SUPPORTING INFORMATION

Carbenium ion formation by fragmentation of electrochemically generated oxonium ions

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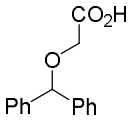
General considerations. All procedures were performed in oven dried glassware under argon atmosphere unless noted otherwise. Reagents and starting materials for synthesis were obtained from commercial sources and used as received. Solvents were purified and dried by standard procedures prior to use.

Flash column chromatography was carried out using silica gel (230−400 mesh). Thin layer chromatography (TLC) was performed on silica gel and was visualized by UV lamp or staining with $KMnO_4$. NMR spectra were recorded on 300 MHz *Brucker UltraShield* or 400 MHz *Varian 400-MR* spectrometers with chemical shift values (δ) in parts per million using the residual chloroform as an internal standard. Gas chromatographic (GC) analysis was performed on Agilent Technologies gas chromatographer with triple-axis detector, heating range 80-280 °C, column 30 m × 0.25 mm, 0.25 μm, 7 inch cage. HRMS analyses were performed on a hybrid quadrupole time-of-flight mass spectrometer equipped with an electrospray ion source.

Controlled current electrolysis was performed using a rectifier „B5-45". Cyclic voltammetry was performed using Advanced Electrochemical System PARSTAT 2273, using a stationary glassy carbon disk electrode (Ø 6 mm) as working electrode, Pt wire as counter electrode and Ag wire as reference electrode. Oxidation potentials are shown *vs* NHE (normal hydrogen electrode). Potential scan rate was 100 mV/s, c(substrate) = 5×10^{-4} M. Experiments were carried out in MeCN distilled from $KMnO_4$, then from P_2O_5, stored over CaH_2 and distilled from it just before use. $TBABF_4$ salt was recrystallized from EtOAc and dried under vacuum for 8 h at 80 °C.

Synthesis of electroauxiliary group bearing substrates 1a,b

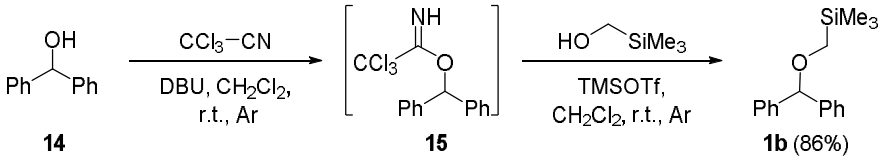
2-(Benzhydryloxy)acetic acid (1a)



Compound **1a** was synthesized according to a literature procedure.[1] This compound has been reported in literature.[1]

^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 10.75 (s, 1H), 7.43 – 7.24 (m, 10H), 5.58 (s, 1H), 4.16 (s, 2H).

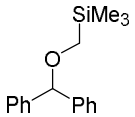
Compound **1b** was obtained from benzhydrol (**14**) in two steps. First, the alcohol was converted to the corresponding trichloroacetimidate **15** which was further alkylated with (trimethylsilyl)methanol in the presence of trimethylsilyltriflate (Scheme 1).



Scheme 1

Trichloroacetimidate **15** was synthesized according to a literature procedure.[2] This compound has been reported in literature.[2]

((Benzhydryloxy)methyl)trimethylsilane (1b)



Trichloroacetimidate **15** (1.18 g, 3.60 mmol) and (trimethylsilyl)methanol (0.45 mL, 3.60 mmol) was dissolved in dry CH_2Cl_2 (20 mL) under argon, then TMSOTf (0.07 mL, 0.36 mmol) was added after 5 min. After 1.5 h, solid sodium hydrogen carbonate was added to the reaction mixture, it was filtered and concentrated in vacuum. The residue was evaporated on silica and purified by column chromatography (eluent hexanes:EtOAc 20:1). Product was obtained as a colourless oil (0.84 g, 86%).

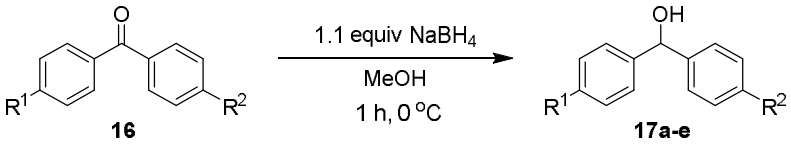
^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.43 – 7.20 (m, 10H), 5.22 (s, 1H), 3.11 (s, 2H), 0.11 (s, 9H) ppm.

^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 143.07, 128.34, 127.30, 127.13, 87.17, 62.69, -2.83 ppm.

Unstable under the conditions of HRMS.

Preparation of alcohols

Alcohols **17a–e** were obtained from commercially available ketones by reduction with $NaBH_4$ (Scheme 2).

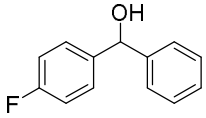


Scheme 2

General procedure for ketone reduction

The ketone (1.0 equiv) was dissolved in MeOH and cooled in an ice bath. Then, $NaBH_4$ (1.1 equiv) was added in portions and the reaction mixture was stirred for approx.1 h, allowing it to warm to r.t., until the reaction was complete as indicated by TLC. Then, the reaction mixture was quenched by sat. NH_4Cl solution, extracted with CH_2Cl_2 (2x), organic layers washed with brine, dried over Na_2SO_4, filtered and evaporated in vacuum to give the corresponding alcohol which was used further without purification.

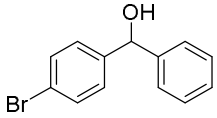
(4-Fluorophenyl)(phenyl)methanol (17a)



Obtained according to the general procedure from 4-fluorobenzophenone (1.00 g, 5.00 mmol) and $NaBH_4$ (0.21 g, 5.50 mmol). (4-Fluorophenyl)(phenyl)methanol (**17a**) was obtained as a white solid (1.00 g, 98%). This compound has been reported in literature.[3]

^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.49 – 7.19 (m, 8H (including $CDCl_3$)), 7.13 – 6.96 (m, 2H), 5.85 (s, 1H), 2.22 (s, 1H).

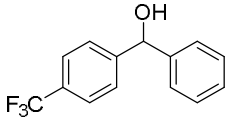
(4-Bromophenyl)(phenyl)methanol (17b)



Obtained according to the general procedure from 4-bromobenzophenone (1.30 g, 5.00 mmol) and $NaBH_4$ (0.21 g, 5.50 mmol). (4-Bromophenyl)(phenyl)methanol (**17b**) was obtained as a white solid (1.28 g, 98%). This compound has been reported in literature.[4]

^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.53 – 7.23 (m, 10H (including $CDCl_3$)), 5.82 (s, 1H), 2.22 (s, 1H).

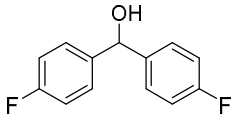
Phenyl(4-(trifluoromethyl)phenyl)methanol (17c)



Obtained according to the general procedure from 4-(trifluoromethyl)benzophenone (1.26 g, 5.00 mmol) and $NaBH_4$ (0.21 g, 5.50 mmol). Phenyl(4-(trifluoromethyl)phenyl)methanol (**17c**) was obtained as a white solid (1.23 g, 97%). This compound has been reported in literature.[5]

^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.65 – 7.46 (m, 4H), 7.42 – 7.23 (m, 5H), 5.89 (s, 1H), 2.27 (s, 1H).

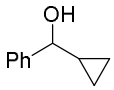
Bis(4-fluorophenyl)methanol (17d)



Obtained according to the general procedure from 4,4'-difluorobenzophenone (1.10 g, 5.00 mmol) and $NaBH_4$ (0.21 g, 5.50 mmol). Bis(4-fluorophenyl)methanol (**17d**) was obtained as a white solid (1.10 g, 98%). This compound has been reported in literature.[4]

^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.38 – 7.28 (m, 4H), 7.09 – 6.97 (m, 4H), 5.82 (s, 1H), 2.18 (s, 1H).

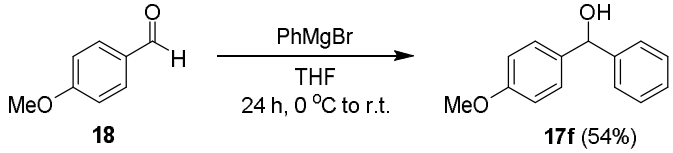
Cyclopropylphenylmethanol (17e)



Obtained according to the general procedure from cyclopropyl(phenyl)methanone (4.3 mL, 30.24 mmol) and $NaBH_4$ (1.26 g, 33.30 mmol). Cyclopropylphenylmethanol (**17e**) was obtained as a colourless oil (4.50 g, quant). This compound has been reported in literature.[6]

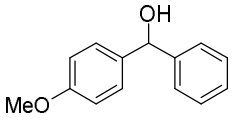
^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.48 – 7.40 (m, 2H), 7.40 – 7.33 (m, 2H), 7.33 – 7.27 (m, 1H), 4.02 (d, J = 8.3 Hz, 1H), 1.94 (s, 1H), 1.23 (m, 1H), 0.70 – 0.61 (m, 1H), 0.61 – 0.52 (m, 1H), 0.52 – 0.44 (m, 1H), 0.43 – 0.34 (m, 1H).

(4-Methoxyphenyl)(phenyl)methanol (**17f**) was synthesized from commercially available benzaldehyde (**18**) and phenylmagnesium bromide in a Grignard reaction (Scheme 3).



