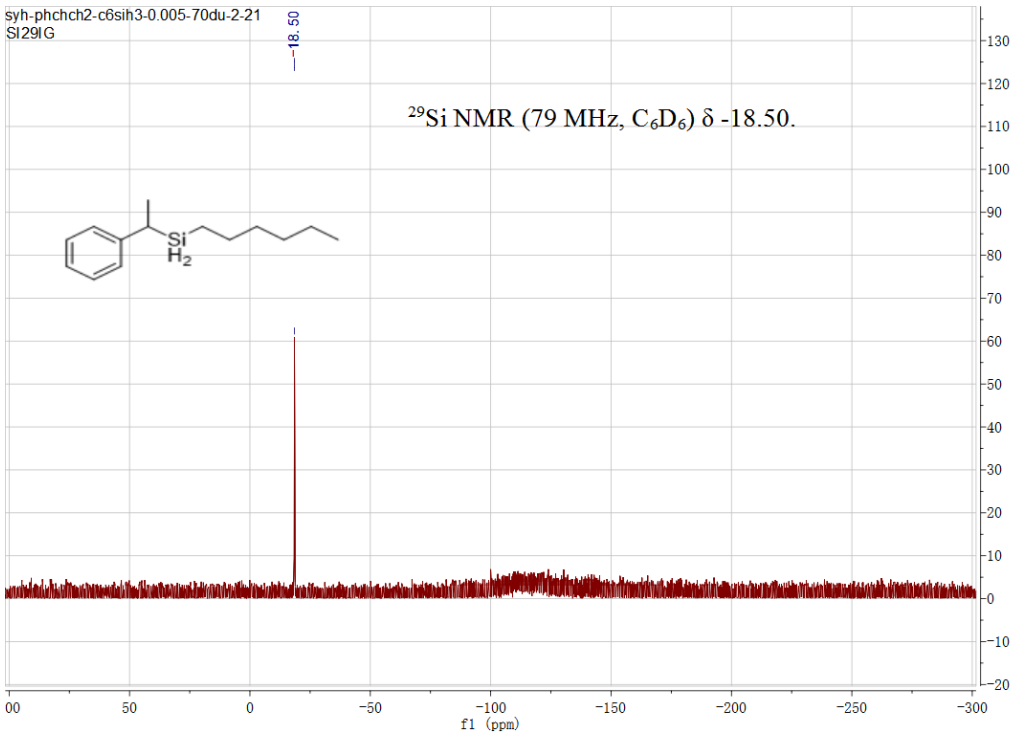

syh-n-c4-chch2-70du-2017-0216
02/16/17 23:11:26
RT: 8.19 - 11.61
RT: 9.98
MA: 2586064
NL:
9.72E5
FID
Analog
syh-n-c4-chch2-70du-2017-0216
n-C4H9
SiH2Ph
Time (min)
Relative Abundance
m/z

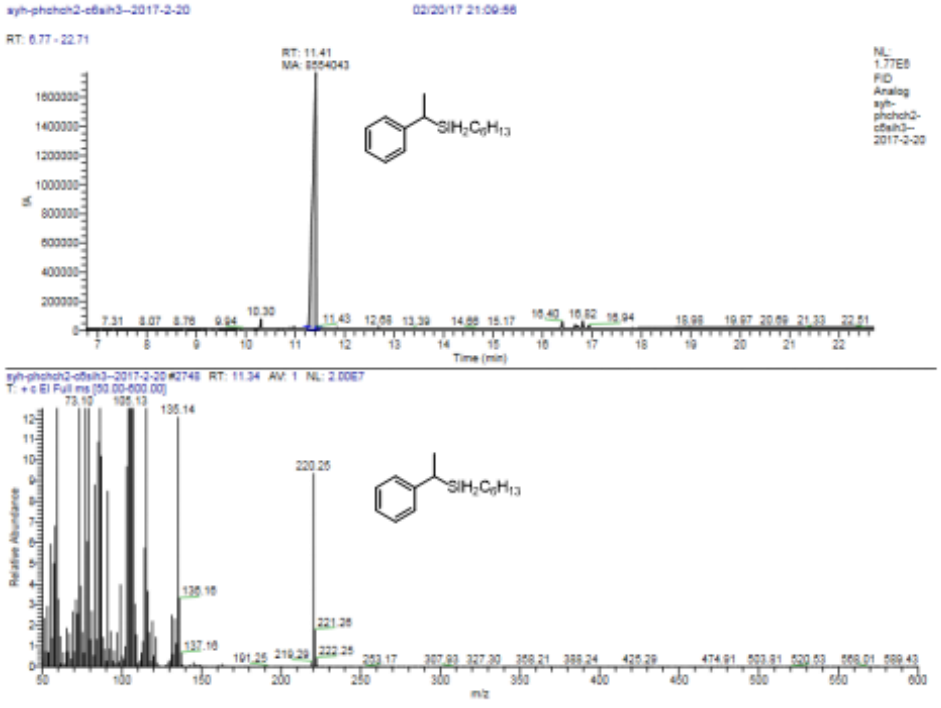

C:\DATE\...\syh-c6-chch2-70du-2017-0216
02/16/17 22:36:17
RT: 10.72 - 12.84
RT: 11.90
MA: 3906388
NL:
1.17E6
FID
Analog
syh-c6-
chch2-
70du-2017-
0216
n-C6H13
SiH2Ph
10.93
11.35
Time (min)
syh-c6-chch2-70du-2017-0216 #2896 RT: 11.85 AV: 1 NL: 2.11E7
T: + c EI Full ms [50.00-600.00]
Relative Abundance
m/z

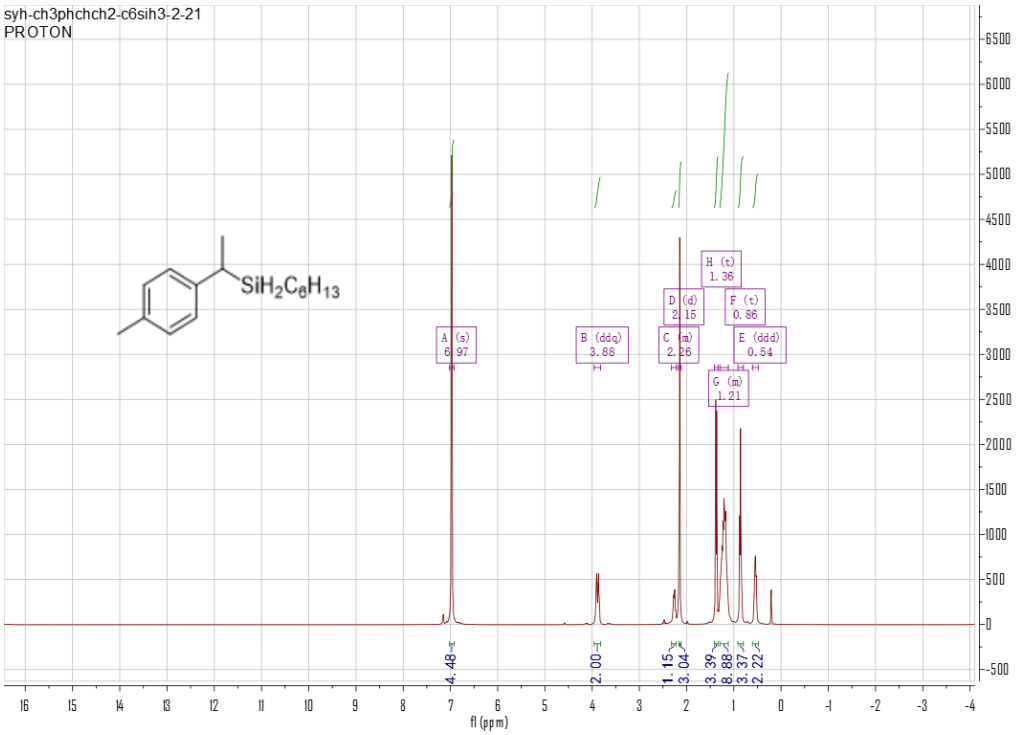

syh-jierxi-2phsih3---70du-2017-0219
02/19/17 20:47:31
RT: 14.21 - 20.57
RT: 16.83
MA: 41192648
NL:
3.07E6
FID Analog
syh-jierxi-
2phsih3---
70du-2017-
0219
PhH2Si
SiH2Ph
16.74
15.59
16.10
15.85
RT: 16.94
MA: 1601883
Time (min)
syh-jierxi-2phsih3---70du-2017-0219 #4326 RT: 16.71 AV: 1 NL: 8.58E6
T: + c EI Full ms [50.00-600.00]
Relative Abundance
m/z

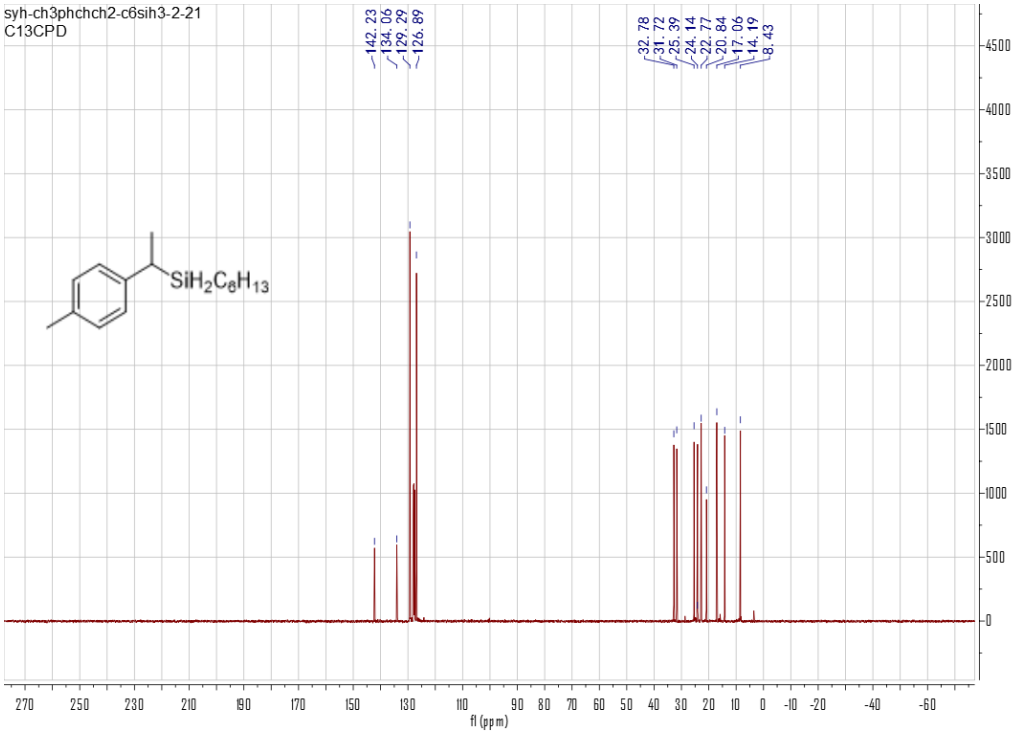

syh-phchch2-c6sih3-0.005-70du-2-21
PROTON
D (m) 7.01
C (t) 7.14
B (m) 3.88
A (m) 2.25
H (d) 1.35
F (t) 0.86
E (s) 0.52
G (m) 1.20
2.06
3.09
1.86
1.00
3.10
8.33
3.13
2.04
f1 (ppm)

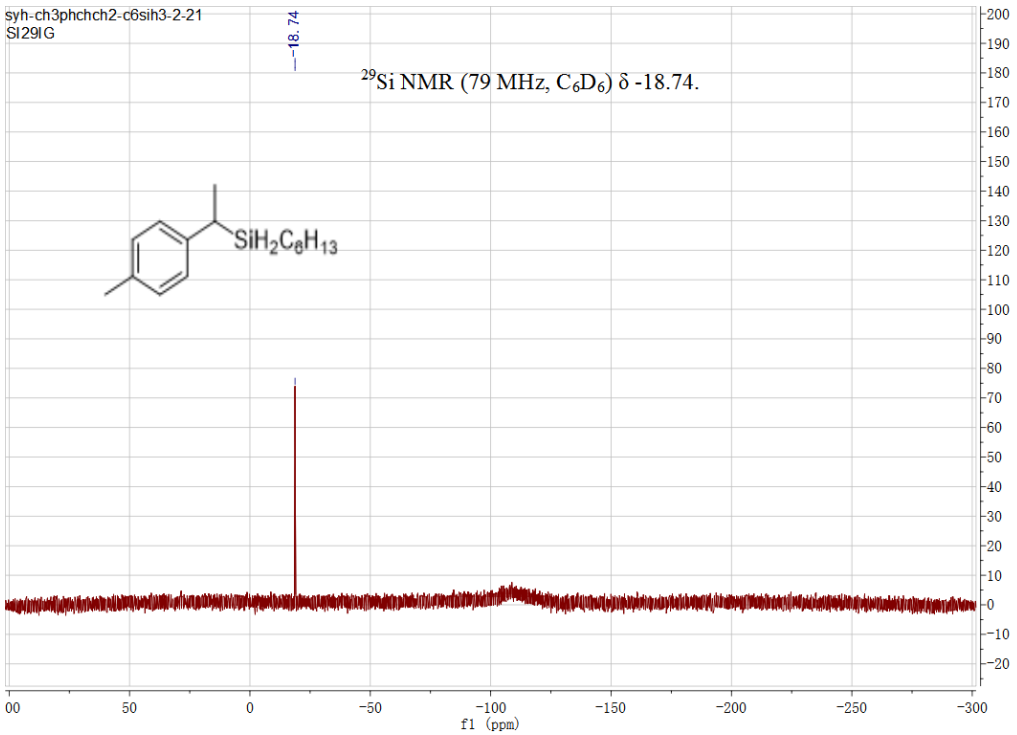

syh-phchch2-c6sih3-0.005-70du-2-21
C13CPD
145.39
128.59
126.99
125.08
32.76
31.69
25.35
24.58
22.77
16.90
14.20
8.37
f1 (ppm)


syh-phchch2-c6sih3-0.005-70du-2-21
SI29IG
-18.50
^{29}Si NMR (79 MHz, C_6D_6) δ -18.50.
Si
H2
f1 (ppm)

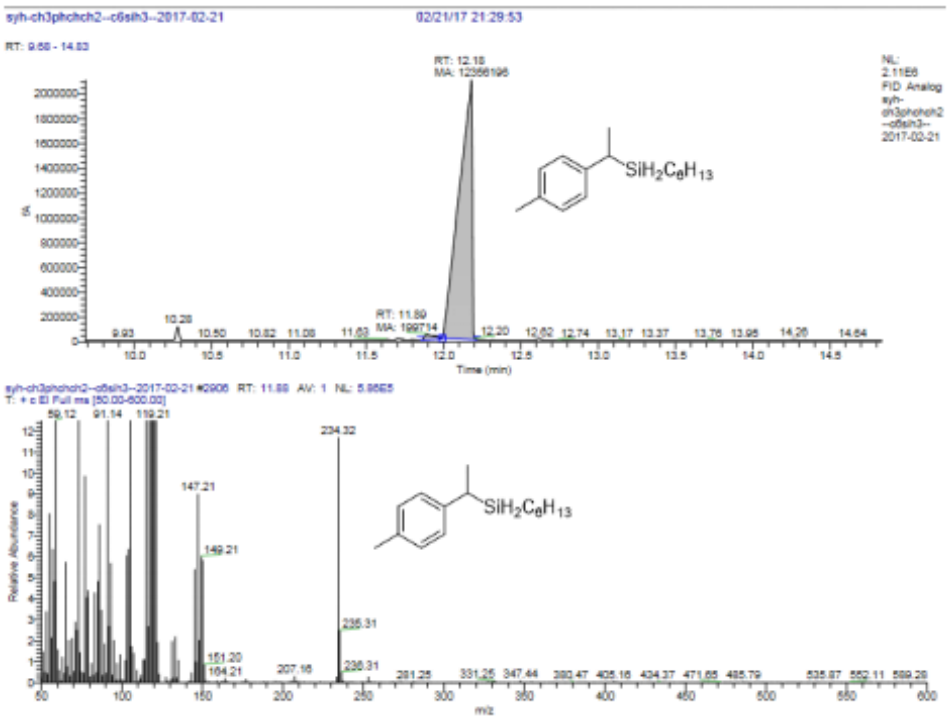

RT: 11.41
MA: 8554043
SiH2C6H13
Time (min)
RT: 11.34
220.26
135.14
136.16
221.26
Relative Abundance
m/z

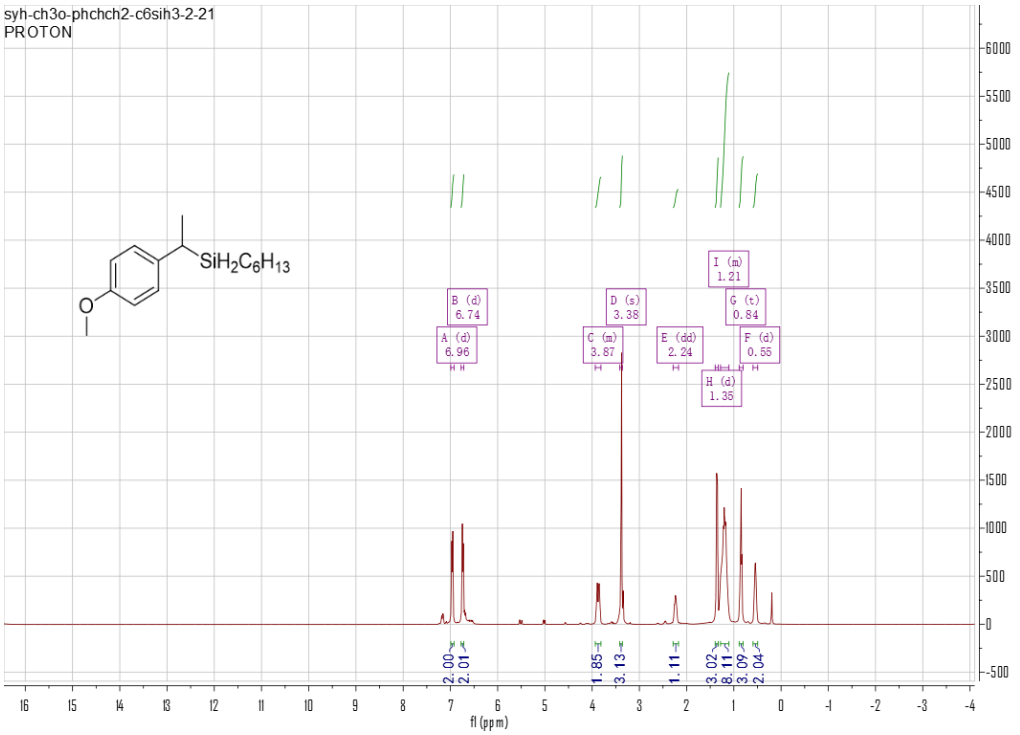

syh-ch3phchch2-c6sih3-2-21
PROTON
SiH2C8H13
A (s) 6.97
B (ddq) 3.88
C (m) 2.26
D (d) 2.15
E (ddd) 0.54
F (t) 0.86
G (m) 1.21
H (t) 1.36
4.48
2.00
1.15
3.04
3.39
8.88
3.37
2.22
f1 (ppm)

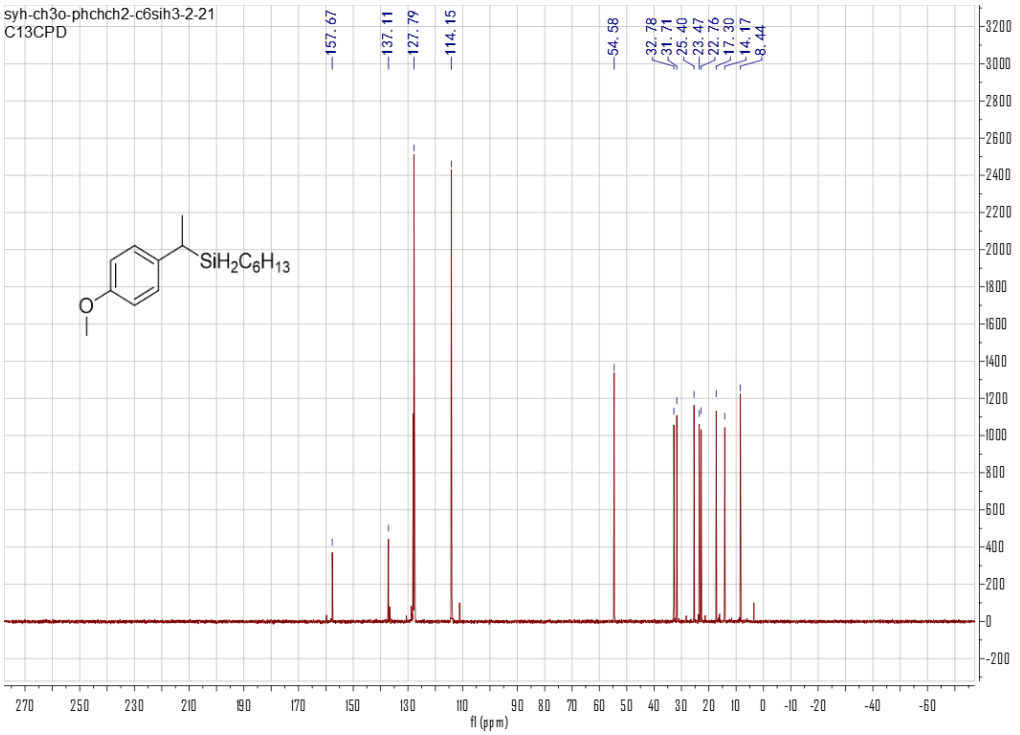

syh-ch3phchch2-c6sih3-2-21
C13CPD
142.23
134.06
129.29
126.89
32.78
31.72
25.39
24.14
22.77
20.84
17.06
14.19
8.43
SiH2C8H13
f1 (ppm)

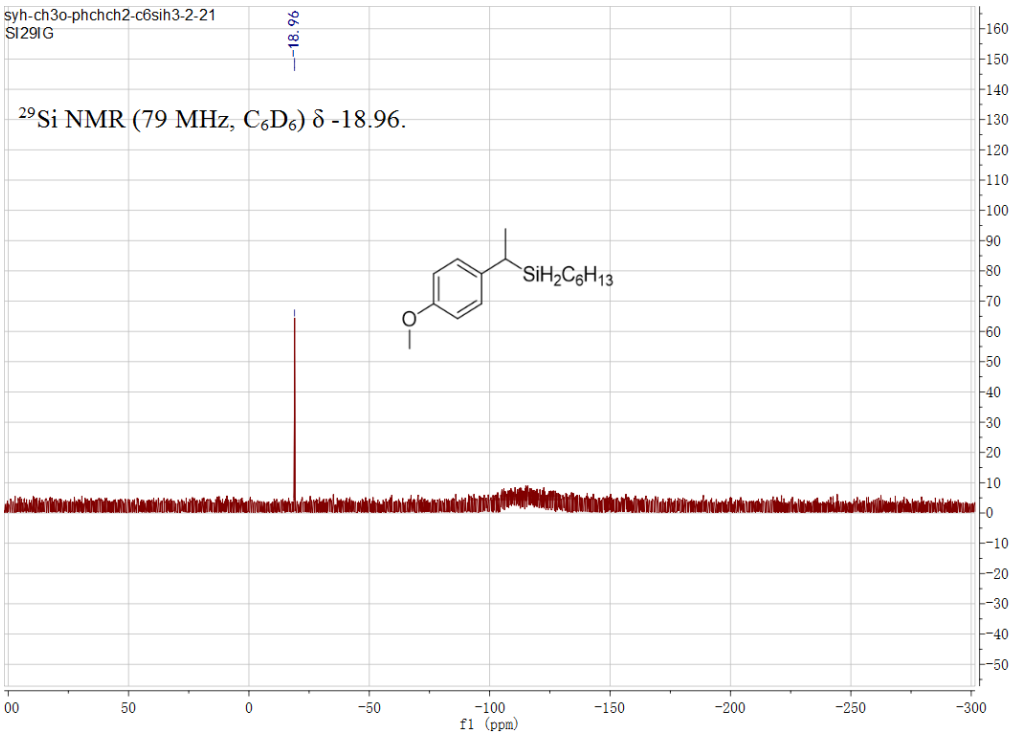


^{29}Si NMR (79 MHz, C_6D_6) δ -18.74.

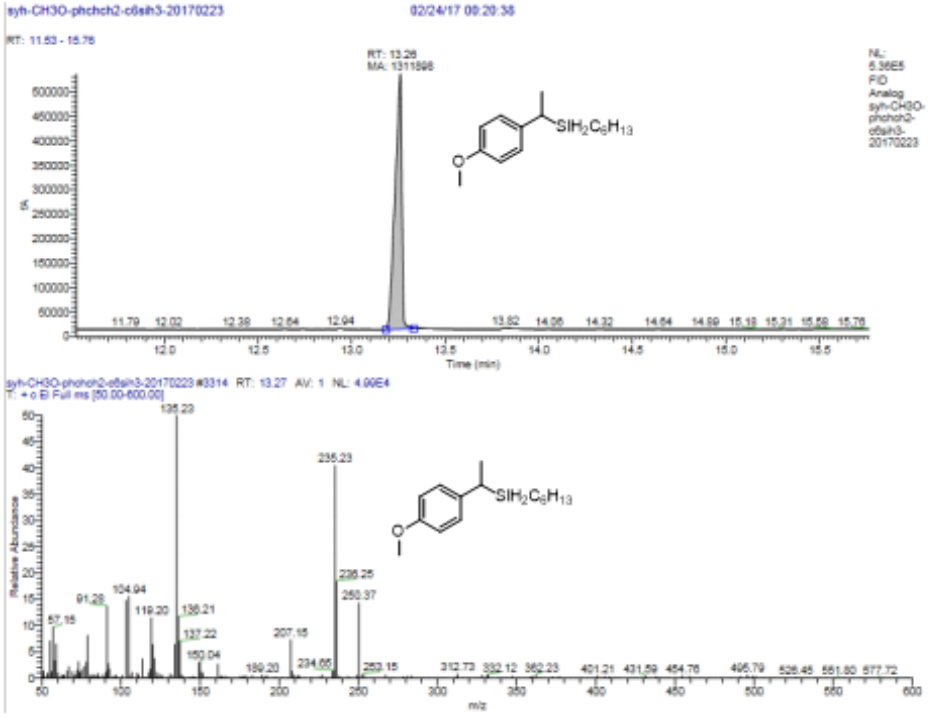


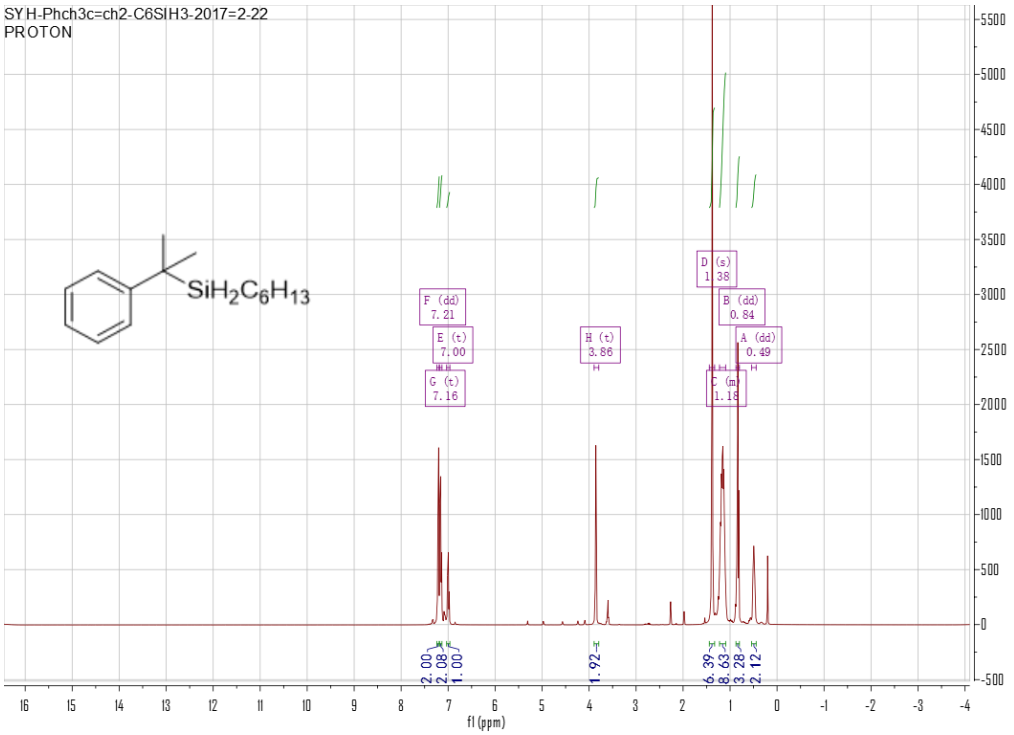

syh-ch3o-phchch2-c6sih3-2-21
PROTON
SiH2C6H13
O
A (d) 6.96
B (d) 6.74
C (m) 3.87
D (s) 3.38
E (dd) 2.24
F (d) 0.55
G (t) 0.84
H (d) 1.35
I (m) 1.21
2.00
2.01
1.85
3.13
1.11
3.02
8.11
3.09
2.04
f1 (ppm)

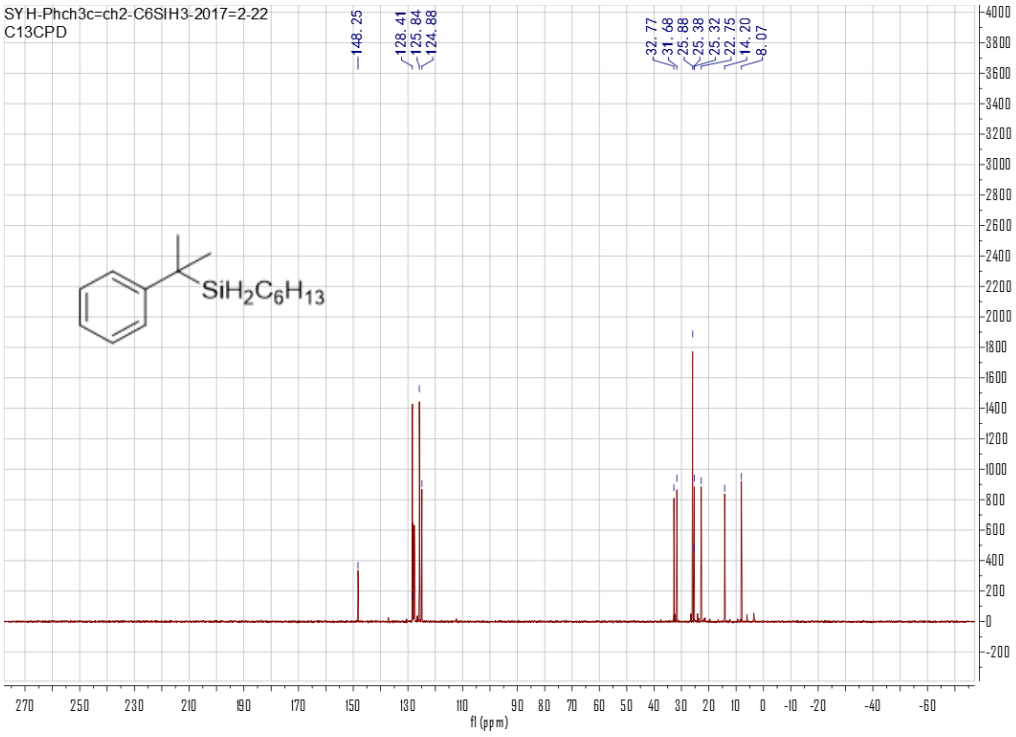

syh-ch3o-phchch2-c6sih3-2-21
C13CPD
157.67
137.11
127.79
114.15
54.58
32.78
31.71
25.40
23.47
22.76
17.30
14.17
8.44
SiH2C6H13
O
f1 (ppm)

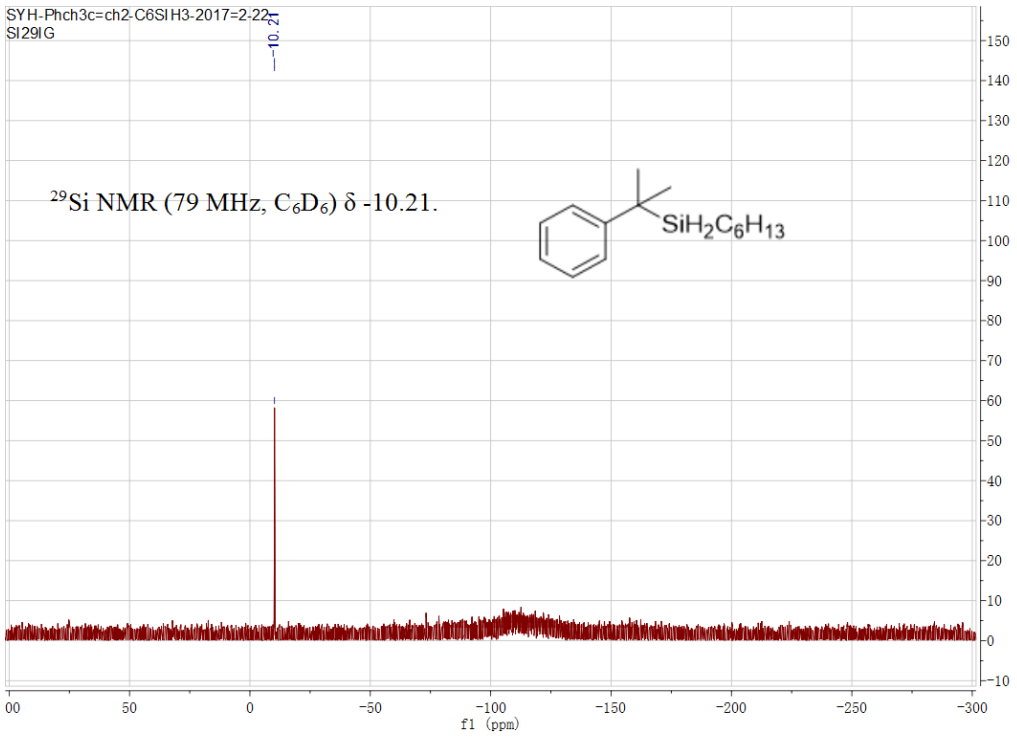


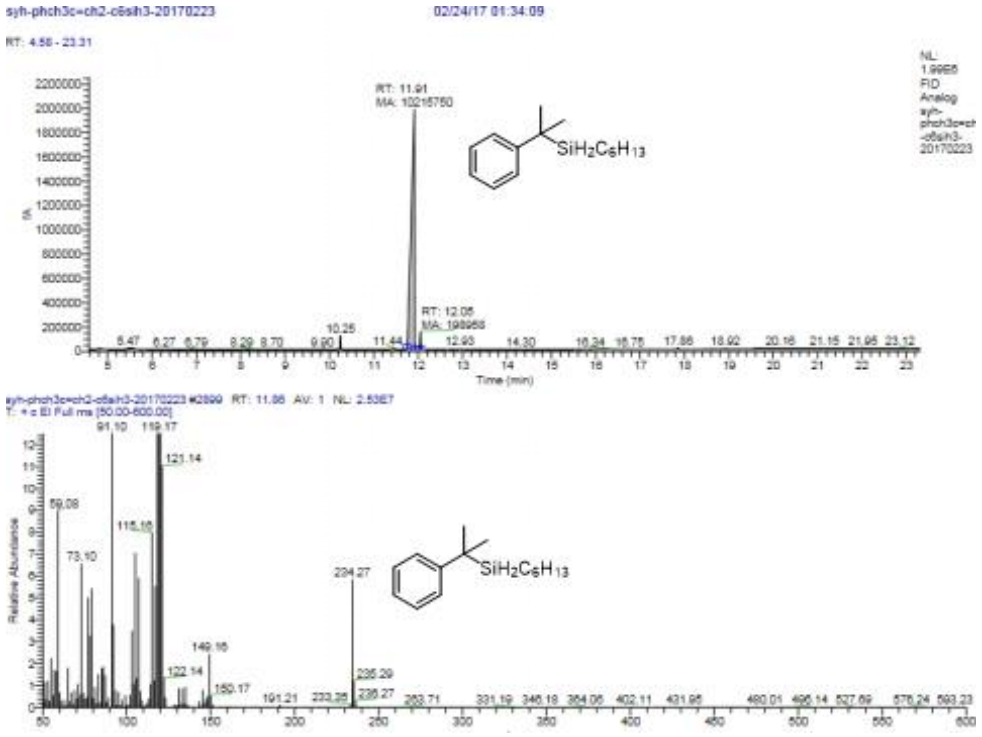
^{29}Si NMR (79 MHz, C_6D_6) δ -18.96.



