

Supplementary Information for:

Phenanthroline-Imine Ligands for Iron-Catalyzed Alkene Hydrosilylation

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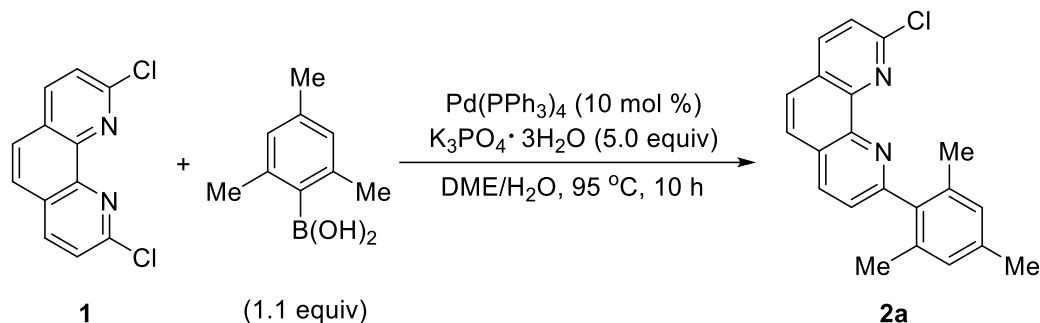
1. Materials and methods

All manipulations were carried out using standard Schlenk, high-vacuum, and glovebox techniques. THF, Et₂O, 1,4-dioxane, and toluene were distilled from sodium benzophenone ketyl prior to use. Iron(II) chloride (99.99%) was purchased from Sigma-Aldrich and used as received. The conjugated dienes **1a**, **1c**, **1d**, **1e**, **1g**, **1h**, **1k**, **1n**, **1p**, **1w**, **1y**, **1z** and **1aa** used for hydrosilylation were synthesized according to reported procedures.¹ The conjugated dienes **1b**, **1f**, **1i**, **1j** and **1q** were synthesized according to reported procedures.^{1,2} The conjugated dienes **1l**,³ **1m**,⁴ **1o**,^{1,5} **1t**,⁶ **1u**,⁷ and **1x**⁸ were synthesized according to corresponding literatures. The silanes **2a**, **2j**, **2k** conjugated diene **1r**, **1s**, and alkenes **7a-7h**, **7k-7o** were purchased from Sigma-Aldrich, Alfa Aesar, Acros, TCI and other reagent companies. Alkenes **7i** and **7j** were synthesized according to reported procedures.⁹ The silanes **2b-2i** and **2e-d** were synthesized according to reported procedures.¹⁰ Conjugated dienes, alkenes, and silanes were dried over LiAlH₄ or CaH₂ and distilled prior to use. 2,9-dichloro-1,10-phenanthroline was prepared according to reported procedures.¹¹

Melting points were measured on a RY-I apparatus and uncorrected. Infrared spectra were recorded on a Bruker Fourier transform spectrometric (FT-IR) and reported in wave number. High resolution mass spectrometric (HRMS) were determined on an IonSpec FT-ICR mass spectrometer or a Waters GCT Premier mass spectrometer. The molar masses and their distribution for the polymer samples were determined by GPC on a Waters system equipped with a set of three Ultrastyrigel columns HT2 30 cm x 7.8 mm; 10 μm particles; exclusion limits: 100-10000 g/mol, respectively), THF was used as the mobile phase (1 mL/min), and polystyrene samples as the standards in the calibration of the molar masses. ¹H NMR, ¹³C NMR and ¹⁹F NMR spectra were recorded with a Bruker AV 400 spectrometer at 400 MHz (¹H NMR), 101 MHz (¹³C NMR) and 376 MHz (¹⁹F NMR), respectively in CDCl₃. ²H NMR spectra was recorded with a Bruker AV 600 spectrometer at 92 MHz in DCM. Chemical shifts were reported in ppm down field from internal Me₄Si (¹H NMR) and CDCl₃ (¹³C NMR).

2. Synthesis of new ligands and catalysts

2.1. Synthesis of 2-chloro-9-aryl-1,10-phenanthrolines



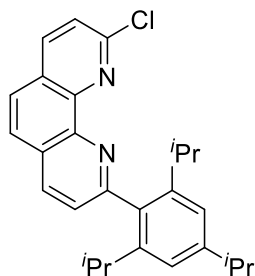
To a 100 mL three-necked round-bottom flask fitted with a reflux condenser tube, 2,9-dichloro-1,10-phenanthroline (1.24 g, 5 mmol), 2,4,6-trimethylphenylboronic acid (0.9 g, 5.5 mmol, 1.1 equiv), Pd(PPh₃)₄ (577 mg, 0.5 mmol, 10 mol%), K₃PO₄·3H₂O (6.65 g, 25 mmol, 5 equiv), DME (50 mL), and water (5 mL) were introduced. The resulted reaction mixture was degassed three times through freeze degassing, replaced with an argon atmosphere, and placed in an oil bath, and heated to 95 °C until the reaction was finished. After cooling to room temperature, the reaction mixture was neutralized with saturated NH₄Cl (aq., 50 mL) and extracted with CH₂Cl₂ (100 mL × 3). The combined organic layer was dried over anhydrous MgSO₄ and concentrated under reduced pressure. The residue was purified by silica-gel column chromatography with petroleum ether/ethyl acetate (PE/EA) = 10:1 (v/v) as eluent to give 2-chloro-9-(2,4,6-trimethylphenyl)-1,10-phenanthroline (**2a**) as a white solid (1.1 g, 66% yield), melting point: 231.2 – 233.0 °C.

¹H NMR (400 MHz, CDCl₃) δ 8.28 (d, *J* = 8.2 Hz, 1H), 8.20 (d, *J* = 8.4 Hz, 1H), 7.89 – 7.84 (m, 1H), 7.82 – 7.77 (m, 1H), 7.63 – 7.55 (m, 2H), 6.97 (s, 2H), 2.35 (s, 3H), 2.14 (s, 6H).

¹³C NMR (101 MHz, CDCl₃) δ 160.7 (1C), 151.2 (1C), 146.3 (1C), 145.0 (1C), 138.6 (2C), 137.9 (1C), 137.5 (1C), 136.1 (1C), 135.8 (1C), 128.4 (2C), 127.5 (1C), 127.3 (1C), 126.8 (1C), 125.4 (2C), 124.1 (1C), 21.1 (1C), 20.6 (2C).

HRMS (ESI) calcd for [M+H, C₂₁H₁₈ClN₂]⁺: 333.1153, found: 333.1156.

2-chloro-9-(2,4,6-triisopropylphenyl)-1,10-phenanthroline (2b)



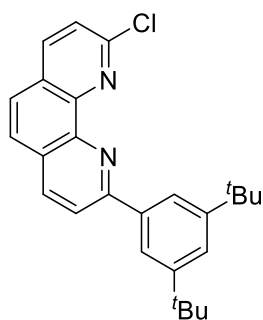
White solid, 83% yield, melting point: 248.0 – 250.0 °C.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 8.26 (d, $J = 8.1$ Hz, 1H), 8.17 (d, $J = 8.4$ Hz, 1H), 7.86 (d, $J = 8.7$ Hz, 1H), 7.79 (d, $J = 8.7$ Hz, 1H), 7.65 (d, $J = 8.2$ Hz, 1H), 7.58 (d, $J = 8.4$ Hz, 1H), 7.12 (s, 2H), 2.96 (hept, $J = 6.9$ Hz, 1H), 2.59 (hept, $J = 6.9$ Hz, 2H), 1.32 (d, $J = 6.9$ Hz, 6H), 1.19 (d, $J = 6.8$ Hz, 6H), 1.12 (d, $J = 6.9$ Hz, 6H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 161.1 (1C), 151.2 (1C), 148.9 (1C), 146.5 (1C), 146.4 (2C), 144.9 (1C), 138.4 (1C), 137.0 (1C), 135.2 (1C), 127.6 (1C), 127.4 (1C), 126.8 (1C), 125.6 (1C), 125.4 (1C), 124.2 (1C), 120.8 (2C), 34.5 (1C), 30.5 (2C), 24.2 (6C).

HRMS (ESI) calcd for $[\text{M}+\text{H}, \text{C}_{27}\text{H}_{30}\text{ClN}_2]^+$: 417.2092, found 417.2093.

2-chloro-9-(3,5-di-*tert*-butylphenyl)-1,10-phenanthroline (2c)



White solid, 95% yield, melting point: 285.5 – 287.9 °C.

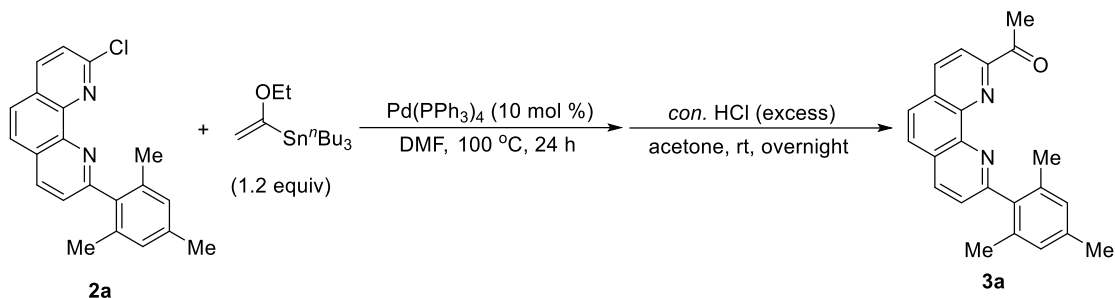
$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 8.33 (d, $J = 8.4$ Hz, 1H), 8.20 (d, $J = 8.4$ Hz, 1H), 8.15 – 8.06 (m, 3H), 7.86 (d, $J = 8.7$ Hz, 1H), 7.77 (d, $J = 8.7$ Hz, 1H), 7.63 (d, $J = 8.3$ Hz, 1H), 7.58 (t, $J = 1.8$ Hz, 1H), 1.45 (s, 18H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 159.3 (1C), 151.4 (1C), 151.2 (2C), 146.3 (1C), 144.9 (1C), 139.2 (1C), 138.6 (1C), 136.6 (1C), 127.7 (1C), 127.6 (1C), 126.7 (1C), 125.1 (1C),

124.1 (1C), 123.8 (1C), 122.4 (2C), 121.6 (1C), 35.1 (2C), 31.6 (6C).

HRMS (ESI) calcd for $[M+H, C_{26}H_{28}ClN_2]^+$: 403.1936, found 403.1938.

2.2. Synthesis of 2-acetyl-9-aryl-1,10-phenanthrolines

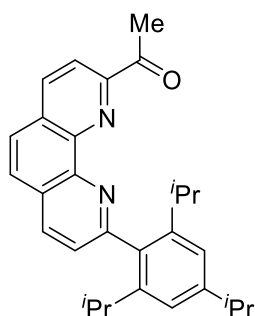


Compound **2a** (0.8 g, 2.4 mmol) and Pd(PPh₃)₄ (277 mg, 0.24 mmol, 10 mol%) were introduced into a 100 mL three-necked round-bottom flask fitted with a reflux condenser tube. The reaction system was replaced with an argon atmosphere, followed by the addition of 1-ethoxyvinyltri-*n*-butylstannane (1.04 g, 2.88 mmol, 1.2 equiv) and anhydrous DMF (30 ml) using a syringe, respectively, and then stirred at 100 °C for 24 h until the reaction was finished. After cooling to room temperature, the reaction mixture was quenched with saturated KF (aq., 50 mL) and extracted with Et₂O (100 mL × 3). The combined organic layer was dried over anhydrous Na₂SO₄ and concentrated under reduced pressure. The crude product was dissolved in acetone (30 mL), and was added dropwise concentrated hydrochloric acid (6 mL) with stirring overnight. Complete consumption of the reactants was determined by TLC. The reaction mixture was neutralized with aqueous NaHCO₃ solution, the acetone was removed under reduced pressure, extracted with DCM, dried with anhydrous Na₂SO₄, and concentrated under reduced pressure. The residue was purified by silica-gel column chromatography with PE/EA = 10:1 (v/v) as eluent to give the target product 1-(9-mesityl-1,10-phenanthrolin-2-yl)ethan-1-one (**3a**) as a white solid (628 mg, 76% yield), melting point: 237.5 – 238.2 °C. ¹H NMR (400 MHz, CDCl₃) δ 8.41 – 8.26 (m, 3H), 7.93 (d, *J* = 8.8 Hz, 1H), 7.84 (d, *J* = 8.8 Hz, 1H), 7.66 (d, *J* = 8.2 Hz, 1H), 7.02 (s, 2H), 2.97 (s, 3H), 2.37 (s, 3H), 2.27 (s, 6H).

^{13}C NMR (101 MHz, CDCl_3) δ 201.2 (1C), 160.3 (1C), 153.0 (1C), 145.9 (1C), 145.4 (1C), 137.7 (1C), 137.6 (1C), 136.8 (1C), 136.4 (1C), 135.6 (1C), 130.6 (1C), 128.8 (3C), 128.6 (1C), 127.0 (1C), 125.8 (1C), 125.6 (1C), 120.0 (1C), 25.9 (1C), 21.1 (1C), 20.9 (2C).

HRMS (ESI) calcd for $[\text{M}+\text{H}, \text{C}_{23}\text{H}_{21}\text{N}_2\text{O}]^+$: 341.1648, found 341.1652.

1-(9-(2,4,6-triisopropylphenyl)-1,10-phenanthrolin-2-yl)ethan-1-one (3b)



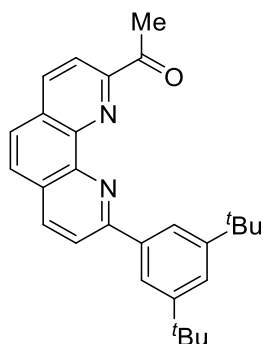
White solid, 98% yield, melting point: 185.7 – 186.1 °C.

^1H NMR (400 MHz, CDCl_3) δ 8.34 (q, $J = 8.3$ Hz, 2H), 8.28 (d, $J = 8.1$ Hz, 1H), 7.95 (d, $J = 8.7$ Hz, 1H), 7.85 (d, $J = 8.8$ Hz, 1H), 7.68 (d, $J = 8.1$ Hz, 1H), 7.18 (s, 2H), 3.07 – 2.96 (m, 1H), 2.94 (s, 3H), 2.69 (hept, $J = 6.0$ Hz, 2H), 1.36 (d, $J = 6.8$ Hz, 6H), 1.26 (d, $J = 6.7$ Hz, 6H), 1.19 (d, $J = 6.8$ Hz, 6H).

^{13}C NMR (101 MHz, CDCl_3) δ 201.5 (1C), 160.6 (1C), 153.0 (1C), 148.8 (1C), 146.7 (2C), 145.9 (1C), 145.6 (1C), 136.7 (1C), 136.6 (1C), 135.2 (1C), 130.7 (1C), 128.6 (1C), 127.1 (1C), 125.8 (1C), 125.5 (1C), 120.9 (2C), 119.9 (1C), 34.4 (1C), 30.7 (2C), 26.2 (1C), 24.9 (2C), 24.1 (4C).

HRMS (ESI) calcd for $[\text{M}+\text{H}, \text{C}_{29}\text{H}_{33}\text{N}_2\text{O}]^+$: 425.2587, found 425.2589.

1-(9-(3,5-di-*tert*-butylphenyl)-1,10-phenanthrolin-2-yl)ethan-1-one (**3c**)



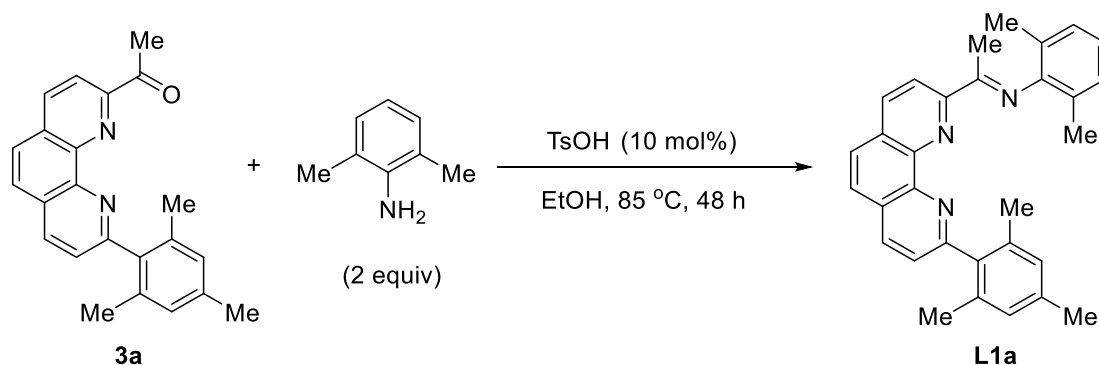
White solid, 67% yield, melting point: 160.2 – 162.1 °C.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 8.40 – 8.31 (m, 5H), 8.22 (d, $J = 8.4$ Hz, 1H), 7.92 (d, $J = 8.8$ Hz, 1H), 7.81 (d, $J = 8.7$ Hz, 1H), 7.61 – 7.58 (m, 1H), 3.14 (s, 3H), 1.47 (s, 18H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 200.9 (1C), 158.2 (1C), 152.7 (1C), 151.3 (2C), 145.9 (1C), 145.4 (1C), 138.4 (1C), 136.9 (1C), 136.8 (1C), 130.9 (1C), 128.6 (1C), 127.6 (1C), 125.5 (1C), 124.1 (1C), 122.0 (2C), 120.3 (1C), 120.0 (1C), 35.1 (2C), 31.5 (6C), 25.4 (1C).

HRMS (ESI) calcd for $[\text{M}+\text{H}, \text{C}_{28}\text{H}_{31}\text{N}_2\text{O}]^+$: 411.2431, found 411.2433.

2.3 Synthesis of 2-imino-9-aryl-1,10-phenanthrolines ligands



To a 100 mL three-necked round-bottom flask fitted with a reflux condenser tube, was added the compound **3a** (342 mg, 1.0 mmol) and the catalyst TsOH (17.2 mg, 0.1 mmol, 10 mol%). The resulted mixture was replaced with an argon atmosphere, added 2,6-dimethylaniline (242 mg, 2.0 mmol, 2.0 equiv) and anhydrous ethanol (10 mL), and stirred in an oil bath at 85 °C for 48 h until the reaction was finished. The reaction mixture was

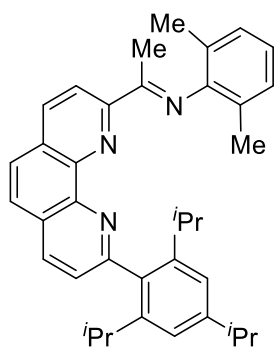
concentrated under reduced pressure, and the residue was purified by silica-gel column chromatography with PE/EA/Et₃N= 50:10:1 (v/v/v) as eluent to give the target product (*E*)-*N*-(2,6-dimethylphenyl)-1-(9-mesityl-1,10-phenanthrolin-2-yl)ethan-1-imine (**L1a**) as a yellow solid (330 mg, 74% yield), melting point: 236.0 – 237.0 °C.

¹H NMR (400 MHz, CDCl₃) δ 8.76 (d, *J* = 8.4 Hz, 1H), 8.31 (d, *J* = 8.4 Hz, 1H), 8.26 (d, *J* = 8.2 Hz, 1H), 7.88-7.80 (m, 2H), 7.61 (d, *J* = 8.2 Hz, 1H), 7.07 (d, *J* = 7.5 Hz, 2H), 6.99 (s, 2H), 6.97-6.90 (m, 1H), 2.44 (s, 3H), 2.34 (s, 3H), 2.27 (s, 6H), 2.04 (s, 6H).

¹³C NMR (101 MHz, CDCl₃) δ 168.3 (1C), 159.9 (1C), 155.9 (1C), 149.0 (1C), 146.0 (1C), 145.4 (1C), 137.7 (1C), 137.6 (1C), 136.5 (2C), 136.3 (1C), 135.7 (1C), 129.6 (1C), 128.8 (2C), 127.9 (2C), 127.4 (1C), 127.0 (1C), 126.1 (1C), 125.3 (3C), 123.0 (1C), 120.6 (1C), 21.2 (1C), 21.1 (2C), 18.1 (2C), 16.8 (1C).

HRMS (ESI) calculated for [M+H, C₃₁H₃₀N₃]⁺: 444.2434, found: 444.2438.

(*E*)-*N*-(2,6-dimethylphenyl)-1-(9-(2,4,6-triisopropylphenyl)-1,10-phenanthrolin-2-yl)ethan-1-imine (L1b**)**



Yellow solid, 64% yield, melting point: 211.2 – 213.4 °C.

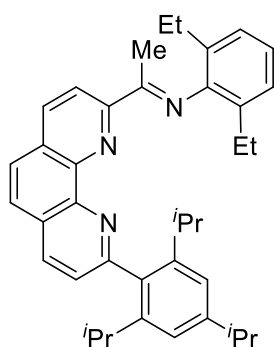
¹H NMR (400 MHz, CDCl₃) δ 8.73 (d, *J* = 8.4 Hz, 1H), 8.33 (d, *J* = 8.4 Hz, 1H), 8.27 (d, *J* = 8.2 Hz, 1H), 7.92 – 7.84 (m, 2H), 7.65 (d, *J* = 8.1 Hz, 1H), 7.15 (s, 2H), 7.09 – 7.04 (m, 2H), 6.97 – 6.91 (m, 1H), 2.99 (hept, *J* = 6.9 Hz, 1H), 2.73 (p, *J* = 6.8 Hz, 2H), 2.39 (s, 3H), 2.05 (s, 6H), 1.34 (d, *J* = 6.9 Hz, 6H), 1.24 (d, *J* = 6.7 Hz, 6H), 1.17 (d, *J* = 6.9 Hz, 6H).

¹³C NMR (101 MHz, CDCl₃) δ 168.6 (1C), 160.2 (1C), 155.9 (1C), 149.0 (1C), 148.7 (1C),

146.8 (2C), 145.9 (1C), 145.6 (1C), 136.7 (1C), 136.1 (1C), 135.1 (1C), 129.6 (1C), 127.8 (2C), 127.3 (1C), 127.0 (2C), 126.0 (1C), 125.4 (1C), 125.2 (1C), 122.9 (1C), 120.9 (2C), 120.4 (1C), 34.3 (1C), 30.6 (2C), 24.9 (2C), 24.2 (2C), 24.1 (2C), 18.0 (2C), 17.0 (1C).

HRMS (ESI) calcd for $[M+H, C_{37}H_{42}N_3]^+$: 528.3373, found: 528.3375.

(E)-N-(2,6-diethylphenyl)-1-(9-(2,4,6-triisopropylphenyl)-1,10-phenanthrolin-2-yl)ethan-1-imine (L1c)



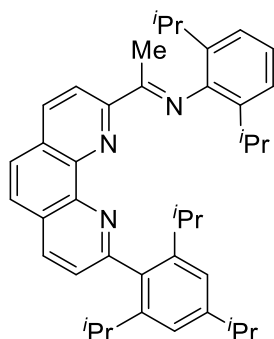
Yellow solid, 67% yield, melting point: 204.9 – 206.2 °C.

1H NMR (400 MHz, $CDCl_3$) δ 8.72 (d, $J = 8.4$ Hz, 1H), 8.32 (d, $J = 8.4$ Hz, 1H), 8.26 (d, $J = 8.2$ Hz, 1H), 7.92 – 7.82 (m, 2H), 7.64 (d, $J = 8.2$ Hz, 1H), 7.15 (s, 2H), 7.13 – 7.08 (m, 2H), 7.06 – 7.00 (m, 1H), 2.99 (hept, $J = 6.9$ Hz, 1H), 2.73 (hept, $J = 6.8$ Hz, 2H), 2.50 – 2.29 (m, 7H), 1.34 (d, $J = 6.9$ Hz, 6H), 1.24 (d, $J = 6.8$ Hz, 6H), 1.19 – 1.11 (m, 12H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 168.3 (1C), 160.2 (1C), 156.0 (1C), 148.7 (1C), 148.0 (1C), 146.8 (2C), 146.0 (1C), 145.6 (1C), 136.8 (1C), 136.1 (1C), 135.1 (1C), 131.2 (2C), 129.6 (1C), 127.3 (1C), 127.0 (1C), 126.0 (1C), 125.9 (2C), 125.2 (1C), 123.2 (1C), 120.9 (2C), 120.3 (1C), 34.4 (1C), 30.6 (2C), 24.9 (2C), 24.6 (2C), 24.1 (4C), 17.3 (1C), 13.7 (2C).

HRMS (ESI) calcd for $[M+H, C_{39}H_{46}N_3]^+$: 556.3686, found: 556.3689.

(E)-N-(2,6-diisopropylphenyl)-1-(9-(2,4,6-triisopropylphenyl)-1,10-phenanthrolin-2-yl)ethan-1-imine (L1d)



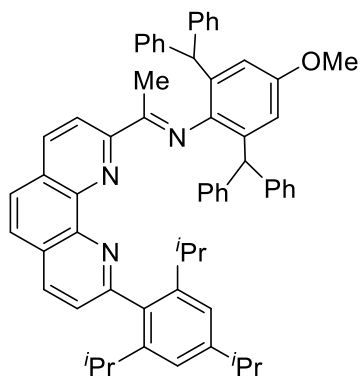
Yellow solid, 90% yield, melting point: 249.0 – 251.2 °C.

¹H NMR (400 MHz, CDCl₃) δ 8.72 (d, *J* = 8.4 Hz, 1H), 8.33 (d, *J* = 8.4 Hz, 1H), 8.26 (d, *J* = 8.1 Hz, 1H), 7.93 – 7.83 (m, 2H), 7.64 (d, *J* = 8.2 Hz, 1H), 7.19 – 7.14 (m, 4H), 7.13 – 7.06 (m, 1H), 2.99 (hept, *J* = 6.9 Hz, 1H), 2.77 (dp, *J* = 24.9, 6.8 Hz, 4H), 2.42 (s, 3H), 1.34 (d, *J* = 6.9 Hz, 6H), 1.24 (d, *J* = 6.8 Hz, 6H), 1.19 – 1.11 (m, 18H).

¹³C NMR (101 MHz, CDCl₃) δ 168.3 (1C), 160.1 (1C), 155.9 (1C), 148.6 (1C), 146.8 (2C), 146.7 (1C), 146.0 (1C), 145.6 (1C), 136.8 (1C), 136.1 (1C), 135.7 (2C), 135.1 (1C), 129.6 (1C), 127.3 (1C), 127.0 (1C), 126.0 (1C), 125.2 (1C), 123.5 (1C), 122.9 (2C), 120.9 (2C), 120.4 (1C), 34.3 (1C), 30.6 (2C), 28.2 (2C), 24.9 (2C), 24.2 (2C), 24.1 (2C), 23.2 (2C), 22.9 (2C), 17.6 (1C).

HRMS (ESI) calcd for [M+H, C₄₁H₅₀N₃]⁺: 584.3999, found 584.4003.

(E)-N-(2,6-dibenzhydryl-4-methoxyphenyl)-1-(9-(2,4,6-triisopropylphenyl)-1,10-phenanthrolin-2-yl)ethan-1-imine (L1e)



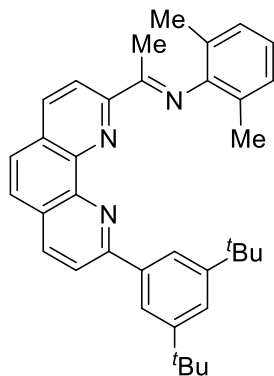
Yellow solid, 66% yield, melting point: 127.1 – 129.0 °C. The amount of arylamine is 1.2 equivalents.

¹H NMR (400 MHz, CDCl₃) δ 8.24 (q, *J* = 9.0, 8.5 Hz, 3H), 7.85 (q, *J* = 8.8 Hz, 2H), 7.62 (d, *J* = 8.1 Hz, 1H), 7.24 – 6.92 (m, 22H), 6.46 (s, 2H), 5.33 (s, 2H), 3.56 (s, 3H), 3.02 (p, *J* = 7.0 Hz, 1H), 2.62 (p, *J* = 6.9 Hz, 2H), 1.38 (d, *J* = 6.9 Hz, 6H), 1.32 (s, 3H), 1.15 (dd, *J* = 16.5, 6.8 Hz, 12H).

¹³C NMR (101 MHz, CDCl₃) δ 171.0 (1C), 159.2 (1C), 155.0 (1C), 154.0 (1C), 147.6 (1C), 145.7 (2C), 145.0 (1C), 144.5 (1C), 142.5 (2C), 141.3 (1C), 141.1 (2C), 136.0 (1C), 134.7 (1C), 134.0 (1C), 132.6 (2C), 128.7 (4C), 128.4 (4C), 128.3 (1C), 127.4 (4C), 126.9 (4C), 126.1 (1C), 125.9 (1C), 125.2 (2C), 125.0 (3C), 123.8 (1C), 119.7 (2C), 119.3 (1C), 112.7 (2C), 54.1 (1C), 51.1 (2C), 33.4 (1C), 29.7 (2C), 23.9 (2C), 23.2 (2C), 22.8 (2C), 16.3 (1C).

HRMS (ESI) calcd for [M+H, C₆₂H₆₀N₃O]⁺: 862.4731, found: 862.4735.

(*E*)-1-(9-(3,5-di-*tert*-butylphenyl)-1,10-phenanthrolin-2-yl)-N-(2,6-dimethylphenyl)ethan-1-imine (L1f)



Yellow solid, 48% yield, melting point: 202.8 – 203.3 °C.

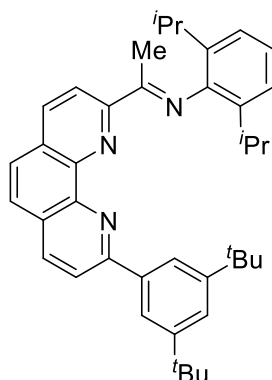
¹H NMR (400 MHz, CDCl₃) δ 8.80 (d, *J* = 8.4 Hz, 1H), 8.37 – 8.31 (m, 4H), 8.21 (d, *J* = 8.4 Hz, 1H), 7.91 – 7.81 (m, 2H), 7.59 – 7.54 (m, 1H), 7.12 (d, *J* = 7.5 Hz, 2H), 7.02 – 6.95 (m, 1H), 2.64 (s, 3H), 2.10 (s, 6H), 1.43 (s, 18H).

¹³C NMR (101 MHz, CDCl₃) δ 168.0 (1C), 157.8 (1C), 155.5 (1C), 151.1 (2C), 149.1 (1C), 145.9 (1C), 145.2 (1C), 138.5 (1C), 136.8 (1C), 136.3 (1C), 129.7 (1C), 127.9 (2C),

127.5 (1C), 127.3 (1C), 125.7 (1C), 125.3 (2C), 123.9 (1C), 123.0 (1C), 121.9 (2C),
120.3 (1C), 119.9 (1C), 35.0 (2C), 31.5 (6C), 18.0 (2C), 16.4 (1C).

HRMS (ESI) calcd for $[M+H, C_{36}H_{40}N_3]^+$: 514.3217, found: 514.3220.

(E)-1-(9-(3,5-di-*tert*-butylphenyl)-1,10-phenanthrolin-2-yl)-N-(2,6-diisopropylphenyl)ethan-1-imine (L1g)



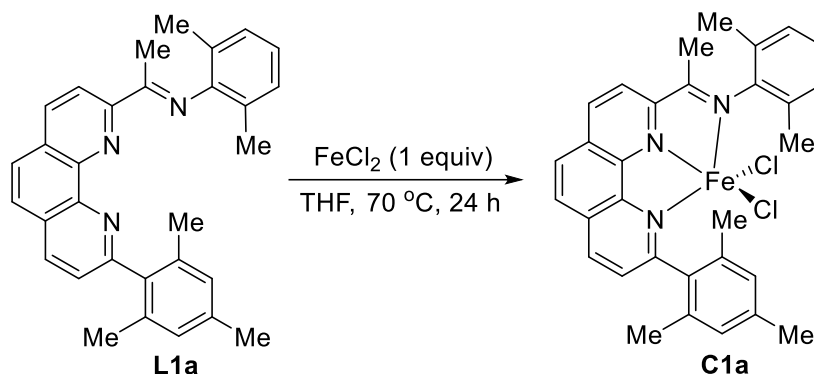
Yellow solid, 98% yield, melting point: 281.5 – 282.9 °C.

1H NMR (400 MHz, $CDCl_3$) δ 8.79 (d, $J = 8.4$ Hz, 1H), 8.40 – 8.28 (m, 4H), 8.21 (d, $J = 8.4$ Hz, 1H), 7.86 (q, $J = 8.7$ Hz, 2H), 7.55 (s, 1H), 7.24 – 7.18 (m, 2H), 7.18 – 7.09 (m, 1H), 2.85 (p, $J = 6.9$ Hz, 2H), 2.66 (s, 3H), 1.42 (s, 18H), 1.17 (d, $J = 6.8$ Hz, 12H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 167.8 (1C), 157.8 (1C), 155.6 (1C), 151.2 (2C), 146.8 (1C), 145.9 (1C), 145.2 (1C), 138.5 (1C), 136.8 (1C), 136.3 (1C), 135.8 (2C), 129.7 (1C), 127.5 (1C), 127.2 (1C), 125.7 (1C), 123.9 (1C), 123.6 (1C), 123.0 (2C), 121.9 (2C), 120.3 (1C), 119.9 (1C), 35.1 (2C), 31.5 (6C), 28.3 (2C), 23.3 (2C), 22.9 (2C), 17.1 (1C).

HRMS (ESI) calcd for $[M+H, C_{40}H_{48}N_3]^+$: 570.3843, found: 570.3846.

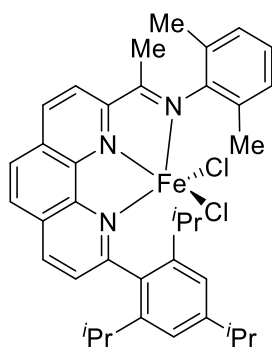
2.4 Preparation of iron complexes with 2-imino-9-aryl-1,10-phenanthroline ligands



In an argon-filled glovebox, a tube with branch seal (125 mL) was charged with **L1a** (90 mg, 0.2 mmol), FeCl_2 (25.3 mg, 1 equiv) and dry THF (20 mL). The reaction mixture was stirred at $70\text{ }^\circ\text{C}$ for 24 h until the free ligand was fully consumed according to ^1H NMR analysis. The solvent was partially removed under vacuum (about 5 mL left), then dry *n*-hexane (15 mL) was added, and solids precipitated. The product was collected by filtration, washed with 20 mL *n*-hexane, and dried under vacuum to give dark blue solid **C1a** (110 mg, 96% yield), decomposition temperature: $270\text{ }^\circ\text{C}$

^1H NMR (400 MHz, CDCl_3) δ 70.82, 47.63, 30.79, 28.78, 18.25, 9.08, 7.84, 4.21, 3.77, 2.78, 2.04, 1.86, 1.26, 0.88, -3.47, -5.90, -20.93.

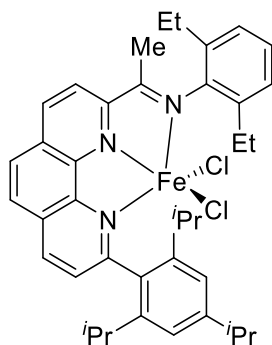
IR (neat): 2912w, 1617m, 1558m, 1500m, 1435m, 1371m, 1295m, 1255m, 1204m, 1158m, 1140m, 1112m, 1091m, 1066m, 1034m, 989w, 912w, 898w, 866s, 846m, 789m, 777m, 764m, 752w, 734m, 652w, 619m cm^{-1} .



C1b, gray-green solid, 96% yield, decomposition temperature: $260\text{ }^\circ\text{C}$.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 69.70, 46.31, 39.20, 32.23, 31.79, 19.29, 6.03, 5.82, 5.48, 4.20, 1.75, 1.41, 1.37, 1.34, 1.25, 1.19, 0.87, -3.49, -6.23, -28.34, -48.96.

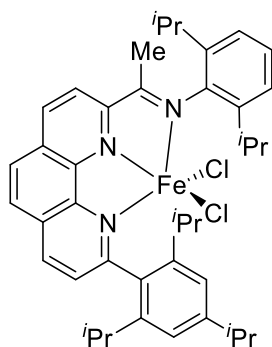
IR (KBr): 3053w, 2959s, 2926m, 2868m, 1611m, 1499m, 1465m, 1442m, 1376m, 1304m, 1266m, 1206m, 1149w, 867m, 792w, 765s, 742s, 703w cm^{-1} .



C1c, green solid, 94% yield, decomposition temperature: 236 °C.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 69.47, 46.22, 39.59, 34.02, 31.55, 19.33, 6.12, 5.88, 5.68, 4.17, 2.04, -2.61, -4.24, -6.39, -13.52, -28.93, -48.95.

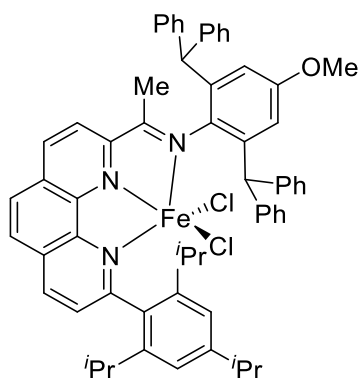
IR (KBr): 2959s, 2930m, 2868m, 2361s, 2342s, 1609m, 1575m, 1507s, 1458s, 1374s, 1299s, 1267s, 1245s, 1192s, 1059m, 865s, 785s, 735m cm^{-1} .



C1d, dark blue solid, 96% yield, decomposition temperature: 290 °C.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 69.49, 53.02, 47.24, 45.42, 32.26, 19.67, 7.52, 6.16, 5.62, 5.42, 2.51, -0.58, -2.10, -8.17, -9.74, -17.41, -33.98, -36.73, -62.40.

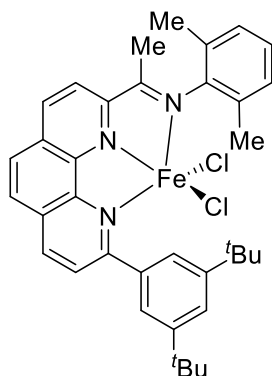
IR (KBr): 2959s, 2927m, 2867m, 2359w, 2333w, 1609m, 1559m, 1497m, 1461m, 1382m, 1303m, 1189m, 1139w, 1109w, 1057w, 864m, 783m, 735w cm^{-1} .



C1e, dark green solid, 96% yield, decomposition temperature: >320 °C.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 63.39, 56.47, 51.54, 49.42, 33.93, 21.38, 11.52, 10.71, 8.67, 7.99, 7.30, 6.11, 3.84, 1.72, 0.88, -9.20, -11.60, -23.81, -38.84, -65.42.

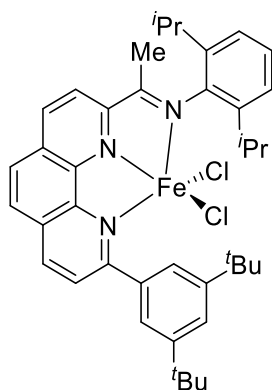
IR (KBr) : 3547m, 3478s, 3414s, 3240w, 2958w, 2360w, 2341w, 1638m, 1617m, 1495w, 1436w, 1373w, 1305w, 1205w, 864w, 703m, 624m, 605m, 484w cm^{-1} .



C1f, green solid, 94% yield, decomposition temperature: 220 °C.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 79.50, 44.28, 31.28, 27.29, 15.77, 15.00, 10.21, 4.02, 1.92, -1.58, -5.02, -6.13, -22.41, -27.33.

IR (KBr) : 3062w, 2958s, 2907m, 2867m, 1615m, 1597m, 1557m, 1500s, 1470m, 1420m, 1371m, 1297w, 1267w, 1203m, 1140w, 1094w, 862s, 799w, 768s, 709m, 629w cm^{-1} .



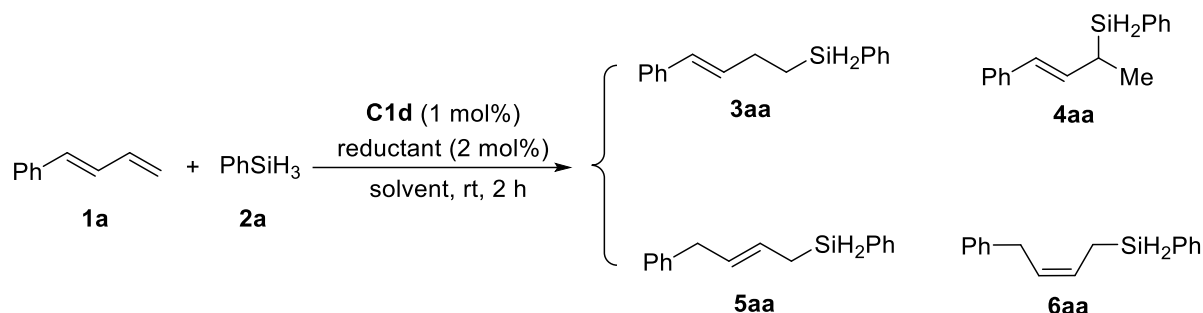
C1g, dark green solid, 92% yield, decomposition temperature: 248 °C.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 82.81, 42.19, 34.99, 27.35, 13.57, 10.43, 7.28, 4.08, 3.46, -5.84, -6.55, -6.70, -9.97, -26.40, -37.71, -39.22.

IR (KBr): 3060w, 2962s, 2867m, 2360s, 2341s, 1605m, 1557m, 1498m, 1458m, 1371s, 1298s, 1244m, 1188m, 1057w, 934w, 863s, 809m, 794m, 779m, 731w cm^{-1} .

3. Additional optimization of reaction conditions

3.1 Effect of additives and solvents



General procedure: In an argon-filled glovebox, a vial (10 mL) was charged with **C1d** (3.6 mg, 0.005 mmol, 1 mol%) and solvent (1 mL). The reaction mixture was stirred at room temperature for 1 min, then was added the conjugated diene **1a** (65 mg, 0.5 mmol), PhSiH₃ (59.4 mg, 0.55 mmol) and additive (0.01 mmol, 2 mol%). After stirring for 2 h at room temperature, the vial was removed from the glovebox and the reaction mixture was concentrated by rotary evaporation. Iron species were removed by flash column chromatography with DCM as eluent. The raw product was detected by ¹H NMR with 1,3,5-trimethoxybenzene as internal standard. The results were listed as following.

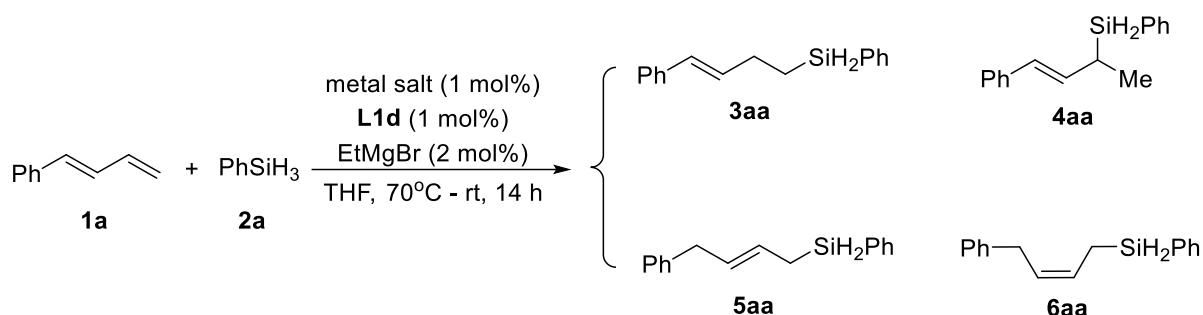
Table S1 Effect of additives and solvents

entry	[Fe]	reductant	solvent	conv. (%)	yield (%)	3aa/4aa/5aa/6aa
1	C1d	EtMgBr	THF	>95	99	99:1:0:0
2	C1d	MeMgBr	THF	>95	98	98:2:0:0
3	C1d	MeMgCl	THF	>95	97	98.5:1.5:0:0
4	C1d	PhMgBr	THF	>95	99	98:2:0:0
5	C1d	ZnEt ₂	THF	<5	ND ^a	NA ^b
6	C1d	LiAlH ₄	THF	<5	ND	NA
7	C1d	NaHBET ₃	THF	56	22	88:12:0:0
8	C1d	^t BuOK	THF	75	38	91:9:0:0
9	C1d	LDA	THF	>95	20	93:7:0:0

10	C1d	none	THF	<5	ND	NA
11	C1d	EtMgBr	Et ₂ O	59	45	98:2:0:0
12	C1d	EtMgBr	dioxane	<5	ND	NA
13	C1d	EtMgBr	toluene	62	40	98:2:0:0
14	C1d	EtMgBr	hexane	67	57	98:2:0:0

^aND, not detected. ^bNA, not applicable.

3.2 Effect of metal salts



General procedure: In an argon-filled glovebox, a vial (10 mL) was charged with metal salt (0.005 mmol, 1 mol%), **L1d** (2.9 mg, 0.005 mmol, 1 mol%) and THF (1 mL). The reaction mixture was stirred at 70 °C for 12 h, and then cooled to room temperature. The conjugated diene **1a** (65 mg, 0.5 mmol), PhSiH₃ (59.4 mg, 0.55 mmol, 1.1 equiv) and EtMgBr (10 μL, 0.01 mmol, 2 mol%) was added and the mixture was stirred for 2 h at room temperature. The vial was removed from the glovebox and the reaction mixture was concentrated by rotary evaporation. Metal species were removed by flash column chromatography with DCM as eluent. The raw product was detected by ¹H NMR with 1,3,5-trimethoxybenzene as internal standard. The results were listed as following.

Table S2 Effect of metal salts

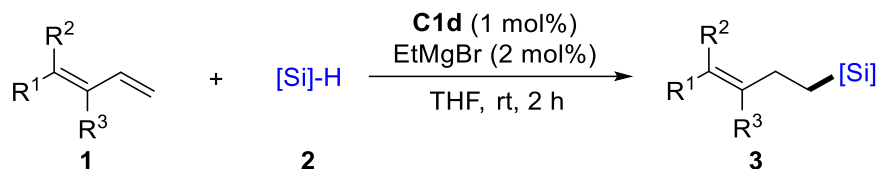
entry	metal salt	conv. (%)	yield (%)	3aa/4aa/5aa/6aa
1	FeCl ₂	>95	98	98:2:0:0
2	Fe(acac) ₂	<5	ND ^a	NA ^b

3	CoCl ₂	<5	ND	NA
4	NiCl ₂	<5	ND	NA
5	MnCl ₂	<5	ND	NA
6	CuCl ₂	<5	ND	NA
7	ZnCl ₂	<5	ND	NA
8	none	<5	ND	NA

^aND, not detected. ^b NA, not applicable.

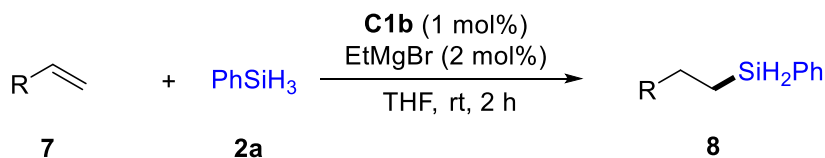
4. Typical procedures for hydrosilylation reactions

4.1. Hydrosilylation of conjugated dienes



In an argon-filled glovebox, a vial (10 mL) was charged with complexes **C1d** (5.0 mg, 0.007 mmol), dry anhydrous THF (1 mL), conjugated dienes **1** (0.7 mmol) and silanes **2** (0.77 mmol, 1.1 equiv) successively. The vial was removed from the glovebox after EtMgBr (1 M in THF, 14 μL , 0.014 mmol, 2.0 mol%) was added and the reaction mixture was stirred at room temperature for 2 h. When the reaction was finished, the mixture was concentrated by rotating evaporation. The residue was purified by column chromatography to afford the desired products **3**.

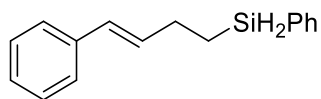
4.2 Hydrosilylation of terminal alkenes



In an argon-filled glovebox, a vial (10 mL) was charged with complexes **C1b** (4.6 mg, 0.007 mmol), dry anhydrous THF (1 mL), alkene **7** (0.7 mmol) and phenylsilane (0.77 mmol, 1.1 equiv) successively. The vial was removed from the glovebox after EtMgBr (1 M in THF, 14 μL , 0.014 mmol, 2.0 mol%) was added and the reaction mixture was stirred at room temperature for 2 h. When the reaction was finished, the mixture was concentrated by rotating evaporation. The residue was purified by column chromatography to afford the desired product **8**.

5. Analytical data of hydrosilylation products

(*E*)-phenyl(4-phenylbut-3-en-1-yl)silane (3aa)¹²

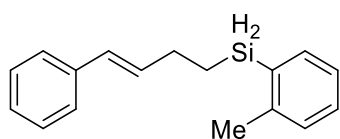


Serial number: sw-2-76, 162.6 mg, 98% yield, >98:2 r.r., colorless oil, R_f = 0.52 (PE)

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.62 – 7.55 (m, 2H), 7.43 – 7.26 (m, 7H), 7.23 – 7.15 (m, 1H), 6.37 (d, J = 15.8 Hz, 1H), 6.25 (dt, J = 15.7, 6.5 Hz, 1H), 4.34 (t, J = 3.6 Hz, 2H), 2.41 – 2.32 (m, 2H), 1.18 – 1.10 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 137.7 (1C), 135.3 (2C), 132.2 (2C), 129.6 (1C), 129.2 (1C), 128.4 (2C), 128.0 (2C), 126.9 (1C), 126.0 (2C), 28.4 (1C), 9.9 (1C).

(*E*)-(4-phenylbut-3-en-1-yl)(*o*-tolyl)silane (3ab)



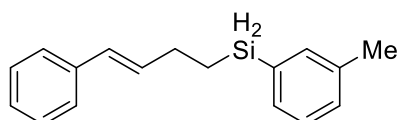
Serial number: sw-3-43, 167.0 mg, 95% yield, 94:6 r.r., colorless oil. R_f = 0.59 (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.56 – 7.50 (m, 1H), 7.34 – 7.25 (m, 5H), 7.22 – 7.14 (m, 3H), 6.37 (d, J = 15.7 Hz, 1H), 6.25 (dt, J = 15.8, 6.5 Hz, 1H), 4.37 (t, J = 3.7 Hz, 2H), 2.45 (s, 3H), 2.40 – 2.32 (m, 2H), 1.19 – 1.09 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 144.0 (1C), 137.7 (1C), 136.4 (1C), 132.2 (1C), 131.6 (1C), 130.1 (1C), 129.4 (1C), 129.2 (1C), 128.4 (2C), 126.8 (1C), 126.0 (2C), 125.2 (1C), 28.6 (1C), 22.6 (1C), 9.6 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{17}\text{H}_{20}\text{Si}]^+$: 252.1334, found: 252.1328.

(*E*)-(4-phenylbut-3-en-1-yl)(*m*-tolyl)silane (3ac)



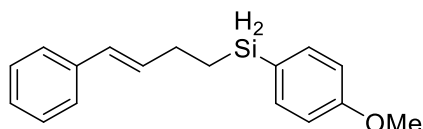
Serial number: sw-3-44, 163.6 mg, 93% yield, >98:2 r.r., colorless oil. $R_f = 0.50$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.42 – 7.35 (m, 2H), 7.33 – 7.24 (m, 5H), 7.23 – 7.15 (m, 2H), 6.37 (d, $J = 15.7$ Hz, 1H), 6.25 (dt, $J = 15.8, 6.5$ Hz, 1H), 4.32 (t, $J = 3.7$ Hz, 2H), 2.42 – 2.29 (m, 5H), 1.18 – 1.05 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 137.8 (1C), 137.5 (1C), 136.0 (1C), 132.3 (3C), 130.5 (1C), 129.3 (1C), 128.5 (2C), 128.0 (1C), 126.9 (1C), 126.0 (2C), 28.5 (1C), 21.5 (1C), 10.0 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{17}\text{H}_{20}\text{Si}]^+$: 252.1334, found: 252.1328.

(*E*)-(4-methoxyphenyl)(4-phenylbut-3-en-1-yl)silane (3ad)



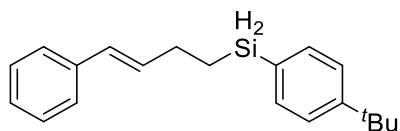
Serial number: sw-2-144, 178.0 mg, 95% yield, >98:2 r.r., colorless oil. $R_f = 0.30$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.55 – 7.45 (m, 2H), 7.32 – 7.25 (m, 4H), 7.23 – 7.14 (m, 1H), 6.95 – 6.86 (m, 2H), 6.37 (d, $J = 15.8$ Hz, 1H), 6.24 (dt, $J = 15.7, 6.5$ Hz, 1H), 4.32 (t, $J = 3.6$ Hz, 2H), 3.81 (s, 3H), 2.40 – 2.31 (m, 2H), 1.15 – 1.07 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 160.9 (1C), 137.7 (2C), 136.7 (1C), 132.3 (1C), 129.2 (1C), 128.4 (2C), 126.8 (1C), 126.0 (2C), 122.8 (1C), 113.9 (2C), 55.0 (1C), 28.4 (1C), 10.2 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{17}\text{H}_{20}\text{OSi}]^+$: 268.1283, found: 268.1278.

(*E*)-(4-(*tert*-butyl)phenyl)(4-phenylbut-3-en-1-yl)silane (3ae)



Serial number: sw-2-194, 204 mg, 99% yield, >98:2 r.r., colorless oil. $R_f = 0.48$ (PE).

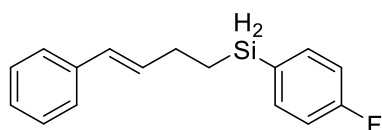
$^1\text{H NMR}$ (400 MHz, CDCl_3) 7.56 – 7.49 (m, 2H), 7.43 – 7.37 (m, 2H), 7.33 – 7.25 (m, 4H), 7.21 – 7.15 (m, 1H), 6.37 (d, $J = 15.7$ Hz, 1H), 6.24 (dt, $J = 15.7, 6.5$ Hz, 1H), 4.33

(t, $J = 3.6$ Hz, 2H), 2.42 – 2.32 (m, 2H), 1.32 (s, 9H), 1.18 – 1.08 (m, 2H).

^{13}C NMR (101 MHz, CDCl_3) δ 152.7 (1C), 137.7 (1C), 135.2 (2C), 132.3 (1C), 129.2 (1C), 128.6 (1C), 128.4 (2C), 126.8 (1C), 126.0 (2C), 125.0 (2C), 34.7 (1C), 31.2 (3C), 28.5 (1C), 10.0 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{20}\text{H}_{26}\text{Si}]^+$: 294.1804, found: 294.1796.

(E)-(4-fluorophenyl)(4-phenylbut-3-en-1-yl)silane (3af)



Serial number: sw-4-126, 169.4 mg, 94% yield, >98:2 r.r., colorless oil. $R_f = 0.78$ (PE).

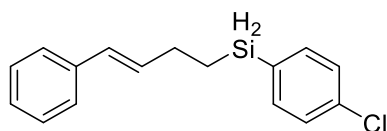
^1H NMR (400 MHz, CDCl_3) δ 7.59 – 7.51 (m, 2H), 7.33 – 7.26 (m, 4H), 7.23 – 7.16 (m, 1H), 7.10 – 7.02 (m, 2H), 6.36 (d, $J = 17.2$ Hz, 1H), 6.23 (dt, $J = 15.7, 6.6$ Hz, 1H), 4.33 (t, $J = 3.6$ Hz, 2H), 2.41 – 2.30 (m, 2H), 1.17 – 1.07 (m, 2H).

^{13}C NMR (101 MHz, CDCl_3) δ 164.0 ($J = 250.5$ Hz, 1C), 162.8 (1C), 137.6 (1C), 137.2 (1C), 137.2 (1C), 131.9 (1C), 129.4 (1C), 128.5 (2C), 127.6 (1C), 126.9 (1C), 126.0 (2C), 115.4 (1C), 115.2 (1C), 28.3 (1C), 10.0 (1C).

^{19}F NMR (376 MHz, CDCl_3) δ -110.83.

HRMS (EI) calculated for $[\text{M}, \text{C}_{16}\text{H}_{17}\text{FSi}]^+$: 256.1084, found: 256.1078.

(E)-(4-chlorophenyl)(4-phenylbut-3-en-1-yl)silane (3ag)



Serial number: sw-4-118, 185.2 mg, 97% yield, >98:2 r.r., colorless oil. $R_f = 0.81$ (PE).

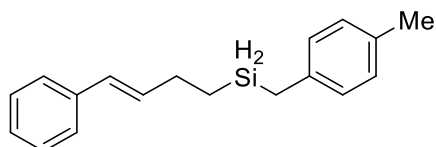
^1H NMR (400 MHz, CDCl_3) δ 7.49 (d, $J = 8.2$ Hz, 2H), 7.33 (d, $J = 8.1$ Hz, 2H), 7.31 – 7.25 (m, 4H), 7.22 – 7.16 (m, 1H), 6.36 (d, $J = 15.7$ Hz, 1H), 6.21 (dt, $J = 15.8, 6.6$ Hz, 1H), 4.32 (t, $J = 3.6$ Hz, 2H), 2.41 – 2.27 (m, 2H), 1.18 – 1.06 (m, 2H).

^{13}C NMR (101 MHz, CDCl_3) δ 137.5 (1C), 136.6 (2C), 136.0 (1C), 131.8 (1C), 130.5 (1C),

129.4 (1C), 128.5 (2C), 128.3 (2C), 126.9 (1C), 125.9 (2C), 28.3 (1C), 9.8 (1C).

HRMS (EI) calculated for $[M, C_{16}H_{17}ClSi]^+$: 272.0788, found: 272.0783.

(E)-(4-methylbenzyl)(4-phenylbut-3-en-1-yl)silane (3ah)



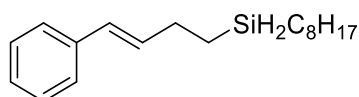
Serial number: sw-2-146, 178.8 mg, 96% yield, >98:2 r.r., colorless oil. $R_f = 0.55$ (PE).

1H NMR (400 MHz, $CDCl_3$) δ 7.36 – 7.27 (m, 4H), 7.23 – 7.14 (m, 1H), 7.09 – 6.94 (m, 4H), 6.34 (d, $J = 15.8$ Hz, 1H), 6.20 (dt, $J = 15.8, 6.6$ Hz, 1H), 3.83 (p, $J = 3.6$ Hz, 2H), 2.32 – 2.24 (m, 5H), 2.22 (t, $J = 3.7$ Hz, 2H), 0.91 – 0.80 (m, 2H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 137.7 (1C), 136.4 (1C), 134.0 (1C), 132.2 (1C), 129.2 (2C), 129.1 (1C), 128.5 (2C), 128.0 (2C), 126.9 (1C), 126.0 (2C), 28.5 (1C), 20.9 (1C), 18.4 (1C), 8.7 (1C).

HRMS (EI) calculated for $[M, C_{18}H_{22}Si]^+$: 266.1491, found: 266.1486.

(E)-octyl(4-phenylbut-3-en-1-yl)silane (3ai)



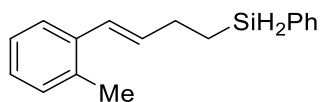
Serial number: sw-4-179, 175.3 mg, 91% yield, 98:2 r.r., colorless oil. $R_f = 0.72$ (PE).

1H NMR (400 MHz, $CDCl_3$) δ 7.36 – 7.27 (m, 4H), 7.22 – 7.16 (m, 1H), 6.38 (d, $J = 15.8$ Hz, 1H), 6.26 (dt, $J = 15.7, 6.5$ Hz, 1H), 3.70 (p, $J = 3.6$ Hz, 2H), 2.37 – 2.25 (m, 2H), 1.42 – 1.25 (m, 12H), 0.92 – 0.85 (m, 5H), 0.76 – 0.67 (m, 2H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 137.8 (1C), 132.6 (1C), 129.0 (1C), 128.5 (2C), 126.8 (1C), 126.0 (2C), 32.9 (1C), 31.9 (1C), 29.3 (1C), 29.2 (1C), 28.8 (1C), 25.4 (1C), 22.7 (1C), 14.1 (1C), 9.1 (1C), 9.0 (1C).

HRMS (EI) calculated for $[M, C_{18}H_{30}Si]^+$: 274.2117, found: 274.2112.

(E)-phenyl(4-(*o*-tolyl)but-3-en-1-yl)silane (3ba)



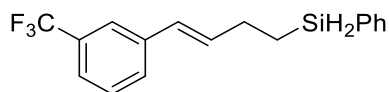
Serial number: sw-2-107, 170.4 mg, 96% yield, 98:2 r.r., colorless oil. $R_f = 0.52$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.63 – 7.54 (m, 2H), 7.43 – 7.32 (m, 4H), 7.16 – 7.08 (m, 3H), 6.57 (d, $J = 15.6$ Hz, 1H), 6.11 (dt, $J = 15.6, 6.7$ Hz, 1H), 4.35 (t, $J = 3.7$ Hz, 2H), 2.44 – 2.35 (m, 2H), 2.31 (s, 3H), 1.19 – 1.11 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 136.8 (1C), 135.3 (2C), 135.0 (1C), 133.5 (1C), 132.3 (1C), 130.1 (1C), 129.6 (1C), 128.0 (2C), 127.1 (1C), 126.8 (1C), 126.0 (1C), 125.5 (1C), 28.7 (1C), 19.8 (1C), 10.0 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{17}\text{H}_{20}\text{Si}]^+$: 252.1334, found: 252.1327.

(E)-phenyl(4-(3-(trifluoromethyl)phenyl)but-3-en-1-yl)silane (3ca)



Serial number: sw-2-138, 196.8 mg, 92% yield, 98:2 r.r., colorless oil. $R_f = 0.48$ (PE).

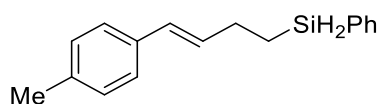
$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.62 – 7.49 (m, 3H), 7.48 – 7.31 (m, 6H), 6.39 (d, $J = 15.9$ Hz, 1H), 6.30 (dt, $J = 15.7, 6.2$ Hz, 1H), 4.35 (t, $J = 3.6$ Hz, 2H), 2.39 (q, $J = 7.1$ Hz, 2H), 1.21 – 1.07 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 138.4 (1C), 135.2 (2C), 134.2 (1C), 132.1 (1C), 130.9 (q, $J = 32.1$ Hz, 1C), 129.7 (1C), 129.1 (d, $J = 1.4$ Hz, 1C), 128.8 (1C), 128.1 (3C), 124.2 (q, $J = 270$ Hz, 1C), 123.4 (q, $J = 3.8$ Hz, 1C), 122.6 (q, $J = 4.0$ Hz, 1C), 28.4 (1C), 9.7 (1C).

$^{19}\text{F NMR}$ (376 MHz, CDCl_3) δ -62.73.

HRMS (ESI) calculated for $[\text{M-H}, \text{C}_{17}\text{H}_{16}\text{F}_3\text{Si}]^-$: 305.0979, found: 305.0965.

(E)-phenyl(4-(*p*-tolyl)but-3-en-1-yl)silane (3da)



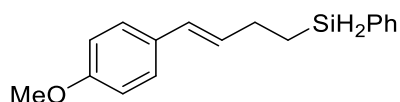
Serial number: sw-2-108, 172.1 mg, 98% yield, >98:2 r.r., colorless oil. R_f = 0.52 (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.62 – 7.54 (m, 2H), 7.44 – 7.31 (m, 3H), 7.23 – 7.18 (m, 2H), 7.12 – 7.06 (m, 2H), 6.34 (d, J = 15.8 Hz, 1H), 6.19 (dt, J = 15.7, 6.6 Hz, 1H), 4.34 (t, J = 3.6 Hz, 2H), 2.39 – 2.33 (m, 2H), 2.32 (s, 3H), 1.17 – 1.07 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 136.6 (1C), 135.3 (2C), 134.9 (1C), 132.3 (1C), 131.2 (1C), 129.6 (1C), 129.2 (2C), 129.1 (1C), 128.1 (2C), 125.9 (2C), 28.4 (1C), 21.2 (1C), 10.0 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{17}\text{H}_{20}\text{Si}]^+$: 252.1334, found: 252.1327.

(E)-4-(4-methoxyphenyl)but-3-en-1-yl(phenyl)silane (3ea)



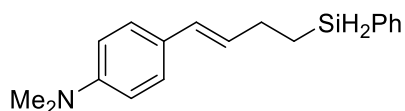
Serial number: sw-2-86, 178.2 mg, 95% yield, >98:2 r.r., colorless oil. R_f = 0.53 (PE/EA = 20:1, v/v).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.64 – 7.52 (m, 2H), 7.43 – 7.32 (m, 3H), 7.26 – 7.22 (m, 2H), 6.88 – 6.76 (m, 2H), 6.31 (d, J = 15.6, 1H), 6.10 (dt, J = 15.7, 6.7 Hz, 1H), 4.33 (t, J = 3.6 Hz, 2H), 3.79 (d, J = 1.4 Hz, 3H), 2.35 (dtd, J = 7.8, 6.4, 1.4 Hz, 2H), 1.18 – 1.05 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 158.6 (1C), 135.2 (2C), 132.3 (1C), 130.5 (1C), 130.0 (1C), 129.6 (1C), 128.6 (1C), 128.0 (2C), 127.0 (2C), 113.9 (2C), 55.2 (1C), 28.3 (1C), 10.0 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{17}\text{H}_{20}\text{OSi}]^+$: 268.1283, found 268.1278.

(E)-N,N-dimethyl-4-(4-(phenylsilyl)but-1-en-1-yl)aniline (3fa)



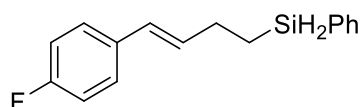
Serial number: sw-2-160, 193 mg, 98% yield, >98:2 r.r., yellow oil. $R_f = 0.24$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.62 – 7.52 (m, 2H), 7.42 – 7.31 (m, 3H), 7.24 – 7.15 (m, 2H), 6.70 – 6.62 (m, 2H), 6.28 (d, $J = 15.7$ Hz, 1H), 6.04 (dt, $J = 15.9, 6.7$ Hz, 1H), 4.33 (t, $J = 3.5$ Hz, 2H), 2.92 (s, 6H), 2.39 – 2.28 (m, 2H), 1.16 – 1.07 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 149.7 (1C), 135.3 (2C), 132.5 (1C), 129.5 (1C), 129.0 (1C), 128.0 (3C), 126.8 (2C), 126.4 (1C), 112.6 (2C), 40.6 (2C), 28.4 (1C), 10.2 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{18}\text{H}_{23}\text{NSi}]^+$: 281.1600, found: 281.1592.

(E)-(4-(4-fluorophenyl)but-3-en-1-yl)(phenyl)silane (3ga)



Serial number: sw-2-99, 177.2 mg, 99% yield, >98:2 r.r., colorless oil. $R_f = 0.59$ (PE).

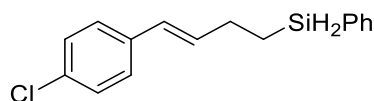
$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.63 – 7.53 (m, 2H), 7.46 – 7.30 (m, 3H), 7.29 – 7.21 (m, 2H), 7.03 – 6.88 (m, 2H), 6.32 (d, $J = 15.7$ Hz, 1H), 6.14 (dt, $J = 15.8, 6.6$ Hz, 1H), 4.34 (t, $J = 3.6$ Hz, 2H), 2.41 – 2.30 (m, 2H), 1.18 – 1.07 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 161.9 ($J = 244.1$ Hz, 1C), 135.2 (2C), 133.8 (1C), 132.2 (1C), 131.9 (1C), 129.6 (1C), 128.1 (1C), 128.0 (2C), 127.4 (1C), 127.3 (1C), 115.4 (1C), 115.2 (1C), 28.3 (1C), 9.9 (1C).

$^{19}\text{F NMR}$ (376 MHz, CDCl_3) δ -115.71.

HRMS (EI) calculated for $[\text{M}, \text{C}_{16}\text{H}_{17}\text{FSi}]^+$: 256.1084, found: 256.1078.

(E)-(4-(4-chlorophenyl)but-3-en-1-yl)(phenyl)silane (3ha)



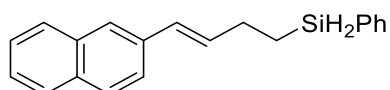
Serial number: sw-2-126, 186.9 mg, 98% yield, >98:2 r.r., colorless oil. $R_f = 0.63$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.62 – 7.52 (m, 2H), 7.45 – 7.31 (m, 3H), 7.25 – 7.18 (m, 4H), 6.32 (d, $J = 15.8$, 1H), 6.21 (dt, $J = 15.8, 6.4$ Hz, 1H), 4.34 (t, $J = 3.6$ Hz, 2H), 2.44 – 2.29 (m, 2H), 1.18 – 1.08 (m, 2H).

^{13}C NMR (101 MHz, CDCl_3) δ 136.2 (1C), 135.2 (2C), 132.9 (1C), 132.4(1C), 132.1 (1C), 129.6 (1C), 128.6 (2C), 128.1 (1C), 128.0 (2C), 127.2 (2C), 28.4 (1C), 9.8 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{16}\text{H}_{17}\text{ClSi}]^+$: 272.0788, found: 272.0783.

(E)-(4-(naphthalen-2-yl)but-3-en-1-yl)(phenyl)silane (3ia)



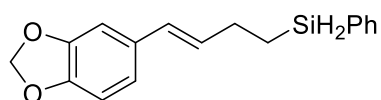
Serial number: sw-2-148, 199 mg, 99% yield, 98:2 r.r., colorless oil. R_f = 0.50 (PE).

^1H NMR (400 MHz, CDCl_3) δ 7.81 – 7.71 (m, 3H), 7.66 – 7.57 (m, 3H), 7.53 (dd, J = 8.5, 1.7 Hz, 1H), 7.47 – 7.32 (m, 5H), 6.53 (d, J = 15.7 Hz, 1H), 6.37 (dt, J = 15.7, 6.6 Hz, 1H), 4.37 (t, J = 3.6 Hz, 2H), 2.49 – 2.35 (m, 2H), 1.23 – 1.11 (m, 2H).

^{13}C NMR (101 MHz, CDCl_3) δ 135.3 (2C), 135.1 (1C), 133.7 (1C), 132.7 (1C), 132.6 (1C), 132.2 (1C), 129.6 (1C), 129.4 (1C), 128.0 (3C), 127.8 (1C), 127.6 (1C), 126.1 (1C), 125.4 (2C), 123.6 (1C), 28.5 (1C), 9.9 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{20}\text{H}_{20}\text{Si}]^+$: 288.1334, found: 288.1329.

(E)-(4-(benzo[d][1,3]dioxol-5-yl)but-3-en-1-yl)(phenyl)silane (3ja)



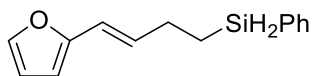
Serial number: sw-3-8, 196.2 mg, 99% yield, 98:2 r.r., colorless oil. R_f = 0.53 (PE/EA = 10:1, v/v).

^1H NMR (400 MHz, CDCl_3) δ 7.63 – 7.52 (m, 2H), 7.45 – 7.31 (m, 3H), 6.88 – 6.82 (m, 1H), 6.76 – 6.68 (m, 2H), 6.28 (d, J = 15.7, 1H), 6.07 (dt, J = 15.8, 6.8 Hz, 1H), 5.93 (s, 2H), 4.38 – 4.29 (m, 2H), 2.39 – 2.27 (m, 2H), 1.17 – 1.06 (m, 2H).

^{13}C NMR (101 MHz, CDCl_3) δ 147.9 (1C), 146.6 (1C), 135.2 (2C), 132.2 (2C), 130.4 (1C), 129.6 (1C), 128.8 (1C), 128.0 (2C), 120.3 (1C), 108.2 (1C), 105.4 (1C), 100.9 (1C), 28.3 (1C), 10.0 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{17}\text{H}_{18}\text{O}_2\text{Si}]^+$: 282.1076, found: 282.1069.

(E)-(4-(furan-2-yl)but-3-en-1-yl)(phenyl)silane (3ka)



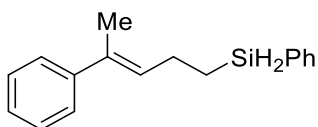
Serial number: sw-2-161, 148 mg, 93% yield, 97:3 r.r., colorless oil. $R_f = 0.73$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.60 – 7.52 (m, 2H), 7.43 – 7.27 (m, 4H), 6.35 – 6.30 (m, 1H), 6.22 – 6.17 (m, 2H), 6.14 – 6.09 (m, 1H), 4.33 (t, $J = 3.7$ Hz, 2H), 2.39 – 2.27 (m, 2H), 1.17 – 1.05 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 153.2 (1C), 141.3 (1C), 135.2 (2C), 132.2 (1C), 131.2 (1C), 129.6 (1C), 128.0 (2C), 118.0 (1C), 111.1 (1C), 106.2 (1C), 28.1 (1C), 9.7 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{14}\text{H}_{16}\text{OSi}]^+$: 228.0970, found 228.0966.