Scheme 3

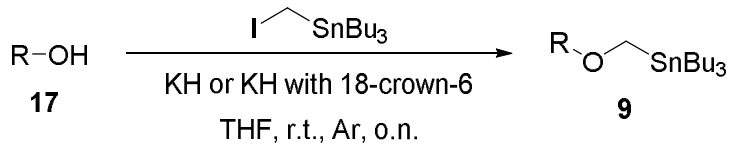
(4-Methoxyphenyl)(phenyl)methanol (17f)



Benzaldehyde (**18**) (5.00 g, 36.72 mmol) was dissolved in dry THF (50 mL) at 0 °C. Phenylmagnesium bromide (1.0 M in THF, 37 mL, 36.72 mmol) was added dropwise and the solution was stirred for 10 min. Then, the reaction mixture was allowed to warm to room temperature and stirred for additional 24 h. Afterwards, the reaction was quenched with sat. NH_4Cl solution (100 mL), THF was evaporated in vacuum, and the mixture was extracted with diethyl ether (2 × 100 mL). The combined organic layers were washed with brine (100 mL), dried over Na_2SO_4, and concentrated under vacuum to afford a yellow oil that crystallizes upon standing. Recrystallization from EtOAc/hexanes gave

4.25 g (54%) of (4-methoxyphenyl)(phenyl)methanol (**17f**) as white needles. This compound has been reported in literature.[5]
^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.46 – 7.23 (m, 6H), 6.96 – 6.83 (m, 2H), 5.85 (d, *J* = 2.7 Hz, 1H), 3.82 (s, 3H), 2.22 – 2.14 (m, 1H).

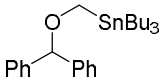
Preparation of tributylstannylmethyl ethers
Substrates were synthesized according to the general procedure (Scheme 4). Synthesis method was adapted from literature.[7]



Scheme 4

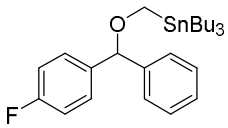
Oven dried flask was charged with 35% KH suspension in oil (2.00 equiv) in THF. Where specified, 18-crown-6 (1.50 equiv) was added and the mixture was stirred for 30 min. Then, alcohol (1.00 equiv) was added to the suspension in portions and the solution was stirred for 30 min at room temperature. Afterwards, tributyl(iodomethyl)stannane (1.05 equiv) was added and the reaction mixture was stirred overnight. Then, the excess KH was quenched by slow addition of water, the reaction mixture was diluted with diethyl ether and washed with water. The organic phase was dried over $MgSO_4$ and the solvent was evaporated to afford a crude mixture which was purified by flash column chromatography on silica gel.

((Benzhydryloxy)methyl)tributylstannane (1c)



Prepared according to the general method from benzhydrol (**14**) (1.01 g, 5.46 mmol), potassium hydride (35 % in oil, 1.25 g, 10.91 mmol), and tributyl(iodomethyl)stannane (2.47 g, 5.73 mmol). Purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 1.96 g (74 %) of product as a colourless oil.
^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.34 – 7.15 (m, 10H), 5.12 (s, 1H), 3.66 (s, $J(^{117/119}Sn\text{-}^1H)$ = 8.3 Hz, 2H), 1.62 – 1.38 (m, 6H), 1.29 (h, *J* = 7.3 Hz, 6H), 1.01 – 0.81 (m, 15H).
^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 143.03, 128.31, 127.29, 127.16, 88.13, 60.07, 29.33, 27.50, 13.86, 9.24.
HR-MS (ESI-TOF) m/z: calcd. for $C_{22}H_{31}OSn$ $[M–Bu]^+$ 431.1397; found: 431.1388.

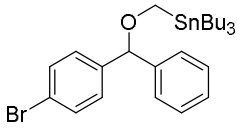
Tributyl(((4-fluorophenyl)(phenyl)methoxy)methyl)stannane (9a)



Prepared according to the general method from (4-fluorophenyl)(phenyl)methanol (**17a**) (0.78 g, 3.87 mmol), potassium hydride (35 % in oil, 0.89 g, 7.74 mmol), 18-crown-6 (1.54 g, 5.81 mmol), and tributyl(iodomethyl)stannane (1.75 g, 4.07 mmol). Purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 1.80 g (92 %) of product as a colourless oil.

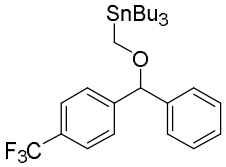
^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.35 – 7.20 (m, 7H), 7.03 – 6.93 (m, 2H), 5.10 (s, 1H), 3.68 – 3.61 (m, 2H), 1.50 (tt, *J* = 8.2, 6.3 Hz, 7H), 1.29 (h, *J* = 7.3 Hz, 7H), 0.90 (m, 16H).
^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 163.36, 160.92, 142.75, 138.85, 128.76, 128.68, 128.39, 127.44, 127.09, 115.22, 115.01, 87.43, 60.01, 29.32, 27.49, 13.87, 9.22.
^{19}F NMR (376 MHz, $CDCl_3$, ppm) δ -115.83.
HR-MS (ESI-TOF) m/z: calcd. for $C_{22}H_{30}OSnF$ $[M–Bu]^+$ 449.1303; found: 449.1309.

(((4-Bromophenyl)(phenyl)methoxy)methyl)tributylstannane (9b)



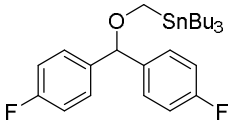
Prepared according to the general method from (4-bromophenyl)(phenyl)methanol (**17b**) (0.71 g, 2.69 mmol), potassium hydride (35 % in oil, 0.62 g, 5.38 mmol), 18-crown-6 (1.02 g, 4.04 mmol), and tributyl(iodomethyl)stannane (1.22 g, 2.83 mmol). Purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 1.10 g (72 %) of product as a colourless oil.
^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.46 – 7.16 (m, 12H), 5.08 (s, 1H), 3.70 – 3.59 (m, $J(^{117/119}Sn\text{-}^{1}H)$ = 9.6 Hz, 2H), 1.63 – 1.39 (m, 7H), 1.38 – 1.22 (m, 7H), 0.99 – 0.81 (m, 21H).
^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 142.39, 142.15, 131.42, 128.82, 128.44, 127.56, 127.10, 121.16, 87.49, 60.11, 29.32, 27.49,13.88, 9.22.
HR-MS (ESI-TOF) m/z: calcd. for $C_{22}H_{30}OBrSn$ $[M–Bu]^+$ 509.0502; found: 509.0499.

Tributyl((phenyl(4-(trifluoromethyl)phenyl)methoxy)methyl)stannane (9c)



Prepared according to the general method from phenyl(4-(trifluoromethyl)phenyl)methanol (1.22 g, 4.86 mmol), potassium hydride (35 % in oil, 1.11 g, 9.72 mmol), 18-crown-6 (1.93 g, 7.29 mmol), and tributyl(iodomethyl)stannane (2.20 g, 5.10 mmol). Purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 1.15 g (42 %) of product as a colourless oil.
^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.55 (d, *J* = 8.1 Hz, 2H), 7.44 (d, *J* = 8.1 Hz, 2H), 7.37 – 7.23 (m, 6H), 5.17 (s, 1H), 3.66 (q, *J* = 9.9 Hz, 2H), 1.58 – 1.44 (m, 6H), 1.30 (h, *J* = 7.3 Hz, 6H), 0.96 – 0.84 (m, 14H).
^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 147.14, 142.06, 129.45 (q, *J* = 32.0 Hz), 128.55, 127.76, 127.20, 125.50 (q, *J* = 3.8 Hz), 124.27 (q, *J* = 272.0 Hz, 87.61, 60.25, 29.32, 27.49, 13.86, 9.23.
^{19}F NMR (376 MHz, $CDCl_3$, ppm) δ -62.47.
HR-MS (ESI-TOF) m/z: calcd. for $C_{23}H_{30}OF_3Sn$ $[M–Bu]^+$ 499.1271; found: 499.1270.

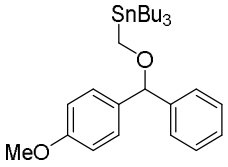
((Bis(4-fluorophenyl)methoxy)methyl)tributylstannane (9d)



Prepared according to the general method from bis(4-fluorophenyl)methanol (1.08 g, 4.91 mmol), potassium hydride (35 % in oil, 1.12 g, 9.82 mmol), 18-crown-6 (1.95 g, 7.36 mmol), and tributyl(iodomethyl)stannane (2.2 g, 5.15 mmol). Purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 1.77 g (69 %) of product as a colourless oil.

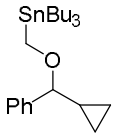
^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.32 – 6.95 (m, 9H), 5.10 (s, 1H), 3.64 (s, $J(^{117/119}Sn\text{-}^{1}H)$ = 8.7 Hz, 2H), 1.55 – 1.41 (m, 5H), 1.32 (hept, *J* = 7.1 Hz, 6H), 0.91 (m, 14H).
^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 163.43, 160.99, 138.58, 138.55, 128.73, 128.65, 115.32, 115.11, 86.78, 59.98, 29.32, 27.48, 13.87, 9.22.
^{19}F NMR (376 MHz, $CDCl_3$, ppm) δ -115.47.
HR-MS (ESI-TOF) m/z: calcd. for $C_{22}H_{29}OSnF_2$ $[M–Bu]^+$ 467.1208; found: 467.1216.