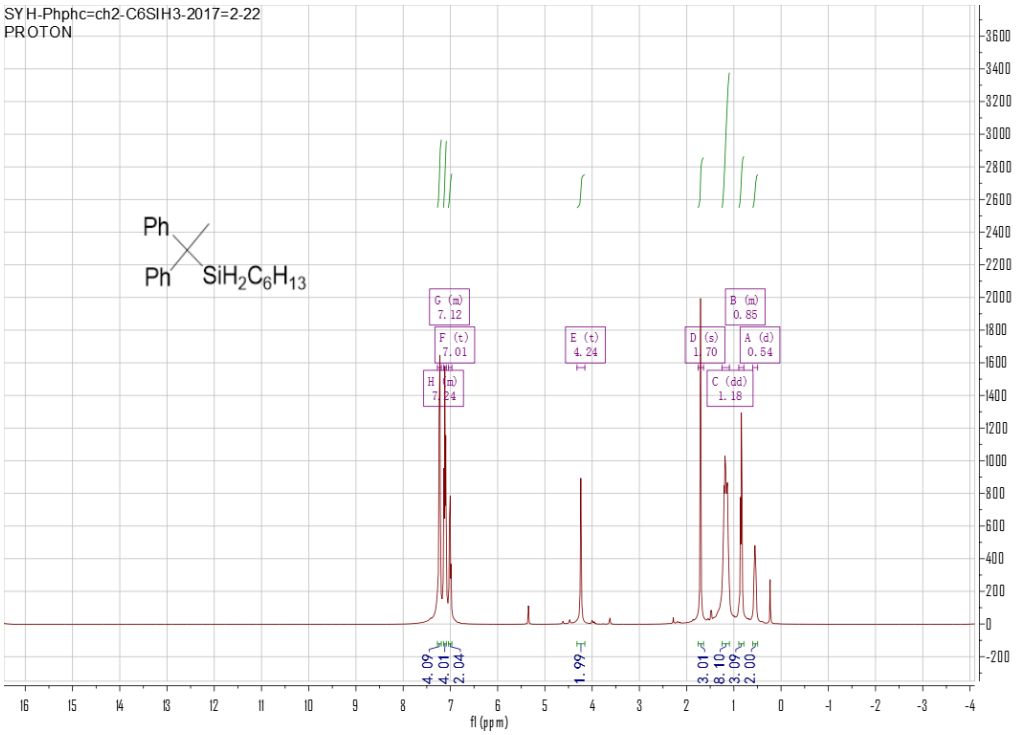

SYH-Phch3c=ch2-C6SIH3-2017=2-22
PROTON
SiH2C6H13
F (dd) 7.21
E (t) 7.00
G (t) 7.16
H (t) 3.86
D (s) 1.38
B (dd) 0.84
A (dd) 0.49
C (m) 1.18
2.00
2.08
1.00
1.92
6.39
8.63
3.28
2.12
f1 (ppm)

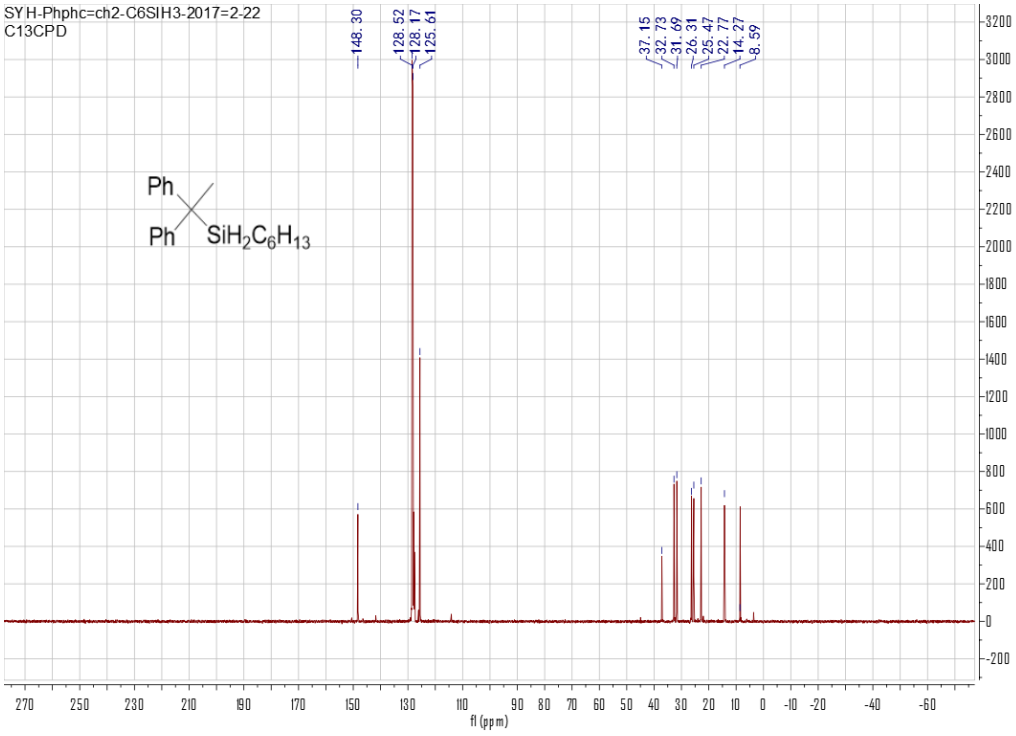

SYH-Phch3c=ch2-C6SIH3-2017=2-22
C13CPD
148.25
128.41
125.84
124.88
32.77
31.68
25.88
25.38
25.32
22.75
14.20
8.07
SiH2C6H13
f1 (ppm)

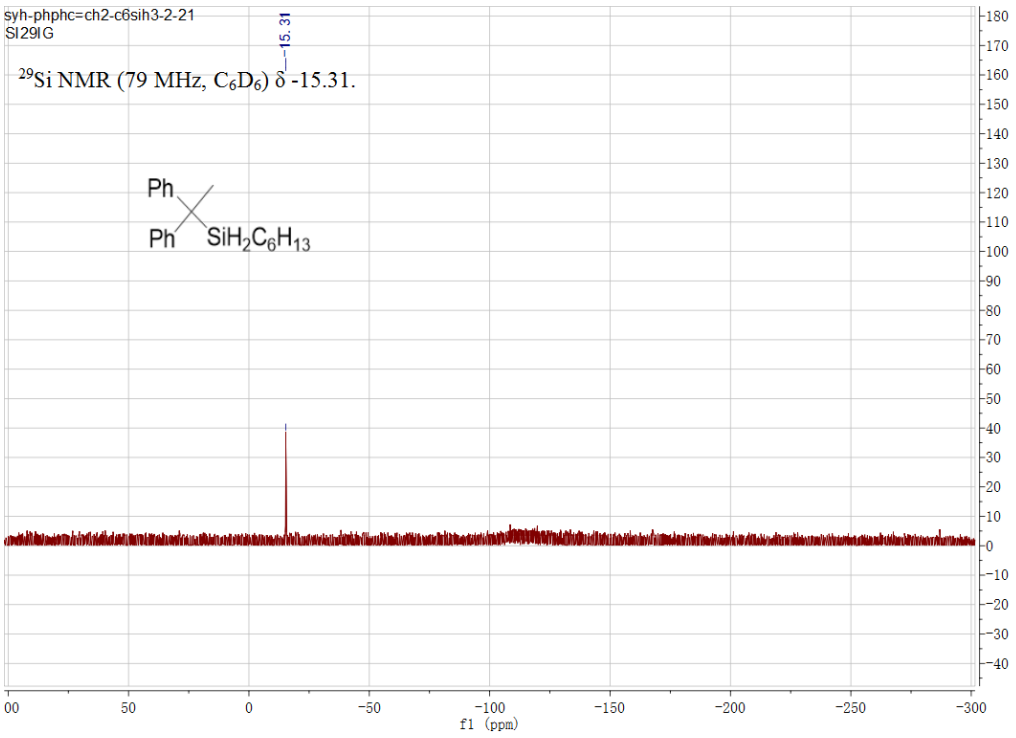

SYH-Phch3c=ch2-C6SIH3-2017=2-22-
SI29IG
10.21
^{29}Si NMR (79 MHz, C_6D_6) δ -10.21.
$SiH_2C_6H_{13}$
f1 (ppm)


syh-phch3c=ch2-c6sih3-20170223
02/24/17 01:34:09
RT: 4.58 - 23.31
RT: 11.91
MA: 10215750
$SiH_2C_6H_{13}$
RT: 12.05
MA: 199958
Time (min)

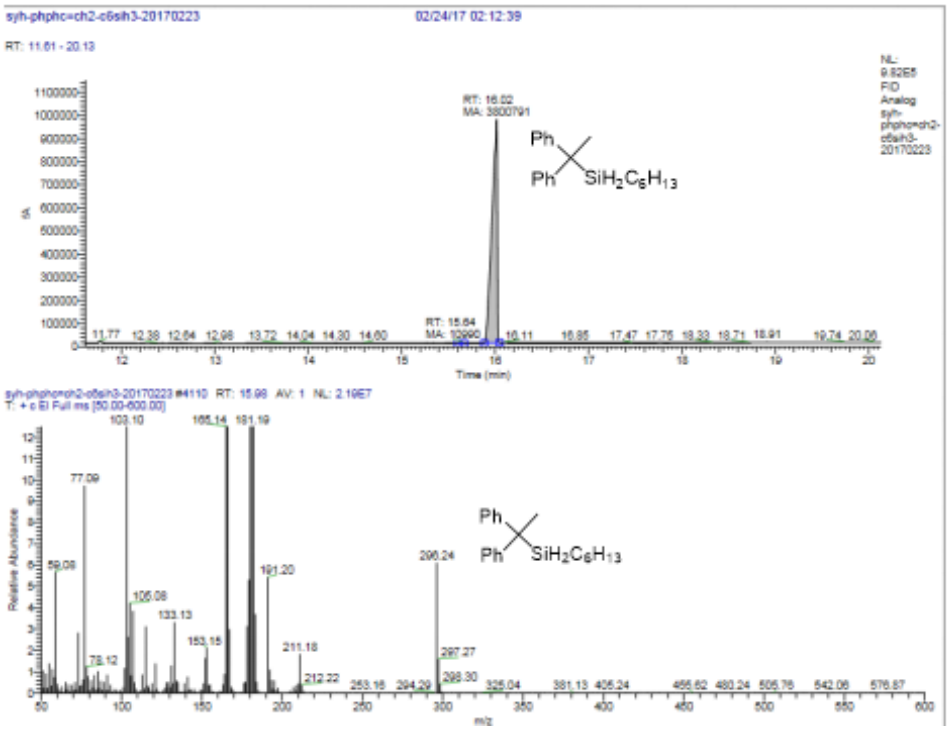
91.10
159.17
121.14
59.08
115.16
73.10
234.27
$SiH_2C_6H_{13}$
149.16
122.14
150.17
235.29
236.27
Relative Abundance

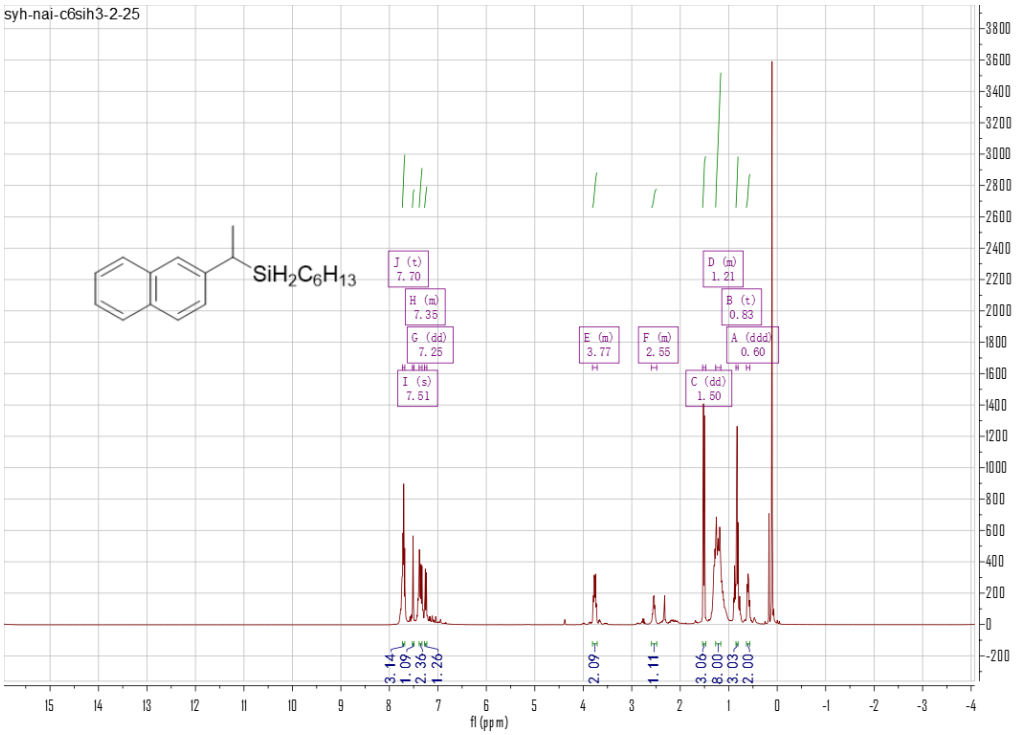

SYH-Phphc=ch2-C6SIH3-2017=2-22
PROTON
Ph
Ph
SiH2C6H13
G (m) 7.12
F (t) 7.01
H (m) 7.24
E (t) 4.24
D (s) 1.70
B (m) 0.85
A (d) 0.54
C (dd) 1.18
4.09
4.01
2.04
1.99
3.01
8.10
3.09
2.00
f1 (ppm)

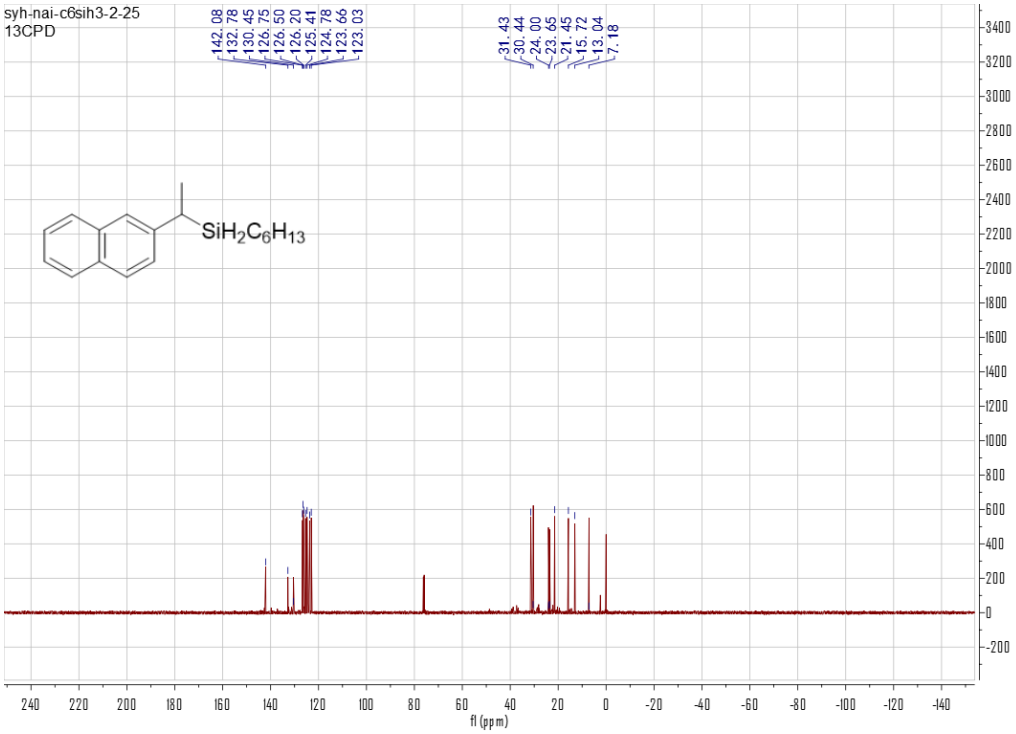

SYH-Phphc=ch2-C6SIH3-2017=2-22
C13CPD
148.30
128.52
128.17
125.61
37.15
32.73
31.69
26.31
25.47
22.77
14.27
8.59
Ph
Ph
SiH2C6H13
f1 (ppm)

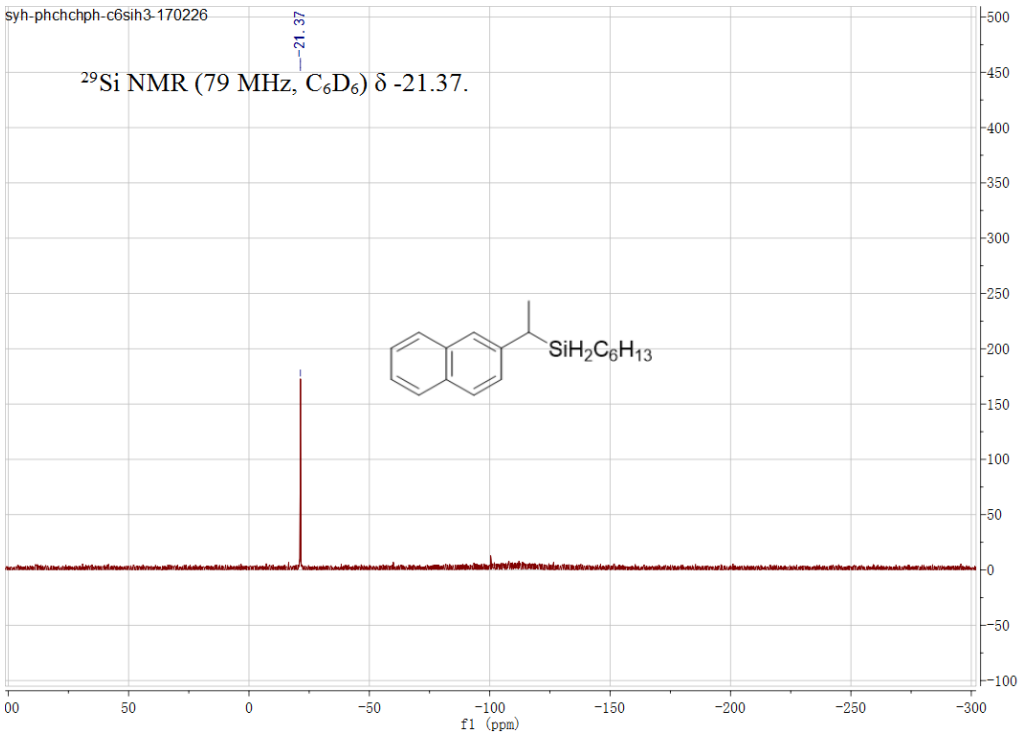


^{29}Si NMR (79 MHz, C_6D_6) δ -15.31.

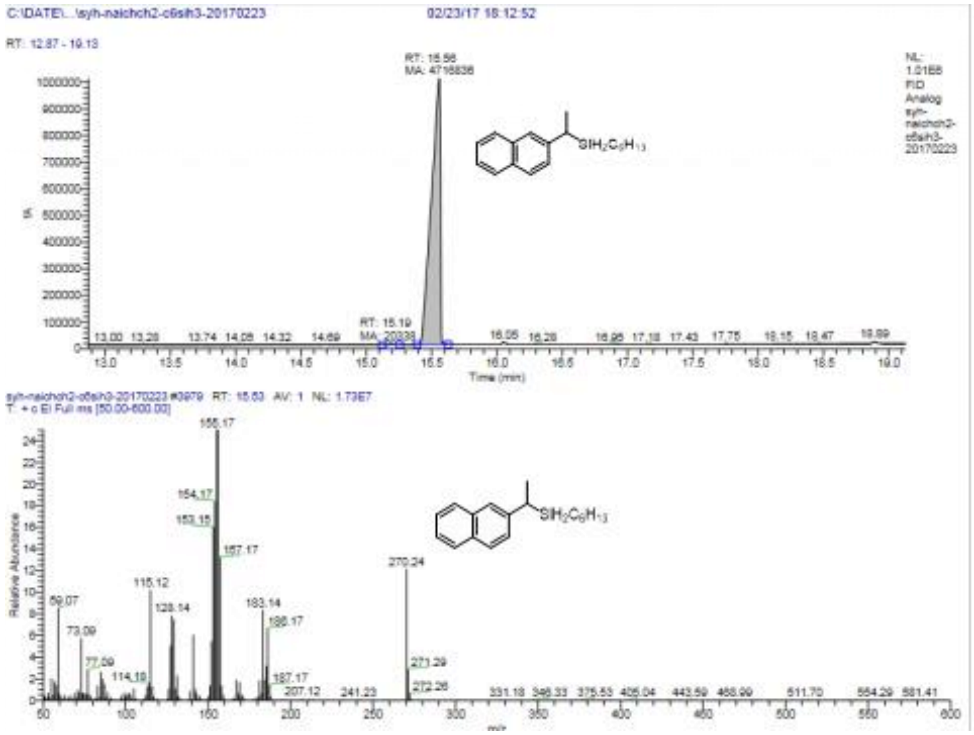


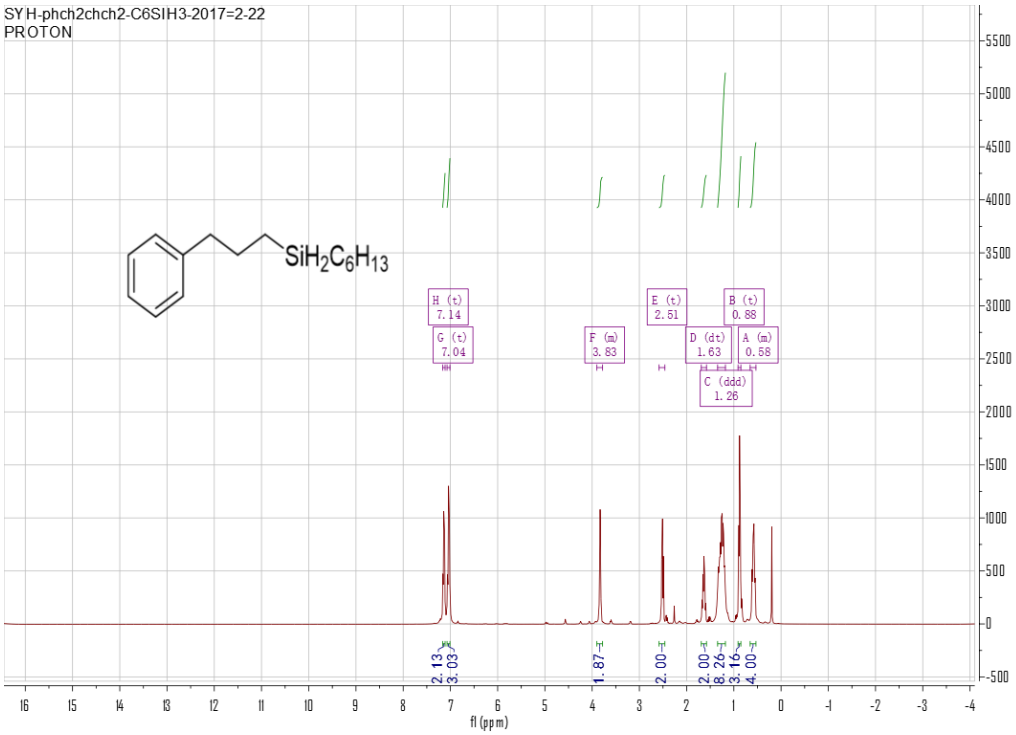

syh-nai-c6sih3-2-25
SiH2C6H13
J (t) 7.70
H (m) 7.35
G (dd) 7.25
I (s) 7.51
E (m) 3.77
F (m) 2.55
D (m) 1.21
B (t) 0.83
A (ddd) 0.60
C (dd) 1.50
3.14
1.09
2.36
1.26
2.09
1.11
3.06
8.00
3.03
2.00
f1 (ppm)

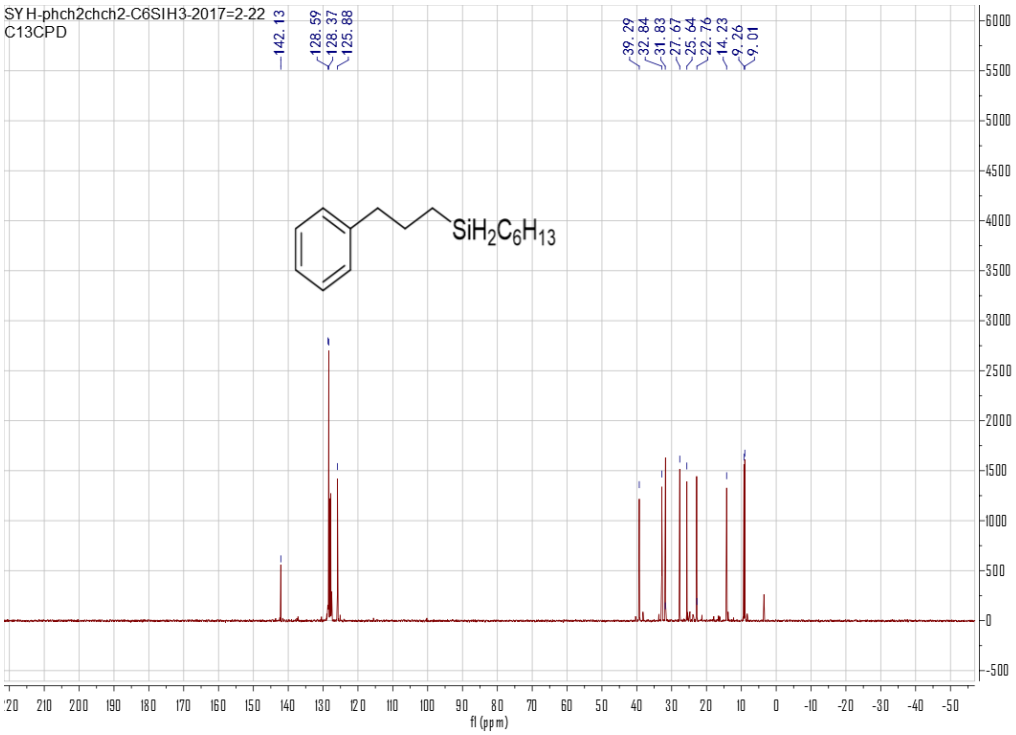

syh-nai-c6sih3-2-25
13CPD
142.08
132.78
130.45
126.75
126.50
126.20
125.41
124.78
123.66
123.03
31.43
30.44
24.00
23.65
21.45
15.72
13.04
7.18
SiH2C6H13
f1 (ppm)

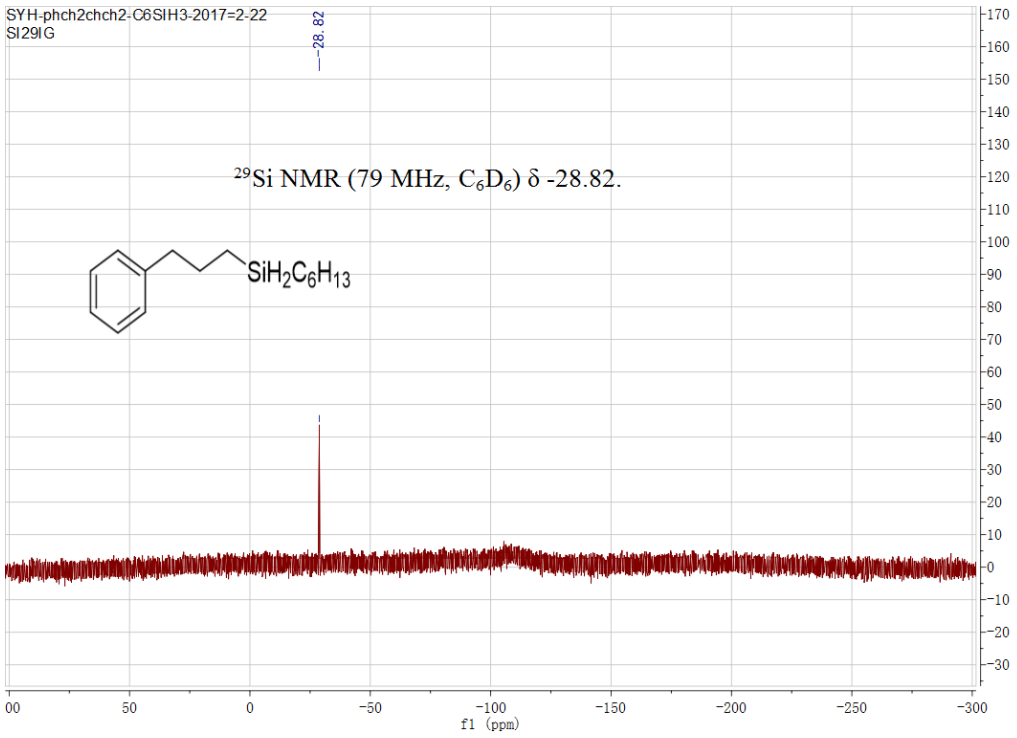


^{29}Si NMR (79 MHz, C_6D_6) δ -21.37.