(E)-phenyl(4-phenylpent-3-en-1-yl)silane (3la)



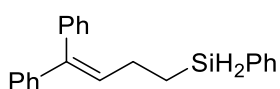
Serial number: sw-2-202, 167.0 mg, 95% yield, >98:2 r.r., colorless oil. $R_f = 0.61$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.62 – 7.55 (m, 2H), 7.43 – 7.27 (m, 7H), 7.24 – 7.18 (m, 1H), 5.83 – 5.74 (m, 1H), 4.34 (t, $J = 3.6$, 2H), 2.42 – 2.30 (m, 2H), 1.98 (s, 3H), 1.18 – 1.07 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 143.8 (1C), 135.2 (2C), 134.3 (1C), 132.4 (1C), 129.9 (1C), 129.6 (1C), 128.1 (2C), 128.0 (2C), 126.5 (1C), 125.6 (2C), 24.1 (1C), 15.8 (1C), 10.3 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{17}\text{H}_{20}\text{Si}]^+$: 252.1334, found: 252.1329.

(4,4-diphenylbut-3-en-1-yl)(phenyl)silane (3ma)



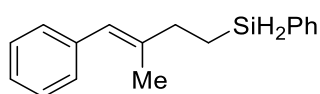
Serial number: sw-3-190, 191.7 mg, 87% yield, >98:2 r.r., colorless oil. Complex **C1b** was used as the catalyst. $R_f = 0.29$ (PE).

¹H NMR (400 MHz, CDCl₃) δ 7.52 – 7.46 (m, 2H), 7.40 – 7.11 (m, 13H), 6.08 (t, *J* = 7.4 Hz, 1H), 4.28 (t, *J* = 3.7 Hz, 2H), 2.29 (q, *J* = 7.7 Hz, 2H), 1.15 – 1.03 (m, 2H).

¹³C NMR (101 MHz, CDCl₃) δ 142.7 (1C), 141.1 (1C), 140.0 (1C), 135.2 (2C), 132.3 (1C), 131.3 (1C), 129.9 (2C), 129.6 (1C), 128.2 (2C), 128.1 (2C), 128.0 (2C), 127.3 (2C), 126.9 (1C), 126.9 (1C), 25.2 (1C), 10.7 (1C).

HRMS (EI) calculated for [M, C₂₂H₂₂Si]⁺: 314.1491, found: 314.1481.

(*E*)-(3-methyl-4-phenylbut-3-en-1-yl)(phenyl)silane (3na)¹³



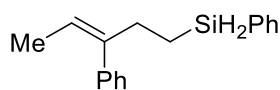
Serial number: sw-2-162, 176.2 mg, 99% yield, >98:2 r.r., colorless oil. *R_f* = 0.69 (PE).

¹H NMR (400 MHz, CDCl₃) δ 7.62 – 7.55 (m, 2H), 7.43 – 7.25 (m, 5H), 7.24 – 7.13 (m, 3H), 6.29 (s, 1H), 4.34 (t, *J* = 3.6 Hz, 2H), 2.36 – 2.26 (m, 2H), 1.84 (s, 3H), 1.24 – 1.12 (m, 2H).

¹³C NMR (101 MHz, CDCl₃) δ 140.2 (1C), 138.5 (1C), 135.3 (2C), 132.4 (1C), 129.6 (1C), 128.8 (2C), 128.0 (4C), 125.9 (1C), 124.4 (1C), 35.8 (1C), 17.5 (1C), 8.7 (1C).

HRMS (EI) calculated for [M, C₁₇H₂₀Si]⁺: 252.1334, found: 252.1328.

(*Z*)-phenyl(3-phenylpent-3-en-1-yl)silane (3oa)



Serial number: llj-1-106, 172.9 mg, 98% yield, 98:2 r.r., colorless oil. Complex **C1b** (2 mol%) was used as the catalyst. *R_f* = 0.59 (PE).

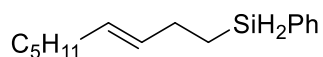
¹H NMR (400 MHz, CDCl₃) 7.56 – 7.48 (m, 2H), 7.43 – 7.28 (m, 5H), 7.22 (d, *J* = 7.3 Hz, 1H), 7.15 – 7.08 (m, 2H), 5.59 – 5.51 (m, 1H), 4.26 (t, *J* = 3.7 Hz, 2H), 2.53 – 2.43 (m, 2H), 1.54 (d, *J* = 6.9 Hz, 3H), 1.04 – 0.90 (m, 2H).

¹³C NMR (101 MHz, CDCl₃) δ 142.8 (1C), 140.6 (1C), 135.2 (1C), 132.4 (1C), 129.5 (1C), 128.6 (1C), 128.0 (1C), 127.9 (1C), 126.4 (1C), 120.6 (1C), 34.4 (1C), 14.6 (1C), 8.9

(1C).

HRMS (EI) calculated for $[M, C_{17}H_{20}Si]^+$: 252.1334, found: 252.1328.

(E)-non-3-en-1-yl(phenyl)silane (3pa)¹³

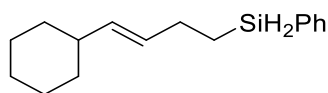


Serial number: sw-4-79A, 156.7 mg, 96% yield, 1,2/1,4 > 98:2 (the 1,2/1,4 refers to the ratio of 1,2- and 1,4-*anti*-Markovnikov hydrosilylation product), colorless oil. Complex **C1e** was used as the catalyst; EtMgBr (4 mol%) was added at $-30\text{ }^{\circ}\text{C}$, and then the mixture was stirred at $0\text{ }^{\circ}\text{C}$ for 10 h. $R_f = 0.85$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.60 – 7.52 (m, 2H), 7.43 – 7.31 (m, 3H), 5.50 – 5.34 (m, 2H), 4.29 (t, $J = 3.7$ Hz, 2H), 2.15 (td, $J = 7.6, 5.3$ Hz, 2H), 1.96 (q, $J = 6.6$ Hz, 2H), 1.37 – 1.20 (m, 6H), 1.07 – 0.97 (m, 2H), 0.88 (t, $J = 6.8$ Hz, 3H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 135.3 (2C), 132.6 (1C), 131.5 (1C), 130.1 (1C), 129.5 (1C), 128.0 (2C), 32.4 (1C), 31.4 (1C), 29.3 (1C), 27.9 (1C), 22.6 (1C), 14.1 (1C), 10.1 (1C).

(E)-(4-cyclohexylbut-3-en-1-yl)(phenyl)silane (3qa)¹³

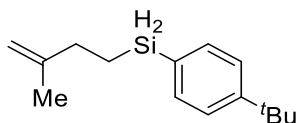


Serial number: sw-4-79B, 164.0 mg, 96% yield, 1,2/1,4 > 98:2 (the 1,2/1,4 refers to the ratio of 1,2- and 1,4-*anti*-Markovnikov hydrosilylation product), colorless oil. Complex **C1e** was used as the catalyst; EtMgBr (4 mol%) was added at $-30\text{ }^{\circ}\text{C}$, and then the mixture was stirred at $0\text{ }^{\circ}\text{C}$ for 10 h. $R_f = 0.86$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.61 – 7.51 (m, 2H), 7.42 – 7.30 (m, 3H), 5.46 – 5.29 (m, 2H), 4.28 (t, $J = 3.7$ Hz, 2H), 2.18 – 2.09 (m, 2H), 1.94 – 1.81 (m, 1H), 1.74 – 1.58 (m, 5H), 1.29 – 0.98 (m, 7H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 136.0 (1C), 135.3 (2C), 132.6 (1C), 129.5 (1C), 128.9 (1C), 128.0 (2C), 40.6 (1C), 33.2 (2C), 28.0 (1C), 26.3 (1C), 26.1 (2C), 10.1 (1C).

(4-(*tert*-butyl)phenyl)(3-methylbut-3-en-1-yl)silane (3re)



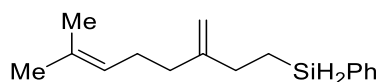
Serial number: sw-3-167, 154.1 mg, 95% yield, 1,2/1,4 = 94:6 (the 1,2/1,4 refers to the ratio of 1,2- and 1,4-*anti*-Markovnikov hydrosilylation product), colorless oil. Silane **2e** was used instead of **2a**. R_f = 0.56 (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.54 – 7.49 (m, 2H), 7.42 – 7.37 (m, 2H), 4.75 – 4.68 (m, 2H), 4.29 (t, J = 3.7 Hz, 2H), 2.20 – 2.10 (m, 2H), 1.73 (s, 3H), 1.32 (s, 9H), 1.13 – 1.02 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 152.7 (1C), 147.4 (1C), 135.2 (2C), 128.8 (1C), 125.0 (2C), 109.1 (1C), 34.7 (1C), 33.0 (1C), 31.2 (3C), 22.2 (1C), 8.3 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{15}\text{H}_{24}\text{Si}]^+$: 232.1647, found: 232.1641.

(7-methyl-3-methyleneoct-6-en-1-yl)(phenyl)silane (3sa)¹³

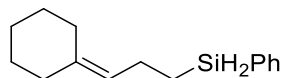


Serial number: sw-4-79C, 153.7 mg, 90% yield, 1,2/1,4 = 93:7 (the 1,2/1,4 refers to the ratio of 1,2- and 1,4-*anti*-Markovnikov hydrosilylation product), colorless oil. Complex **C1d** was used as the catalyst; EtMgBr (4 mol%) was added at $-30\text{ }^\circ\text{C}$, and then the mixture was stirred at $0\text{ }^\circ\text{C}$ for 10 h. R_f = 0.61 (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.61 – 7.54 (m, 2H), 7.43 – 7.32 (m, 3H), 5.14 – 5.04 (m, 1H), 4.77 (s, 1H), 4.73 (s, 1H), 4.30 (t, J = 3.6 Hz, 2H), 2.18 – 2.00 (m, 6H), 1.68 (s, 3H), 1.60 (s, 3H), 1.14 – 1.03 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 151.0 (1C), 135.2 (2C), 132.4 (1C), 131.6 (1C), 129.6 (1C), 128.0 (2C), 124.1 (1C), 108.3 (1C), 35.8 (1C), 31.4 (1C), 26.4 (1C), 25.7 (1C), 17.7 (1C), 8.3 (1C).

(3-cyclohexylidenepropyl)(phenyl)silane (3ta)



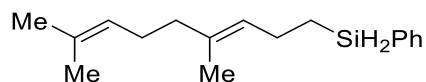
Serial number: sw-3-147, 155.7 mg, 97% yield, 1,2/1,4 = 92:8 (the 1,2/1,4 refers to the ratio of 1,2- and 1,4-*anti*-Markovnikov hydrosilylation product), colorless oil. R_f = 0.64 (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.61 – 7.52 (m, 2H), 7.42 – 7.30 (m, 3H), 5.10 (t, J = 7.1 Hz, 1H), 4.28 (t, J = 3.7 Hz, 2H), 2.15 (q, J = 7.5 Hz, 2H), 2.11 – 1.99 (m, 4H), 1.58 – 1.41 (m, 6H), 1.06 – 0.94 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 139.2 (1C), 135.2 (2C), 132.7 (1C), 129.5 (1C), 127.9 (2C), 122.9 (1C), 37.1 (1C), 28.7 (1C), 28.6 (1C), 27.7 (1C), 27.0 (1C), 22.5 (1C), 10.9 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{15}\text{H}_{22}\text{Si}]^+$: 230.1491, found: 230.1488.

(*E*)-(4,8-dimethylnona-3,7-dien-1-yl)(phenyl)silane (3ua)



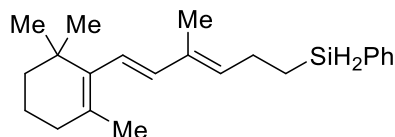
Serial number: sw-3-75, 172.3 mg, 95% yield, 1,2/1,4 = 97:3 (the 1,2/1,4 refers to the ratio of 1,2- and 1,4-*anti*-Markovnikov hydrosilylation product), colorless oil. R_f = 0.81 (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.60 – 7.53 (m, 2H), 7.42 – 7.31 (m, 3H), 5.16 (tq, J = 7.1, 1.4 Hz, 1H), 5.10 (dtd, J = 6.7, 5.2, 4.1, 2.6 Hz, 1H), 4.29 (t, J = 3.7 Hz, 2H), 2.15 (q, J = 7.5 Hz, 2H), 2.09 – 2.00 (m, 2H), 1.99 – 1.92 (m, 2H), 1.68 (s, 3H), 1.60 (s, 3H), 1.56 (s, 3H), 1.05 – 0.96 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 135.2 (2C), 134.7 (1C), 132.7 (1C), 131.3 (1C), 129.5 (1C), 128.0 (2C), 126.1 (1C), 124.4 (1C), 39.7 (1C), 26.7 (1C), 25.7 (1C), 23.2 (1C), 17.7 (1C), 16.0 (1C), 10.5 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{17}\text{H}_{26}\text{Si}]^+$: 258.1804, found: 258.1793.

((3E,5E)-4-methyl-6-(2,6,6-trimethylcyclohex-1-en-1-yl)hexa-3,5-dien-1-yl)(phenyl)silane (3va)



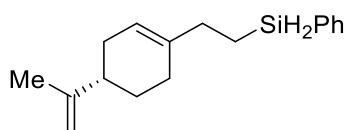
Serial number: llj-1-19, 182.0 mg, 80% yield, 1,2/1,4 > 98:2 (the 1,2/1,4 refers to the ratio of 1,2- and 1,4-*anti*-Markovnikov hydrosilylation product), colorless oil. $R_f = 0.44$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.60 – 7.53 (m, 2H), 7.43 – 7.31 (m, 3H), 5.97 (s, 2H), 5.43 (td, $J = 7.3, 1.4$ Hz, 1H), 4.31 (t, $J = 3.7$ Hz, 2H), 2.30 (q, $J = 7.6$ Hz, 2H), 1.99 (t, $J = 6.3$ Hz, 2H), 1.74 (s, 3H), 1.68 (s, 3H), 1.64 – 1.57 (m, 2H), 1.48 – 1.43 (m, 2H), 1.11 – 1.02 (m, 2H), 1.00 (s, 6H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 137.9 (1C), 137.8 (1C), 135.3 (2C), 133.6 (1C), 132.6 (1C), 132.4 (1C), 129.6 (1C), 128.3 (1C), 128.0 (2C), 124.5 (1C), 39.6 (1C), 34.2 (1C), 32.9 (1C), 28.9 (2C), 23.6 (1C), 21.7 (1C), 19.3 (1C), 12.3 (1C), 10.4 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{22}\text{H}_{32}\text{Si}]^+$: 324.2273, found: 324.2266.

(S)-phenyl(2-(4-(prop-1-en-2-yl)cyclohex-1-en-1-yl)ethyl)silane (3wa)¹³



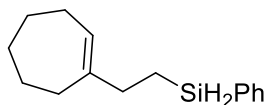
Serial number: sw-3-10, 170.0 mg, 95% yield, 1,2/1,4 > 98:2 (the 1,2/1,4 refers to the ratio of 1,2- and 1,4-*anti*-Markovnikov hydrosilylation product), colorless oil. $R_f = 0.78$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.61 – 7.51 (m, 2H), 7.43 – 7.30 (m, 3H), 5.43 (s, 1H), 4.74 – 4.65 (m, 2H), 4.28 (t, $J = 3.6$ Hz, 2H), 2.13 – 1.75 (m, 8H), 1.72 (s, 3H), 1.47 – 1.33 (m, 1H), 1.12 – 1.01 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 150.3 (1C), 138.6 (1C), 135.2 (2C), 132.6 (1C), 129.5 (1C), 128.0 (2C), 120.0 (1C), 108.4 (1C), 41.2 (1C), 32.7 (1C), 30.7 (1C), 28.6 (1C), 27.8 (1C), 20.8 (1C), 8.2 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{17}\text{H}_{24}\text{Si}]^+$: 256.1647, found: 256.1653.

(2-(cyclohept-1-en-1-yl)ethyl)(phenyl)silane (3xa)¹³

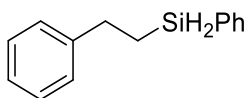


Serial number: sw-4-60, 156.1 mg, 97% yield, 1,2/1,4 = 96:4 (the 1,2/1,4 refers to the ratio of 1,2- and 1,4-*anti*-Markovnikov hydrosilylation product), colorless oil. R_f = 0.68 (PE).

¹H NMR (400 MHz, CDCl₃) δ 7.63 – 7.50 (m, 2H), 7.44 – 7.31 (m, 3H), 5.55 (t, J = 6.5 Hz, 1H), 4.28 (t, J = 3.7 Hz, 2H), 2.14 – 2.01 (m, 6H), 1.71 (p, J = 5.9 Hz, 2H), 1.50 – 1.40 (m, 4H), 1.09 – 0.98 (m, 2H).

¹³C NMR (101 MHz, CDCl₃) δ 145.9 (1C), 135.2 (2C), 132.7 (1C), 129.5 (1C), 127.9 (2C), 125.1 (1C), 35.2 (1C), 32.6 (2C), 28.2 (1C), 27.3 (1C), 26.9 (1C), 8.6 (1C).

phenethyl(phenyl)silane (8aa)¹⁴

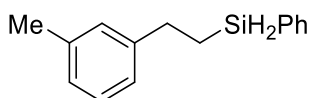


Serial number: lmp-1-109, 147 mg, 99% yield, colorless oil. R_f = 0.64 (PE).

¹H NMR (400 MHz, CDCl₃) δ 7.59 – 7.52 (m, 2H), 7.43 – 7.31 (m, 3H), 7.30 – 7.23 (m, 2H), 7.22 – 7.13 (m, 3H), 4.32 (t, J = 3.6 Hz, 2H), 2.80 – 2.72 (m, 2H), 1.33 – 1.25 (m, 2H).

¹³C NMR (101 MHz, CDCl₃) δ 143.9 (1C), 135.2 (2C), 132.1 (1C), 129.6 (1C), 128.3 (2C), 128.0 (2C), 127.9 (2C), 125.8 (1C), 31.1 (1C), 12.1 (1C).

(3-methylphenethyl)(phenyl)silane (8ba)³



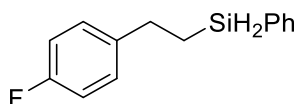
Serial number: sw-3-183, 150.0 mg, 95% yield, colorless oil. R_f = 0.32 (PE).

¹H NMR (400 MHz, CDCl₃) δ 7.60 – 7.52 (m, 2H), 7.44 – 7.31 (m, 3H), 7.21 – 7.12 (m, 1H), 7.02 – 6.95 (m, 3H), 4.31 (t, J = 3.6 Hz, 2H), 2.77 – 2.68 (m, 2H), 2.31 (s, 3H), 1.33

– 1.24 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 143.9 (1C), 137.9 (1C), 135.2 (2C), 132.2 (1C), 129.6 (1C), 128.7 (1C), 128.2 (1C), 128.0 (2C), 126.5 (1C), 124.9 (1C), 31.0 (1C), 21.4 (1C), 12.1 (1C).

(4-fluorophenethyl)(phenyl)silane (8ca)¹⁴

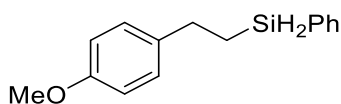


Serial number: Imp-2-99, 159 mg, 99% yield, colorless oil. R_f = 0.75 (PE)

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.60 – 7.51 (m, 2H), 7.44 – 7.31 (m, 3H), 7.16 – 7.06 (m, 2H), 7.00 – 6.89 (m, 2H), 4.30 (t, J = 3.6 Hz, 2H), 2.78 – 2.68 (m, 2H), 1.32 – 1.22 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 161.2 (J = 242.4 Hz, 1C), 139.5 (1C), 135.2 (2C), 132.0 (1C), 129.7 (1C), 129.2 (2C), 128.0 (2C), 115.1 (1C), 114.9 (1C), 30.3 (1C), 12.3 (1C).

(4-methoxyphenethyl)(phenyl)silane(8da)¹⁴

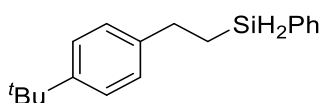


Serial number: Imp-4-87, 163.0 mg, 96% yield, colorless oil. R_f = 0.61 (PE/EA = 20:1, v/v).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.59 – 7.54 (m, 2H), 7.41 – 7.33 (m, 3H), 7.13 – 7.08 (m, 2H), 6.84 – 6.79 (m, 2H), 4.30 (t, J = 3.6 Hz, 2H), 3.79 (s, 3H), 2.75 – 2.68 (m, 2H), 1.31 – 1.23 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 157.7 (1C), 136.0 (1C), 135.2 (2C), 132.2 (1C), 129.6 (1C), 128.8 (2C), 128.0 (2C), 113.7 (2C), 55.2 (1C), 30.2 (1C), 12.3 (1C).

(4-(tert-butyl)phenethyl)(phenyl)silane (8ea)¹⁵

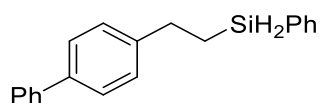


Serial number: sw-3-175, 178.6 mg, 95% yield, colorless oil. R_f = 0.45 (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.58 – 7.51 (m, 2H), 7.42 – 7.32 (m, 3H), 7.32 – 7.27 (m, 2H), 7.15 – 7.09 (m, 2H), 4.32 (t, $J = 3.6$ Hz, 2H), 2.78 – 2.69 (m, 2H), 1.33 – 1.26 (m, 11H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 148.6 (1C), 141.0 (1C), 135.3 (2C), 132.3 (1C), 129.7 (1C), 128.1 (2C), 127.6 (2C), 125.3 (2C), 34.4 (1C), 31.5 (3C), 30.6 (1C), 12.0 (1C).

(2-([1,1'-biphenyl]-4-yl)ethyl)(phenyl)silane (8fa)



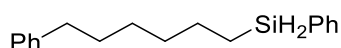
Serial number: sw-3-176, 194.2 mg, 96% yield, colorless oil. $R_f = 0.50$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.62 – 7.54 (m, 4H), 7.53 – 7.47 (m, 2H), 7.46 – 7.29 (m, 6H), 7.28 – 7.23 (m, 2H), 4.35 (t, $J = 3.6$ Hz, 2H), 2.87 – 2.74 (m, 2H), 1.39 – 1.29 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 143.2 (1C), 141.2 (1C), 138.9 (1C), 135.3 (2C), 132.2 (1C), 129.7 (1C), 128.8 (2C), 128.4 (2C), 128.1 (2C), 127.2 (2C), 127.1 (3C), 30.8 (1C), 12.2 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{20}\text{H}_{20}\text{Si}]^+$: 288.1334, found: 288.1329.

phenyl(6-phenylhexyl)silane (8ga)



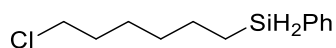
Serial number: lmp-4-68, 176.3 mg, 94% yield, colorless oil. $R_f = 0.41$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.59 – 7.53 (m, 2H), 7.42 – 7.32 (m, 3H), 7.30 – 7.24 (m, 2H), 7.17 (m, 3H), 4.28 (t, $J = 3.7$ Hz, 2H), 2.63 – 2.54 (m, 2H), 1.65 – 1.55 (m, 2H), 1.51 – 1.28 (m, 6H), 0.97 – 0.88 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 142.8 (1C), 135.2 (2C), 132.7 (1C), 129.5 (1C), 128.4 (2C), 128.2 (2C), 127.9 (2C), 125.5 (1C), 35.9 (1C), 32.6 (1C), 31.3 (1C), 28.9 (1C), 25.0 (1C), 10.0 (1C).

HRMS (EI) calculated for $[\text{M}, \text{C}_{18}\text{H}_{24}\text{Si}]^+$: 268.1647, found: 268.1642.

(6-chlorohexyl)(phenyl)silane (8ha)³

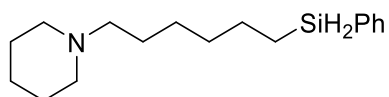


Serial number: Imp-4-6, 133.3 mg, 84% yield, colorless oil. $R_f = 0.72$ (PE).

¹H NMR (400 MHz, CDCl₃) δ 7.62 – 7.52 (m, 2H), 7.43 – 7.33 (m, 3H), 4.29 (t, $J = 3.7$ Hz, 2H), 3.52 (t, $J = 6.7$ Hz, 2H), 1.75 (p, $J = 6.7$ Hz, 2H), 1.53 – 1.34 (m, 6H), 0.98 – 0.91 (m, 2H).

¹³C NMR (101 MHz, CDCl₃) δ 135.2 (2C), 132.6 (1C), 129.5 (1C), 127.9 (2C), 45.1 (1C), 32.5 (1C), 32.0 (1C), 26.5 (1C), 24.9 (1C), 9.9 (1C).

1-(6-(phenylsilyl)hexyl)piperidine (8ia)



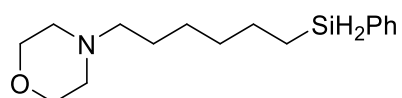
Serial number: Imp-4-1, 162.0 mg, 84% yield, colorless oil. $R_f = 0.15$ (PE/EA = 1:1, v/v).

¹H NMR (400 MHz, CDCl₃) δ 7.59 – 7.53 (m, 2H), 7.41 – 7.31 (m, 3H), 4.27 (t, $J = 3.7$ Hz, 2H), 2.34 (br, 4H), 2.28 – 2.21 (m, 2H), 1.58 (p, $J = 5.7$ Hz, 4H), 1.50 – 1.34 (m, 8H), 1.30 – 1.23 (m, 2H), 0.96 – 0.89 (m, 2H).

¹³C NMR (101 MHz, CDCl₃) δ 135.1 (2C), 132.6 (1C), 129.4 (1C), 127.9 (2C), 59.6 (1C), 54.6 (2C), 32.7 (1C), 27.3 (1C), 26.8 (1C), 26.0 (2C), 24.9 (1C), 24.5 (1C), 9.9 (1C).

HRMS (EI) calcd for [M, C₁₇H₂₉NSi]⁺: 275.2069, found: 275.2063.

4-(6-(phenylsilyl)hexyl)morpholine (8ja)³



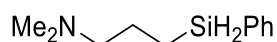
Serial number: Imp-4-22, 169 mg, 87% yield, yellow oil. $R_f = 0.33$ (PE/EA = 1:1, v/v)

¹H NMR (400 MHz, CDCl₃) δ 7.63 – 7.50 (m, 2H), 7.42 – 7.32 (m, 3H), 4.28 (t, $J = 3.7$ Hz, 2H), 3.71 (t, $J = 4.7$ Hz, 4H), 2.48 – 2.26 (m, 6H), 1.50 – 1.24 (m, 8H), 0.99 – 0.87

(m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 135.2 (2C), 132.7 (1C), 129.5 (1C), 127.9 (2C), 67.0 (2C), 59.2 (1C), 53.8 (2C), 32.7 (1C), 27.1 (1C), 26.4 (1C), 25.0 (1C), 9.9 (1C).

N,N-dimethyl-3-(phenylsilyl)propan-1-amine (8ka)¹⁶

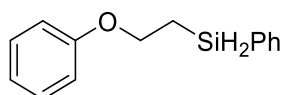


Serial number: sw-4-80, 108.1 mg, 80% yield, colorless oil. The reaction mixture was directly desolvated by vacuum under reduced pressure, and the resulting crude product was distilled under reduced pressure using a high vacuum pump, and the fraction was collected as the pure product.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.59 – 7.53 (m, 2H), 7.42 – 7.31 (m, 3H), 4.31 (t, $J = 3.7$ Hz, 2H), 2.31 – 2.25 (m, 2H), 2.19 (s, 6H), 1.67 – 1.57 (m, 2H), 0.98 – 0.91 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 135.1 (2C), 133.0 (1C), 129.4 (1C), 127.9 (2C), 62.2 (1C), 45.4 (2C), 23.2 (1C), 7.8 (1C).

(2-phenoxyethyl)(phenyl)silane (8la)



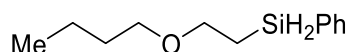
Serial number: sw-4-55, 153.2 mg, 96% yield, colorless oil. $R_f = 0.61$ (PE/EA = 20:1, v/v).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.66 – 7.54 (m, 2H), 7.44 – 7.32 (m, 3H), 7.29 – 7.20 (m, 2H), 6.97 – 6.90 (m, 1H), 6.89 – 6.82 (m, 2H), 4.40 (t, $J = 3.6$ Hz, 2H), 4.13 (t, $J = 7.7$ Hz, 2H), 1.59 – 1.49 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 158.6 (1C), 135.3 (2C), 131.4 (1C), 129.8 (1C), 129.4 (2C), 128.1 (2C), 120.7 (1C), 114.6 (2C), 65.1 (1C), 11.7 (1C).

HRMS (EI) calcd for $[\text{M}, \text{C}_{14}\text{H}_{16}\text{OSi}]^+$: 228.0970, found: 228.0966.

(2-butoxyethyl)(phenyl)silane (8ma)



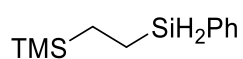
Serial number: imp-3-144, 137.0 mg, 94% yield, colorless oil. Amount of EtMgBr, 5 mol%. R_f = 0.63 (PE/EA = 20:1, v/v).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.61 – 7.56 (m, 2H), 7.42 – 7.32 (m, 3H), 4.31 (t, J = 3.6 Hz, 2H), 3.55 (t, J = 7.8 Hz, 2H), 3.39 (t, J = 6.6 Hz, 2H), 1.59 – 1.49 (m, 2H), 1.41 – 1.31 (m, 4H), 0.91 (t, J = 7.3 Hz, 3H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 135.2 (2C), 132.0 (1C), 129.6 (1C), 128.0 (2C), 70.3 (1C), 67.7 (1C), 31.8 (1C), 19.4 (1C), 13.9 (1C), 12.1 (1C).

HRMS (EI) calcd for $[\text{M}, \text{C}_{12}\text{H}_{20}\text{OSi}]^+$: 208.1283, found: 208.1288.

trimethyl(2-(phenylsilyl)ethyl)silane (8na)¹⁷

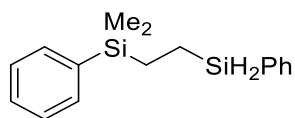


Serial number: sw-4-52, 136.8 mg, 94% yield, colorless oil. Complex **C1d** was used as the catalyst. R_f = 0.76 (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.62 – 7.55 (m, 2H), 7.43 – 7.32 (m, 3H), 4.31 (t, J = 3.6 Hz, 2H), 0.91 – 0.82 (m, 2H), 0.62 – 0.53 (m, 2H), -0.02 (s, 9H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 135.2 (2C), 132.9 (1C), 129.5 (1C), 127.9 (2C), 10.6 (1C), 2.7 (1C), -2.1 (3C).

dimethyl(phenyl)(2-(phenylsilyl)ethyl)silane (8oa)



Serial number: sw-3-180, 176.0 mg, 93% yield, colorless oil. R_f = 0.45 (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.55 – 7.46 (m, 4H), 7.42 – 7.30 (m, 6H), 4.27 (t, J = 3.3 Hz, 2H), 0.89 – 0.77 (m, 4H), 0.26 (s, 6H).

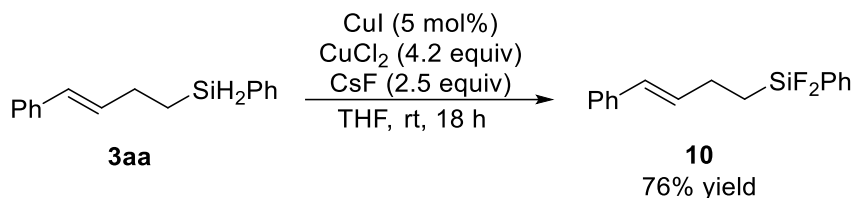
$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 139.0 (1C), 135.3 (2C), 133.7 (2C), 132.7 (1C), 129.6 (1C), 128.9 (1C), 128.0 (2C), 127.8 (2C), 9.8 (1C), 2.8 (1C), -3.5 (2C).

HRMS (ESI) calculated for $[\text{M-H}, \text{C}_{16}\text{H}_{21}\text{Si}_2]^-$: 269.1187, found: 269.1176.

^{13}C NMR (101 MHz, CDCl_3) δ 137.8 (1C), 134.3 (2C), 132.8 (1C), 130.2 (1C), 128.7 (1C), 128.4 (2C), 128.0 (2C), 126.7 (2C), 125.9 (2C), 50.7 (2C), 26.0 (1C), 12.0 (1C).

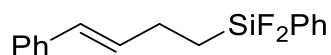
HRMS (EI) calculated for $[\text{M}, \text{C}_{18}\text{H}_{22}\text{O}_2\text{Si}]^+$: 298.1389, found: 298.1383.

6.3 Synthesis of (*E*)-difluoro(phenyl)(4-phenylbut-3-en-1-yl)silane (**10**)³



To a Schlenk tube (15 mL) was charged with CuI (2.9 mg, 0.015 mmol, 5 mol%), CuCl₂ (168.8 mg, 1.26 mmol, 4.2 equiv) and CsF (115.5 mg, 0.76 mmol, 2.5 equiv), the tube was replaced with argon and anhydrous THF (2 mL) was added. Then **3aa** (71.4 mg, 0.3 mmol) was added dropwise at room temperature and stirred for 18 h. When the reaction was finished, the mixture was concentrated by rotating evaporation. The resulting crude product was distilled under reduced pressure using a high vacuum pump, and the fraction was collected as **10** as a colorless oil (62.5 mg, 76% yield).

(*E*)-difluoro(phenyl)(4-phenylbut-3-en-1-yl)silane (**10**)



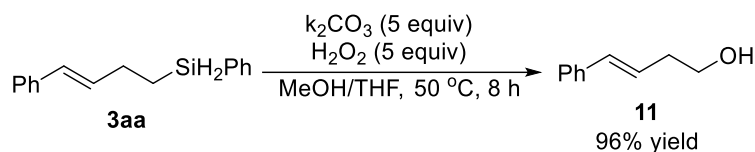
Serial number: sw-4-162, 62.5 mg, 76% yield, colorless oil.

^1H NMR (400 MHz, CDCl_3) δ 7.71 – 7.61 (m, 2H), 7.58 – 7.50 (m, 1H), 7.48 – 7.40 (m, 2H), 7.34 – 7.26 (m, 4H), 7.24 – 7.16 (m, 1H), 6.39 (d, $J = 16.1$ Hz, 1H), 6.22 (dt, $J = 15.6, 6.6$ Hz, 1H), 2.50 – 2.37 (m, 2H), 1.30 – 1.22 (m, 2H).

^{13}C NMR (101 MHz, CDCl_3) δ 137.4 (1C), 133.7 (1C), 131.9 (1C), 130.9 (1C), 129.9 (1C), 129.0 ($J = 20.2$ Hz, 1C), 128.5 (2C), 128.3 (2C), 127.1 (2C), 126.0 (2C), 24.9 (1C), 12.0 ($J = 20.2$ Hz, 1C).

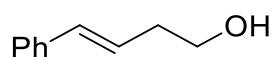
HRMS (EI) calculated for $[\text{M}, \text{C}_{16}\text{H}_{16}\text{F}_2\text{Si}]^+$: 274.0989, found: 274.0985.

6.4 Synthesis of (*E*)-4-phenylbut-3-en-1-ol (**11**)³



To a solution of **3aa** (71.4 mg, 0.3 mmol, 1.0 equiv) in MeOH and THF (3 mL, MeOH/THF = 1:1, v/v), K₂CO₃ (207 mg, 1.5 mmol, 5.0 equiv) and hydrogen peroxide (0.18 mL, 5 equiv, 30% aqueous solution) were added in sequence. Then the mixture was stirred at 50 °C. After 8 h, the mixture was extracted with EtOAc and then the organic layer was separated and washed with brine, dried over anhydrous Na₂SO₄ and concentrated in vacuo. The residue was purified by column chromatography to afford the desired products **11** as a colorless oil (42.5 mg, 96% yield).

(*E*)-4-phenylbut-3-en-1-ol (**11**)

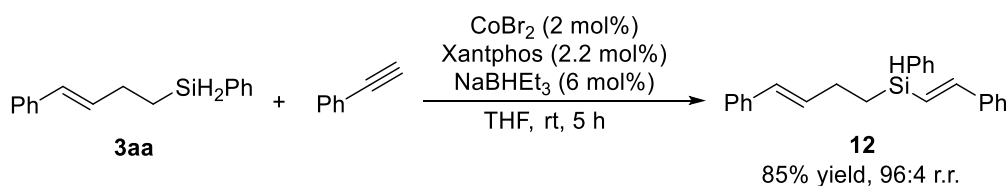


Serial number: sw-4-131, 42.5 mg, 96% yield, colorless oil. *R*_f = 0.35 (PE/EA = 5:1, v:v).

¹H NMR (400 MHz, CDCl₃) δ 7.39 – 7.28 (m, 4H), 7.25 – 7.18 (m, 1H), 6.50 (d, *J* = 15.8 Hz, 1H), 6.21 (dt, *J* = 15.8, 7.1 Hz, 1H), 3.76 (t, *J* = 6.3 Hz, 2H), 2.54 – 2.43 (m, 2H), 1.64 – 1.54 (br, 1H).

¹³C NMR (101 MHz, CDCl₃) δ 137.2 (1C), 132.8 (1C), 128.5 (2C), 127.2 (1C), 126.3 (1C), 126.1 (2C), 62.0 (1C), 36.4 (1C).

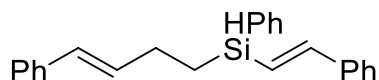
6.5 Synthesis of phenyl(*E*)-4-phenylbut-3-en-1-yl(*E*)-styryl)silane (**12**)¹⁸



In an argon-filled glovebox, a vial (10 mL) was charged with CoBr₂ (1.3 mg, 0.006 mmol, 2 mol%), Xantphos (3.8 mg, 0.0066 mmol, 2.2 mol%) and anhydrous THF (2 mL), the mixture was stirred at room temperature for 2 h. Then **3aa** (71.4 mg, 0.3 mmol, 1.0 equiv) and phenylacetylene (30.6 mg, 0.3 mmol, 1.0 equiv) were added. The vial was removed from the glovebox after NaBHET₃ (1 M in THF, 18 μL, 0.018 mmol, 6.0 mol%) was added and the

reaction mixture was stirred at room temperature for 3 h. When the reaction was finished, the mixture was concentrated by rotating evaporation. The residue was purified by chromatography to afford the desired products **12** as a colorless oil (86.3 mg, 85% yield, 96:4 r.r.).

phenyl((E)-4-phenylbut-3-en-1-yl)((E)-styryl)silane (12**)**



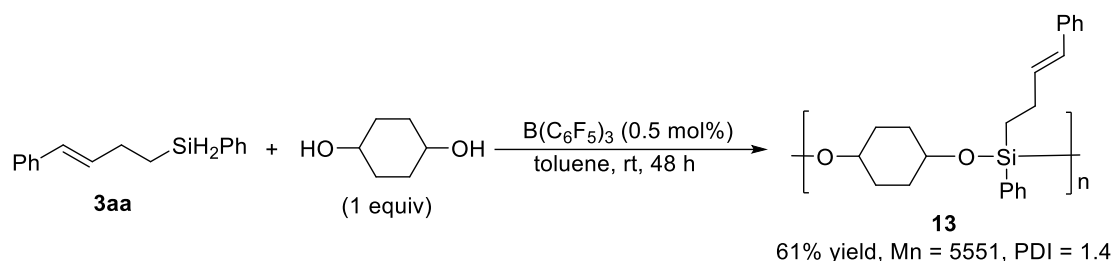
Serial number: sw-4-170, 86.3 mg, 85% yield, 96:4 r.r., colorless oil. $R_f = 0.54$ (PE).

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.65 – 7.57 (m, 2H), 7.44 – 7.25 (m, 12H), 7.21 – 7.16 (m, 1H), 7.08 (d, $J = 19.1$ Hz, 1H), 6.56 (dd, $J = 19.1, 3.4$ Hz, 1H), 6.37 (d, $J = 15.9$ Hz, 1H), 6.28 (dt, $J = 15.8, 6.3$ Hz, 1H), 4.70 (q, $J = 3.5$ Hz, 1H), 2.39 (dt, $J = 9.7, 6.5$ Hz, 2H), 1.26 – 1.19 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 147.9 (1C), 137.9 (1C), 137.7 (1C), 134.9 (2C), 134.4 (1C), 132.7 (1C), 129.6 (1C), 129.0 (1C), 128.6 (2C), 128.4 (3C), 128.0 (2C), 126.8 (1C), 126.6 (2C), 125.9 (2C), 122.3 (1C), 27.8 (1C), 12.1 (1C).

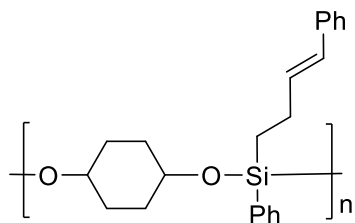
HRMS (EI) calculated for $[\text{M}, \text{C}_{24}\text{H}_{24}\text{Si}]^+$: 340.1647, found: 340.1640.

6.6 Synthesis of polyorganosiloxane **13**



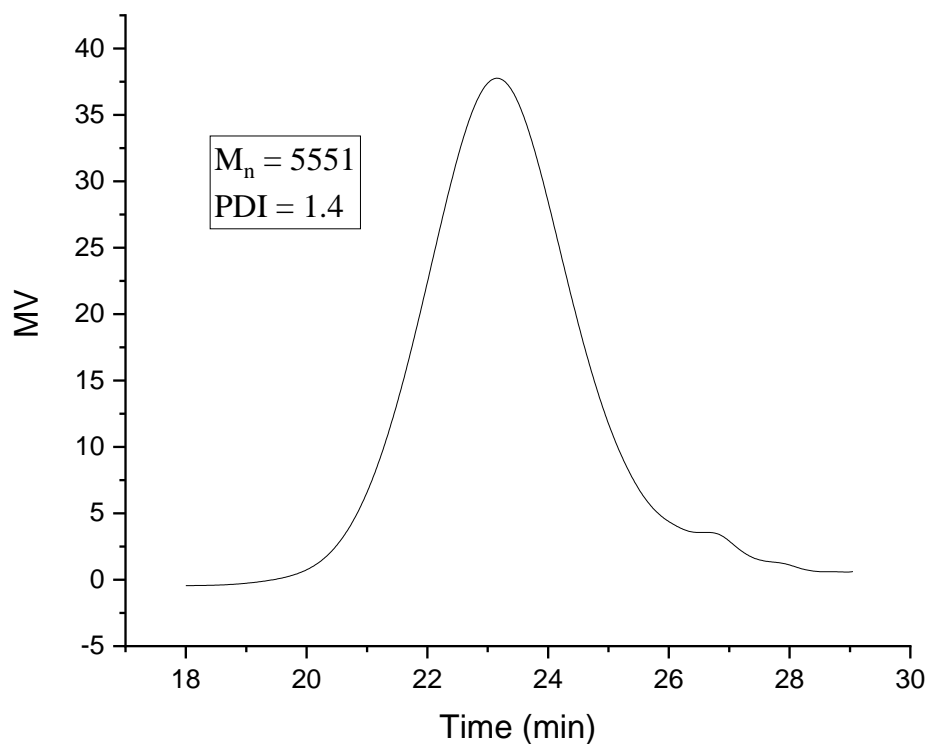
In an argon-filled glovebox, a Schlenk tube (25 mL) was charged with 1,4-cyclohexanediol (116 mg, 1 mmol, 1 equiv), $\text{B}(\text{C}_6\text{F}_5)_3$ (2.6 mg, 0.005 mmol, 0.5 mol%), anhydrous toluene (3 mL) and **3aa** (238 mg, 1 mmol, 1.0 equiv) successively. The tube was removed from the glovebox, connected to an argon filled balloon and stirred at room temperature for 48 h. When the reaction was finished, the mixture was concentrated by rotating evaporation. The residue was dissolved in THF (1 mL), which was added dropwise to hexane

(50 mL). The emulsion formed was centrifuged, and the residue obtained after removing the supernatant was re-precipitated and centrifuged twice more according to the above method. The final residue was collected and dried under vacuum as the target product **13** as solid-liquid mixtures (213.5 mg, 61% yield). The M_n and M_w/M_n values were determined by GPC with THF solvent and polystyrene standards, $M_n = 5551$, $M_w/M_n = 1.4$.



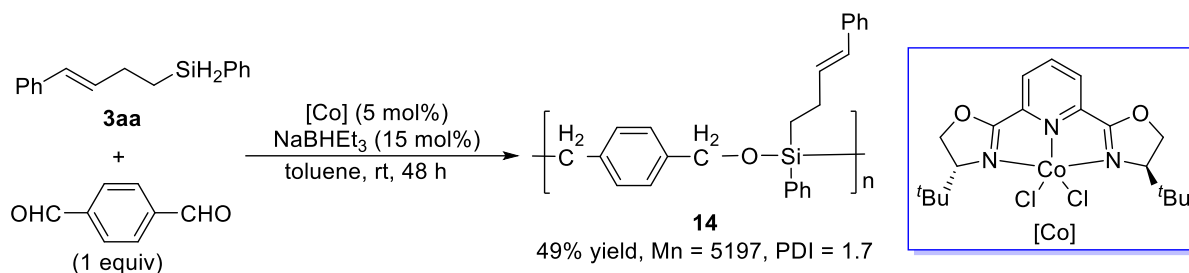
Serial number: sw-5-19B, 213.5 mg, 61% yield, solid-liquid mixtures.

¹H NMR (400 MHz, CDCl₃) δ 7.6 – 7.53 (m, 2H), 7.43 – 7.29 (m, 3H), 7.28 – 7.18 (m, 4H), 7.17 – 7.09 (m, 1H), 6.40 – 6.06 (m, 2H), 3.97 – 3.68 (m, 2H), 2.35 – 2.15 (m, 2H), 1.99 – 1.73 (m, 4H), 1.46 – 1.30 (m, 4H), 1.07 – 0.92 (m, 2H).

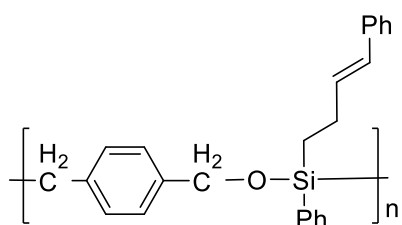


Scheme S1 GPC Spectra of Polymer13

6.7 Synthesis of polyorganosiloxane **14**¹⁹

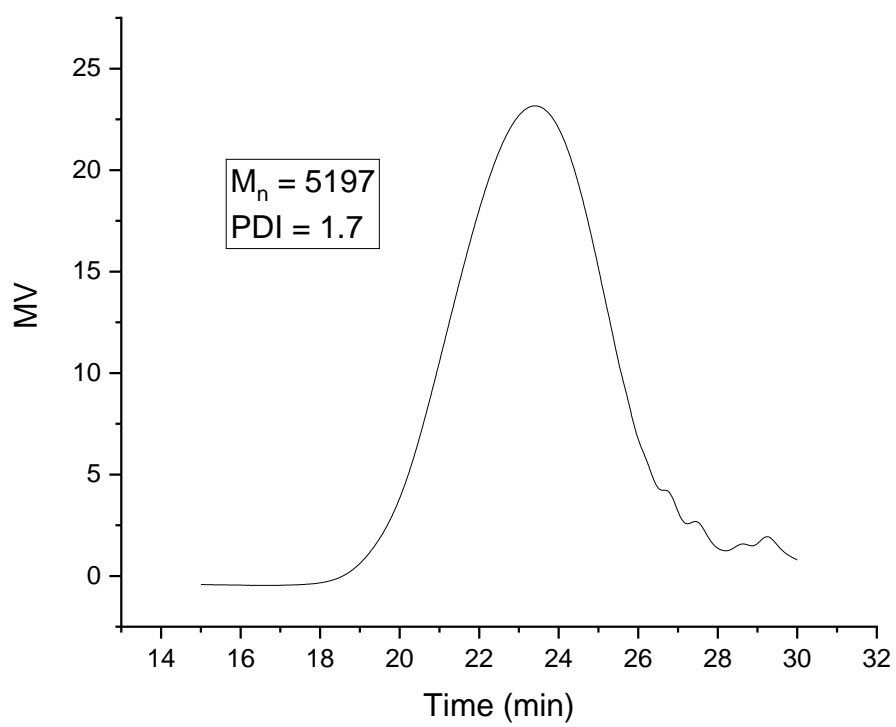


In an argon-filled glovebox, a vial (10 mL) was charged with [Co] (11.5 mg, 0.025 mmol, 5 mol%), anhydrous toluene (3 mL), **3aa** (119 mg, 0.5 mmol) and terephthalaldehyde (67 mg, 0.5 mmol, 1.0 equiv) successively. The vial was removed from the glovebox after NaBEt₃H (1.0 M in THF, 75 μ L, 0.075 mmol, 15 mol%) was added and stirred at room temperature for 48 h. When the reaction was finished, the mixture was concentrated by rotating evaporation. The residue was dissolved in THF (1 mL), which was added dropwise to hexane (50 mL). The emulsion formed was centrifuged, and the residue obtained after removing the supernatant was re-precipitated and centrifuged twice more according to the above method. The final residue was collected and dried under vacuum as the target product **14** as brown viscous liquid (91.2 mg, 49% yield). The M_n and M_w/M_n values were determined by GPC with THF solvent and polystyrene standards, M_n = 5197, M_w/M_n = 1.7.



Serial number: sw-4-190, 91.2 mg, 49% yield, brown viscous liquid.

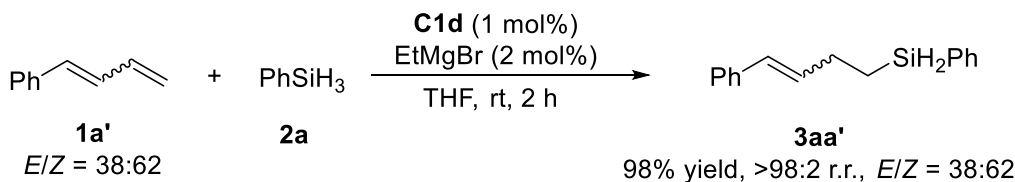
¹H NMR (400 MHz, CDCl₃) δ 7.73 – 7.19 (m, 14H), 6.50-5.95 (m, 2H), 5.00 – 4.55 (m, 4H), 2.50 – 2.00 (m, 2H), 1.22 – 0.98 (m, 2H).



Scheme S2 GPC Spectra of Polymer 14

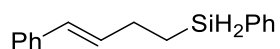
7. Mechanistic studies

7.1 Hydrosilylation of an *E/Z* mixture of 1,3-diene **1a'**



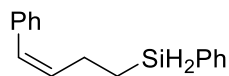
In an argon-filled glovebox, a vial (10 mL) was charged with complexes **C1d** (3.6 mg, 0.005 mmol), dry anhydrous THF (1 mL), 1,3-dienes **1a'** (65 mg, 0.5 mmol, *E/Z* = 38:62) and silanes **2a** (59.4 mg, 0.55 mmol, 1.1 equiv) successively. The reaction mixture was stirred at room temperature for 2 h after EtMgBr (1 M in THF, 10 μ L, 0.01 mmol, 2.0 mol%) was added. The vial was removed from the glovebox and the reaction mixture was concentrated by rotating evaporation. The residue was purified by column chromatography to afford the products **3aa'** as a colorless oil (117 mg, 98% yield, >98:2 r.r., *E/Z* = 38:62).

(*E*)-phenyl(4-phenylbut-3-en-1-yl)silane (**E-3aa**)¹²



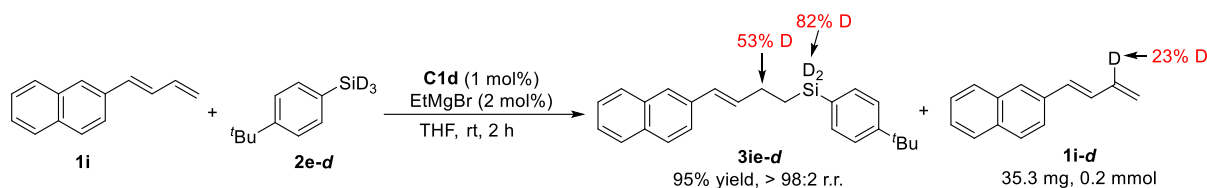
¹H NMR (400 MHz, CDCl₃) δ 7.62 – 7.56 (m, 2H), 7.44 – 7.15 (m, 8H), 6.43 – 6.33 (m, 1H), 6.25 (dt, *J* = 15.6, 6.5 Hz, 1H), 4.34 (t, *J* = 3.3 Hz, 2H), 2.37 (q, *J* = 7.4 Hz, 2H), 1.19 – 1.03 (m, 2H).

(*Z*)-phenyl(4-phenylbut-3-en-1-yl)silane (**Z-3aa**)²⁰

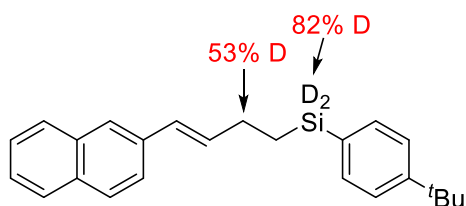


¹H NMR (400 MHz, CDCl₃) δ 7.56 – 7.49 (m, 2H), 7.44 – 7.15 (m, 8H), 6.43 – 6.33 (m, 1H), 5.70 (dt, *J* = 11.5, 7.3 Hz, 1H), 4.31 (q, *J* = 3.3 Hz, 2H), 2.48 (q, *J* = 7.7 Hz, 2H), 1.19 – 1.03 (m, 2H).

7.2 Deuterium labelling experiments



In an argon-filled glovebox, a vial (10 mL) was charged with complexes **C1d** (1.42 mg, 0.002 mmol), dry anhydrous THF (1 mL), **1i** (72 mg, 0.4 mmol, 2 equiv) and silane **2e-d** (33.4 mg, 0.20 mmol) successively. The reaction mixture was stirred at room temperature for 2 h after **EtMgBr** (1 M in THF, 4 μ L, 0.004 mmol, 2.0 mol%) was added. The vial was removed from the glovebox and the reaction mixture was concentrated by rotating evaporation. The residue was purified by column chromatography to afford the products **3ie-d** (65.8 mg, 95% yield, >98:2 r.r.) and **1i-d** (35.3 mg, 98% recovery). The ^2H NMR spectroscopy was measured with CDCl_3 as an internal standard, and the 1,3,5-trimethoxybenzene was used as an internal standard to determine the ratio of product and CDCl_3 by ^1H NMR.



3ie-d, 65.8 mg, 95% yield, >98:2 r.r., colorless oil, $R_f = 0.22$ (PE).

^1H NMR (400 MHz, CDCl_3) δ 7.79 – 7.70 (m, 3H), 7.64 (s, 1H), 7.57 – 7.49 (m, 3H), 7.47 – 7.35 (m, 4H), 6.53 (d, $J = 15.7$ Hz, 1H), 6.37 (dt, $J = 15.7, 6.3$ Hz, 1H), 4.35 (q, $J = 3.8$ Hz, 0.36 H), 2.47 – 2.36 (m, 0.95 H), 1.32 (s, 9H), 1.14 (d, $J = 8.0$ Hz, 2H).

^{13}C NMR (101 MHz, CDCl_3) δ 152.8 (1C), 135.3 (2C), 135.2 (1C), 133.7 (1C), 132.8 (1C), 132.7 (1C), 129.4 (1C), 128.6 (1C), 128.1 (1C), 127.9 (1C), 127.7 (1C), 126.2 (1C), 125.5 (2C), 125.1 (2C), 123.6 (1C), 34.8 (1C), 31.3 (3C), 28.3 (1C), 9.9 (1C).

The ^2H NMR analysis is well consistent with the ^1H NMR analysis. See followed spectrum:

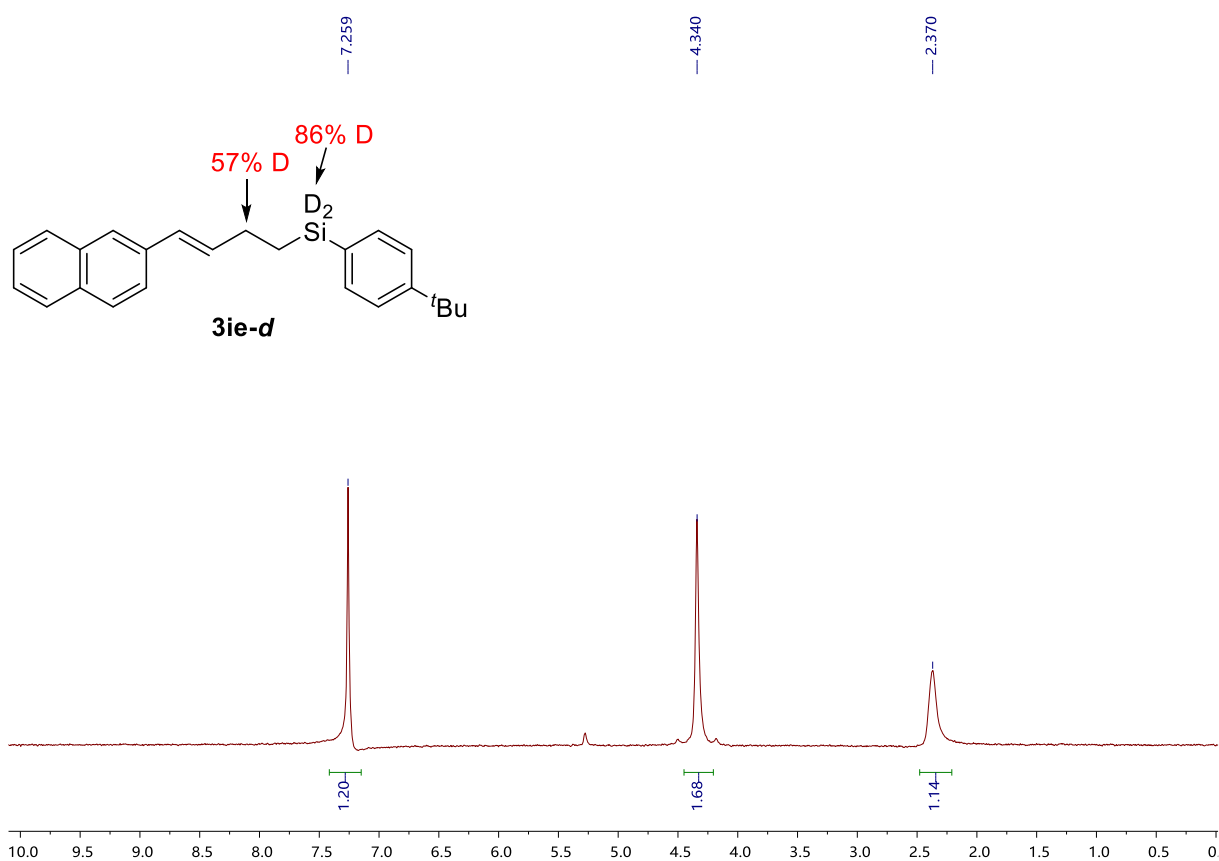
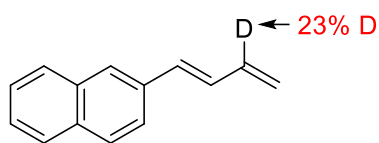


Figure S1. ^2H NMR of the product **3ie-d**. CDCl_3 (1.20 equiv) was used as an internal standard..



1i-d, 35.3 mg, 0.2 mmol, white solid.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.82 – 7.71 (m, 4H), 7.65 – 7.58 (m, 1H), 7.48 – 7.38 (m, 2H), 6.96 – 6.86 (m, 1H), 6.72 (d, $J = 15.6$ Hz, 1H), 6.56 (dt, $J = 16.9, 10.2$ Hz, 0.77 H), 5.38 (dd, $J = 16.8, 1.4$ Hz, 1H), 5.20 (dd, $J = 9.9, 1.5$ Hz, 1H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 137.3 (1C), 134.6 (1C), 133.7 (1C), 133.0 (1C), 132.9 (1C), 130.0 (1C), 128.3 (1C), 128.0 (1C), 127.7 (1C), 126.6 (1C), 126.3 (1C), 125.9 (1C), 123.5 (1C), 117.8 (1C).

The $^2\text{H NMR}$ analysis is well consistent with the $^1\text{H NMR}$ analysis. See followed spectrum:

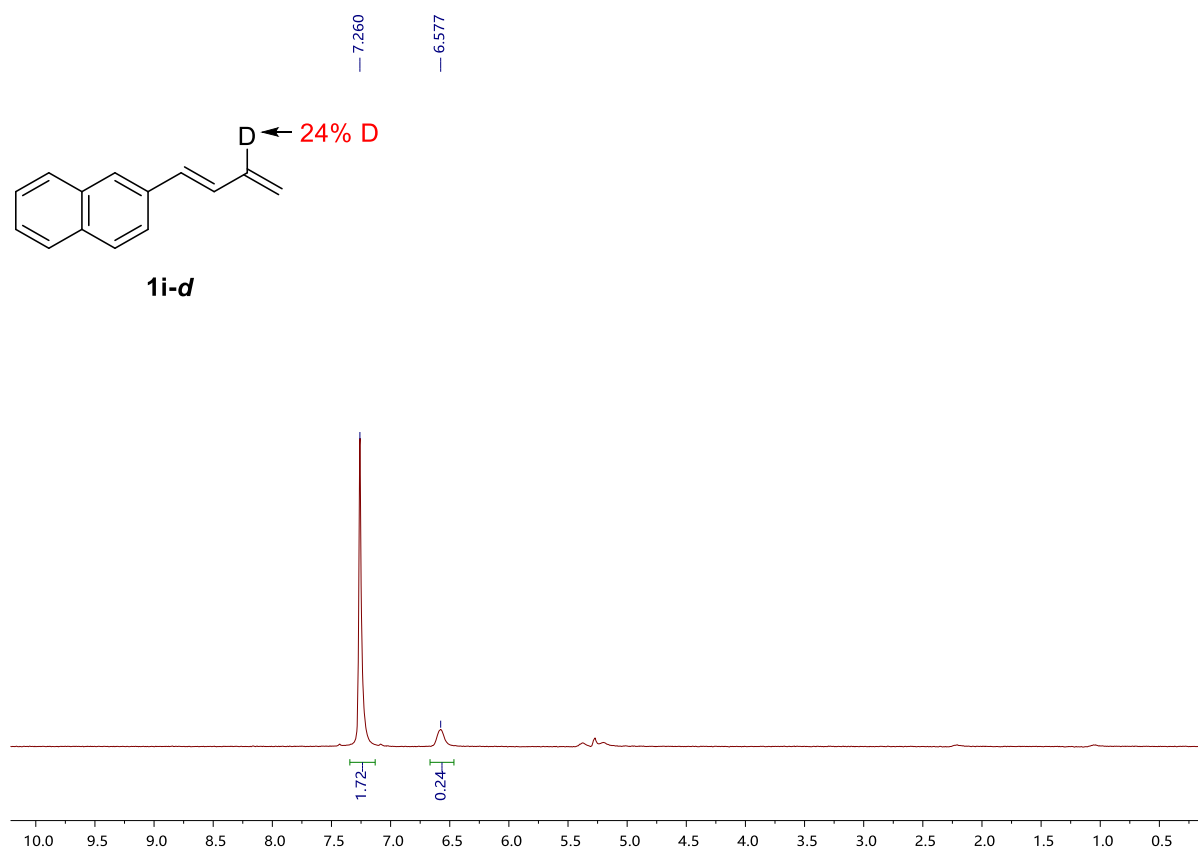
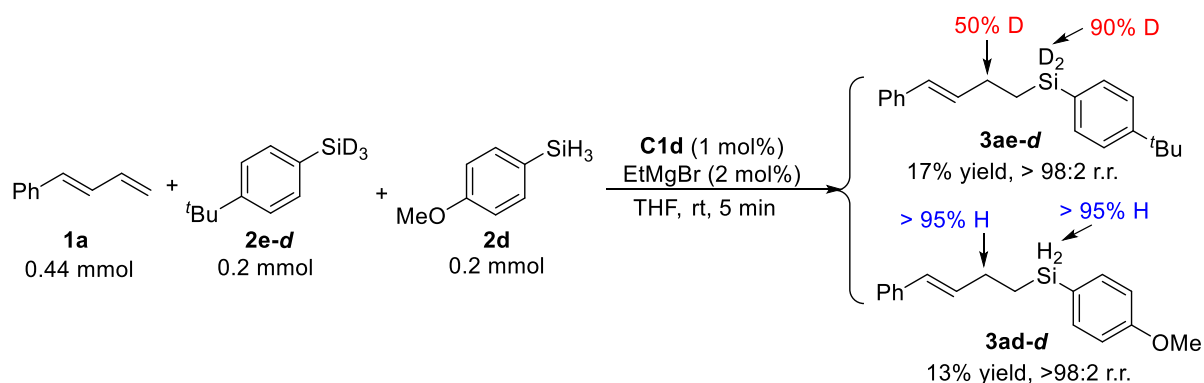
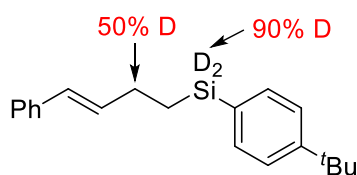


Figure S2. $^2\text{H NMR}$ of the product **1i-d**. CDCl_3 (1.72 equiv) was used as an internal standard.

7.3 Mixture silanes experiment



In an argon-filled glovebox, a vial (10 mL) was charged with complexes **C1d** (2.8 mg, 0.004 mmol), dry anhydrous THF (1 mL), conjugated diene **1a** (57.2 mg, 0.44 mmol, 2.2 equiv), silanes **2e-d** (33.4 mg, 0.2 mmol, 1.0 equiv) and **2d** (27.6 mg, 0.2 mmol, 1 equiv) successively. The reaction mixture was stirred at room temperature for 5 min after **EtMgBr** (1 M in THF, 8 μL , 0.004 mmol, 2.0 mol%) was added. The vial was removed from the glovebox and quenched with 2 drops water, the reaction mixture was concentrated by rotating evaporation. The residue was purified by column chromatography to afford the products **3ae-d** (20 mg, 17% yield, >98:2 r.r.) and **3ad-d** (14 mg, 13% yield, >98:2 r.r.). The ^2H NMR spectroscopy was measured with CDCl_3 as an internal standard, and the 1,3,5-trimethoxybenzene was used as an internal standard to determine the ratio of product and CDCl_3 by ^1H NMR.



3ae-d, 20 mg, 17% yield, >98:2 r.r., colorless oil.

^1H NMR (400 MHz, CDCl_3) δ 7.55 – 7.50 (m, 2H), 7.43 – 7.37 (m, 2H), 7.33 – 7.26 (m, 4H), 7.22 – 7.16 (m, 1H), 6.38 (d, $J = 16.4$, 1H), 6.24 (dd, $J = 15.8, 6.4$ Hz, 1H), 4.32 (q, $J = 3.8$ Hz, 0.24 H), 2.42 – 2.31 (m, 0.98 H), 1.32 (s, 9H), 1.11 (d, $J = 8.0$ Hz, 2H).

^{13}C NMR (101 MHz, CDCl_3) δ 152.7 (1C), 137.7 (1C), 135.2 (2C), 132.3 (1C), 129.2 (1C), 128.6 (1C), 128.4 (2C), 126.8 (1C), 126.0 (2C), 125.0 (2C), 34.7 (1C), 31.2 (3C), 28.1 (1C), 9.8 (1C).

The ^2H NMR analysis is well consistent with the ^1H NMR analysis. See followed spectrum:

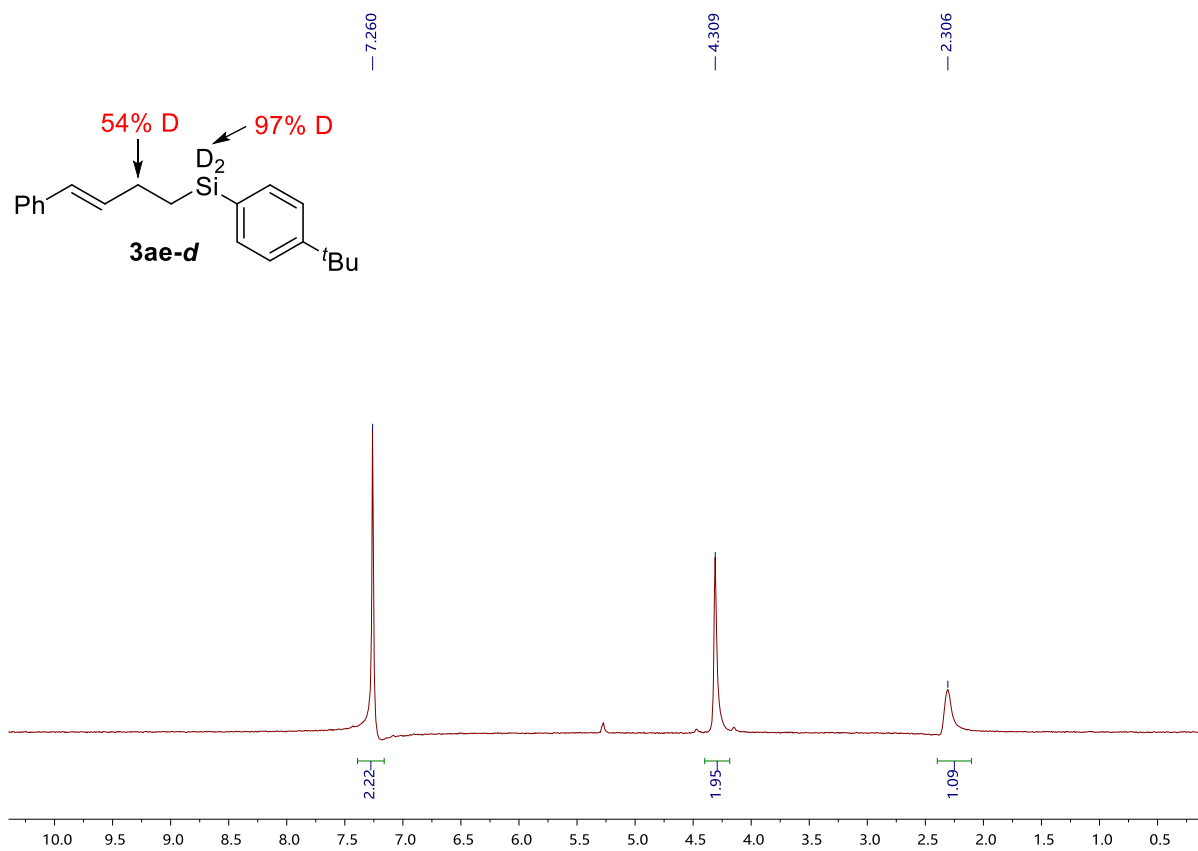
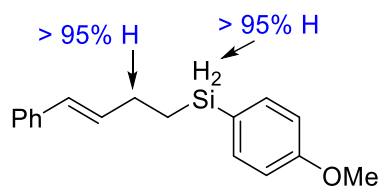


Figure S3. ^2H NMR of the product **3ae-d**. CDCl_3 (2.22 equiv) was used as an internal standard.



3ad-d, 14 mg, 13% yield, >98:2 r.r., colorless oil.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.53 – 7.47 (m, 2H), 7.33 – 7.27 (m, 4H), 7.22 – 7.15 (m, 1H), 6.95 – 6.88 (m, 2H), 6.37 (d, $J = 15.8$, 1H), 6.24 (dt, $J = 15.7$, 6.5 Hz, 1H), 4.32 (t, $J = 3.6$ Hz, 1.87 H), 3.82 (s, 3H), 2.40 – 2.31 (m, 1.94 H), 1.14 – 1.07 (m, 2H).

$^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 160.9 (1C), 137.7 (1C), 136.7 (2C), 132.3 (1C), 129.2 (1C), 128.4 (2C), 126.8 (1C), 125.9 (2C), 122.8 (1C), 113.9 (2C), 55.0 (1C), 28.4 (1C), 10.2 (1C).