Tributyl(((4-methoxyphenyl)(phenyl)methoxy)methyl)stannane (9e)



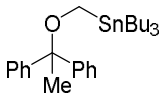
Prepared according to the general method from (4-methoxyphenyl)(phenyl)methanol (0.64 g, 3.00 mmol), potassium hydride (35 % in oil, 0.69 g, 6.00 mmol), and tributyl(iodomethyl)stannane (1.36 g, 3.15 mmol). Purification by column chromatography on silica gel (eluent hexanes/EtOAc 10:1) afforded 0.94 g (60%) of product as a colourless oil.
^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.34 – 7.28 (m, 4H), 7.31 – 7.18 (m, 3H), 6.89 – 6.81 (m, 2H), 5.09 (s, 1H), 3.79 (s, 3H), 3.71 – 3.61 (m, 2H), 1.63 – 1.45 (m, 6H), 1.31 (m, 6H), 1.03 – 0.82 (m, 14H).
^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 158.90, 143.29, 135.21, 128.43, 128.27, 127.16, 127.02, 113.69, 87.58, 59.83, 55.36, 29.33, 27.51, 13.88, 9.21.
HR-MS (ESI-TOF) m/z: calcd. for $C_{23}H_{33}O_2Sn$ $[M–Bu]^+$ 461.1503; found: 461.1486.

Tributyl((cyclopropyl(phenyl)methoxy)methyl)stannane (9f)



Prepared according to the general method from cyclopropyl(phenyl)methanol (1.00 g, 6.75 mmol), potassium hydride (35 % in oil, 1.55 g, 13.50 mmol), and tributyl(iodomethyl)stannane (3.05 g, 7.08 mmol). Purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2| 9:1) afforded 2.11 g (69%) of product as a colourless oil.
^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.38 – 7.23 (m, 5H), 3.62 & 3.50 (dd, *J* = 51.6, 10.1 Hz, 1H), 3.59 (d, *J* = 6.9 Hz, 1H), 1.60 – 1.42 (m, 6H), 1.29 (m, 6H), 1.12 – 1.00 (m, 1H), 0.89 (m, 14H), 0.58 – 0.44 (m, 2H), 0.44 – 0.35 (m, 1H), 0.35 – 0.24 (m, 1H).
^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 142.99, 128.26, 127.35, 127.06, 89.07, 59.74, 29.32, 27.49, 18.03, 13.88, 9.19, 3.61, 2.03.
HR-MS (ESI-TOF) m/z: calcd. for $C_{19}H_{31}OSn$ $[M–Bu]^+$ 395.1397; found: 395.1393.

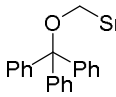
Tributyl((1,1-diphenylethoxy)methyl)stannane (9g)



Prepared according to the general method from 1,1-diphenylethan-1-ol (0.60 g, 3.00 mmol), potassium hydride (35 % in oil, 0.69 g, 6.00 mmol), 18-crown-6 (1.20 g, 4.50 mmol), and tributyl-(iodomethyl)stannane (1.36 g, 3.15 mmol). Purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 1.40 g (94 %) of product as a colourless oil.
^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.38 – 7.15 (m, 10H), 3.36 (s, $J(^{117/119}Sn\text{-}^{1}H)$ = 10.3 Hz, 2H), 1.83 (s, 3H), 1.62 – 1.40 (m, 6H), 1.31 (h, *J* = 7.3 Hz, 6H), 0.91 (m, 14H).
^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 147.30, 127.89, 127.09, 126.64, 82.33, 51.70, 29.37, 27.54, 24.66, 13.88, 9.12.

HR-MS (ESI-TOF) m/z: calcd. for $C_{23}H_{33}OSn$ $[M–Bu–Me]^+$ 445.1553; found: 445.1546.

Tributyl((trityloxy)methyl)stannane (9h)



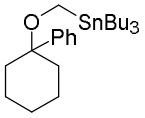
Prepared according to the general method from triphenylmethanol (2.60 g, 10.00 mmol), potassium hydride (35 % in oil, 2.29 g, 20.00 mmol), 18-crown-6 (3.96 g, 15.00 mmol), and tributyl(iodomethyl)-stannane (4.52 g, 10.50 mmol). Purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 4.12 g (73 %) of product as a colourless oil.

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.44 – 7.38 (m, 6H), 7.31 – 7.18 (m, 10H), 3.17 (s, $J(^{117/119}Sn\text{-}^1H)$ = 9.9 Hz, 2H), 1.61 – 1.38 (m, 7H), 1.35 – 1.22 (m, 7H), 1.04 – 0.81 (m, 17H).

^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 144.34, 129.15, 127.67, 126.84, 89.10, 53.35, 29.46, 29.36, 29.25, 27.54, 13.88, 9.17.

HR-MS (ESI-TOF) m/z: calcd. for $C_{28}H_{35}OSn$ $[M–Bu]^+$ 507.1710; found: 507.1730.

Tributyl(((1-phenylcyclohexyl)oxy)methyl)stannane (9i)



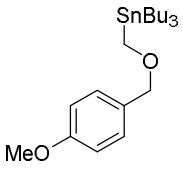
Prepared according to the general method from 1-phenylcyclohexanol (0.88 g, 5.00 mmol), potassium hydride (35 % in oil, 1.15 g, 10.00 mmol), 18-crown-6 (1.98 g, 7.50 mmol), and tributyl(iodomethyl)stannane (2.26 g, 5.25 mmol). Purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 2.06 g (86%) of product as a colourless oil.

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.49 – 7.16 (m, 5H), 3.20 (s, $J(^{117/119}Sn\text{-}^1H)$ = 10.5 Hz, 2H), 2.18 – 2.01 (m, 2H), 1.84 – 1.69 (m, 3H), 1.69 – 1.45 (m, 10H), 1.45 – 1.24 (m, 7H), 0.94 (m, 15H).

^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 146.91, 128.13, 126.67, 126.44, 78.67, 50.68, 35.26, 29.44, 27.60, 25.95, 22.13, 13.91, 9.09.

HR-MS (ESI-TOF) m/z: calcd. for $C_{21}H_{35}OSn$ $[M–Bu]^+$ 423.1710; found: 423.1708.

Tributyl(((4-methoxybenzyl)oxy)methyl)stannane (9j)



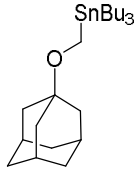
Prepared according to the general method from 4-methoxybenzyl alcohol (0.37 mL, 3.00 mmol), potassium hydride (35 % in oil, 0.69 g, 6.00 mmol), and tributyl(iodomethyl)stannane (1.36 g, 3.15 mmol). Purification by column chromatography on silica gel (eluent hexanes/EtOAc 10:1) afforded 1.10 g (83%) of product as a colourless oil.

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.31 – 7.17 (m, 2H), 6.95 – 6.80 (m, 2H), 4.34 (s, 2H, $J(^{117/119}Sn\text{-}^1H)$ = 7.1 Hz), 3.81 (s, 3H), 3.72 (s, 2H), 1.62 – 1.39 (m, 6H), 1.30 (h, J = 7.3 Hz, 6H), 1.01 – 0.79 (m, 15H).

^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 159.14, 131.19, 129.24, 113.75, 76.94, 61.26, 55.41, 29.30, 27.48, 13.87, 9.16.

HR-MS (ESI-TOF) m/z: calcd. for $C_{17}H_{29}O_2Sn$ $[M–Bu]^+$ 385.1190; found: 385.1177.

Adamantan-1-yl)oxy)methyl)tributylstannane (9k)



Prepared according to the general method from 1-adamantanol (1.52 g, 10.00 mmol), potassium hydride (35 % in oil, 2.29 g, 20.00 mmol), 18-crown-6 (3.96 g, 15.00 mmol), and tributyl-(iodomethyl)stannane (4.53 g, 10.50 mmol). Purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2| 9:1) afforded 1.86 g (41%) of product as a colourless oil.

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 3.57 (s, 2H), 2.17 – 2.07 (m, 3H), 1.68 (d, *J* = 3.0 Hz, 6H), 1.66 – 1.40 (m, 13H), 1.29 (m, 6H), 0.88 (m, 14H).

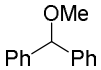
^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 72.78, 48.62, 41.04, 36.88, 30.78, 29.31, 27.43, 13.93, 9.10.

HR-MS (ESI-TOF) m/z: calcd. for $C_{19}H_{35}OSn$ $[M–Bu]^+$ 399.1710; found: 399.1709.

General procedure for electrochemical carbenium ion generation in the presence of methanol

Anodic oxidation was performed in a beaker–type undivided cell (40 mL) equipped with two carbon rod electrodes (Ø 6 mm, 2 cm) in 0.1 M $TBABF_4$/solvent system (10 mL). ((Benzhydryloxy)methyl)tributylstannane (**1c**) (293 mg, 0.6 mmol) was added to the solution. Constant current electrolysis (25 mA) was carried out at ambient temperature with magnetic stirring for approx. 3.5–4 h monitoring by TLC. After the electrolysis, the reaction mixture was concentrated in vacuum and analysed by qNMR using 1,4-bis-trichloromethylbenzene as internal standard. Diphenylmethyl methyl ether (**5**) and diphenylmethoxymethoxymethane (**6**) were obtained in different ratios depending on the solvent system.