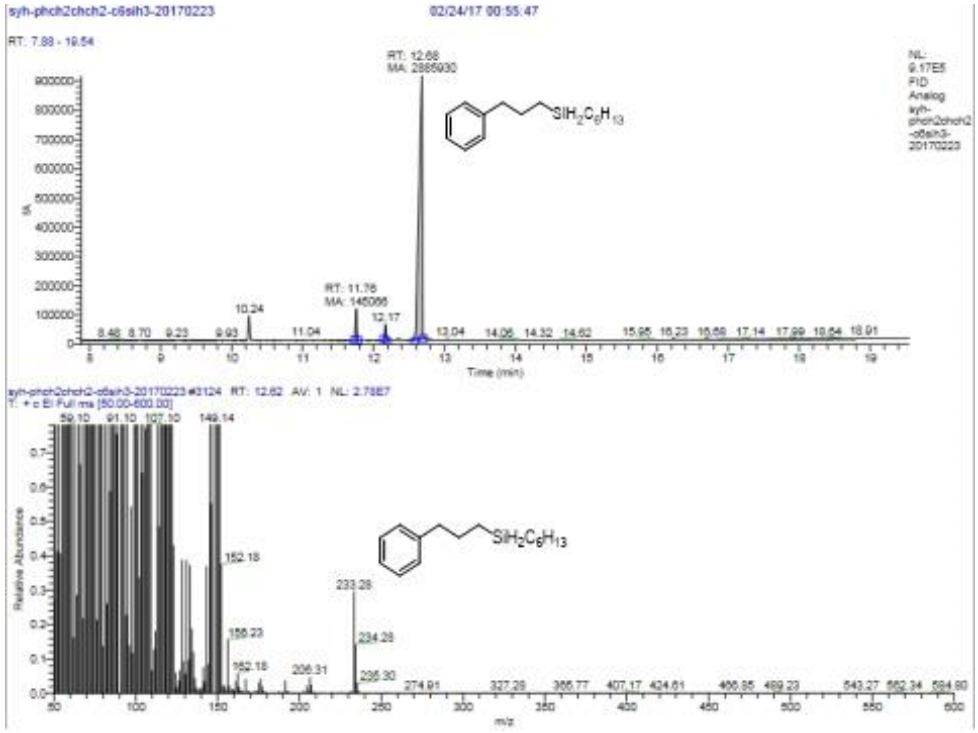


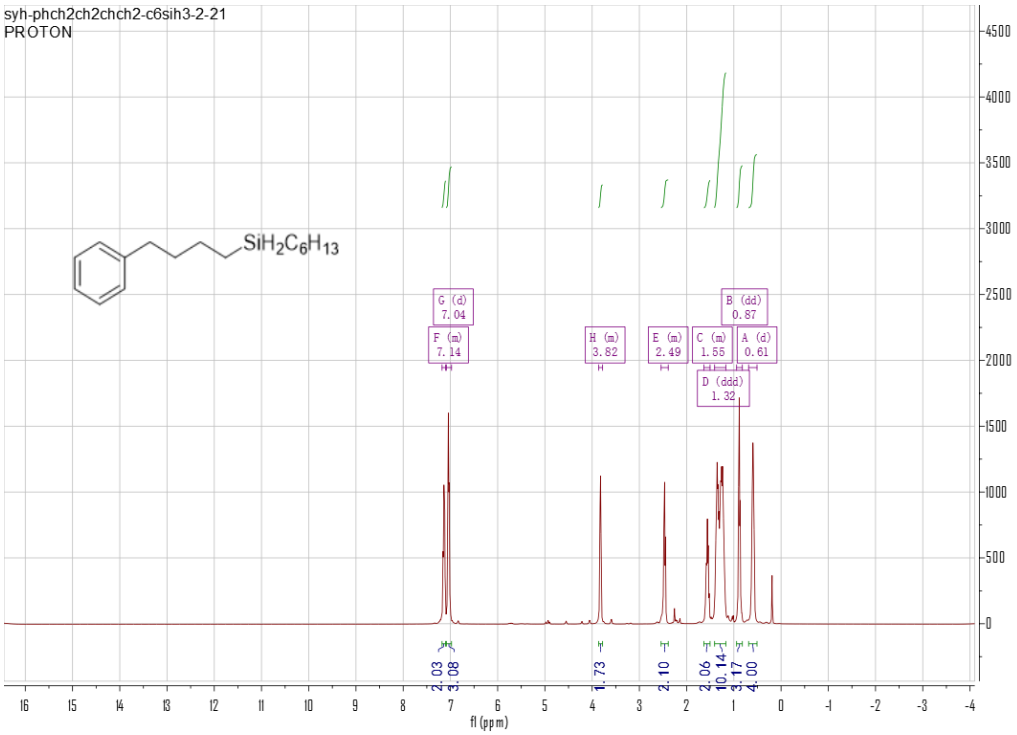

SYH-phch2chch2-C6SIH3-2017=2-22
PROTON
SiH2C6H13
H (t) 7.14
G (t) 7.04
F (m) 3.83
E (t) 2.51
D (dt) 1.63
C (ddd) 1.26
B (t) 0.88
A (m) 0.58
2.13
3.03
1.87
2.00
2.00
8.26
3.15
4.00
f1 (ppm)

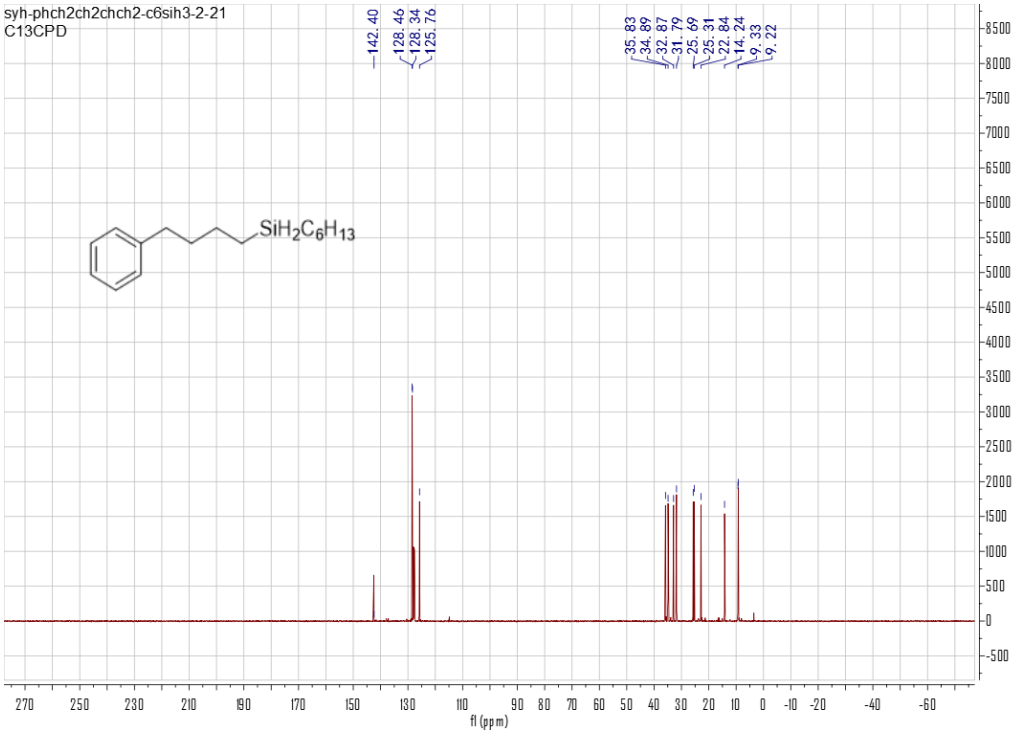

SYH-phch2chch2-C6SIH3-2017=2-22
C13CPD
142.13
128.59
128.37
125.88
39.29
32.84
31.83
27.67
25.64
22.76
14.23
9.26
9.01
SiH2C6H13
f1 (ppm)

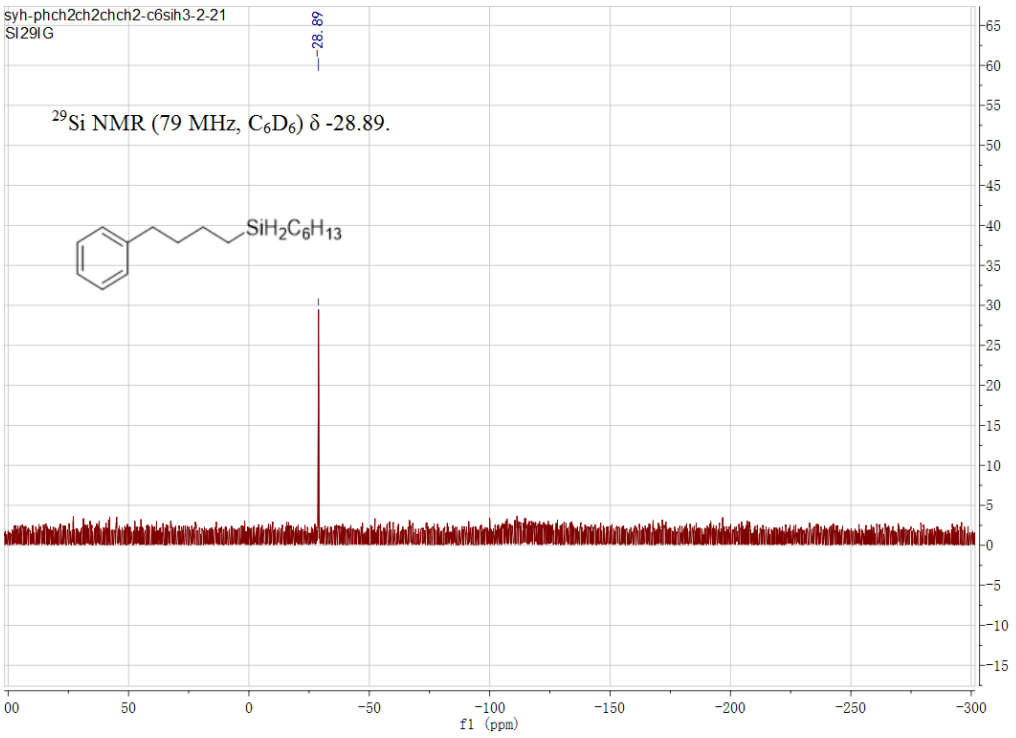


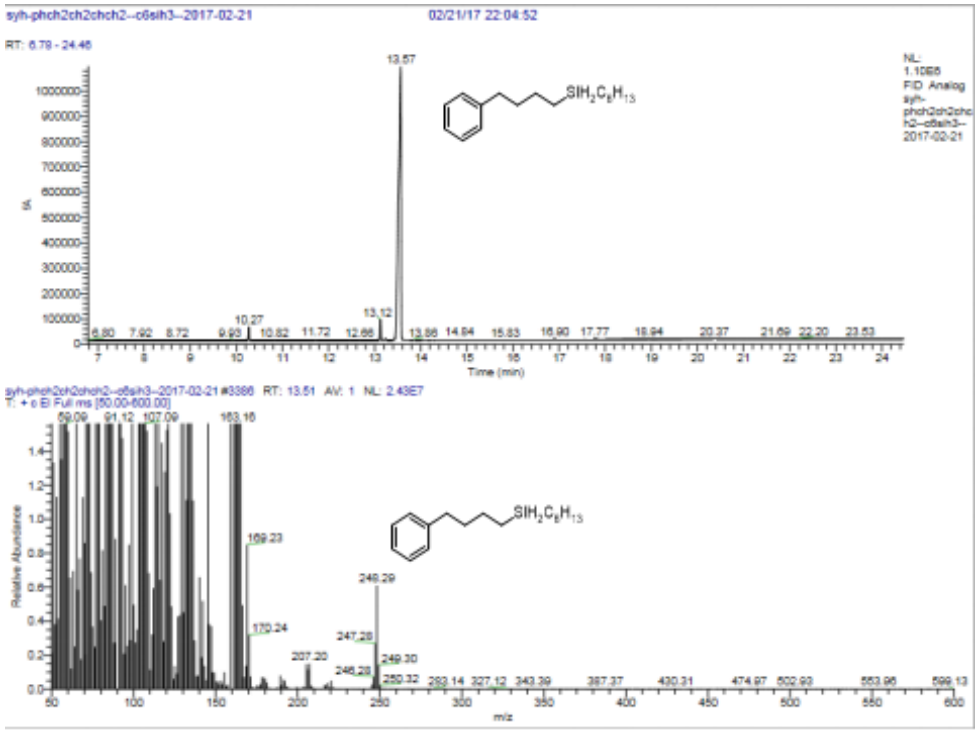
^{29}Si NMR (79 MHz, C_6D_6) δ -28.82.

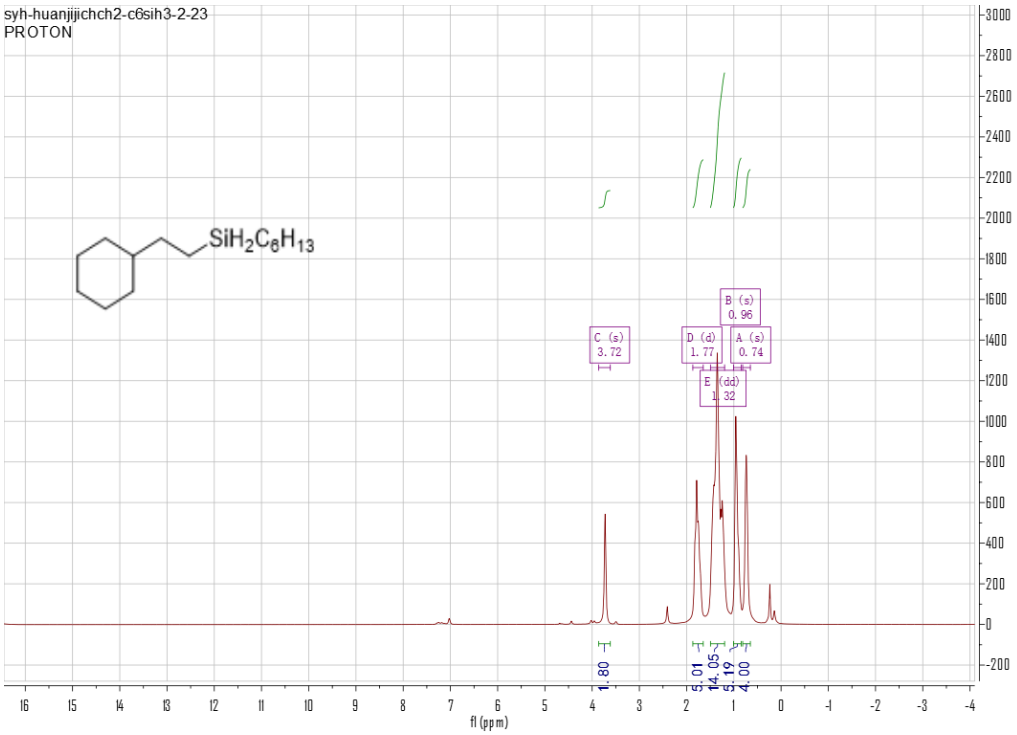


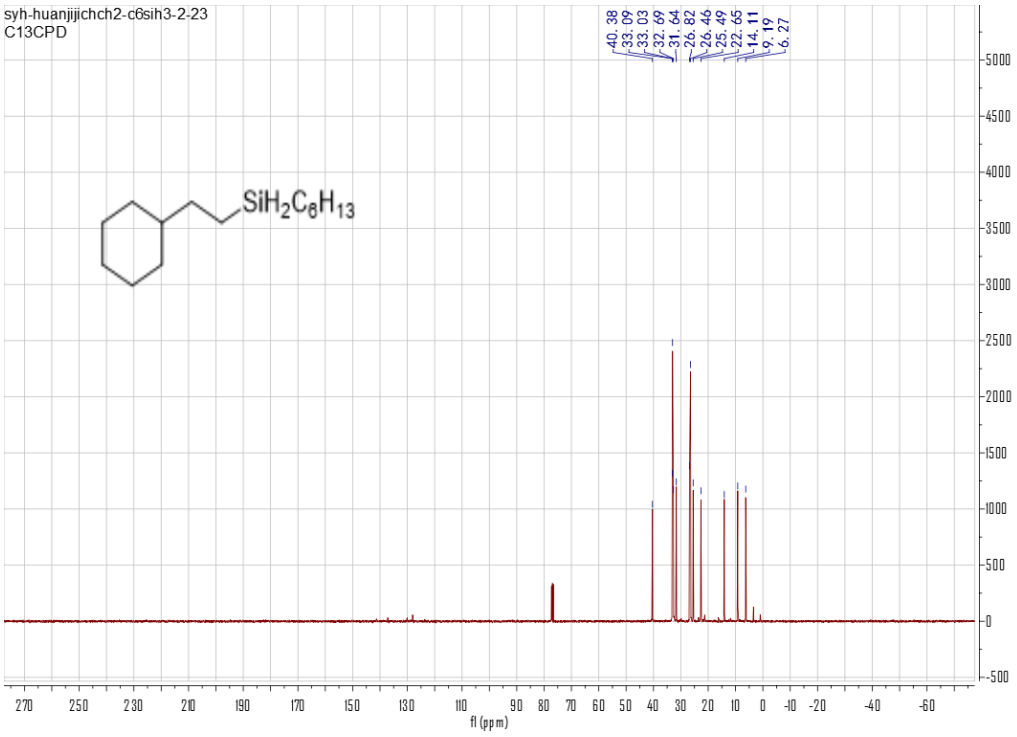

syh-phch2ch2chch2-c6sih3-2-21
PROTON
SiH2C6H13
G (d) 7.04
F (m) 7.14
H (m) 3.82
E (m) 2.49
C (m) 1.55
B (dd) 0.87
A (d) 0.61
D (ddd) 1.32
2.03
3.08
1.73
2.10
2.06
10.14
3.17
4.00
f1 (ppm)

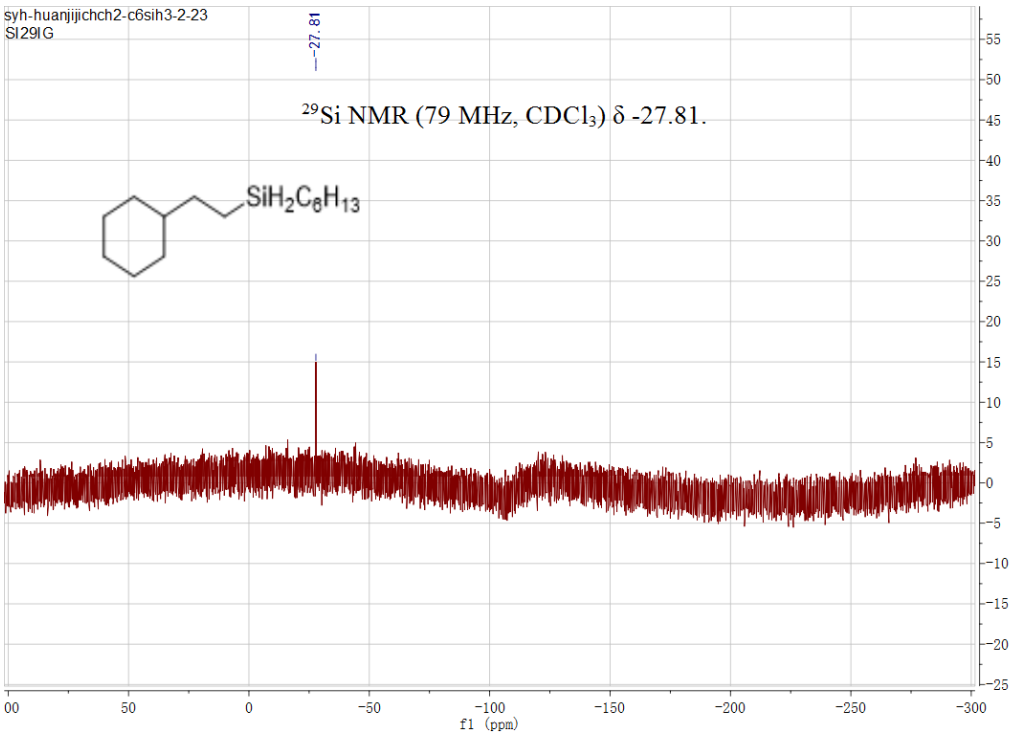

syh-phch2ch2chch2-c6sih3-2-21
C13CPD
142.40
128.46
128.34
125.76
35.83
34.89
32.87
31.79
25.69
25.31
22.84
14.24
9.33
9.22
SiH2C6H13
f1 (ppm)


syh-phch2ch2chch2-c6sih3-2-21
SI29IG
-28.89
^{29}Si NMR (79 MHz, C_6D_6) δ -28.89.
$SiH_2C_6H_{13}$
f1 (ppm)

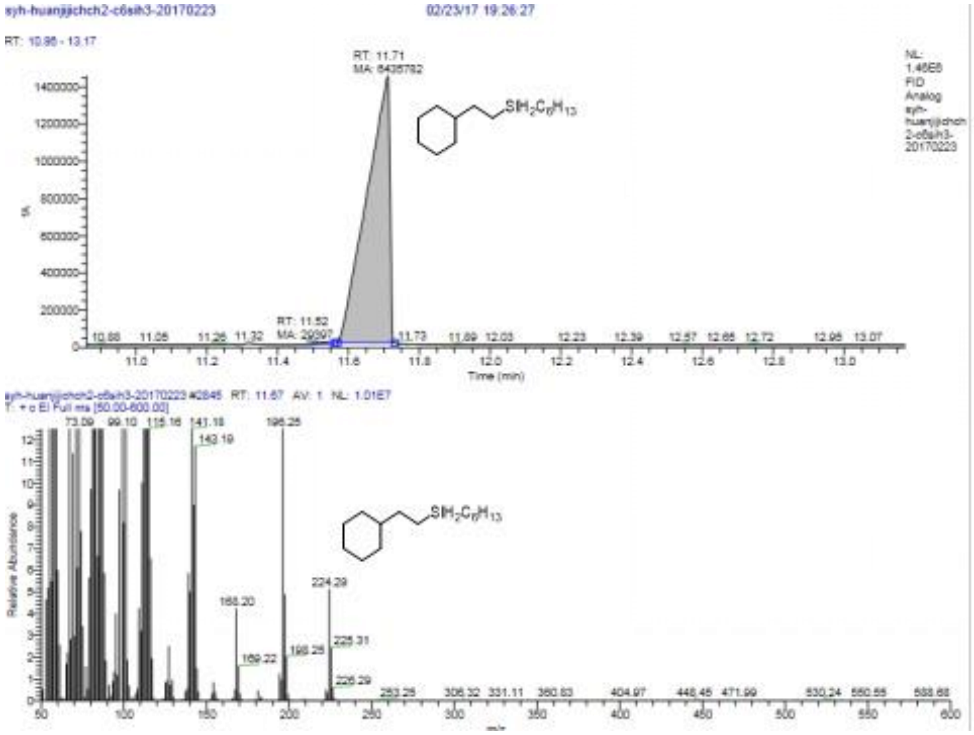

syh-phch2ch2chch2--c6sih3--2017-02-21
02/21/17 22:04:52
RT: 6.78 - 24.46
13.57
10.27
13.12
$SiH_2C_6H_{13}$
Time (min)
Relative Abundance
m/z
169.16
169.23
170.24
249.29
247.28
249.30

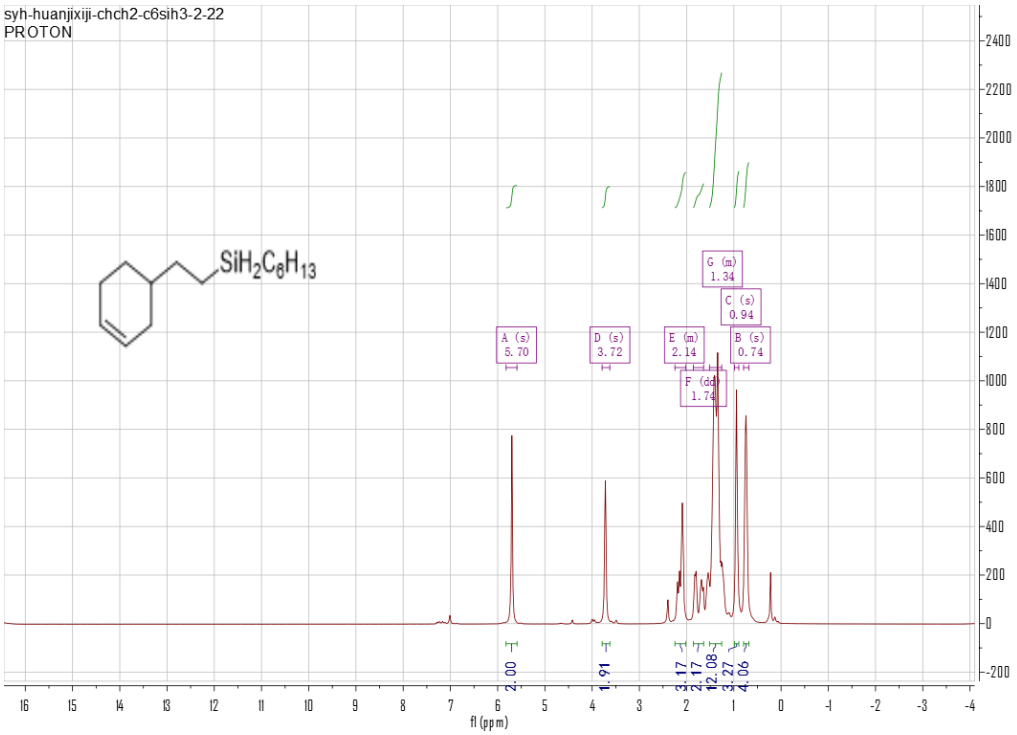

syh-huanjijichch2-c6sih3-2-23
PROTON
SiH2C6H13
C (s)
3.72
B (s)
0.96
D (d)
1.77
A (s)
0.74
E (dd)
1.32
1.80
5.01
14.05
5.19
4.00
f1 (ppm)

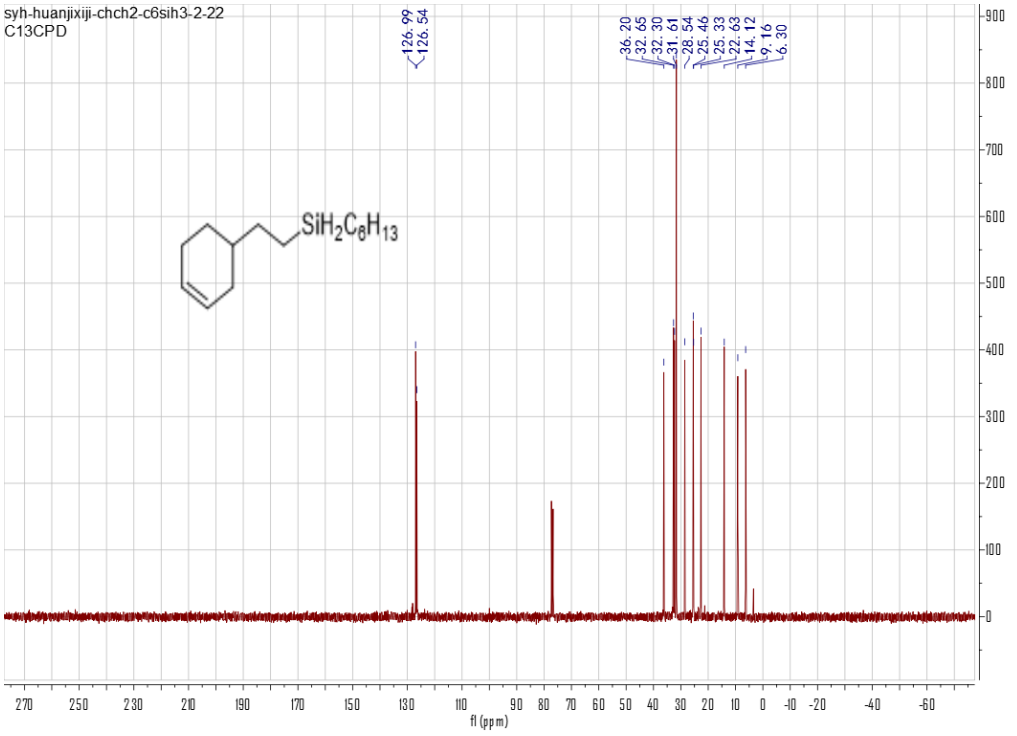

syh-huanjijichch2-c6sih3-2-23
C13CPD
40.38
33.09
33.03
32.69
31.64
26.82
26.46
25.49
22.65
14.11
9.19
6.27
SiH2C6H13
f1 (ppm)

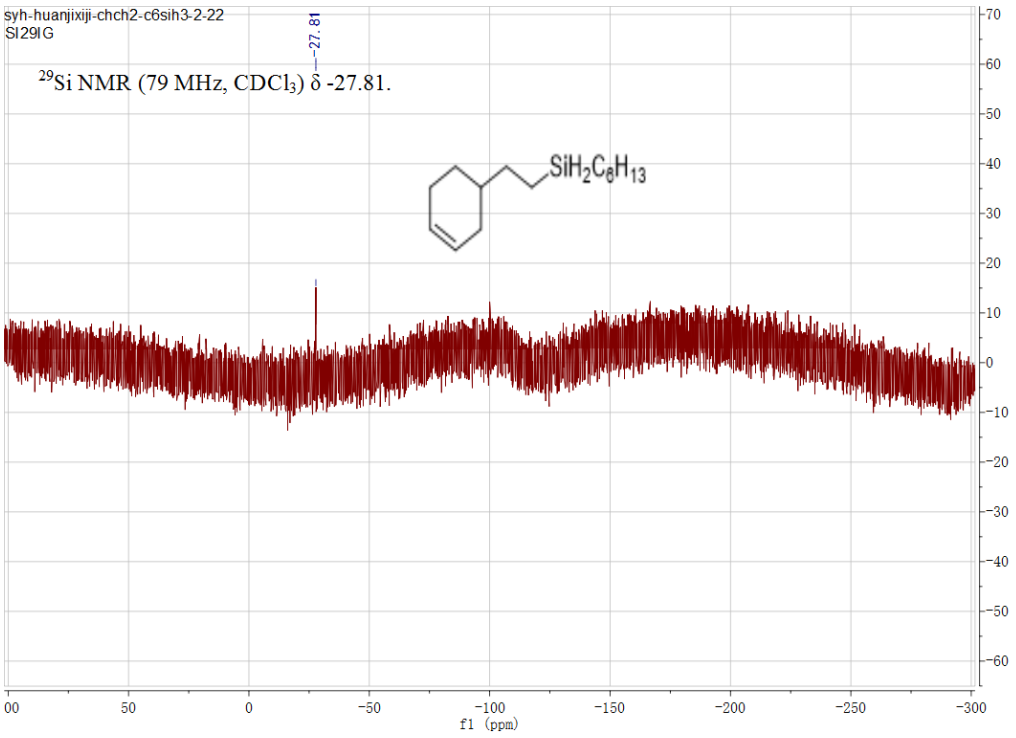


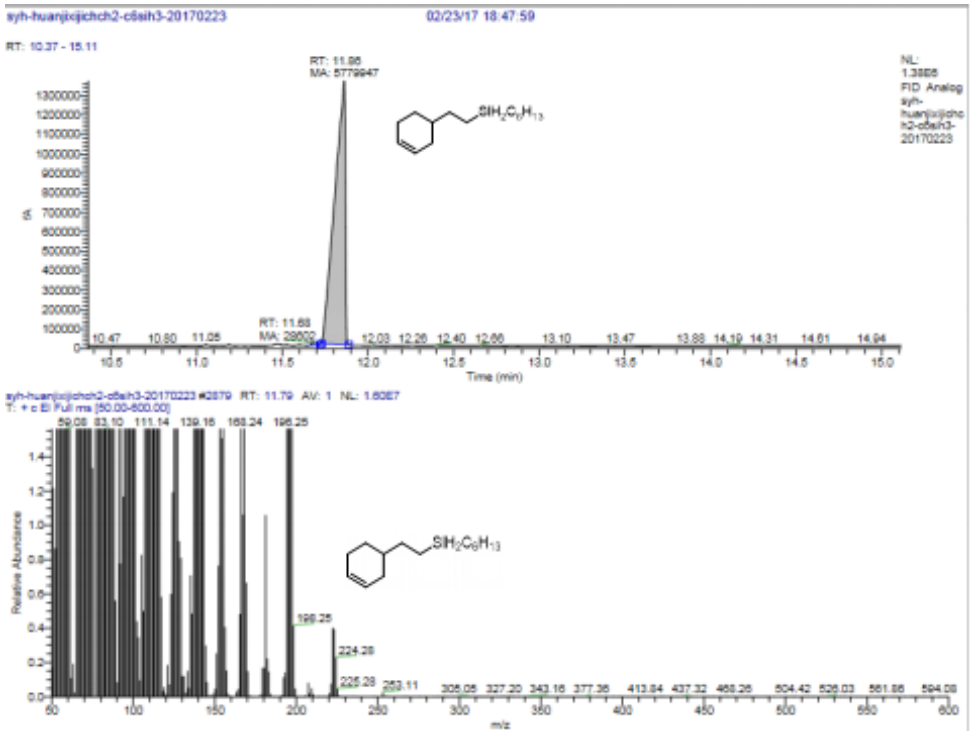
^{29}Si NMR (79 MHz, $CDCl_3$) δ -27.81.