The $^2\text{H NMR}$ analysis is well consistent with the $^1\text{H NMR}$ analysis. See followed spectrum:

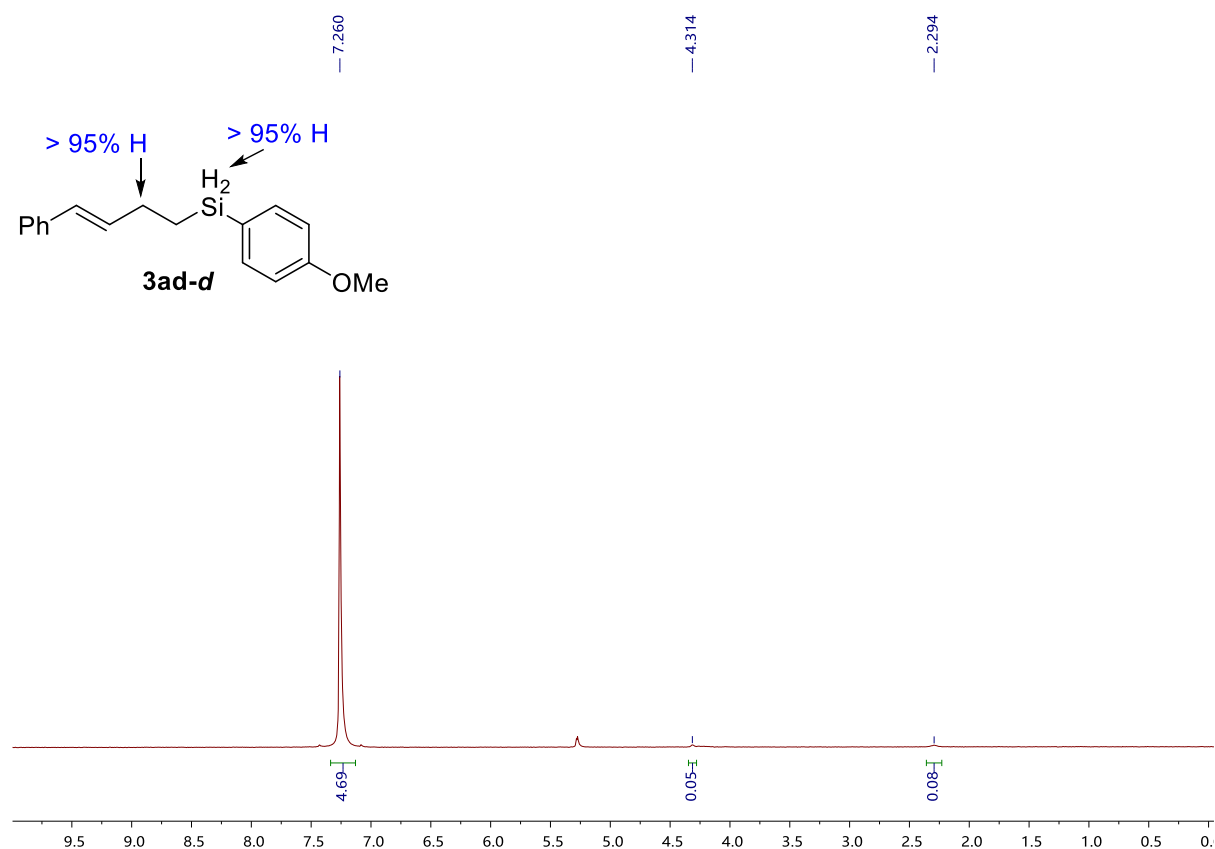
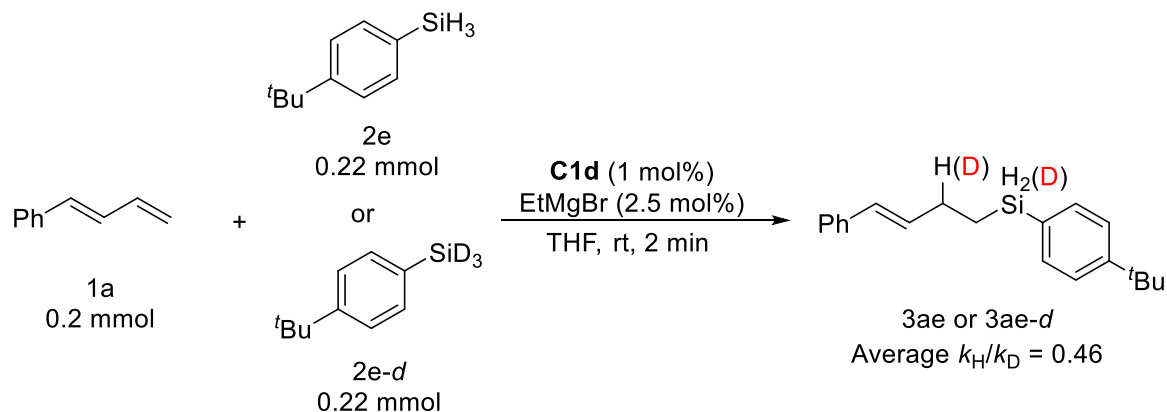


Figure S4. $^2\text{H NMR}$ of the product **3ad-d**. CDCl_3 (4.69 equiv) was used as an internal standard

7.4 Parallel kinetic isotope effect experiment



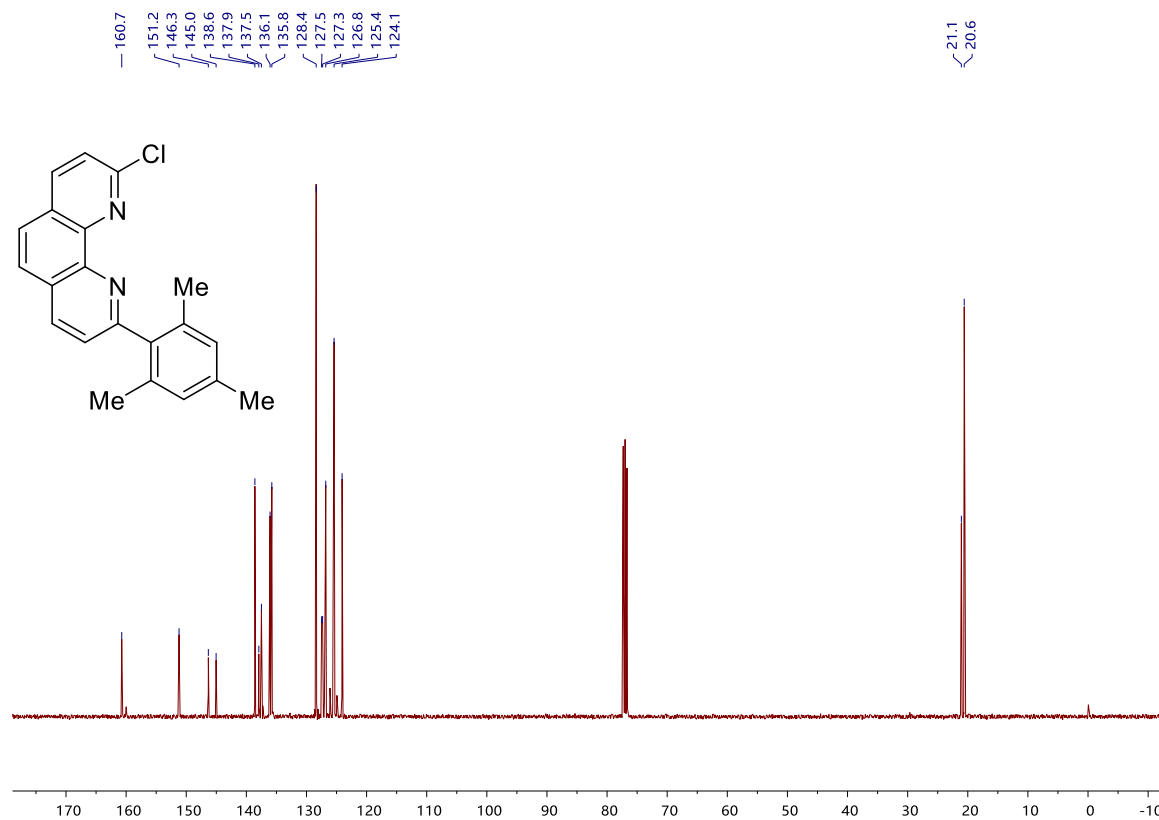
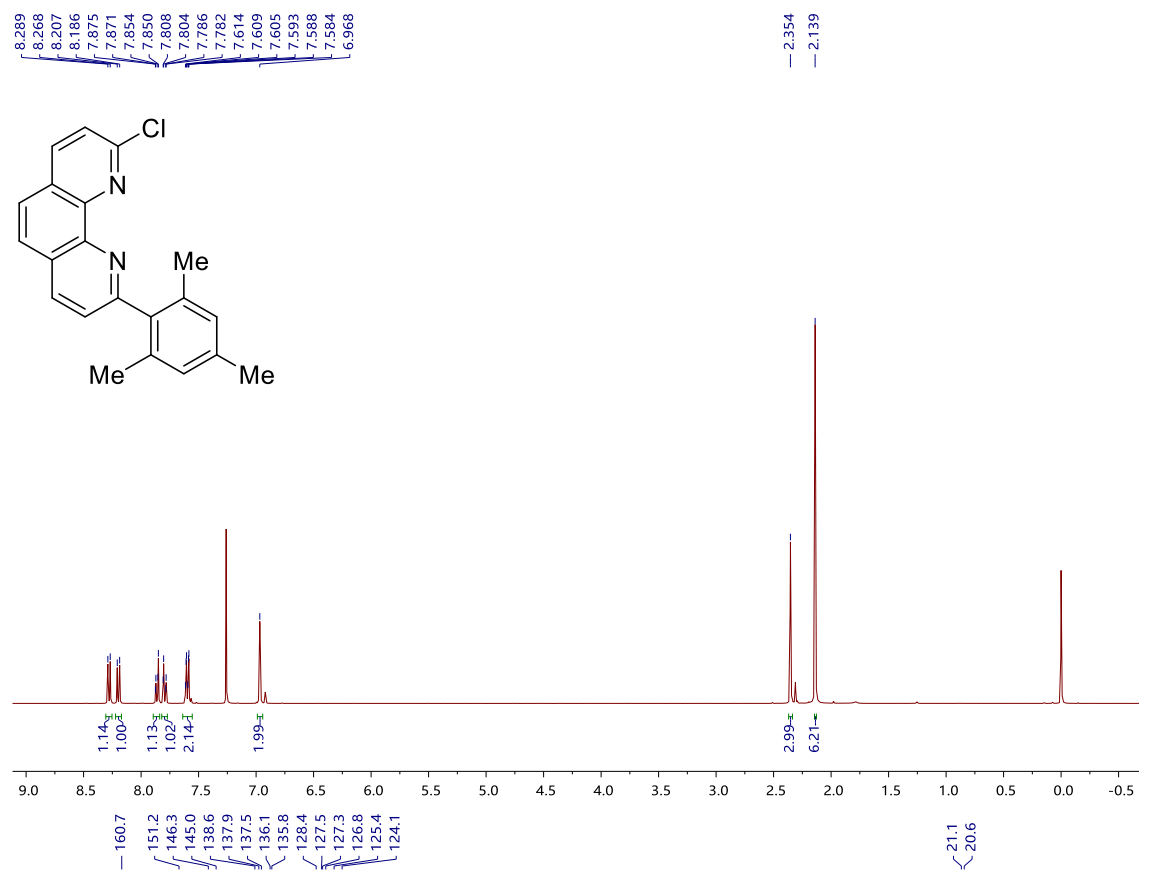
In an argon-filled glovebox, a vial (10 mL) was charged with complexes **C1d** (1.4 mg, 0.002 mmol), dry anhydrous THF (1 mL), conjugated diene **1a** (26.0 mg, 0.2 mmol), silane **2e** (36.1 mg, 0.22 mmol, 1.1 equiv) or **2e-d** (36.7 mg, 0.22 mmol, 1.1 equiv) successively. The reaction mixture was stirred at room temperature for 2 min after **EtMgBr** (1 M in THF, 5 μ L, 0.005 mmol, 2.5 mol%) was added. The vial was removed from the glovebox and quenched with 2 drops water. Iron species were removed by flash column chromatography with DCM as eluent. The raw product was detected by ^1H NMR with 1,3,5-trimethoxybenzene as internal standard. We repeated the experiments for four times, respectively. The average of k_H/k_D is 0.46. The results were listed as following.

Table S3 Parallel kinetic isotope effect experiments

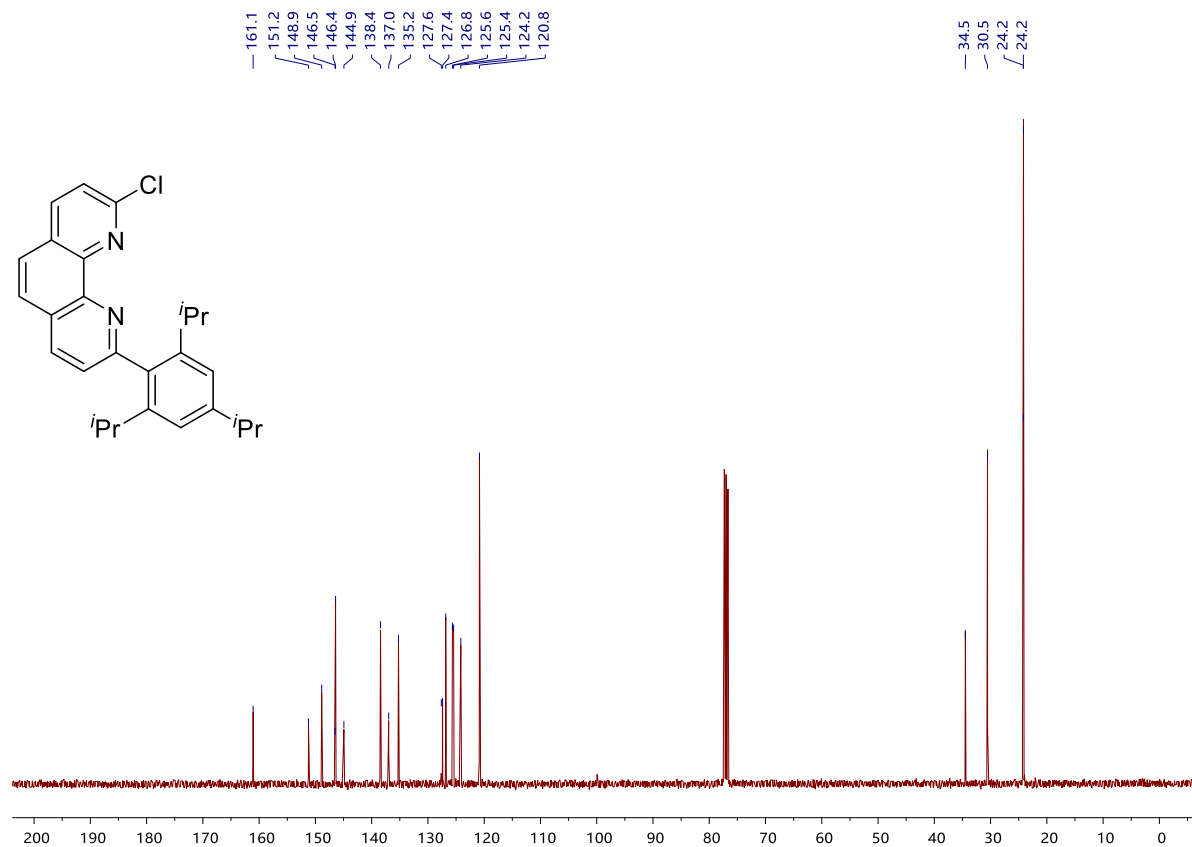
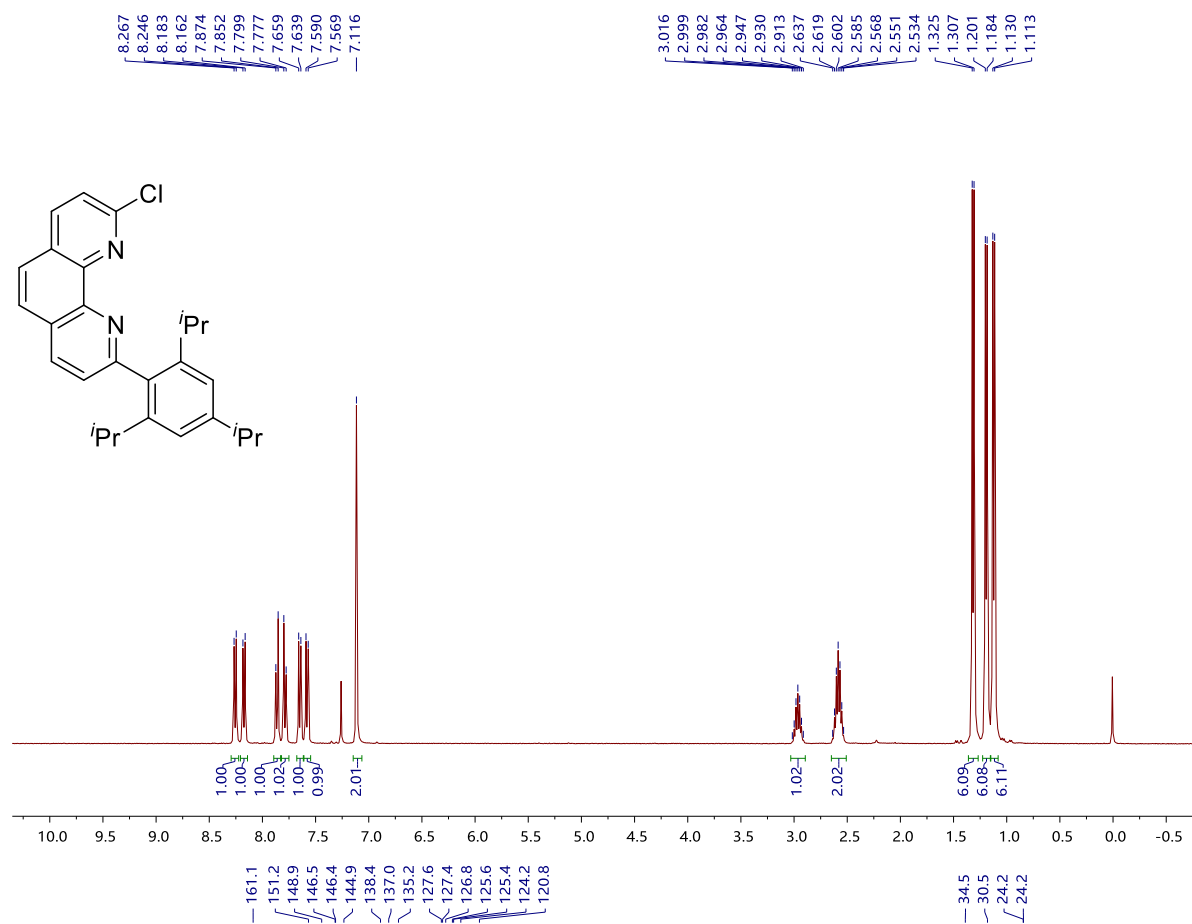
entry	% yield (3ae)	% yield (3ae-d)
1	6.4	14.6
2	6.3	12.1
3	7.6	16.1
4	6.0	15.2
Average yield	6.6	14.5
k_H/k_D		0.46

8 NMR spectra of all products

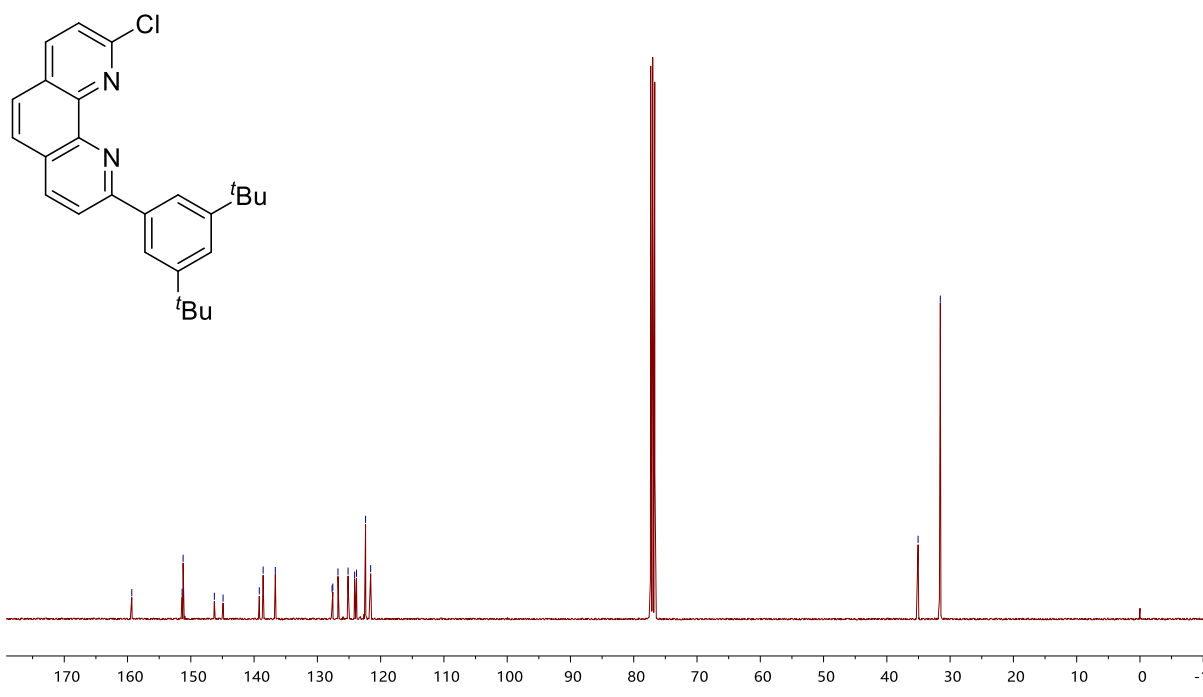
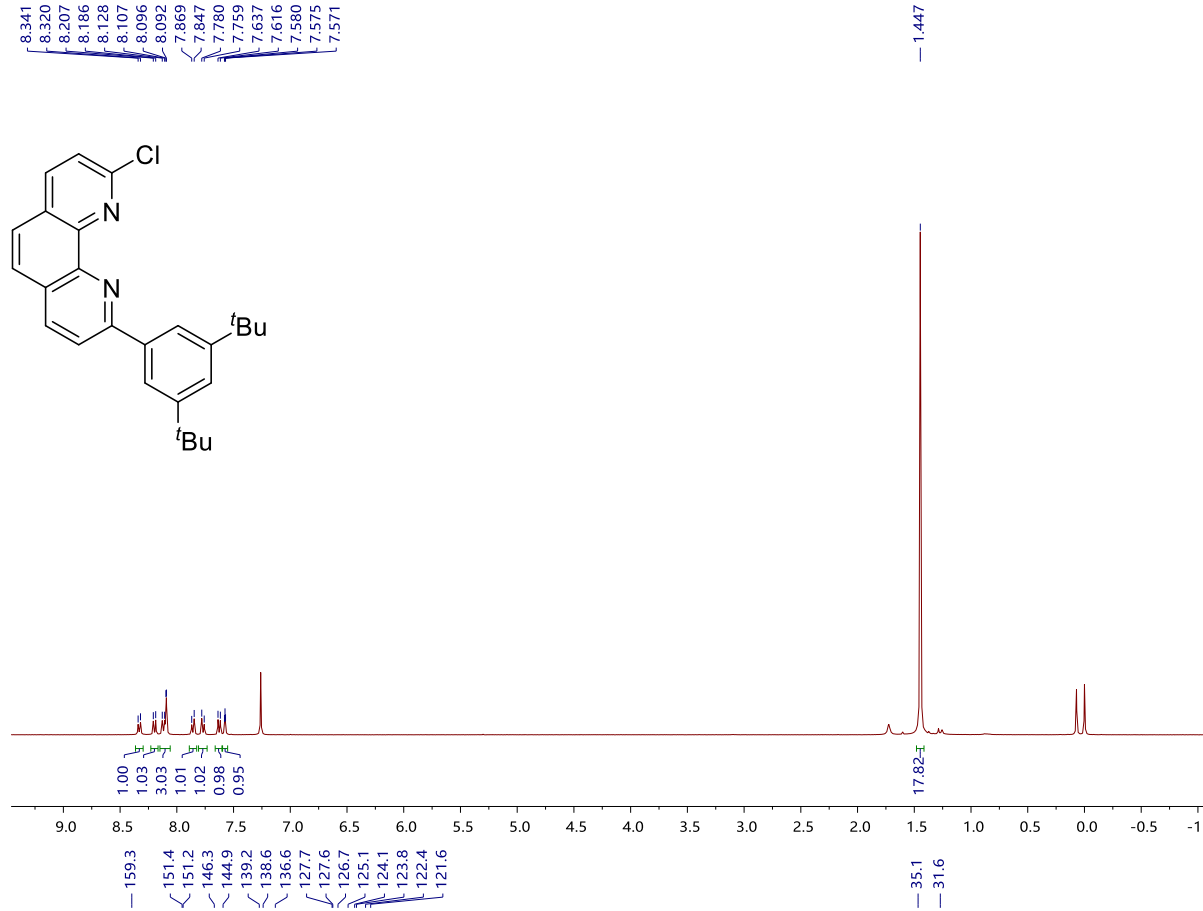
2-chloro-9-mesityl-1,10-phenanthroline (2a)



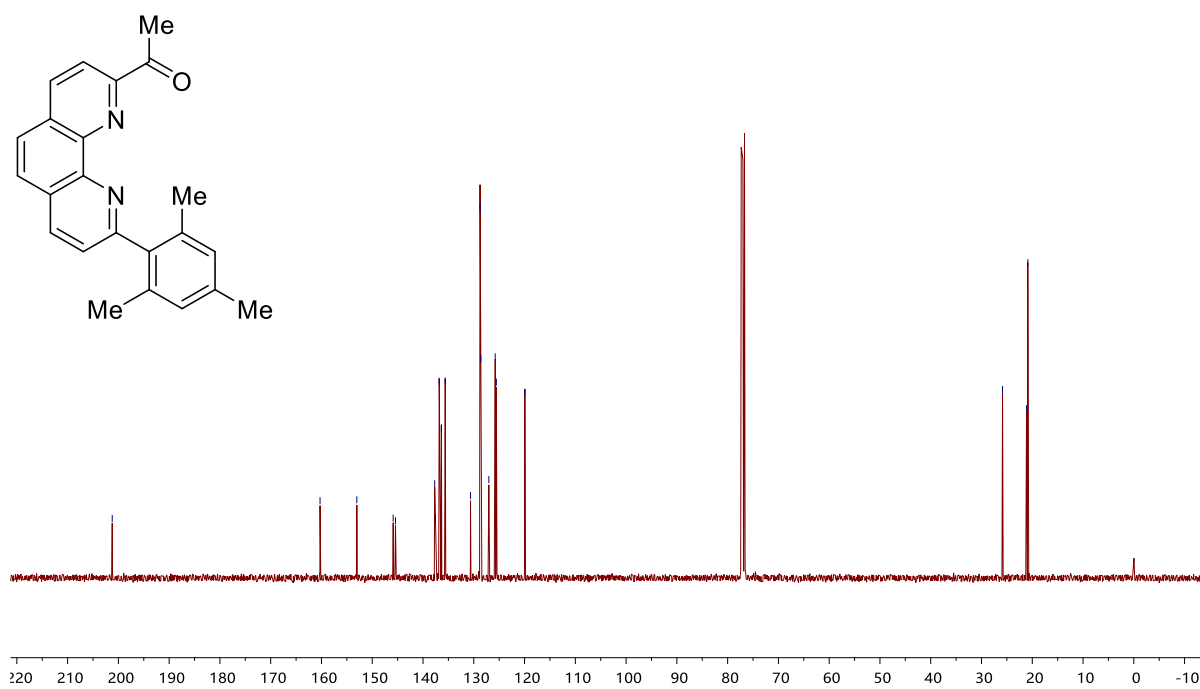
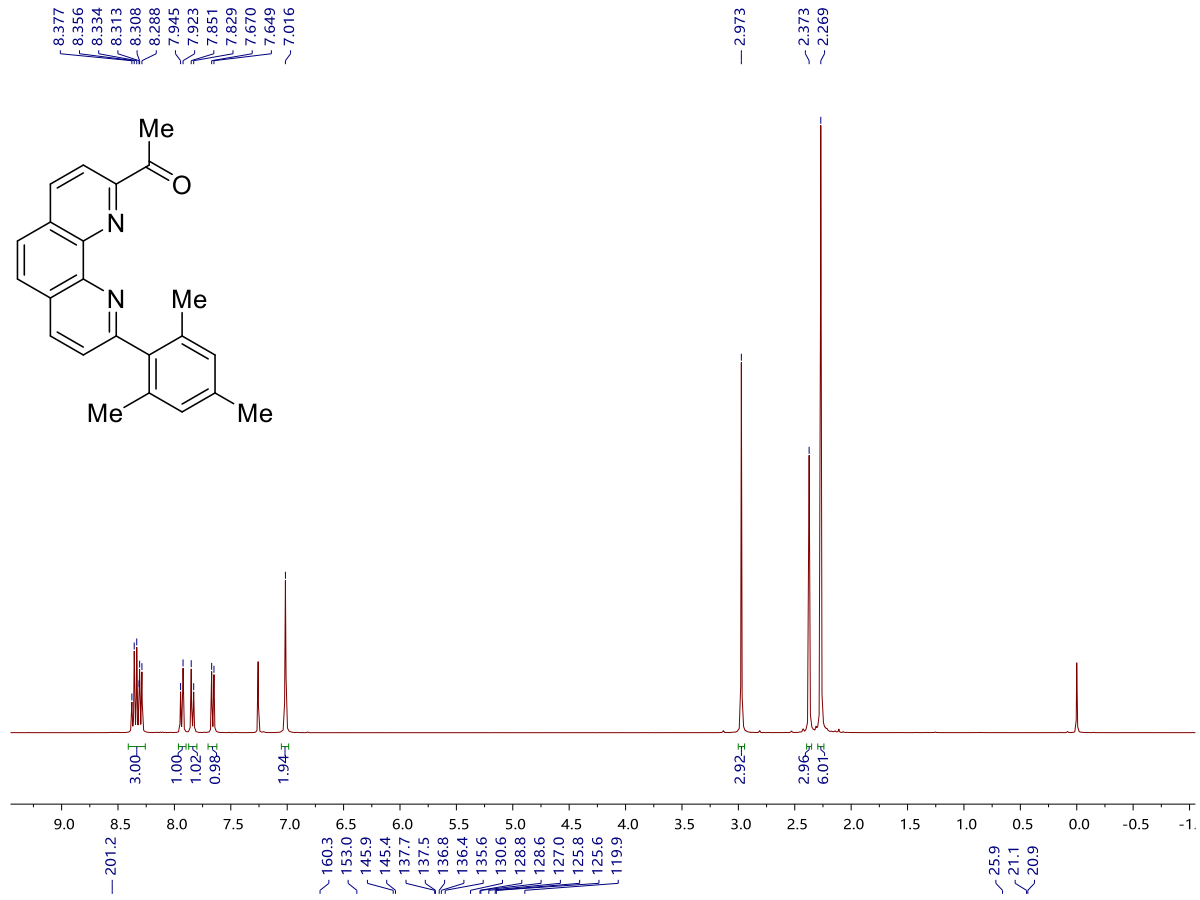
2-chloro-9-(2,4,6-triisopropylphenyl)-1,10-phenanthroline (2b)



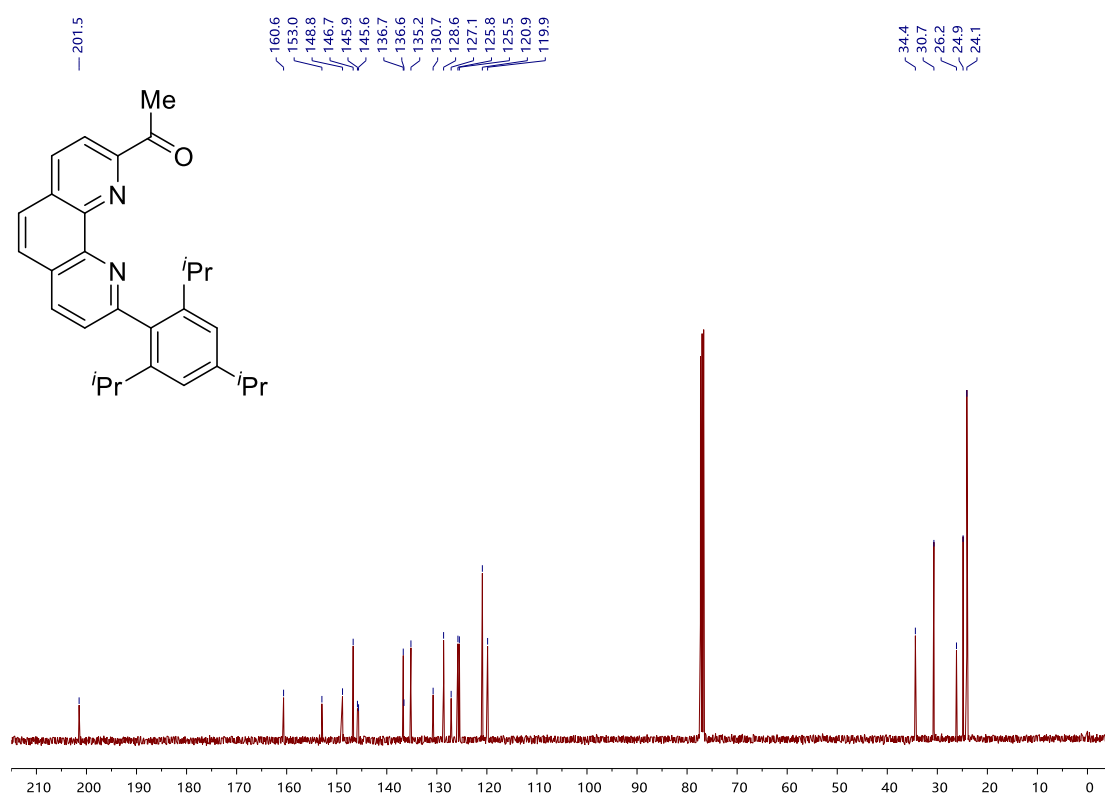
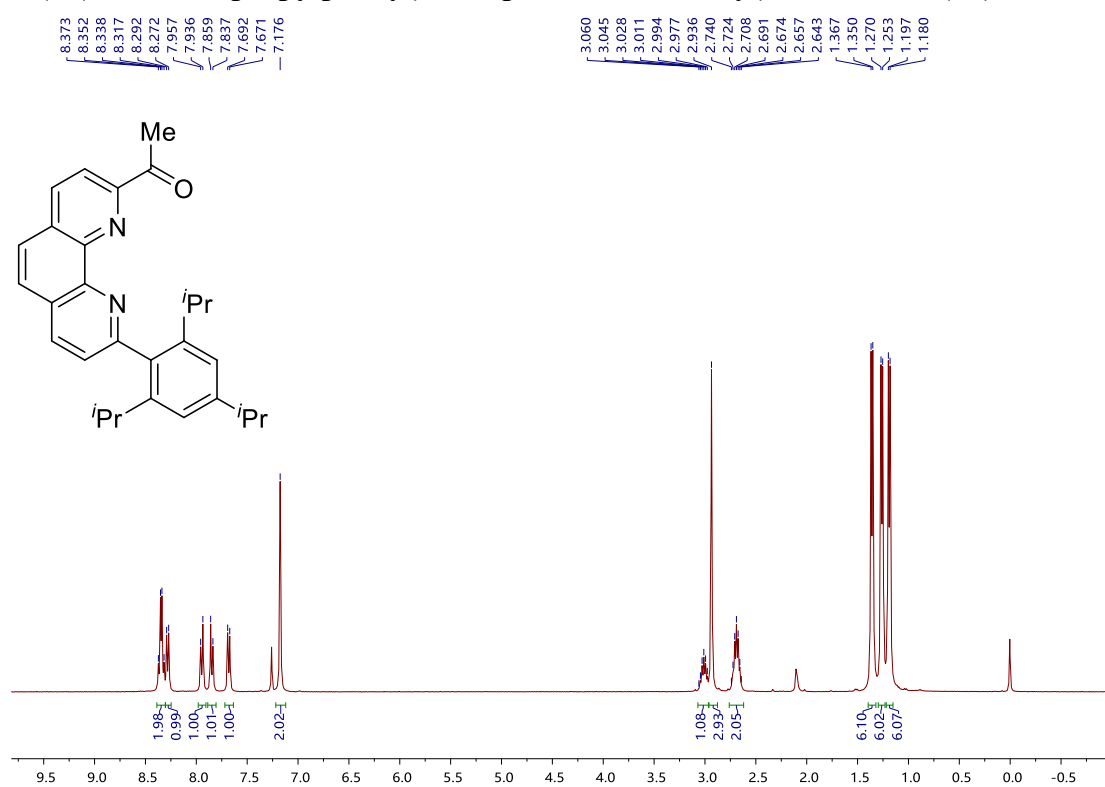
2-chloro-9-(3,5-di-*tert*-butylphenyl)-1,10-phenanthroline (2c)



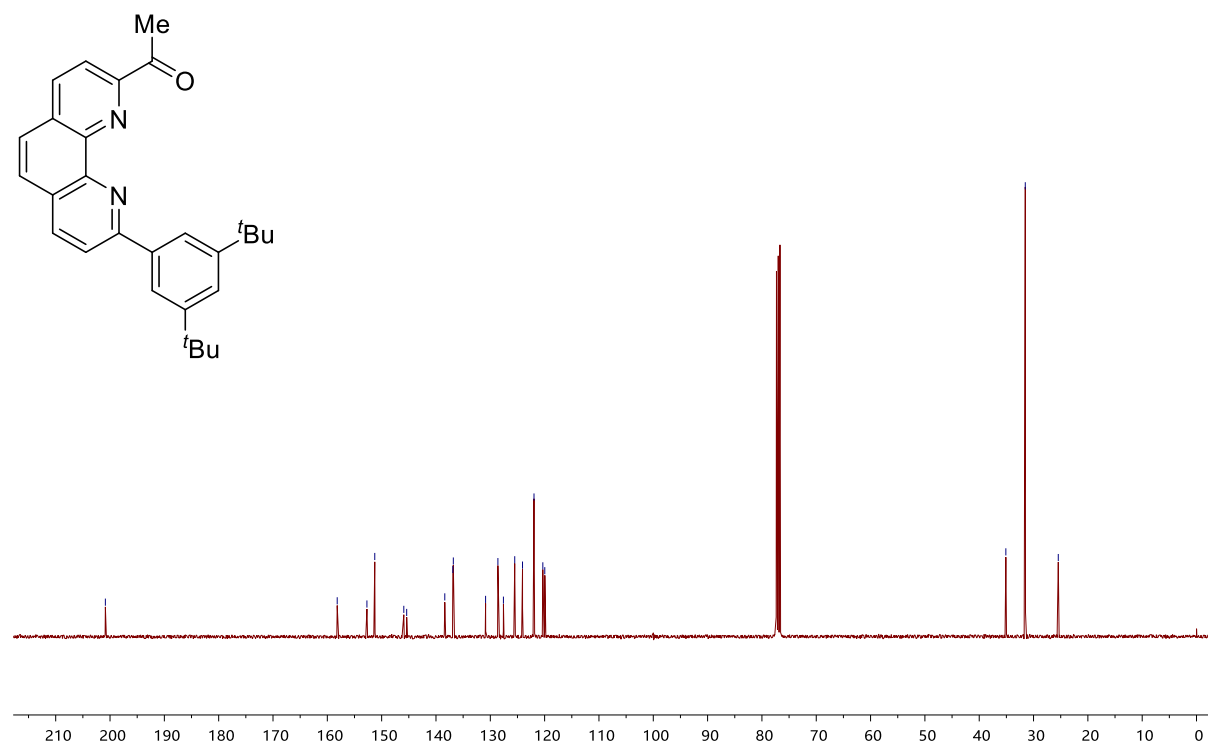
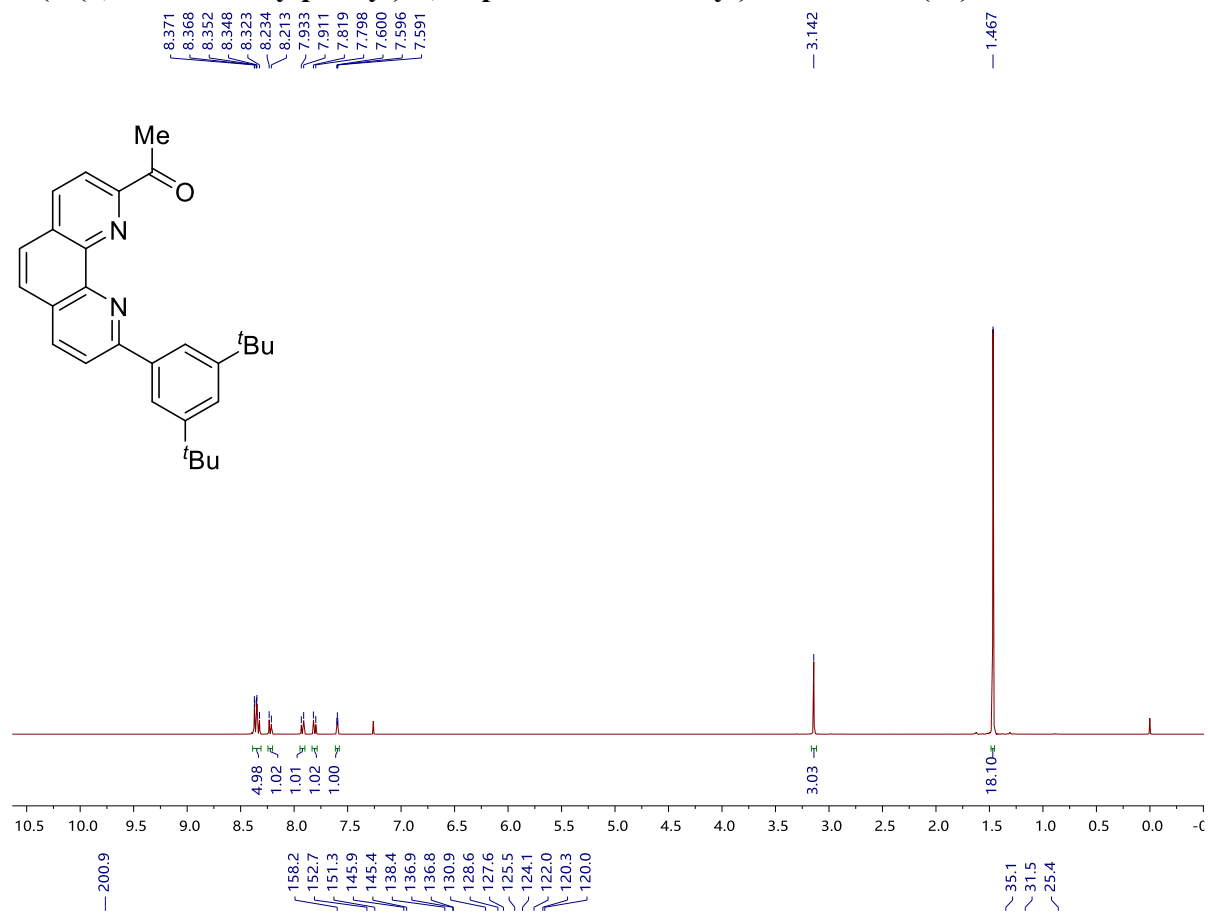
1-(9-mesityl-1,10-phenanthrolin-2-yl)ethan-1-one (3a)



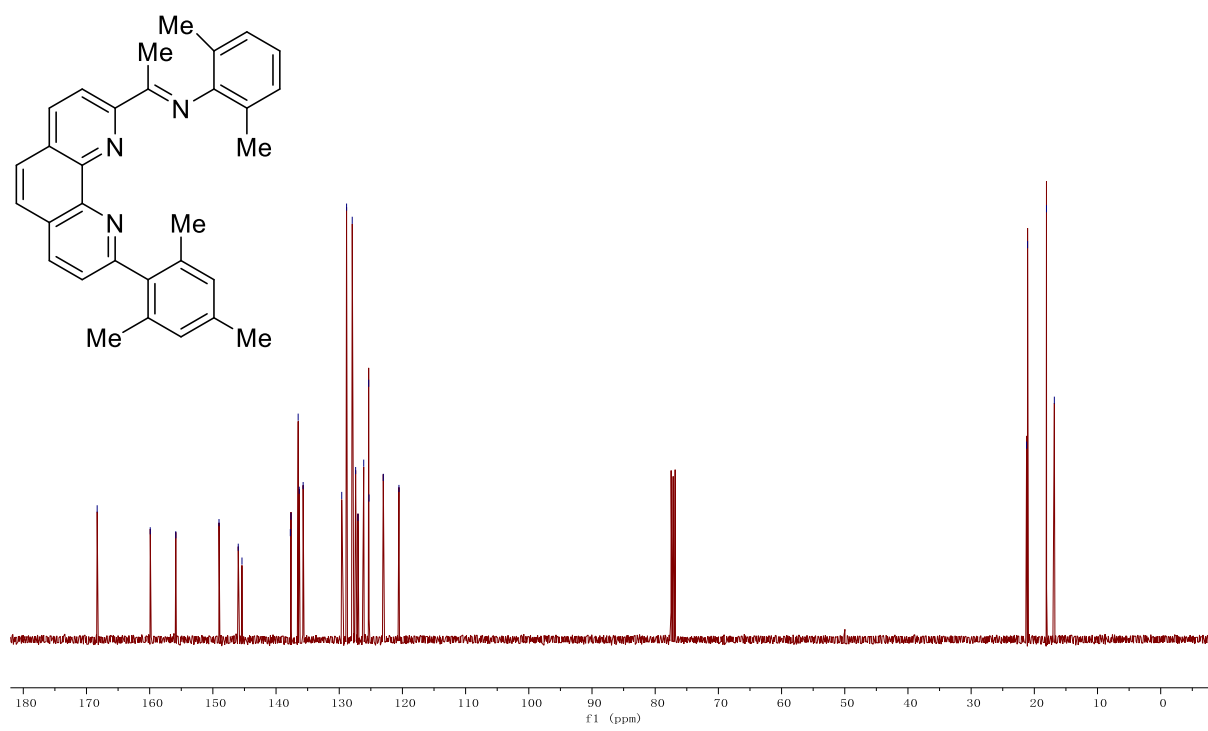
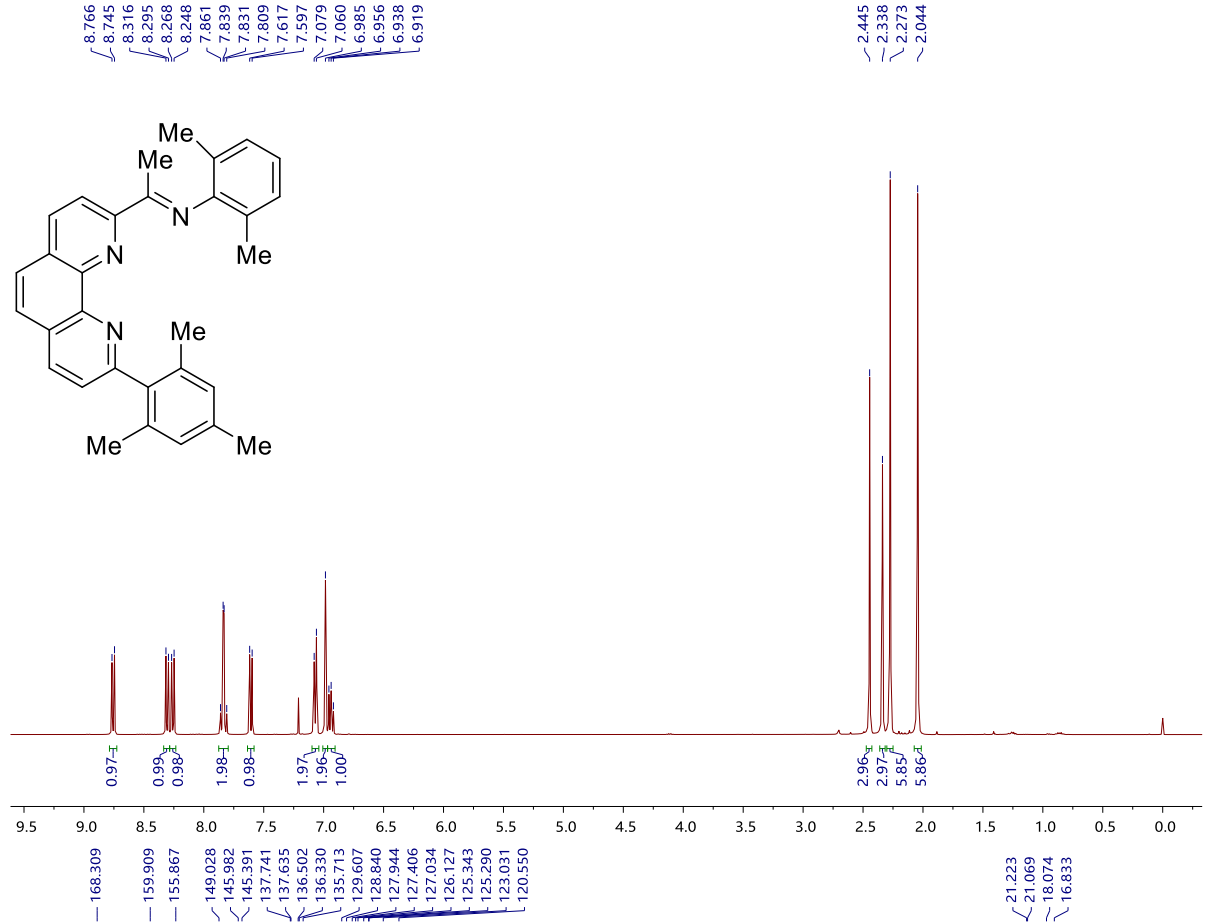
1-(9-(2,4,6-triisopropylphenyl)-1,10-phenanthrolin-2-yl)ethan-1-one (3b)



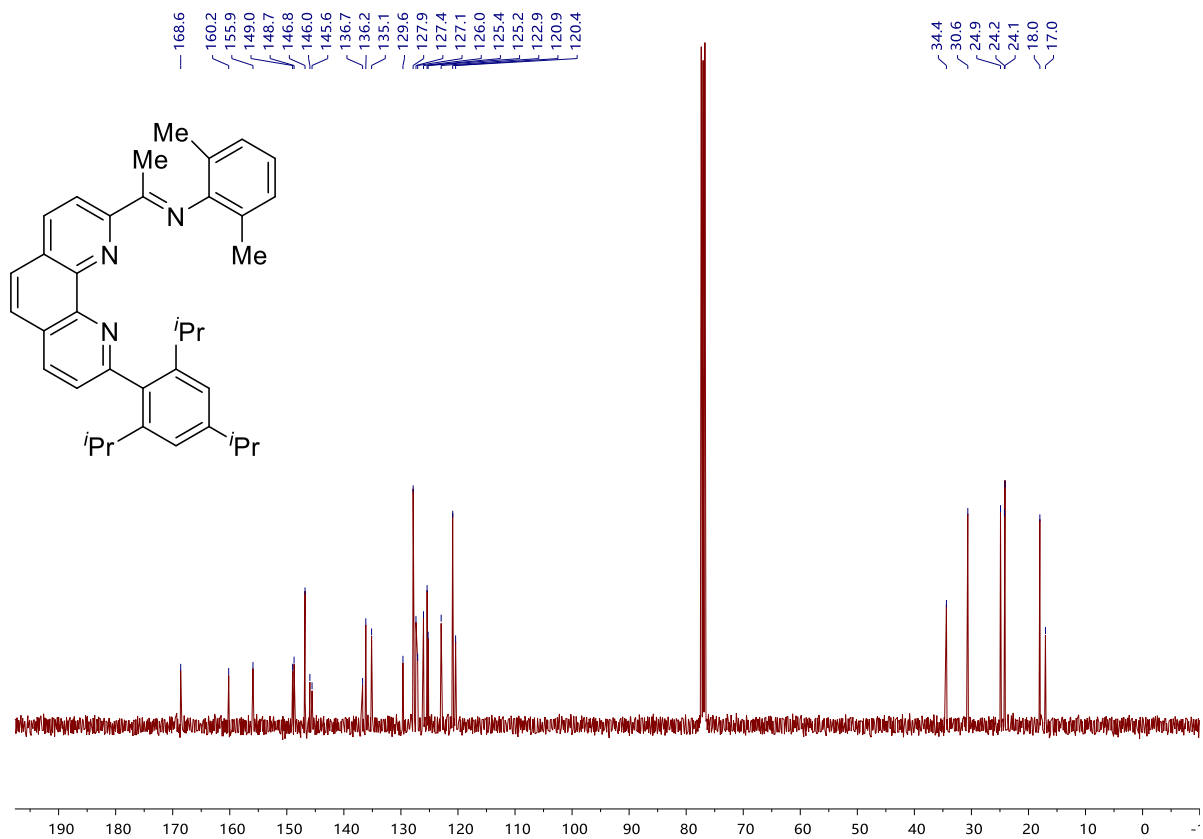
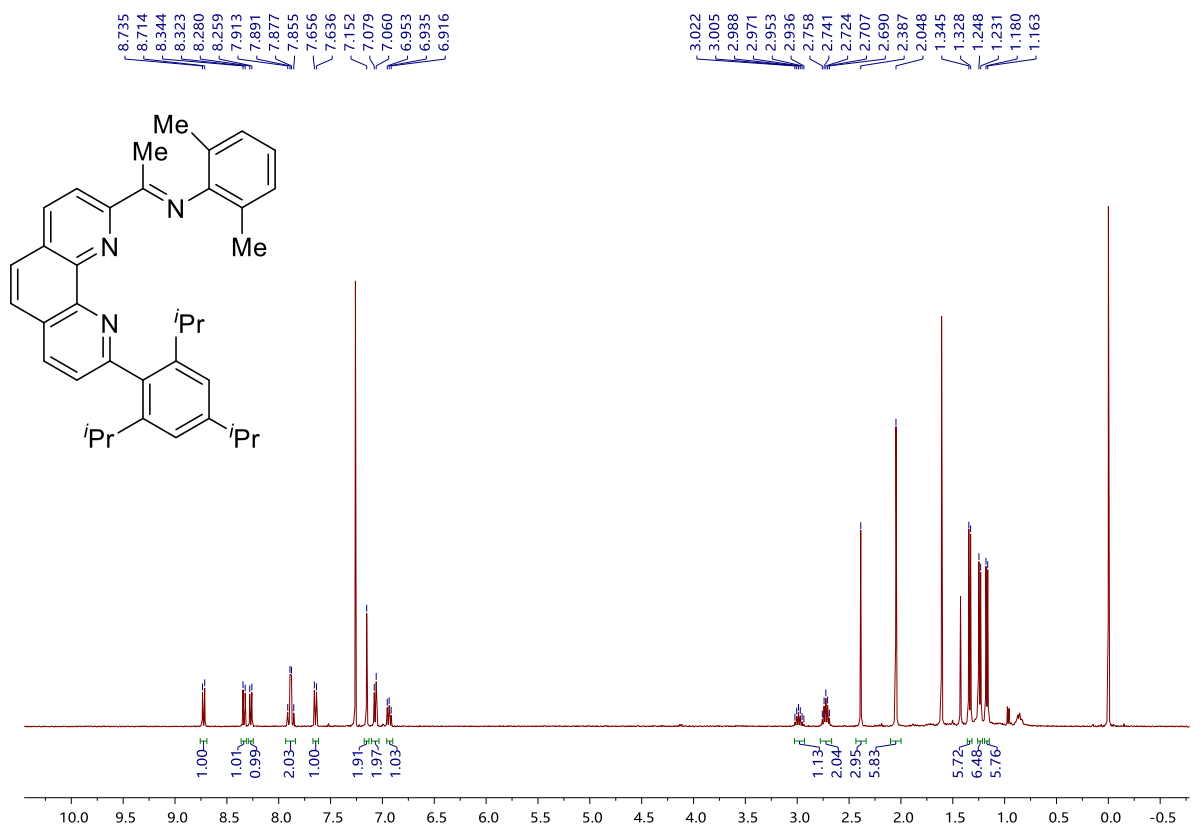
1-(9-(3,5-di-*tert*-butylphenyl)-1,10-phenanthrolin-2-yl)ethan-1-one (3c)



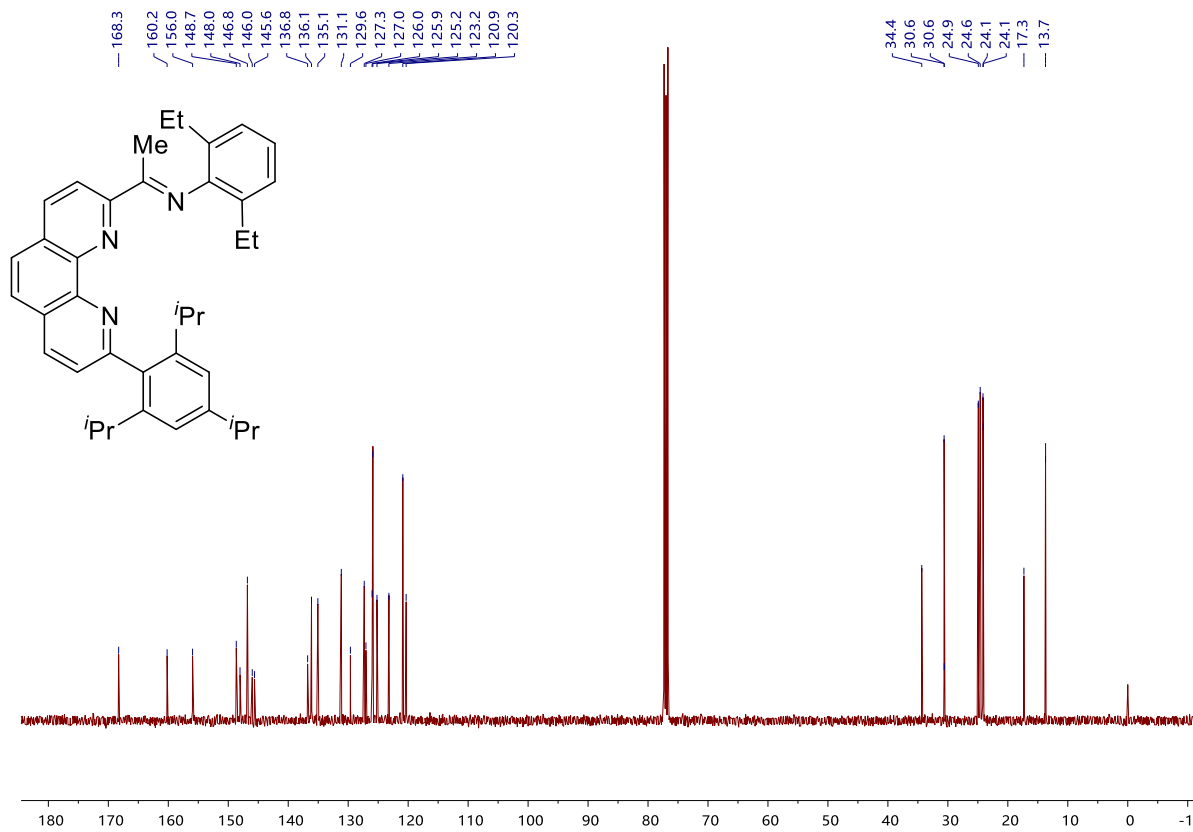
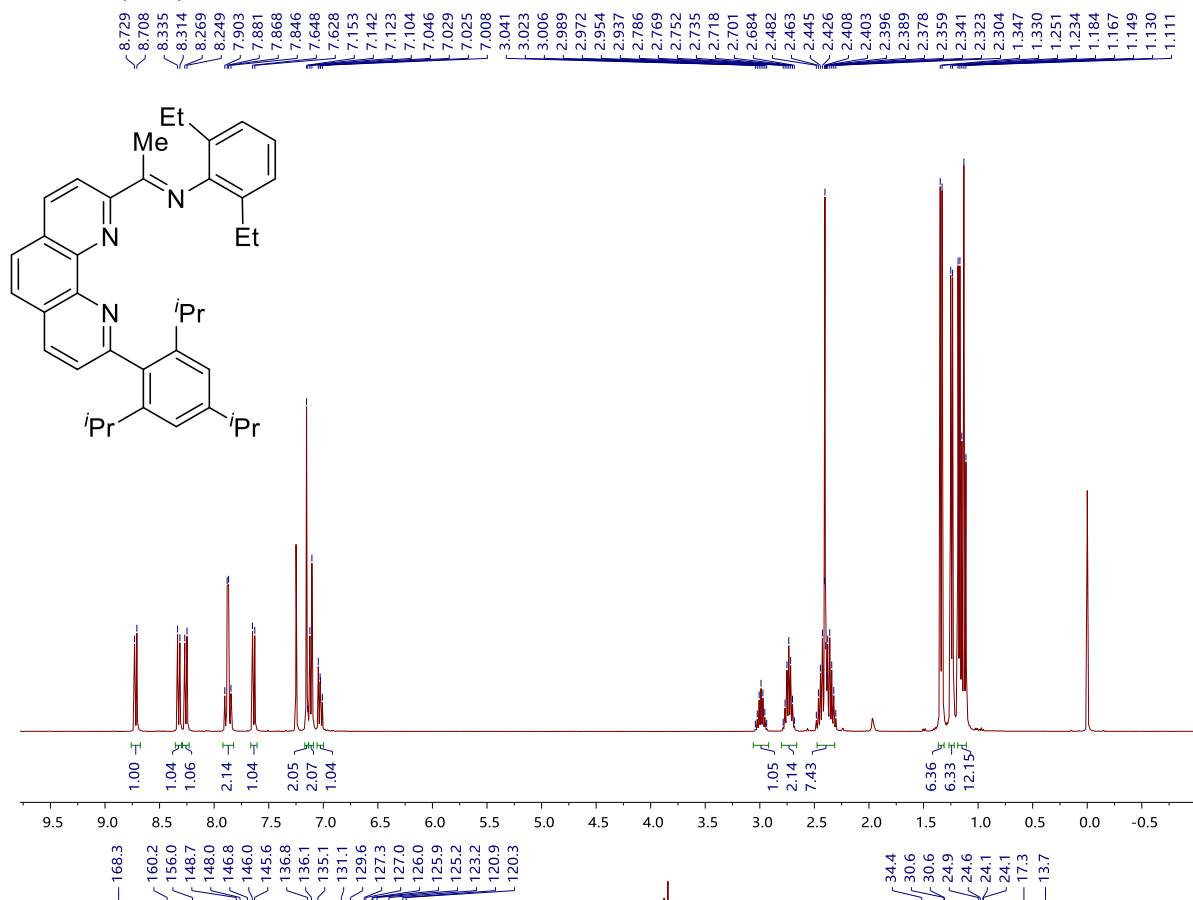
(E)-N-(2,6-dimethylphenyl)-1-(9-mesityl-1,10-phenanthrolin-2-yl)ethan-1-imine (L1a)



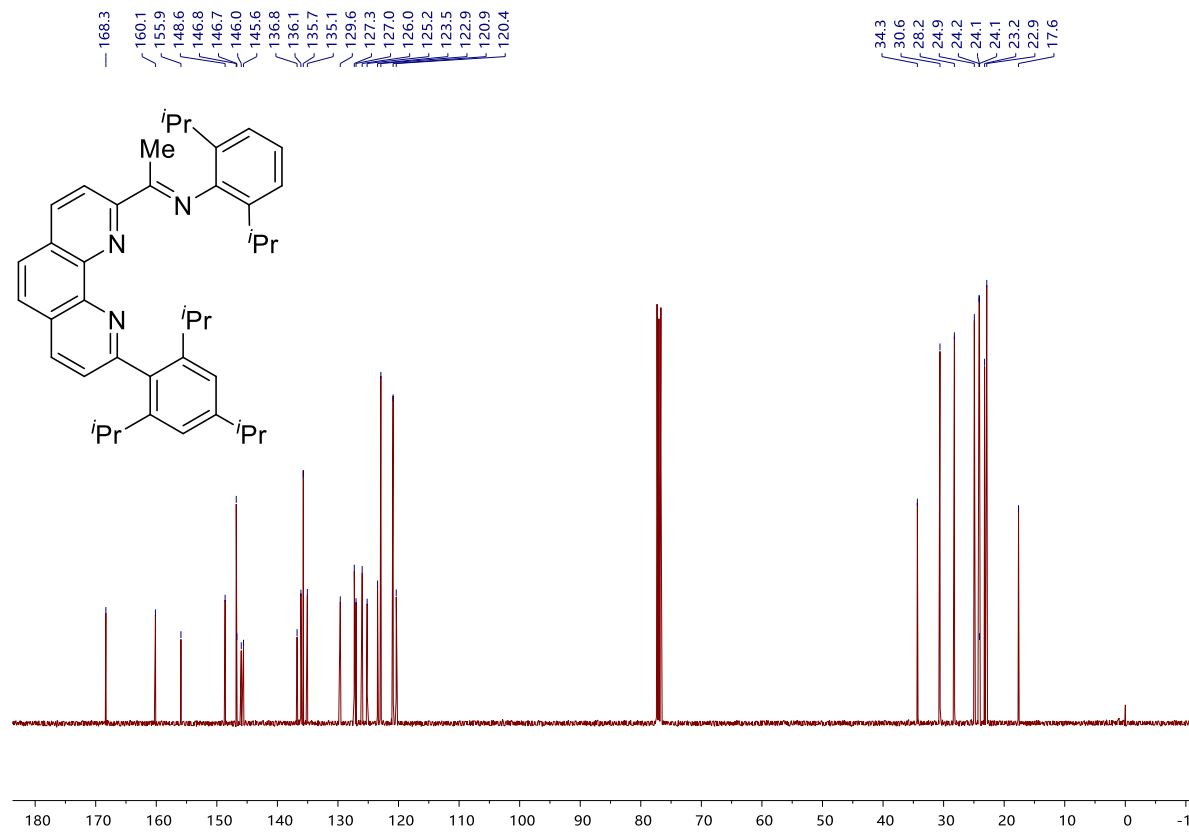
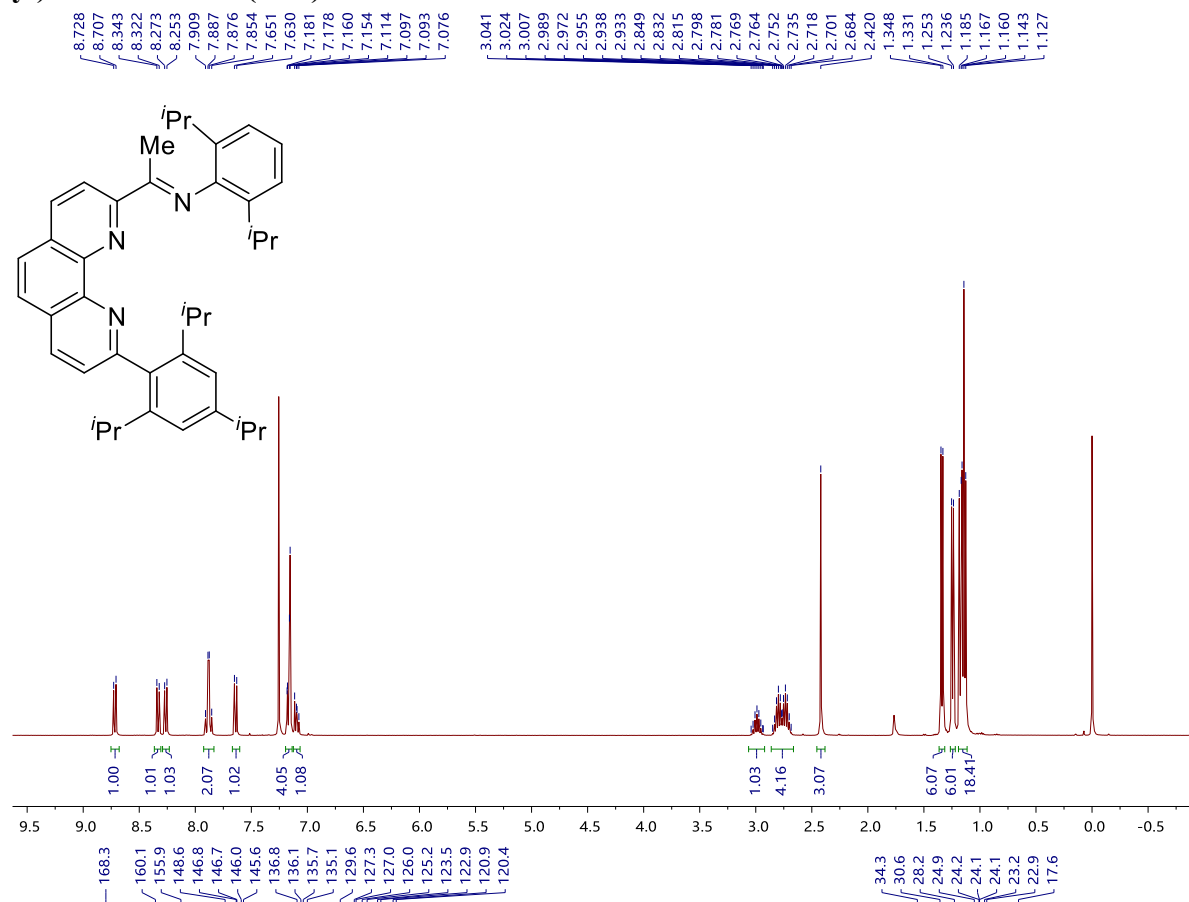
(E)-N-(2,6-dimethylphenyl)-1-(9-(2,4,6-triisopropylphenyl)-1,10-phenanthrolin-2-yl)ethan-1-imine (L1b)