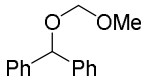
Diphenylmethyl methyl ether (5)



This compound has been reported in literature.[8]

^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.39 – 7.14 (m, 10H), 5.22 (s, 1H), 3.36 (s, 3H).

Diphenyl-methoxymethoxymethane (6)



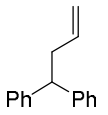
This compound has been reported in literature.[9]

^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.41 – 7.15 (m, 10H), 5.71 (s, 1H), 4.66 (s, 2H), 3.37 (s, 3H).

General procedure for electrochemical carbenium ion generation and *in situ* allylation

Anodic oxidation was performed in a beaker–type undivided cell (40 mL) equipped with two carbon rod electrodes (Ø 6 mm, 2 cm) in 0.1 M $TBABF_4$/dry CH_2Cl_2 (10 mL) solution with addition of HFIP (1.25 mL, 12.00 mmol). The tributylstannylmethyl ether (0.60 mmol) and allyltrimethylsilane (3.00 mmol) was added to the solution. Constant current electrolysis (25 mA) was carried out at ambient temperature with magnetic stirring for approx. 3.5–4 h monitoring by TLC. After the electrolysis, the reaction mixture was concentrated in vacuum and purified by column chromatography on silica gel.

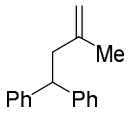
4,4'-Diphenyl-1-butene (8a)



Electrochemical oxidation of ((benzhydryloxy)methyl)tributylstannane (**1c**) (293 mg, 0.60 mmol) in the presence of allyltrimethylsilane (0.48 mL, 3.00 mmol) according to the general procedure and purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 109 mg (87%) of product as a colourless oil. This compound has been reported in literature.[10]

^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.40 – 7.13 (m, 10H), 5.76 (m, 1H), 5.15 – 4.94 (m, 2H), 4.05 (t, *J* = 7.9 Hz, 1H), 2.86 (ddt, *J* = 8.0, 6.7, 1.4 Hz, 2H).

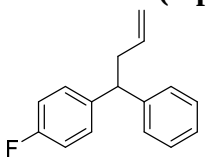
(3-methylbut-3-ene-1,1-diyl)dibenzene (8b)



Electrochemical oxidation of ((benzhydryloxy)methyl)tributylstannane (**1c**) (293 mg, 0.60 mmol) in the presence of methallyltrimethylsilane (0.51 mL, 3.00 mmol) according to the general procedure and purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 85 mg (64%) of product as a colourless oil. This compound has been reported in literature.[11]

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.35 – 7.10 (m, 10H), 4.70 (m, 1H), 4.64 – 4.57 (m, 1H), 4.18 (t, *J* = 7.9 Hz, 1H), 2.79 (d, *J* = 7.9 Hz, 2H), 1.69 (s, 3H).

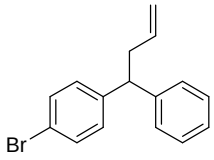
1-Fluoro-4-(1-phenylbut-3-en-1-yl)benzene (10a)



Electrochemical oxidation of tributyl(((4-fluorophenyl)(phenyl) methoxy)methyl)stannane (**9a**) (306 mg, 0.60 mmol) in the presence of allyltrimethylsilane (0.48 mL, 3.00 mmol) according to the general procedure and purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 102 mg (74%) of product as a colourless oil. This compound has been reported in literature.[12]

^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.35 – 7.14 (m, 8H (including $CDCl_3$)), 7.03 – 6.91 (m, 2H), 5.71 (m, 1H), 5.11 – 4.91 (m, 2H), 4.01 (t, *J* = 7.9 Hz, 1H), 2.80 (m, 2H).

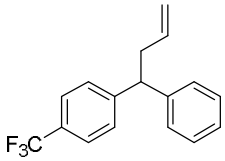
1-Bromo-4-(1-phenylbut-3-en-1-yl)benzene (10b)



Electrochemical oxidation of (((4-bromophenyl)(phenyl)methoxy) methyl)tributylstannane (**9b**) (342 mg, 0.60 mmol) in the presence of allyltrimethylsilane (0.48 mL, 3.00 mmol) according to the general procedure and purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 136 mg (79%) of product as a colourless oil. This compound has been reported in literature.[12]

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.47 – 7.39 (m, 2H), 7.36 – 7.28 (m, 2H), 7.27 – 7.18 (m, 3H), 7.17 – 7.07 (m, 2H), 5.73 (m, 1H), 5.13 – 4.95 (m, 2H), 4.01 (t, *J* = 7.9 Hz, 1H), 2.91 – 2.73 (m, 2H).

1-(1-Phenylbut-3-en-1-yl)-4-(trifluoromethyl)benzene (10c)

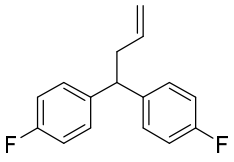


Electrochemical oxidation of tributyl((phenyl(4-(trifluoromethyl) phenyl)methoxy)methyl)stannane (**9c**) (255 mg, 0.60 mmol) in the presence of allyltrimethylsilane (0.48 mL, 3.00 mmol) according to the general procedure and purification by column chromatography

on silica gel (eluent hexanes/CH_2Cl_2 2:1) afforded 126 mg (76%) of product as a yellow oil. This compound has been reported in literature.[13]

^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.56 (d, *J* = 8.1 Hz, 2H), 7.44 – 7.15 (m, 8H (including $CDCl_3$)), 5.73 (m, 1H), 5.17 – 4.91 (m, 2H), 4.10 (t, *J* = 7.9 Hz, 1H), 2.86 (m, 2H), 1.04 – 0.82 (m, 1H).

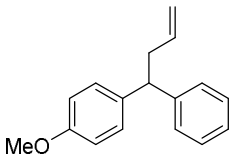
4,4'-(But-3-ene-1,1-diyl)bis(fluorobenzene) (10d)



Electrochemical oxidation of tributyl(((4-fluorophenyl)(phenyl) methoxy)methyl)stannane (**9d**) (313 mg, 0.60 mmol) in the presence of allyltrimethylsilane (0.48 mL, 3.00 mmol) according to the general procedure and purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 118 mg (81%) of product as a colourless oil. This compound has been reported in literature.[14]

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.22 – 7.13 (m, 4H), 7.02 – 6.93 (m, 4H), 5.69 (m, 1H), 5.08 – 4.94 (m, 2H), 3.99 (t, *J* = 7.9 Hz, 1H), 2.81 – 2.71 (m, 2H).

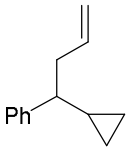
1-Methoxy-4-(1-phenylbut-3-en-1-yl)benzene (10e)



Electrochemical oxidation of tributyl(((4-methoxyphenyl)(phenyl) methoxy)methyl)stannane (**9e**) (215 mg, 0.42 mmol) in the presence of allyltrimethylsilane (0.33 mL, 2.08 mmol) according to the general procedure and purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 71 mg (72%) of product as a light yellow oil that crystallizes upon standing. This compound has been reported in literature.[14]

^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.33 – 7.10 (m, 8H (including $CDCl_3$)), 6.88 – 6.79 (m, 2H), 5.72 (m, 1H), 5.10 – 4.89 (m, 2H), 3.97 (t, *J* = 7.9 Hz, 1H), 3.77 (s, 3H), 2.79 (m, 2H).

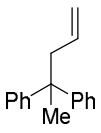
(1-Cyclopropylbut-3-en-1-yl)benzene (10f)



Electrochemical oxidation of tributyl((cyclopropyl(phenyl)methoxy) methyl)stannane (**9f**) (271 mg, 0.60 mmol) in the presence of allyltrimethylsilane (0.48 mL, 3.00 mmol) according to the general procedure and purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 9:1) afforded 94 mg (91%) of product as a colourless oil. This compound has been reported in literature.[15]

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.30 (dd, *J* = 8.1, 6.9 Hz, 2H), 7.24 – 7.16 (m, 3H), 5.74 (m, 1H), 5.04 – 4.86 (m, 2H), 2.61 – 2.45 (m, 2H), 1.90 (ddd, *J* = 9.5, 8.1, 6.3 Hz, 1H), 1.01 (m, 1H), 0.61 (m, 1H), 0.48 – 0.33 (m, 1H), 0.24 (m, 1H), 0.09 (m, 1H).

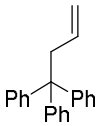
Pent-4-ene-2,2-diyldibenzene (10g)



Electrochemical oxidation of tributyl((1,1-diphenylethoxy)methyl)stannane (**9g**) (275 mg, 0.60 mmol) in the presence of allyltrimethylsilane (0.48 mL, 3.00 mmol) according to the general procedure and purification by column

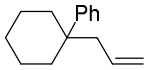
chromatography on silica gel (eluent hexanes/CH_2Cl_2 5:1) afforded 34 mg (26%) of product as a yellow oil. This compound has been reported in literature.[16]
^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.33 – 7.08 (m, 12H (including $CDCl_3$)), 5.47 (m, 1H), 5.12 – 4.88 (m, 2H), 2.94 – 2.84 (m, 2H), 1.62 (s, 3H).
1,1-Diphenylethylene (**19**) was isolated as a side product in the electrochemical oxidation of tributyl((1,1-diphenylethoxy)methyl)stannane (**9g**). Obtained as a colourless oil (22 mg, 20%). This compound has been reported in literature. [17]
^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.40 – 7.29 (m, 10H), 5.47 (s, 2H).