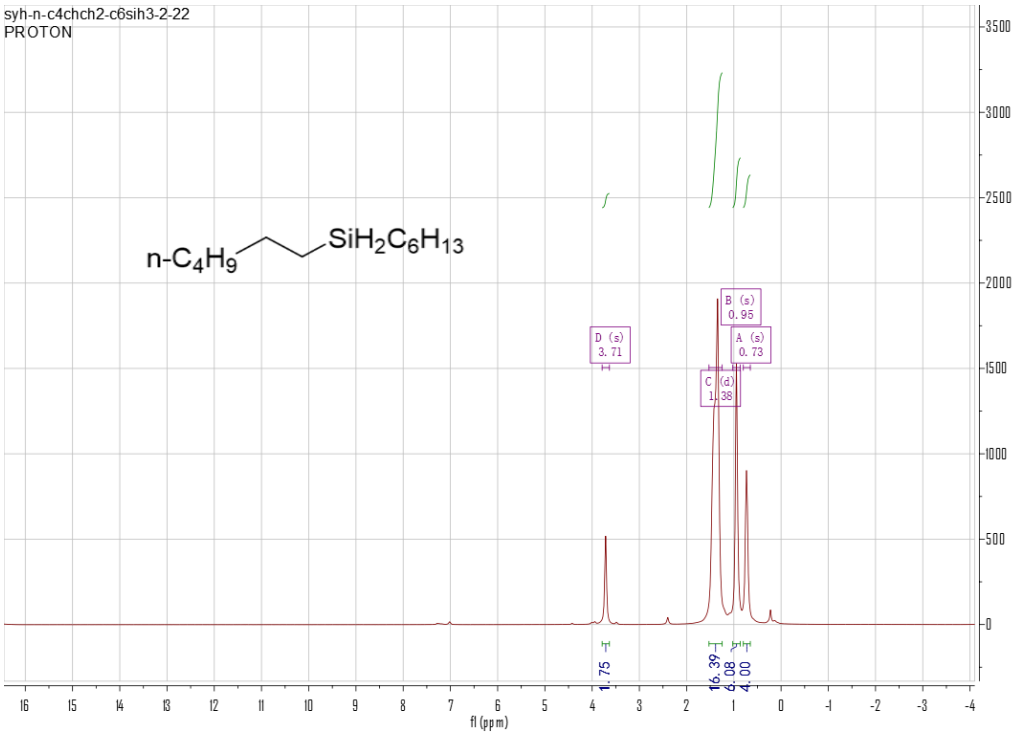


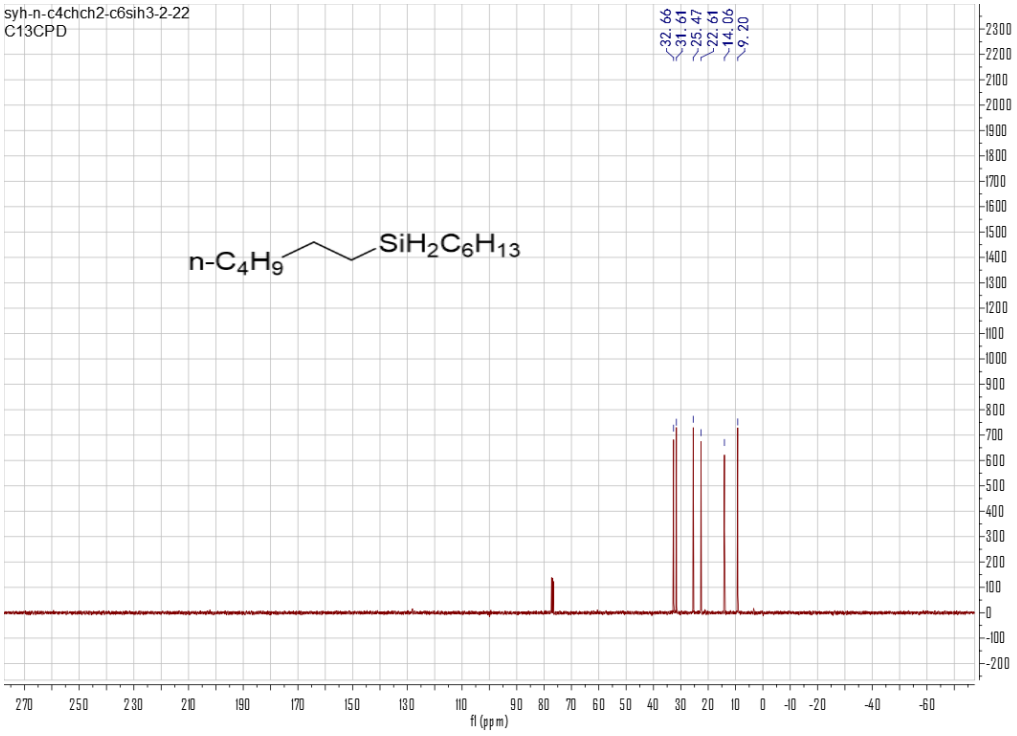

syh-huanjixiji-chch2-c6sih3-2-22
PROTON
SiH2C8H13
A (s)
5.70
D (s)
3.72
E (m)
2.14
F (dd)
1.74
G (m)
1.34
C (s)
0.94
B (s)
0.74
2.00
1.91
3.17
2.17
12.08
3.27
4.06
f1 (ppm)

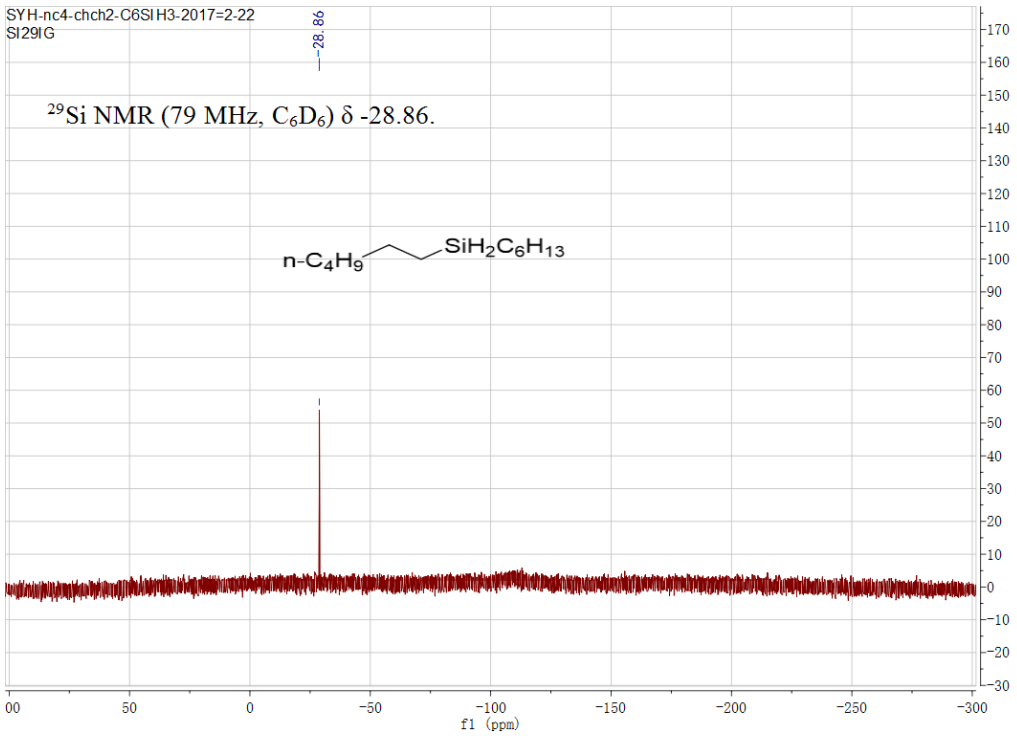

syh-huanjixiji-chch2-c6sih3-2-22
C13CPD
SiH2C8H13
126.99
126.54
36.20
32.65
32.30
31.61
28.54
25.46
25.33
22.63
14.12
9.16
6.30
f1 (ppm)


syh-huanjixiji-chch2-c6sih3-2-22
SI29IG
-27.81
^{29}Si NMR (79 MHz, $CDCl_3$) δ -27.81.
$SiH_2C_6H_{13}$
f1 (ppm)

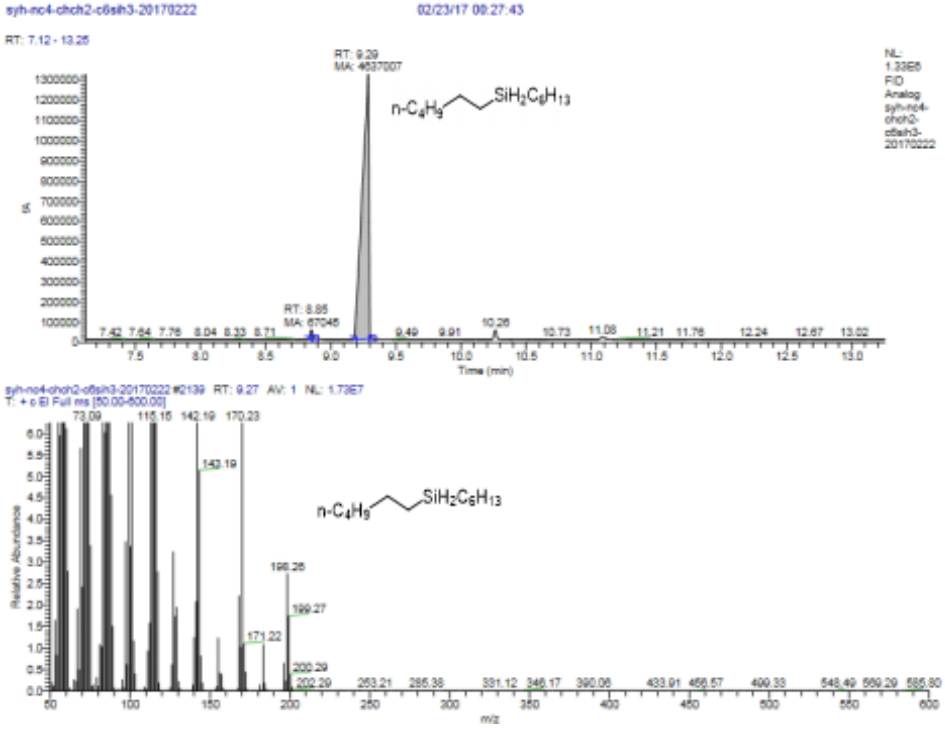

syh-huanjixijichch2-c6sih3-20170223
02/23/17 18:47:59
RT: 10.37 - 15.11
RT: 11.86
MA: 5779947
NL:
1.38E6
FID Analog
syh-huanjixijichch2-c6sih3-20170223
$SiH_2C_6H_{13}$
RT: 11.68
MA: 2900
Time (min)
Relative Abundance
m/z
199.25
224.28
225.28

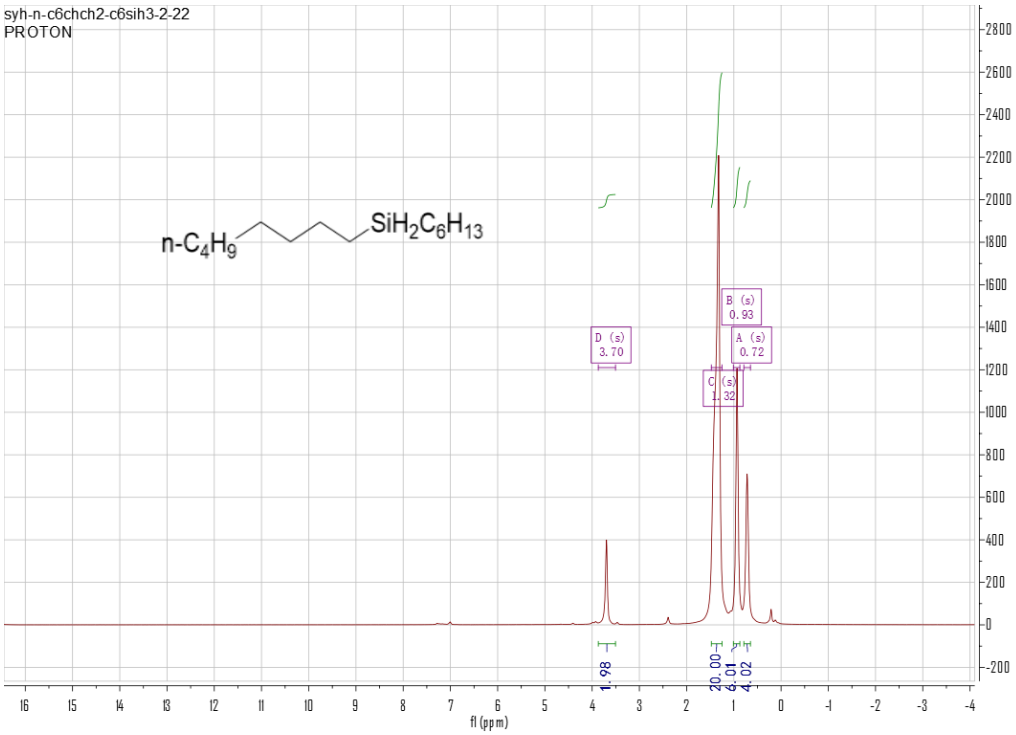

syh-n-c4chch2-c6sih3-2-22
PROTON
n-C4H9
SiH2C6H13
D (s)
3.71
B (s)
0.95
A (s)
0.73
C (d)
1.38
1.75
16.39
6.08
4.00
f1 (ppm)

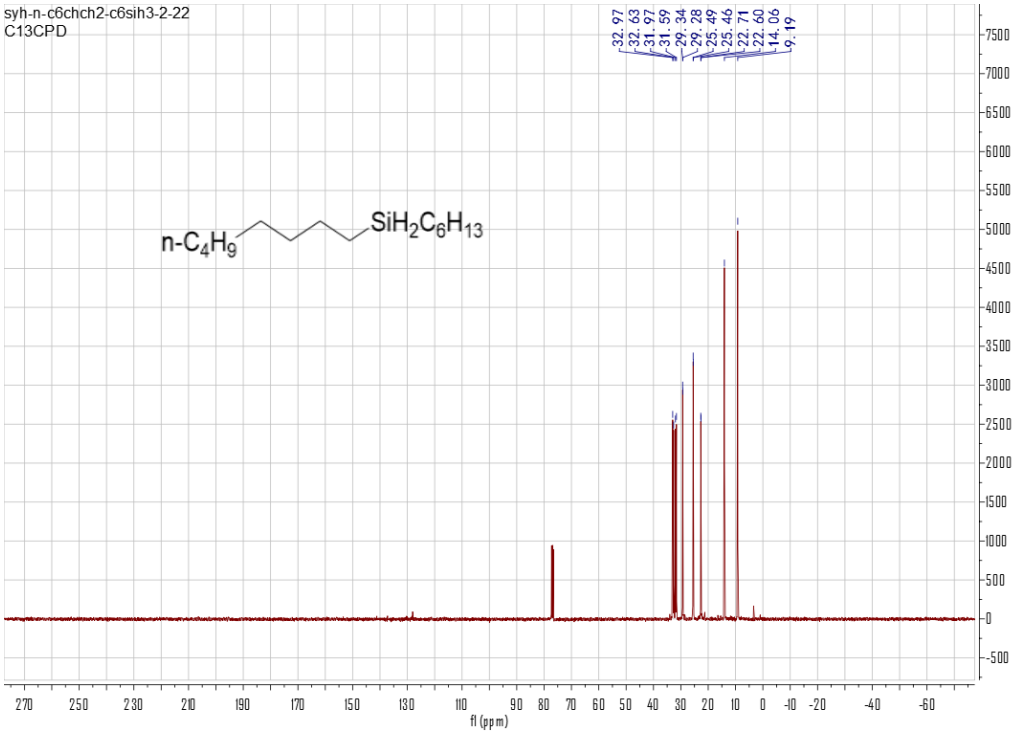

syh-n-c4chch2-c6sih3-2-22
C13CPD
32.66
31.61
25.47
22.61
14.06
9.20
n-C4H9
SiH2C6H13
f1 (ppm)

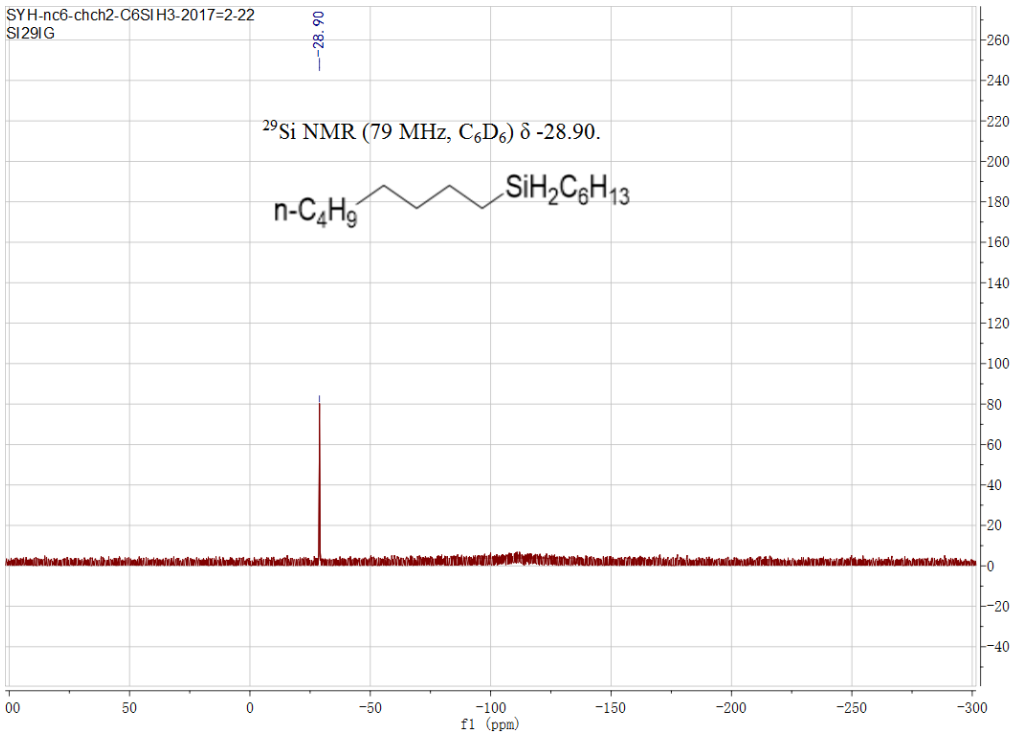


^{29}Si NMR (79 MHz, C_6D_6) δ -28.86.

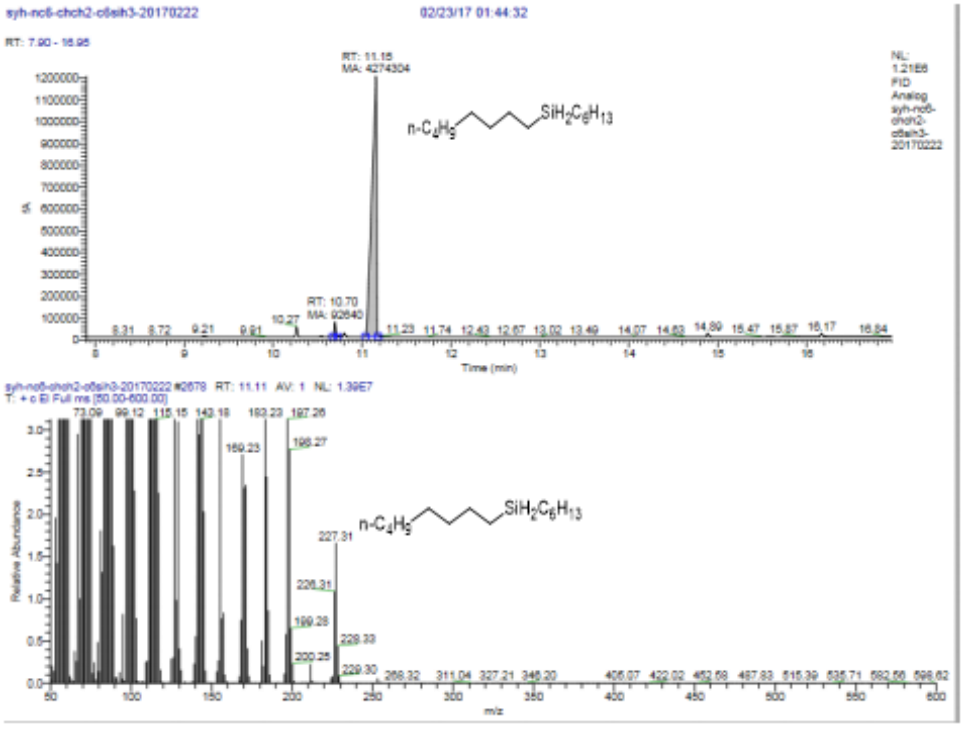


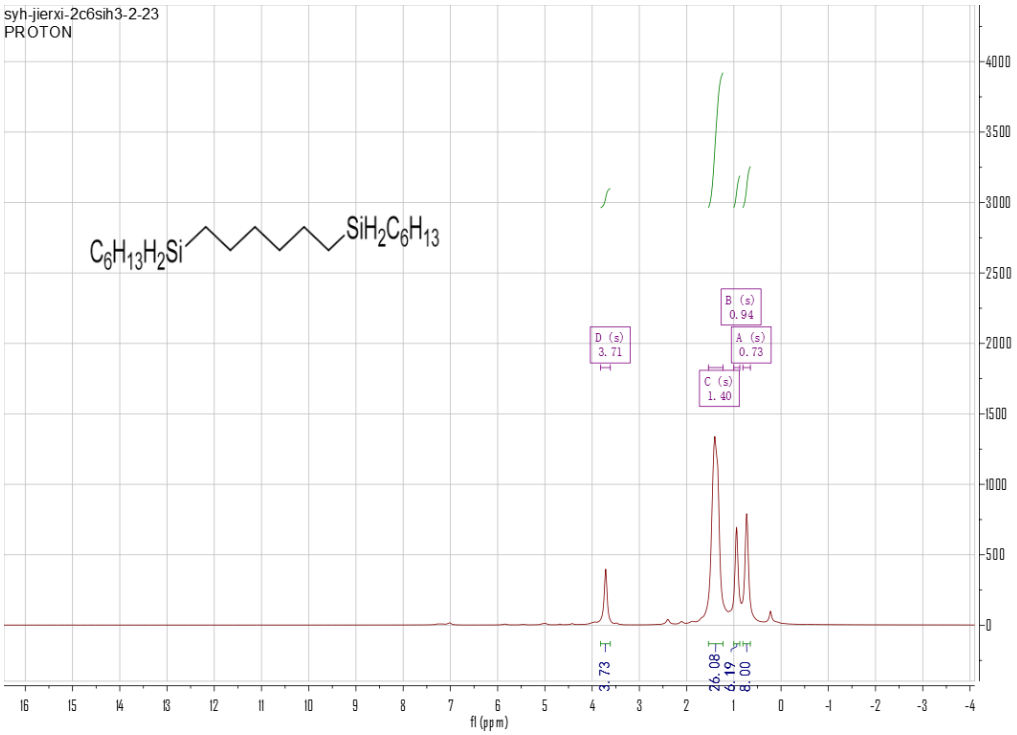

syh-n-c6chch2-c6sih3-2-22
PROTON
n-C4H9
SiH2C6H13
D (s)
3.70
B (s)
0.93
A (s)
0.72
C (s)
1.32
1.98
20.00
6.01
4.02
f1 (ppm)

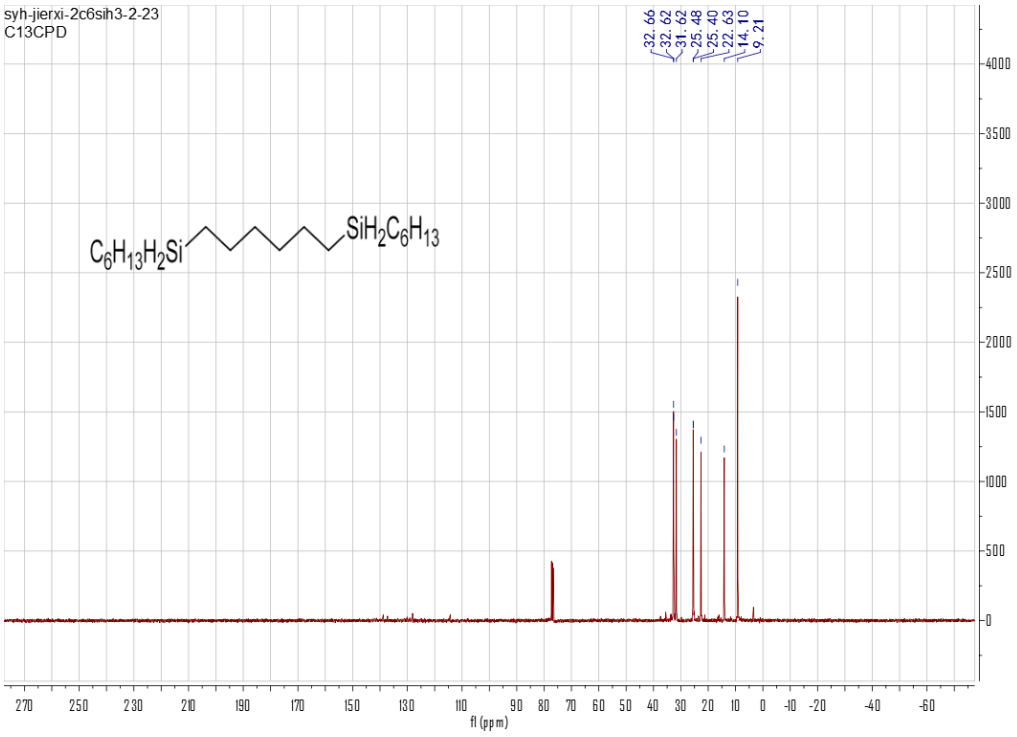

syh-n-c6chch2-c6sih3-2-22
C13CPD
32.97
32.63
31.97
31.59
29.34
29.28
25.49
25.46
22.71
22.60
14.06
9.19
n-C4H9
SiH2C6H13
f1 (ppm)

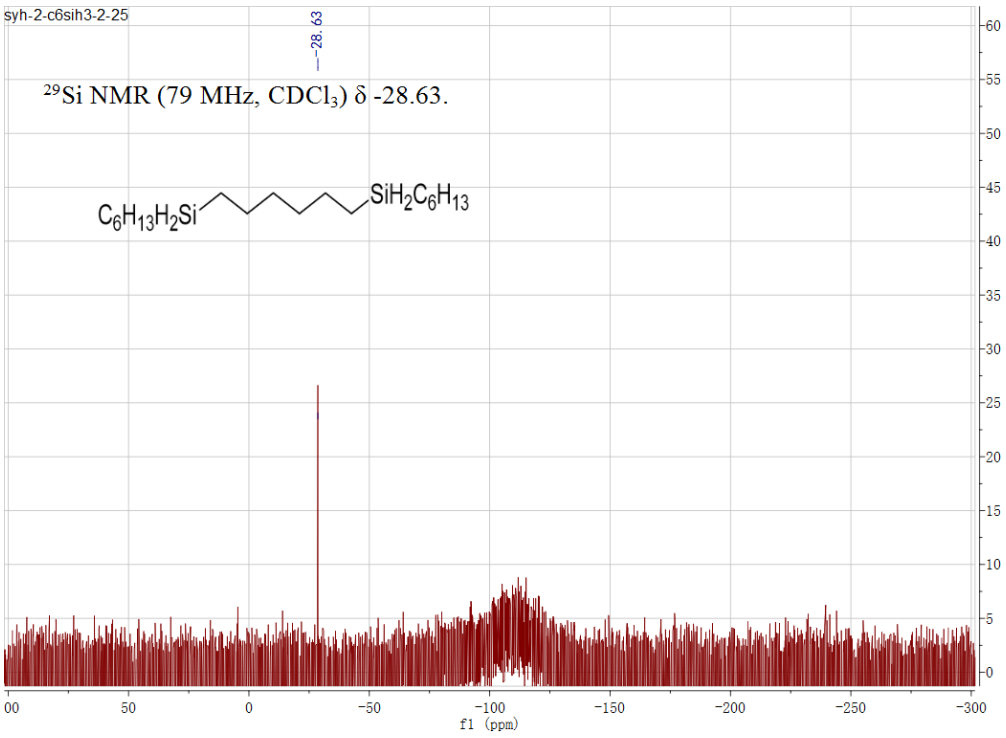


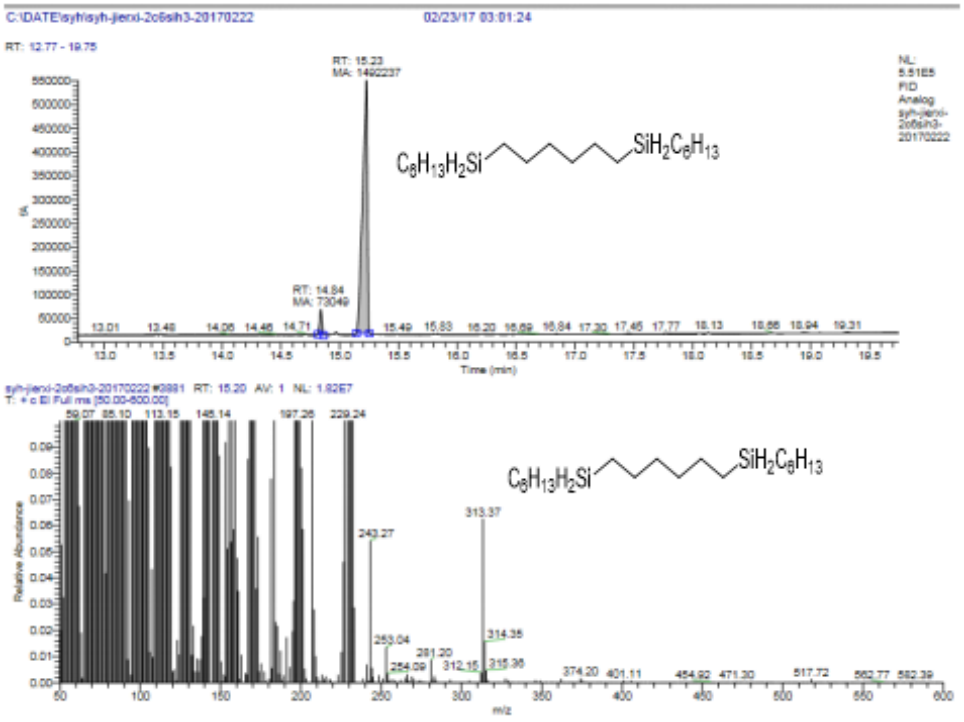
^{29}Si NMR (79 MHz, C_6D_6) δ -28.90.