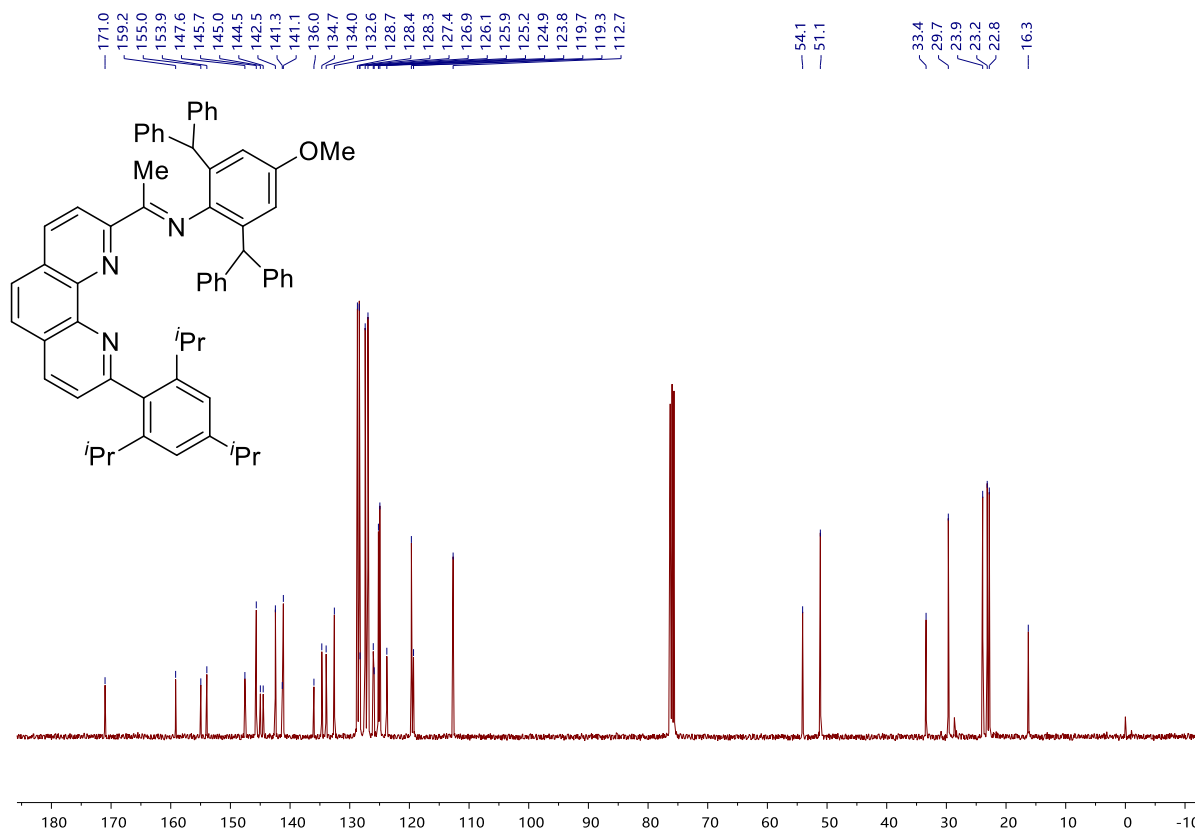
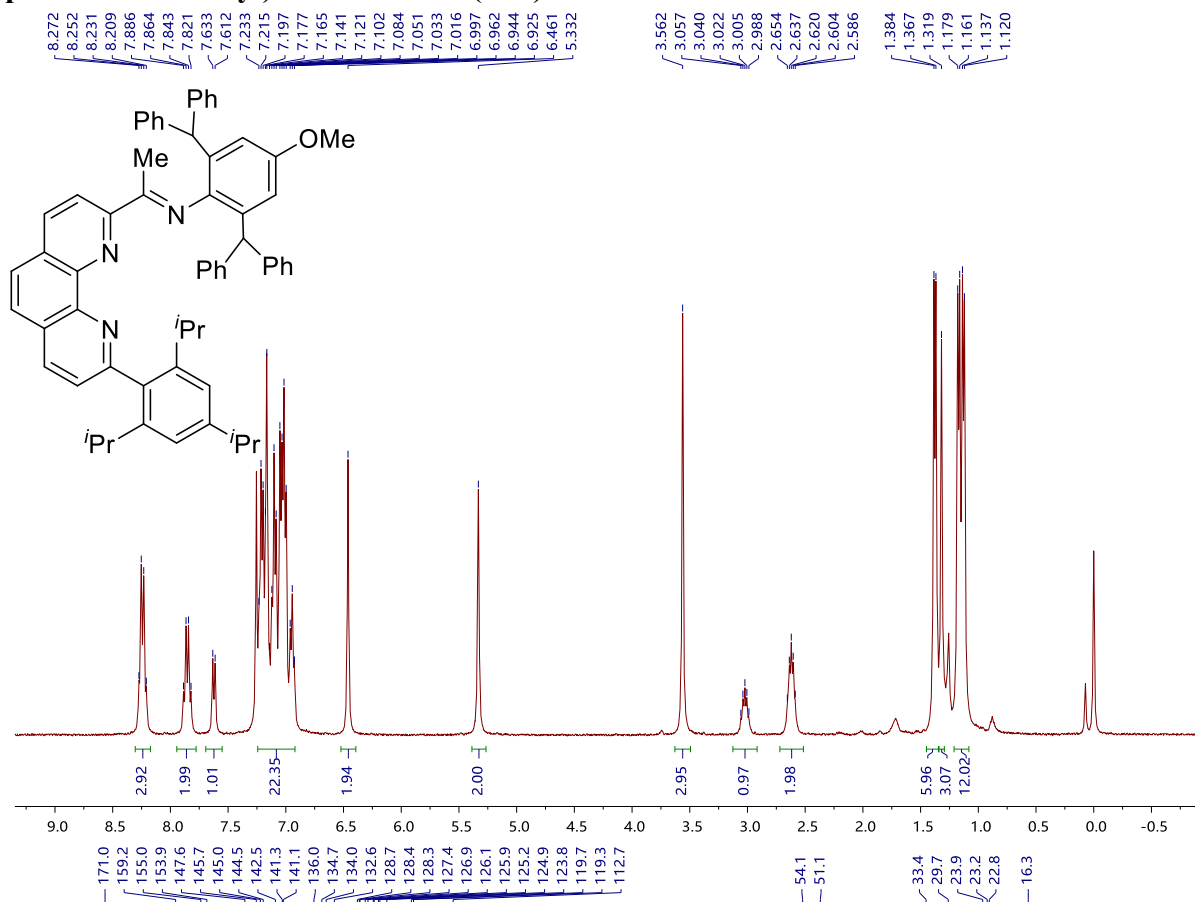
(E)-N-(2,6-diethylphenyl)-1-(9-(2,4,6-triisopropylphenyl)-1,10-phenanthrolin-2-yl)ethan-1-imine (L1c)



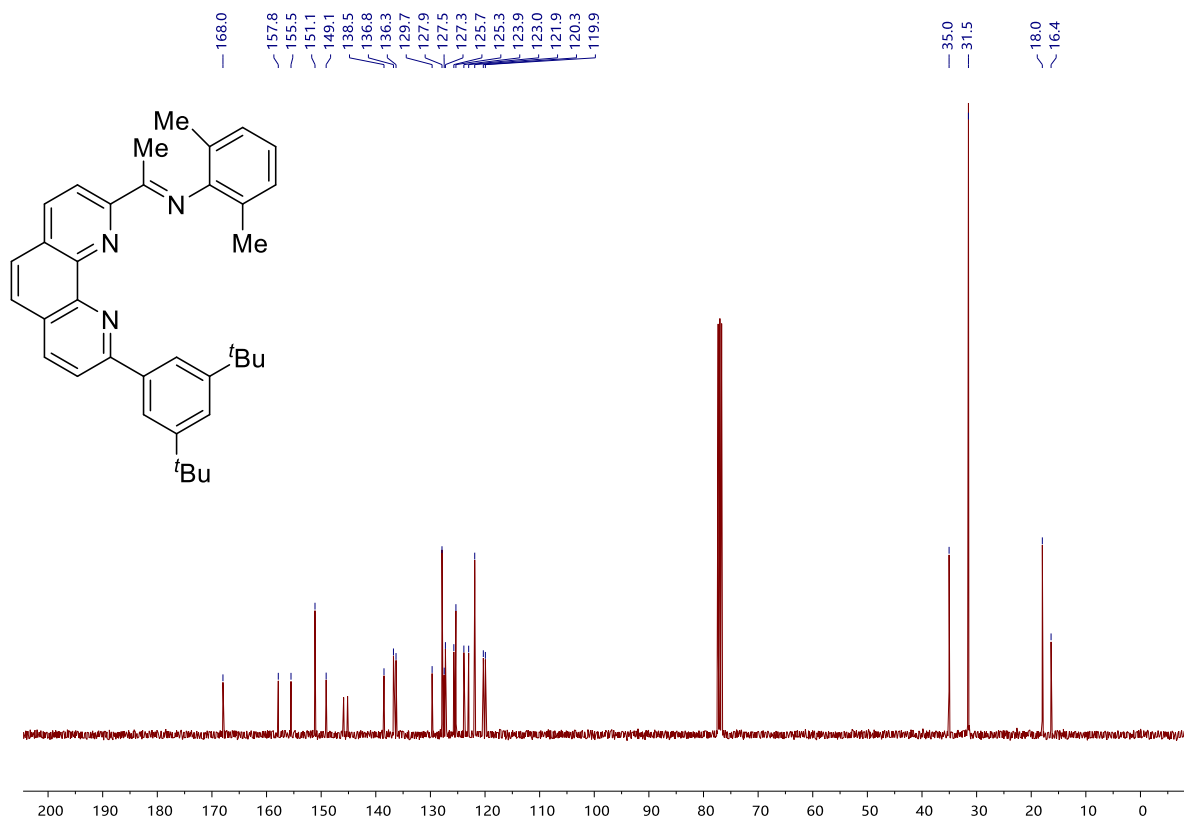
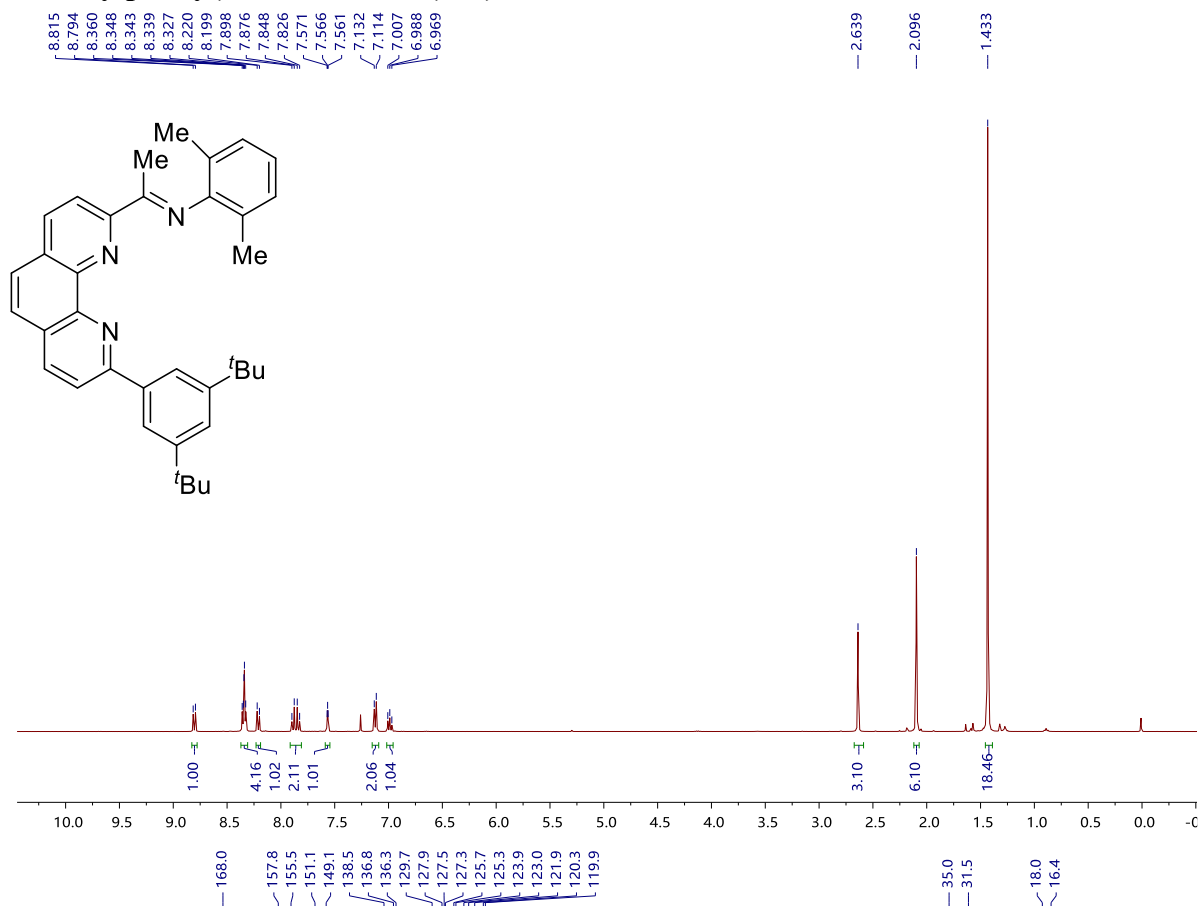
(E)-N-(2,6-diisopropylphenyl)-1-(9-(2,4,6-triisopropylphenyl)-1,10-phenanthrolin-2-yl)ethan-1-imine (L1d)



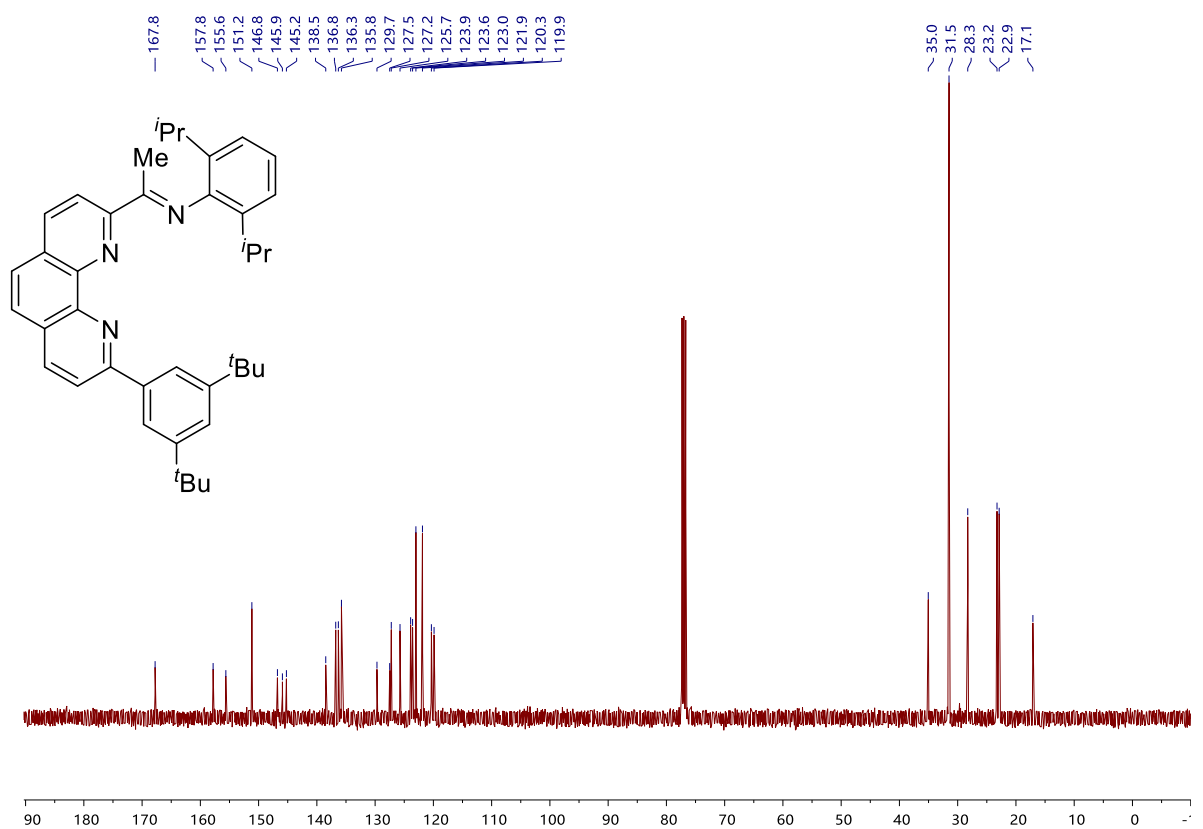
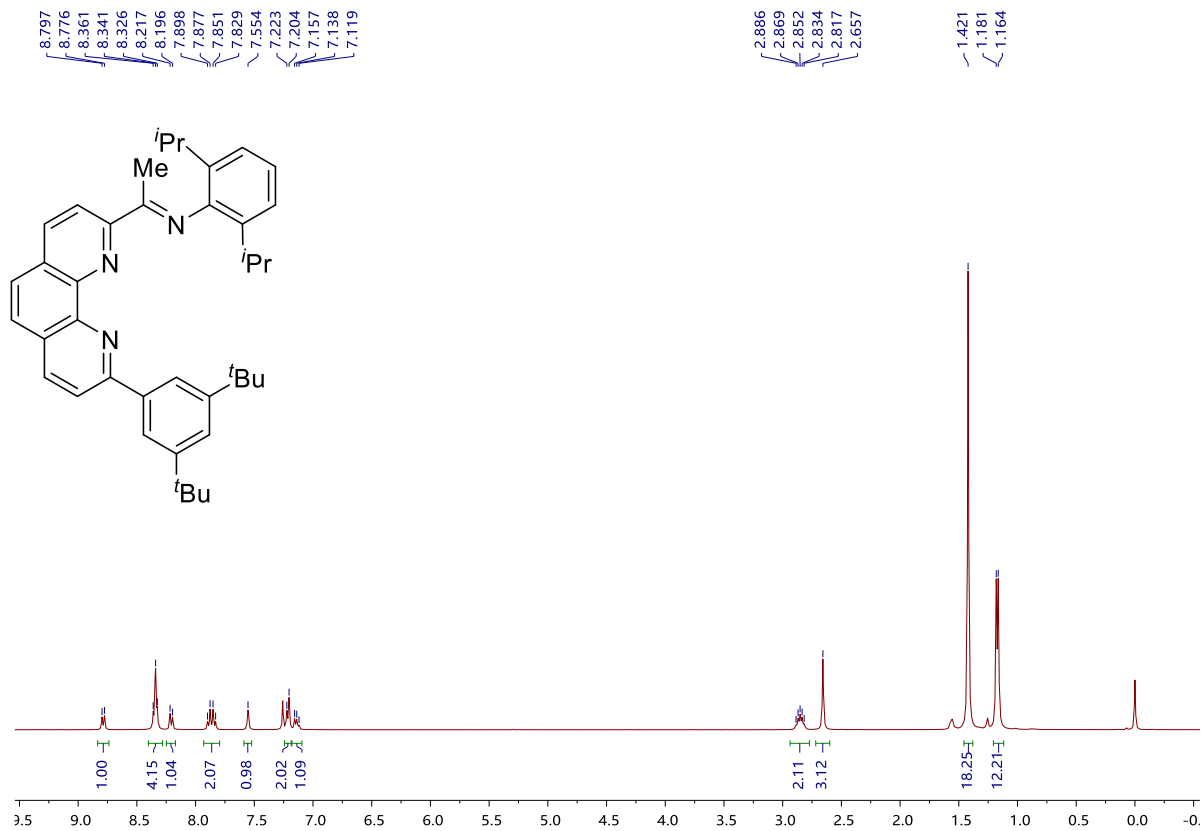
(E)-N-(2,6-dibenzhydryl-4-methoxyphenyl)-1-(9-(2,4,6-triisopropylphenyl)-1,10-phenanthrolin-2-yl)ethan-1-imine (L1e)



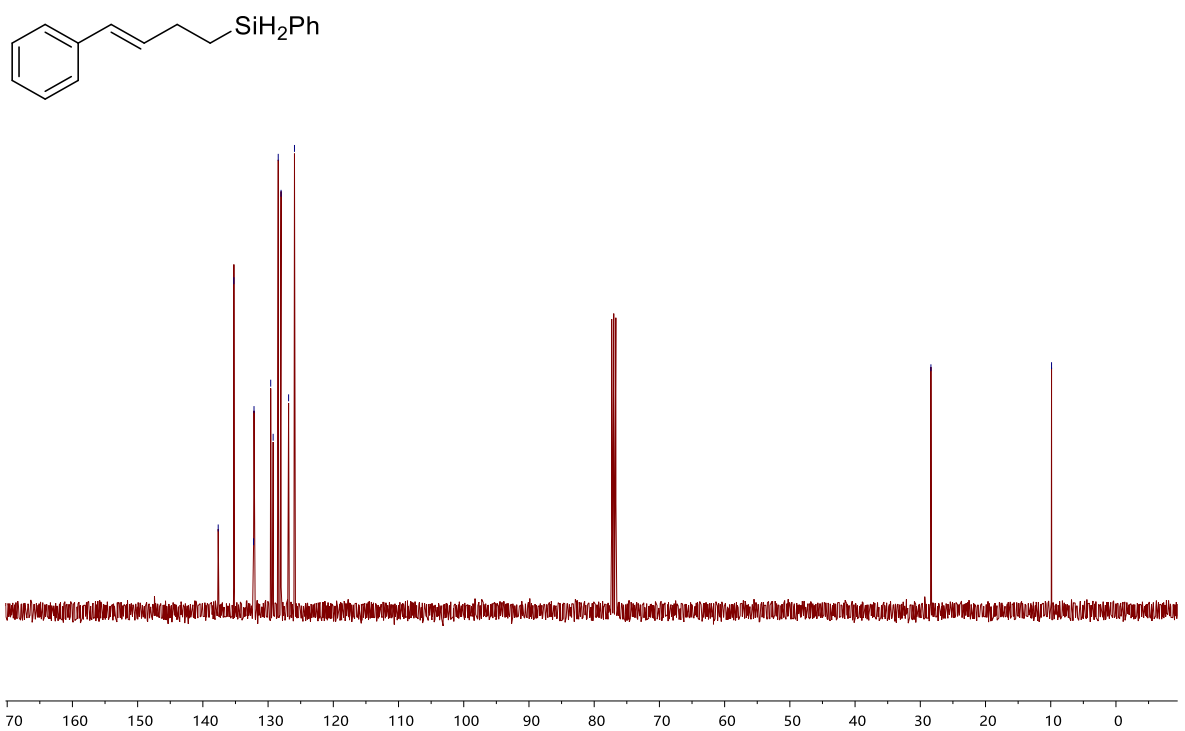
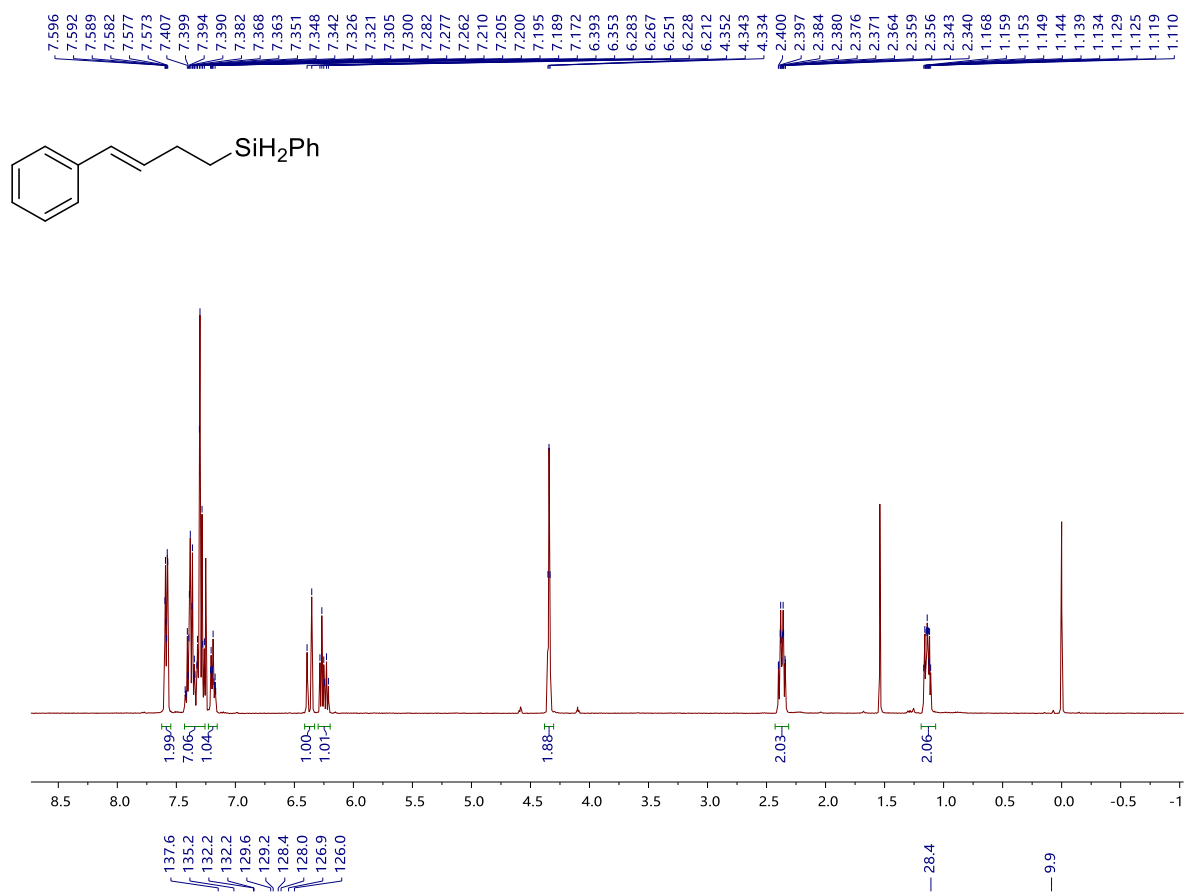
(E)-1-(9-(3,5-di-*tert*-butylphenyl)-1,10-phenanthrolin-2-yl)-N-(2,6-dimethylphenyl)ethan-1-imine (L1f)



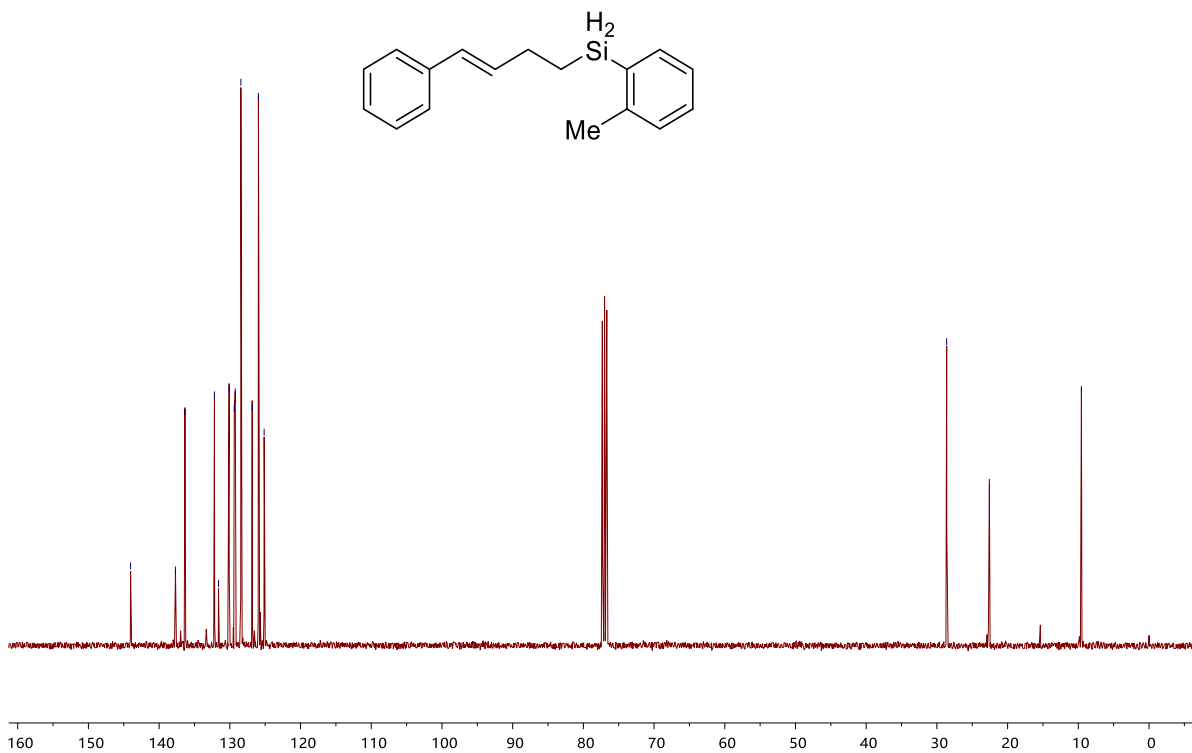
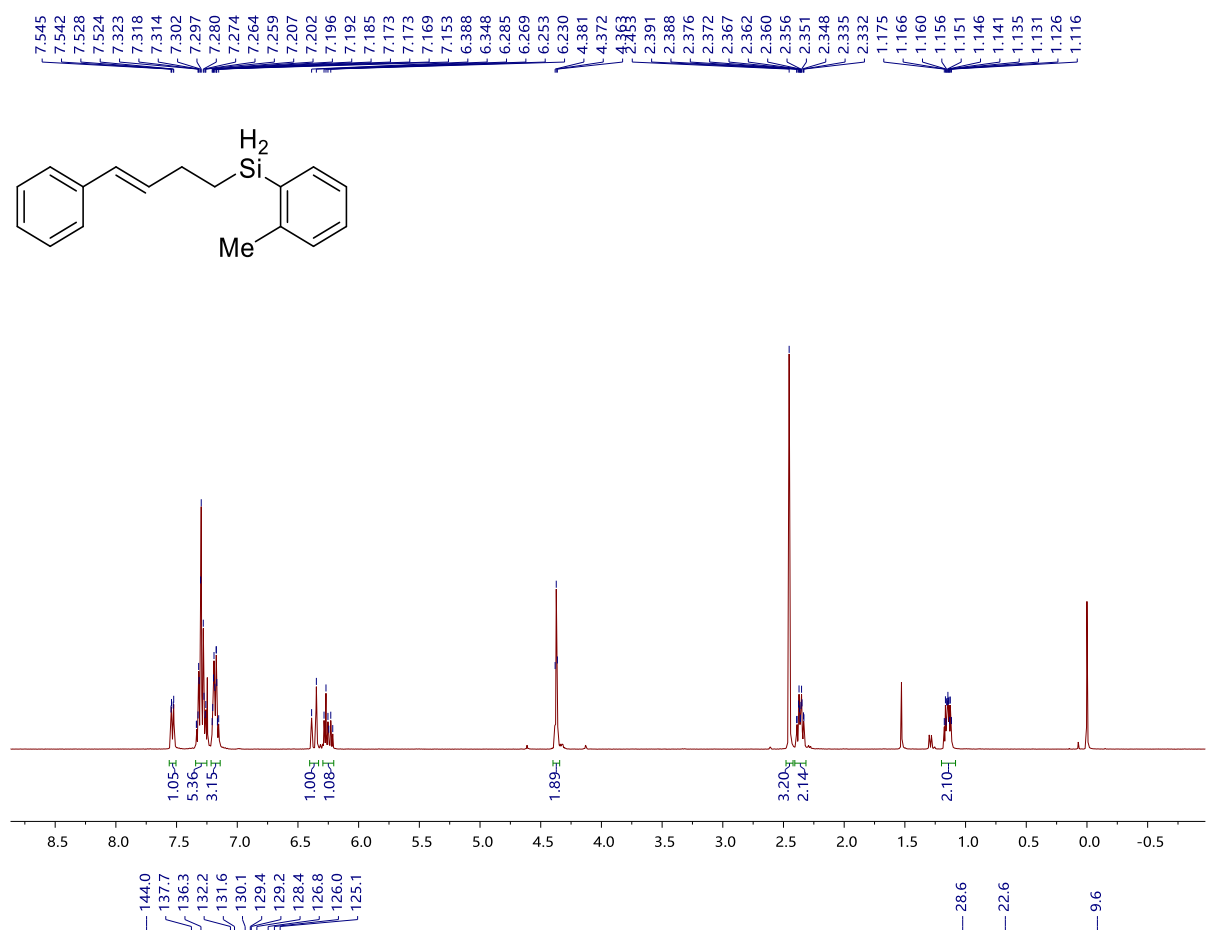
(E)-1-(9-(3,5-di-*tert*-butylphenyl)-1,10-phenanthrolin-2-yl)-N-(2,6-diisopropylphenyl)ethan-1-imine (L1g)



(E)-phenyl(4-phenylbut-3-en-1-yl)silane (3aa)

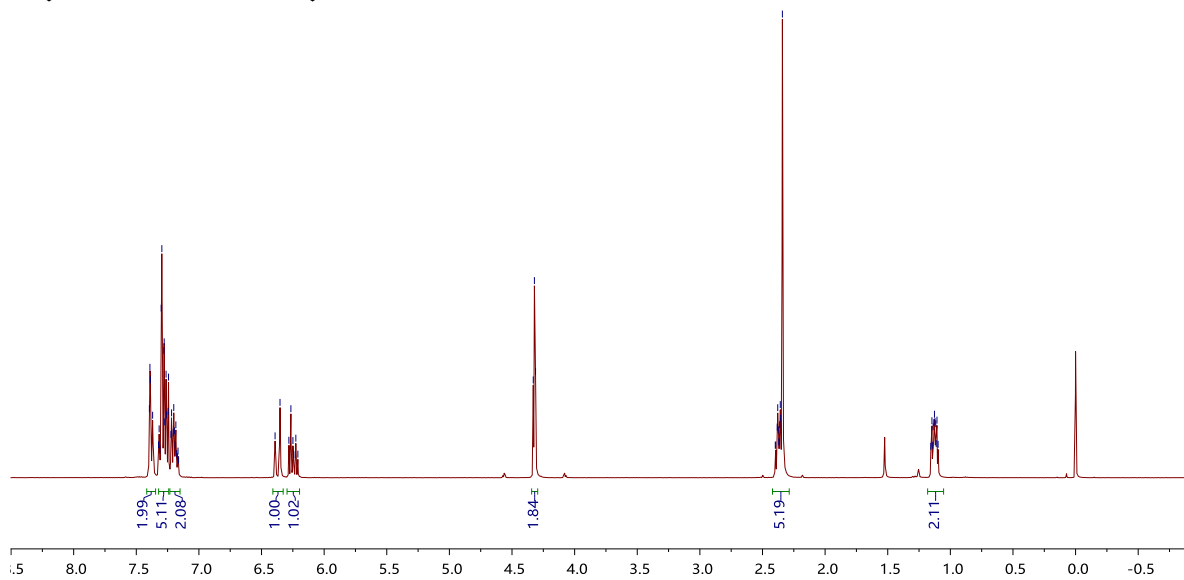
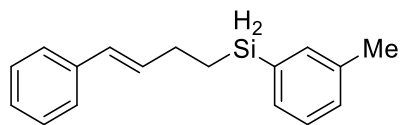


(E)-(4-phenylbut-3-en-1-yl)(o-tolyl)silane (3ab)

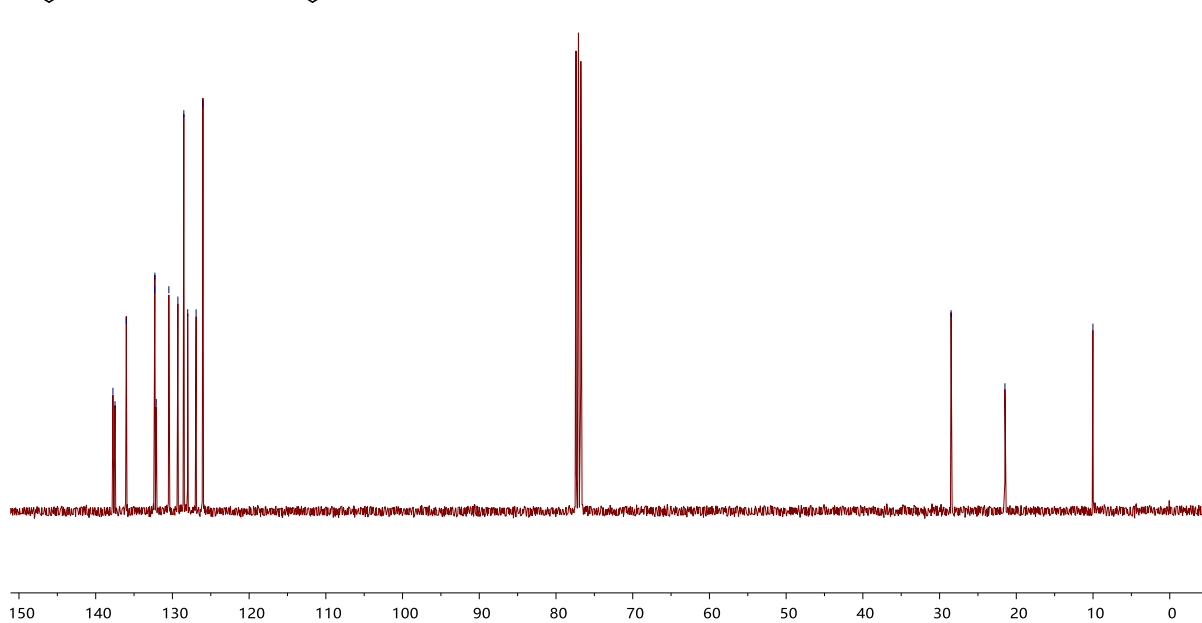
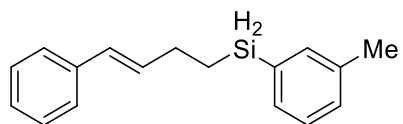


(E)-4-phenylbut-3-en-1-yl(m-tolyl)silane (3ac)

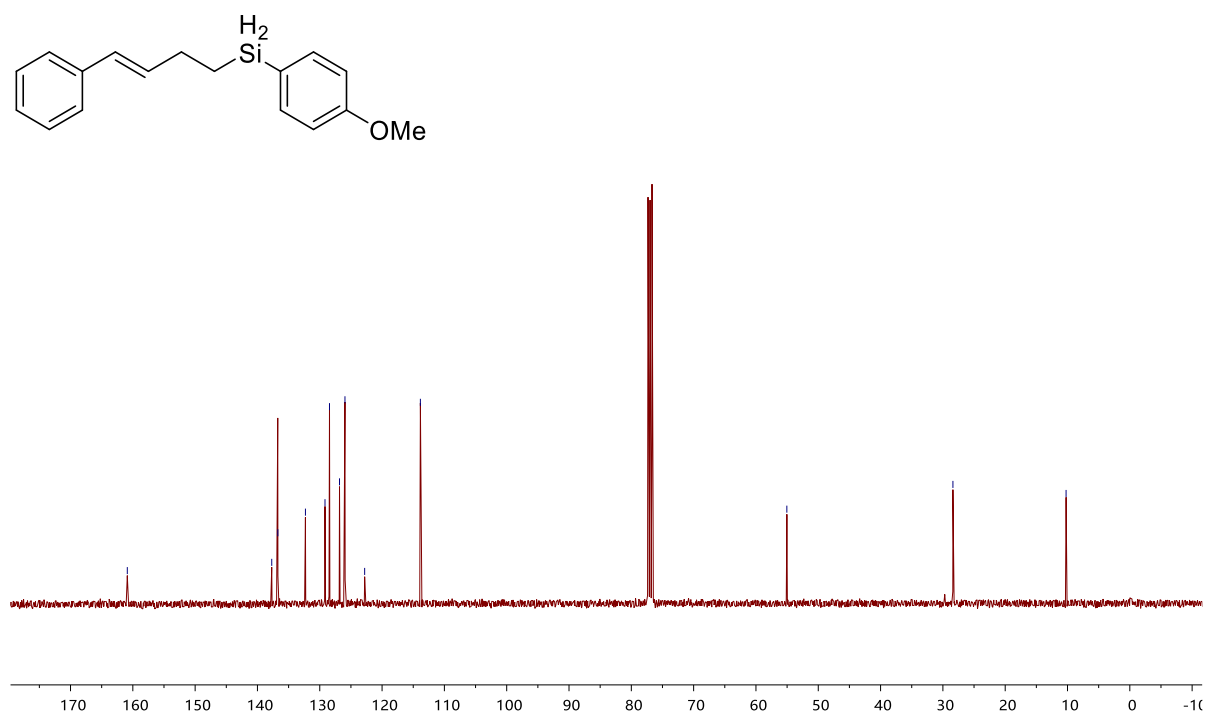
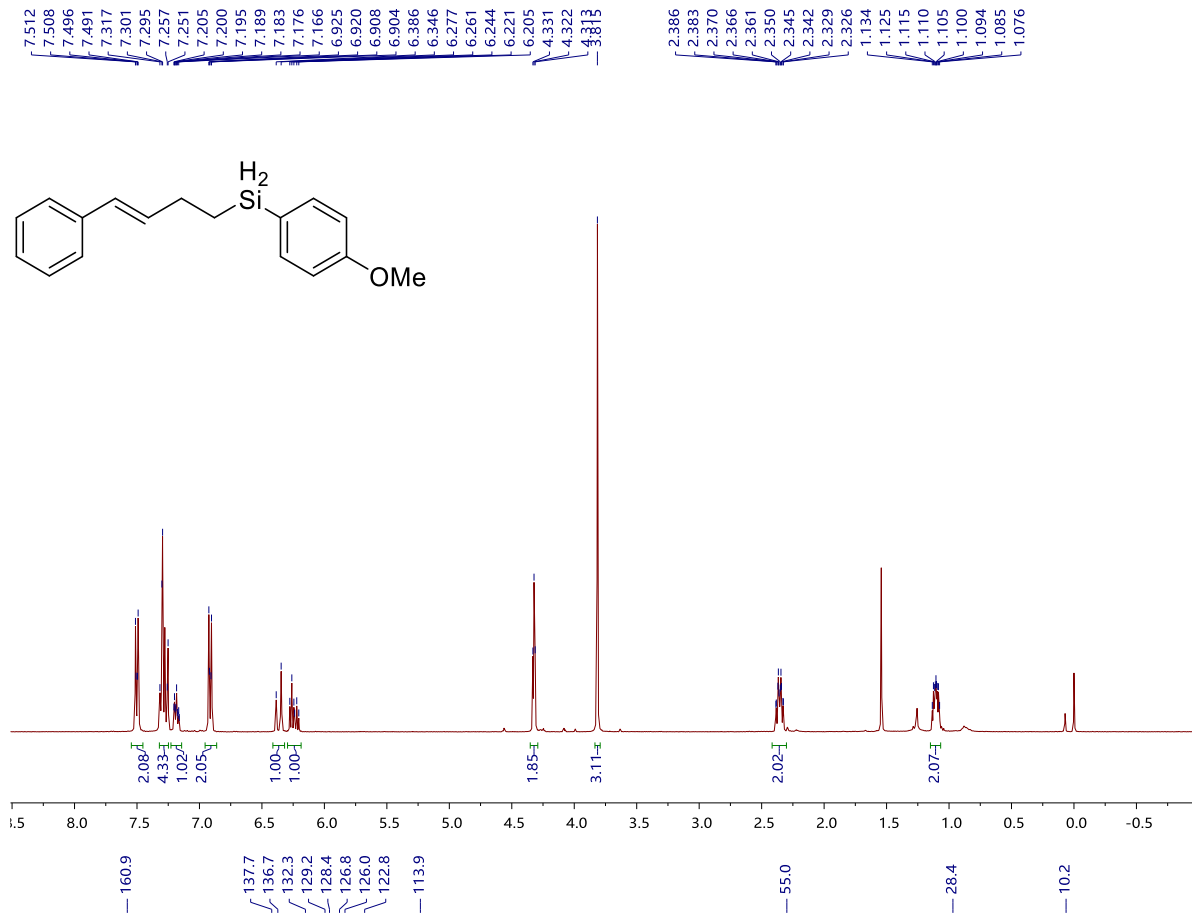
7.395, 7.391, 7.388, 7.370, 7.322, 7.318, 7.312, 7.301, 7.296, 7.280, 7.277, 7.273, 7.262, 7.258, 7.245, 7.243, 7.223, 7.218, 7.205, 7.201, 7.196, 7.190, 7.184, 7.177, 7.171, 7.167, 7.162, 6.392, 6.352, 6.282, 6.265, 6.249, 6.242, 6.226, 6.210, 6.210, 4.330, 4.321, 4.312, 2.398, 2.394, 2.382, 2.378, 2.374, 2.369, 2.366, 2.362, 2.358, 2.355, 2.341, 2.341, 1.156, 1.147, 1.141, 1.137, 1.132, 1.127, 1.122, 1.117, 1.113, 1.107, 1.098



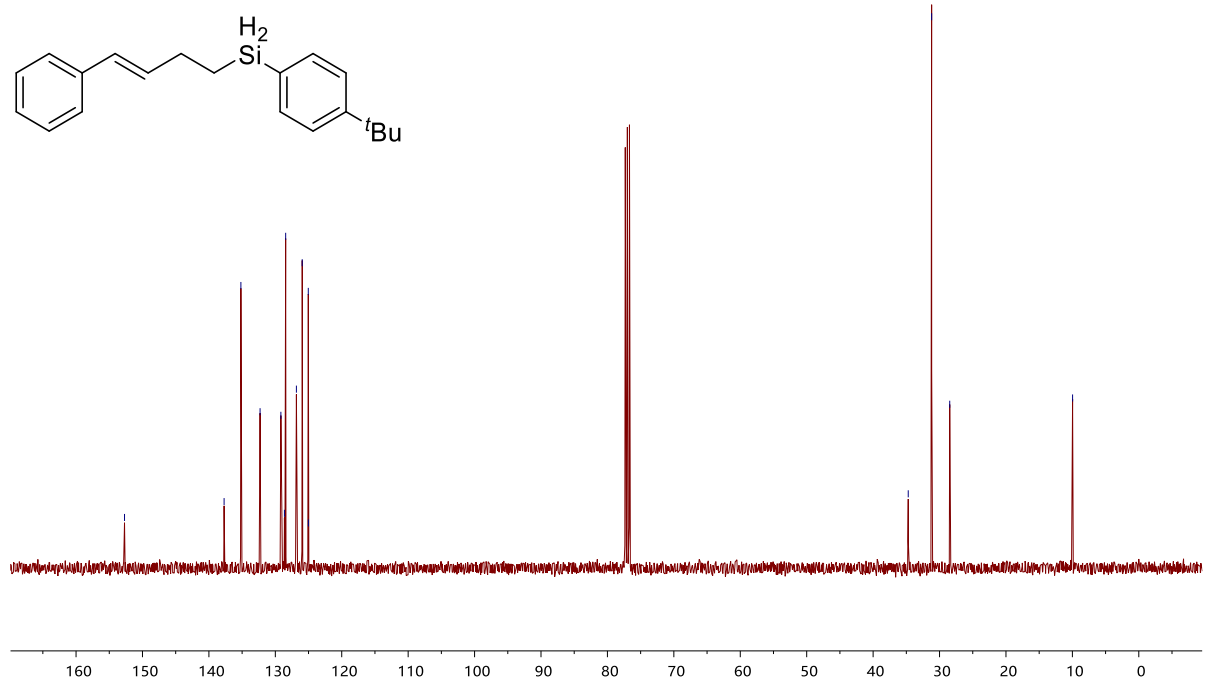
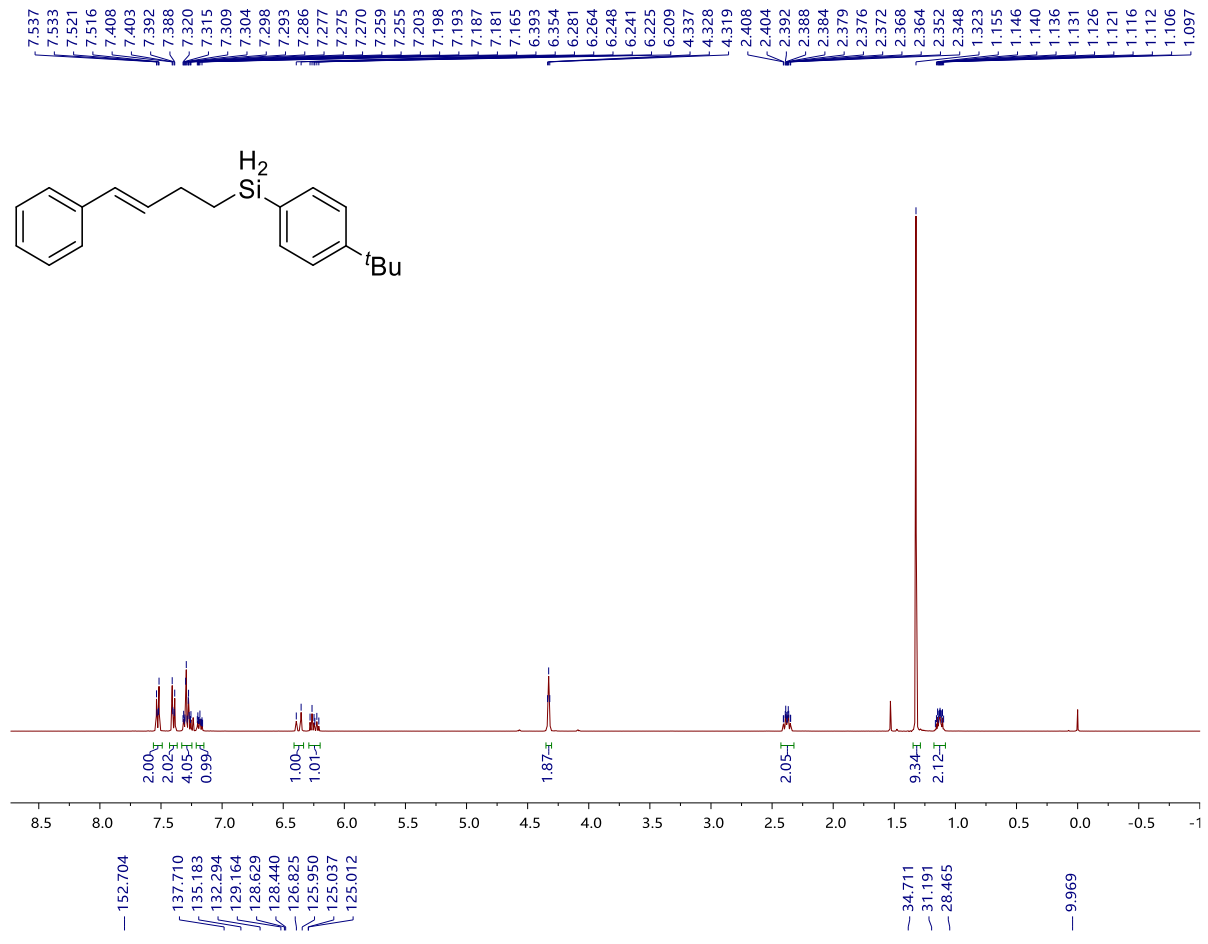
137.8, 137.5, 136.0, 132.3, 132.3, 132.1, 130.5, 129.3, 128.5, 128.0, 126.9, 126.0, -28.5, -21.5, -10.0



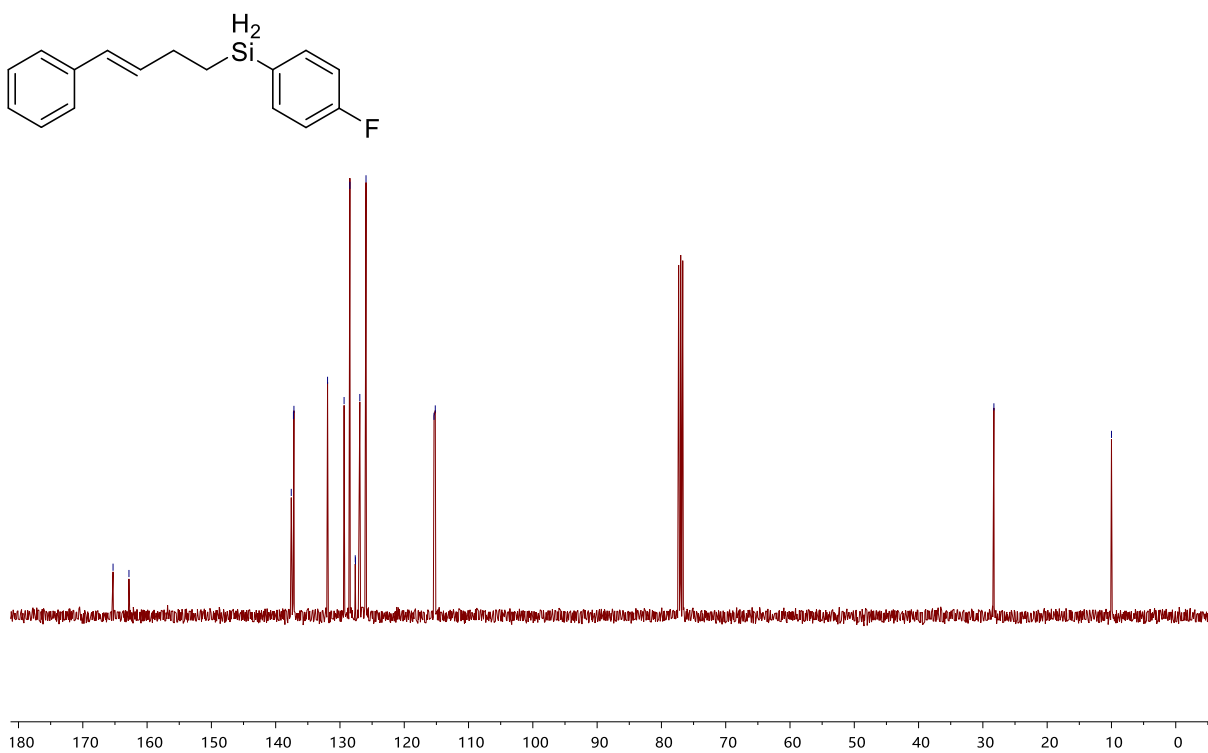
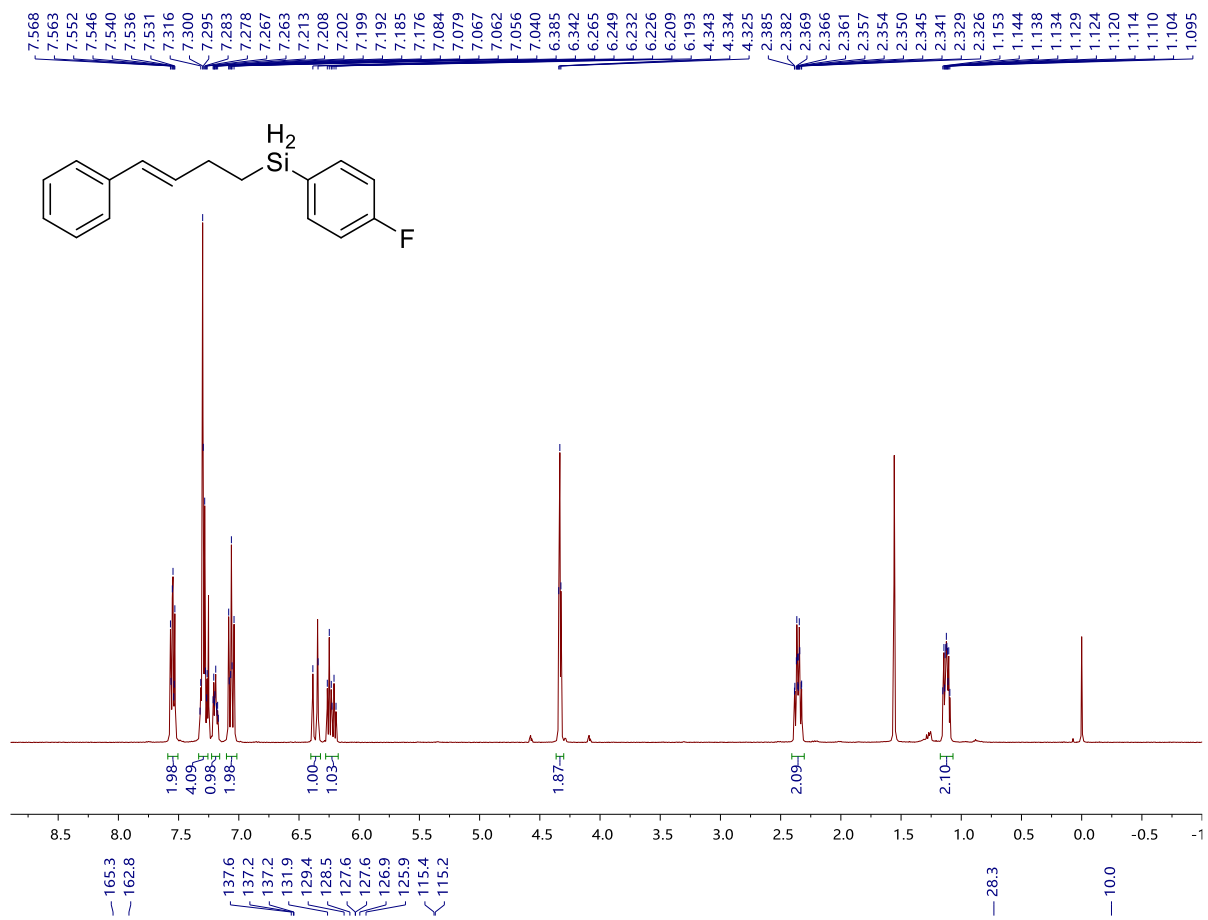
(E)-(4-methoxyphenyl)(4-phenylbut-3-en-1-yl)silane (3ad)

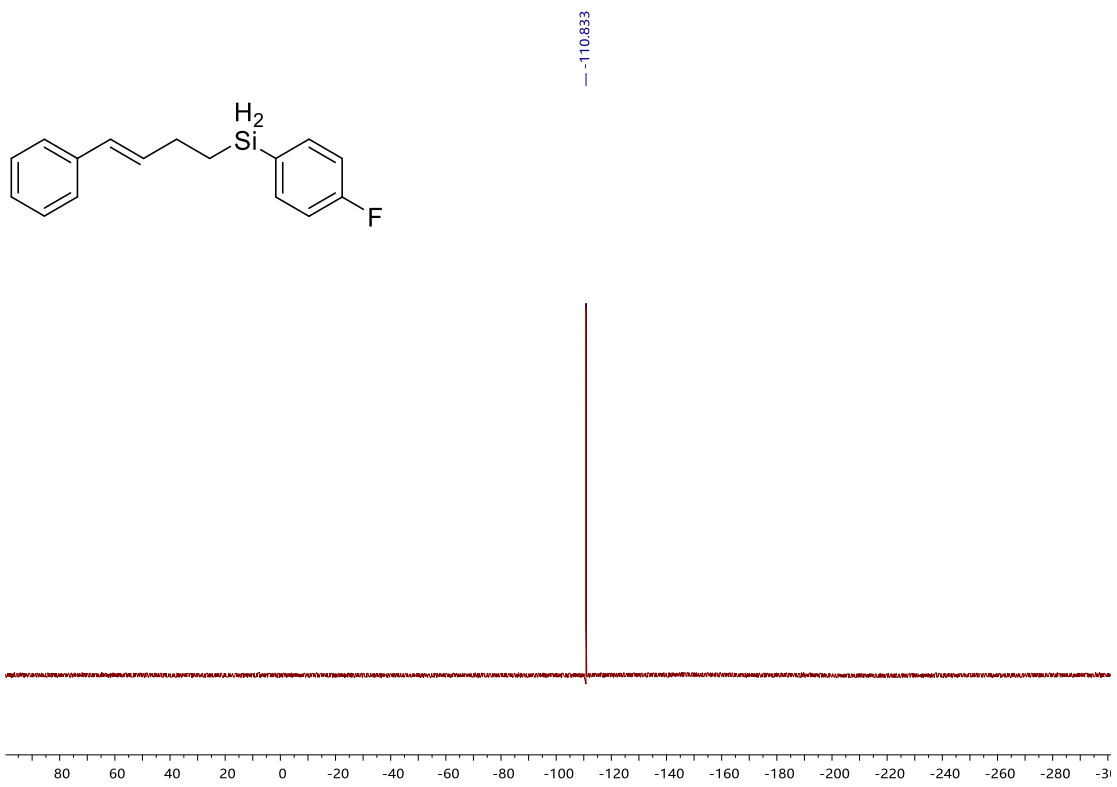


(E)-4-(tert-butylphenyl)(4-phenylbut-3-en-1-yl)silane (3ae)

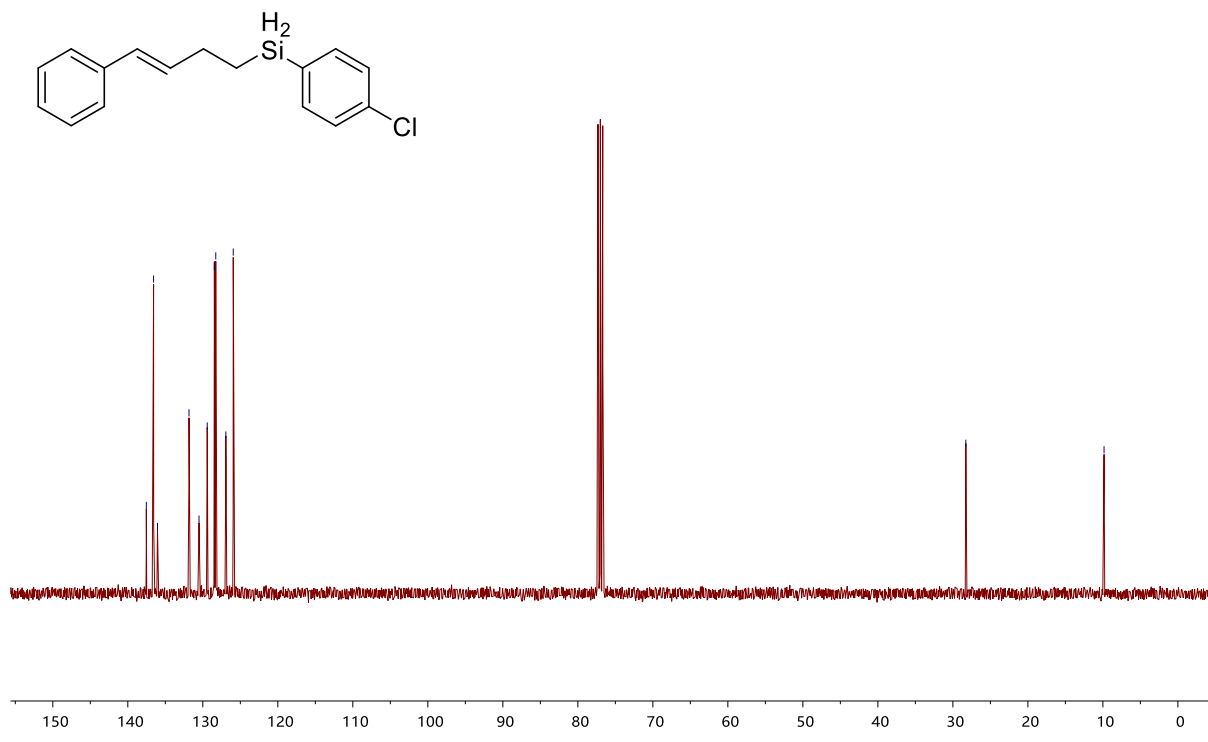
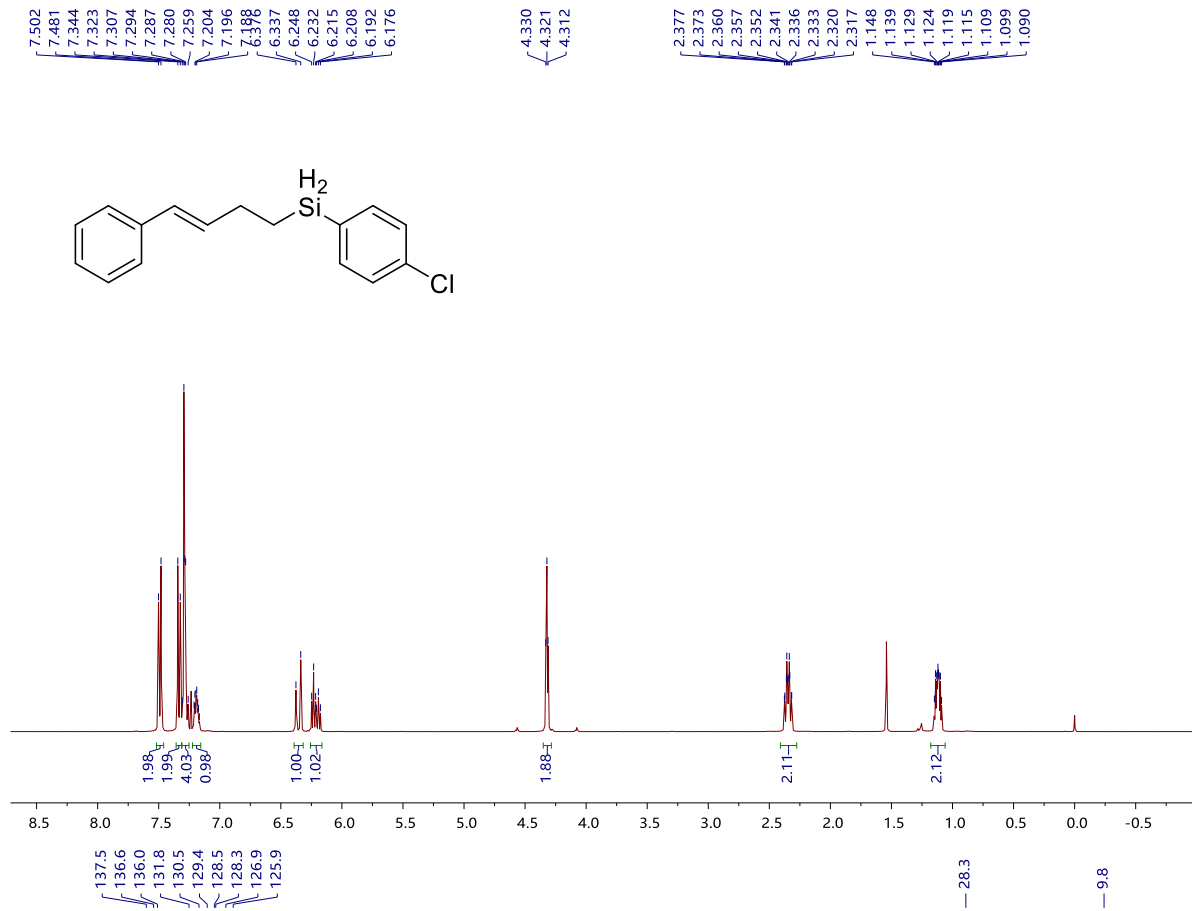


(E)-(4-fluorophenyl)(4-phenylbut-3-en-1-yl)silane (3af)

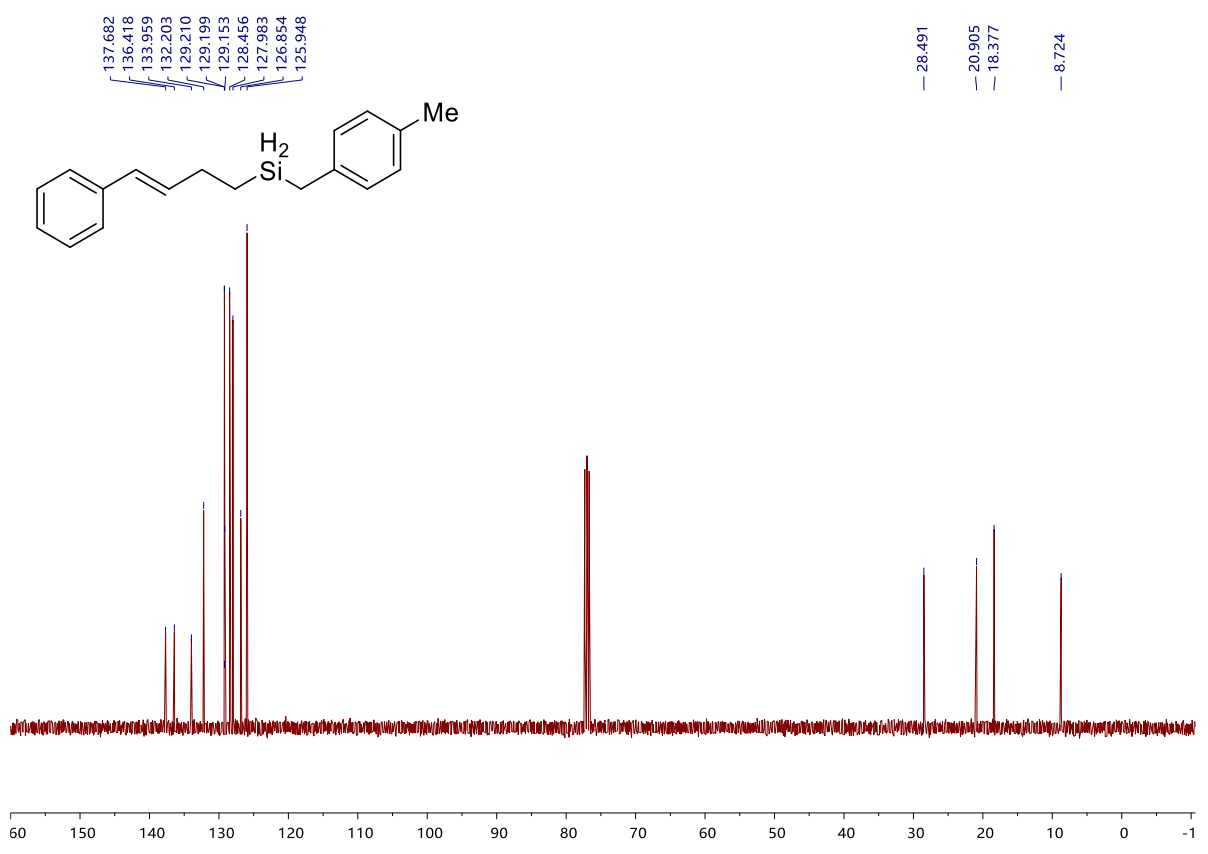
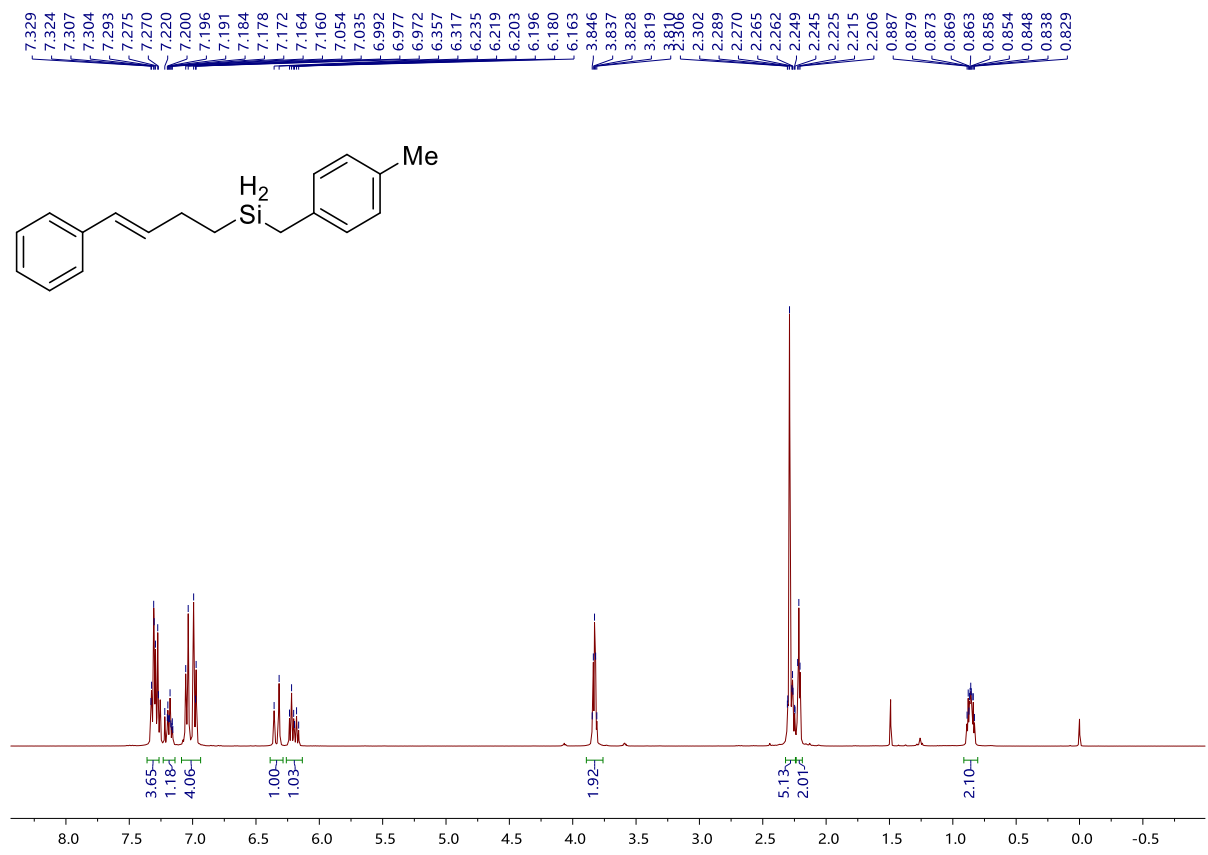