But-3-ene-1,1,1-triyltribenzene (10h)



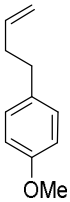
Electrochemical oxidation of tributyl((trityloxy)methyl)stannane (**9h**) (338 mg, 0.60 mmol) in the presence of allyltrimethylsilane (0.48 mL, 3.00 mmol) according to the general procedure gave an inseparable mixture of but-3-ene-1,1,1-triyltribenzene and triphenylmethane in ratio 2.5:1. Yield of but-3-ene-1,1,1-triyltribenzene (42%) and triphenylmethane (17%) was estimated by qNMR using 1,4-bis-trichloromethylbenzene as an internal standard.
But-3-ene-1,1,1-triyltribenzene (**10h**)[18] and triphenylmethane[19] have been reported in literature.

(1-Allylcyclohexyl)benzene (10i)



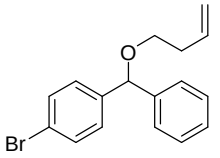
Electrochemical oxidation of tributyl(((1-phenylcyclohexyl)oxy)methyl) stannane (**9i**) (288 mg, 0.60 mmol) in the presence of allyltrimethylsilane (0.48 mL, 3.00 mmol) according to the general procedure and purification by column chromatography on silica gel (eluent hexanes/EtOAc 99:1) afforded 90 mg (75%) of product as a colourless oil. This compound has been reported in literature.[20]
^{1}H NMR (300 MHz, $CDCl_3$, ppm) δ 7.32 (d, *J* = 4.2 Hz, 4H), 7.23 – 7.12 (m, 1H), 5.40 (m, 1H), 4.90 (m, 1H), 4.88 – 4.82 (m, 1H), 2.27 (m, 2H), 2.08 (m, 2H), 1.68 – 1.30 (m, 9H (including water)).

1-(But-3-en-1-yl)-4-methoxybenzene (10j)



Electrochemical oxidation of tributyl(((4-methoxybenzyl)oxy)methyl)stannane (**9j**) (255 mg, 0.60 mmol) in the presence of allyltrimethylsilane (0.48 mL, 3.00 mmol) according to the general procedure and purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 2:1) afforded 13 mg (14%) of product as a yellow oil. This compound has been reported in literature.[21]
^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.16 – 7.08 (m, 2H), 6.88 – 6.81 (m, 2H), 5.86 (m, 1H), 5.09 – 4.95 (m, 2H), 3.80 (s, 3H), 2.66 (dd, *J* = 8.9, 6.7 Hz, 2H), 2.35 (m, 2H).

1-Bromo-4-((but-3-en-1-yloxy)(phenyl)methyl)benzene (11)



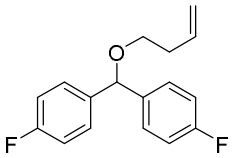
Isolated as a side product in the electrochemical oxidation of (((4-bromophenyl)(phenyl)methoxy)methyl)tributylstannane (**9b**). Obtained as a light yellow oil (10 mg, 6%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.50 – 7.41 (m, 2H), 7.33 (s, 2H), 7.43 – 7.25 (m, 2H), 7.29 – 7.19 (m, 2H), 5.87 (m, 1H), 5.32 (s, 1H), 5.16 – 5.01 (m, 1H), 3.51 (m, 2H), 2.42 (m, 2H).

^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 141.98, 141.71, 135.37, 131.58, 128.77, 128.61, 127.77, 127.06, 121.39, 116.58, 83.11, 68.65, 34.45.

Unstable under the conditions of HR-MS.

4,4'-((But-3-en-1-yloxy)methylene)bis(fluorobenzene) (12)



Isolated as a side product in the electrochemical oxidation of ((bis(4-fluorophenyl)methoxy)methyl)tributylstannane (**9d**). Obtained as a yellow oil (10 mg, 6%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 7.32 – 7.22 (m, 5H), 7.04 – 6.94 (m, 5H), 5.83 (m, 1H), 5.29 (s, 1H), 5.12 – 4.98 (m, 2H), 3.46 (t, *J* = 6.7 Hz, 2H), 2.38 (m, 2H).

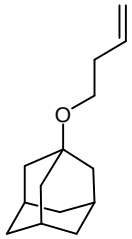
^{19}F NMR (376 MHz, $CDCl_3$, ppm) δ -115.15.

^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 200.39, 163.52, 161.07, 138.17, 138.14, 135.34, 128.72, 128.70, 128.64, 116.62, 115.52, 115.30, 82.39, 68.59, 34.43.

Unstable under the conditions of HRMS.

GC-MS (m/z) = 274.1 ([M^+], 9.2), 203.0 ([M-C_4H_7O•]$^+$, 100).

1-(But-3-en-1-yloxy)adamantane (13)



Electrochemical oxidation of adamantan-1-yl)oxy)methyl)tributylstannane (**9k**) (275 mg, 0.60 mmol) in the presence of allyltrimethylsilane (0.48 mL, 3.00 mmol) according to the general procedure and purification by column chromatography on silica gel (eluent hexanes/CH_2Cl_2 5:1) afforded 55 mg (44%) of product as a yellow oil.

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ 5.83 (m, 1H), 5.15 – 4.94 (m, 2H), 3.45 (t, *J* = 7.0 Hz, 2H), 2.33 – 2.23 (m, 2H), 2.18 – 2.10 (m, 3H), 1.74 (d, *J* = 3.0 Hz, 7H), 1.61 (m, 8H).

^{13}C NMR (101 MHz, $CDCl_3$, ppm) δ 135.89, 116.05, 72.09, 59.49, 41.73, 36.67, 35.40, 30.66.

Unstable under the conditions of HR-MS.

General procedure for the control experiments

The tributylstannylmethyl group bearing substrate (0.10 mmol) and allyltrimethylsilane (0.50 mmol) were dissolved in 0.1 M $TBABF_4$/dry CH_2Cl_2 (1.8 mL) solution with addition of HFIP (0.21 mL, 2.00 mmol). The solution was stirred for 18 h (substrates **8a**, **10a**, **10f**) or 72 h (substrate **10h**). The reaction mixture was concentrated in vacuum and analysed by qNMR using 1,4-bis-trichloromethylbenzene as an internal standard.