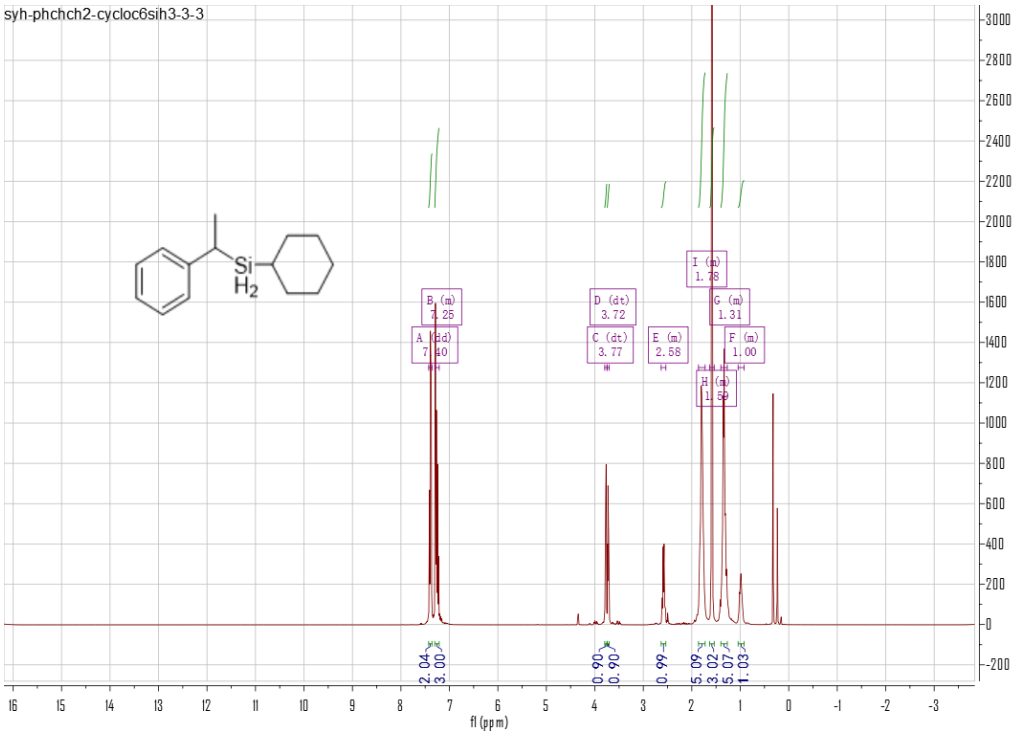


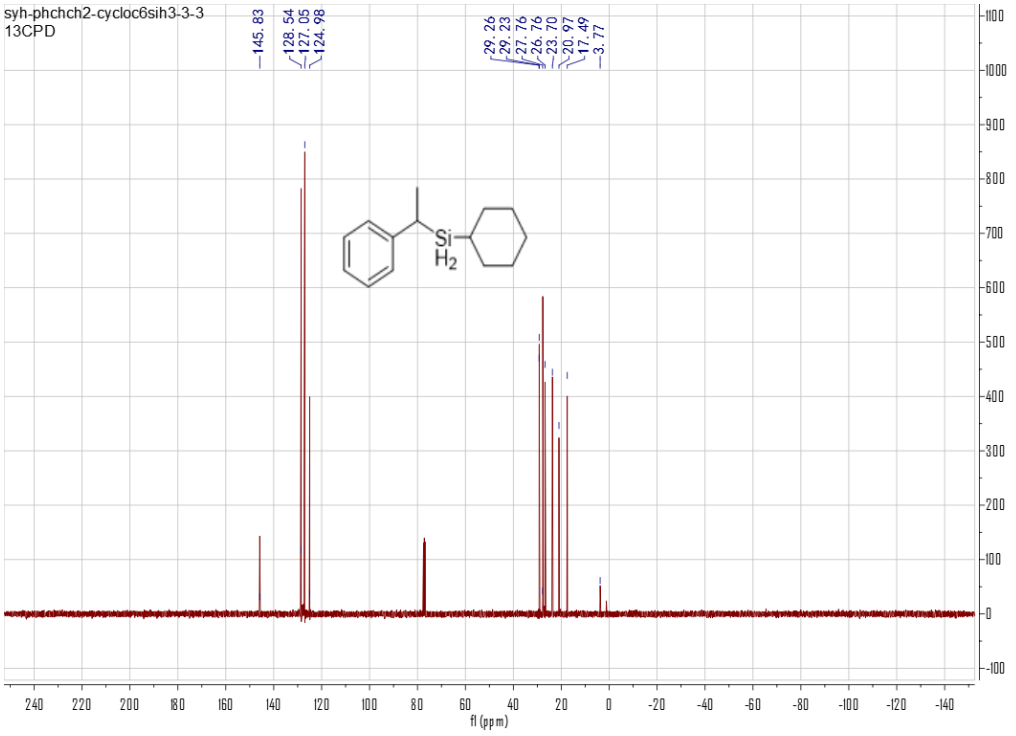

syh-jierxi-2c6sih3-2-23
PROTON
$C_6H_{13}H_2Si$
$SiH_2C_6H_{13}$
D (s)
3.71
B (s)
0.94
A (s)
0.73
C (s)
1.40
3.73
26.08
6.19
8.00
f1 (ppm)

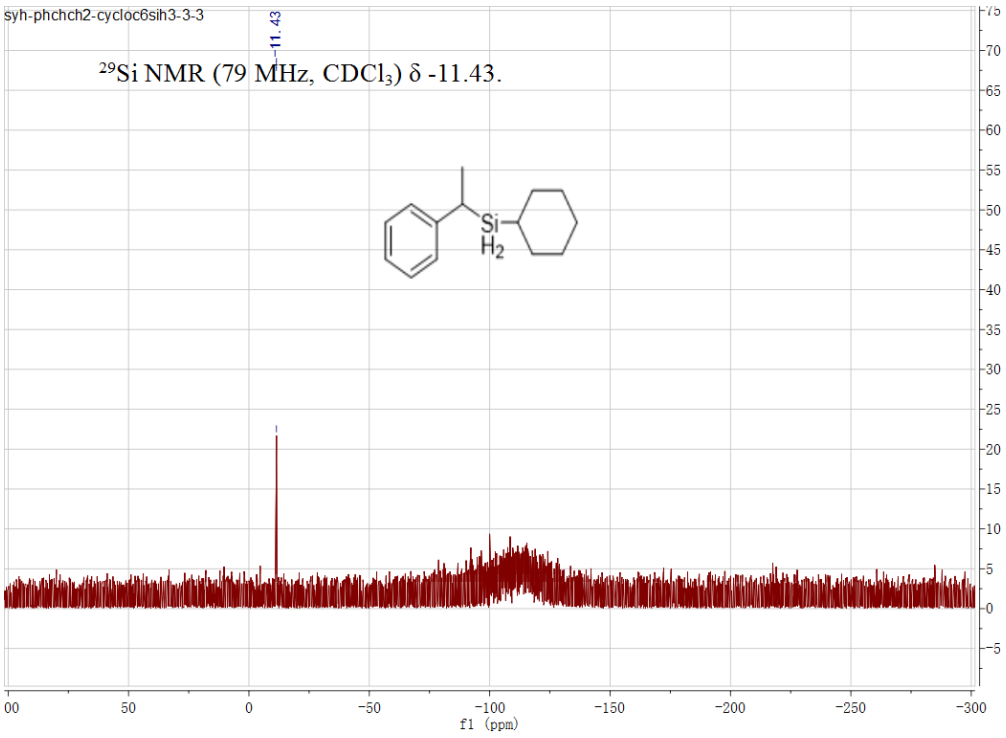

syh-jierxi-2c6sih3-2-23
C13CPD
32.66
32.62
31.62
25.48
25.40
22.63
14.10
9.21
$C_6H_{13}H_2Si$
$SiH_2C_6H_{13}$
f1 (ppm)


syh-2-c6sih3-2-25
-28.63
^{29}Si NMR (79 MHz, $CDCl_3$) δ -28.63.
$C_6H_{13}H_2Si$
$SiH_2C_6H_{13}$
f1 (ppm)

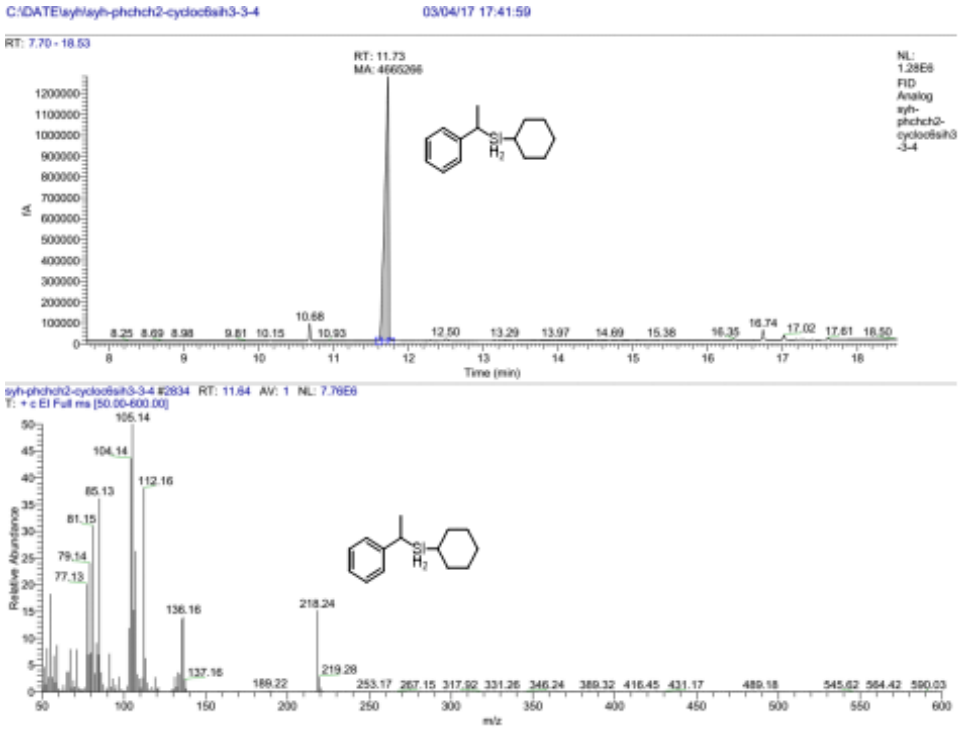

C:\DATE\syh\syh-jierxi-2c6sih3-20170222
02/23/17 03:01:24
RT: 12.77 - 19.75
RT: 15.23
MA: 1492237
RT: 14.84
MA: 73049
$C_8H_{13}H_2Si$
$SiH_2C_6H_{13}$
Time (min)
syh-jierxi-2c6sih3-20170222 #3881 RT: 15.20 AV: 1 NL: 1.82E7
T: + c EI Full ms [50.00-600.00]
Relative Abundance
m/z

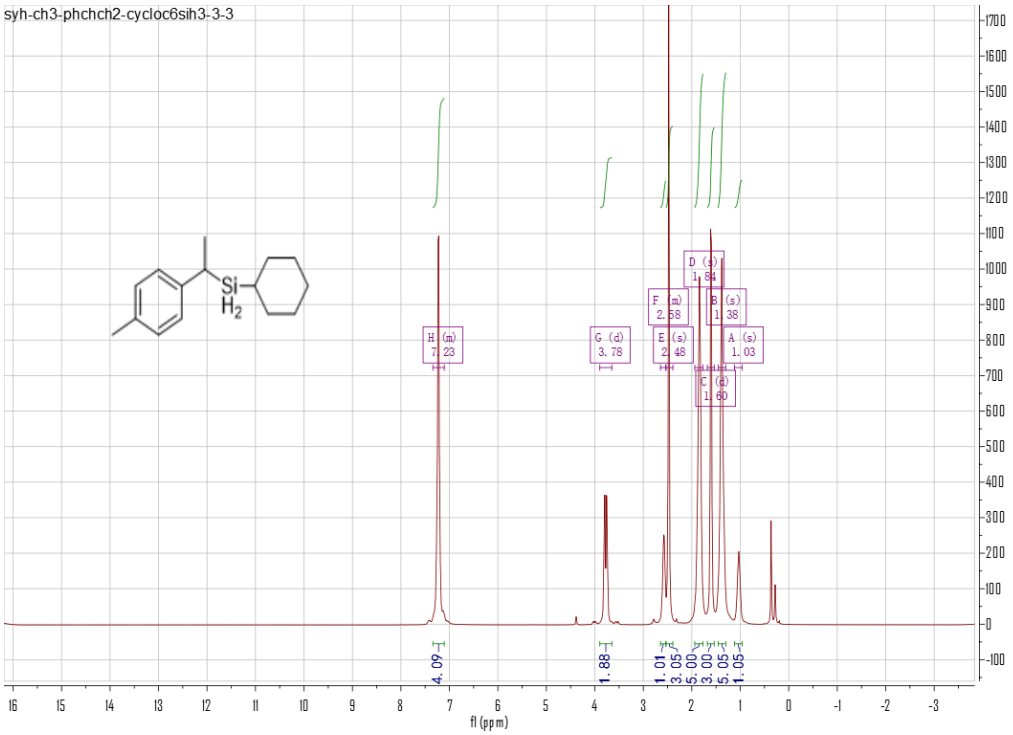

syh-phchch2-cycloc6sih3-3-3
B (m) 7.25
A (dd) 7.40
D (dt) 3.72
C (dt) 3.77
E (m) 2.58
I (m) 1.78
G (m) 1.31
F (m) 1.00
H (m) 1.58
2.04
3.00
0.90
0.90
0.99
5.09
3.02
5.07
1.03
f1 (ppm)

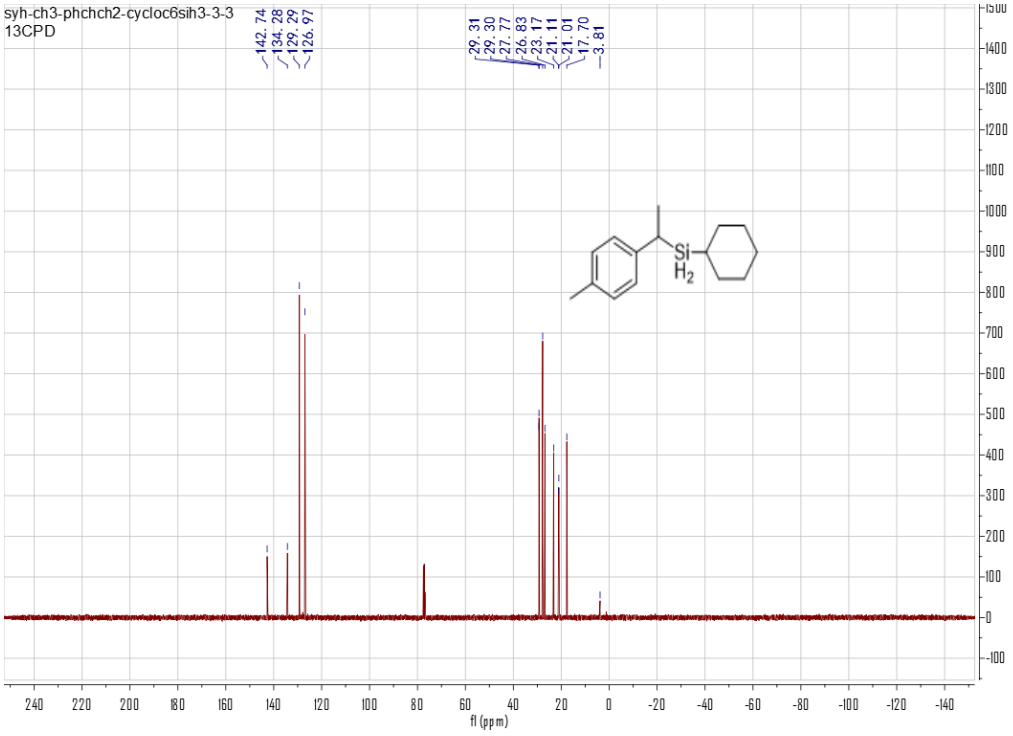

syh-phchch2-cycloc6sih3-3-3
13CPD
145.83
128.54
127.05
124.98
29.26
29.23
27.76
26.76
23.70
20.97
17.49
3.77
f1 (ppm)

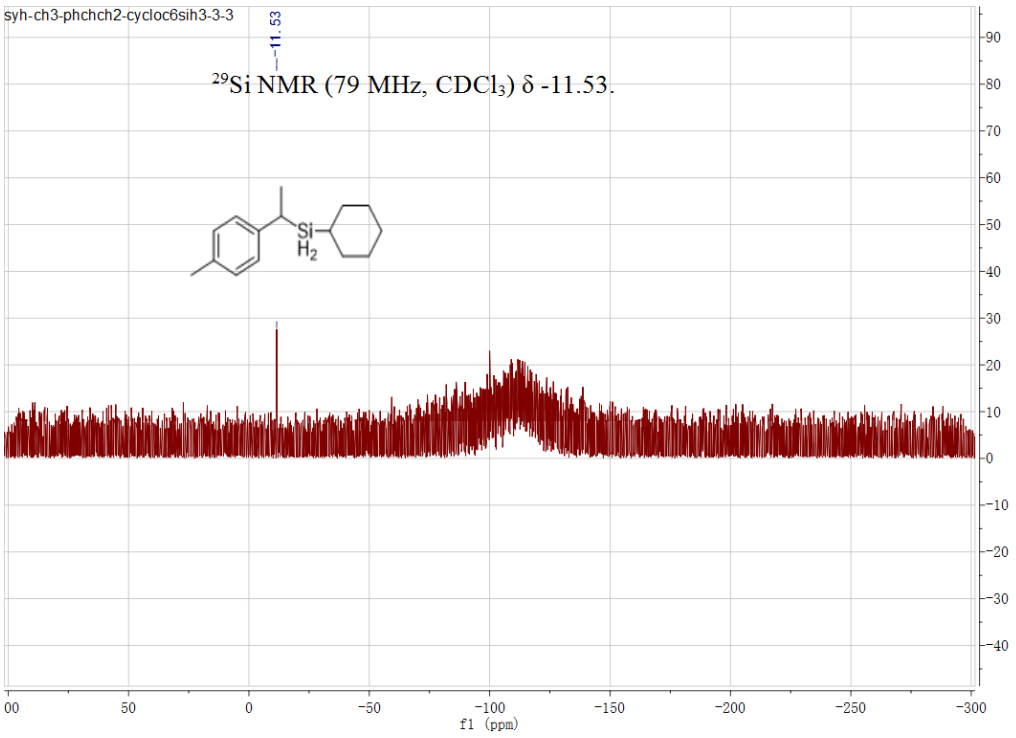


^{29}Si NMR (79 MHz, $CDCl_3$) δ -11.43.

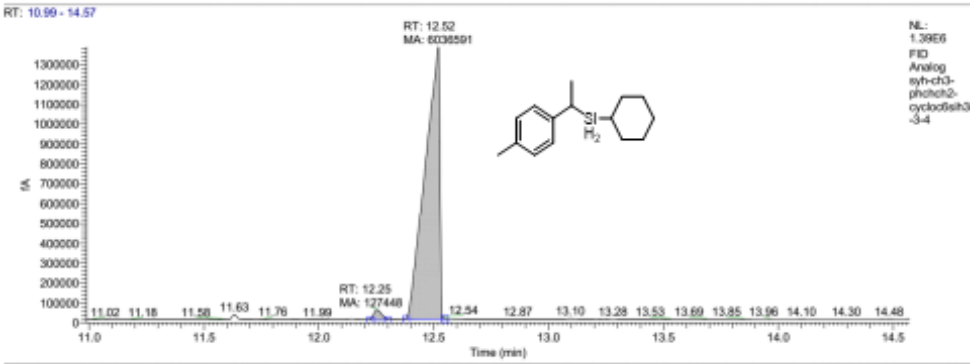


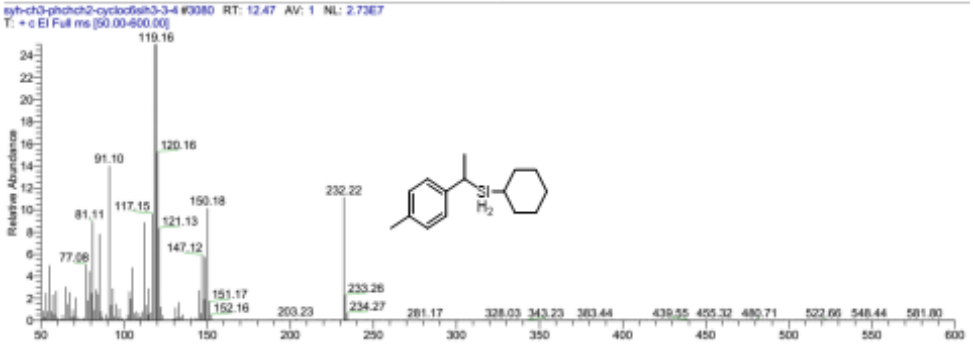

syh-ch3-phchch2-cycloc6sih3-3-3
H (m) 7.23
G (d) 3.78
F (m) 2.58
E (s) 2.48
D (s) 1.84
B (s) 1.38
A (s) 1.03
C (d) 1.60
4.09
1.88
1.01
3.05
5.00
3.00
5.05
1.05
f1 (ppm)

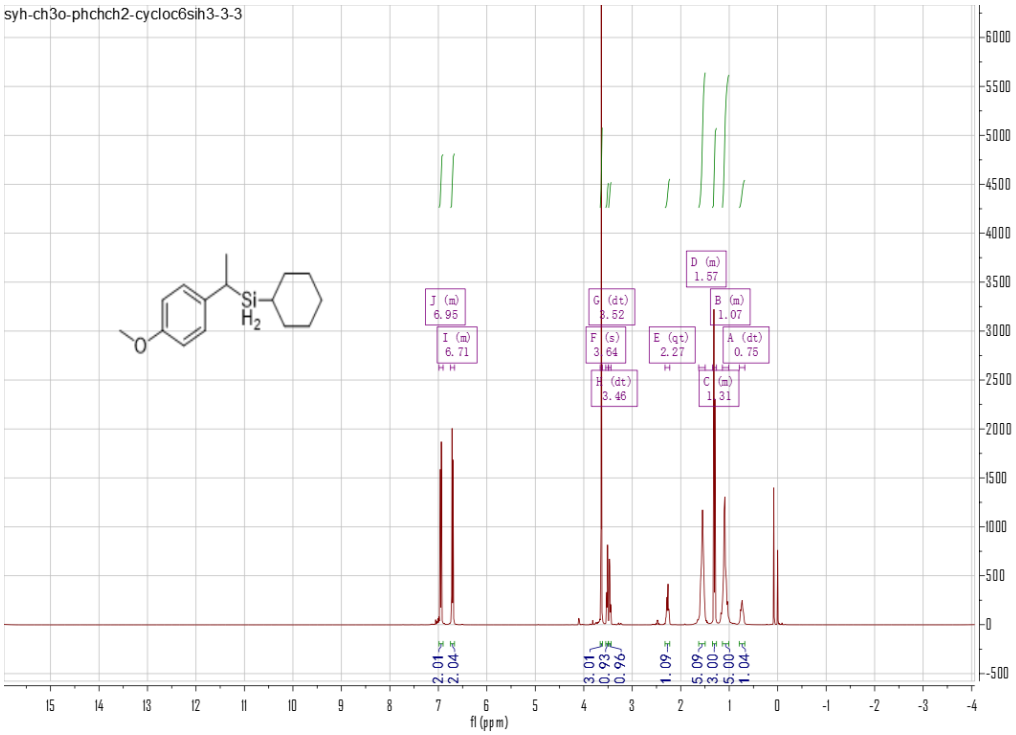

syh-ch3-phchch2-cycloc6sih3-3-3
13CPD
142.74
134.28
129.29
126.97
29.31
29.30
27.77
26.83
23.17
21.11
21.01
17.70
-3.81
f1 (ppm)

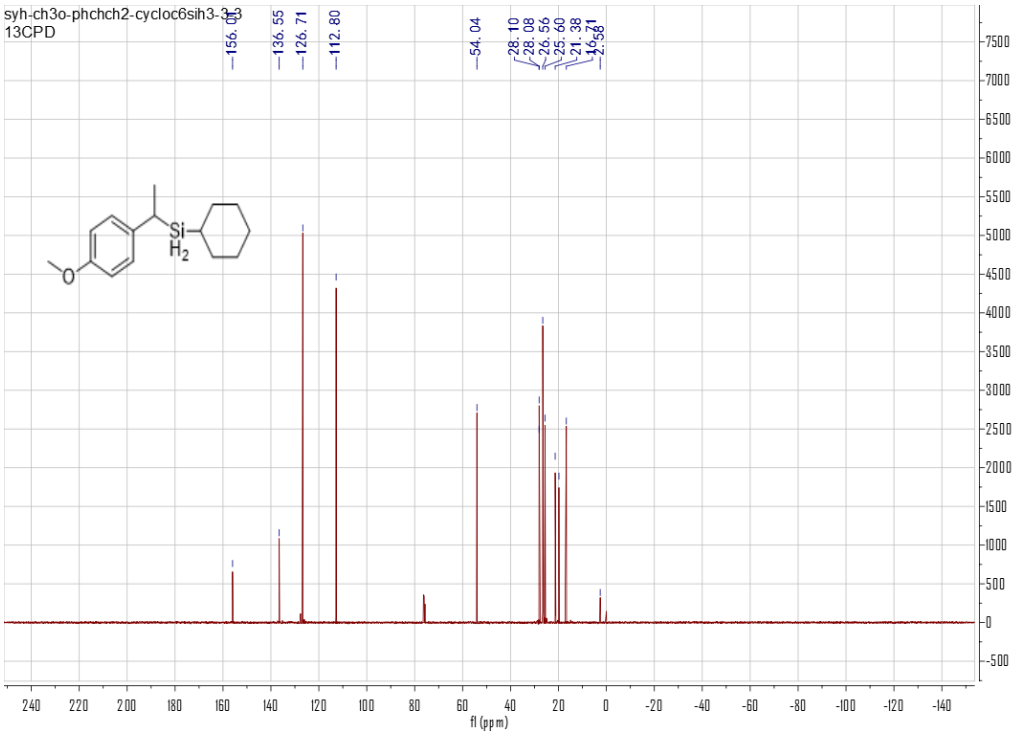


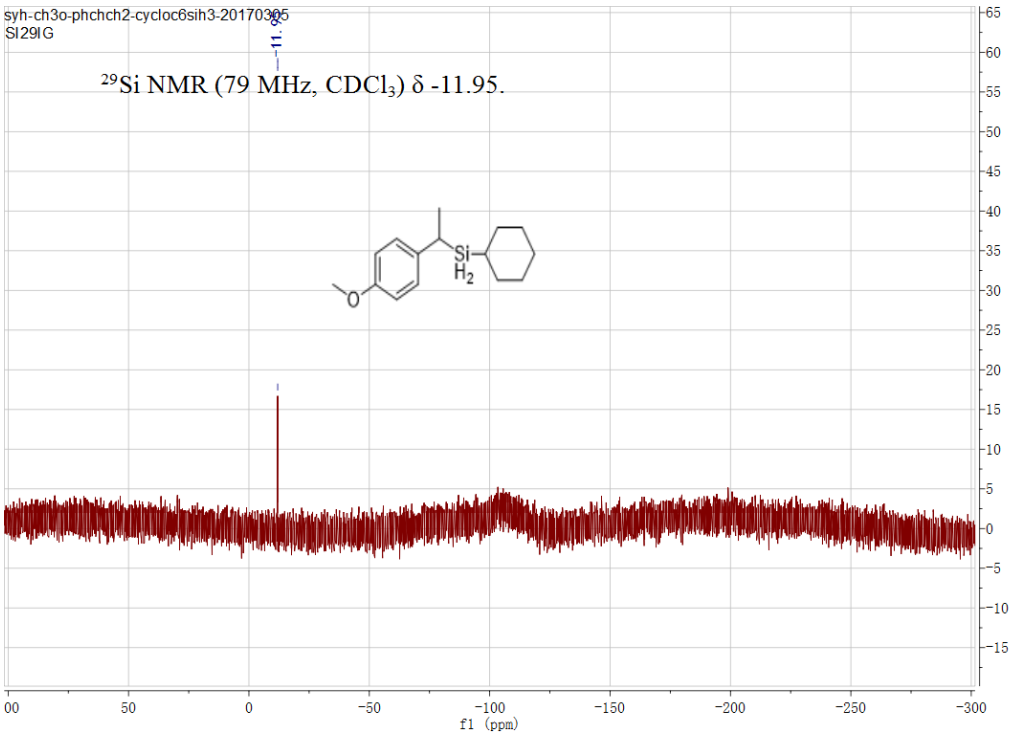
^{29}Si NMR (79 MHz, $CDCl_3$) δ -11.53.



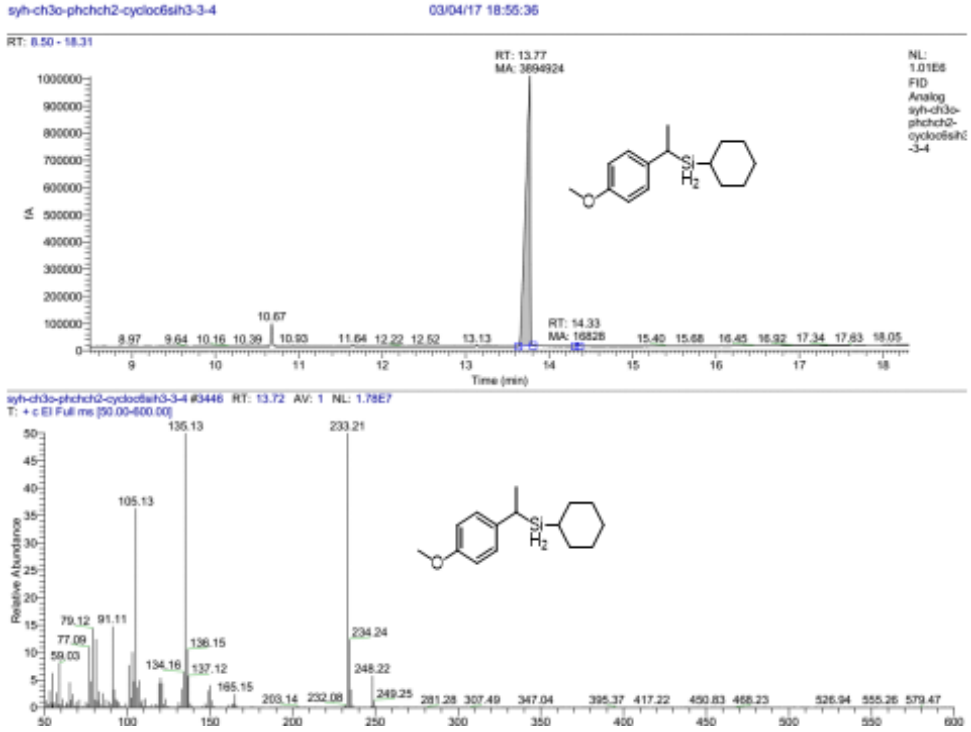


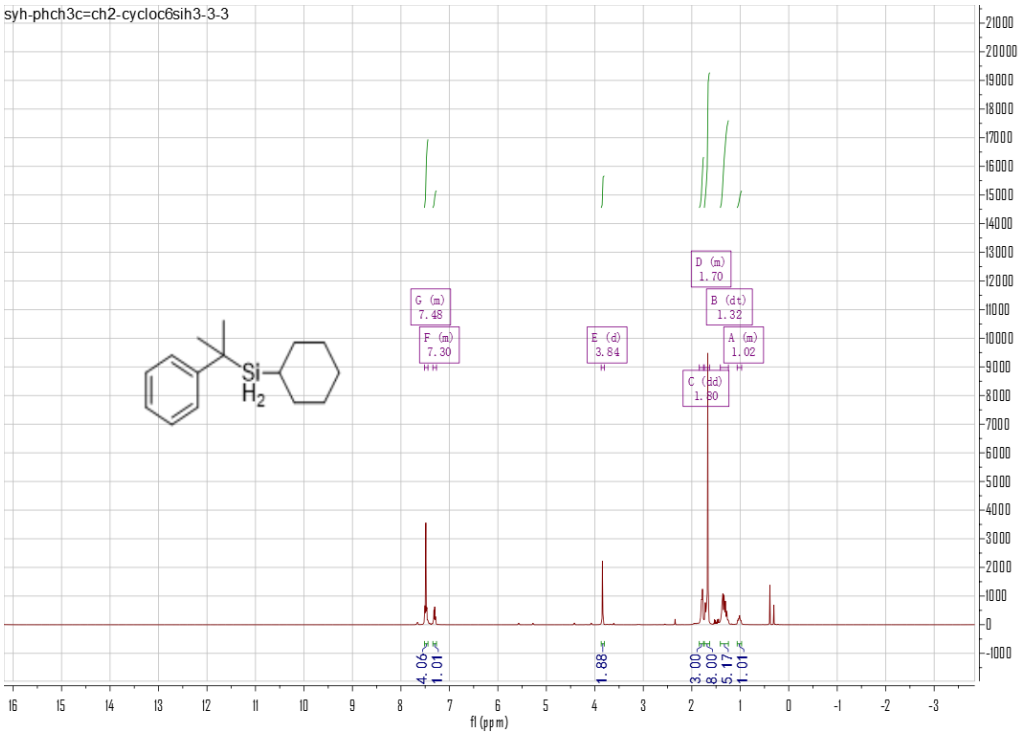

syh-ch3o-phchch2-cycloc6sih3-3-3
J (m) 6.95
I (m) 6.71
G (dt) 3.52
F (s) 3.64
H (dt) 3.46
E (qt) 2.27
D (m) 1.57
B (m) 1.07
A (dt) 0.75
C (m) 1.31
2.01
2.04
3.01
0.93
0.96
1.09
5.09
3.00
5.00
1.04
f1 (ppm)

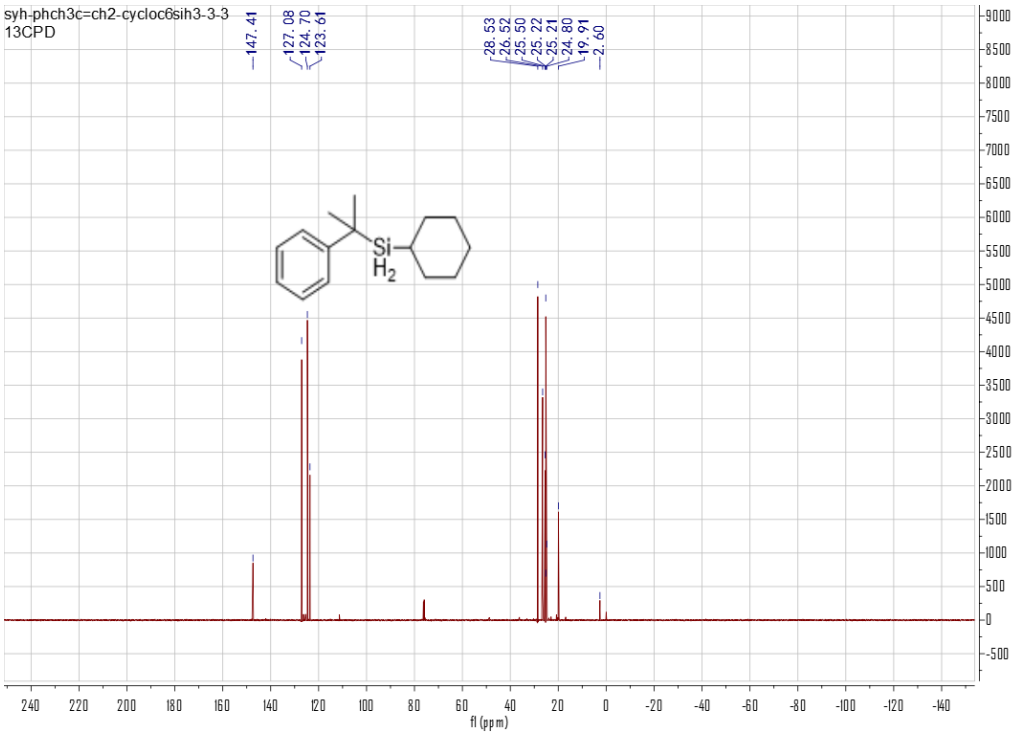

syh-ch3o-phchch2-cycloc6sih3-3-3
13CPD
156.00
136.55
126.71
112.80
54.04
28.10
28.08
26.56
25.60
21.38
16.61
-2.58
f1 (ppm)

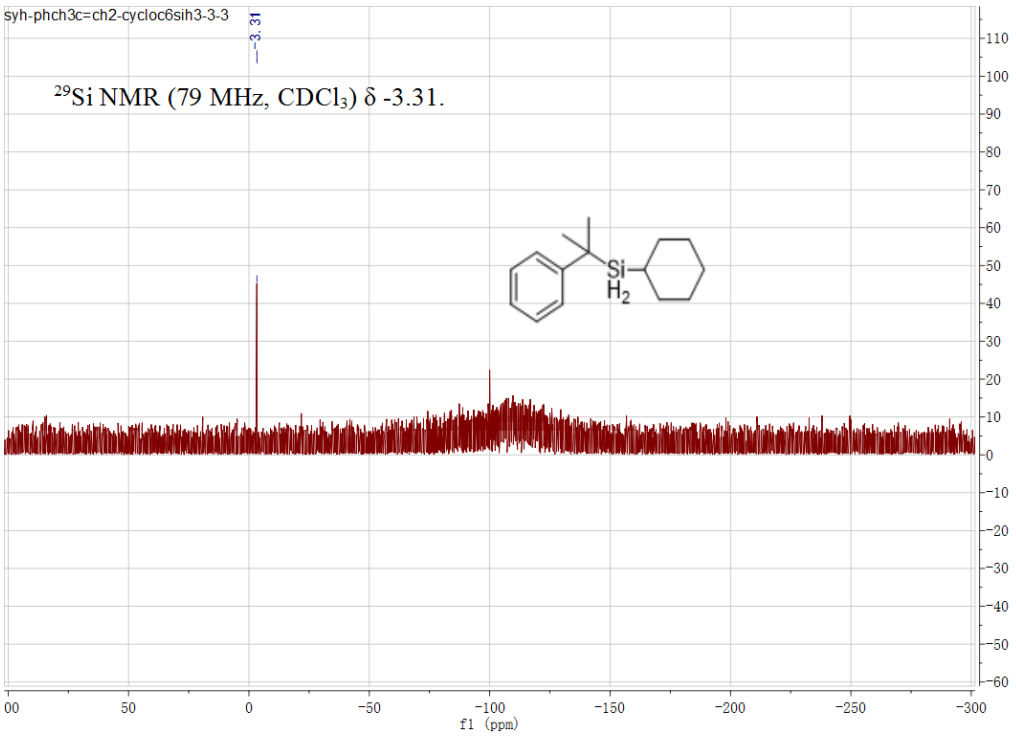


^{29}Si NMR (79 MHz, $CDCl_3$) δ -11.95.