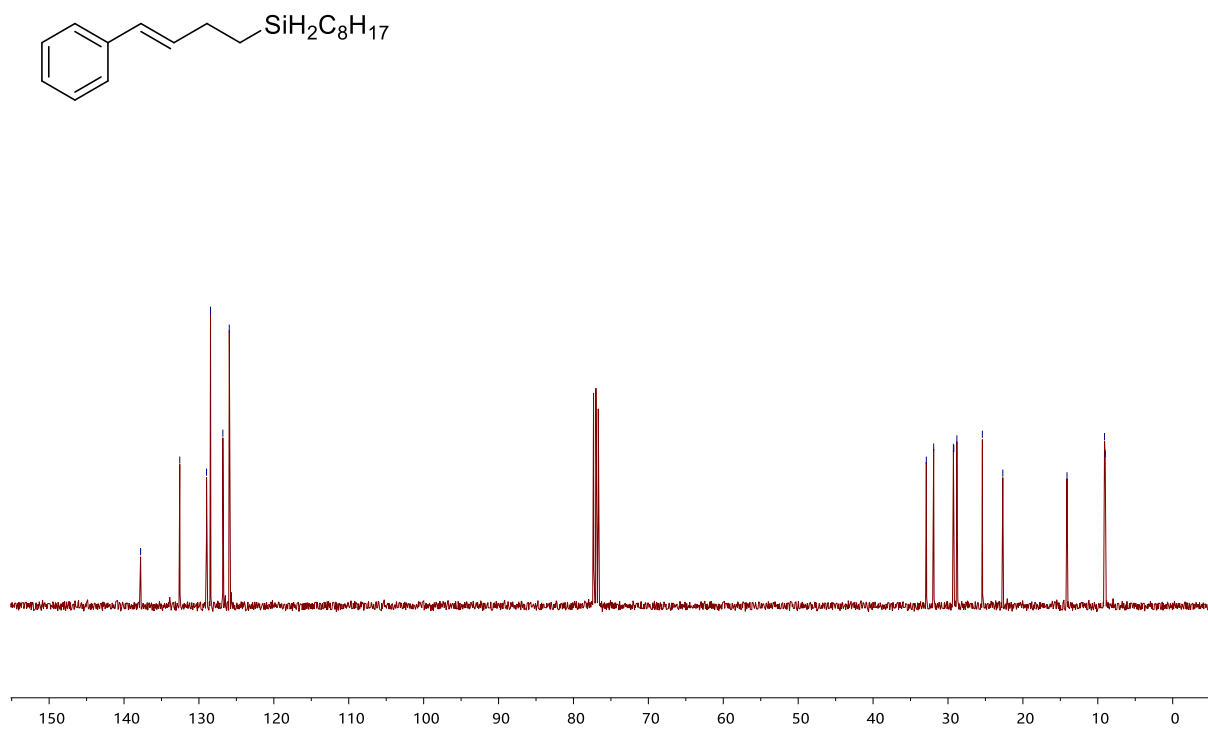
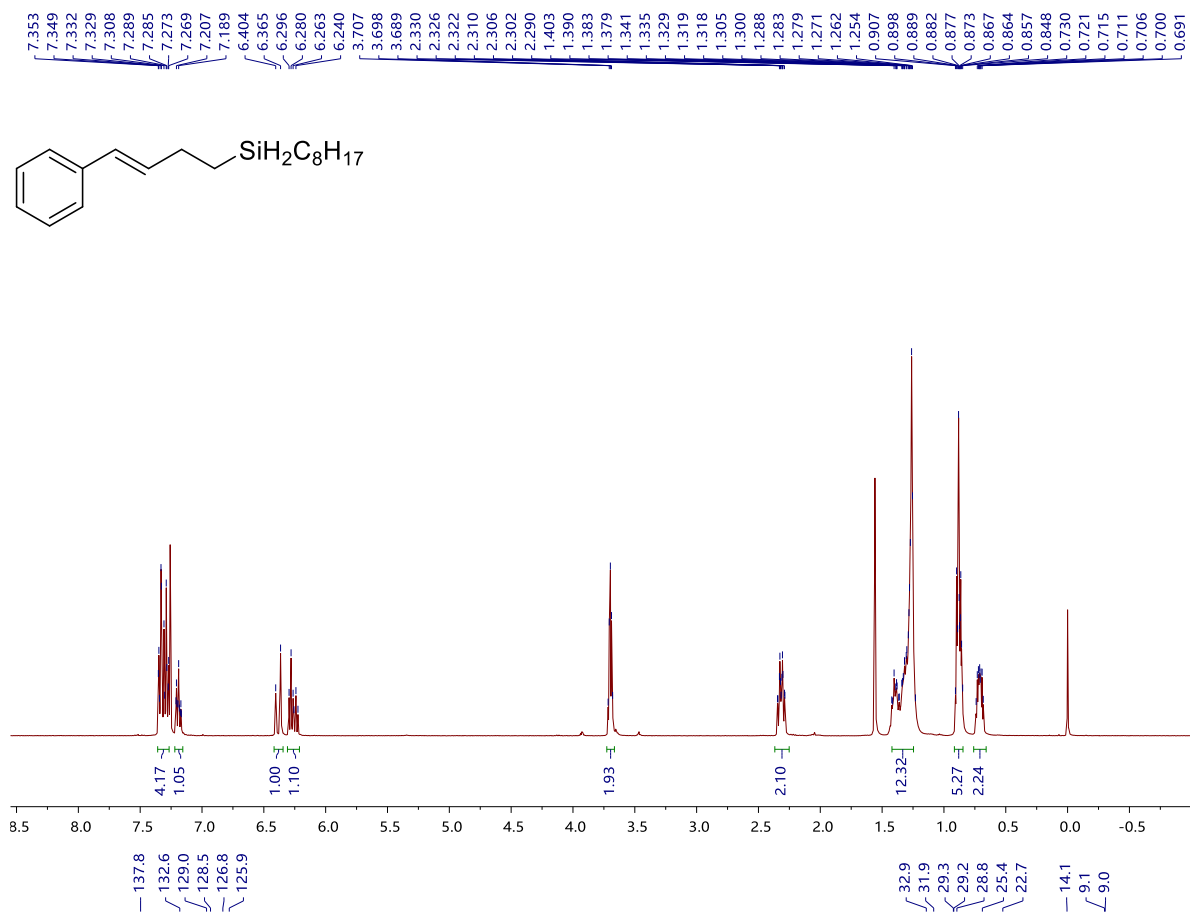
(E)-(4-chlorophenyl)(4-phenylbut-3-en-1-yl)silane (3ag)



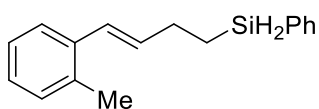
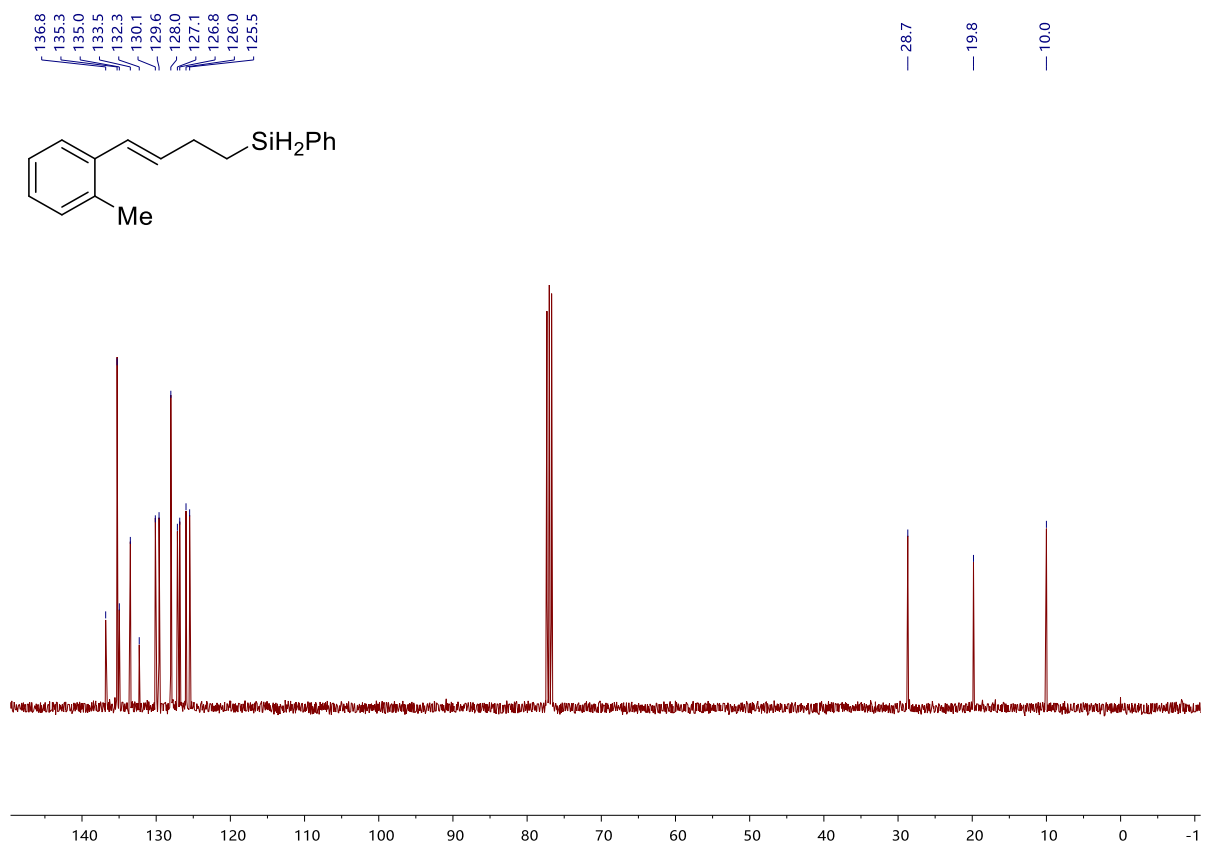
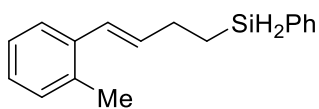
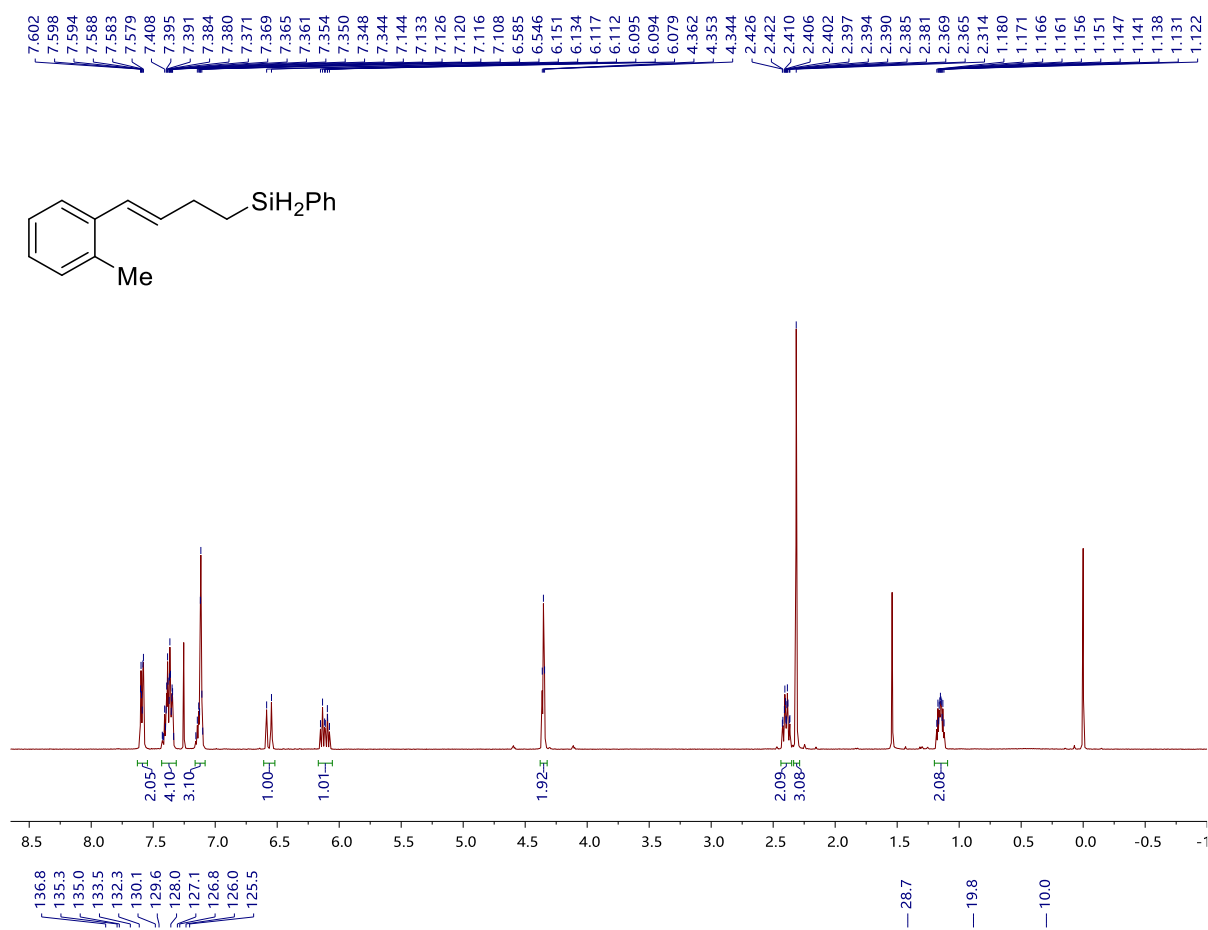
(E)-(4-methylbenzyl)(4-phenylbut-3-en-1-yl)silane (3ah)



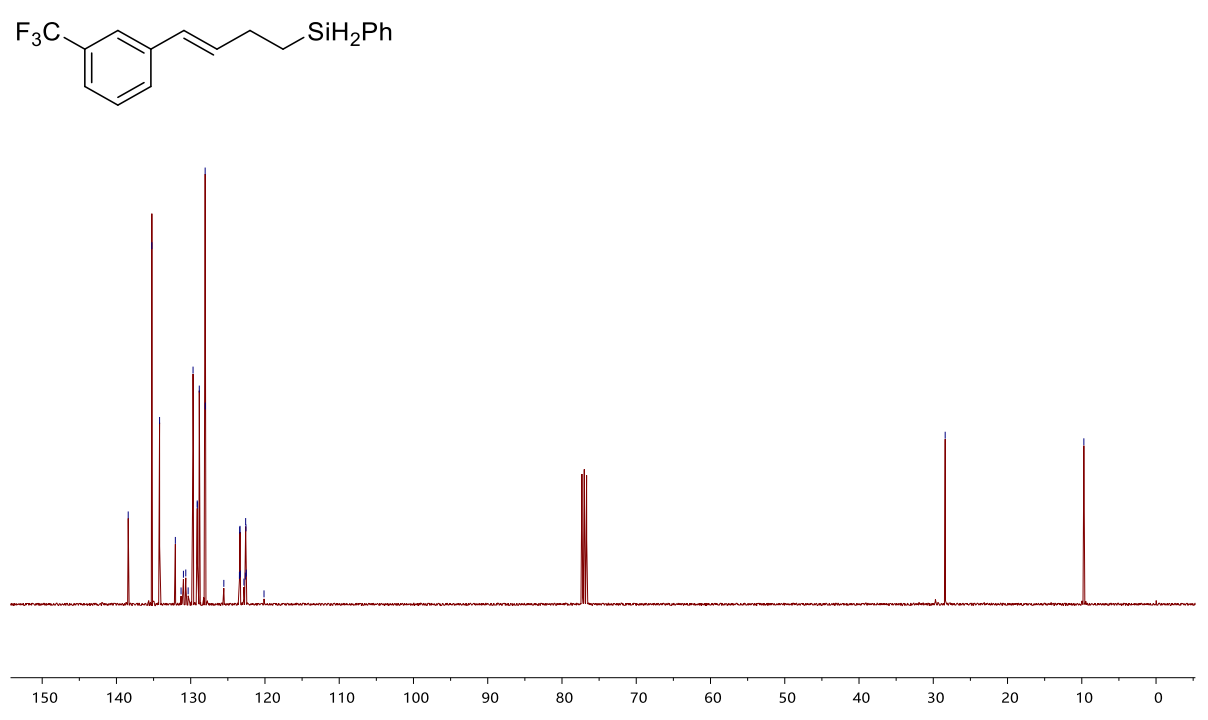
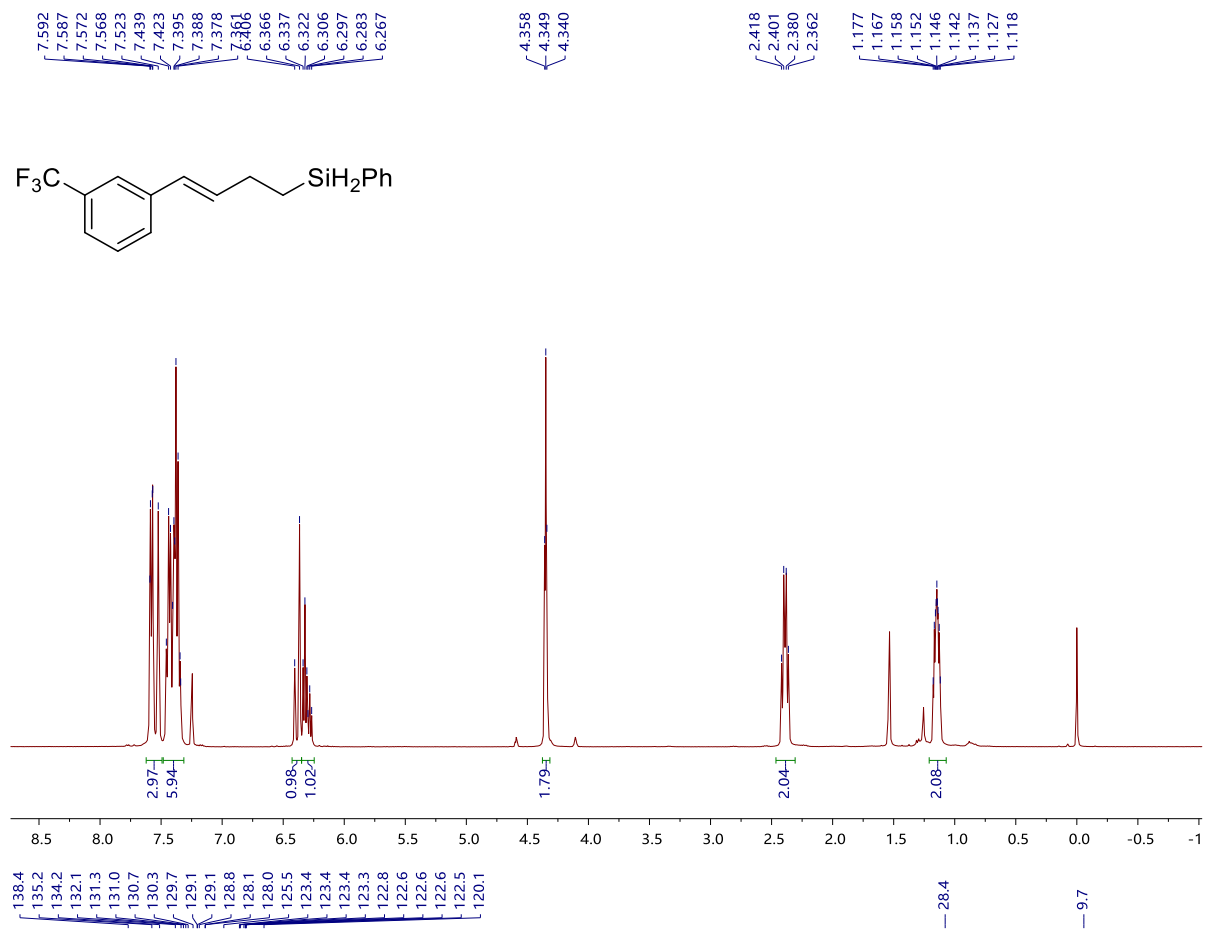
(E)-octyl(4-phenylbut-3-en-1-yl)silane (3ai)

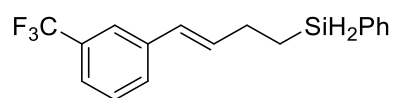


(E)-phenyl(4-(o-tolyl)but-3-en-1-yl)silane (3ba)

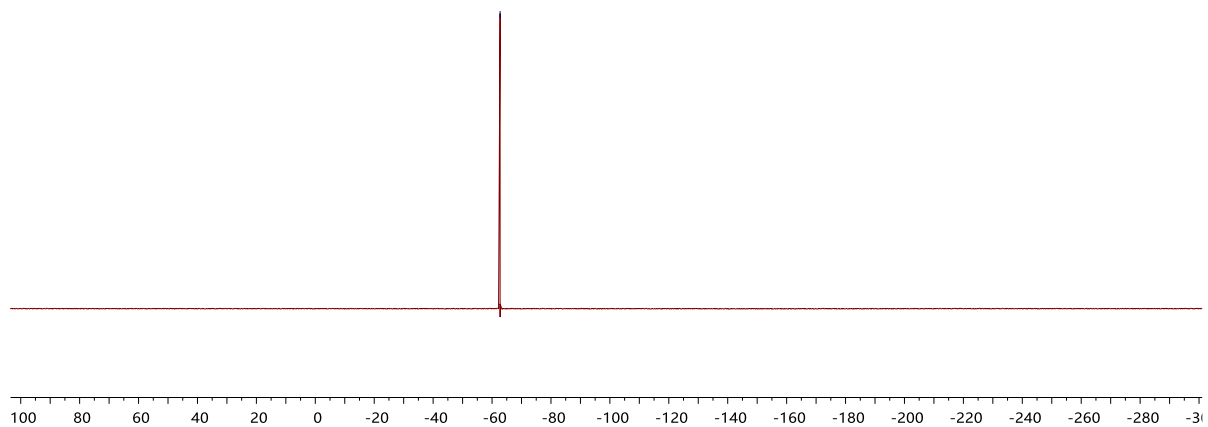


(E)-phenyl(4-(3-(trifluoromethyl)phenyl)but-3-en-1-yl)silane (3ca)

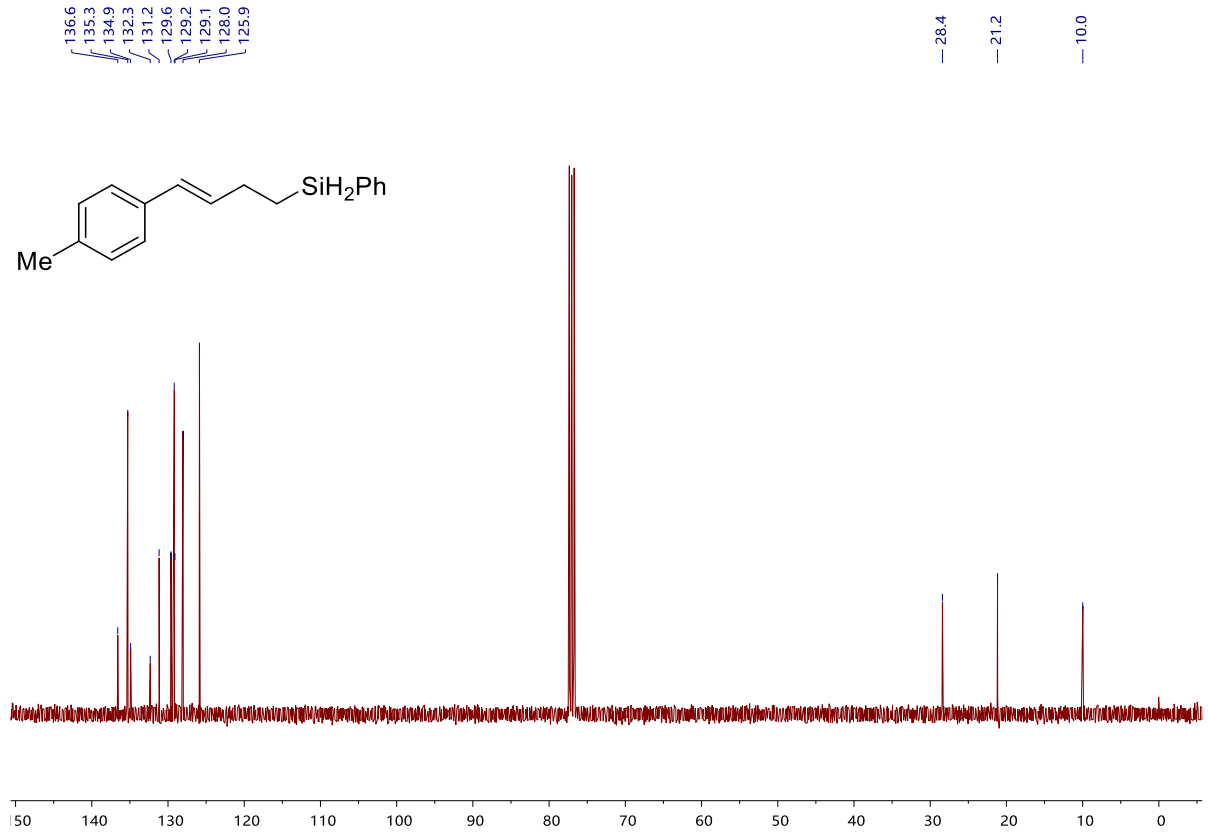
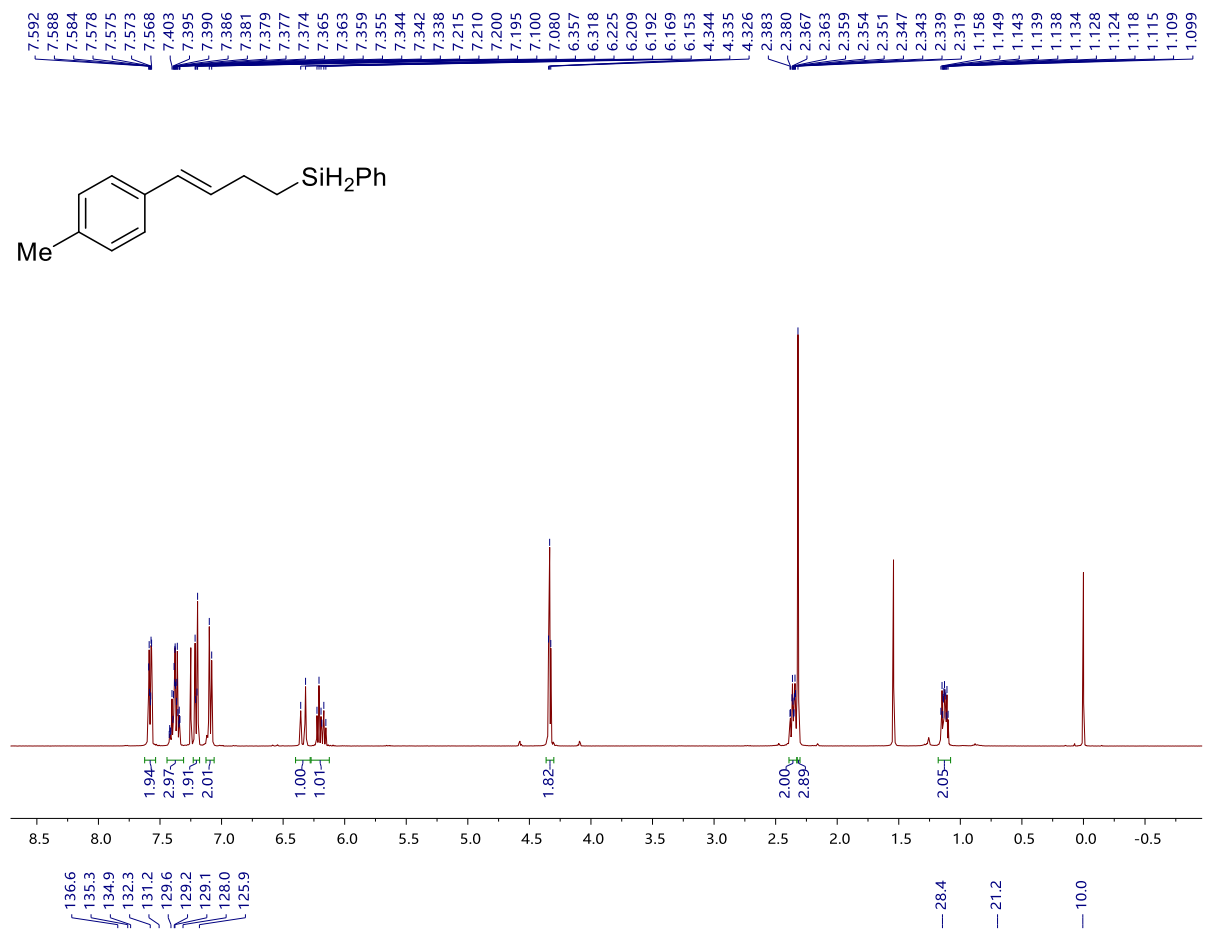




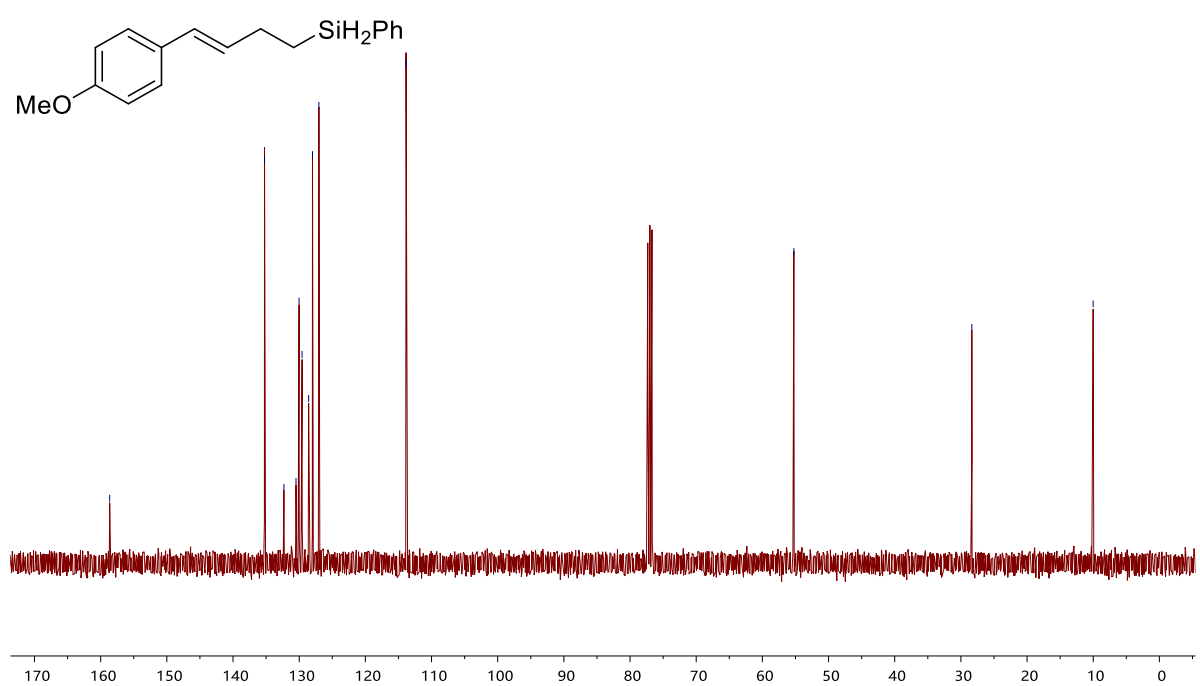
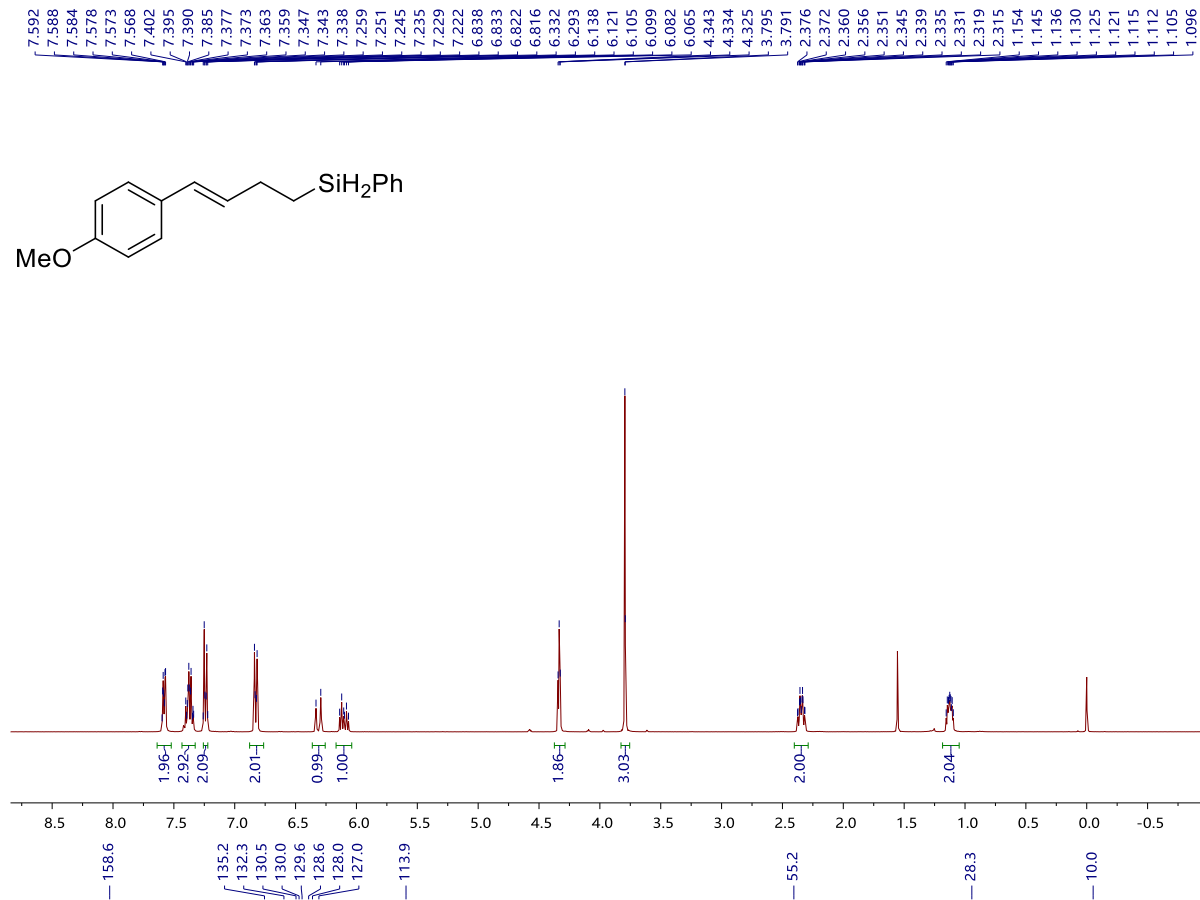
-62.729



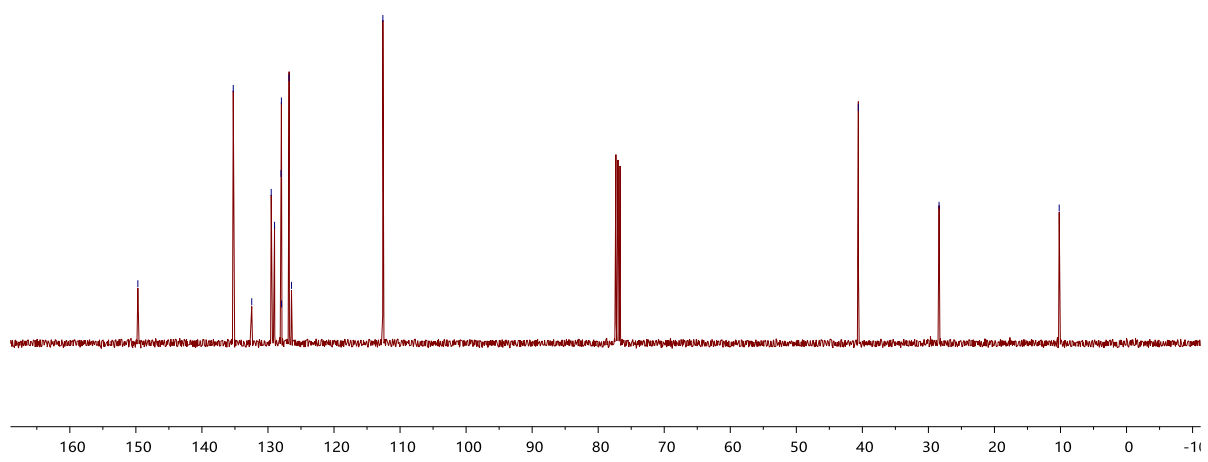
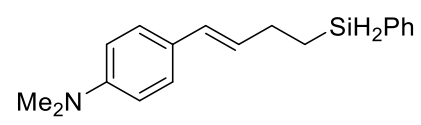
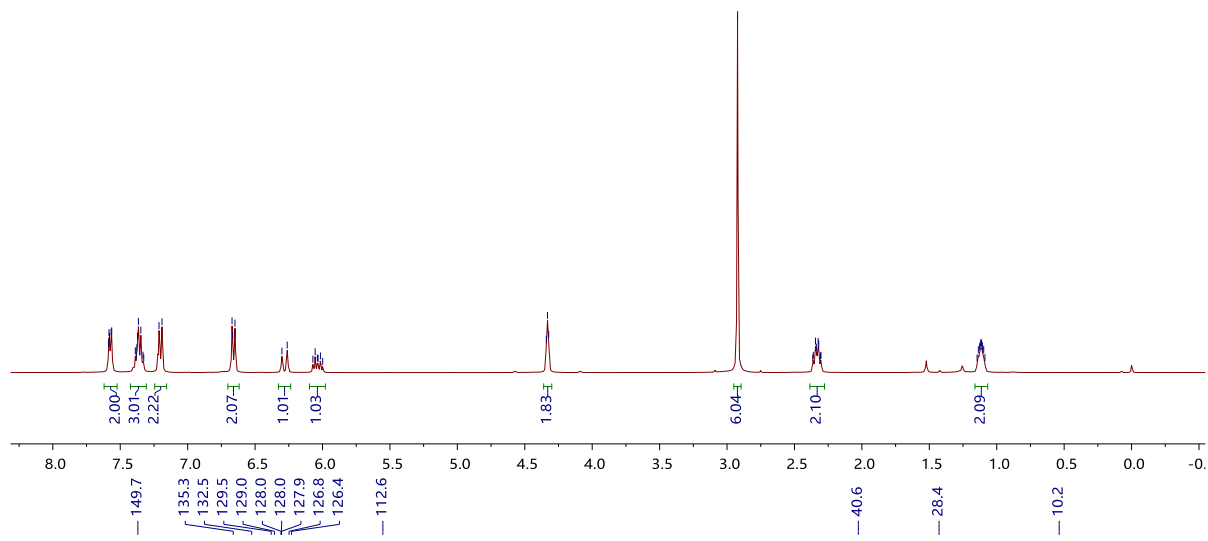
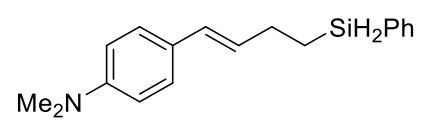
(E)-phenyl(4-(p-tolyl)but-3-en-1-yl)silane (3da)



(E)-4-(4-methoxyphenyl)but-3-en-1-yl(phenyl)silane (3ea)

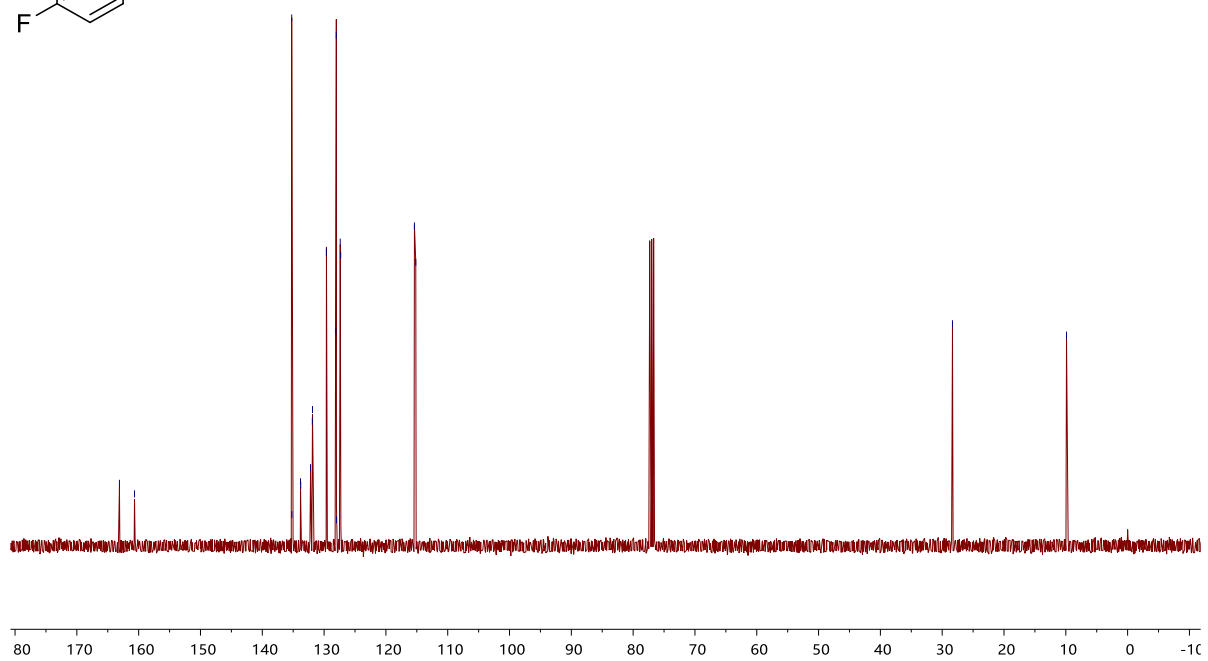
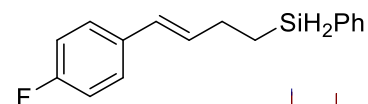
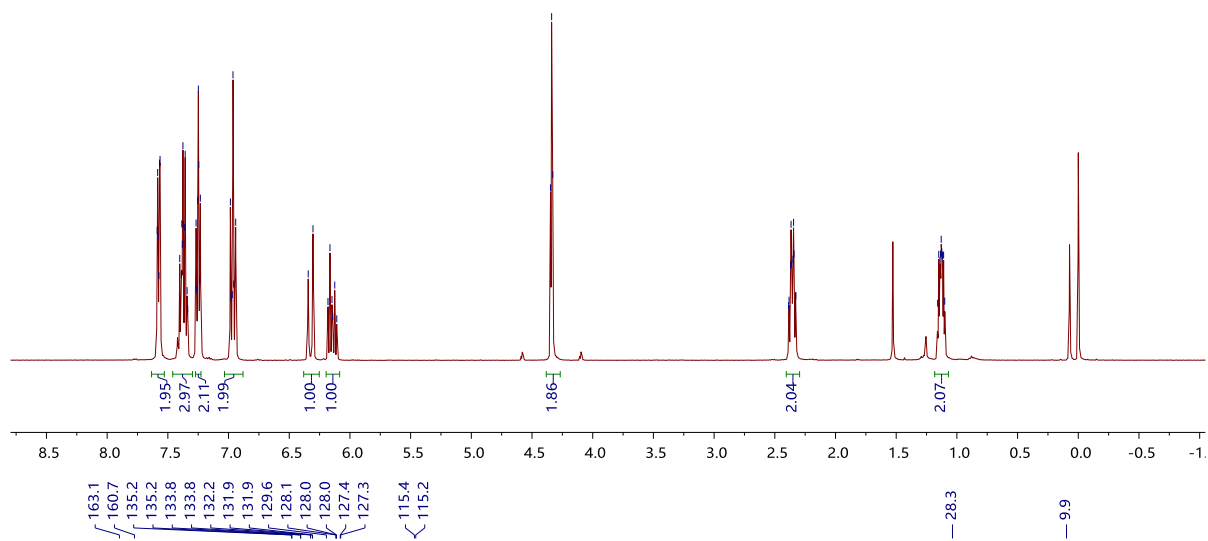
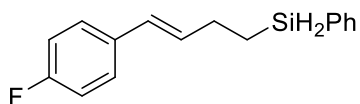


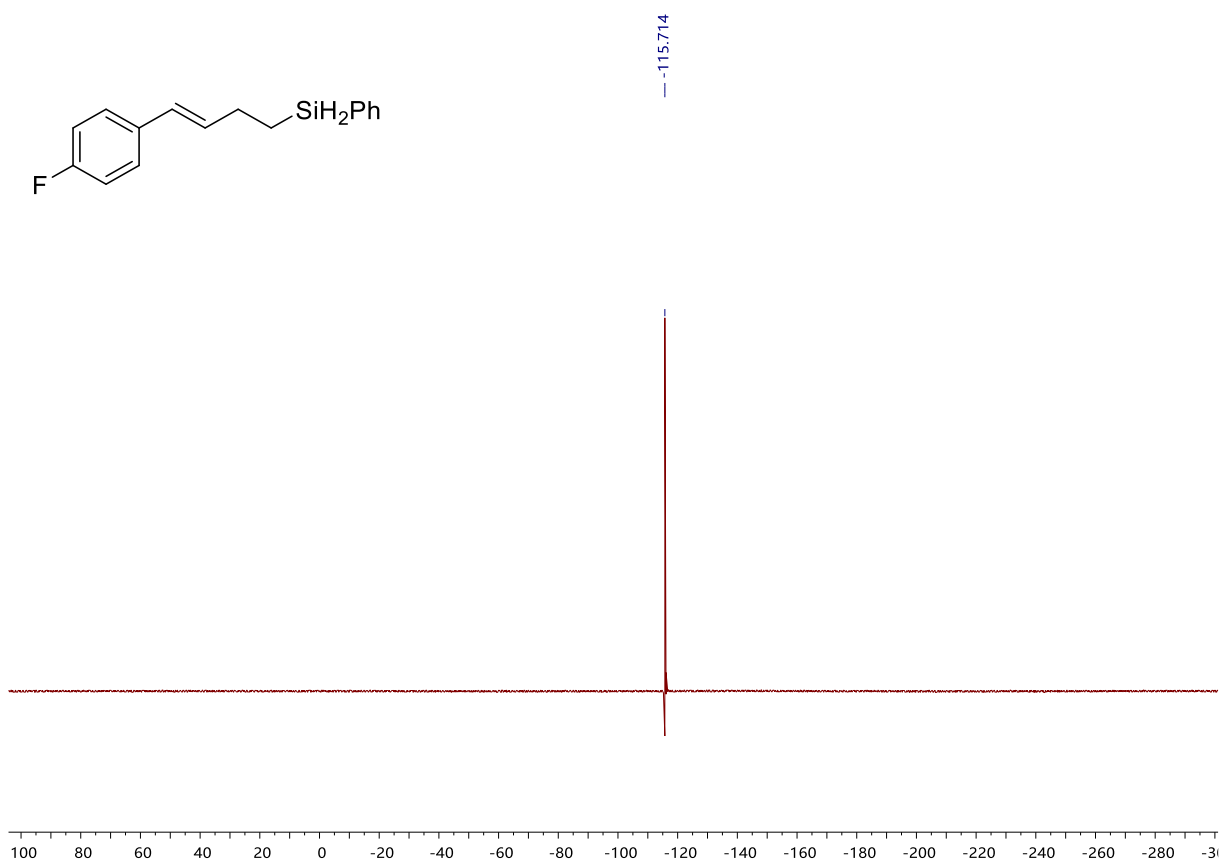
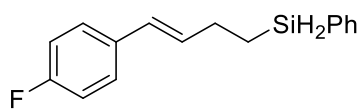
(E)-N,N-dimethyl-4-(4-(phenylsilyl)but-1-en-1-yl)aniline (3fa)



(E)-(4-(4-fluorophenyl)but-3-en-1-yl)(phenyl)silane (3ga)

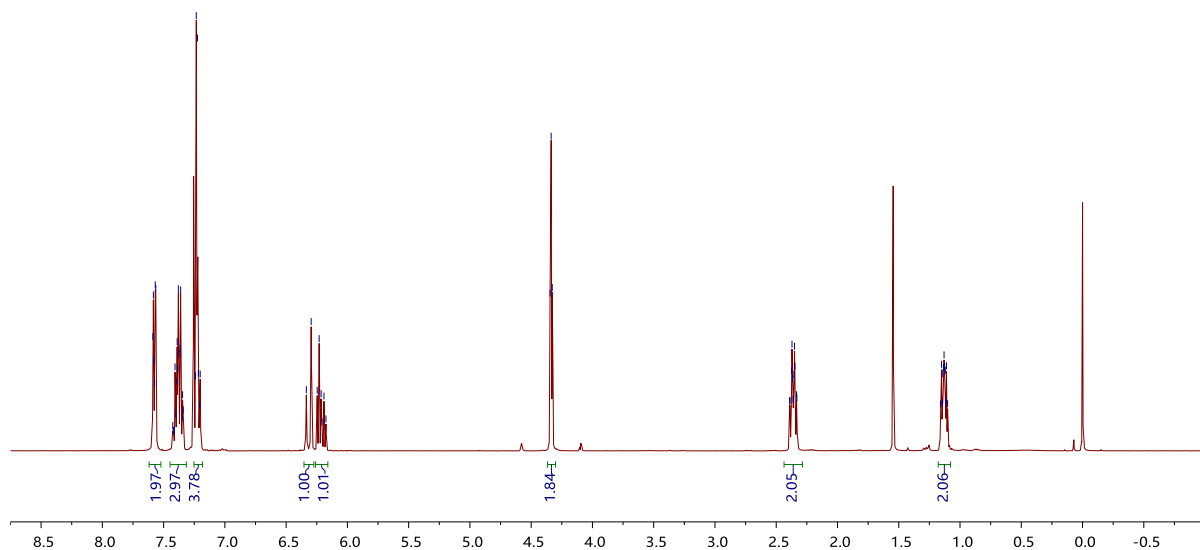
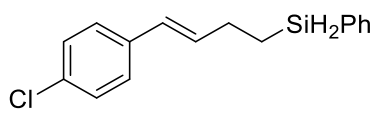
7.588
7.584
7.580
7.574
7.569
7.564
7.402
7.389
7.385
7.380
7.376
7.372
7.361
7.357
7.341
7.336
7.266
7.262
7.254
7.249
7.245
7.238
7.232
6.985
6.980
6.969
6.963
6.958
6.941
6.344
6.304
6.181
6.164
6.148
6.142
6.125
6.109
4.348
4.339
4.329
2.386
2.383
2.370
2.366
2.362
2.350
2.346
2.342
2.329
2.326
1.159
1.149
1.140
1.134
1.129
1.125
1.119
1.109
1.100





(E)-4-(4-chlorophenyl)but-3-en-1-yl(phenyl)silane (3ha)

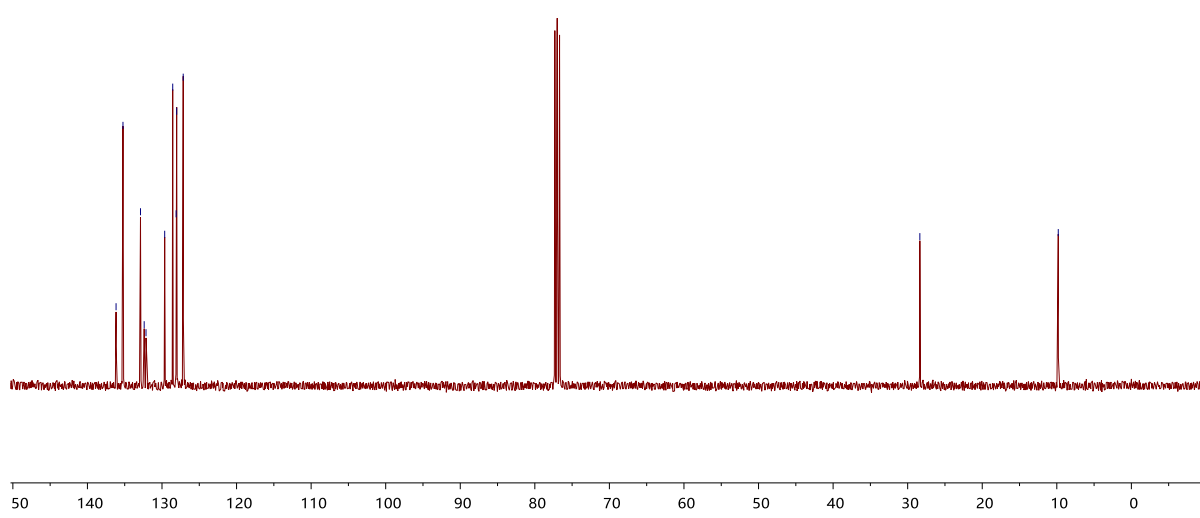
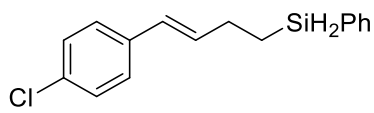
7.587, 7.584, 7.580, 7.573, 7.568, 7.564, 7.425, 7.421, 7.416, 7.407, 7.400, 7.394, 7.389, 7.385, 7.380, 7.376, 7.365, 7.361, 7.349, 7.345, 7.340, 7.240, 7.233, 7.223, 7.217, 7.207, 7.201, 6.335, 6.296, 6.246, 6.230, 6.214, 6.207, 6.191, 6.175, 4.346, 4.337, 4.328, 2.391, 2.388, 2.375, 2.371, 2.367, 2.363, 2.355, 2.351, 2.347, 2.334, 2.331, 1.160, 1.151, 1.145, 1.141, 1.135, 1.130, 1.126, 1.120, 1.116, 1.110, 1.101



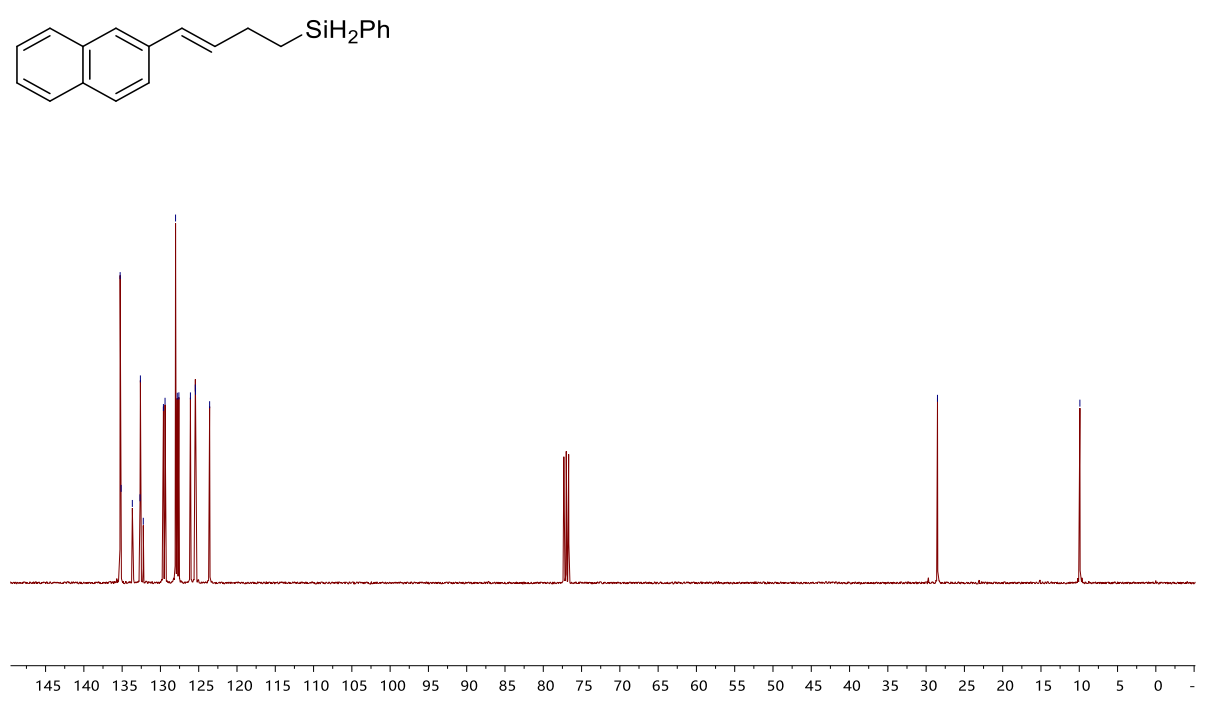
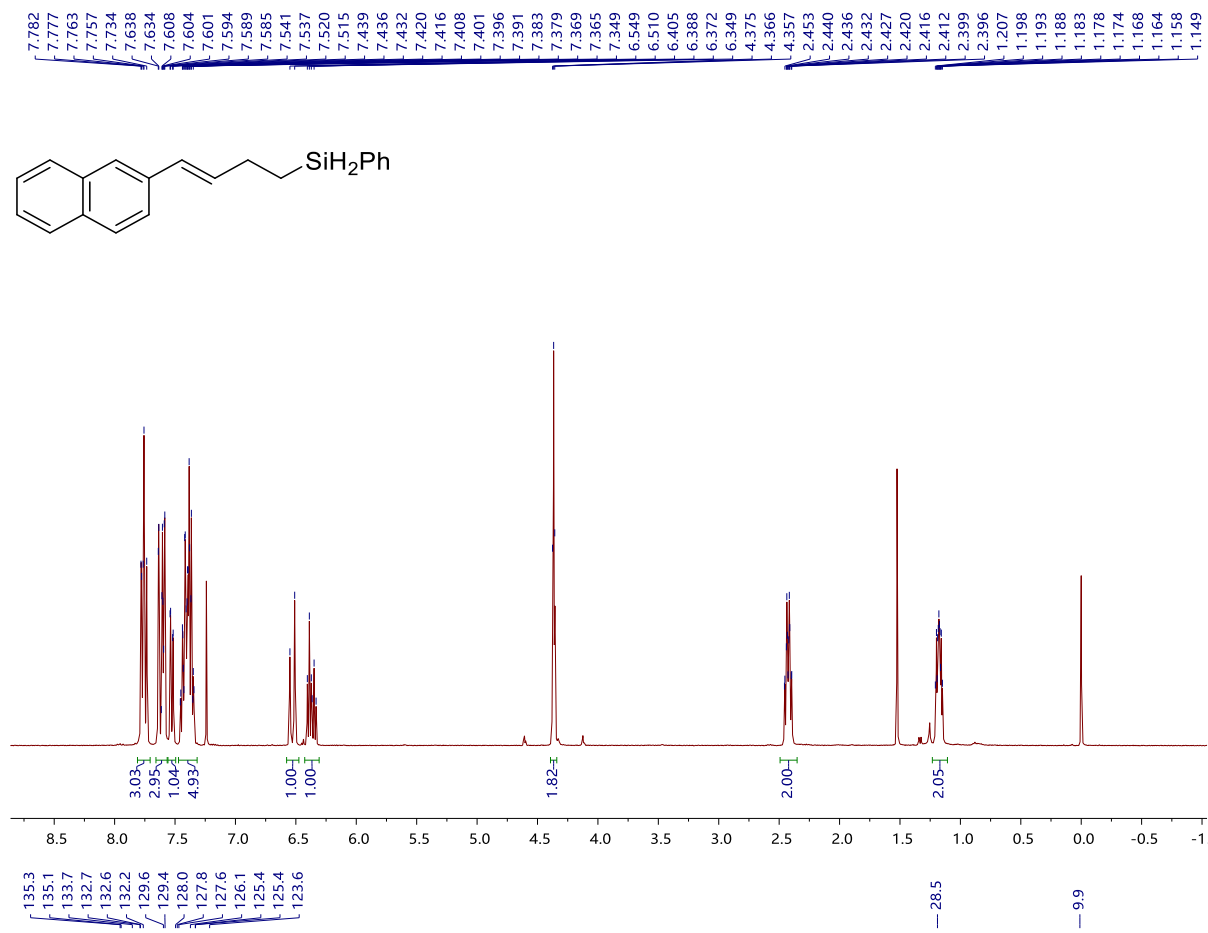
136.2, 135.2, 132.9, 132.4, 132.1, 129.6, 128.6, 128.1, 128.0, 127.2

28.4

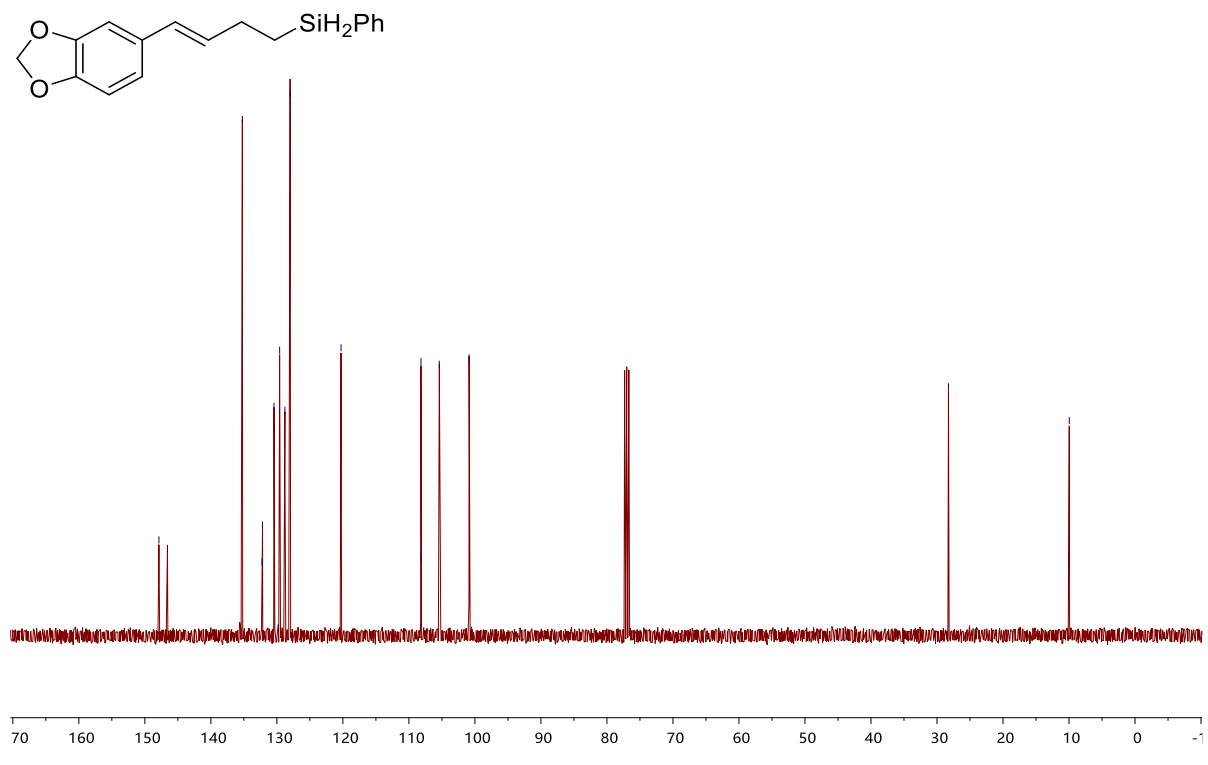
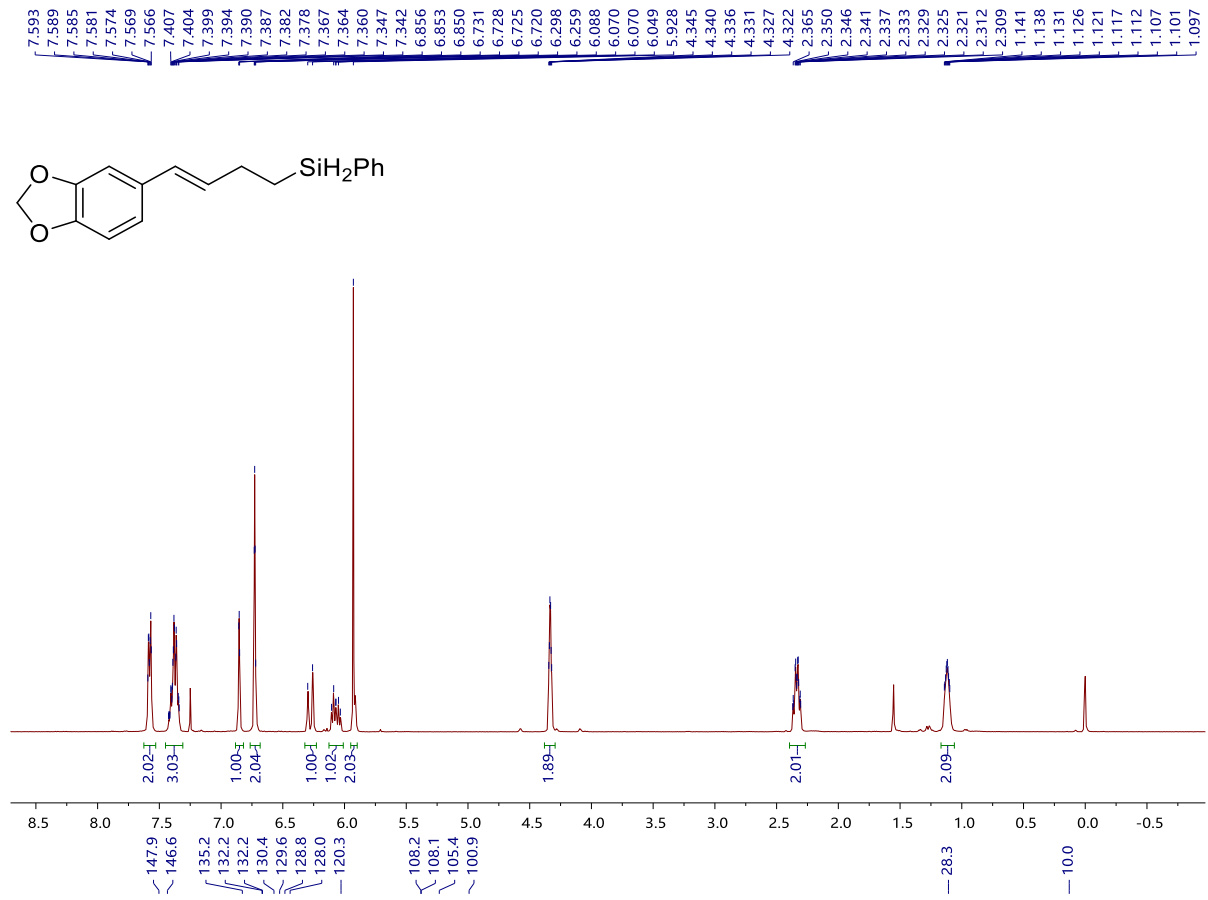
9.8



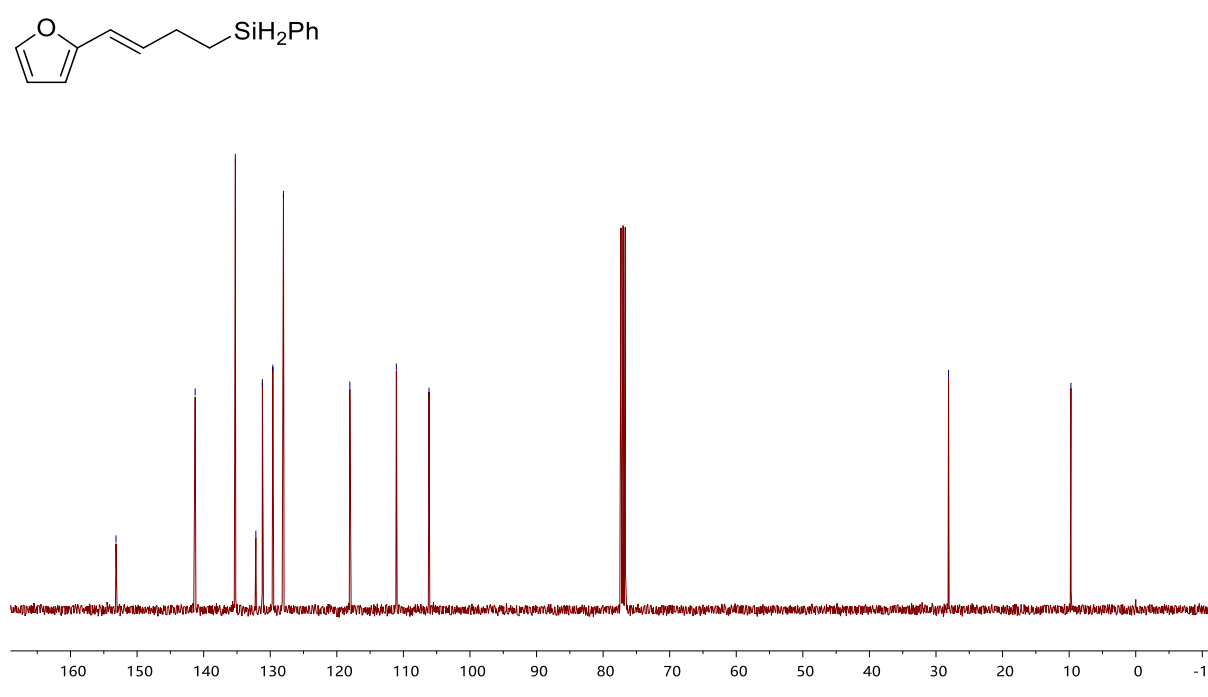
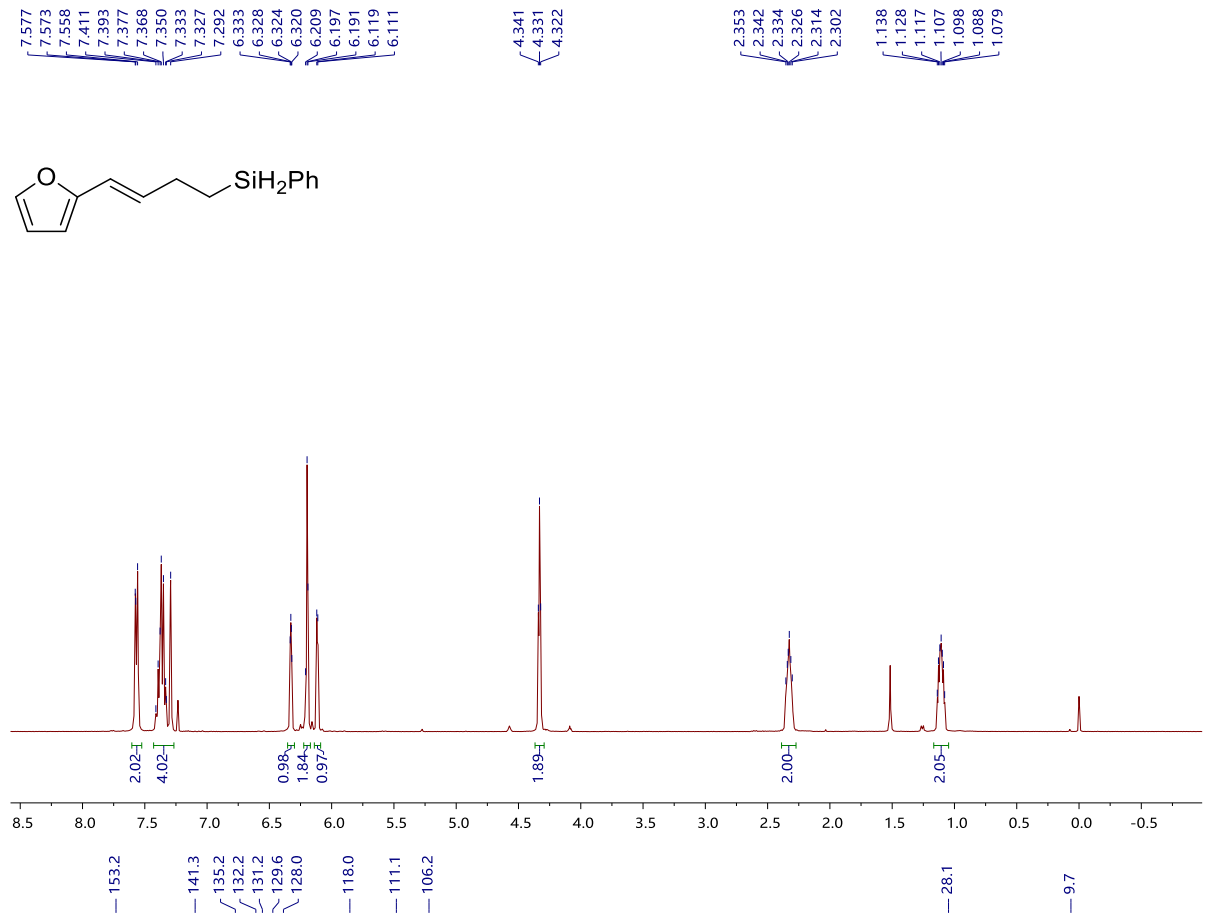
(E)-(4-(naphthalen-2-yl)but-3-en-1-yl)(phenyl)silane (3ia)