References

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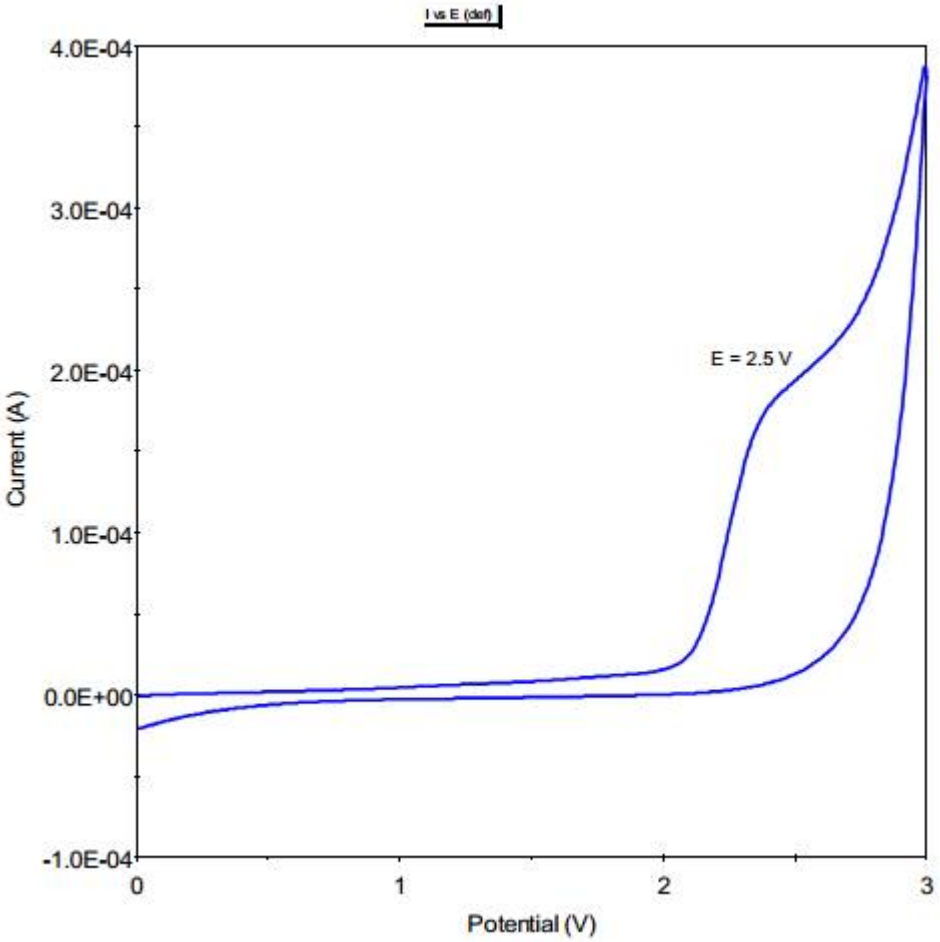
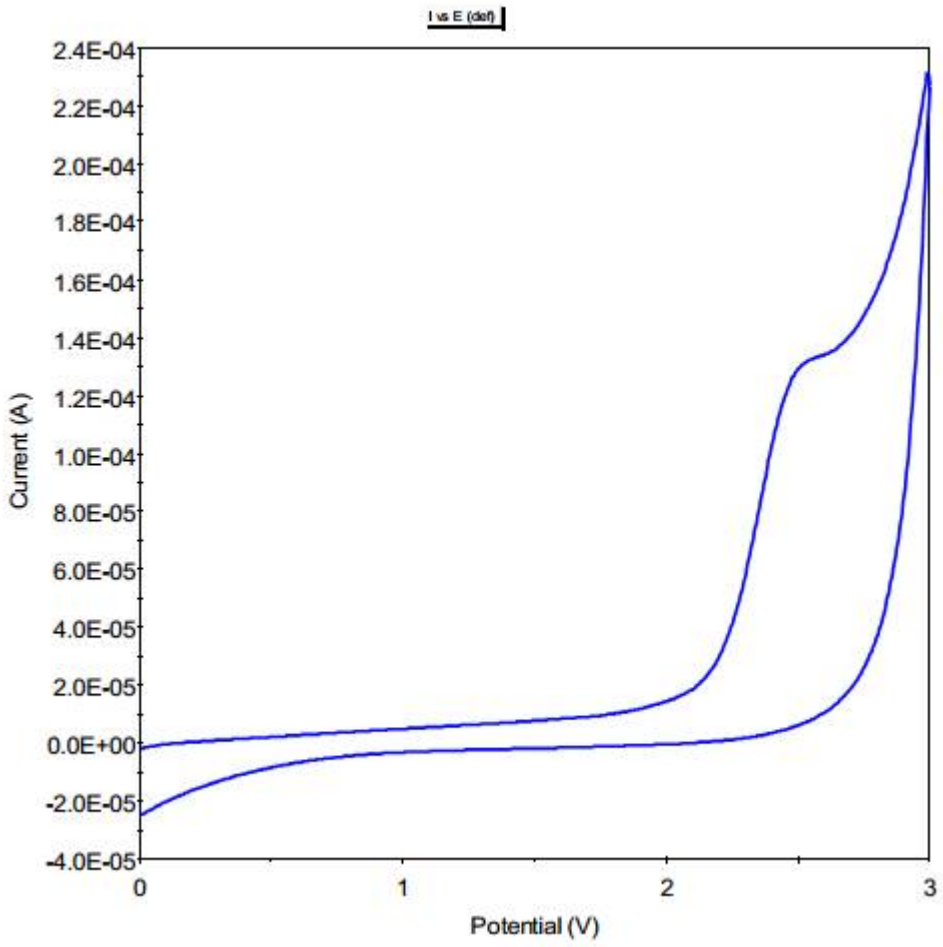
Cyclic voltammetry

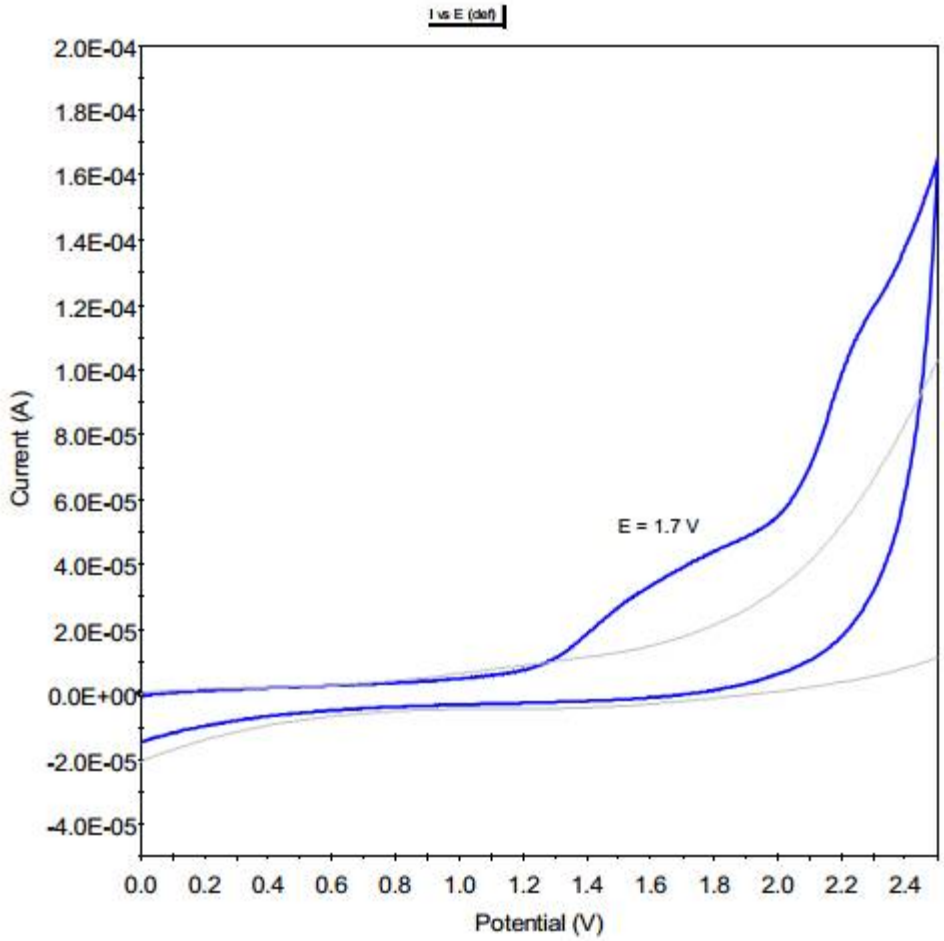
Cyclic voltammogram of 2-(benzhydryloxy)acetic acid (1a)



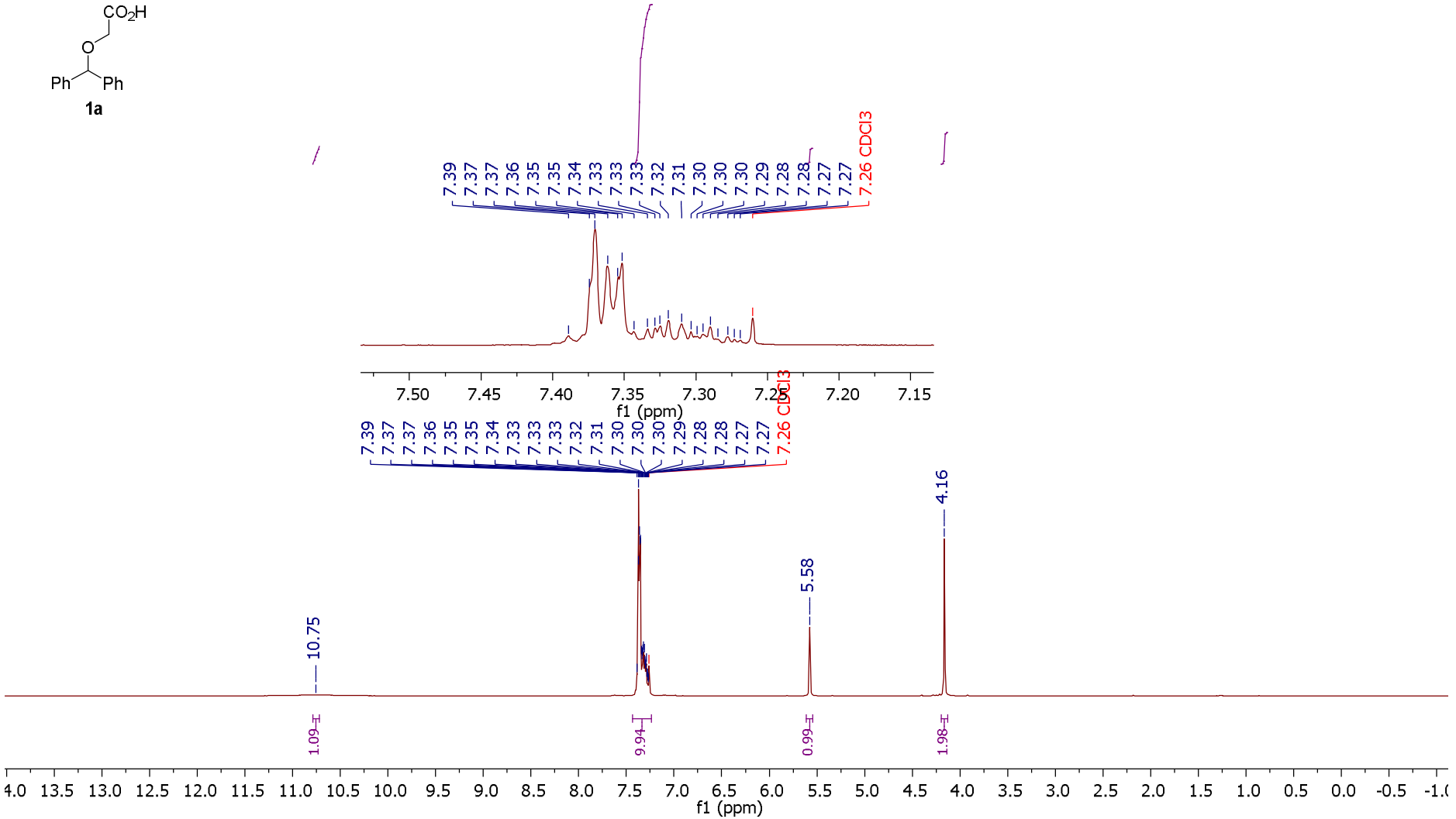
Cyclic voltammogram of((benzhydryloxy)methyl)trimethylsilane (1b)