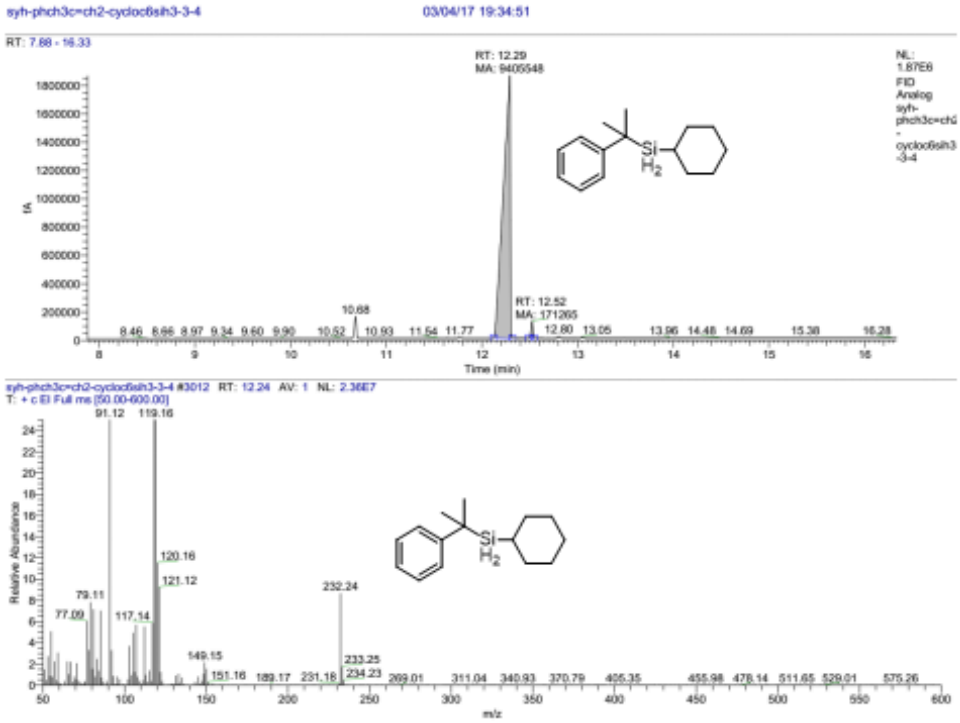


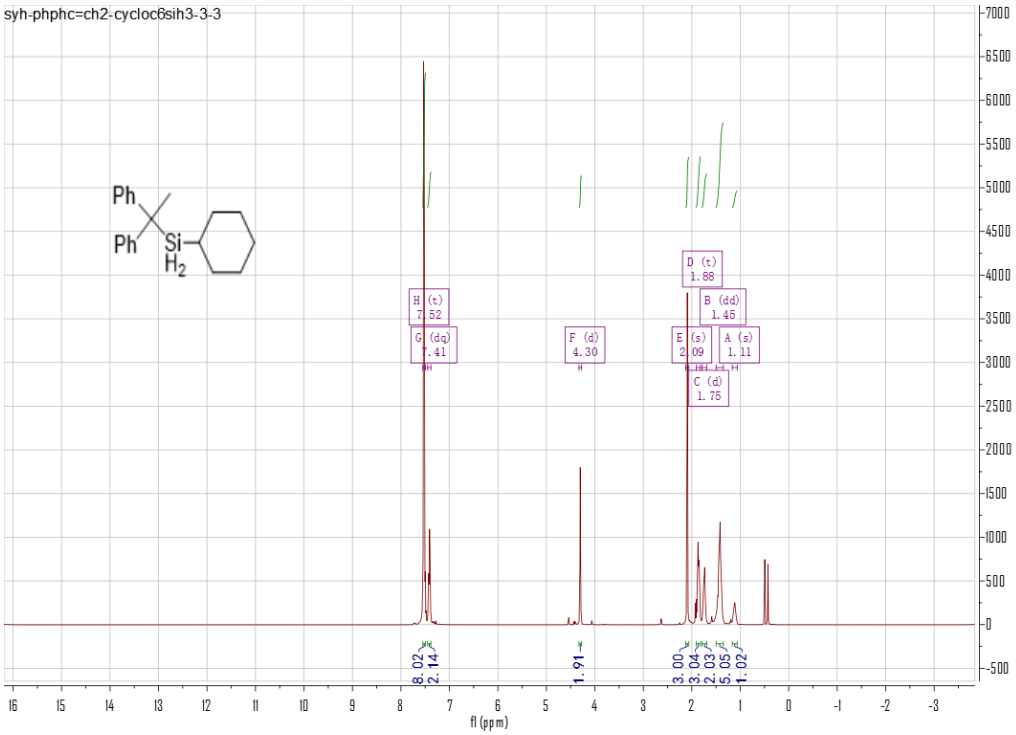

syh-phch3c=ch2-cycloc6sih3-3-3
G (m)
7.48
F (m)
7.30
E (d)
3.84
D (m)
1.70
B (dt)
1.32
A (m)
1.02
C (dd)
1.80
4.06
1.01
1.88
3.00
8.00
5.17
1.01
f1 (ppm)

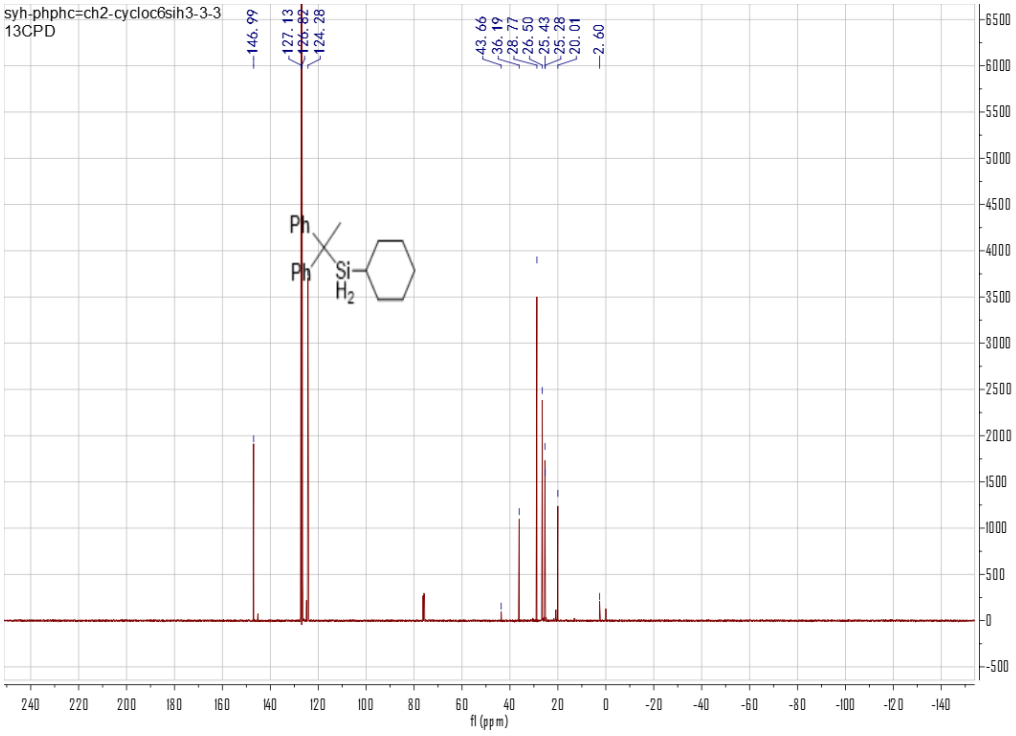

syh-phch3c=ch2-cycloc6sih3-3-3
13CPD
147.41
127.08
124.70
123.61
28.53
26.52
25.50
25.22
25.21
24.80
19.91
2.60
f1 (ppm)

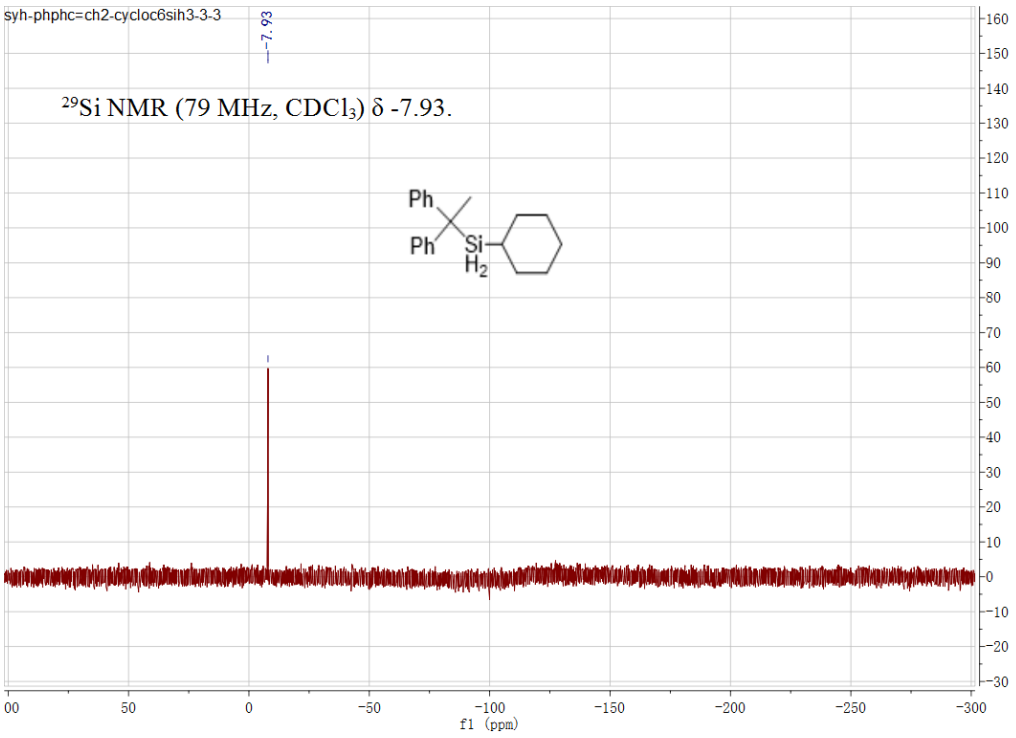


^{29}Si NMR (79 MHz, $CDCl_3$) δ -3.31.

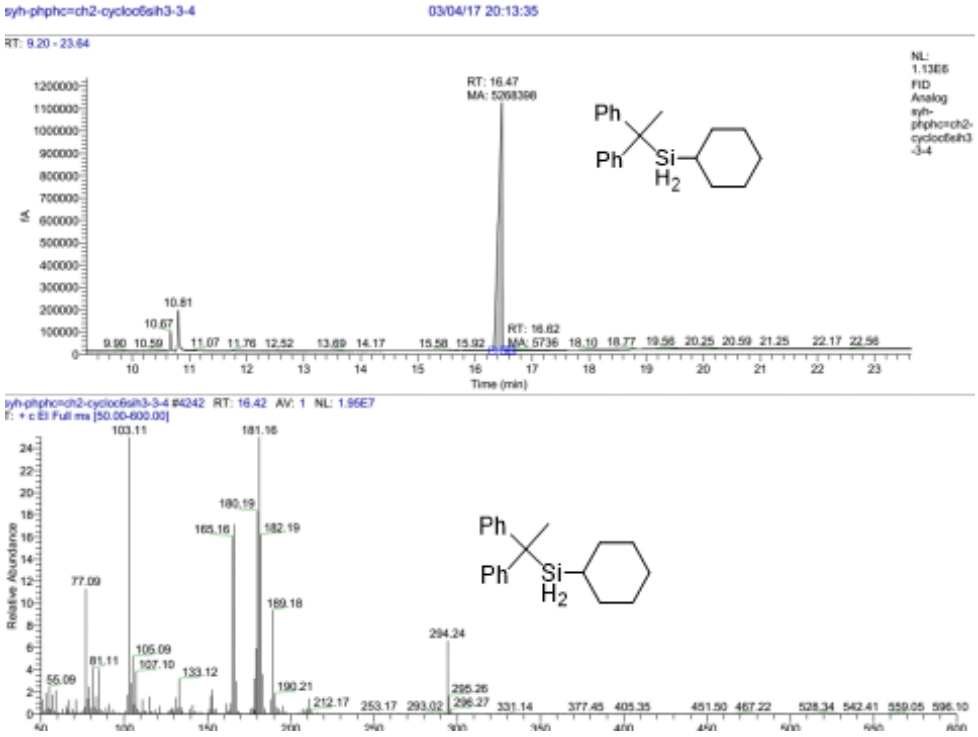


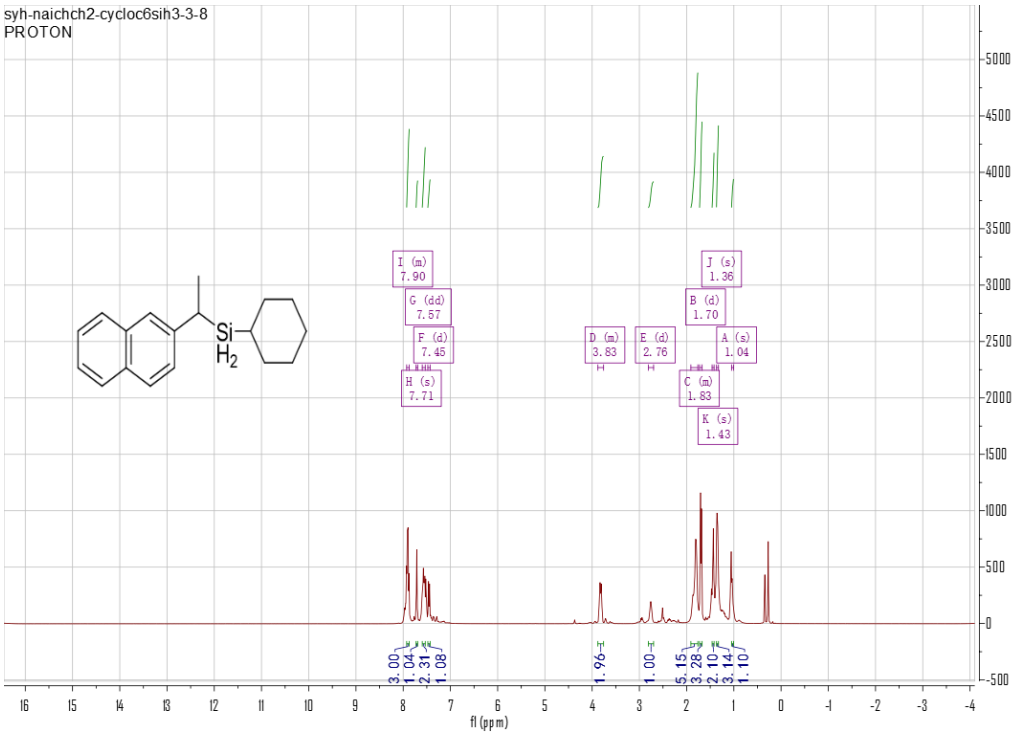

syh-phphc=ch2-cycloc6sih3-3-3
Ph
Ph
Si
H2
H (t) 7.52
G (dq) 7.41
F (d) 4.30
D (t) 1.88
B (dd) 1.45
E (s) 2.09
A (s) 1.11
C (d) 1.75
8.02
2.14
1.91
3.00
3.04
2.03
5.05
1.02
f1 (ppm)

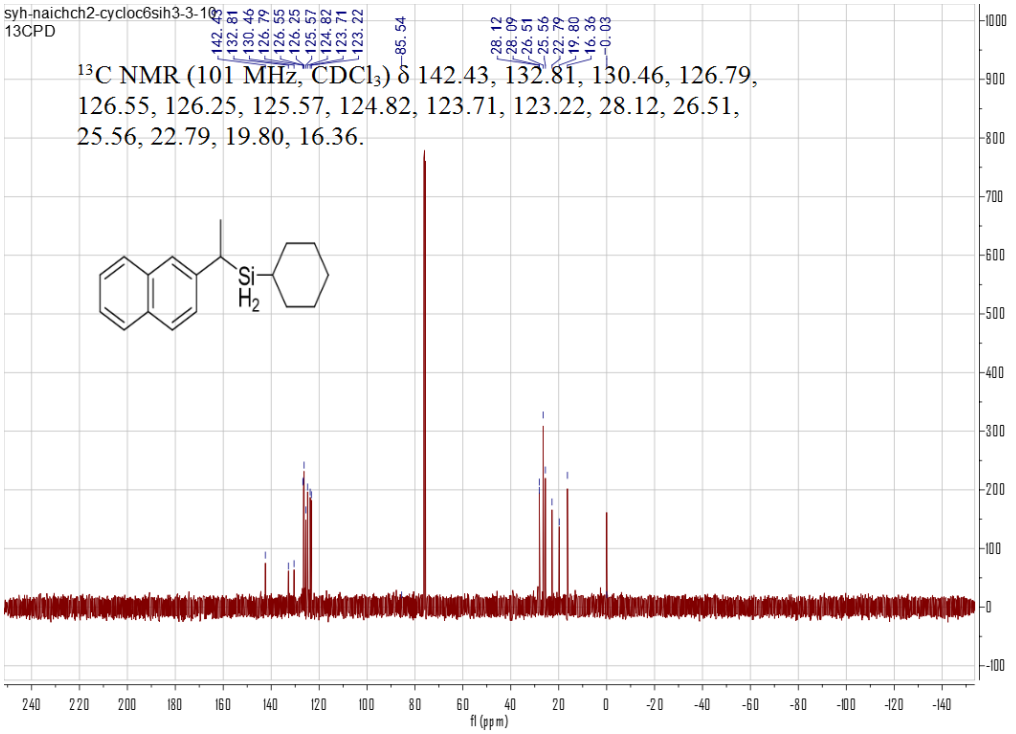

syh-phphc=ch2-cycloc6sih3-3-3
13CPD
146.99
127.13
126.82
124.28
43.66
36.19
28.77
26.50
25.43
25.28
20.01
2.60
Ph
Ph
Si
H2
f1 (ppm)



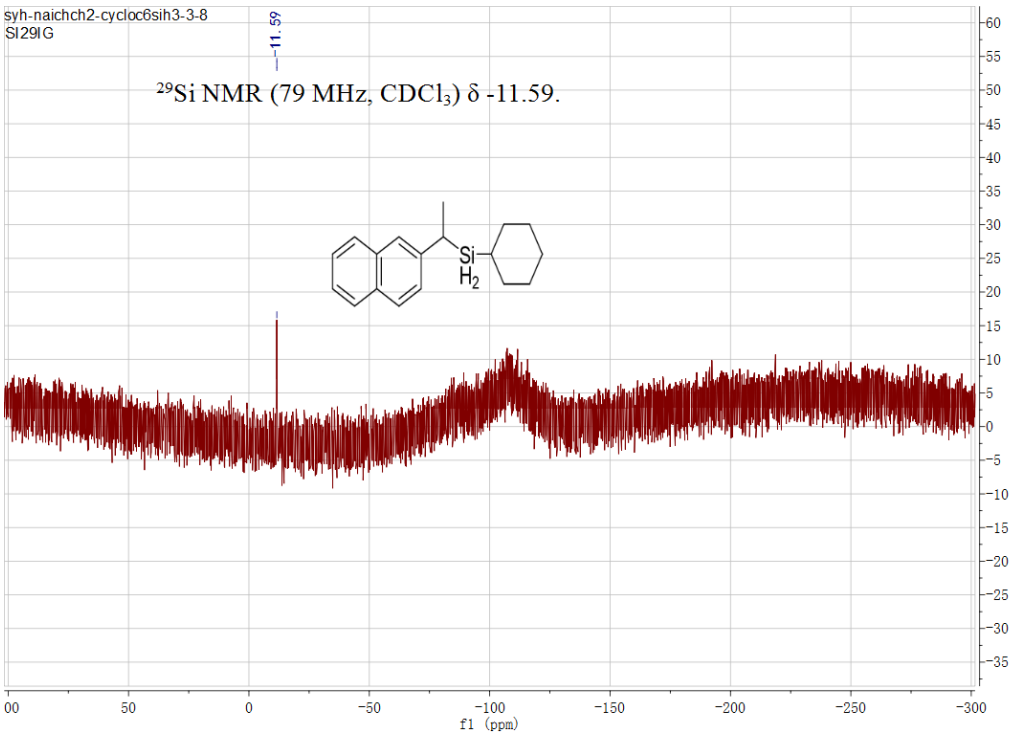
^{29}Si NMR (79 MHz, $CDCl_3$) δ -7.93.



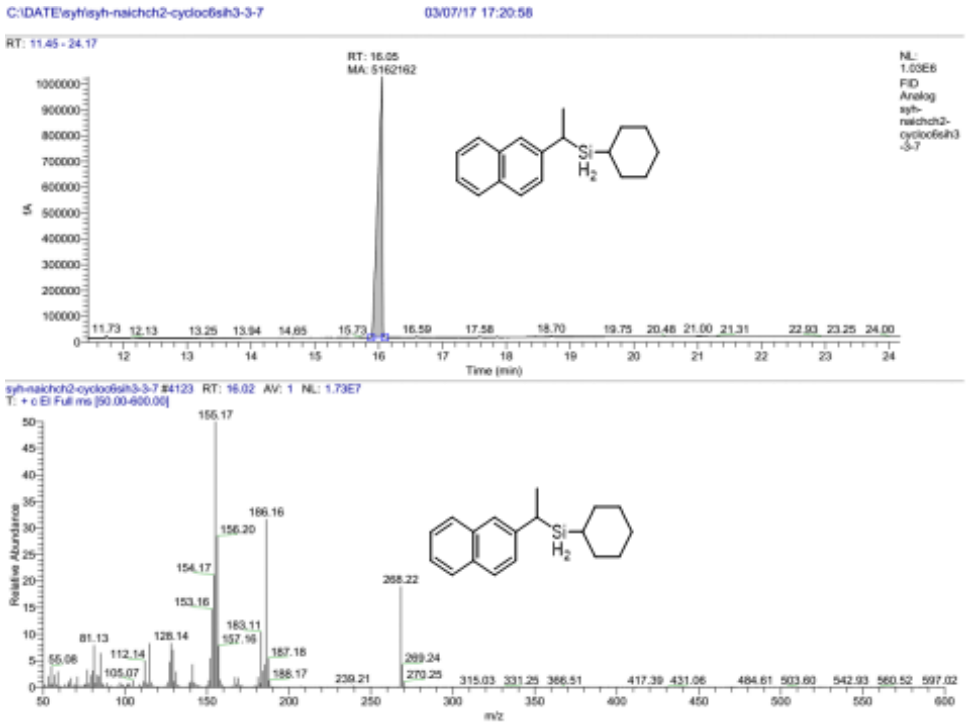


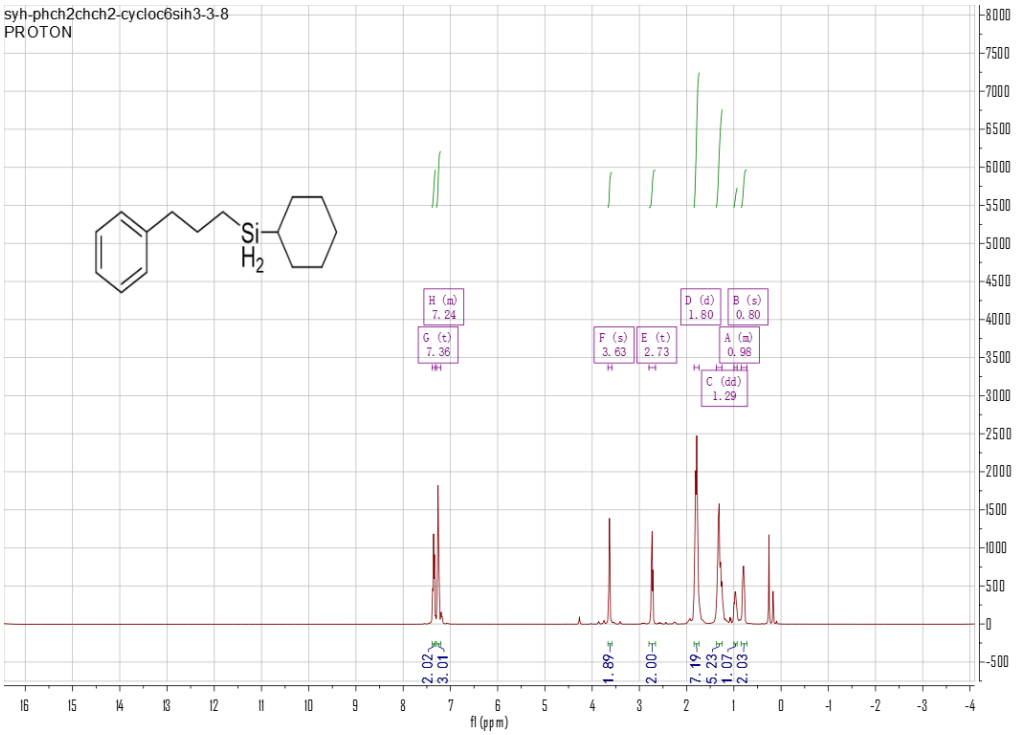


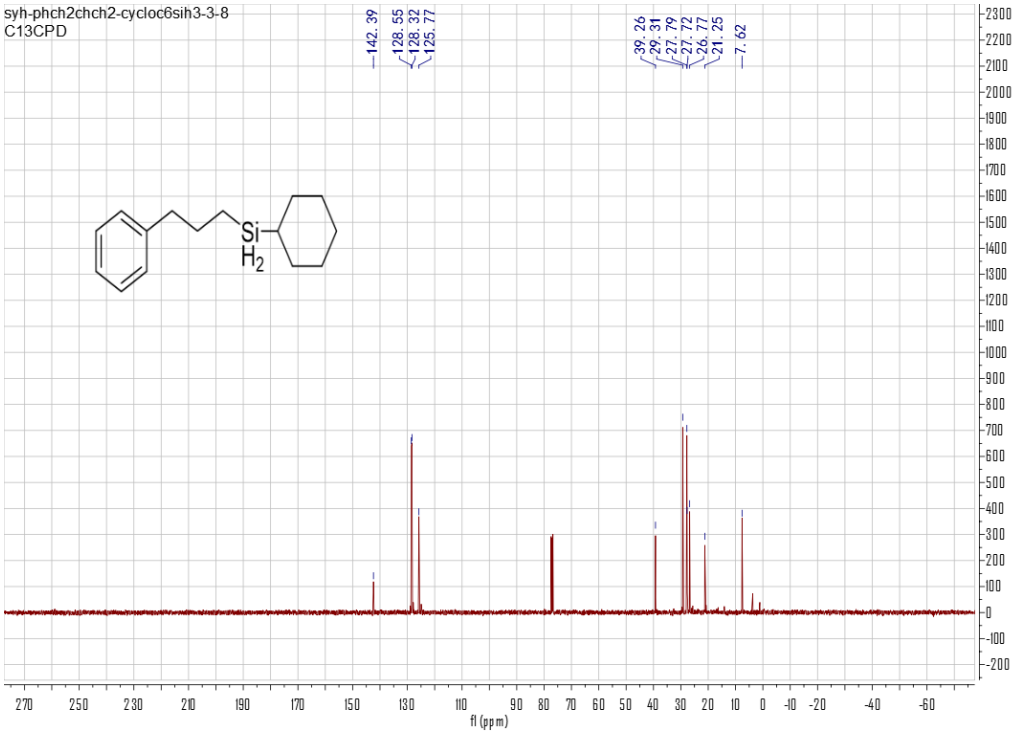
^{13}C NMR (101 MHz, $CDCl_3$) δ 142.43, 132.81, 130.46, 126.79, 126.55, 126.25, 125.57, 124.82, 123.71, 123.22, 28.12, 26.51, 25.56, 22.79, 19.80, 16.36.