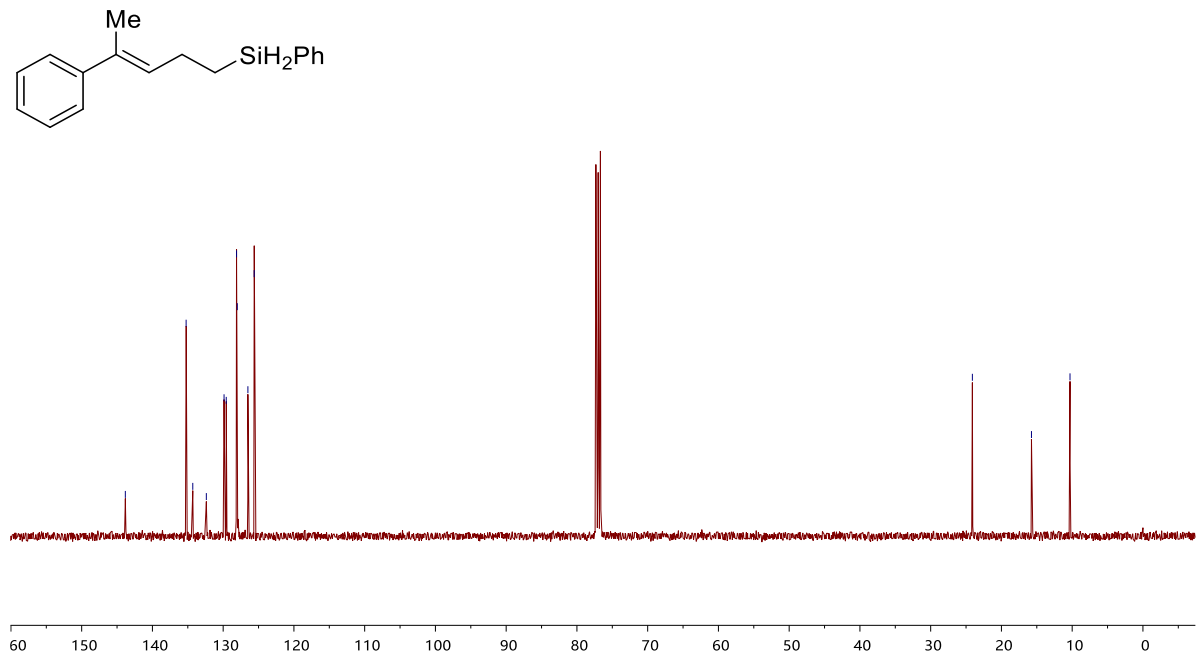
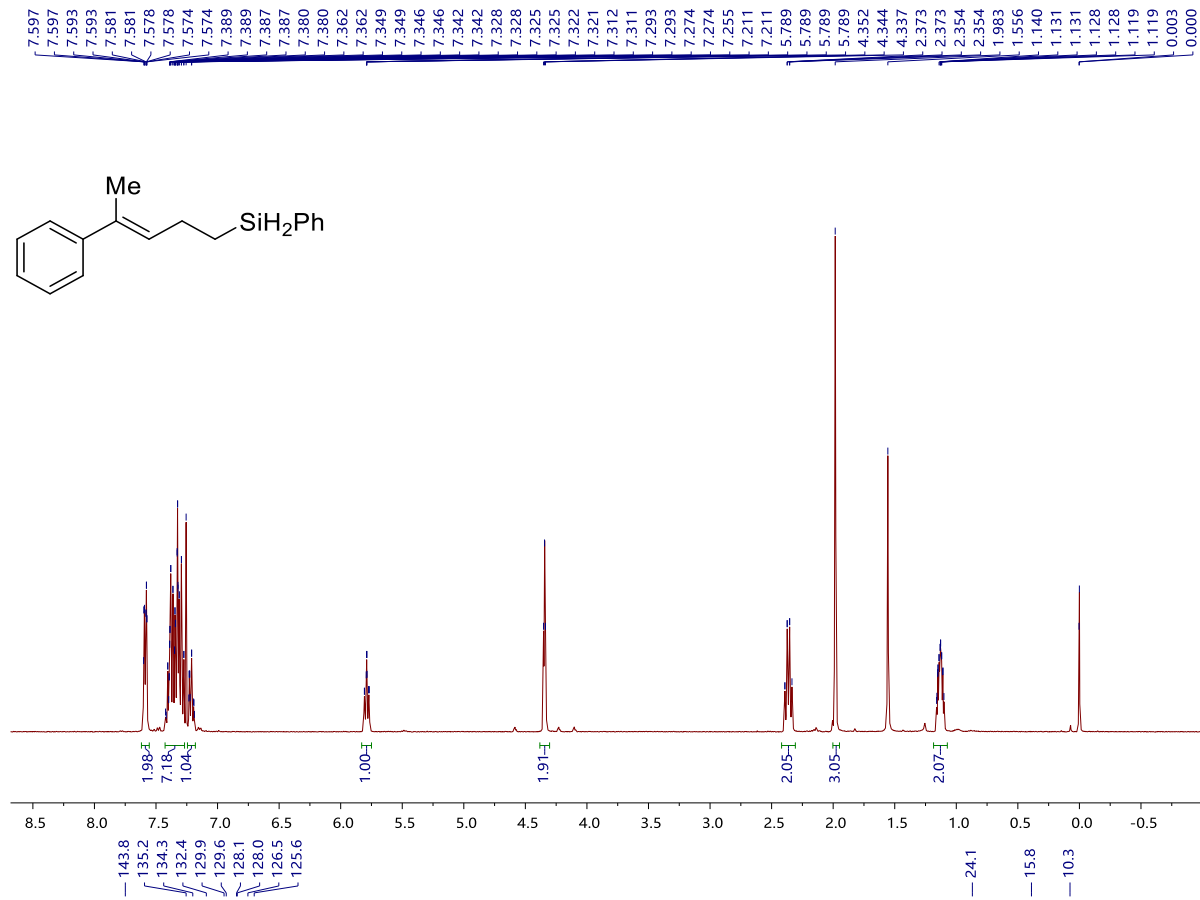
(E)-4-(benzo[d][1,3]dioxol-5-yl)but-3-en-1-yl(phenyl)silane (3ja)



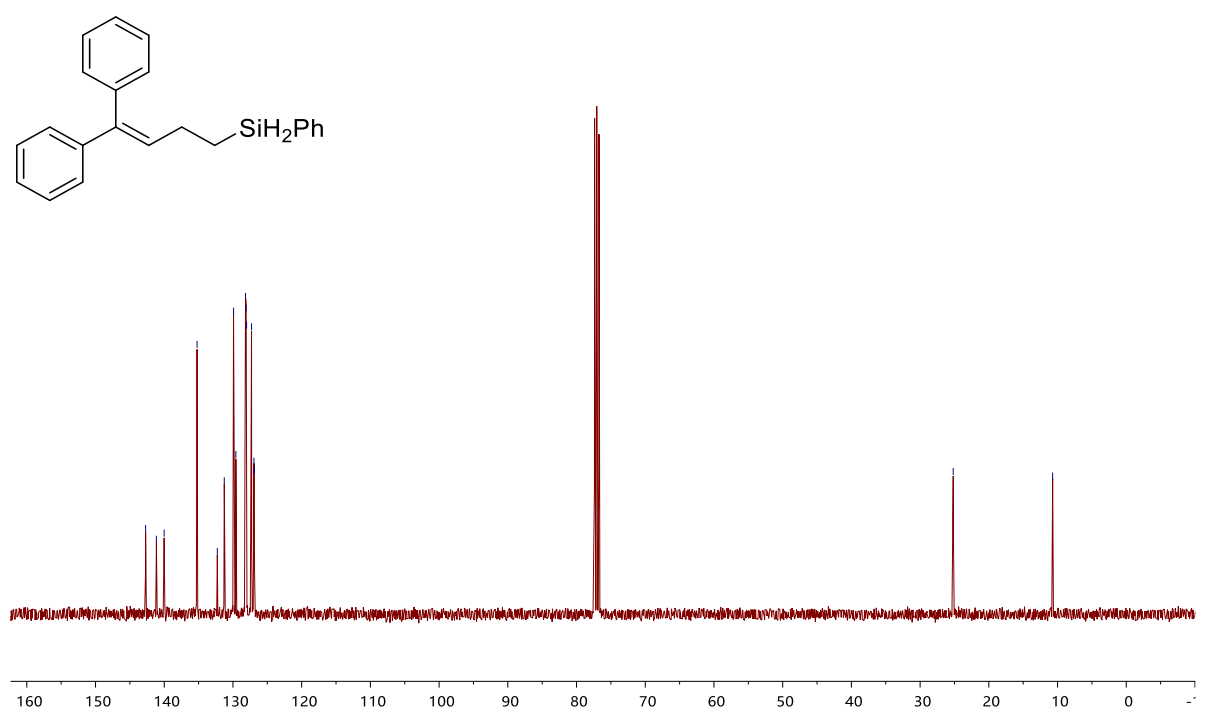
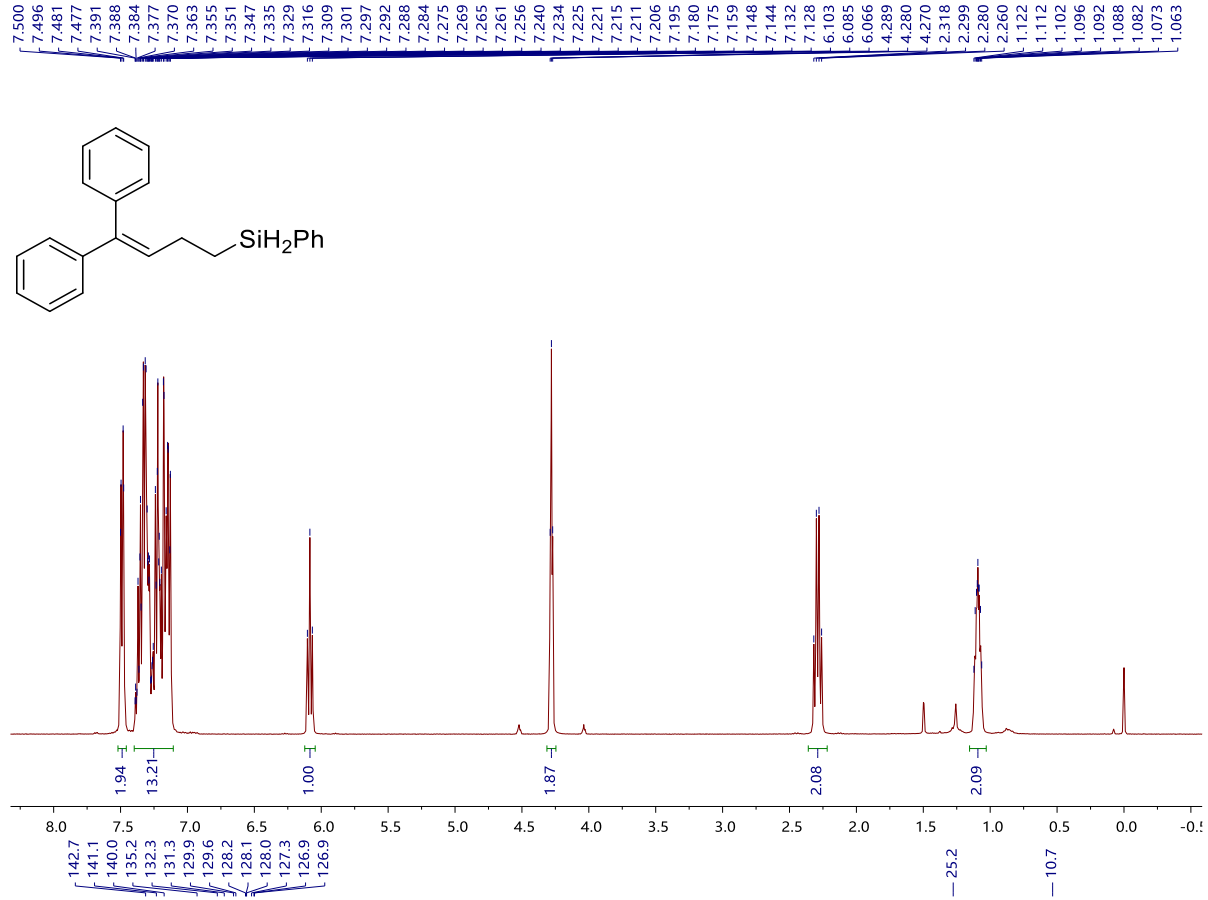
(E)-4-(furan-2-yl)but-3-en-1-yl(phenyl)silane (3ka)



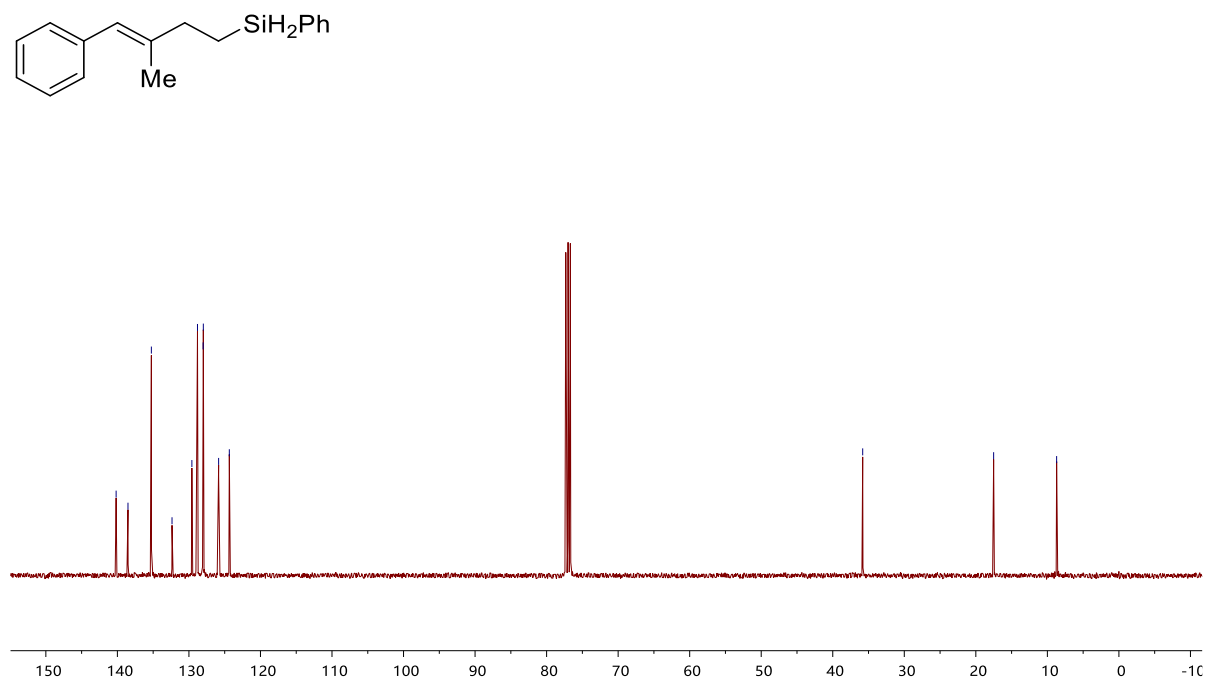
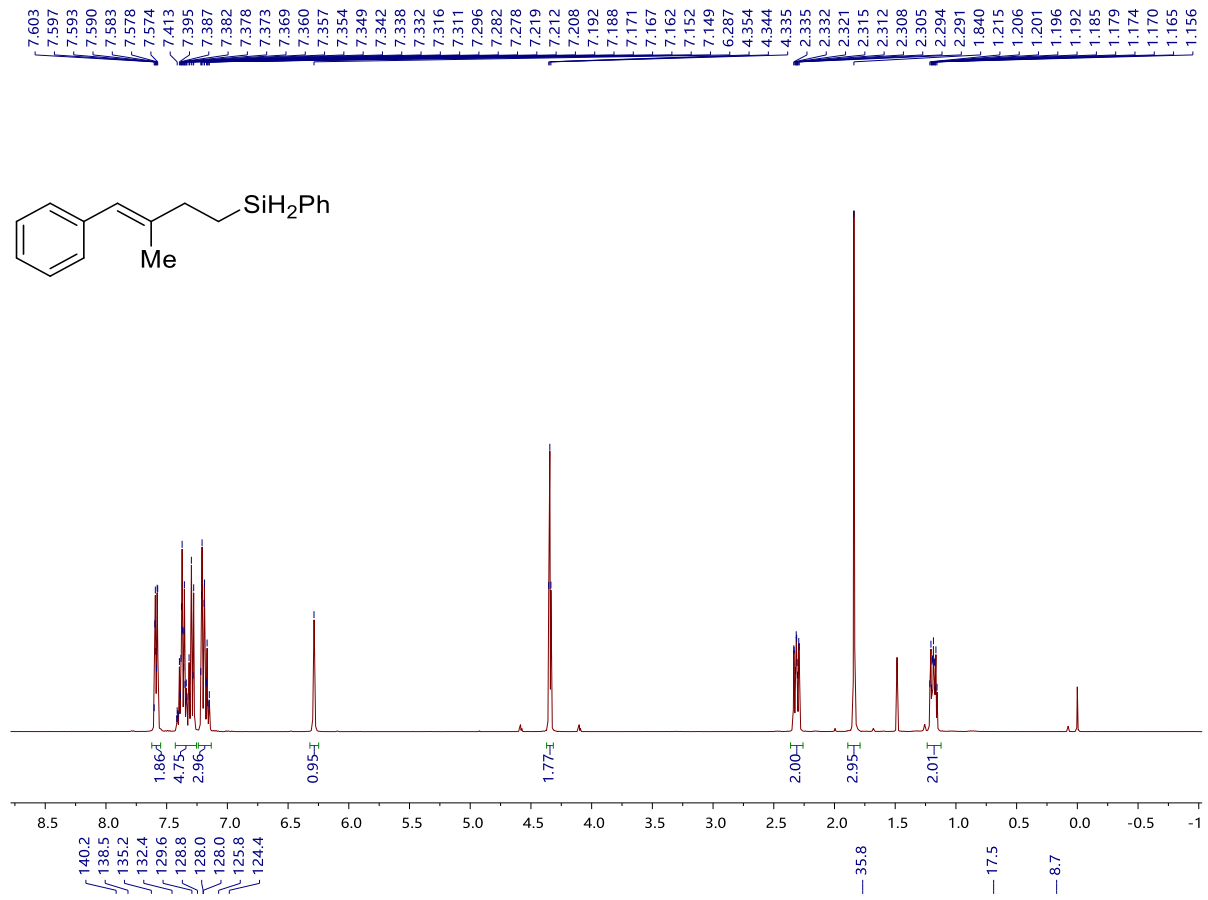
(E)-phenyl(4-phenylpent-3-en-1-yl)silane (3la)



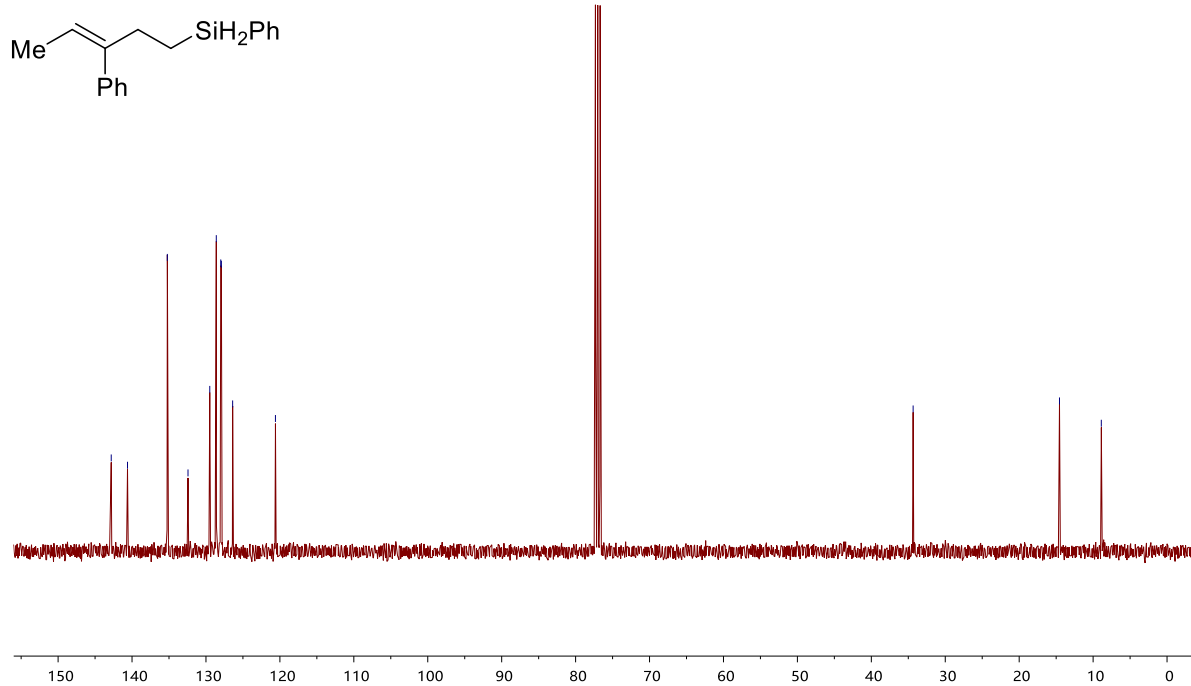
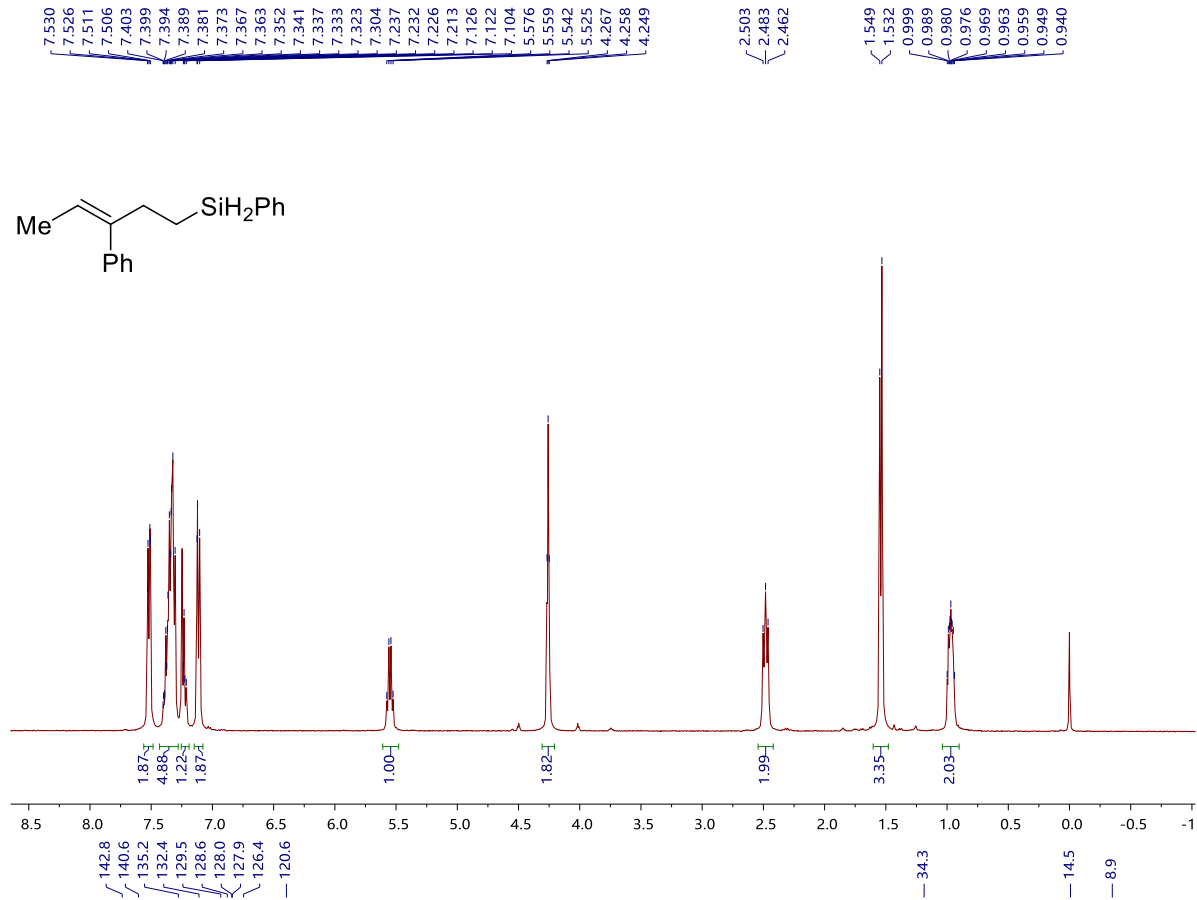
(4,4-diphenylbut-3-en-1-yl)(phenyl)silane (3ma)



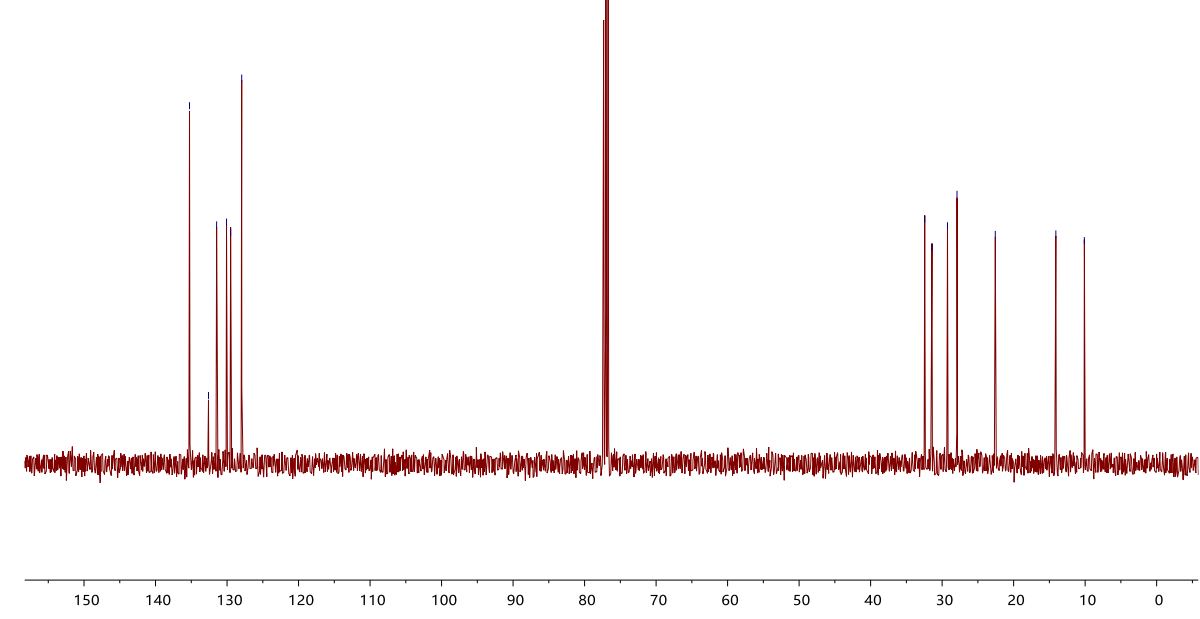
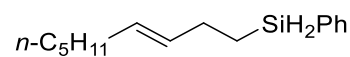
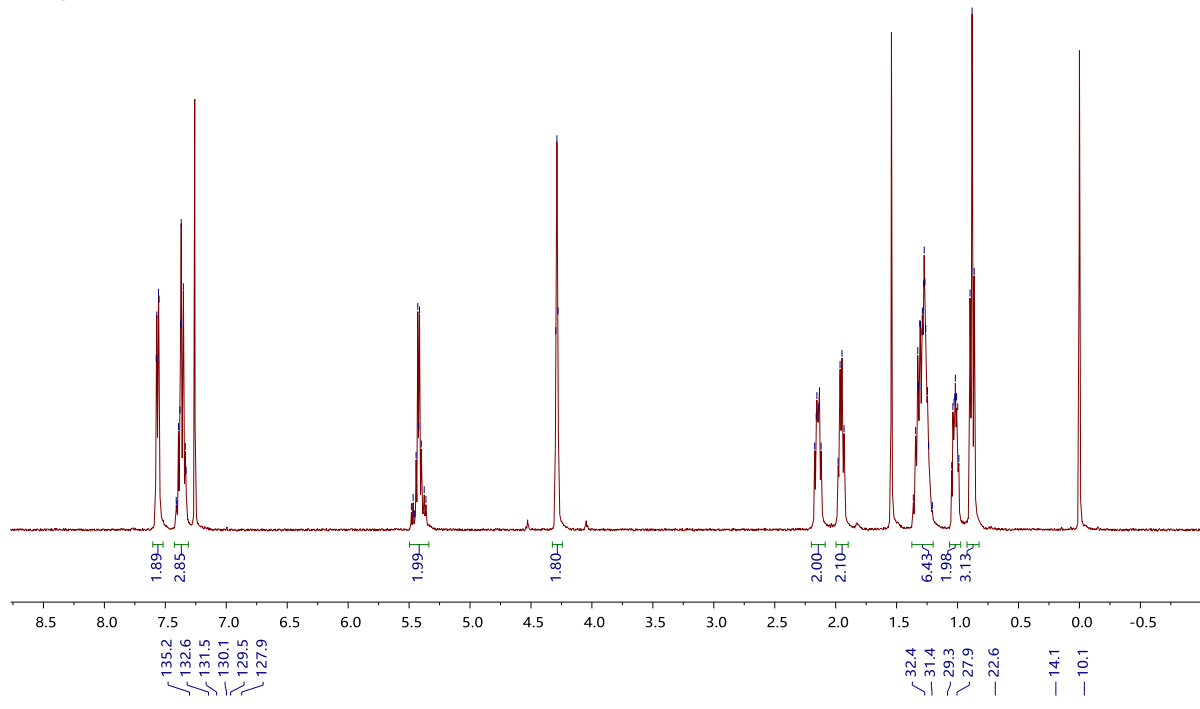
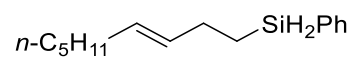
(E)-(3-methyl-4-phenylbut-3-en-1-yl)(phenyl)silane (3na)



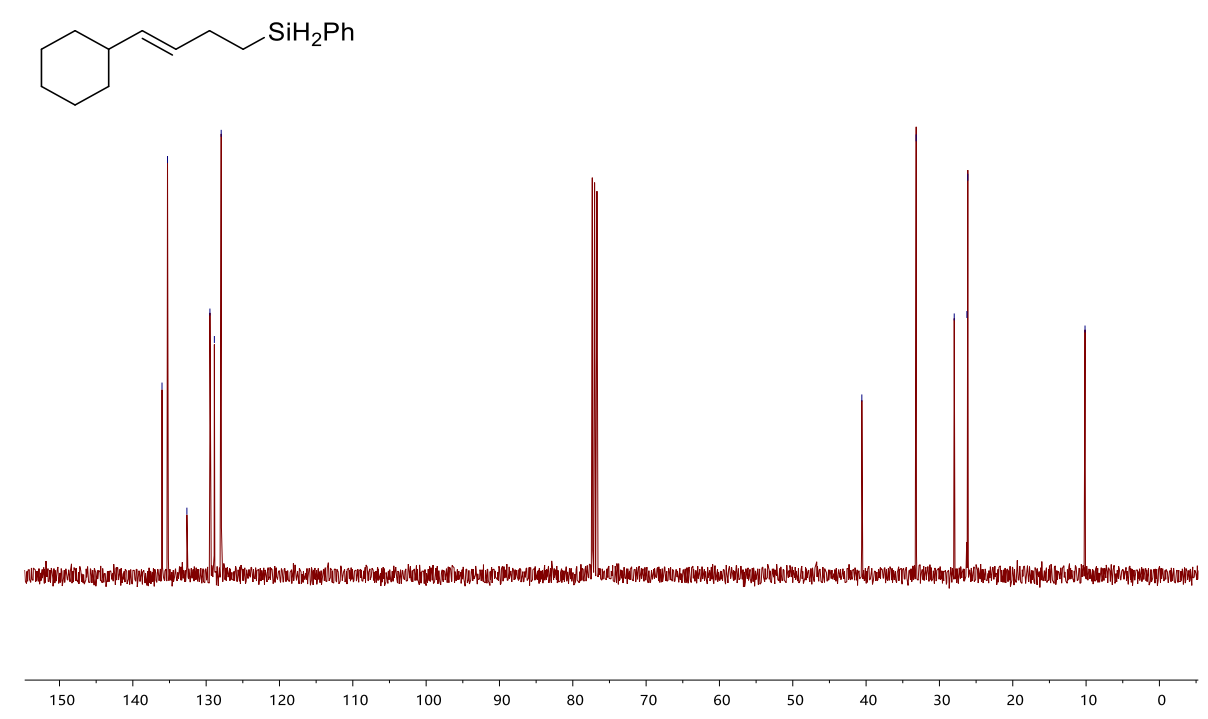
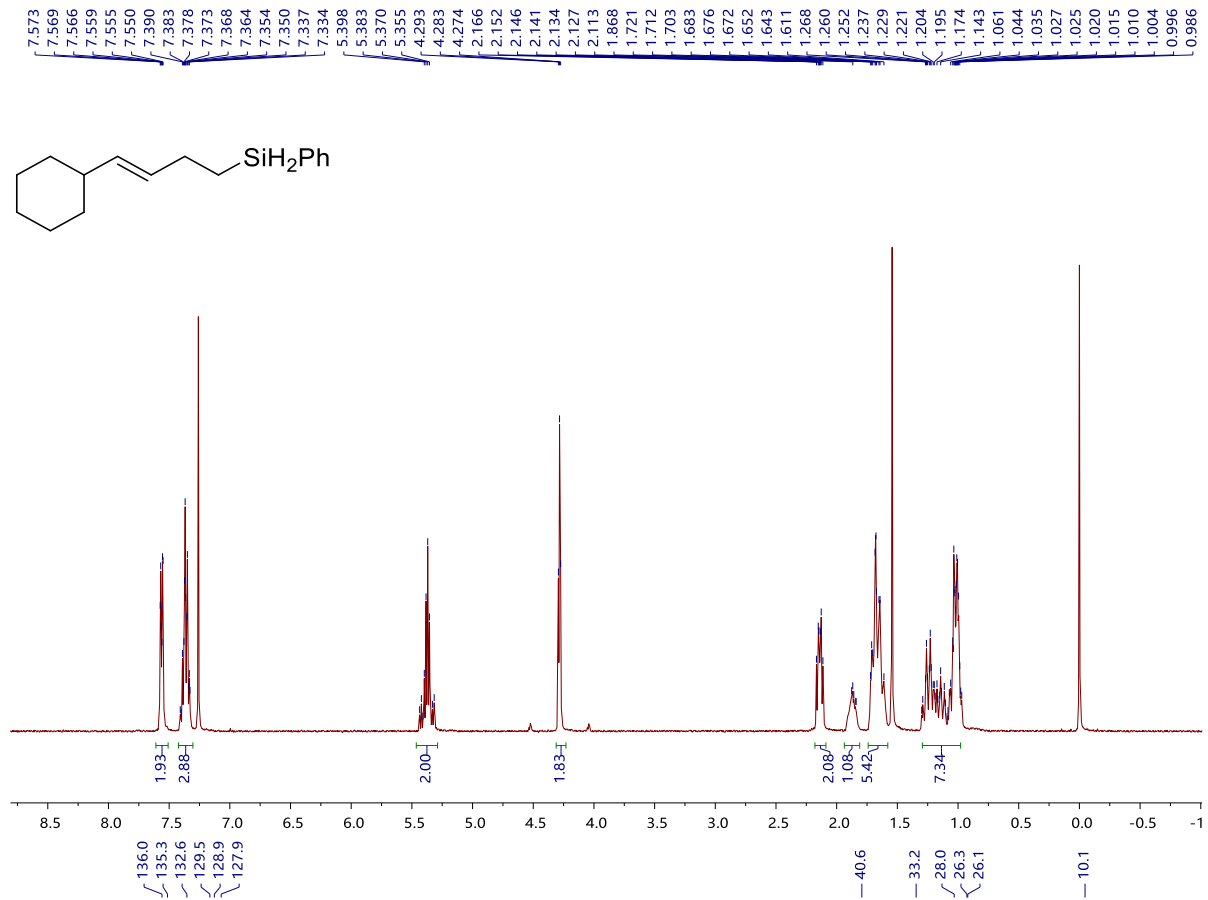
(Z)-phenyl(3-phenylpent-3-en-1-yl)silane (30a)



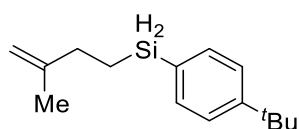
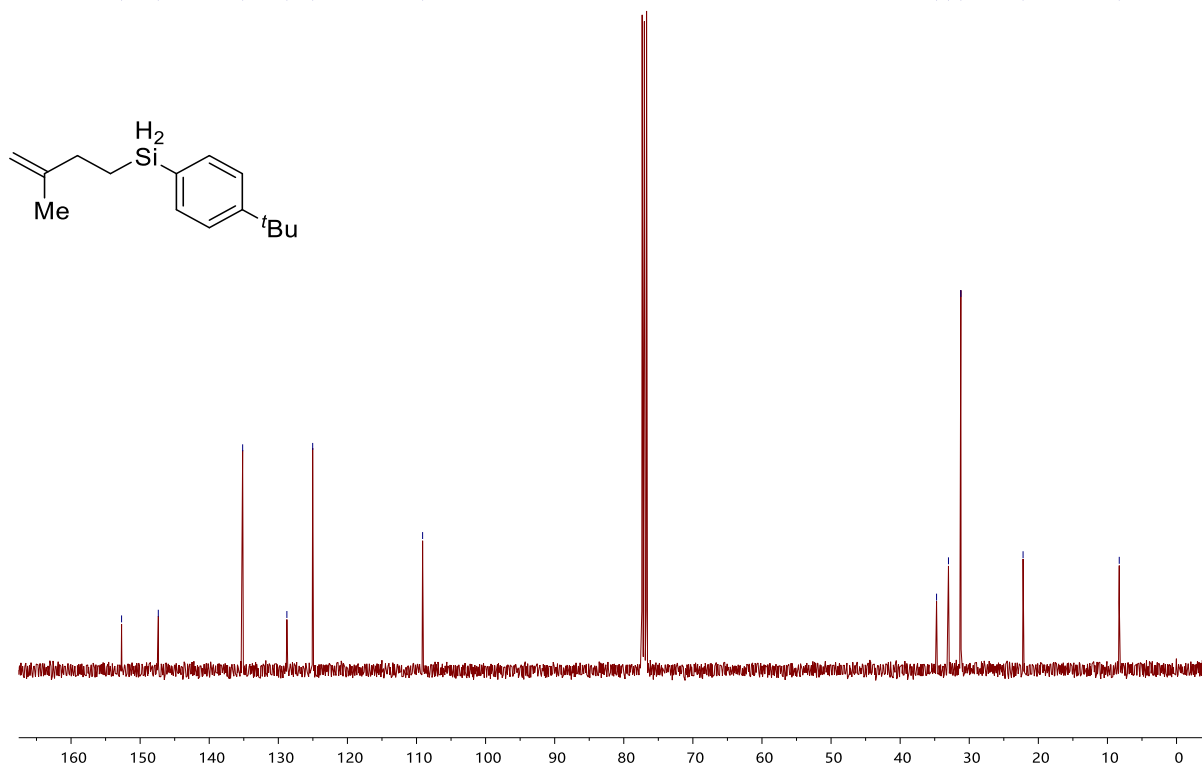
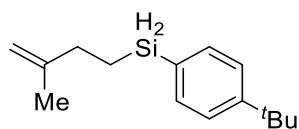
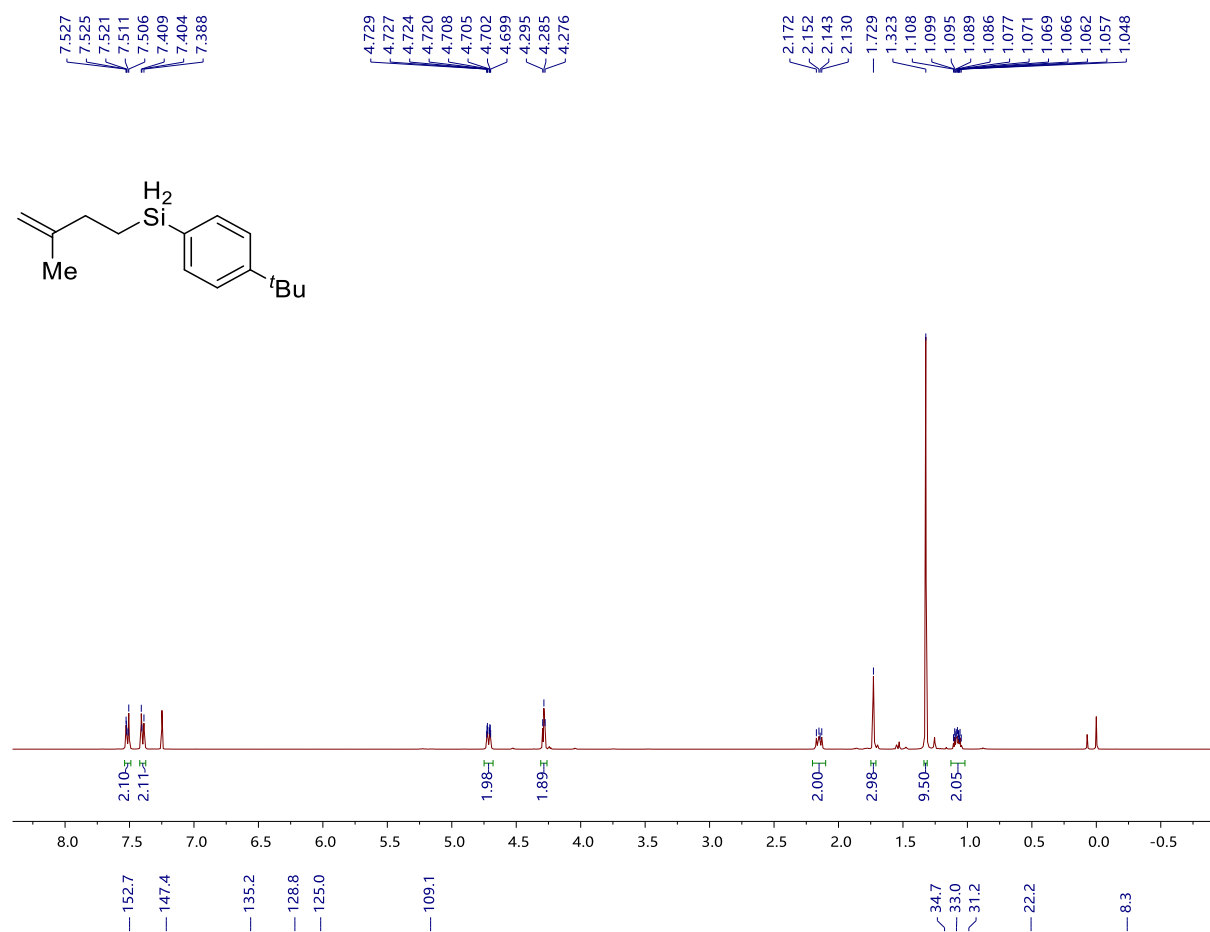
(E)-non-3-en-1-yl(phenyl)silane (3pa)



(E)-(4-cyclohexylbut-3-en-1-yl)(phenyl)silane (3qa)

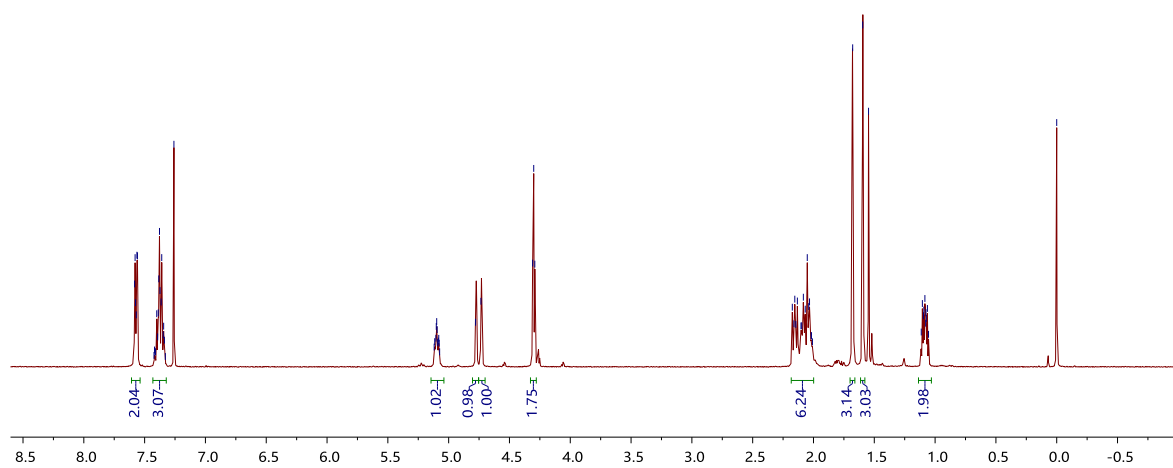
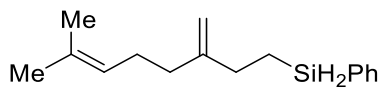


(4-(*tert*-butyl)phenyl)(3-methylbut-3-en-1-yl)silane (3re)

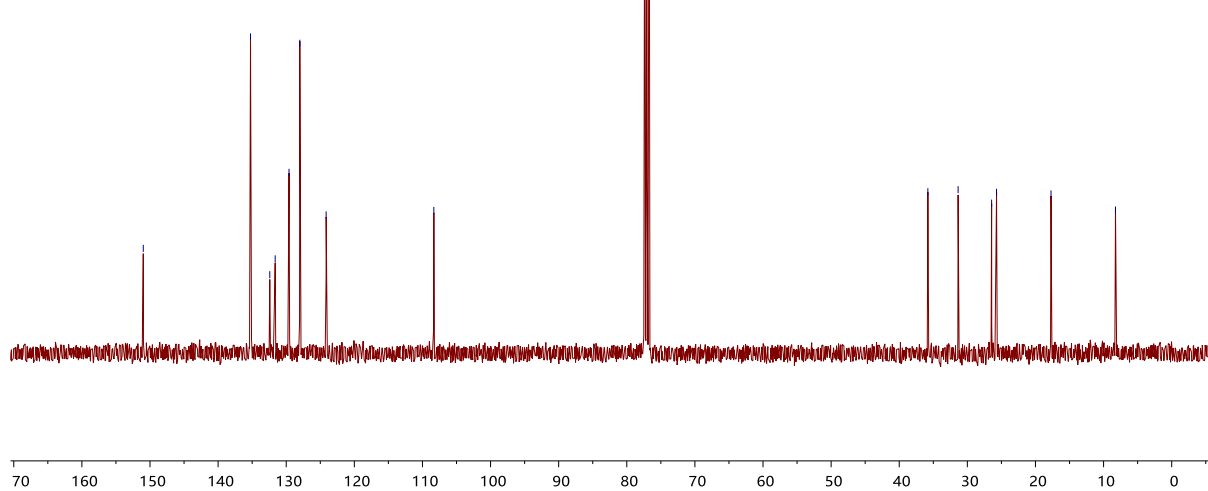
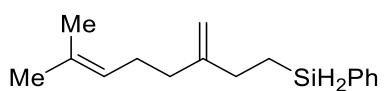


(7-methyl-3-methyleneoct-6-en-1-yl)(phenyl)silane (3sa)

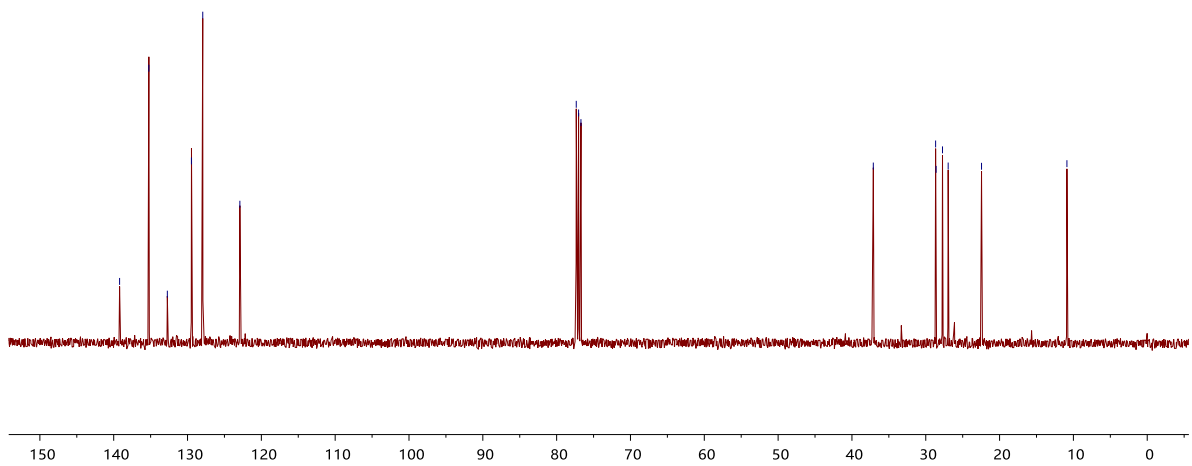
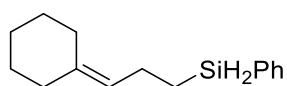
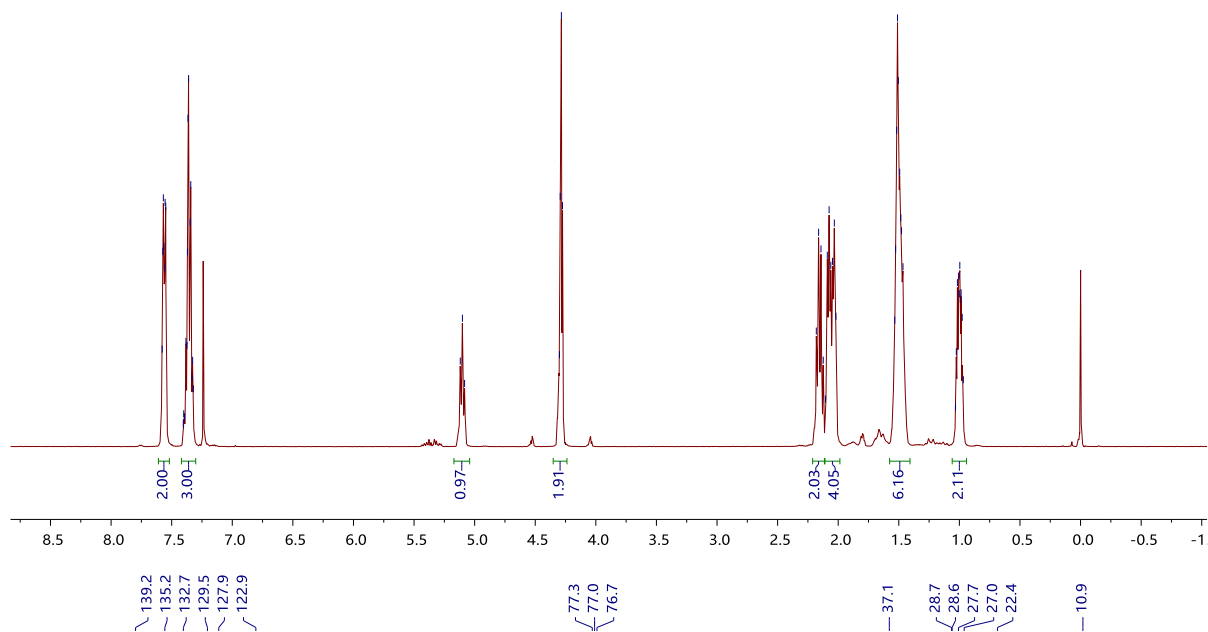
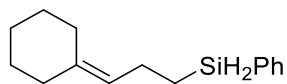
7.582, 7.578, 7.575, 7.569, 7.563, 7.559, 7.400, 7.393, 7.388, 7.383, 7.378, 7.374, 7.364, 7.359, 7.359, 7.347, 7.344, 7.338, 7.259, 5.115, 5.105, 5.102, 5.098, 5.095, 5.091, 5.085, 5.081, 5.078, 4.779, 4.734, 4.310, 4.301, 4.292, 2.174, 2.161, 2.154, 2.145, 2.132, 2.103, 2.097, 2.083, 2.068, 2.051, 2.039, 2.033, 2.018, 2.017, 2.009, 1.678, 1.595, 1.547, 1.114, 1.105, 1.096, 1.093, 1.064, 1.078, 1.075, 1.072, 1.063, 1.054, 0.000



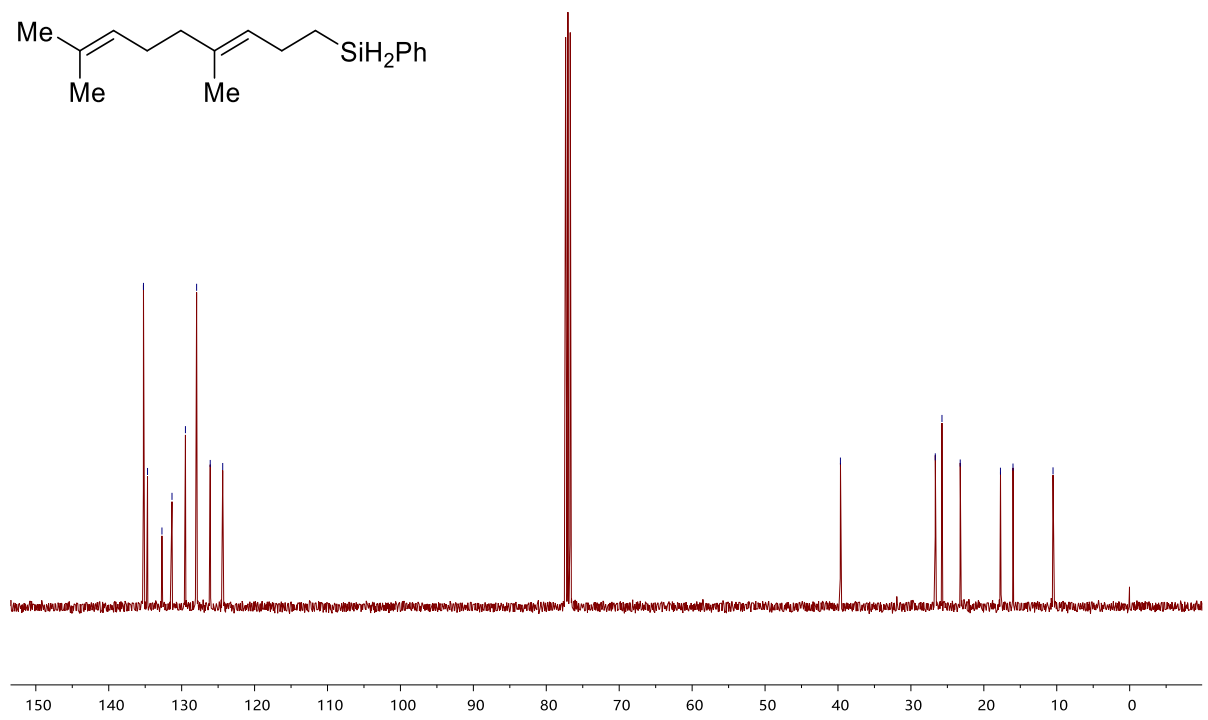
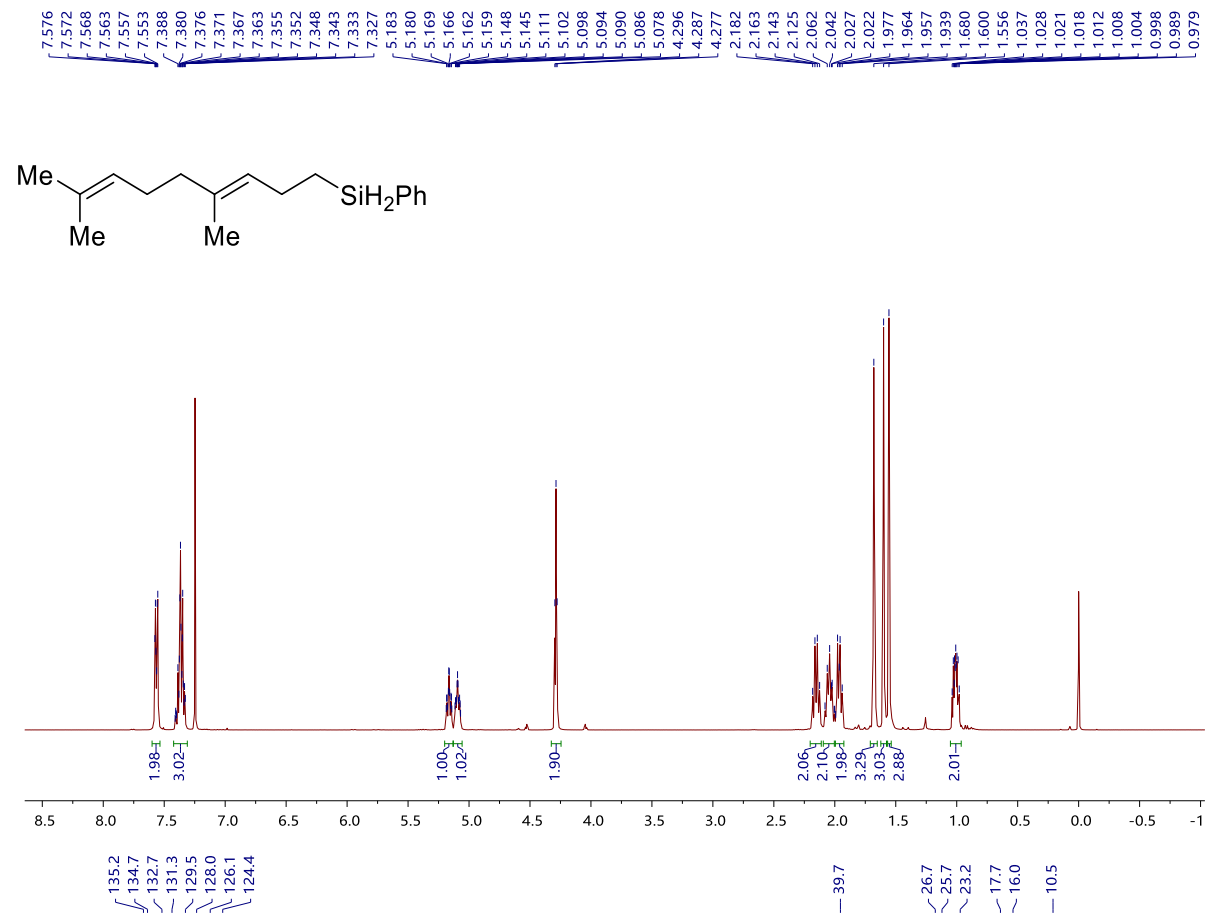
151.0, 135.2, 132.4, 131.6, 129.6, 128.0, 124.1, 108.3, 35.8, 31.4, 26.4, 25.7, 17.7, 8.3



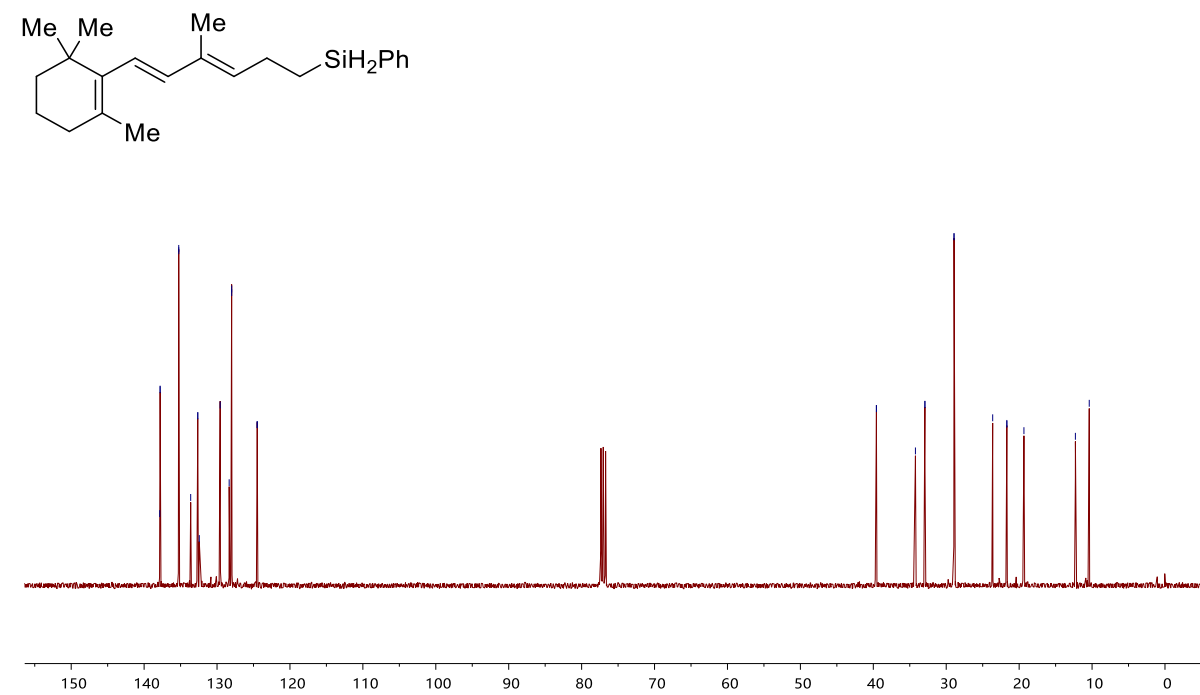
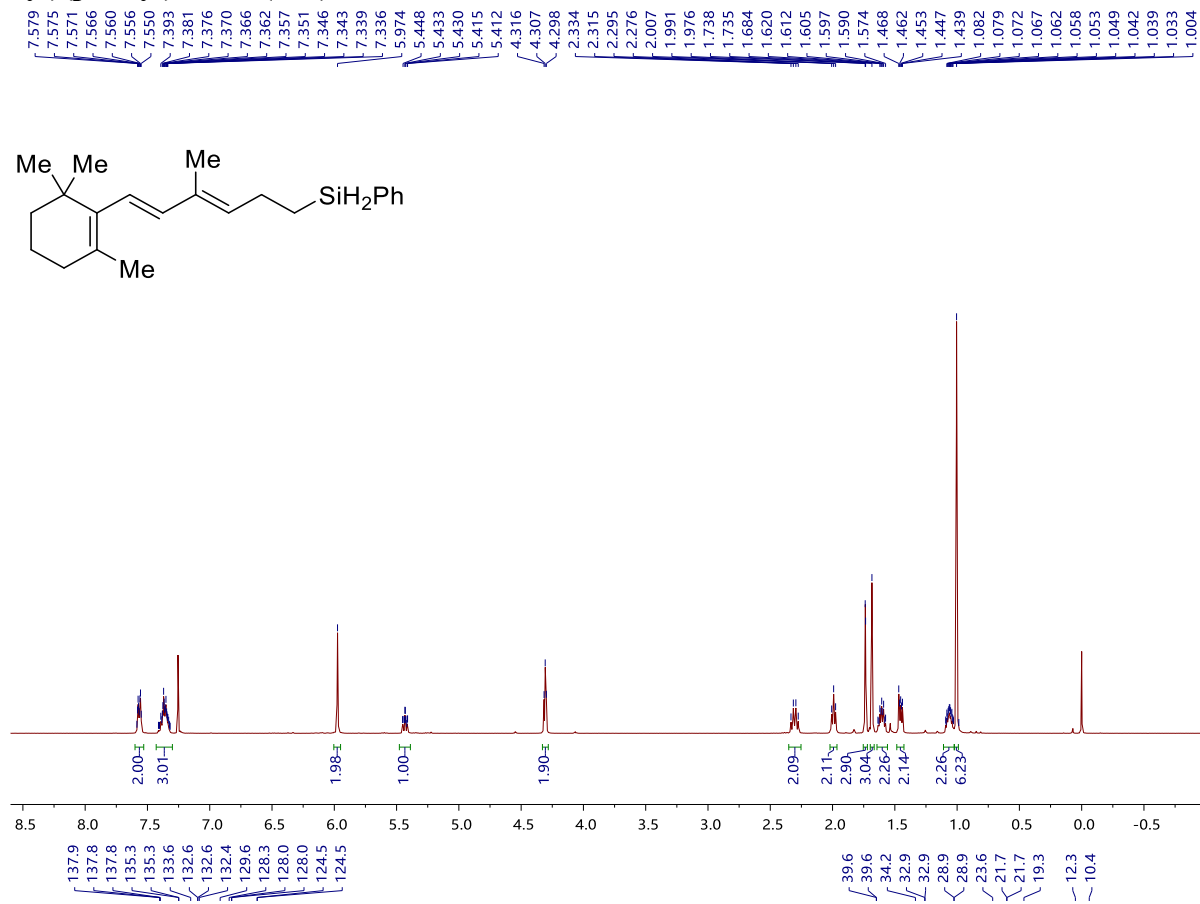
(3-cyclohexylidenepropyl)(phenyl)silane (3ta)



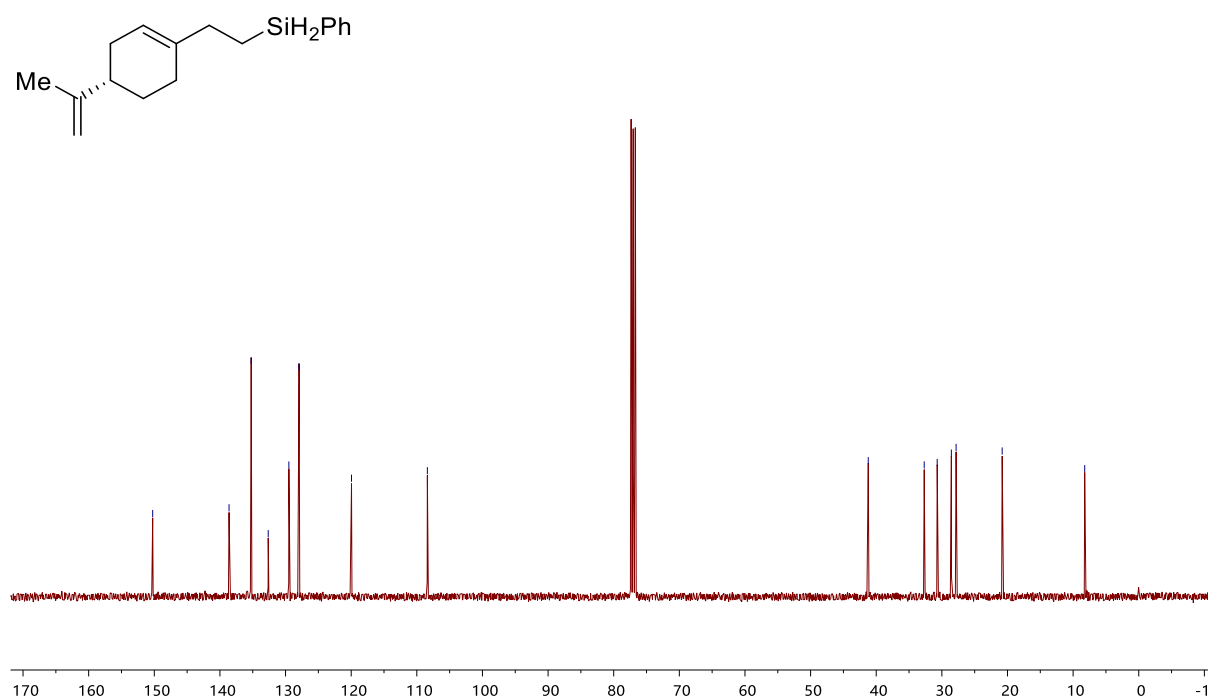
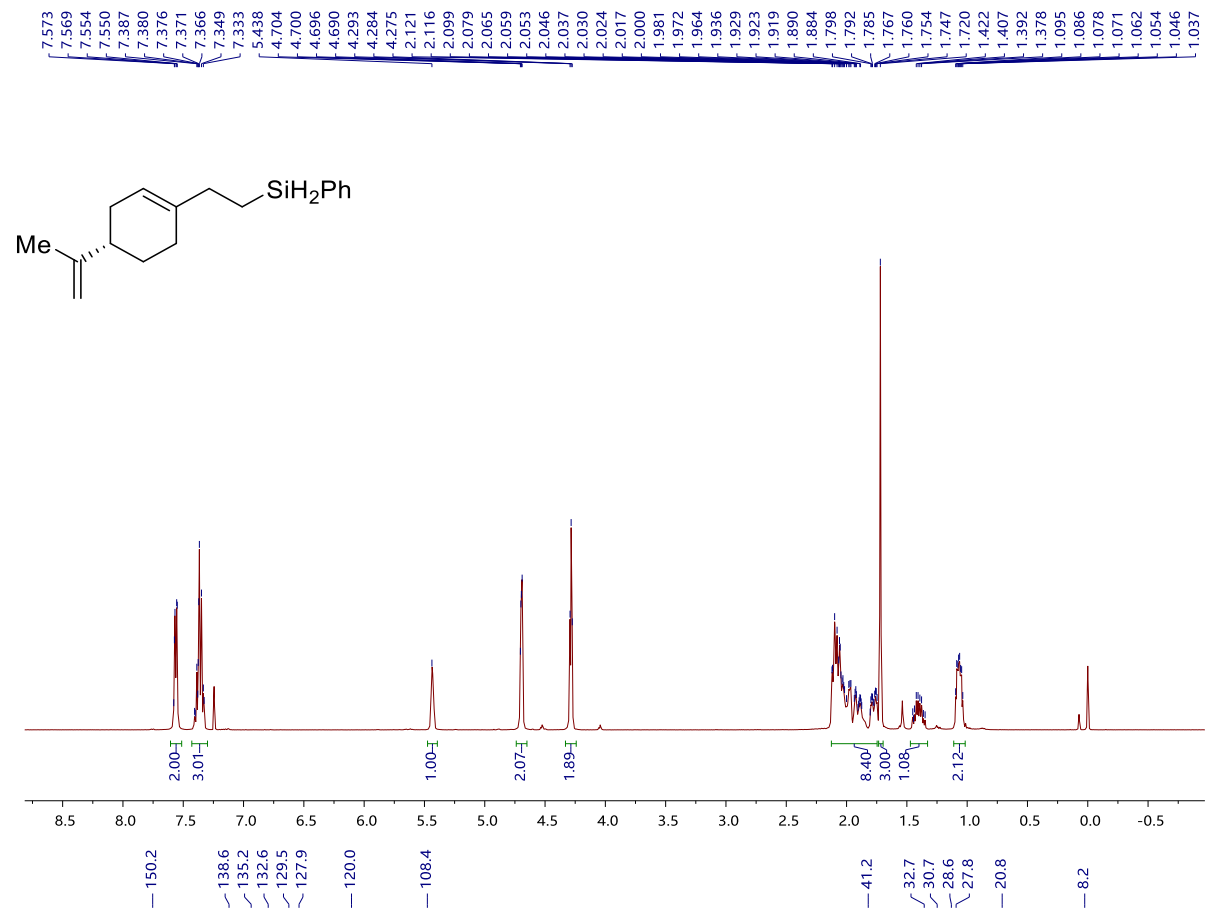
(E)-(4,8-dimethylnona-3,7-dien-1-yl)(phenyl)silane (3ua)