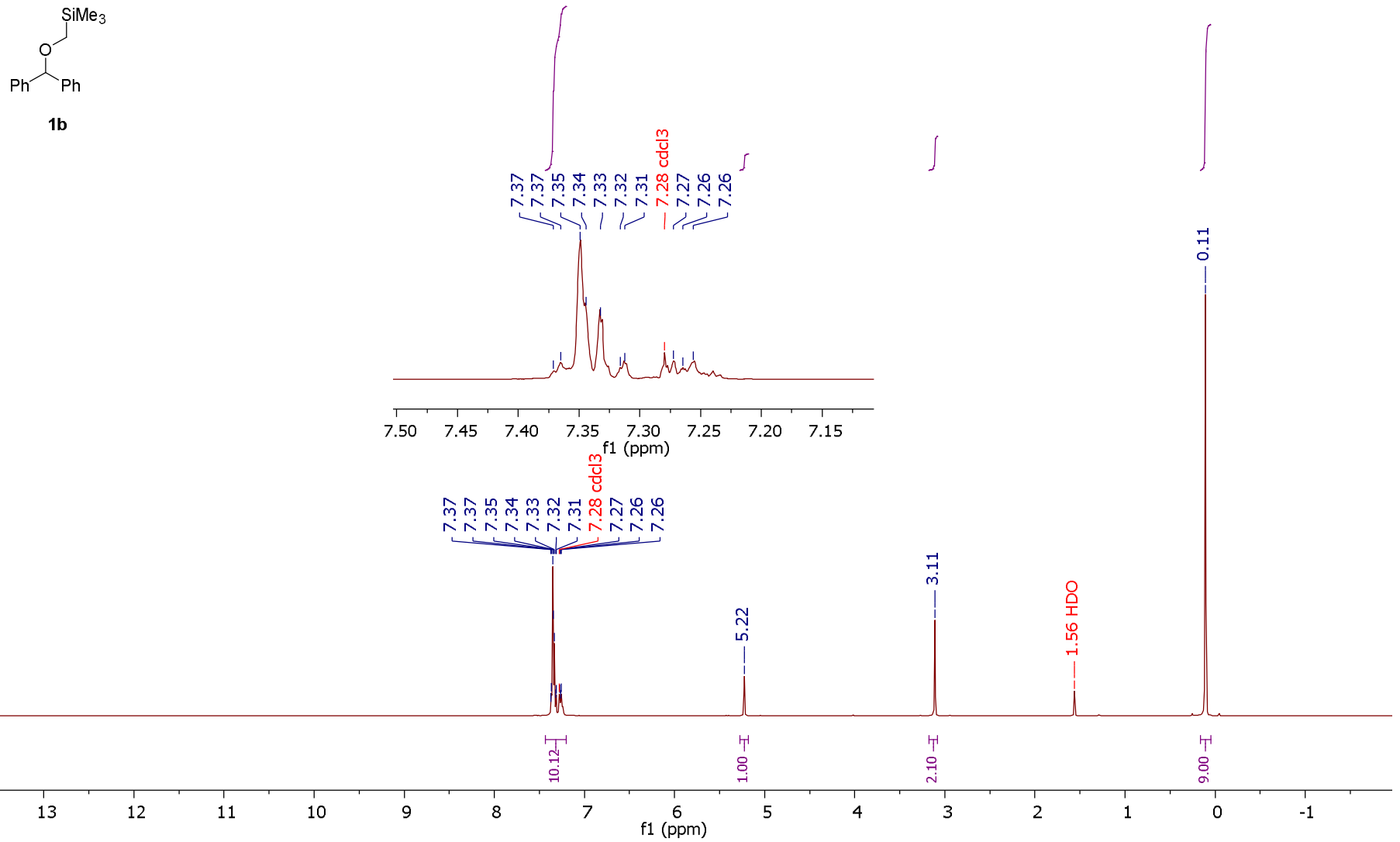


Cyclic voltammogram of ((benzhydryloxy)methyl)tributylstannane (1c)



NMR data


CO2H
O
Ph
Ph
1a
7.39 7.37 7.37 7.36 7.35 7.35 7.34 7.33 7.33 7.33 7.32 7.31 7.30 7.30 7.30 7.29 7.28 7.28 7.27 7.27 7.26 CDCl3
7.50 7.45 7.40 7.35 7.30 7.25 7.20 7.15
f1 (ppm)
10.75
5.58
4.16
1.09
9.94
0.99
1.98
f1 (ppm)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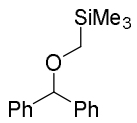
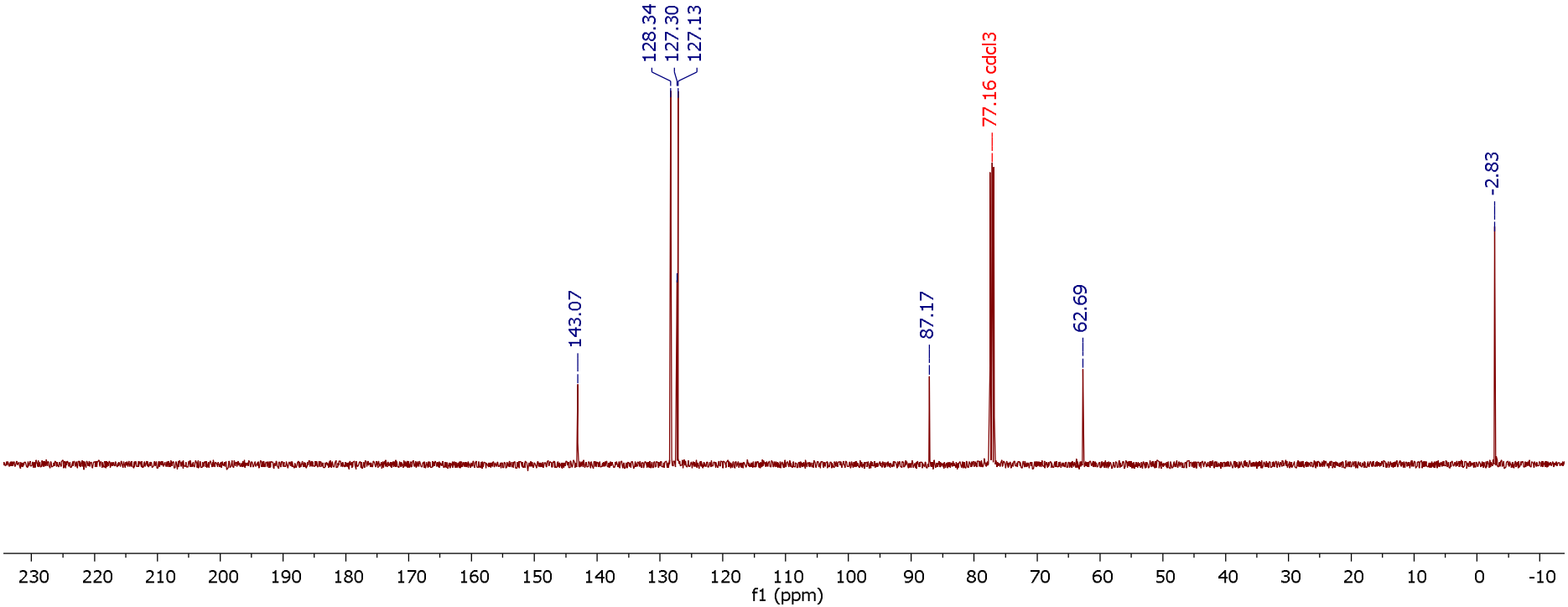
O
Ph
Ph
1b
7.37
7.37
7.35
7.34
7.33
7.32
7.31
7.28 cdcl3
7.27
7.26
7.26
7.50 7.45 7.40 7.35 7.30 7.25 7.20 7.15
f1 (ppm)
0.11
3.11
5.22
1.56 HDO
10.12
1.00
2.10
9.00
14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 -1
f1 (ppm)