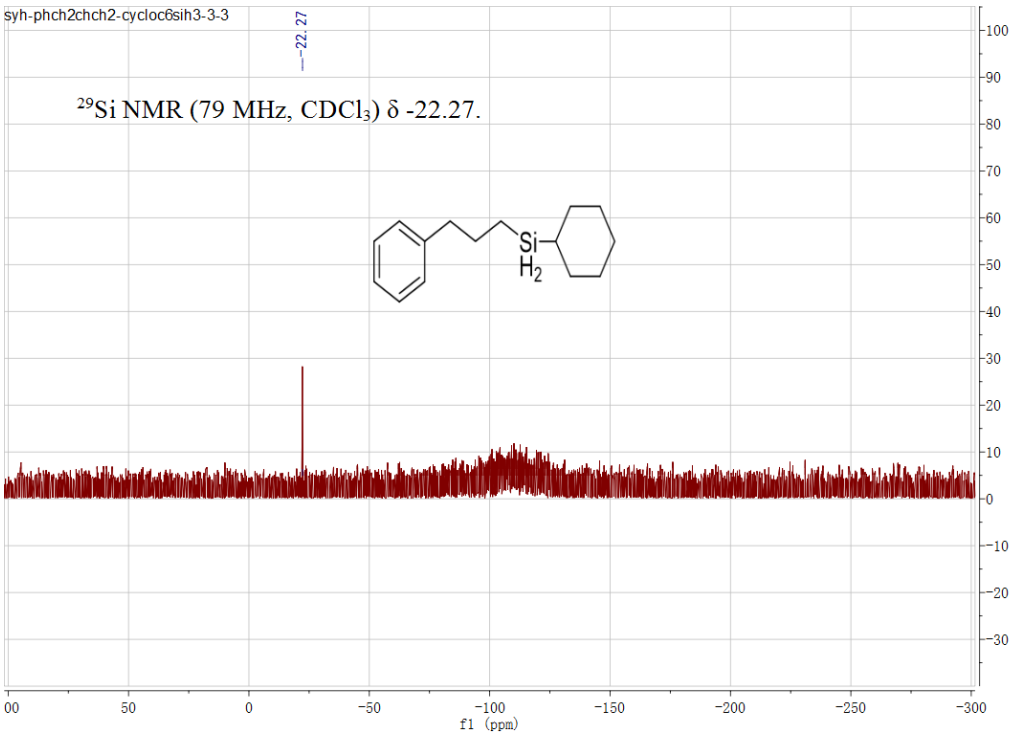


^{29}Si NMR (79 MHz, $CDCl_3$) δ -11.59.

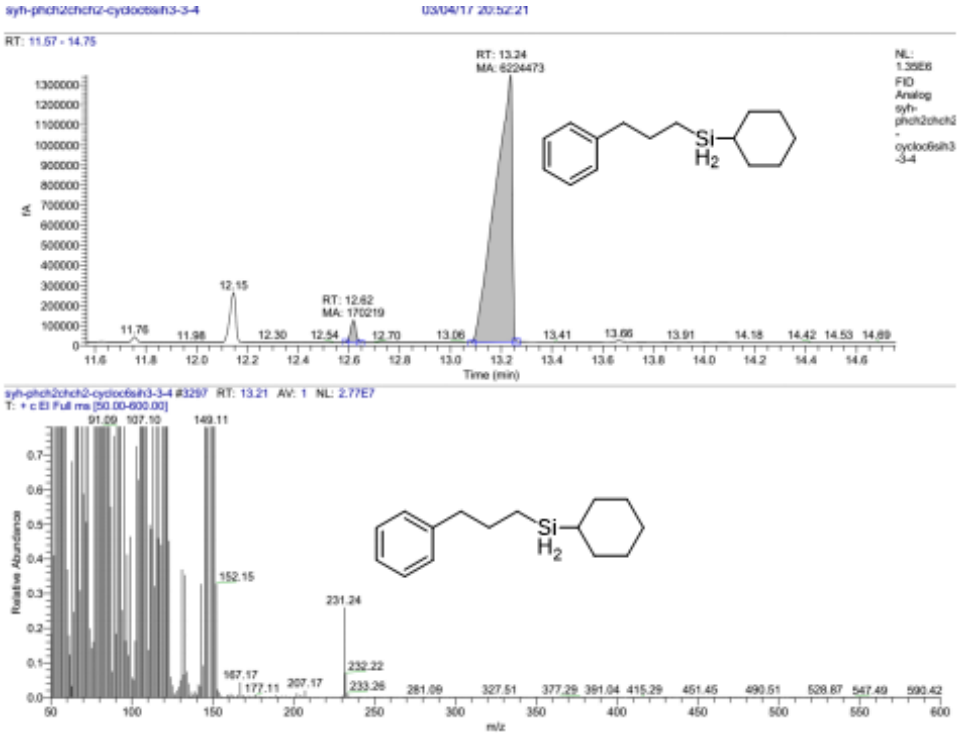


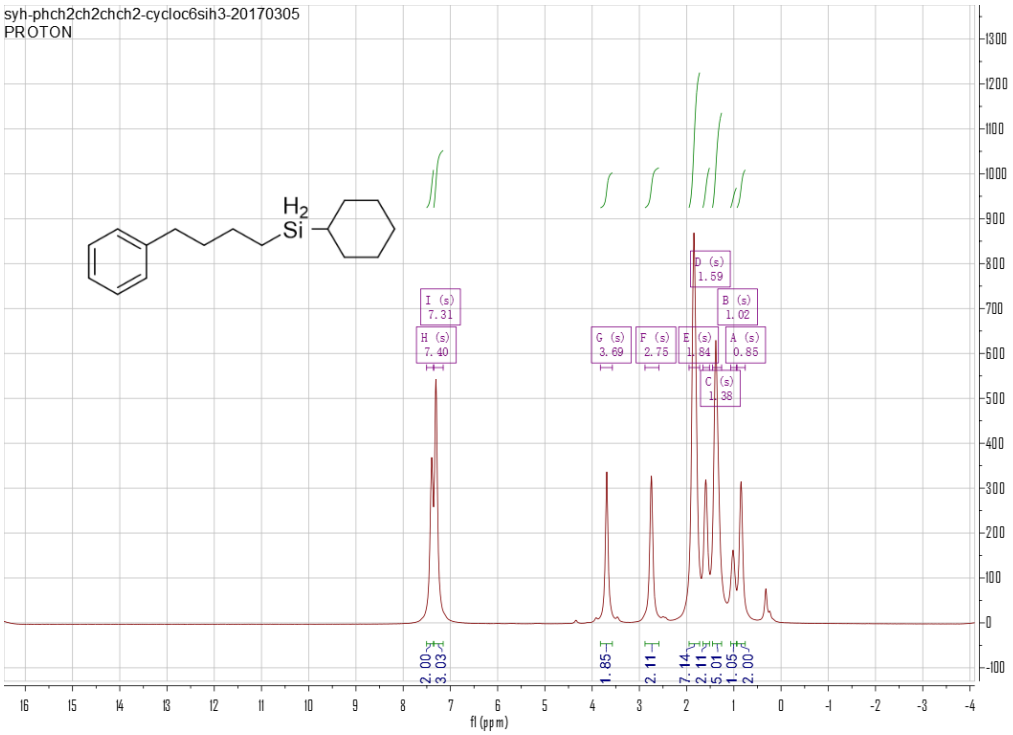

syh-phch2chch2-cycloc6sih3-3-8
PROTON
H (m) 7.24
G (t) 7.36
F (s) 3.63
E (t) 2.73
D (d) 1.80
B (s) 0.80
A (m) 0.98
C (dd) 1.29
2.02
3.01
1.89
2.00
7.19
5.23
1.07
2.03
f1 (ppm)

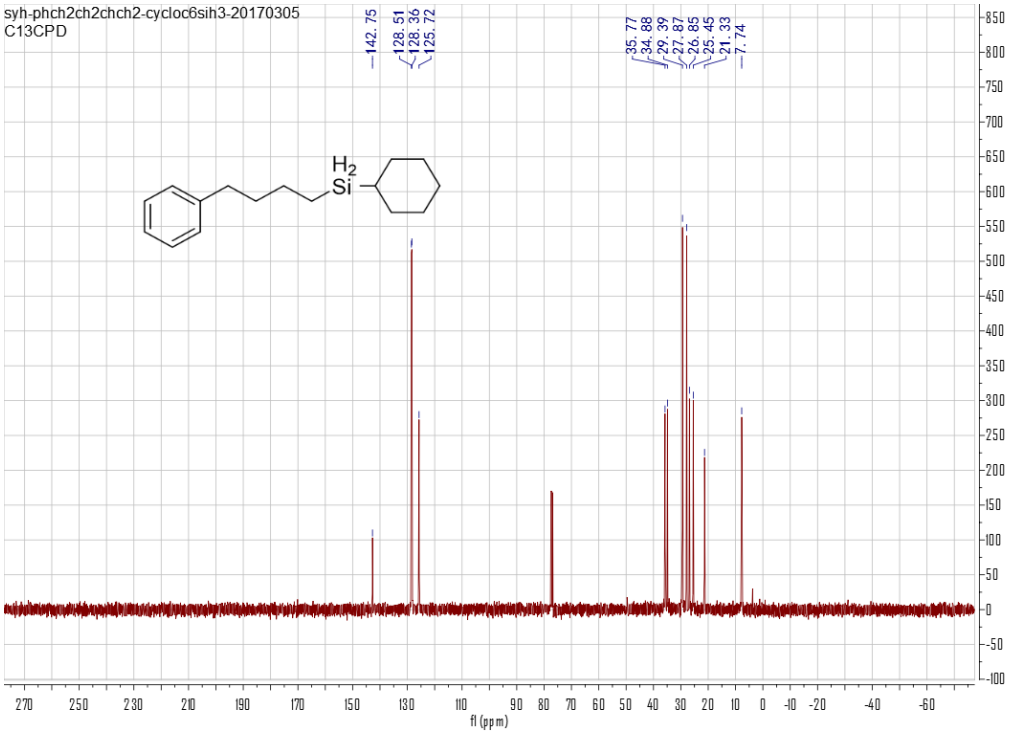

syh-phch2chch2-cycloc6sih3-3-8
C13CPD
142.39
128.55
128.32
125.77
39.26
29.31
27.79
27.72
26.77
21.25
7.62
f1 (ppm)

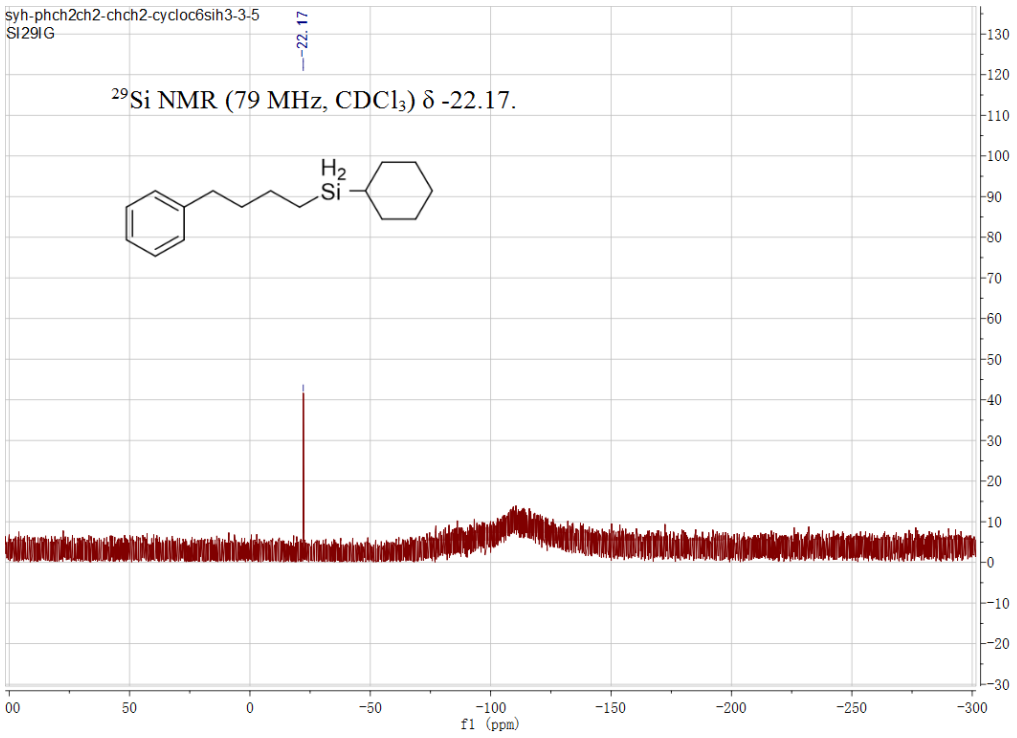


^{29}Si NMR (79 MHz, $CDCl_3$) δ -22.27.

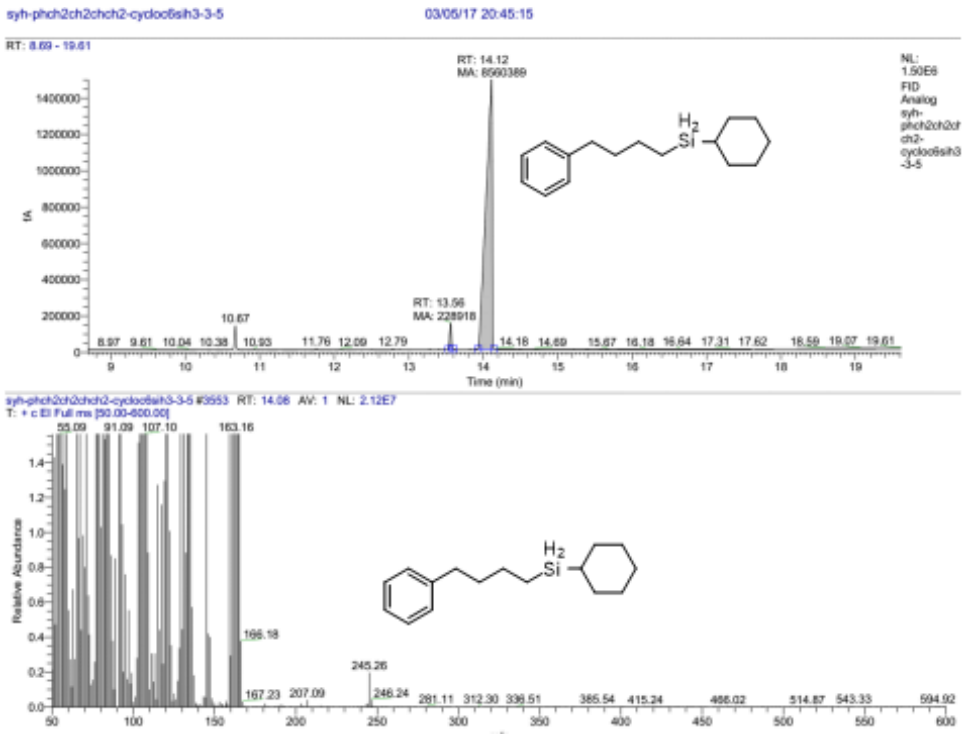


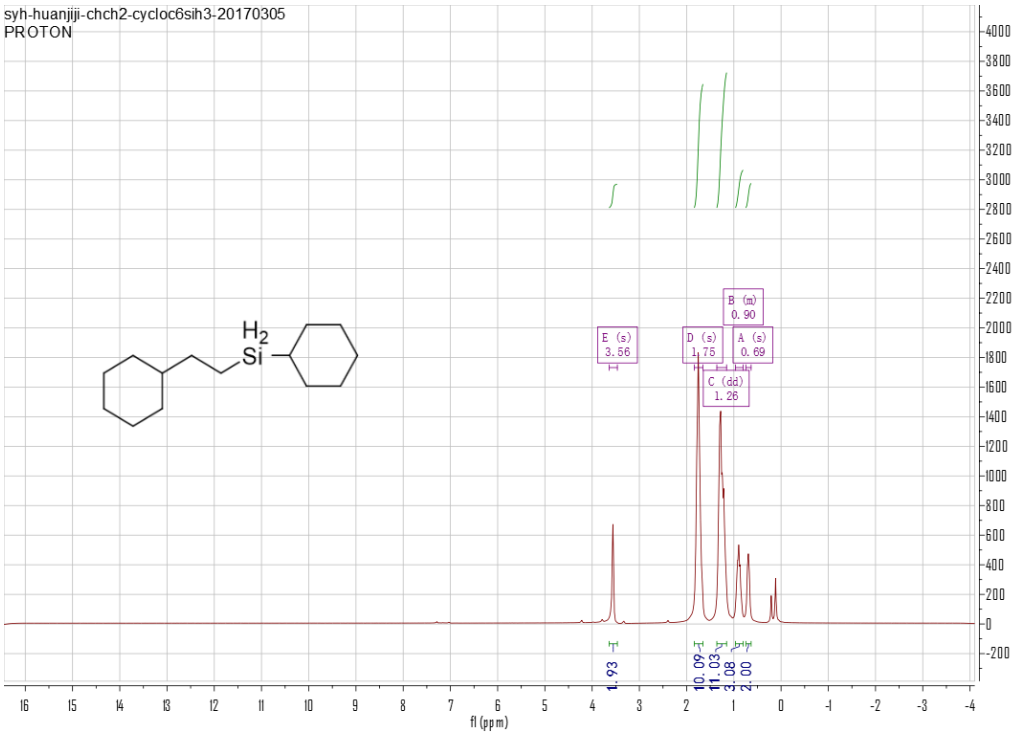

syh-phch2ch2chch2-cycloc6sih3-20170305
PROTON
H2
Si
I (s)
7.31
H (s)
7.40
D (s)
1.59
B (s)
1.02
G (s)
3.69
F (s)
2.75
E (s)
1.84
A (s)
0.85
C (s)
1.38
2.00
3.03
1.85
2.11
7.14
2.11
5.01
1.05
2.00
f1 (ppm)

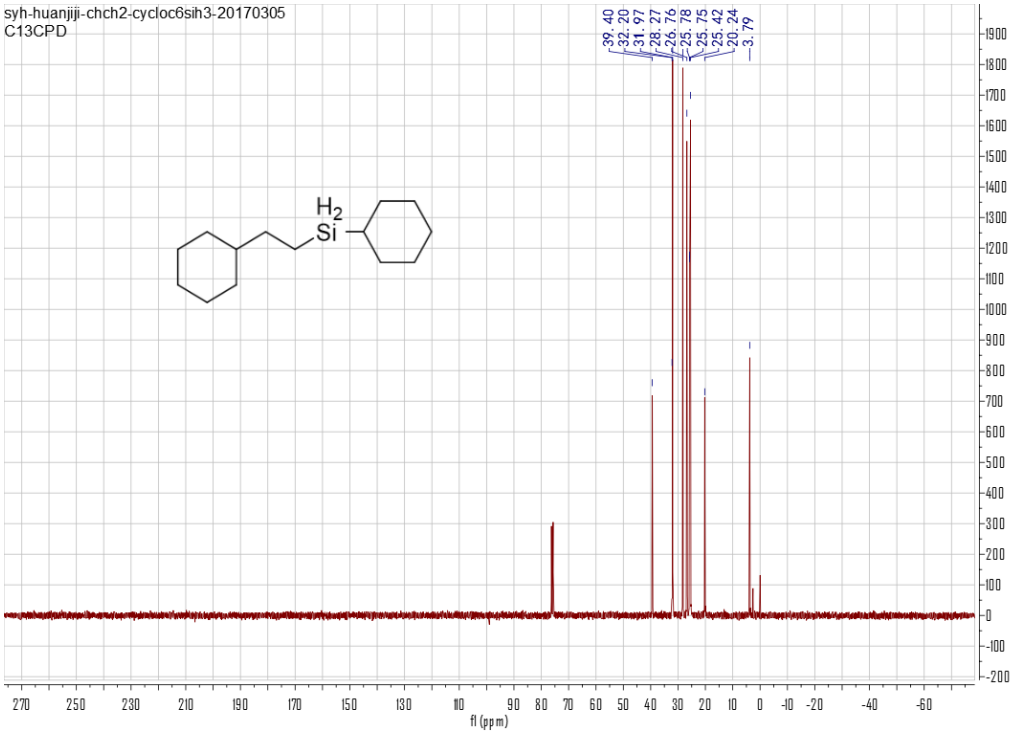

syh-phch2ch2chch2-cycloc6sih3-20170305
C13CPD
142.75
128.51
128.36
125.72
35.77
34.88
29.39
27.87
26.85
25.45
21.33
7.74
H2
Si
f1 (ppm)

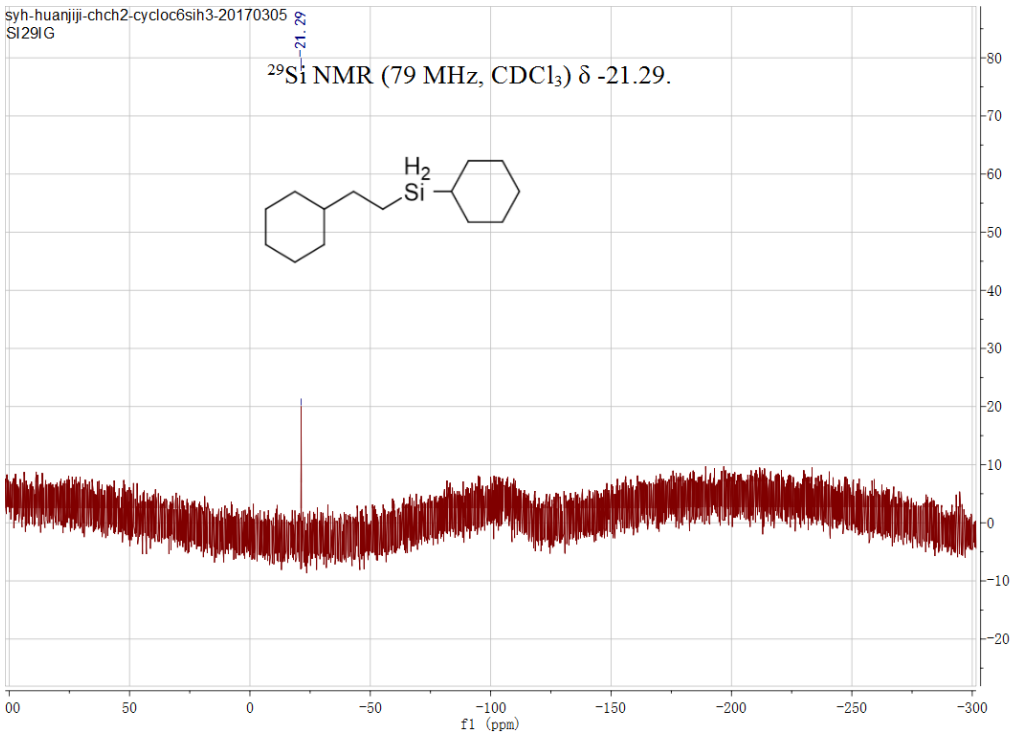


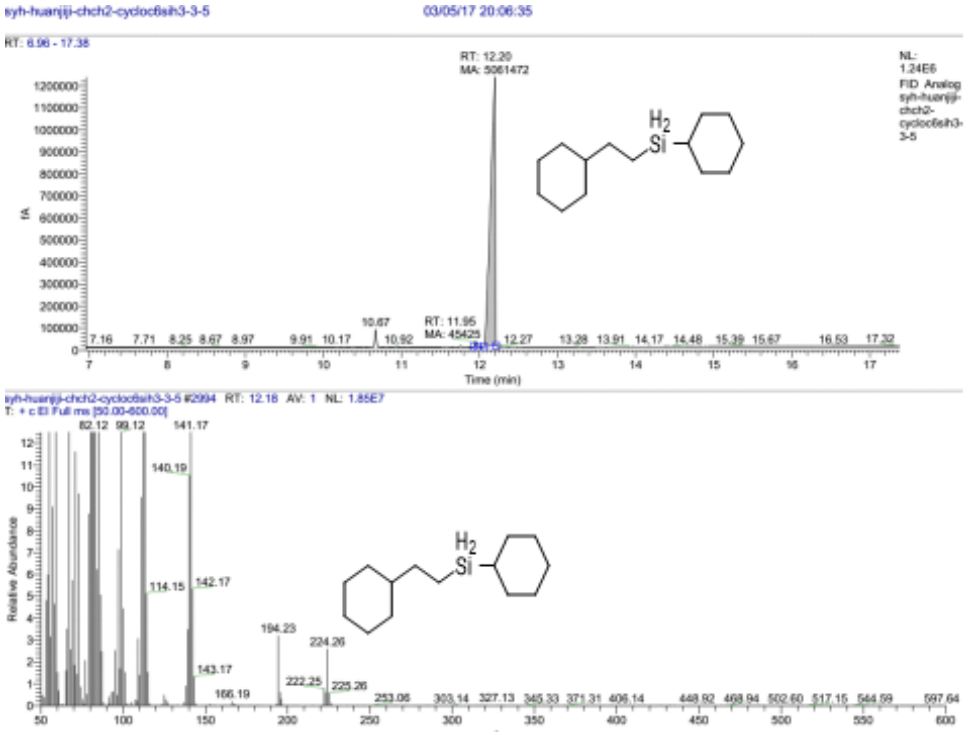
^{29}Si NMR (79 MHz, $CDCl_3$) δ -22.17.

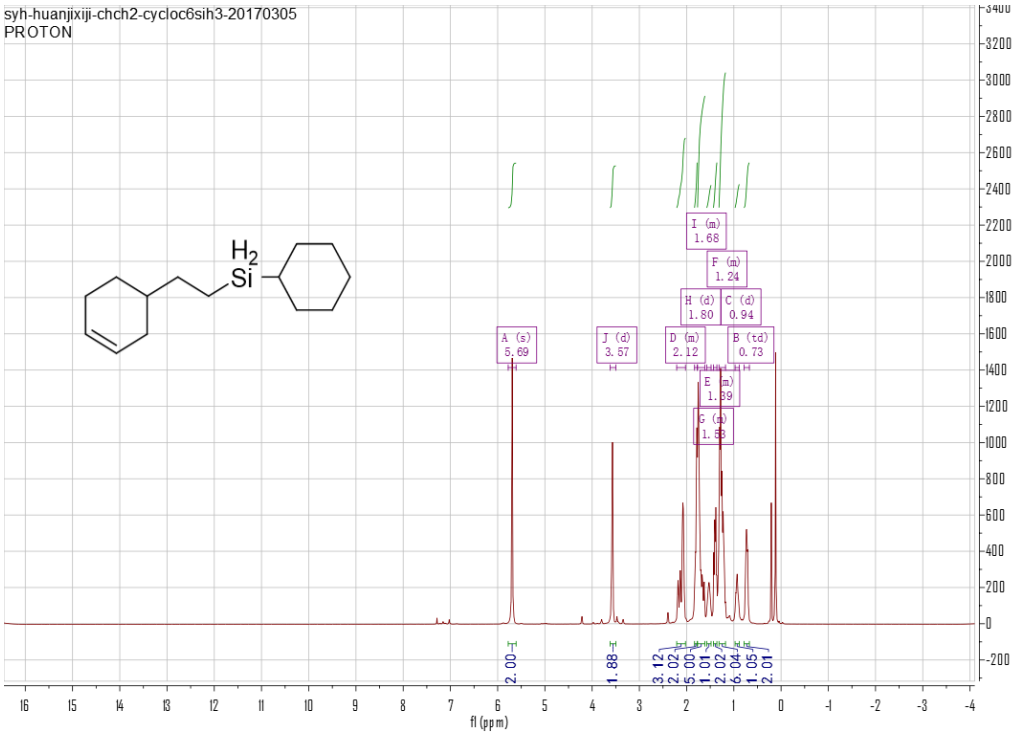


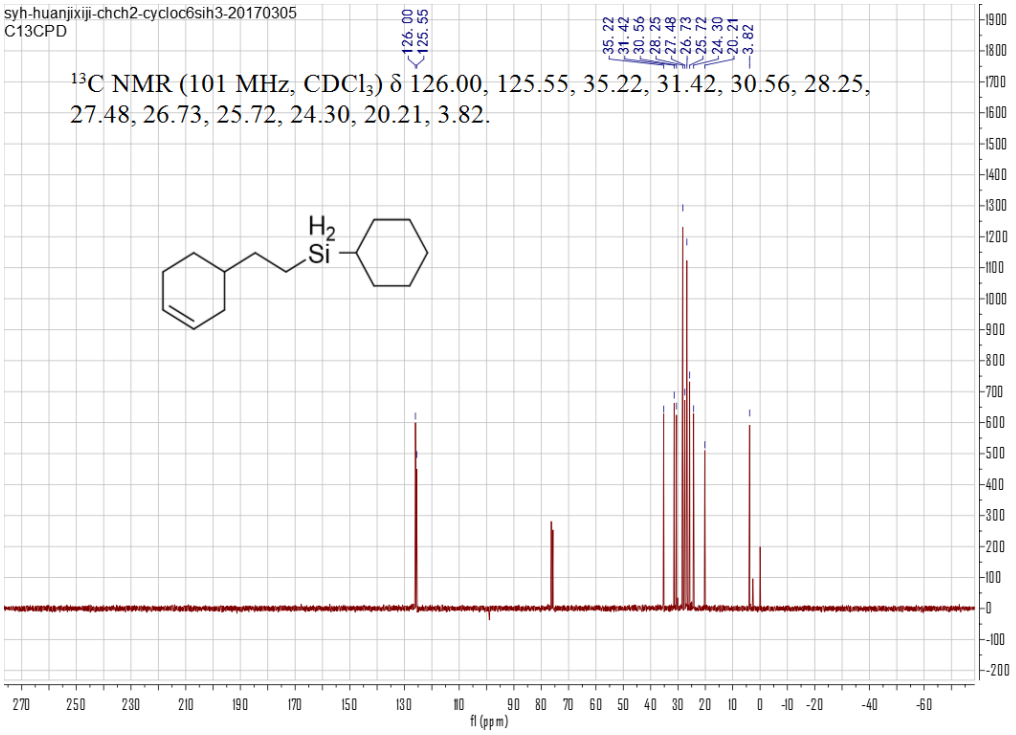

syh-huanjiji-chch2-cycloc6sih3-20170305
PROTON
H2
Si
E (s)
3.56
D (s)
1.75
A (s)
0.69
B (m)
0.90
C (dd)
1.26
1.93
10.09
11.03
3.08
2.00
f1 (ppm)


syh-huanjiji-chch2-cycloc6sih3-20170305
C13CPD
H2
Si
39.40
32.20
31.97
28.27
26.76
25.78
25.75
25.42
20.24
3.79
f1 (ppm)

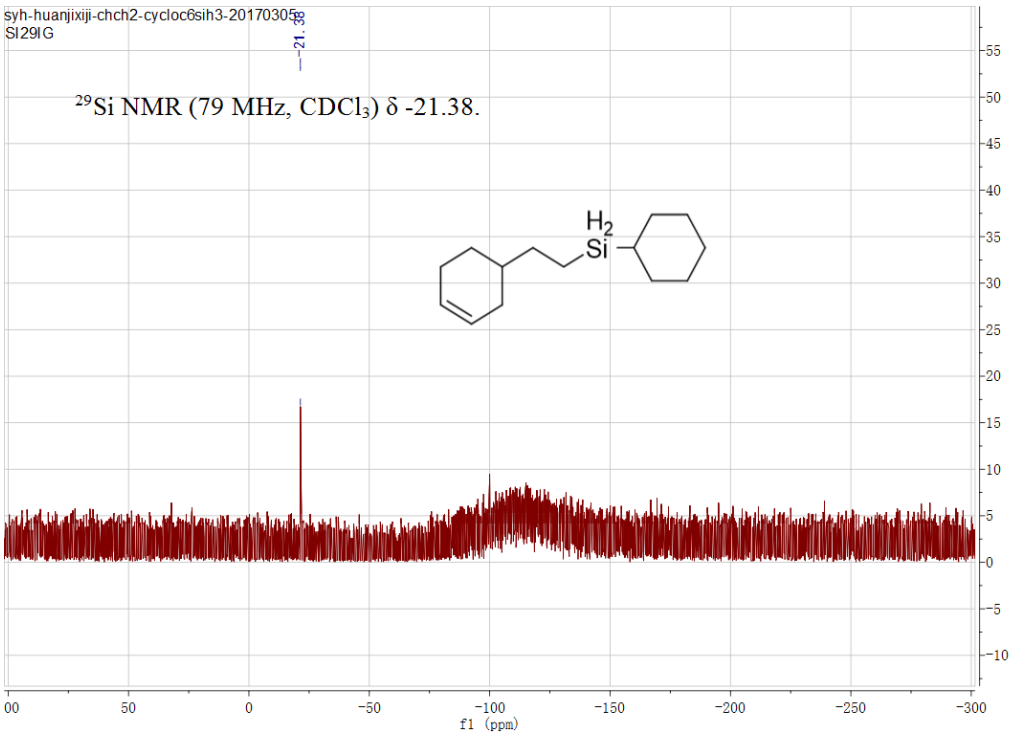

syh-huanjiji-chch2-cycloc6sih3-20170305
SI29IG
-21.29
^{29}Si NMR (79 MHz, $CDCl_3$) δ -21.29.
H2
Si
f1 (ppm)