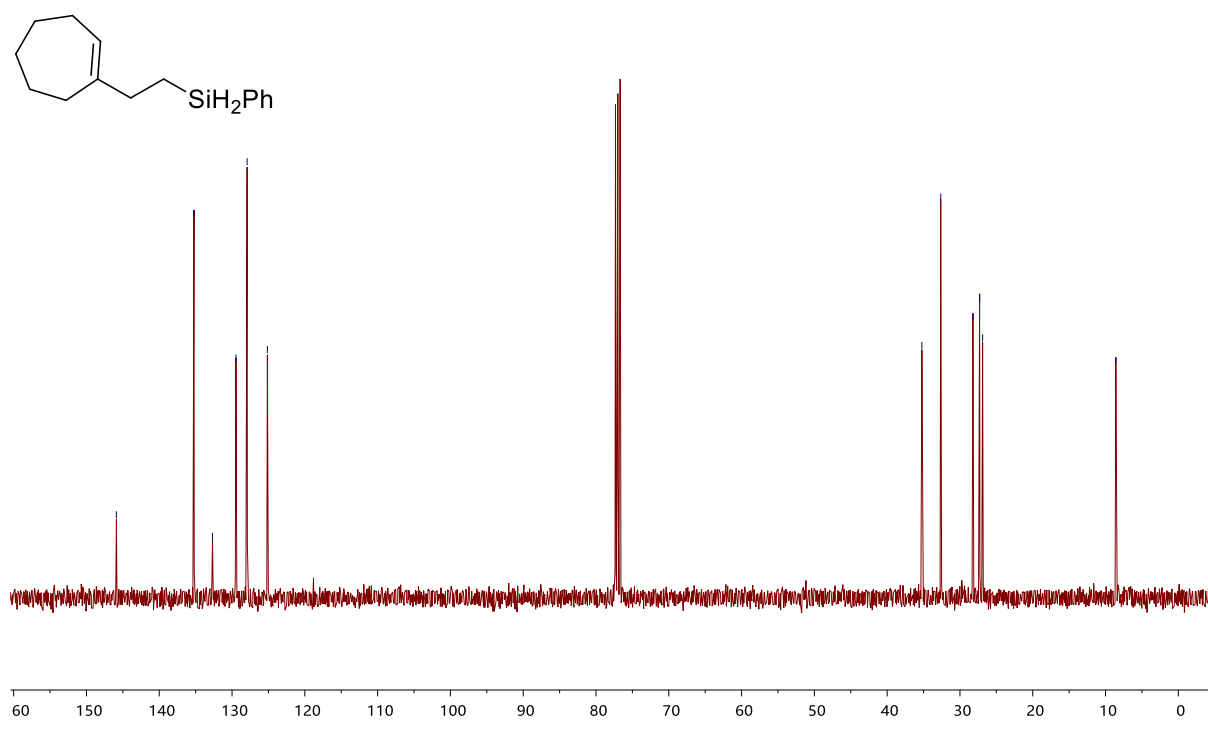
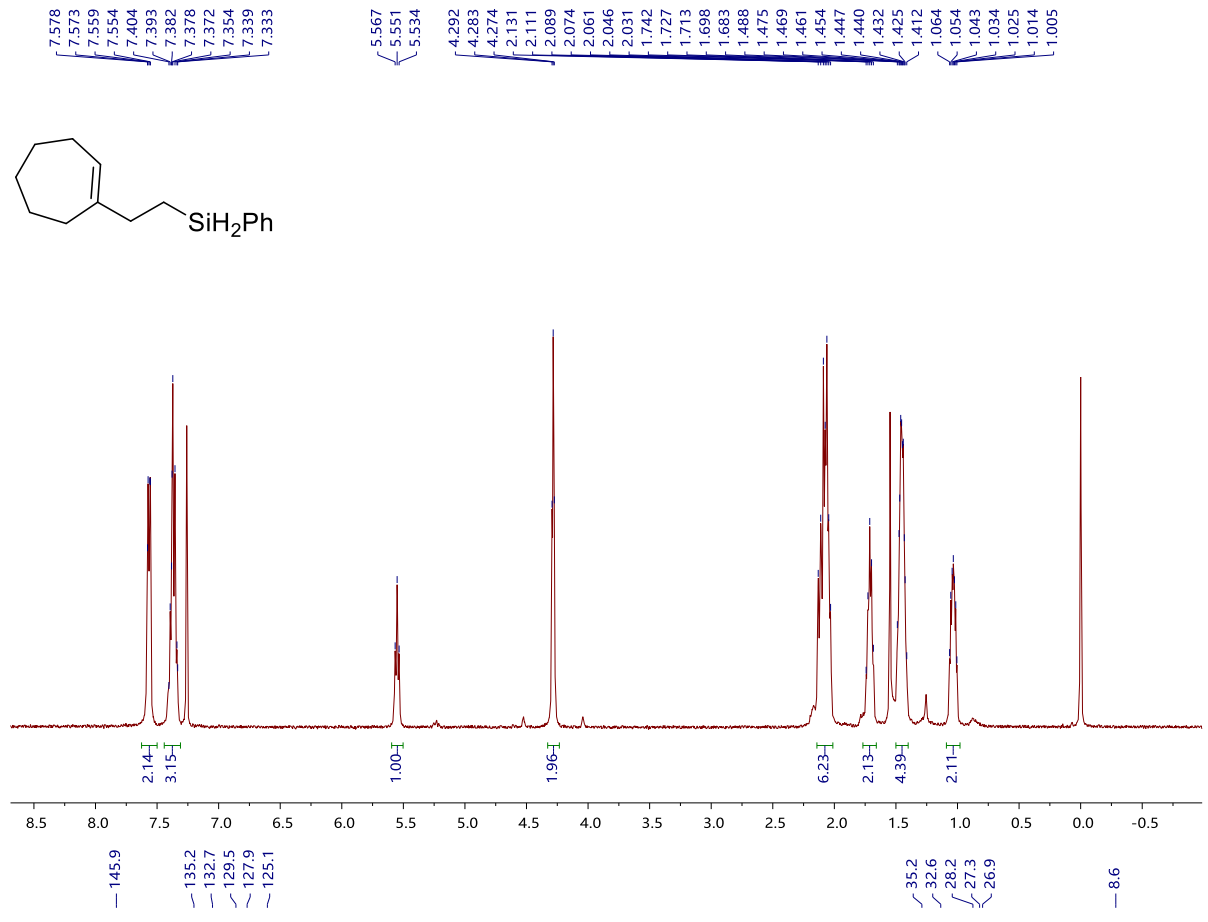
((3*E*,5*E*)-4-methyl-6-(2,6,6-trimethylcyclohex-1-en-1-yl)hexa-3,5-dien-1-yl)(phenyl)silane (3va)



(S)-phenyl(2-(4-(prop-1-en-2-yl)cyclohex-1-en-1-yl)ethyl)silane (3wa)



(2-(cyclohept-1-en-1-yl)ethyl)(phenyl)silane (3a)



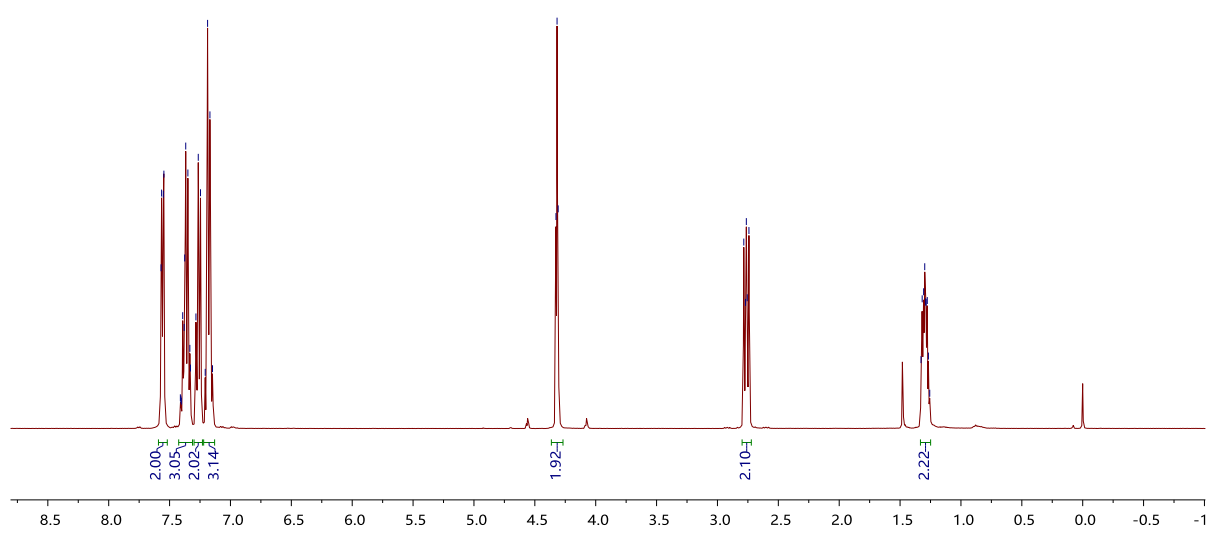
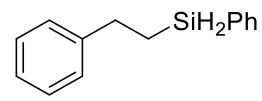
phenethyl(phenyl)silane (8aa)

7.570, 7.566, 7.551, 7.547, 7.411, 7.407, 7.403, 7.392, 7.380, 7.376, 7.367, 7.350, 7.333, 7.328, 7.284, 7.264, 7.246, 7.207, 7.188, 7.169, 7.148

4.326, 4.317, 4.308

2.784, 2.770, 2.763, 2.755, 2.741

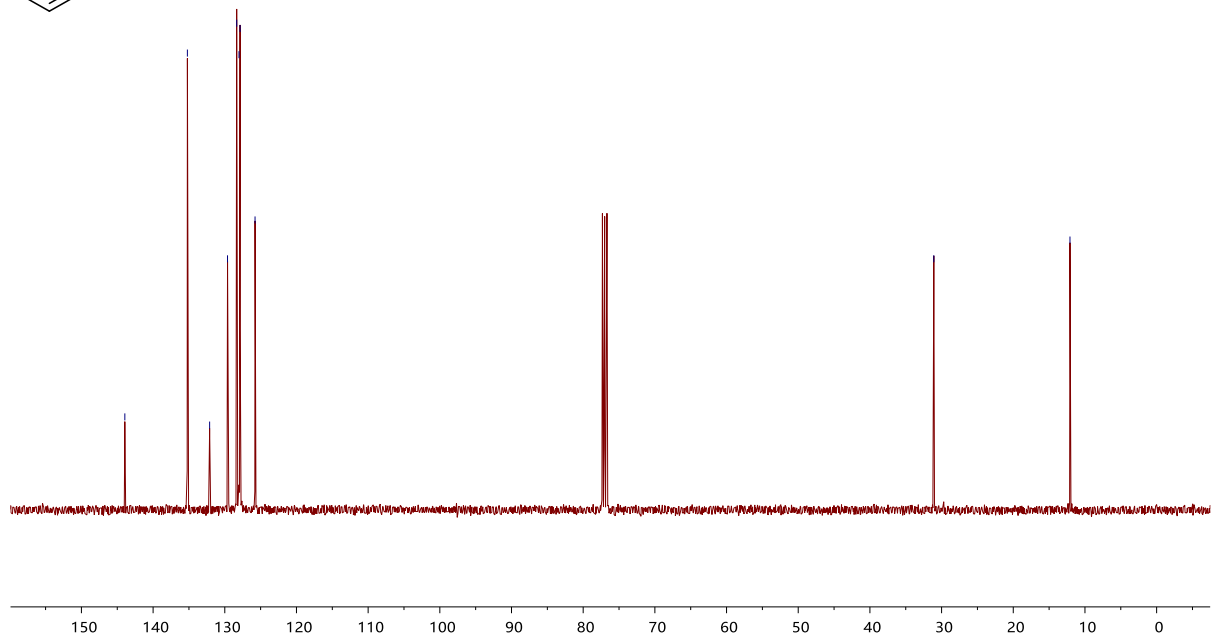
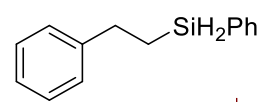
1.328, 1.318, 1.306, 1.297, 1.290, 1.287, 1.277, 1.267, 1.256



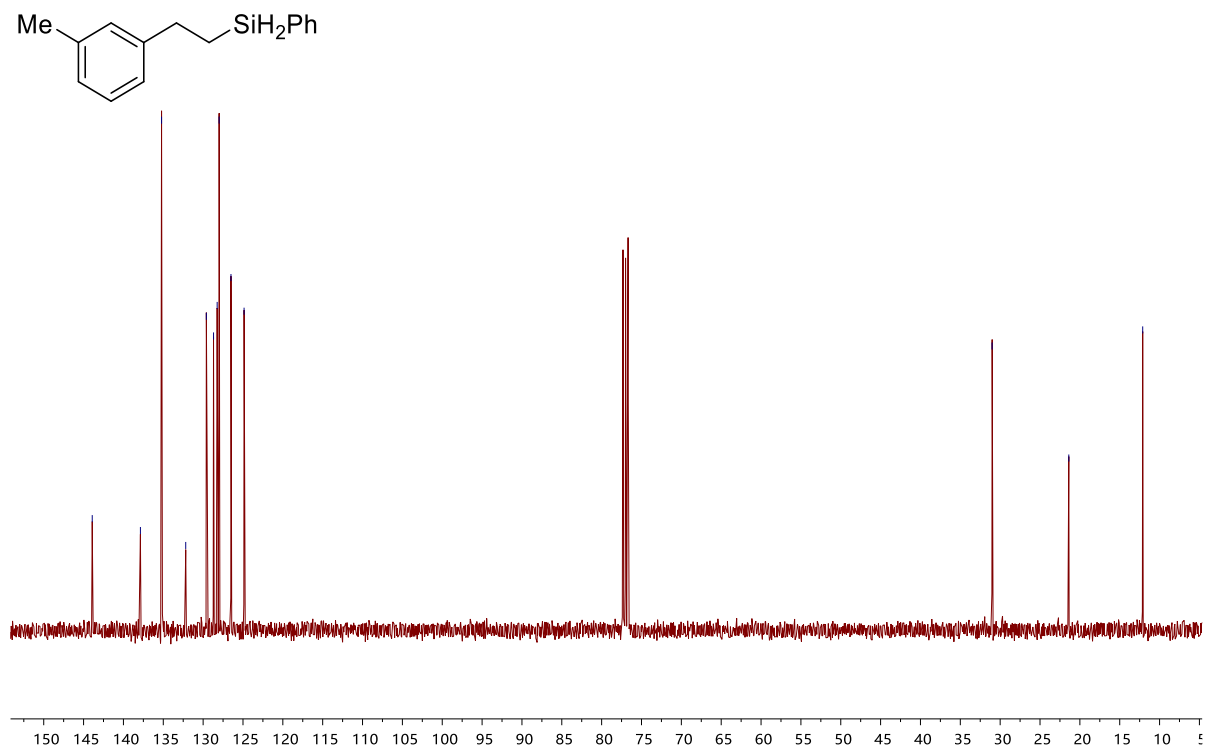
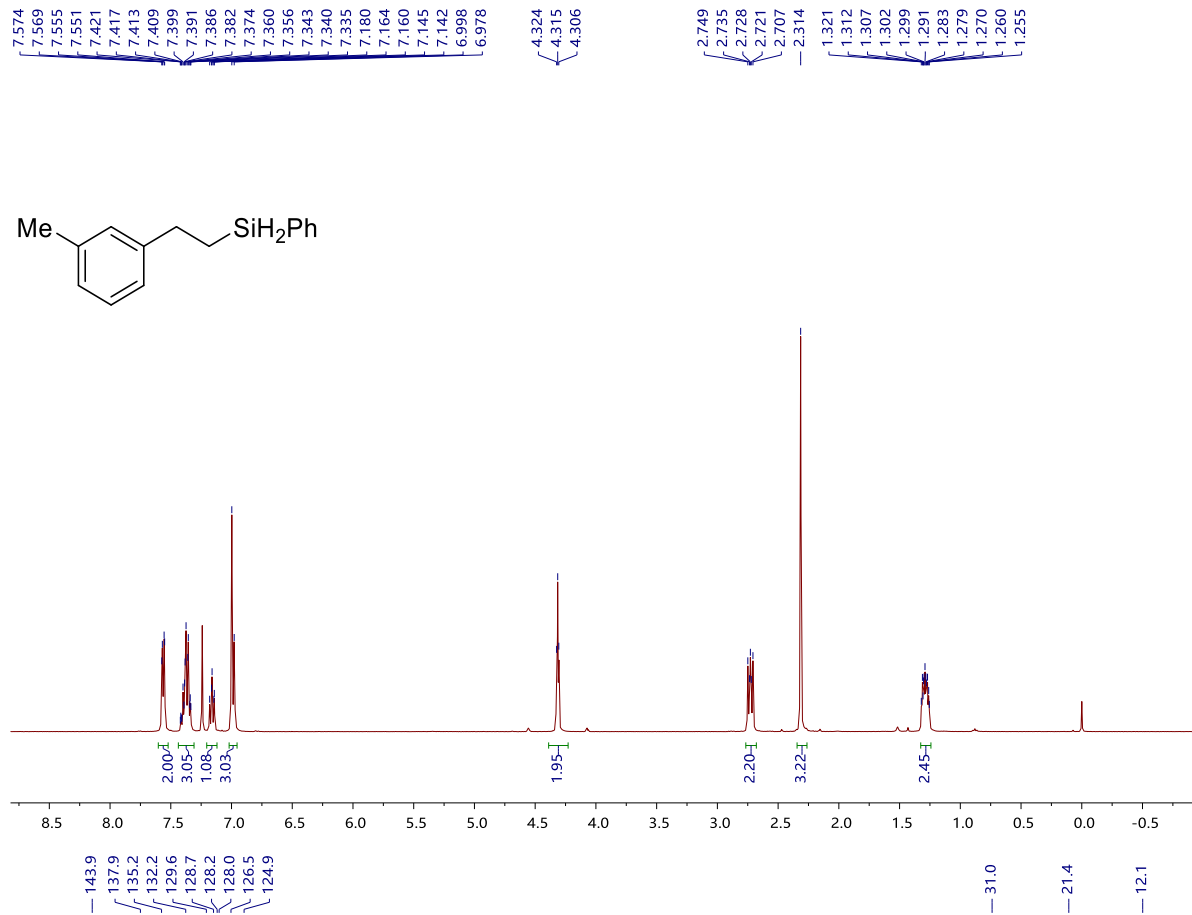
143.9, 135.2, 132.1, 129.6, 128.3, 128.0, 127.9, 125.8

31.1

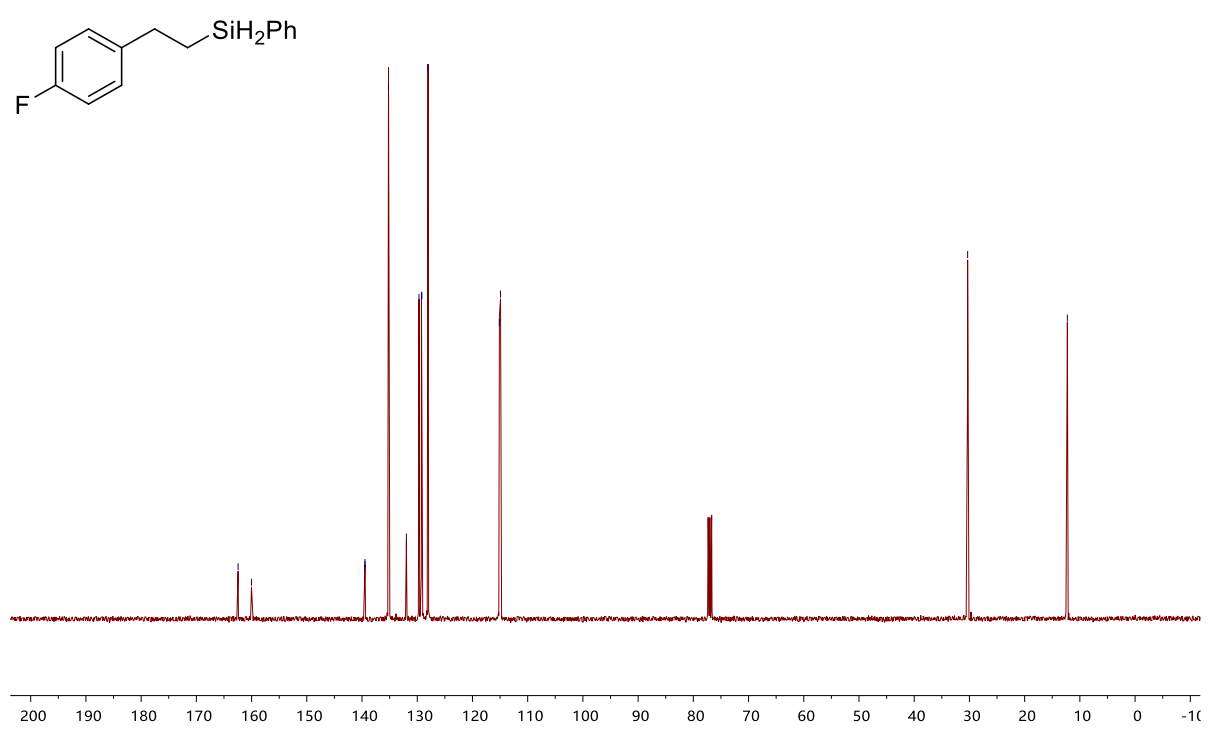
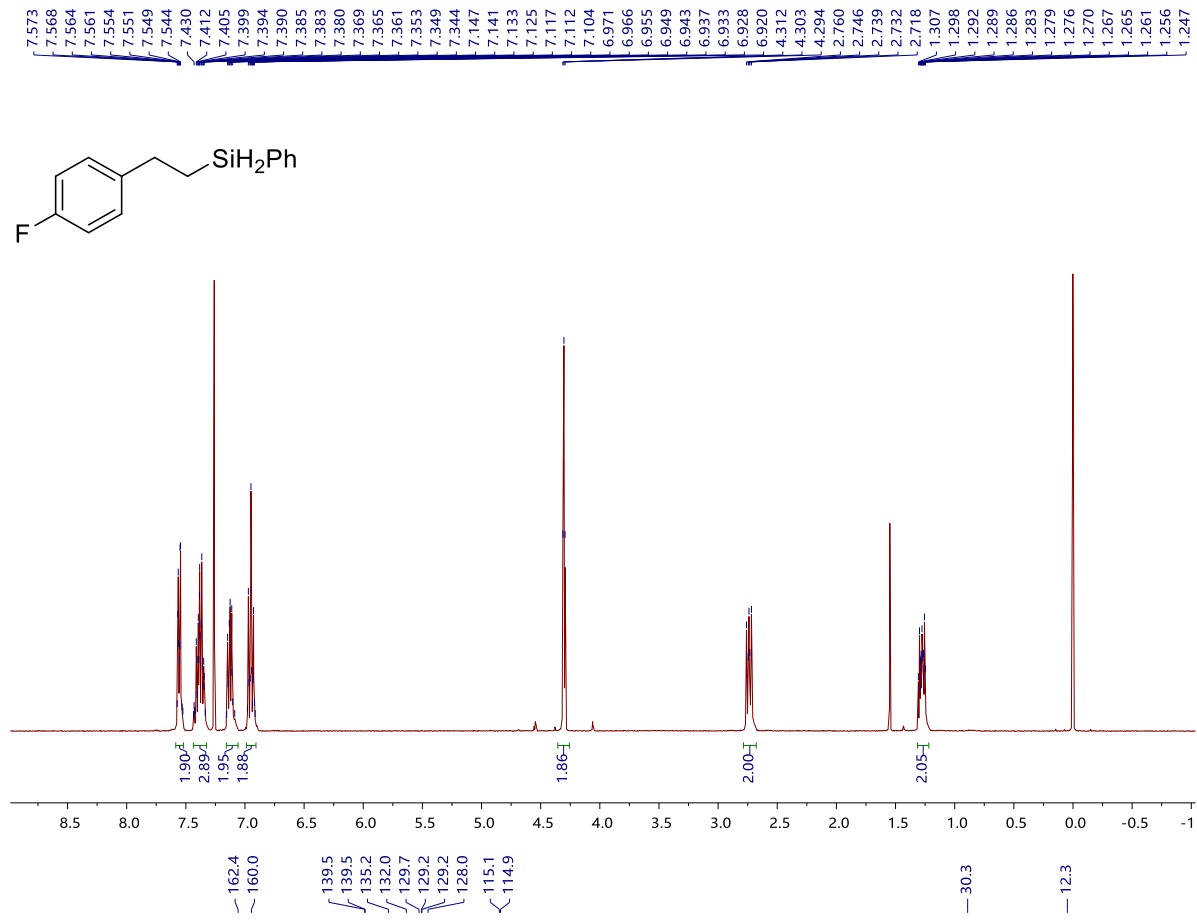
12.1



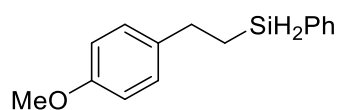
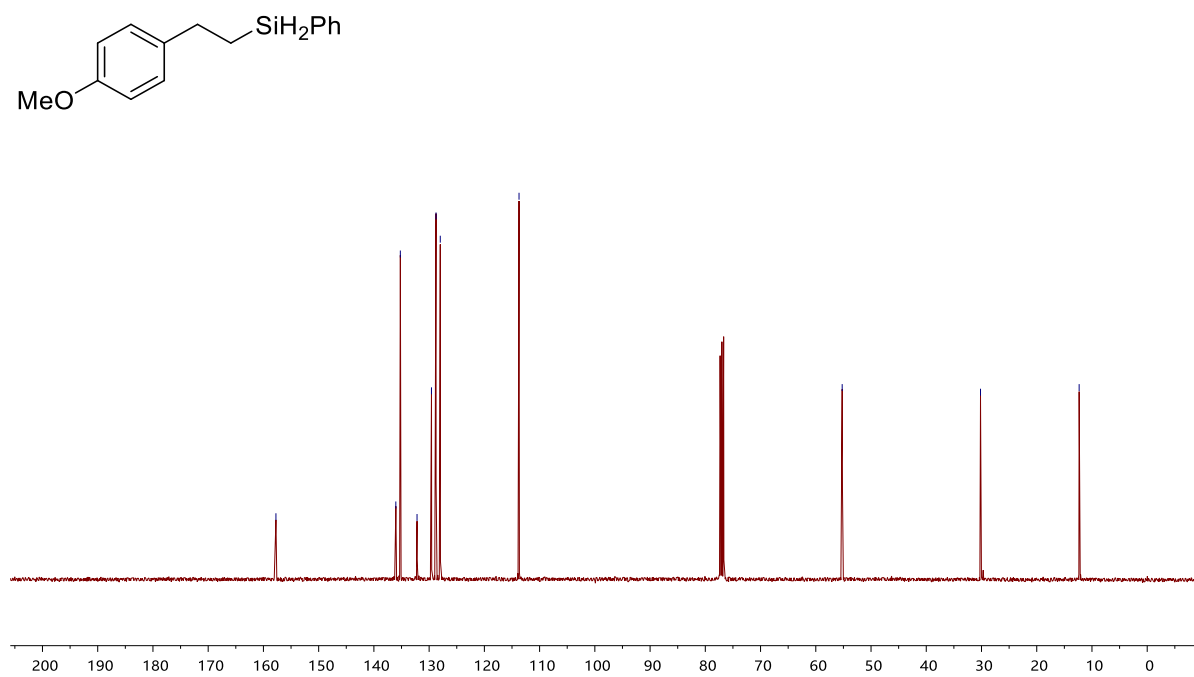
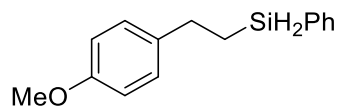
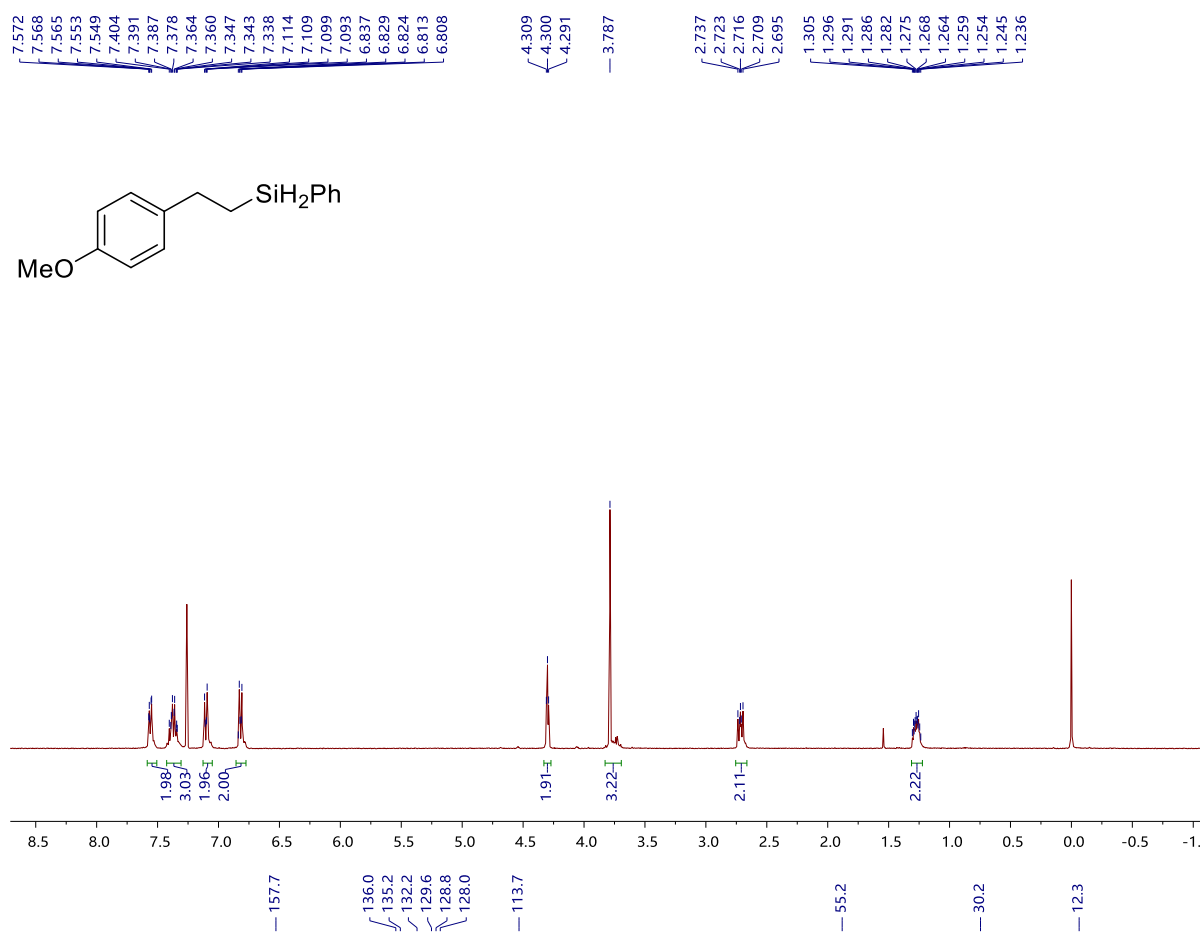
(3-methylphenethyl)(phenyl)silane (8ba)



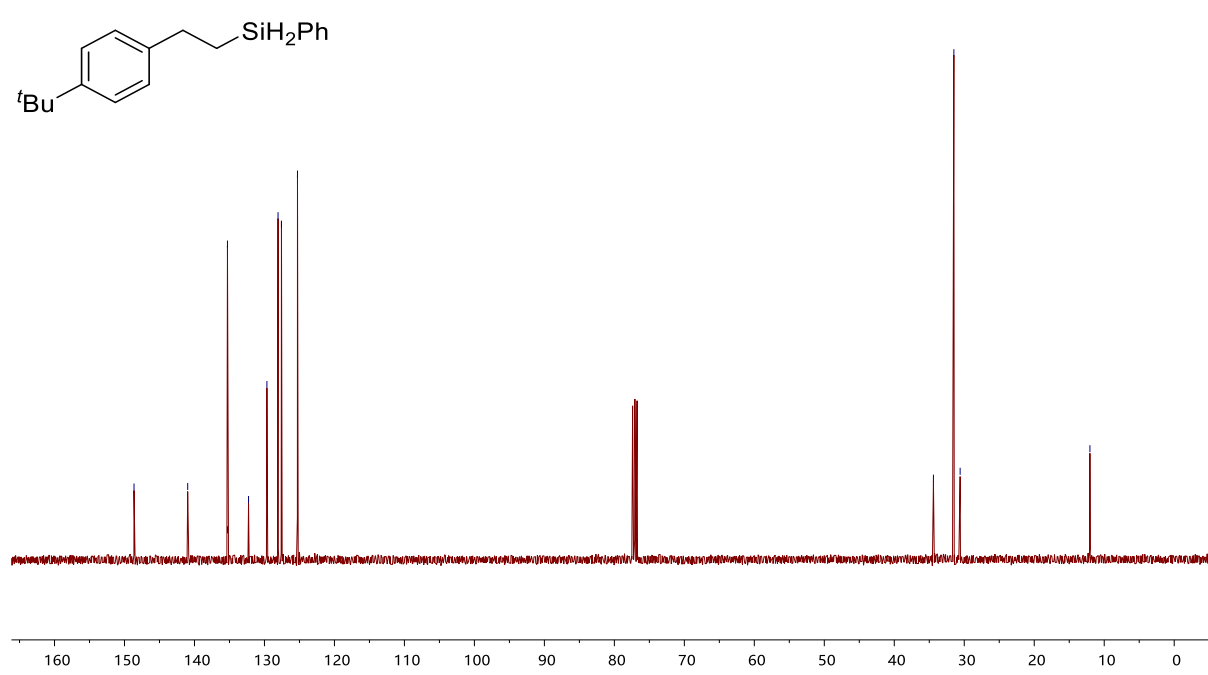
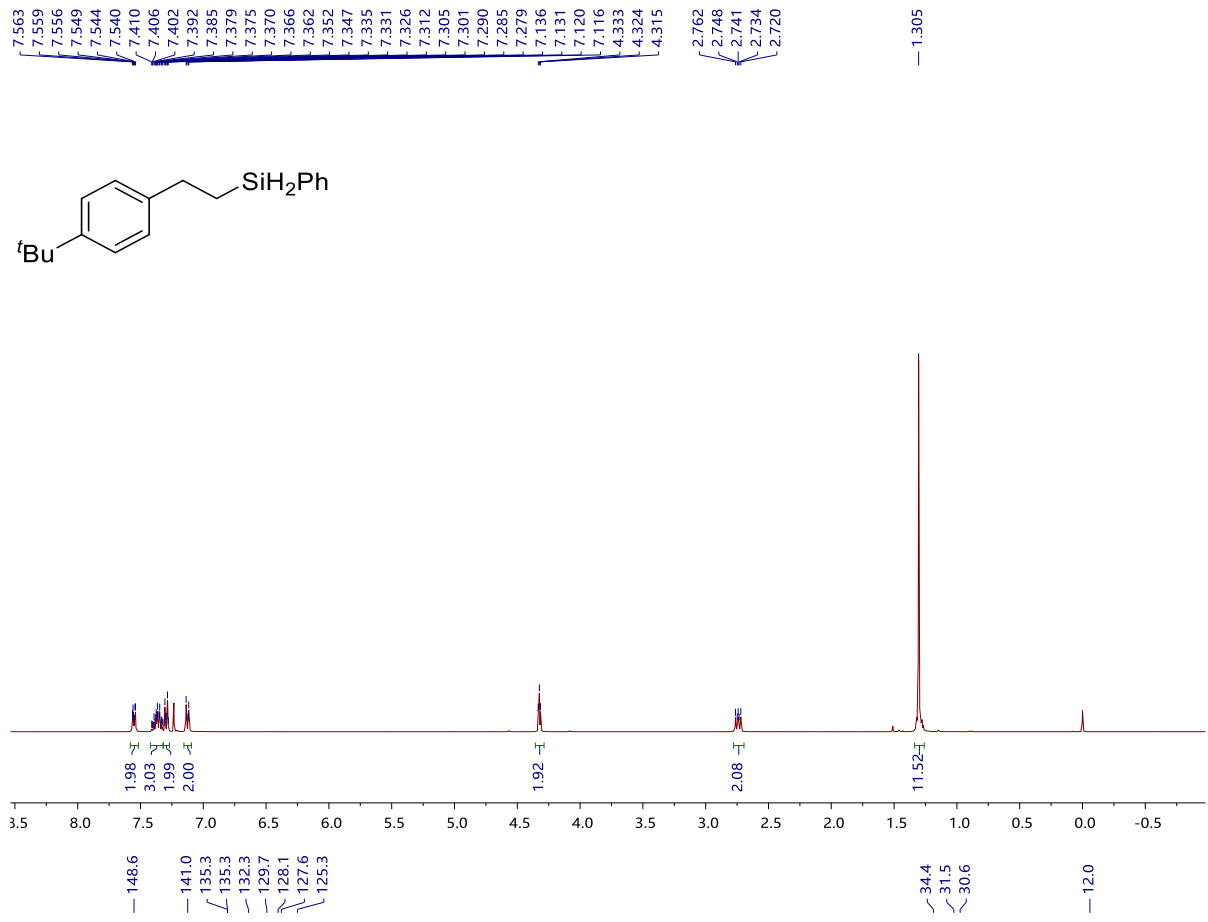
(4-fluorophenethyl)(phenyl)silane (8ca)



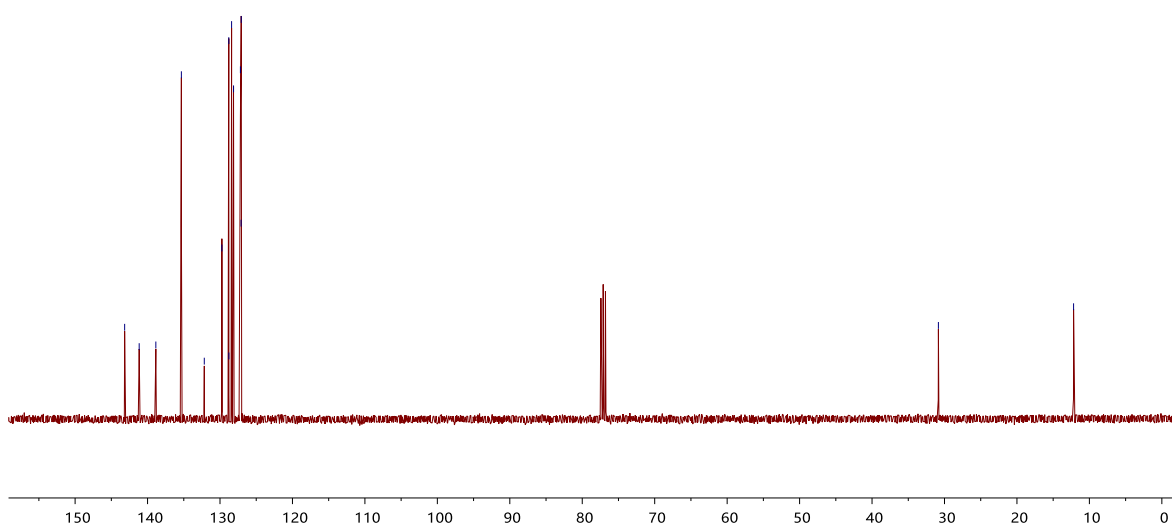
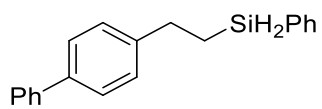
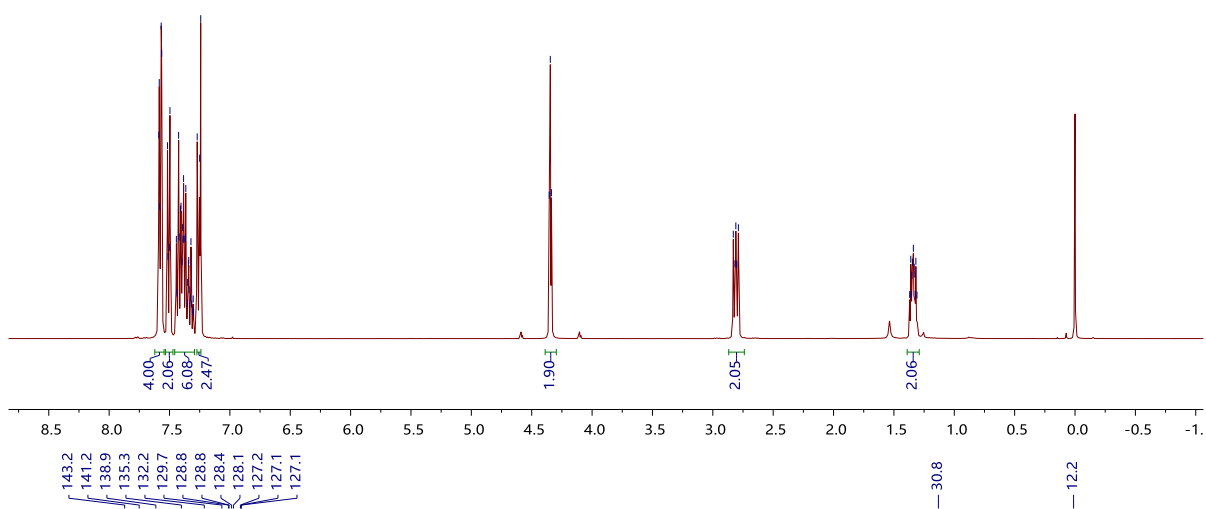
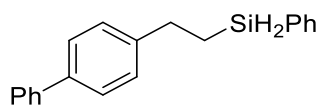
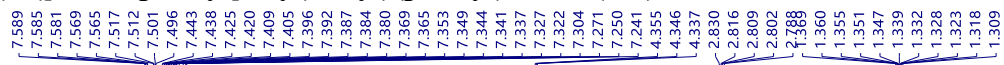
(4-methoxyphenethyl)(phenyl)silane (8da)



(4-*tert*-butylphenethyl)(phenyl)silane (8ea)

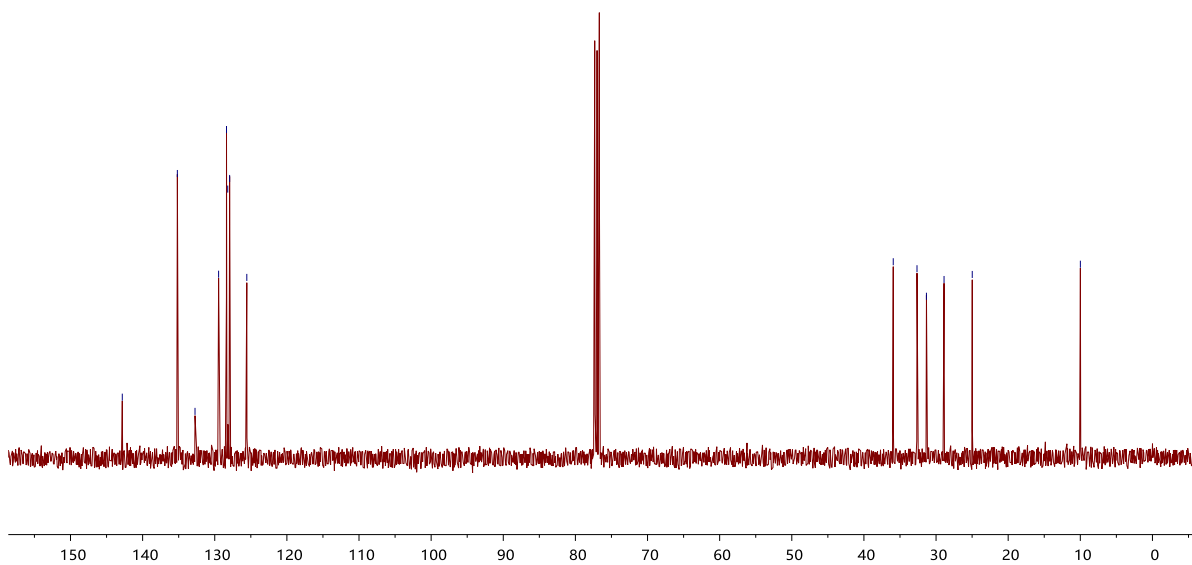
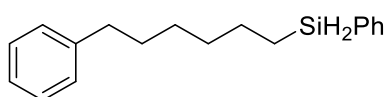
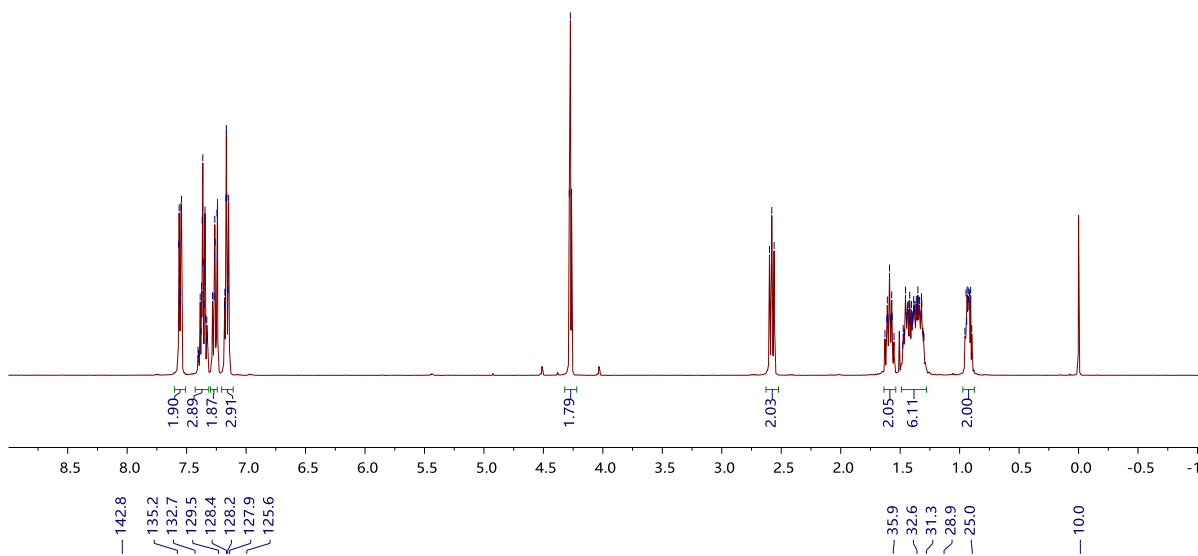
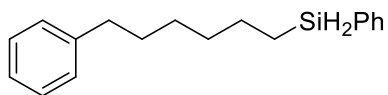


(2-([1,1'-biphenyl]-4-yl)ethyl)(phenyl)silane (8fa)

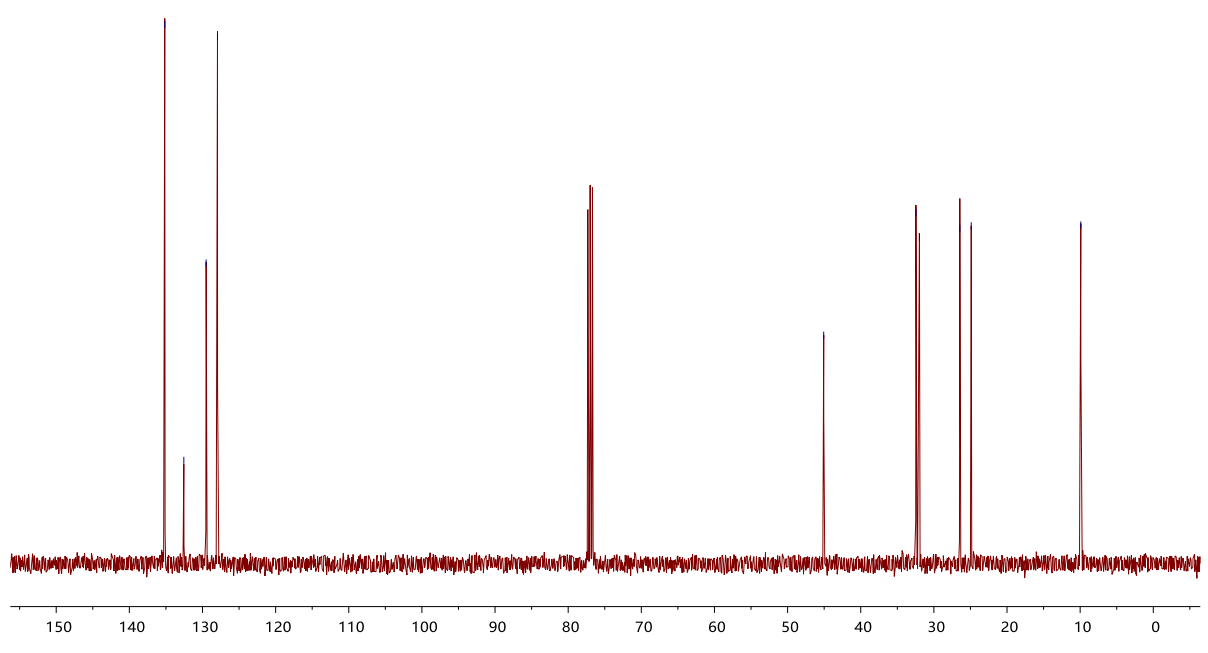
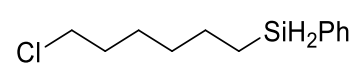
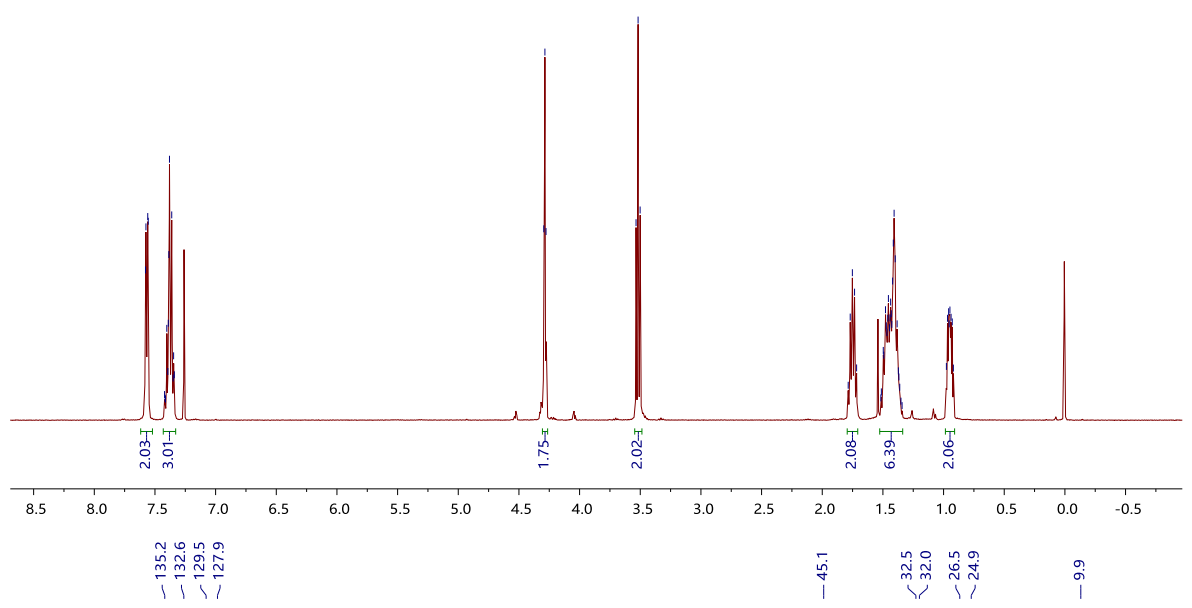
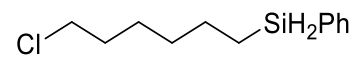


phenyl(6-phenylhexyl)silane (8ga)

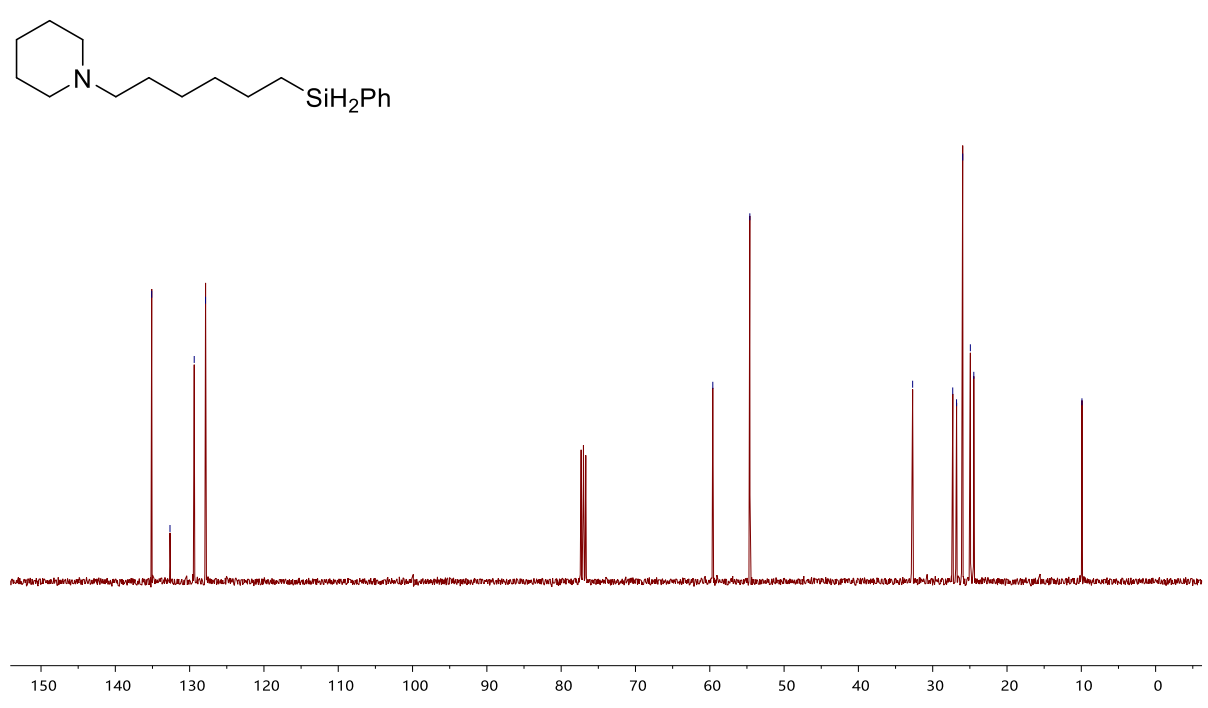
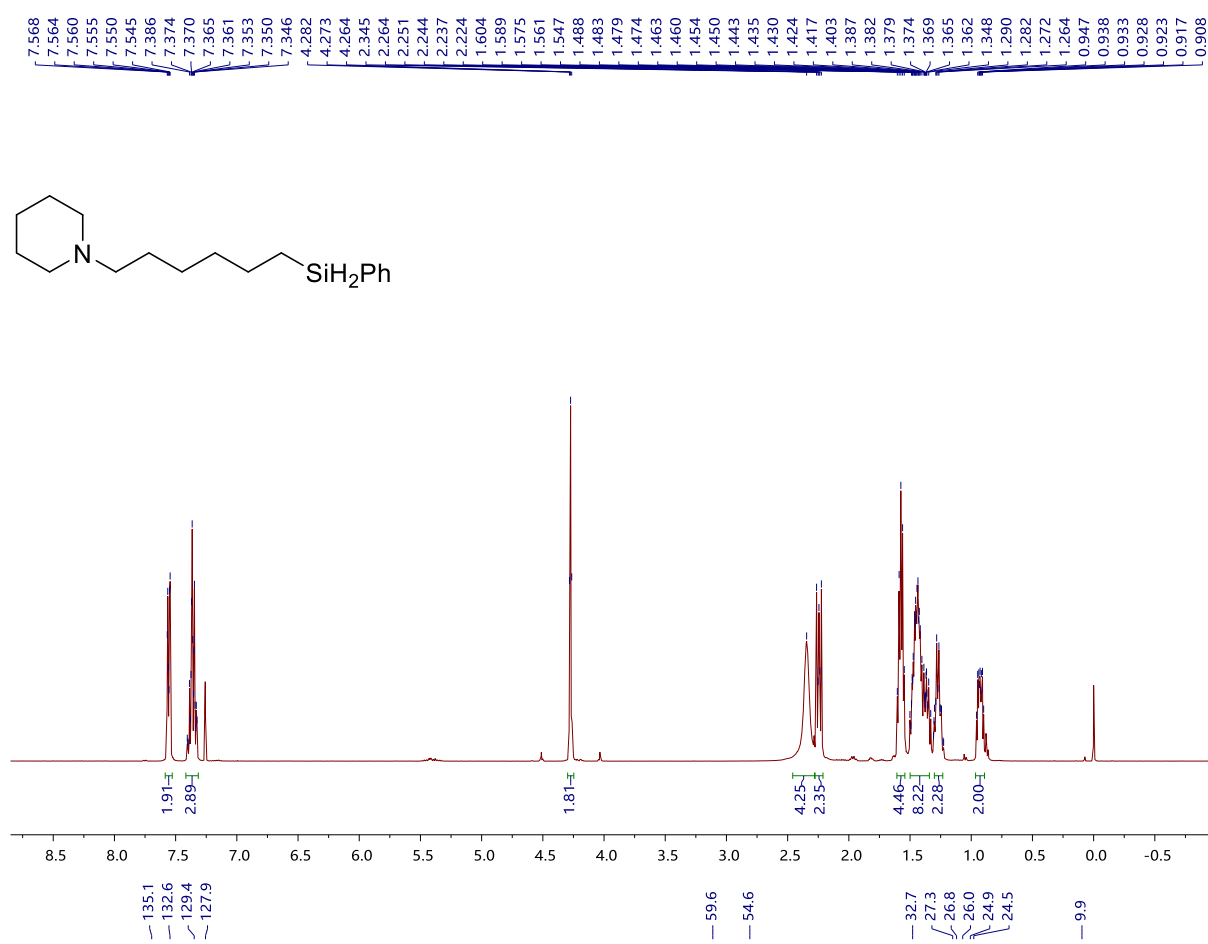
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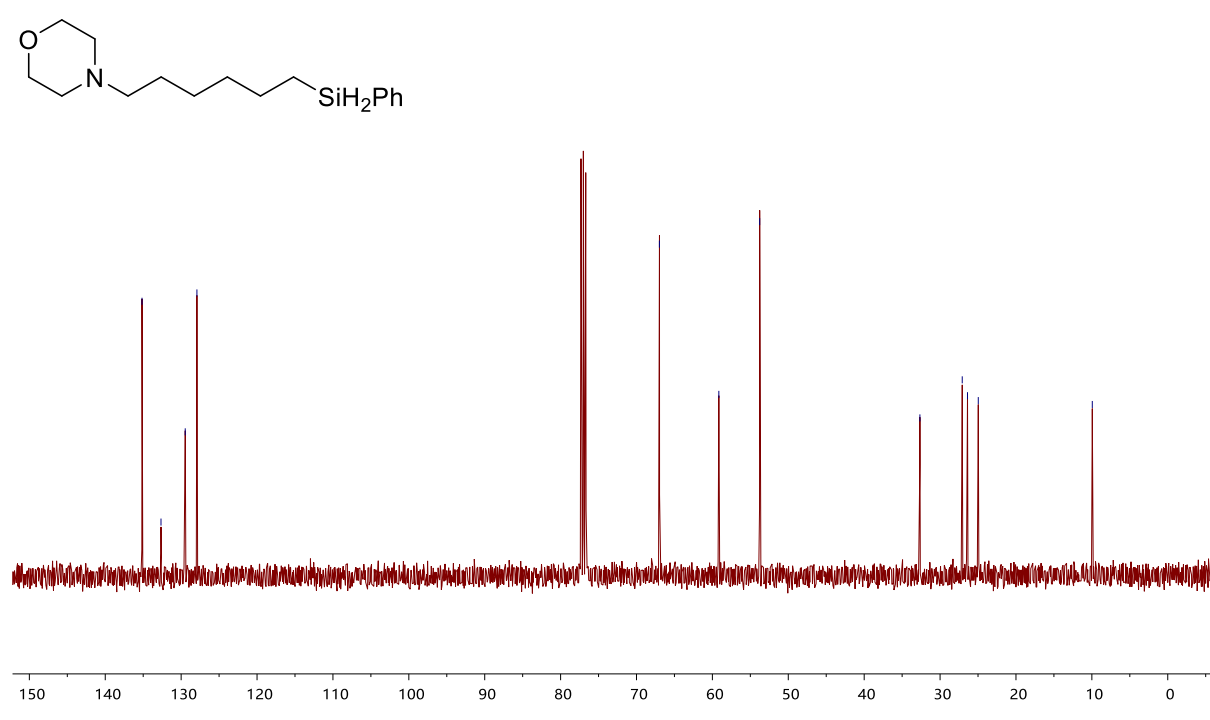
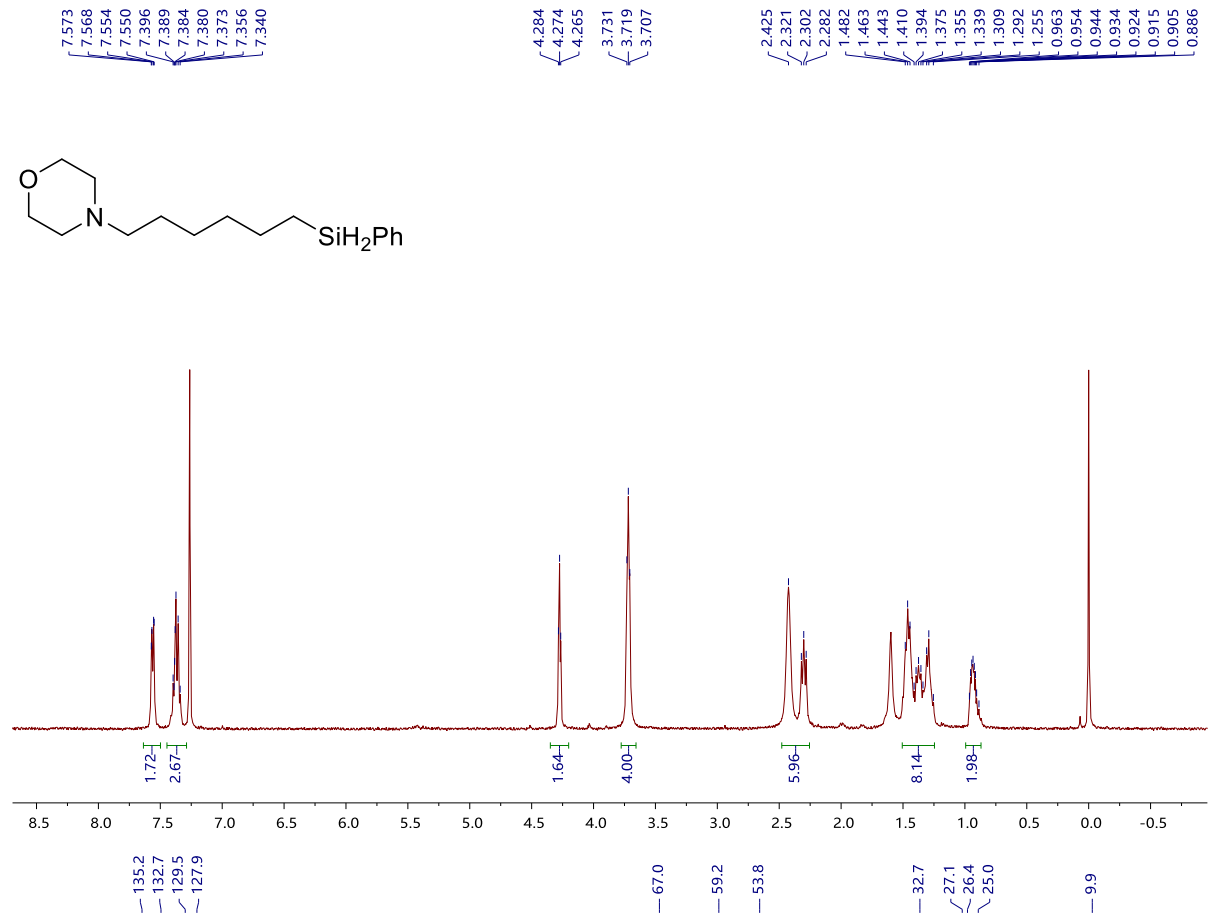
(6-chlorohexyl)(phenyl)silane (8ha)



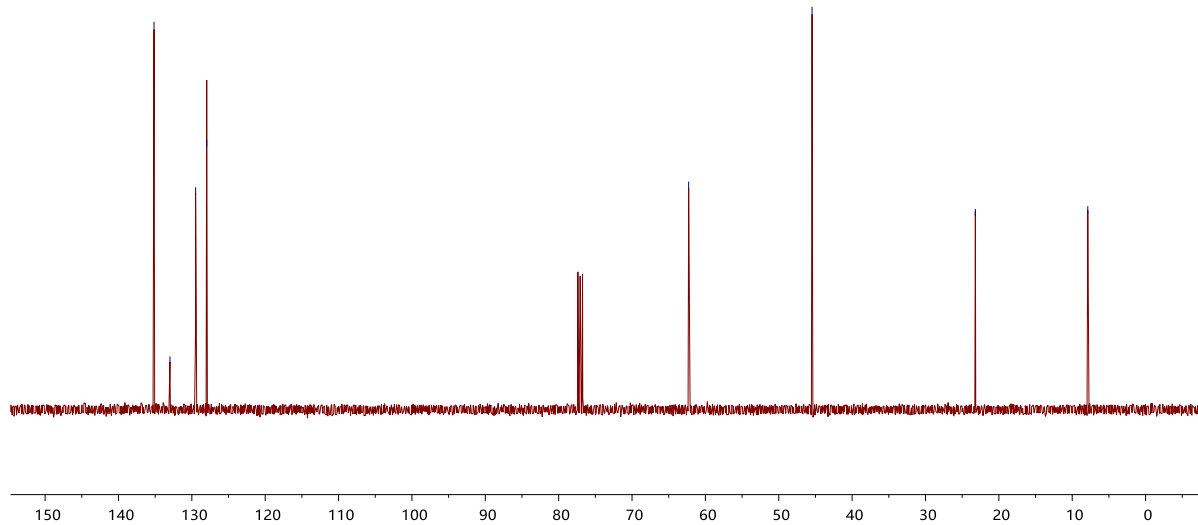
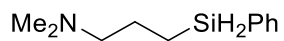
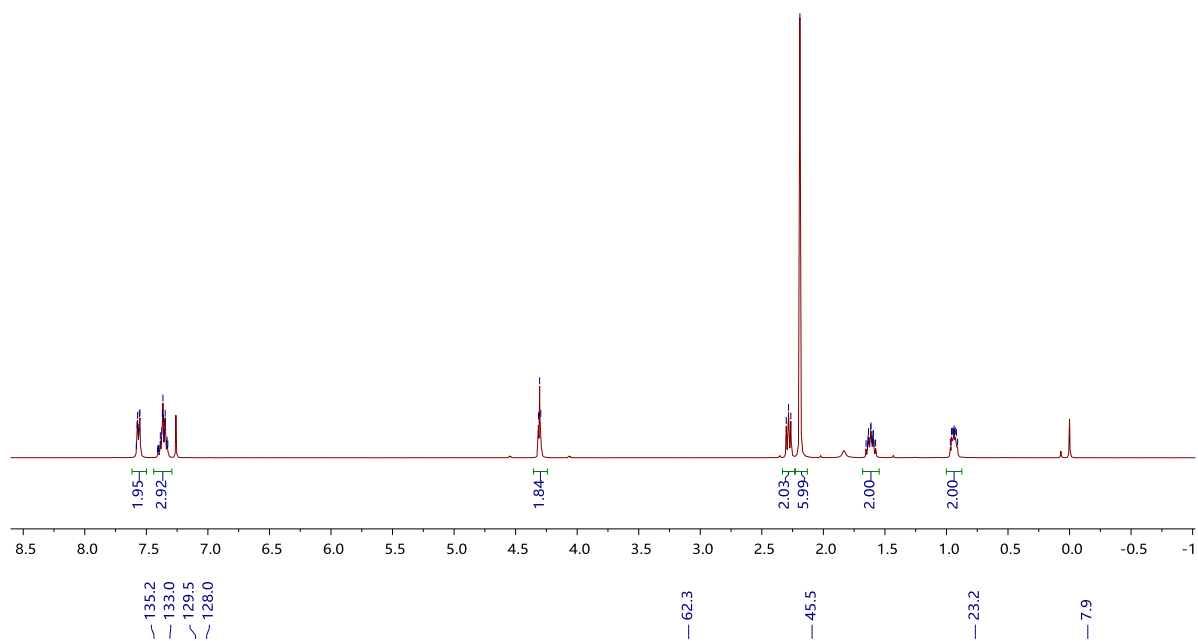
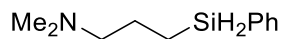
1-(6-(phenylsilyl)hexyl)piperidine (8ia)



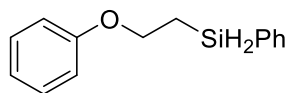
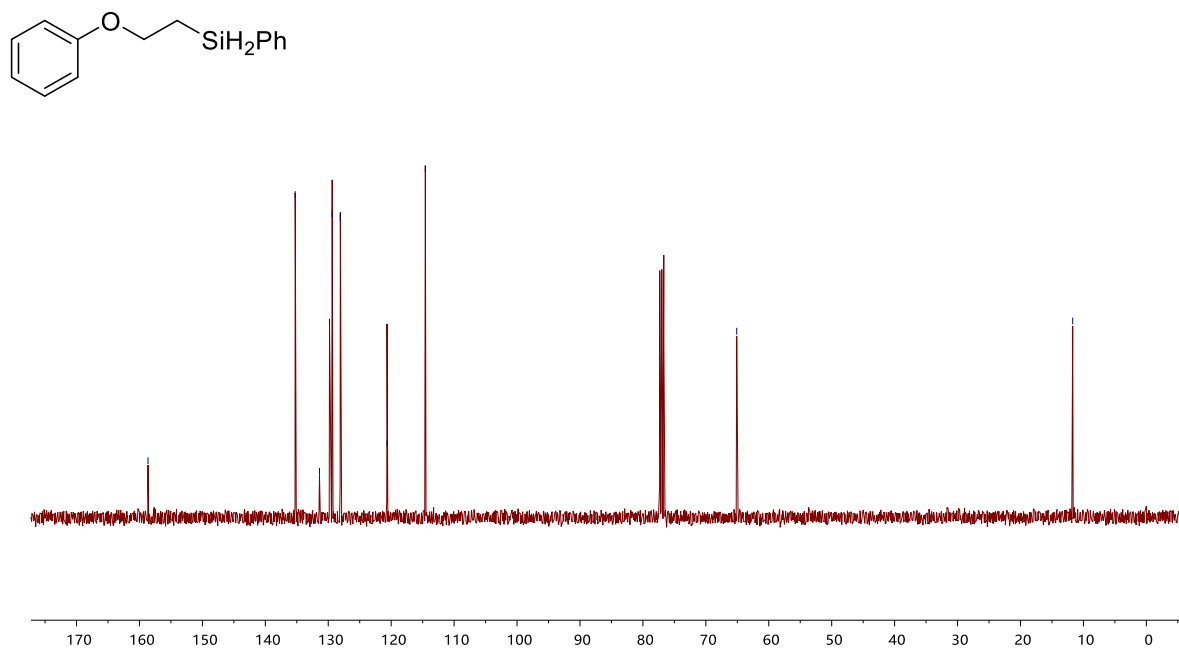
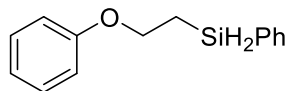
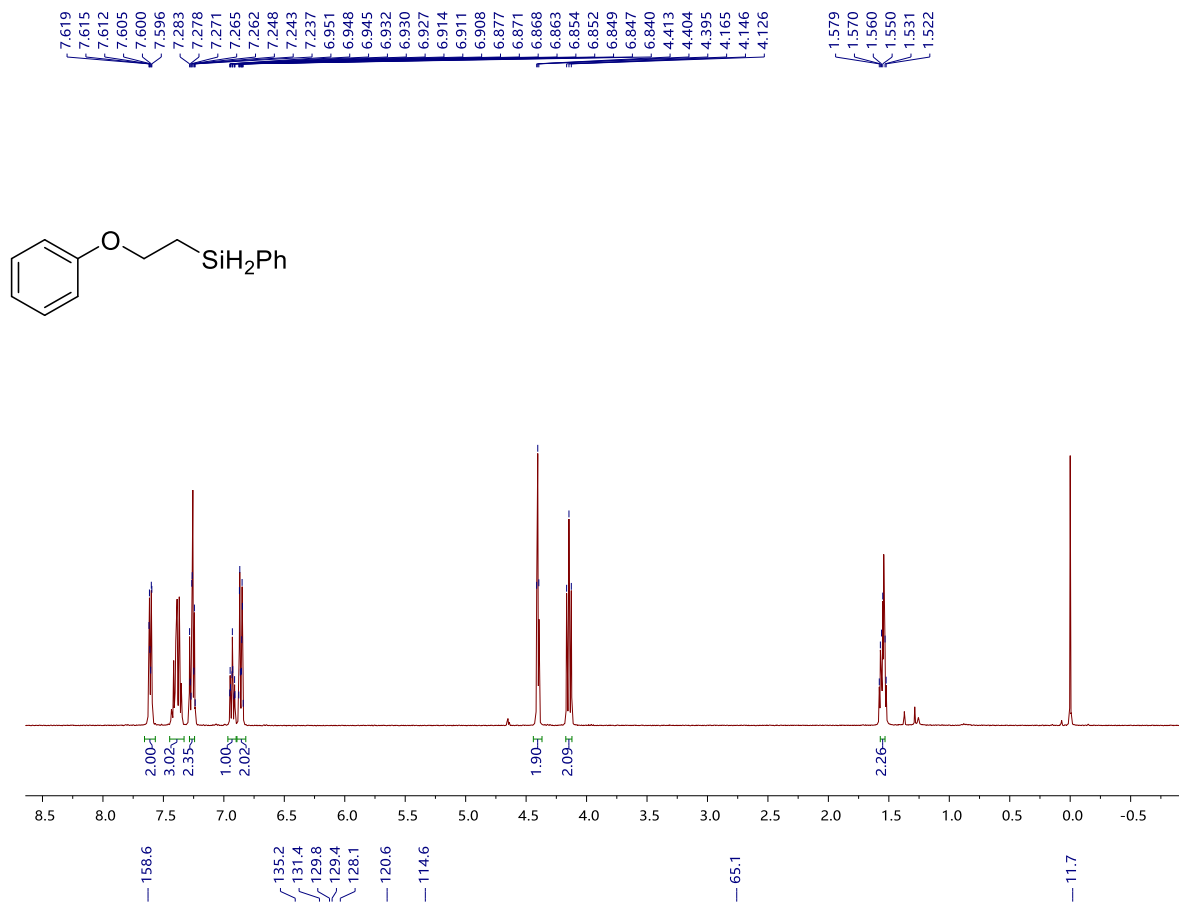
4-(6-(phenylsilyl)hexyl)morpholine (8ja)



N,N-dimethyl-3-(phenylsilyl)propan-1-amine (8ka)

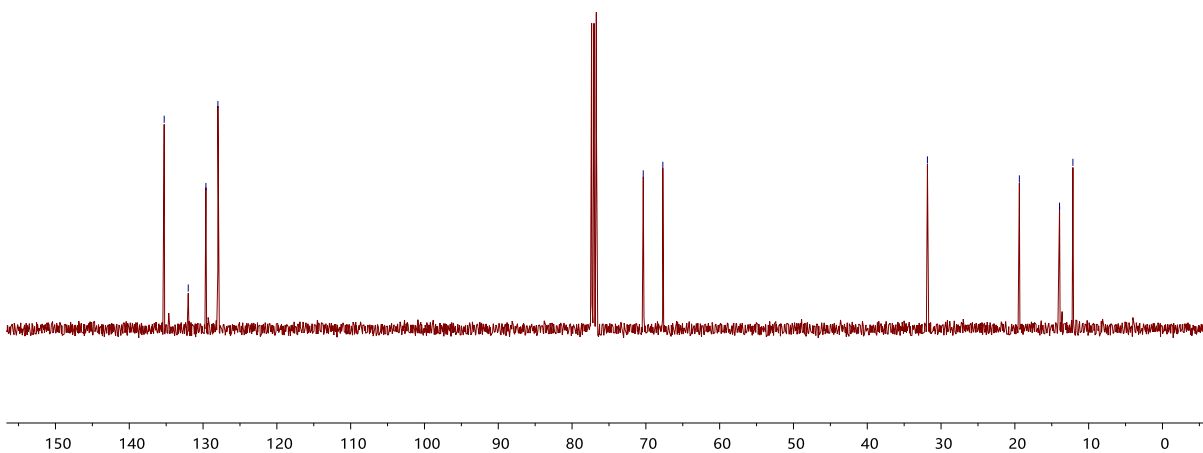
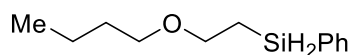
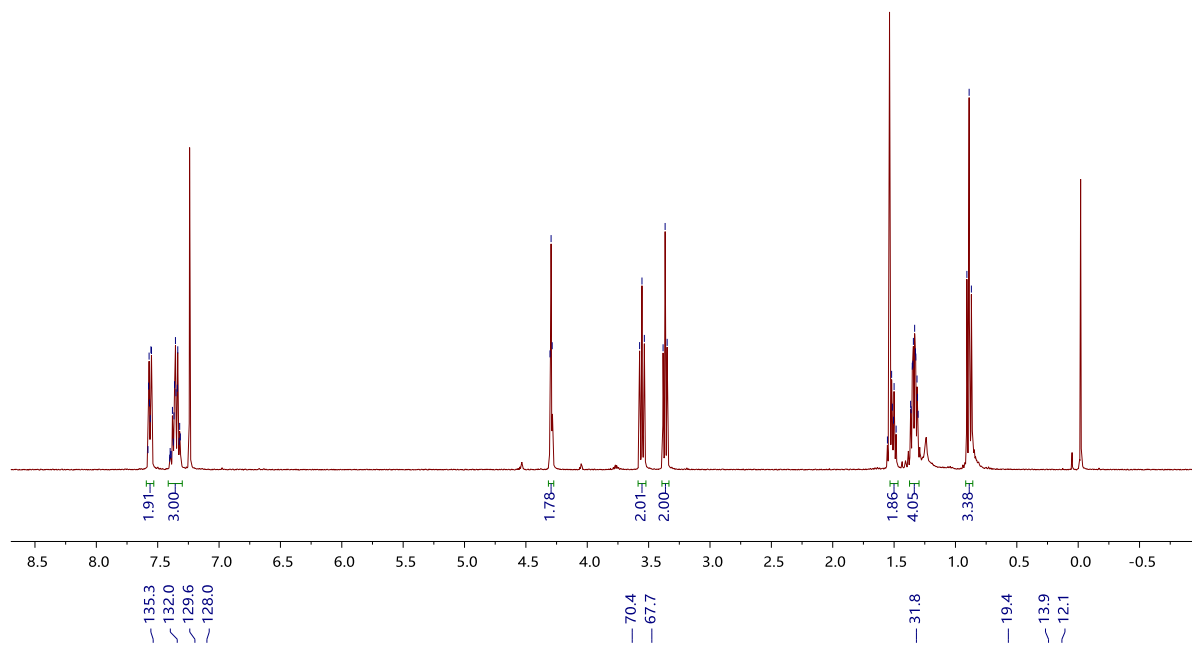
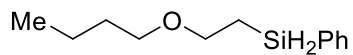


(2-phenoxyethyl)(phenyl)silane(81a)

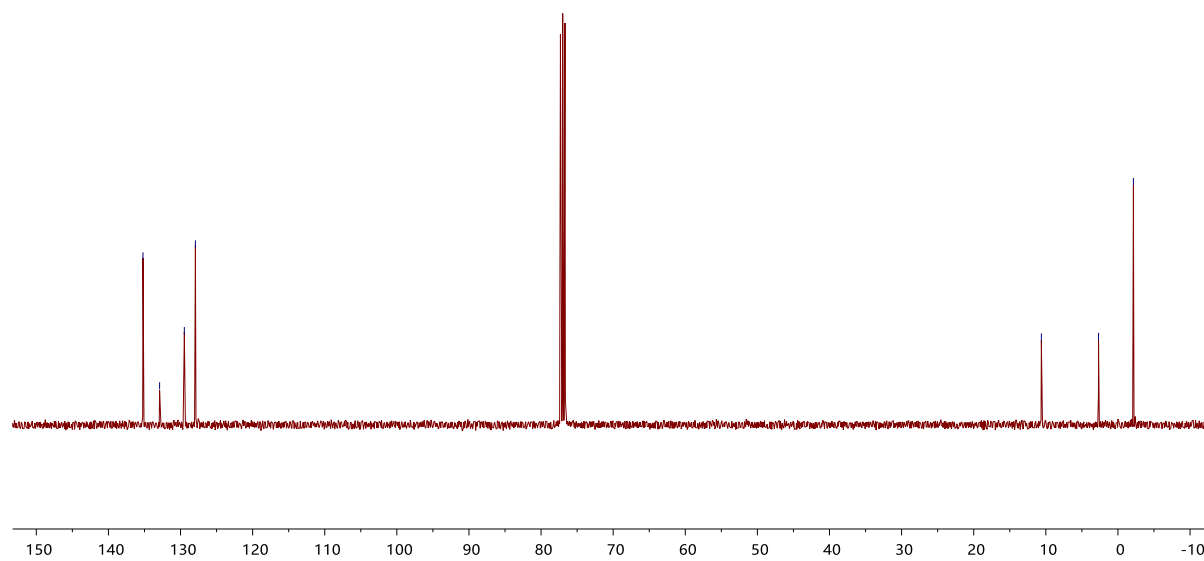
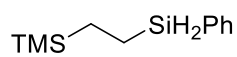
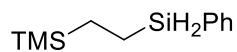
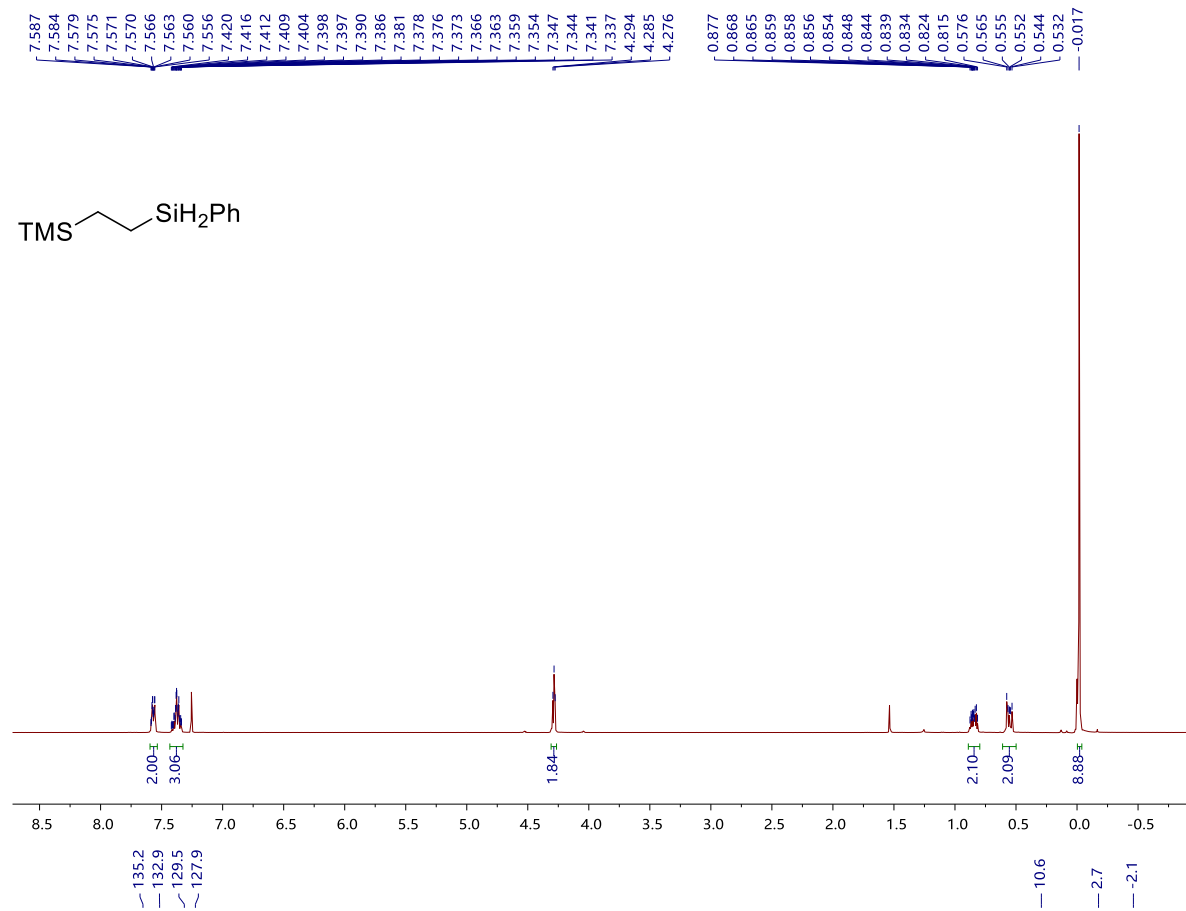


(2-butoxyethyl)(phenyl)silane (8ma)

7.579
7.574
7.570
7.566
7.560
7.555
7.551
7.403
7.398
7.394
7.390
7.380
7.373
7.367
7.363
7.355
7.351
7.340
7.336
7.325
7.321
7.315
4.304
4.295
4.286
3.574
3.554
3.535
3.382
3.366
3.349
1.554
1.520
1.514
1.505
1.500
1.483
1.365
1.361
1.352
1.347
1.343
1.333
1.327
1.323
1.313
1.309
1.304
0.907
0.889
0.870

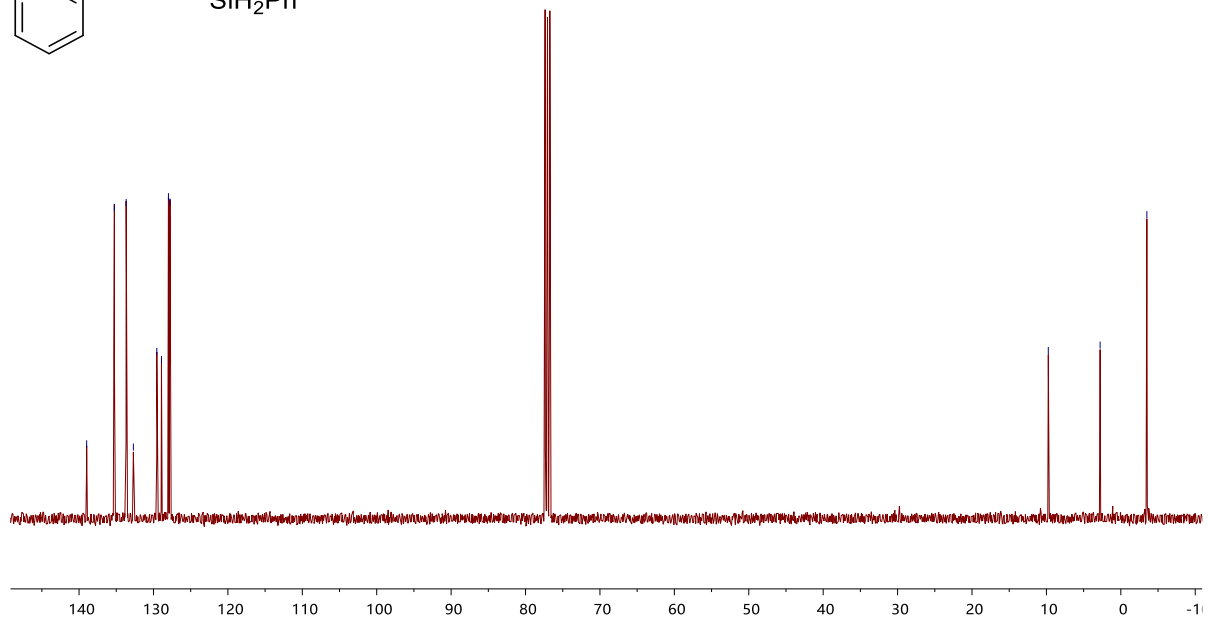
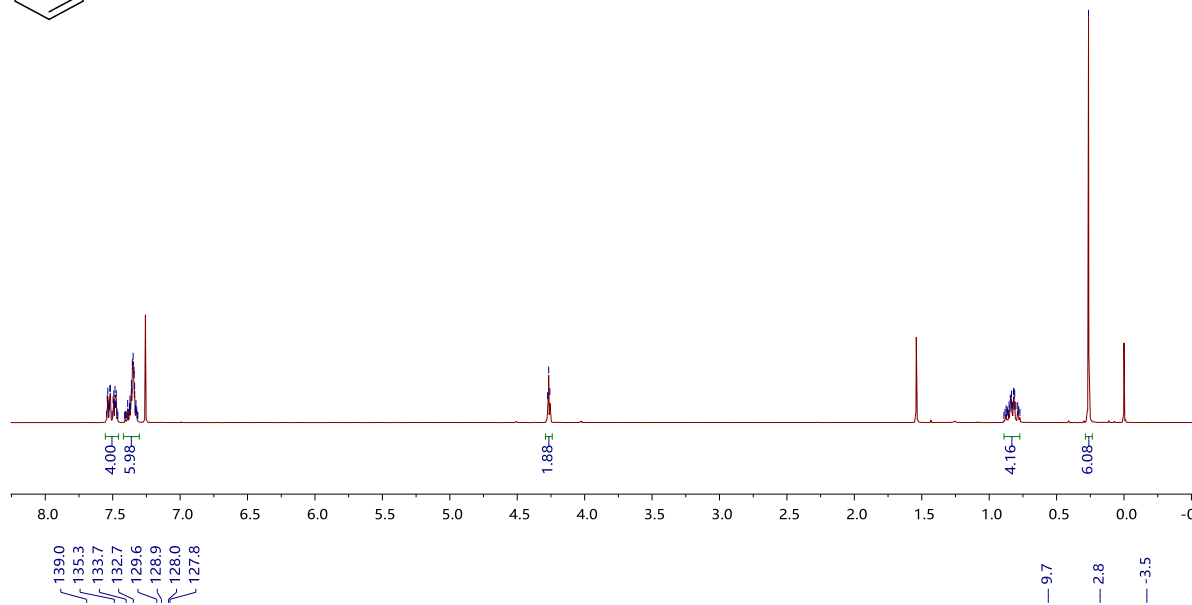


trimethyl(2-(phenylsilyl)ethyl)silane (8na)

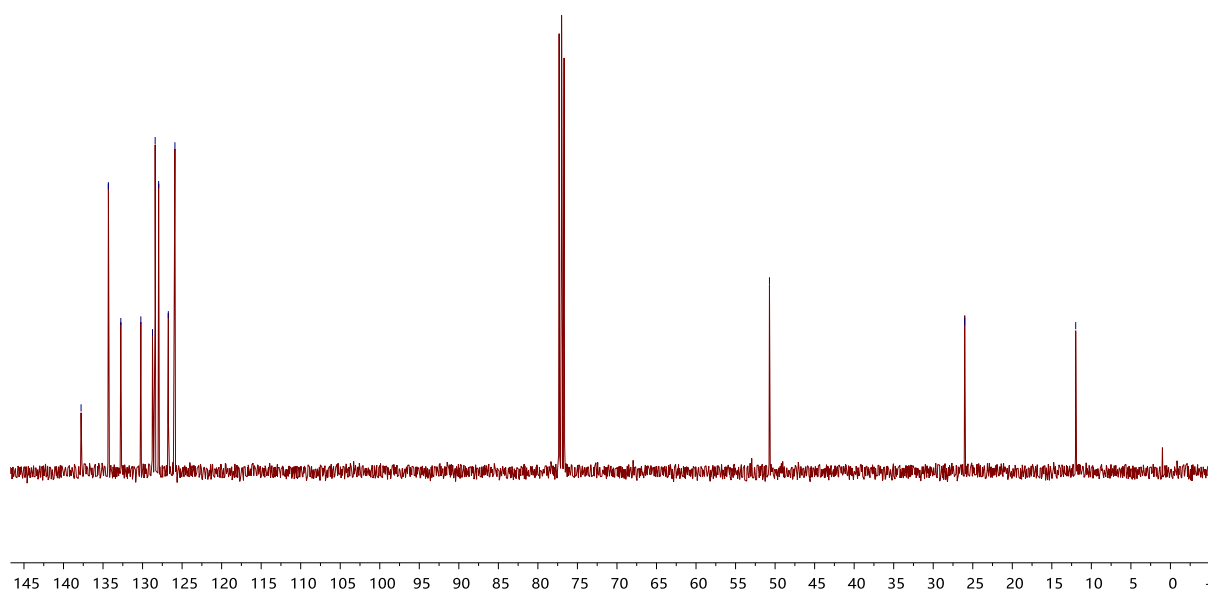
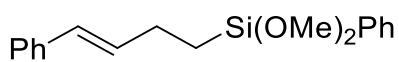
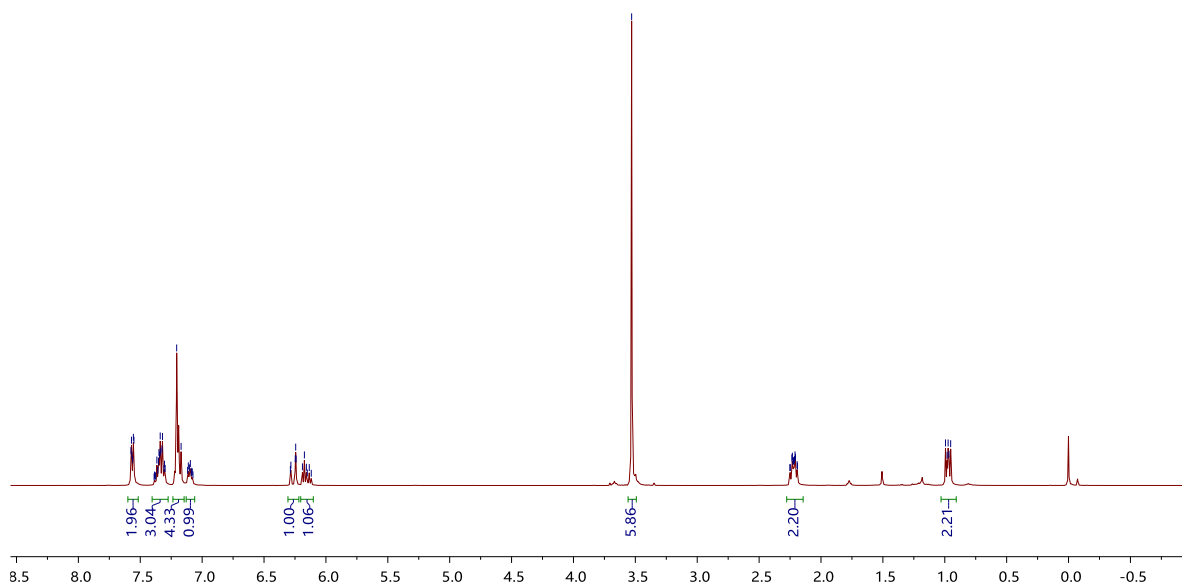
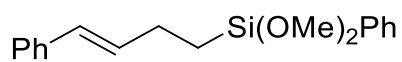


dimethyl(phenyl)(2-(phenylsilyl)ethyl)silane (8oa)

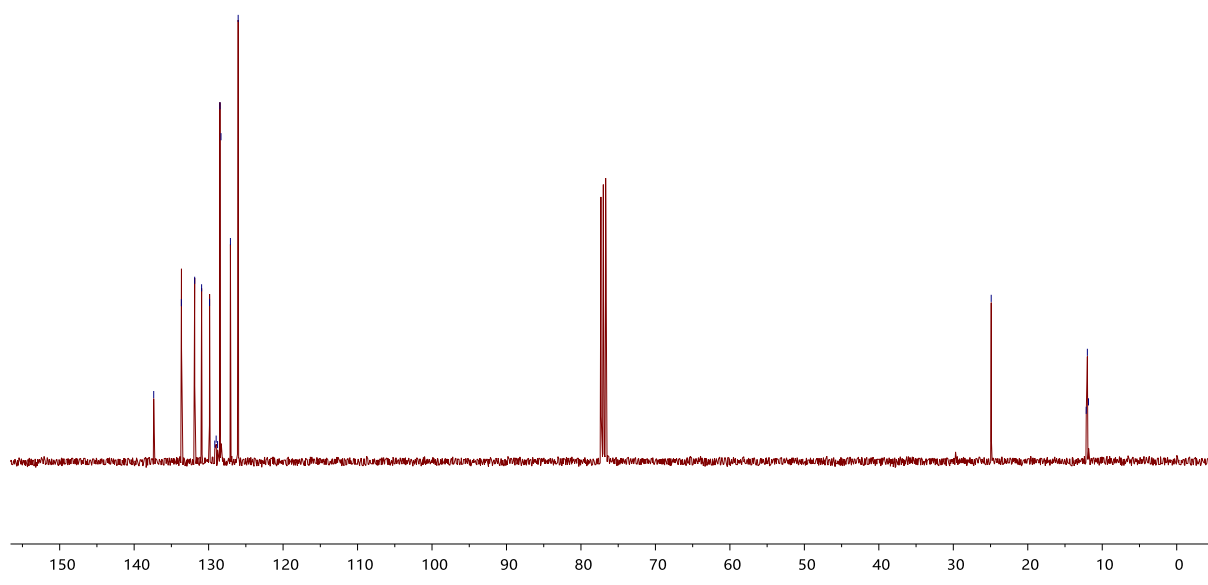
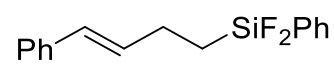
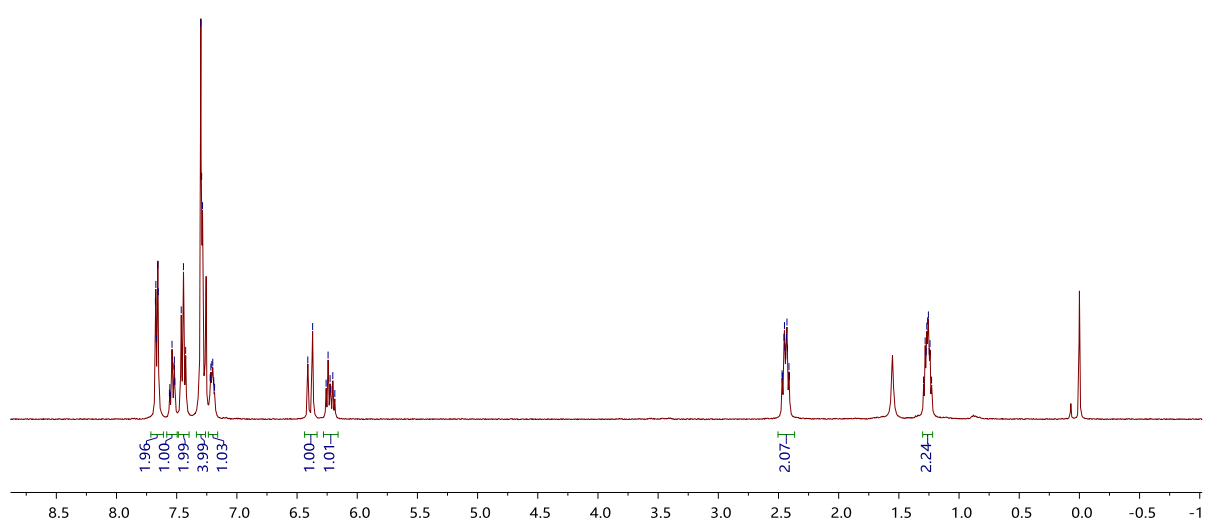
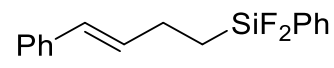
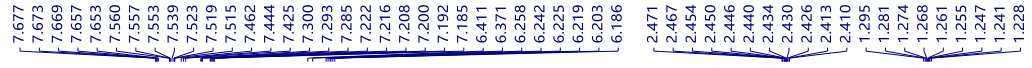
7.545, 7.541, 7.537, 7.533, 7.527, 7.524, 7.521, 7.517, 7.504, 7.497, 7.492, 7.486, 7.483, 7.479, 7.477, 7.473, 7.468, 7.408, 7.399, 7.389, 7.382, 7.376, 7.372, 7.367, 7.361, 7.357, 7.354, 7.349, 7.342, 7.341, 7.337, 7.333, 7.331, 7.327, 7.322, 7.318, 4.275, 4.267, 4.258, 0.883, 0.874, 0.869, 0.866, 0.862, 0.857, 0.852, 0.847, 0.843, 0.839, 0.835, 0.831, 0.828, 0.820, 0.816, 0.811, 0.802, 0.789, 0.786, 0.781, 0.772, 0.263



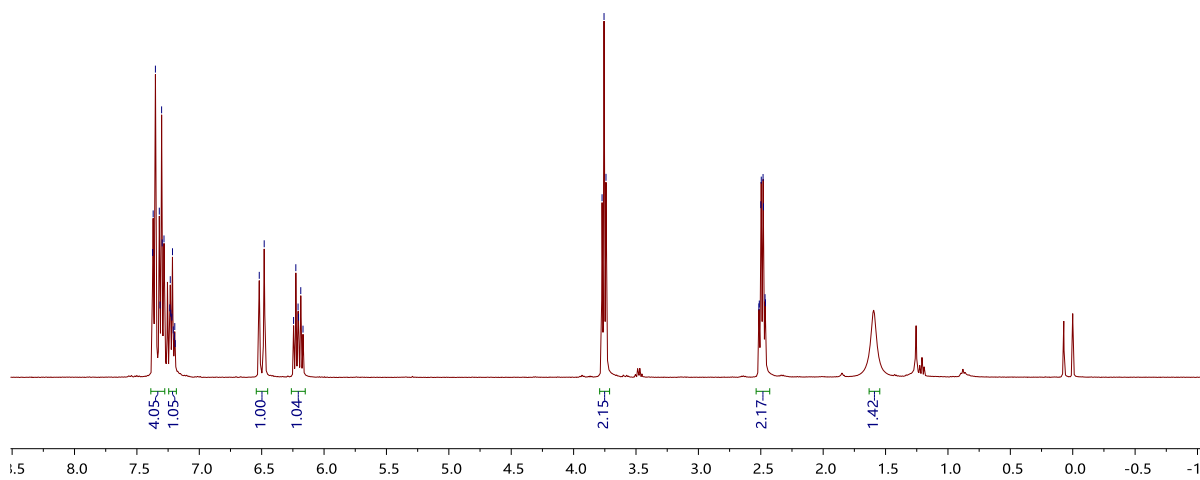
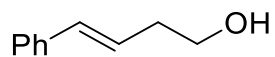
(E)-dimethoxy(phenyl)(4-phenylbut-3-en-1-yl)silane (9)



(E)-difluoro(phenyl)(4-phenylbut-3-en-1-yl)silane (10)

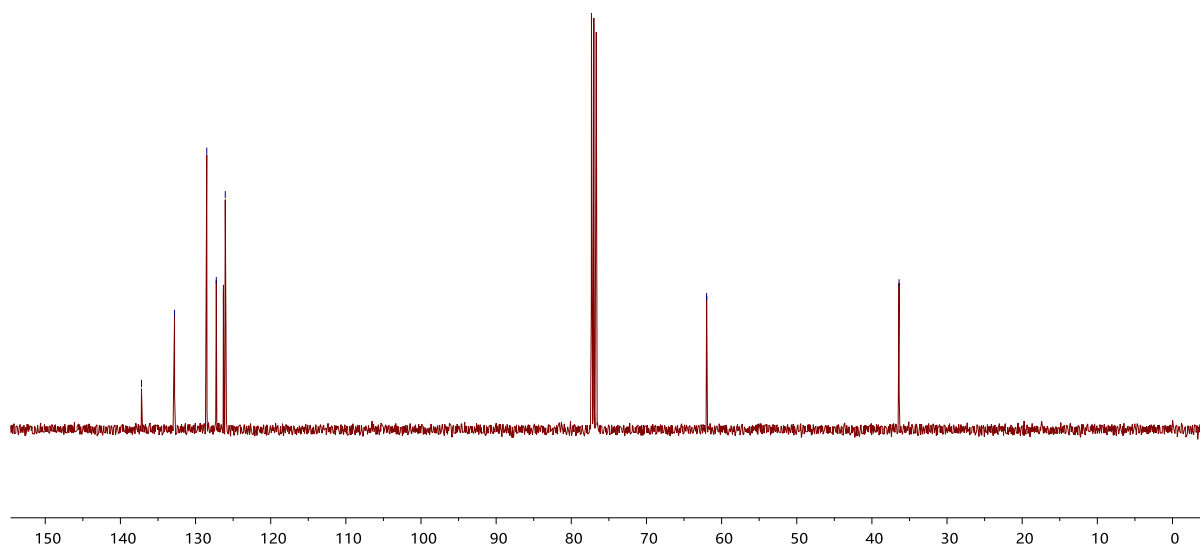
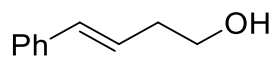


(E)-4-phenylbut-3-en-1-ol (11)

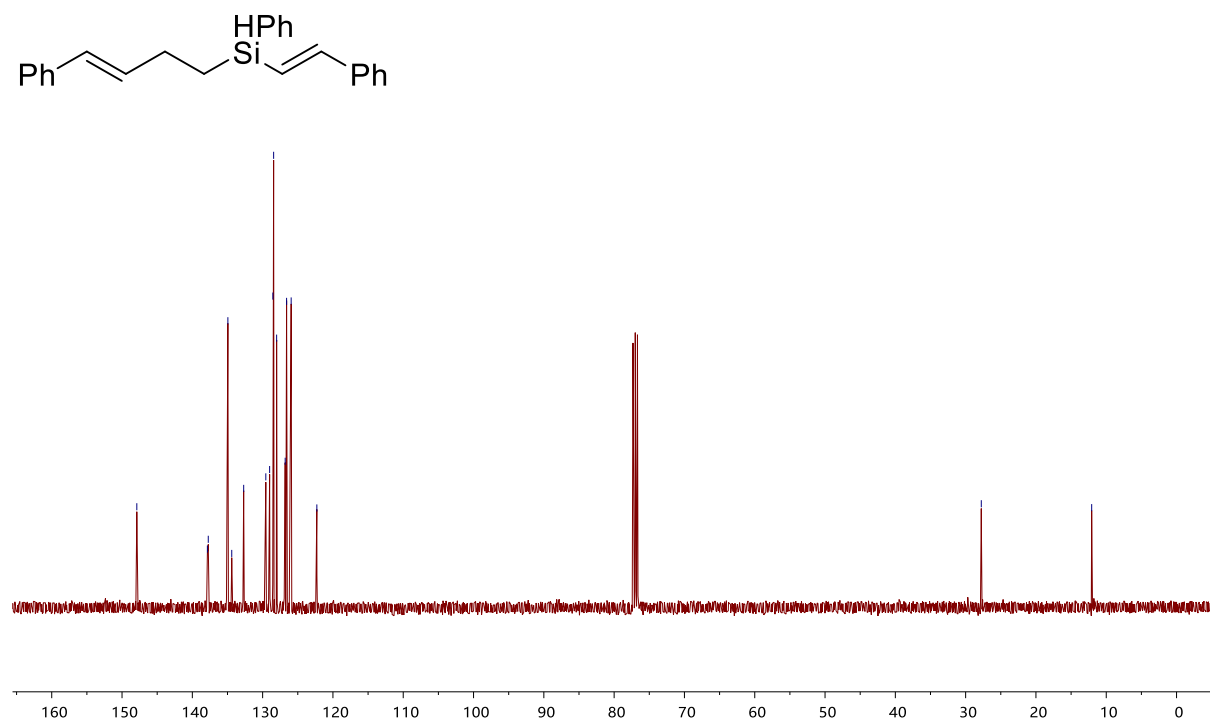
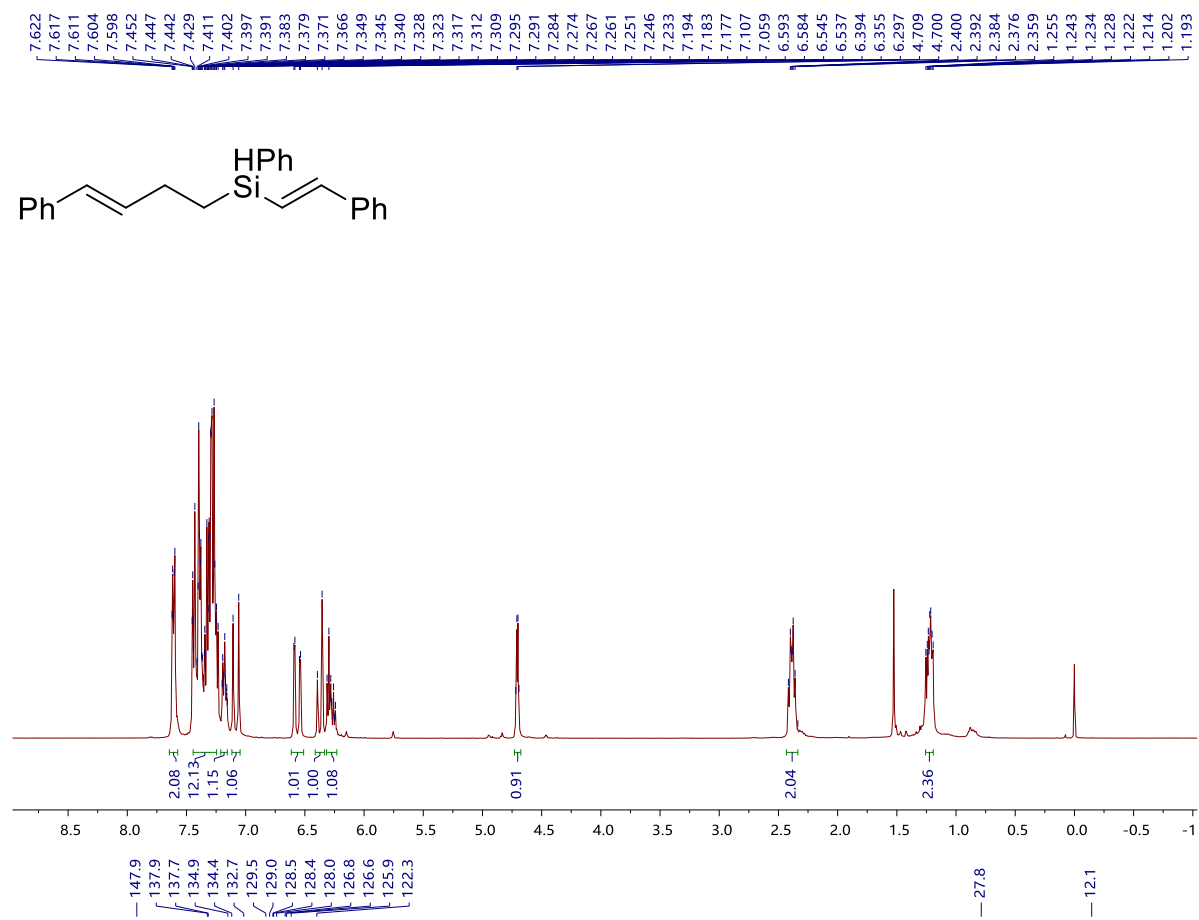


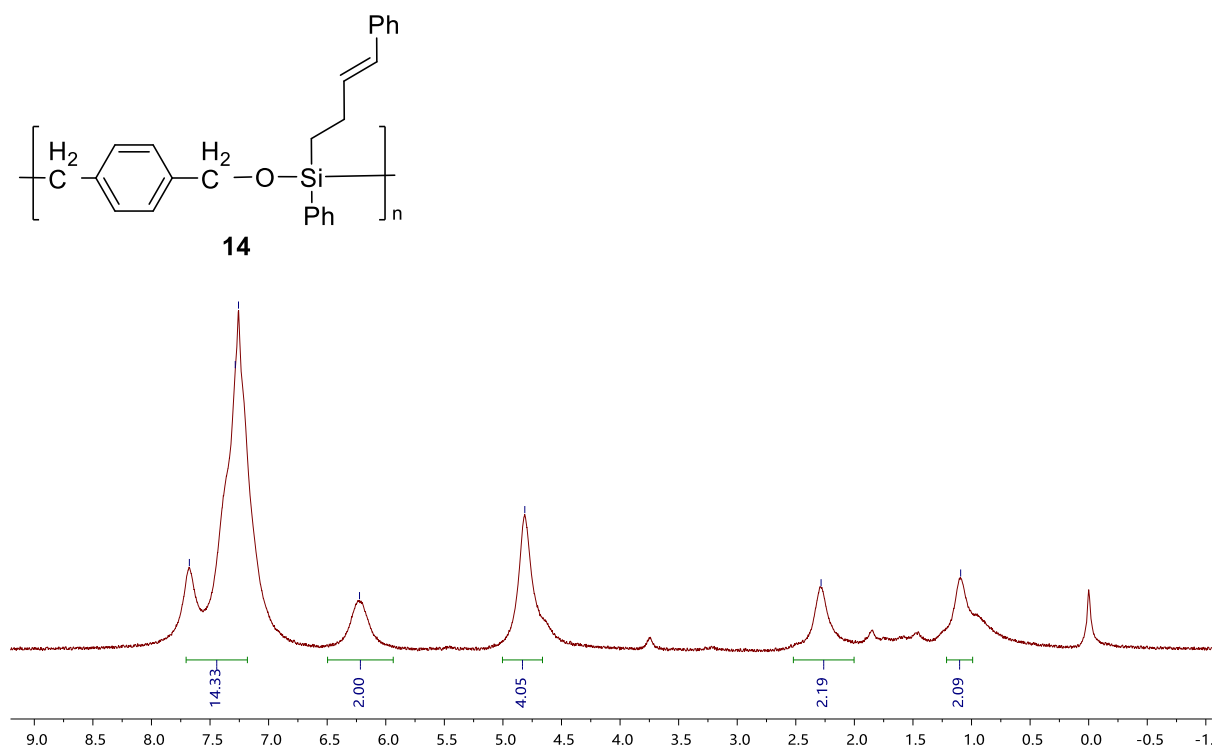
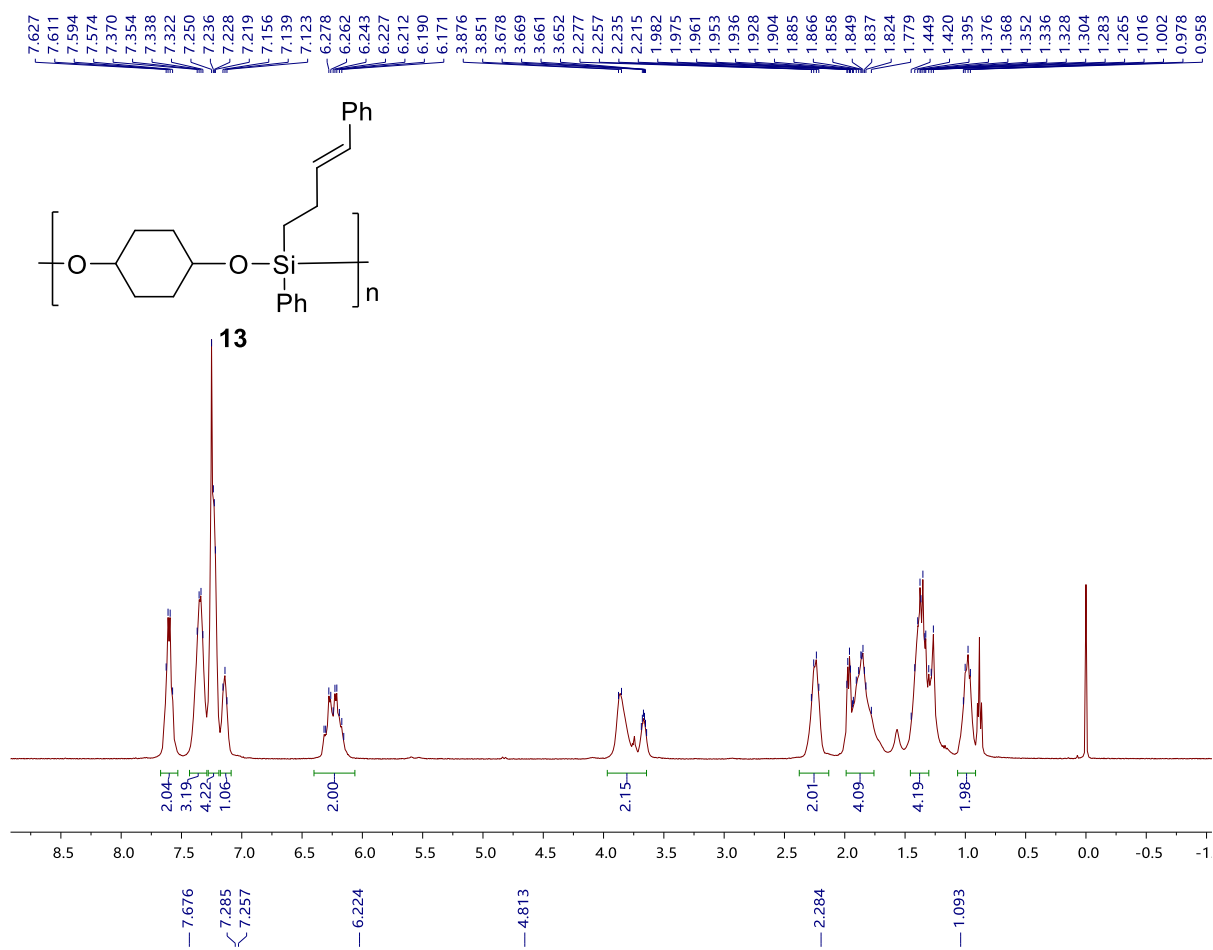
62.0

36.4



phenyl(*E*)-4-phenylbut-3-en-1-yl)((*E*)-styryl)silane (12)



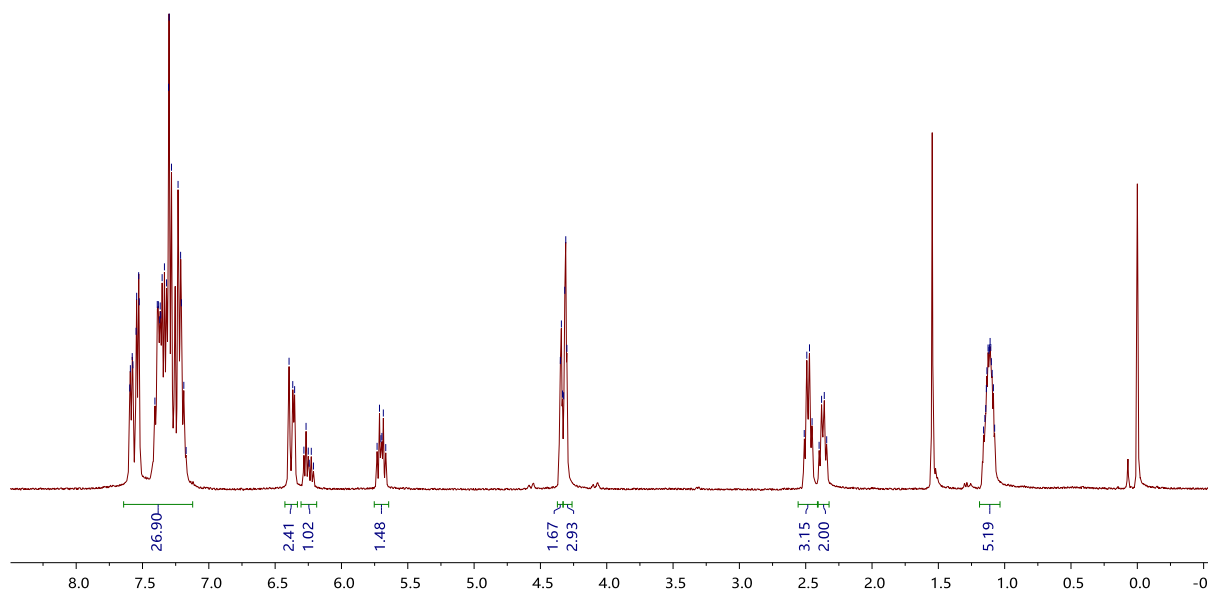


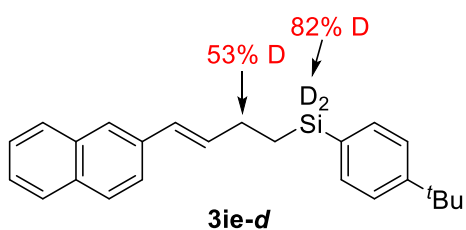
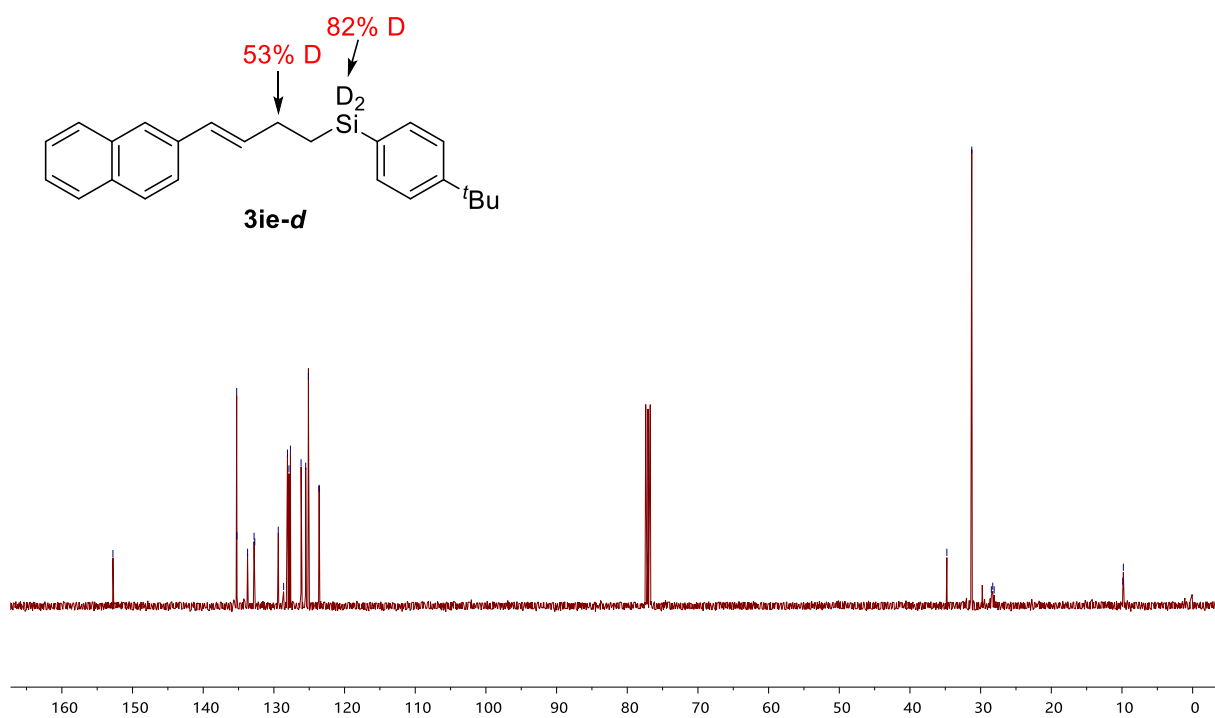
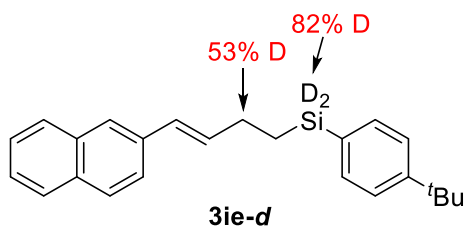
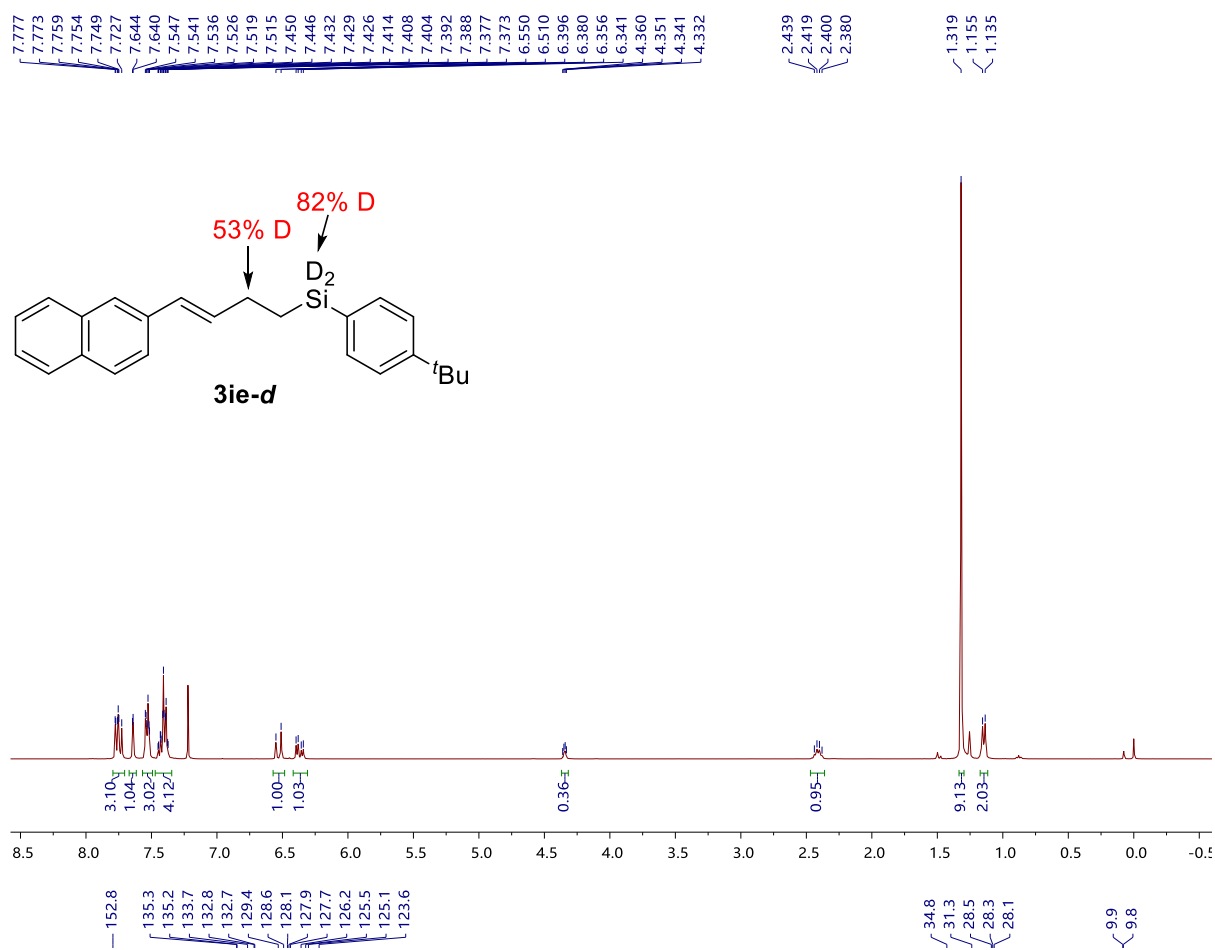
Phenyl(4-phenylbut-3-en-1-yl)silane (3aa')

7.596
7.591
7.577
7.573
7.548
7.544
7.529
7.525
7.407
7.389
7.380
7.371
7.367
7.363
7.352
7.335
7.319
7.303
7.299
7.281
7.232
7.213
7.207
7.189
6.395
6.367
6.353
6.353
6.267
5.713
5.702
5.695
5.684
4.350
4.342
4.334
4.325
4.317
4.309
4.301
2.511
2.492
2.471
2.452
2.399
2.380
2.360
2.342
1.159
1.149
1.143
1.138
1.134
1.125
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1.115
1.110
1.105
1.100
1.094
1.085
1.076

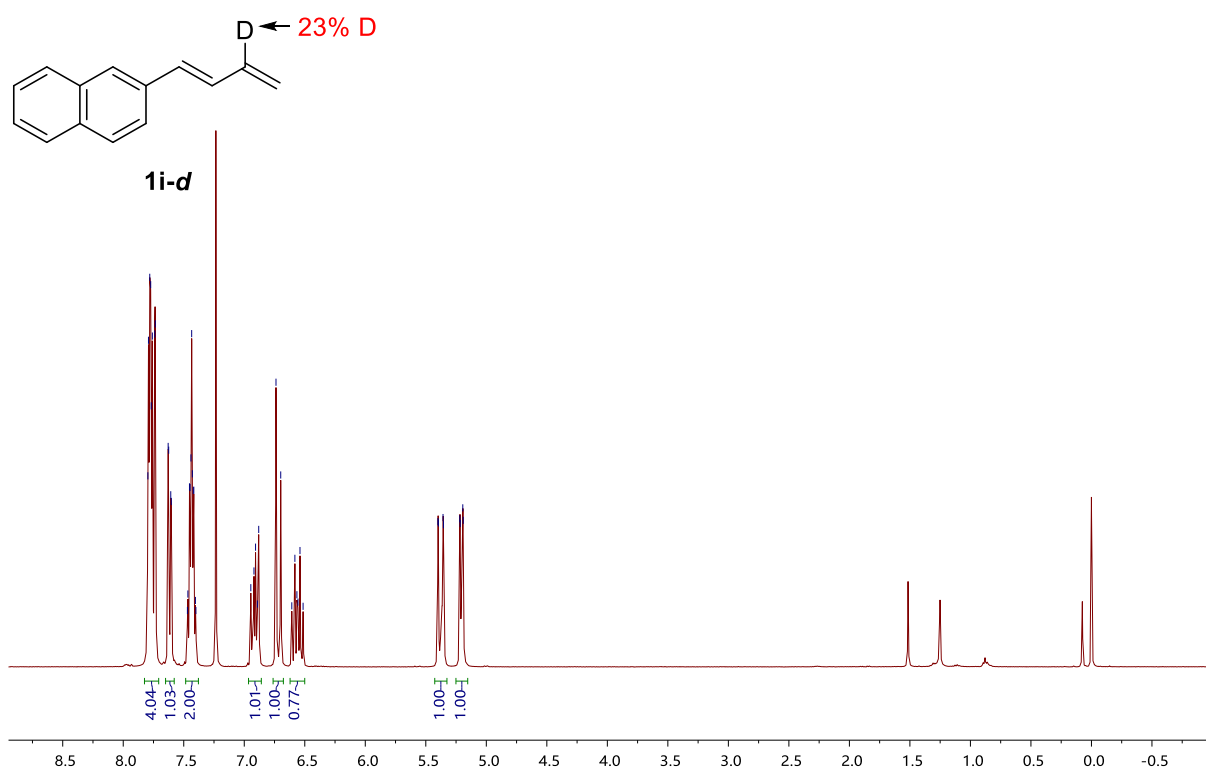


E/Z = 38:62

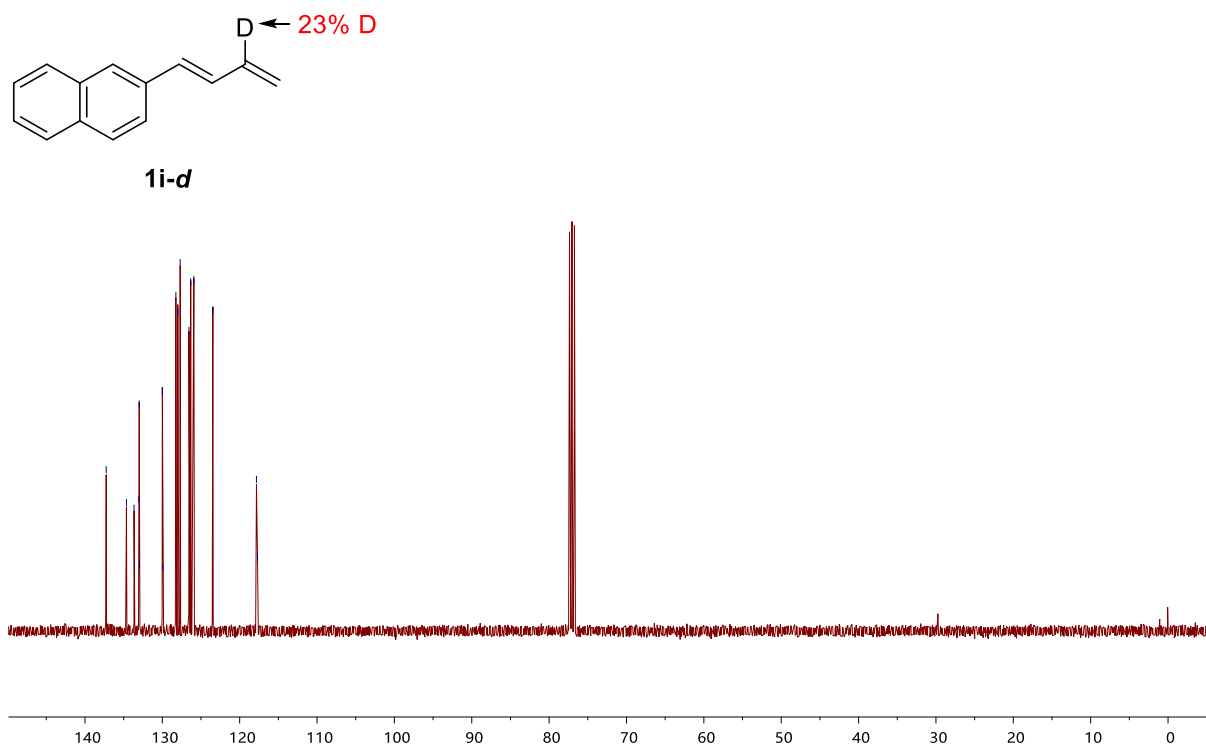


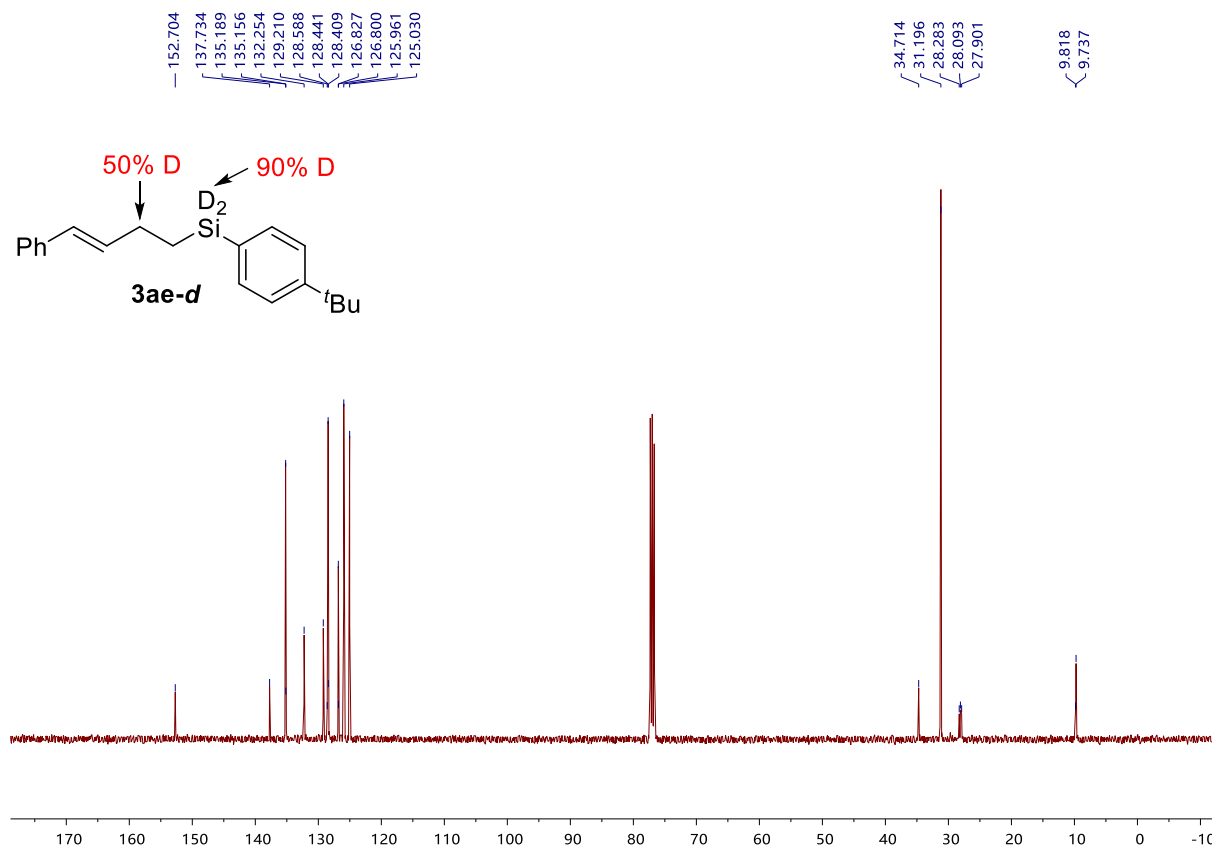
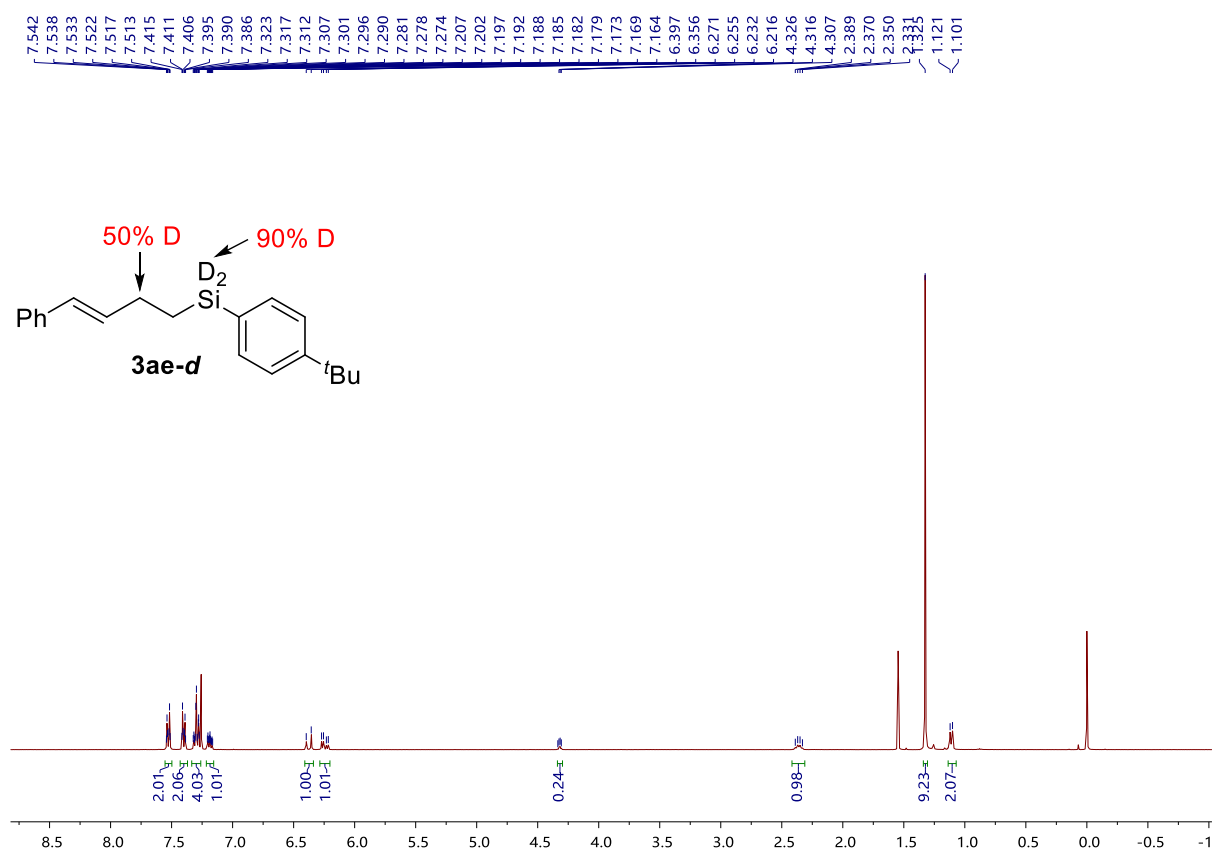


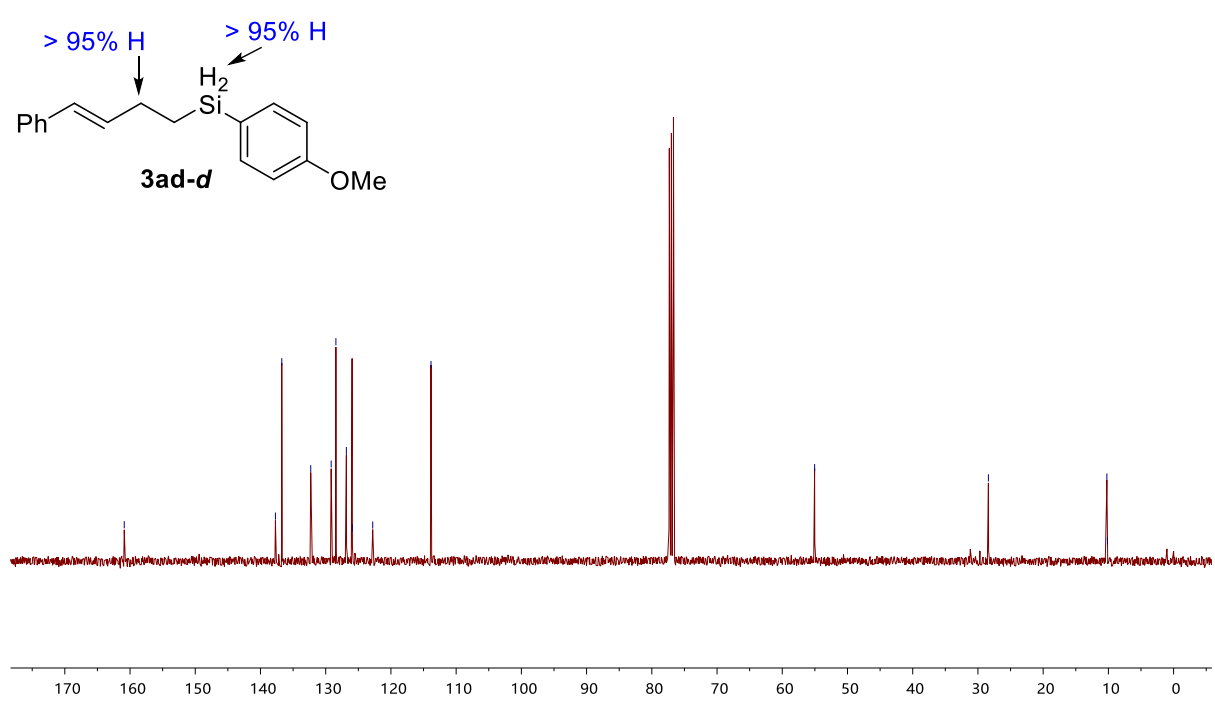
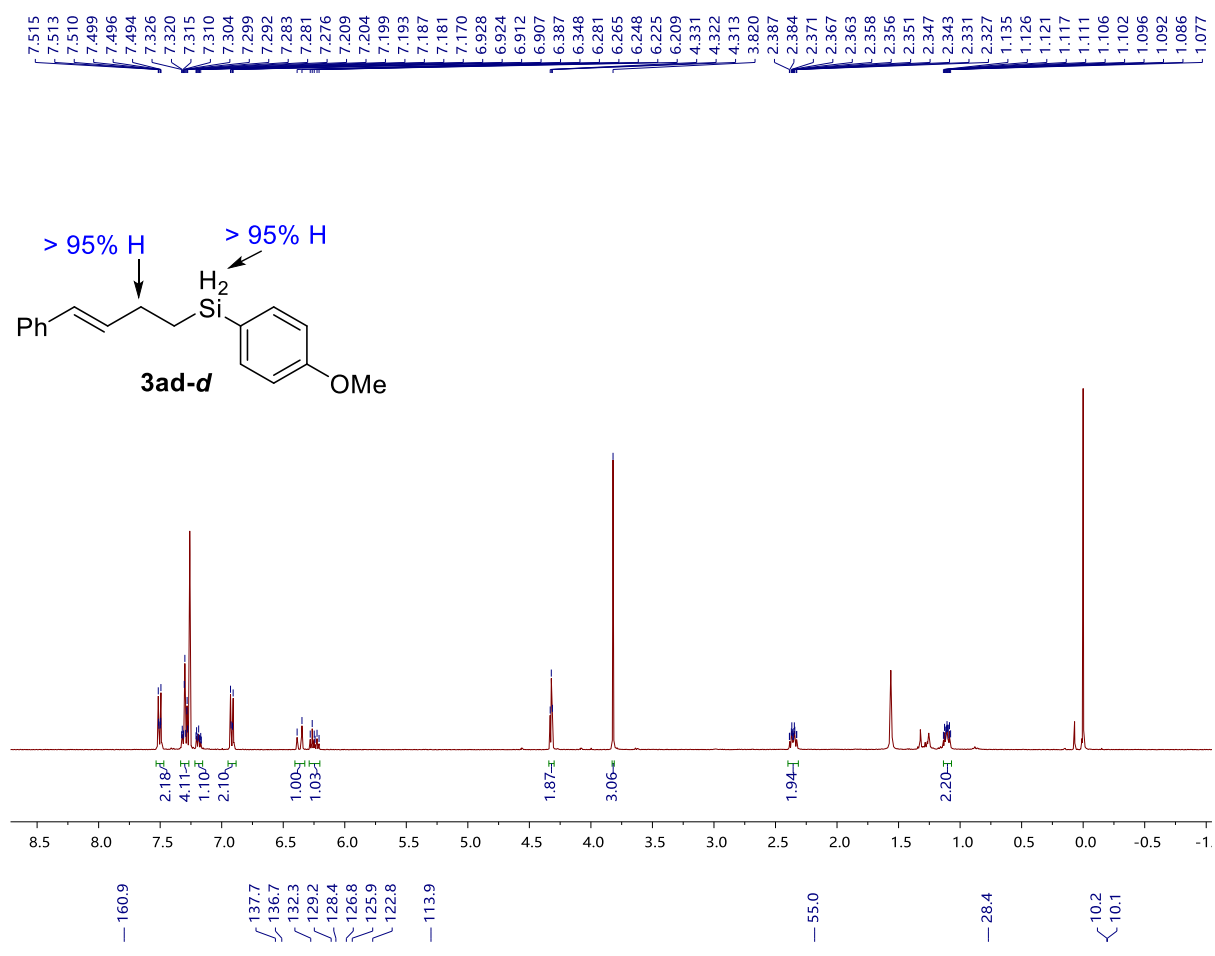
7.796
7.791
7.781
7.773
7.769
7.759
7.739
7.735
7.629
7.624
7.607
7.603
7.470
7.466
7.463
7.448
7.440
7.434
7.429
7.421
7.417
7.403
7.400
6.946
6.920
6.907
6.891
6.881
6.738
6.699
6.607
6.582
6.565
6.556
6.540
6.514
5.400
5.396
5.358
5.354
5.219
5.216
5.194
5.191



137.3
133.0
133.0
130.0
128.2
128.0
127.7
126.6
126.3
125.9
117.8
117.8
117.7







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