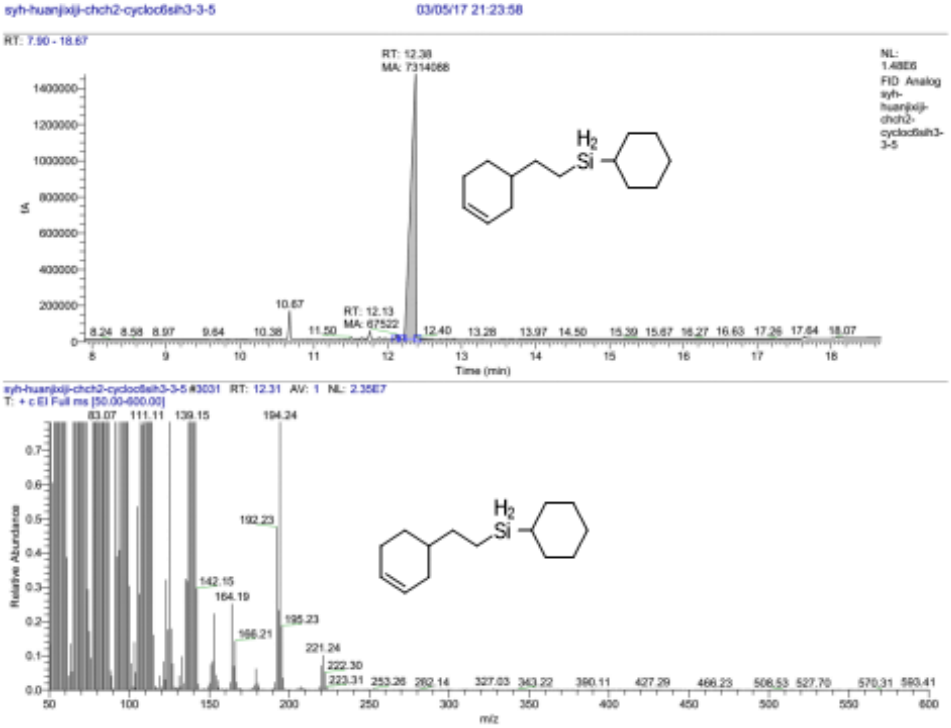

syh-huanjiji-chch2-cycloc6sih3-3-5
03/05/17 20:06:35
RT: 6.96 - 17.38
RT: 12.20
MA: 5061472
RT: 11.95
MA: 45425
NL:
1.24E6
FID Analog
syh-huanjiji-chch2-cycloc6sih3-3-5
H2
Si
fA
Time (min)
syh-huanjiji-chch2-cycloc6sih3-3-5 #2994 RT: 12.18 AV: 1 NL: 1.85E7
T: + c EI Full ms [50.00-600.00]
Relative Abundance
82.12
99.12
141.17
140.19
114.15
142.17
143.17
166.19
194.23
224.26
222.25
225.26
253.06
303.14
327.13
345.33
371.31
406.14
448.92
468.94
502.60
517.15
544.59
597.64
H2
Si

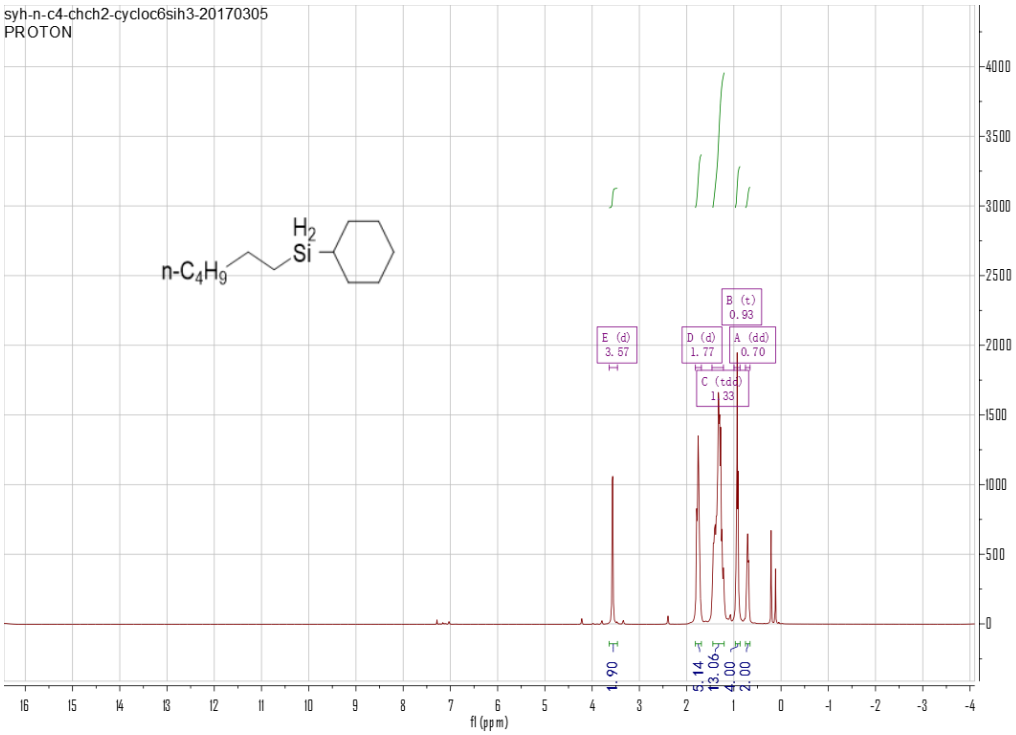


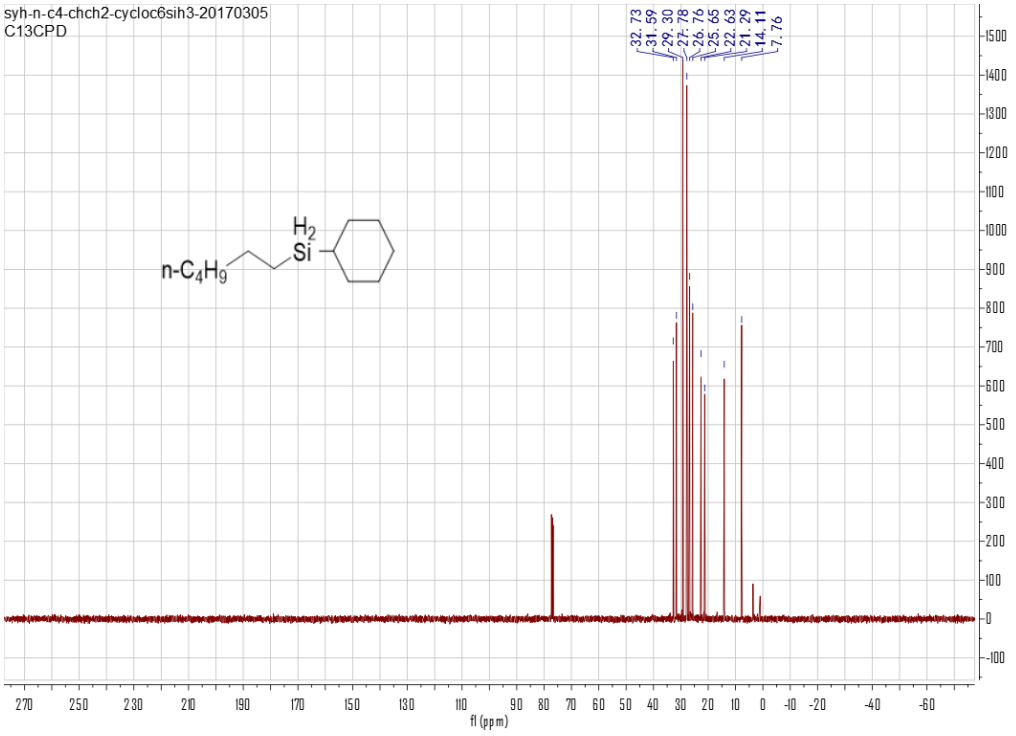


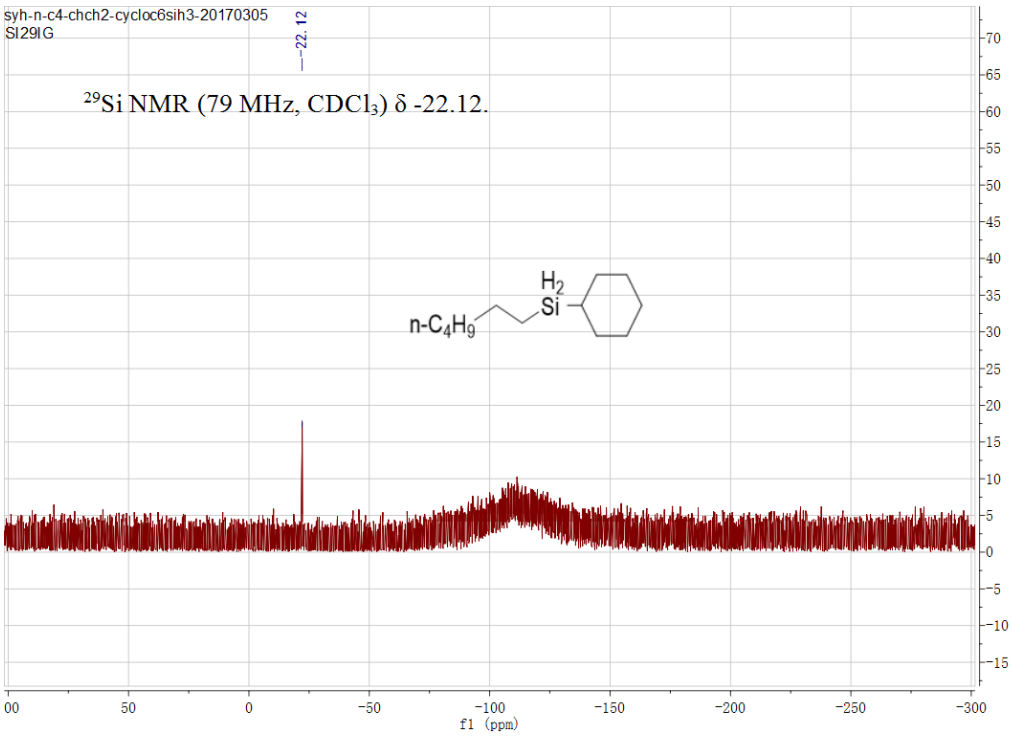
^{13}C NMR (101 MHz, $CDCl_3$) δ 126.00, 125.55, 35.22, 31.42, 30.56, 28.25, 27.48, 26.73, 25.72, 24.30, 20.21, 3.82.

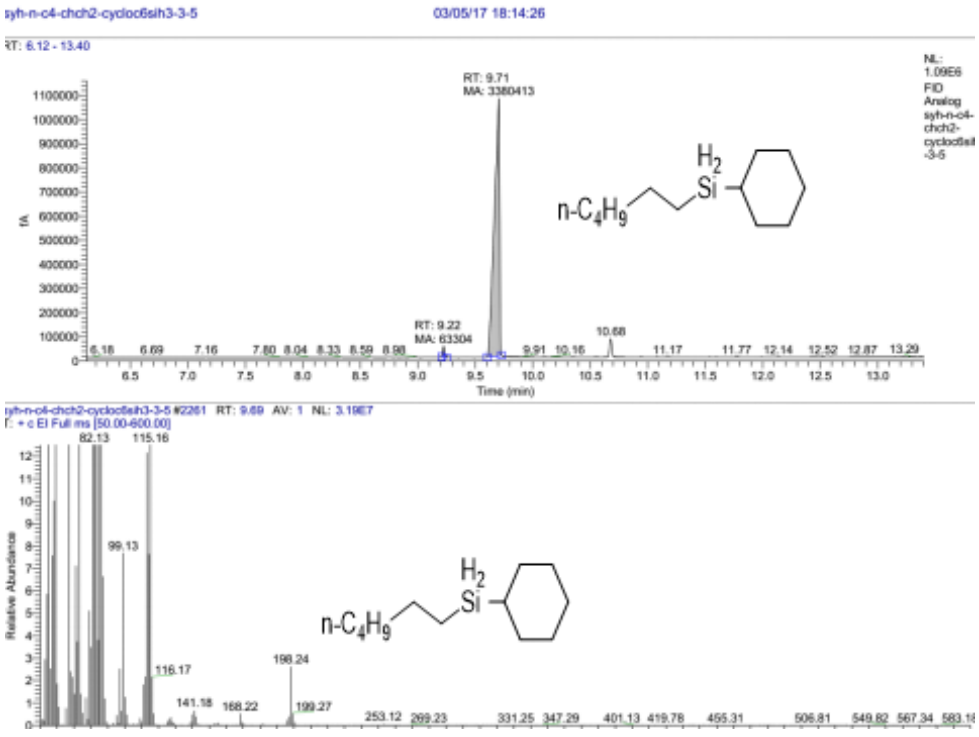

syh-huanjixiji-chch2-cycloc6sih3-20170305
SI29IG
-21.38
^{29}Si NMR (79 MHz, $CDCl_3$) δ -21.38.
H2
Si
f1 (ppm)

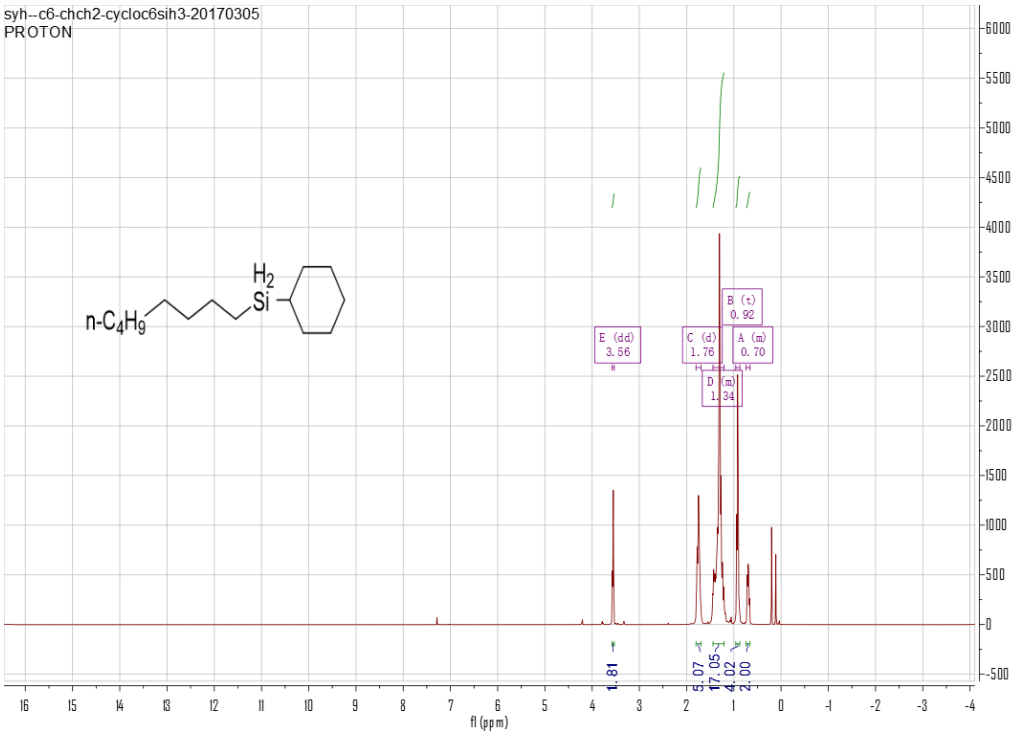

syh-huanjixiji-chch2-cycloc6sih3-3-5
03/05/17 21:23:58
RT: 7.90 - 18.67
RT: 12.38
MA: 7314088
RT: 12.13
MA: 67522
10.67
NL:
1.48E6
FID Analog
syh-huanjixiji-chch2-cycloc6sih3-3-5
H2
Si
IA
Time (min)
syh-huanjixiji-chch2-cycloc6sih3-3-5 #3031 RT: 12.31 AV: 1 NL: 2.35E7
T: + c EI Full ms [50.00-600.00]
83.07
111.11
139.15
194.24
192.23
142.15
164.19
166.21
195.23
221.24
222.30
223.31
Relative Abundance
m/z

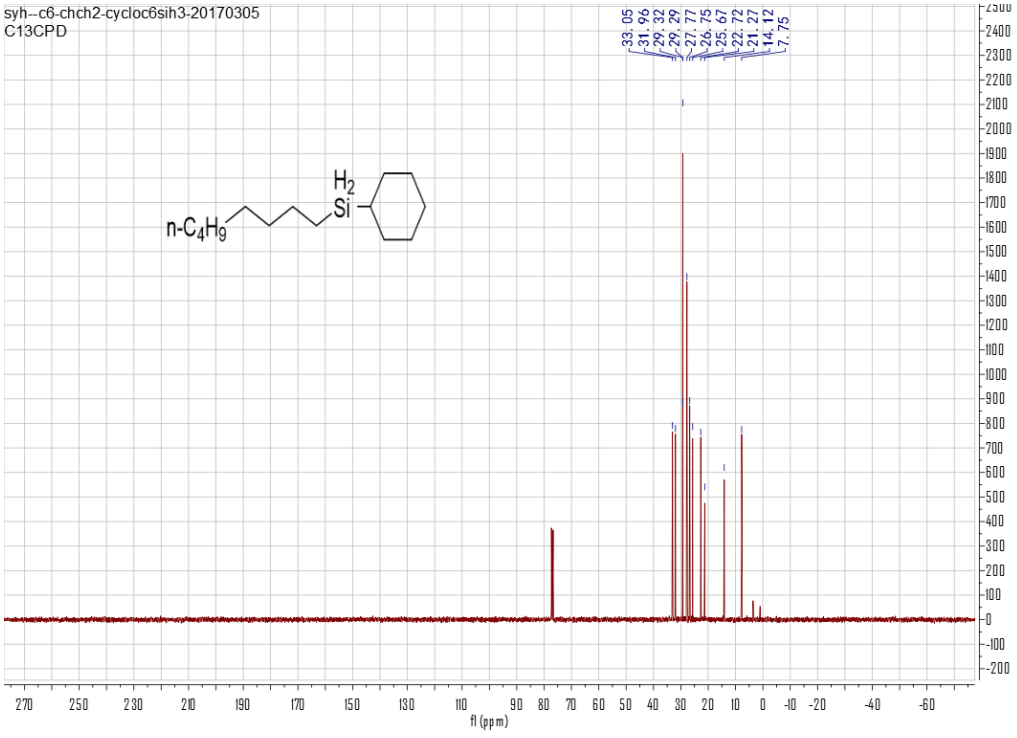

syh-n-c4-chch2-cycloc6sih3-20170305
PROTON
n-C4H9
H2
Si
E (d)
3.57
D (d)
1.77
A (dd)
0.70
B (t)
0.93
C (tdd)
1.33
1.90
5.14
13.06
4.00
2.00
f1 (ppm)

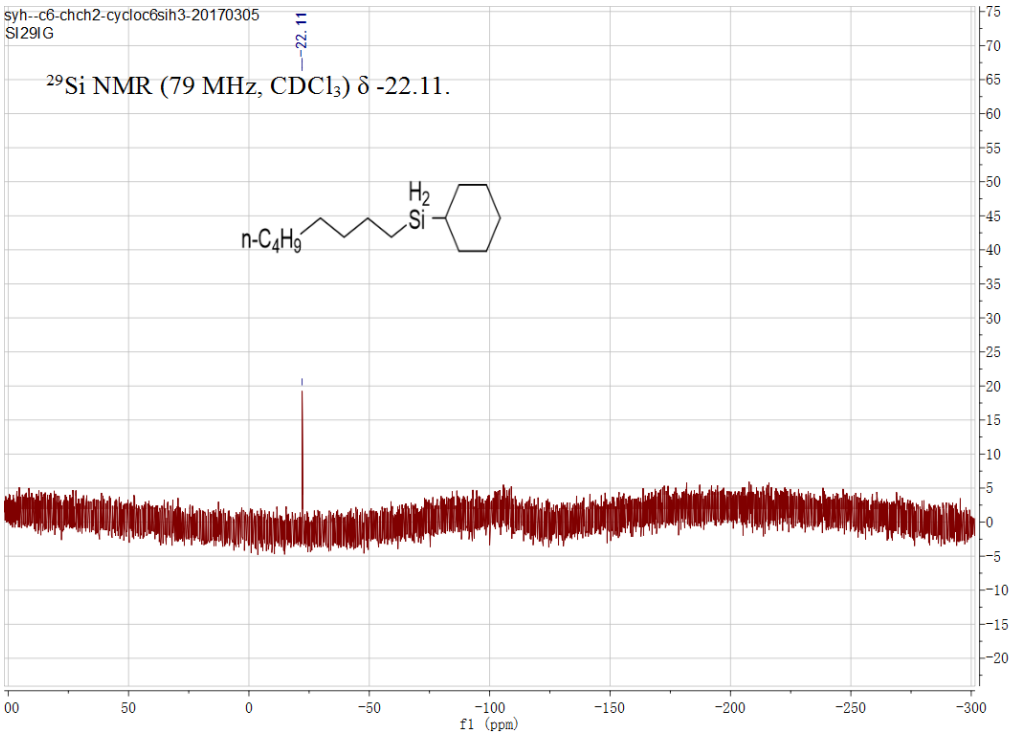

syh-n-c4-chch2-cycloc6sih3-20170305
C13CPD
32.73
31.59
29.30
27.78
26.76
25.65
22.63
21.29
14.11
7.76
n-C4H9
H2
Si
f1 (ppm)

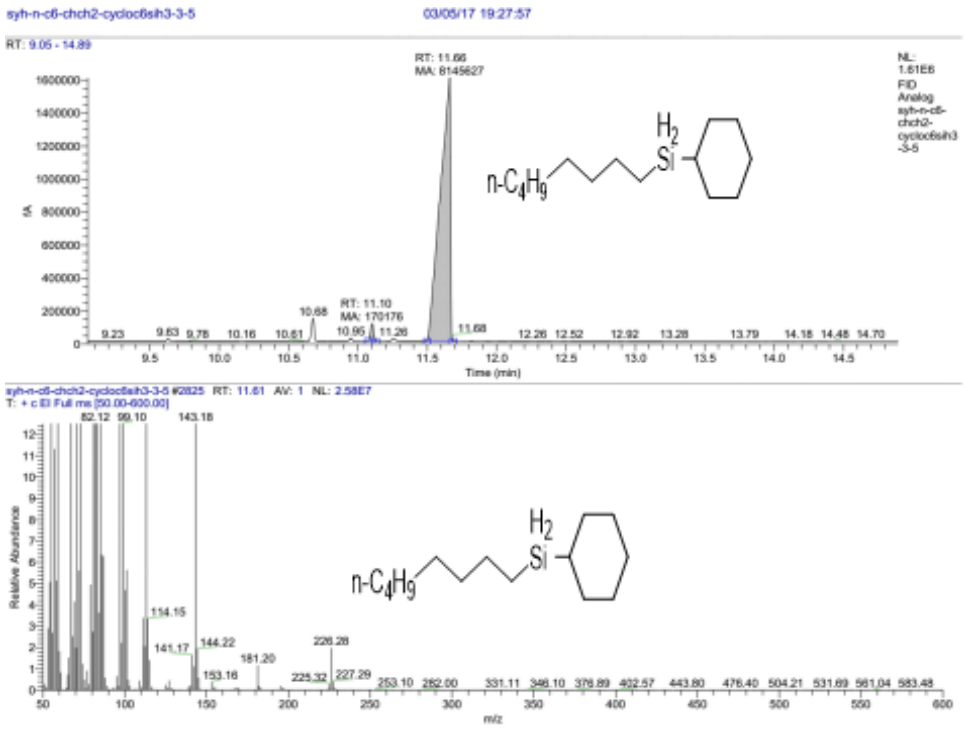

syh-n-c4-chch2-cycloc6sih3-20170305
SI29IG
-22.12
^{29}Si NMR (79 MHz, $CDCl_3$) δ -22.12.
H2
Si
n-C4H9
f1 (ppm)

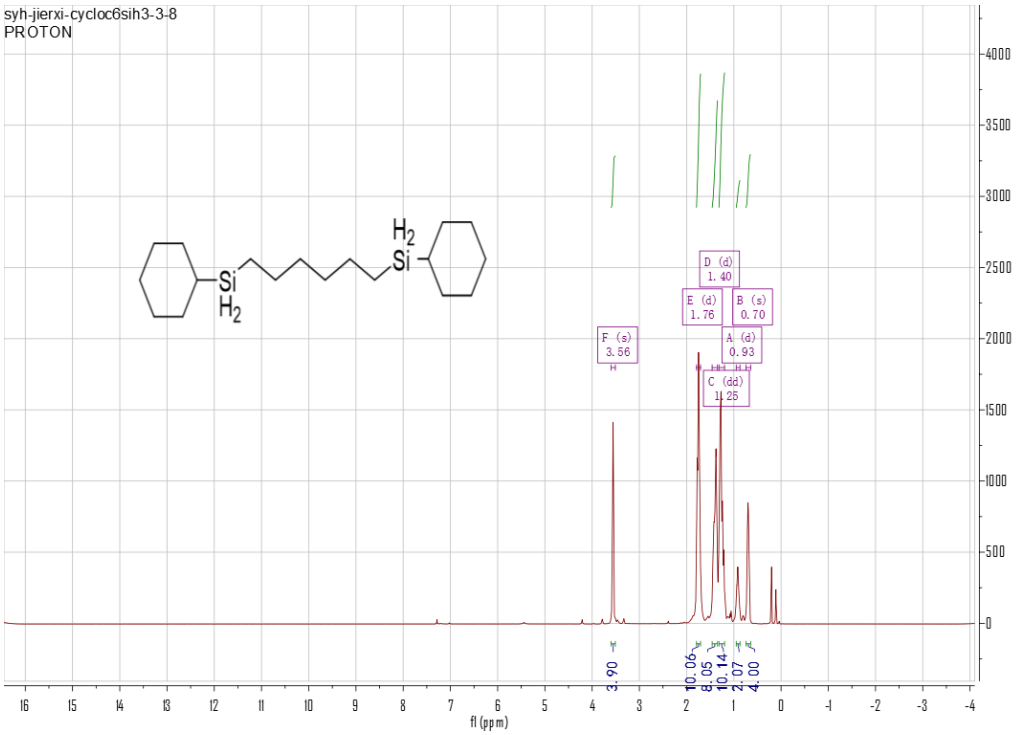

syh-n-c4-chch2-cycloc6sih3-3-5
03/05/17 18:14:26
RT: 6.12 - 13.40
RT: 9.71
MA: 3380413
RT: 9.22
MA: 63304
10.68
NL: 1.09E6 FID Analog syh-n-c4-chch2-cycloc6sih3-3-5
H2
Si
n-C4H9
Time (min)
syh-n-c4-chch2-cycloc6sih3-3-5 #2261 RT: 9.69 AV: 1 NL: 3.19E7
T: + c EI Full ms [50.00-600.00]
82.13
115.16
99.13
116.17
198.24
141.18
168.22
199.27
253.12
269.23
331.25
347.29
401.13
419.78
455.31
506.81
549.82
567.34
583.19
Relative Abundance

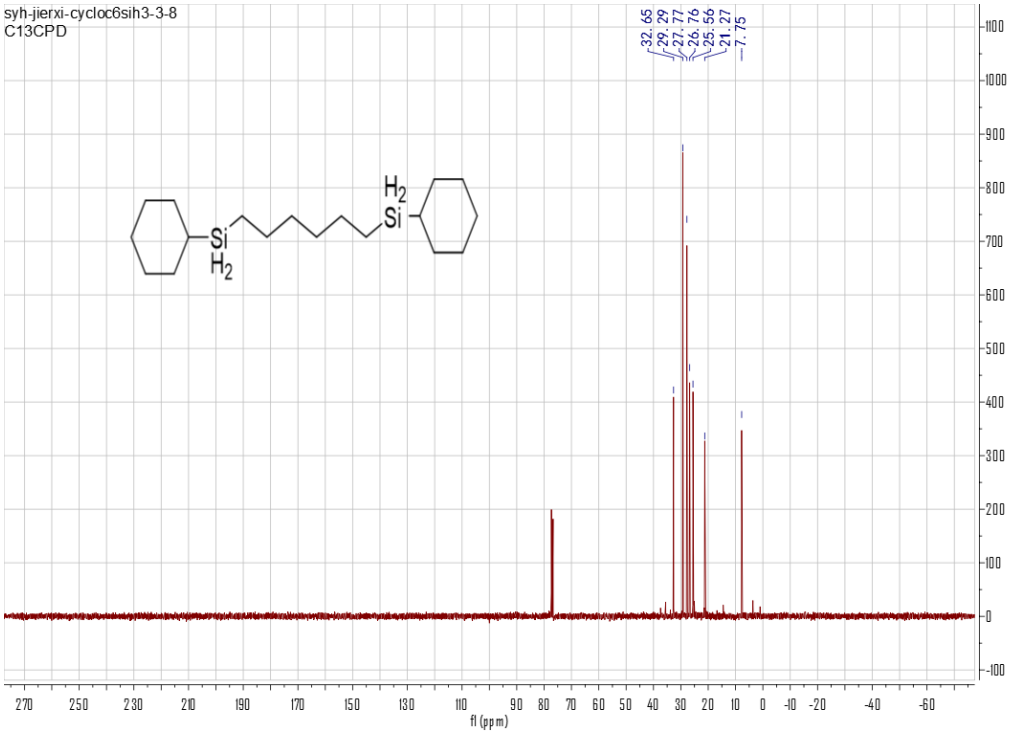

syh--c6-chch2-cycloc6sih3-20170305
PROTON
n-C4H9
H2
Si
E (dd)
3.56
C (d)
1.76
B (t)
0.92
A (m)
0.70
D (m)
1.34
1.81
5.07
17.05
4.02
2.00
f1 (ppm)

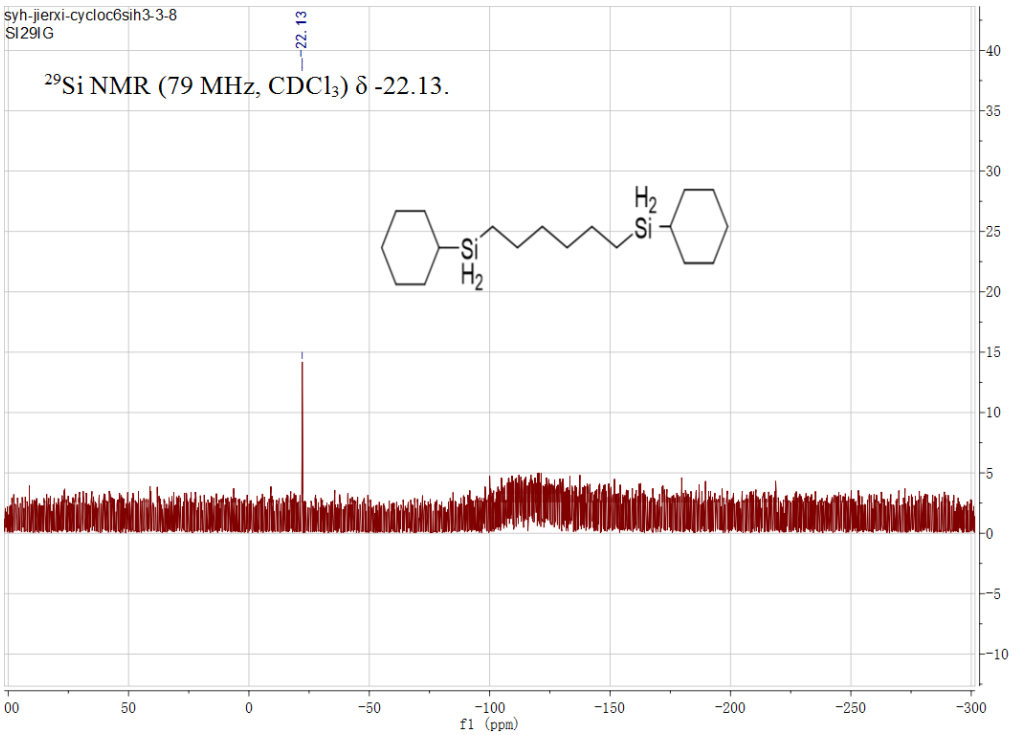

syh--c6-chch2-cycloc6sih3-20170305
C13CPD
n-C4H9
H2
Si
33.05
31.96
29.32
29.29
27.77
26.75
25.67
22.72
21.27
14.12
7.75
f1 (ppm)


syh--c6-chch2-cycloc6sih3-20170305
SI29IG
-22.11
^{29}Si NMR (79 MHz, $CDCl_3$) δ -22.11.
H_2
Si
n-C_4H_9
f1 (ppm)


syh-n-c6-chch2-cycloc6sih3-3-5
03/05/17 19:27:57
RT: 9.05 - 14.89
RT: 11.66
MA: 8145627
RT: 11.10
MA: 170176
NL:
1.61E6
FID
Analog
syh-n-c6-chch2-cycloc6sih3-3-5
H_2
Si
n-C_4H_9
Time (min)
Relative Abundance
m/z


syh-jierxi-cycloc6sih3-3-8
PROTON
D (d) 1.40
E (d) 1.76
B (s) 0.70
F (s) 3.56
A (d) 0.93
C (dd) 1.25
3.90
10.06
8.05
10.14
2.07
4.00
f1 (ppm)


syh-jierxi-cycloc6sih3-3-8
C13CPD
32.65
29.29
27.77
26.76
25.56
21.27
7.75
f1 (ppm)



^{29}Si NMR (79 MHz, $CDCl_3$) δ -22.13.