SiMe3
O
Ph
Ph

1b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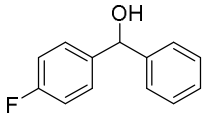
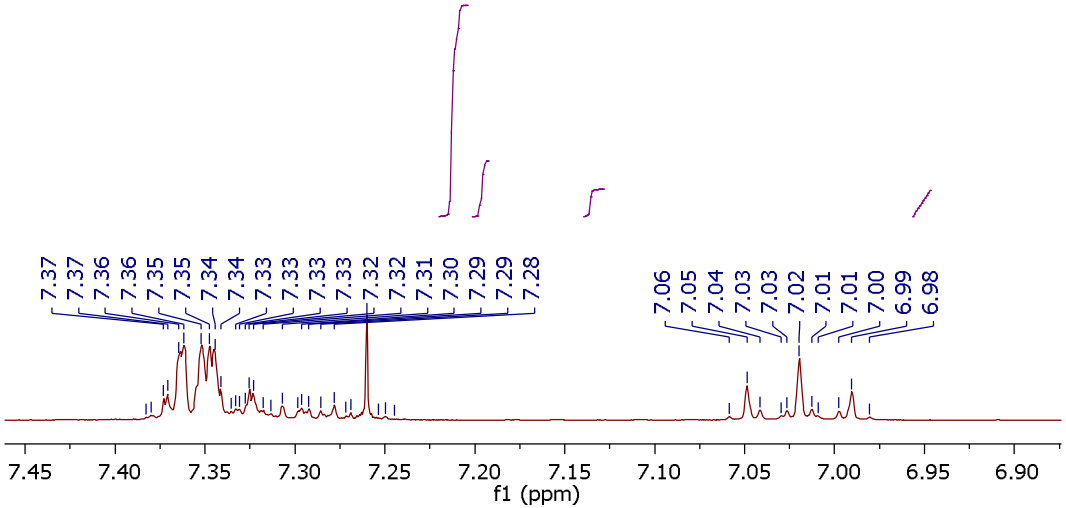
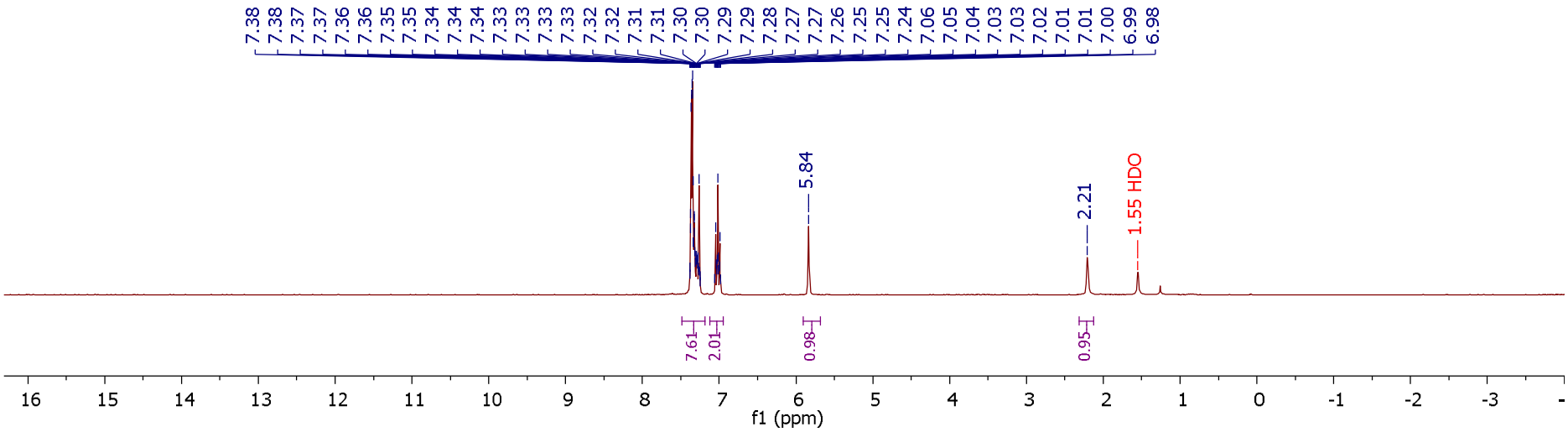
127.30
127.13
77.16 cdcl3
143.07
87.17
62.69
-2.83
230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)


OH
F

17a


7.37 7.37 7.36 7.36 7.35 7.35 7.34 7.34 7.33 7.33 7.33 7.33 7.32 7.32 7.31 7.30 7.29 7.29 7.28
7.06 7.05 7.04 7.03 7.03 7.02 7.01 7.01 7.00 6.99 6.98
7.45 7.40 7.35 7.30 7.25 7.20 7.15 7.10 7.05 7.00 6.95 6.90
f1 (ppm)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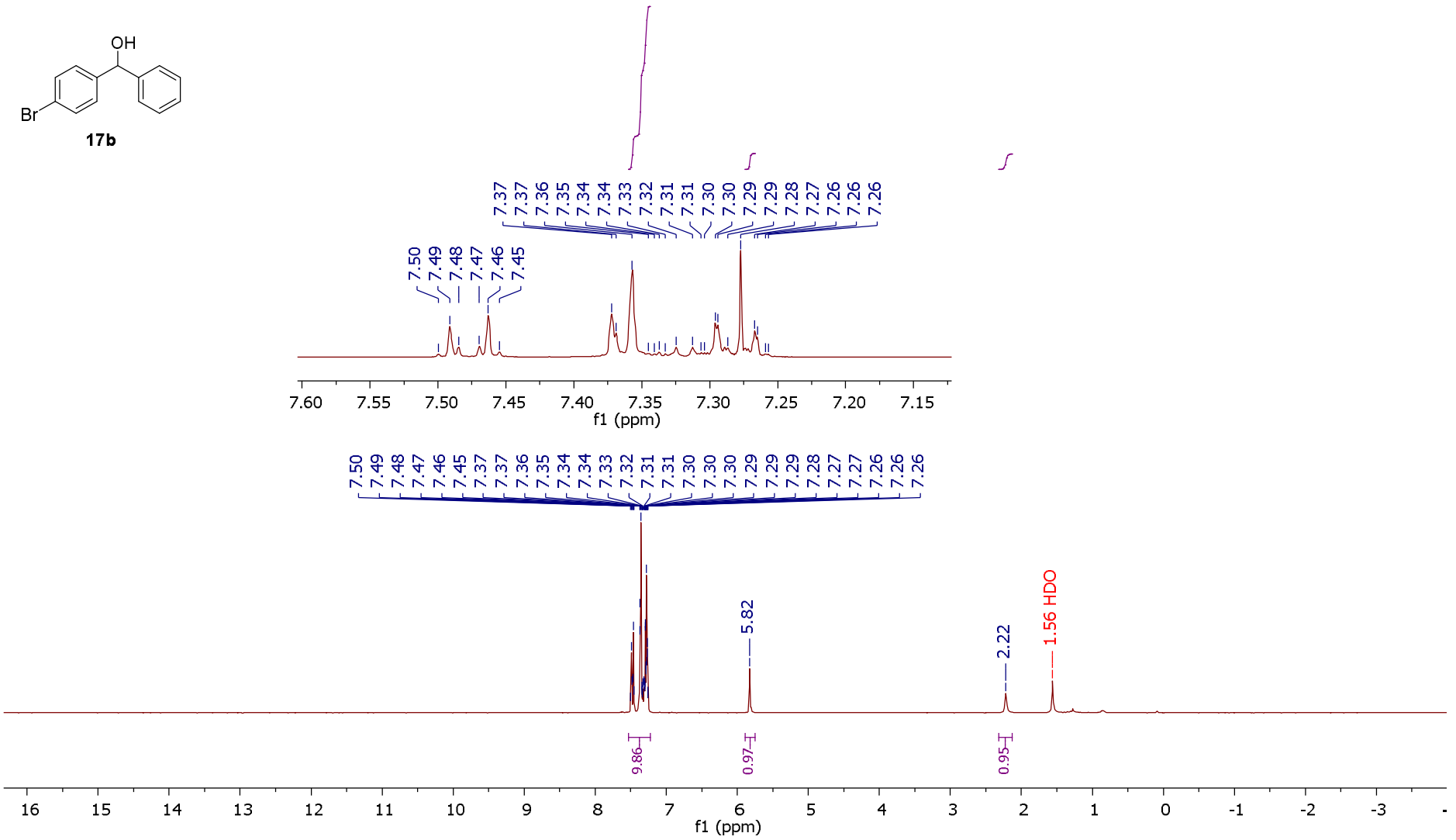
5.84
2.21
1.55 HDO
7.61
2.01
0.98
0.95
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 -1 -2 -3
f1 (ppm)


OH
Br
17b
7.37 7.37 7.36 7.35 7.34 7.34 7.33 7.32 7.31 7.31 7.30 7.30 7.29 7.28 7.27 7.26 7.26 7.26
7.50 7.49 7.48 7.47 7.46 7.45
7.60 7.55 7.50 7.45 7.40 7.35 7.30 7.25 7.20 7.15
f1 (ppm)
7.50 7.49 7.48 7.47 7.46 7.45 7.37 7.37 7.36 7.35 7.34 7.34 7.33 7.32 7.31 7.31 7.30 7.30 7.30 7.29 7.29 7.29 7.28 7.27 7.27 7.26 7.26 7.26
5.82
2.22
1.56 HDO
9.86
0.97
0.95
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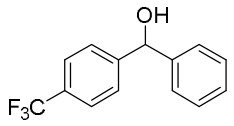
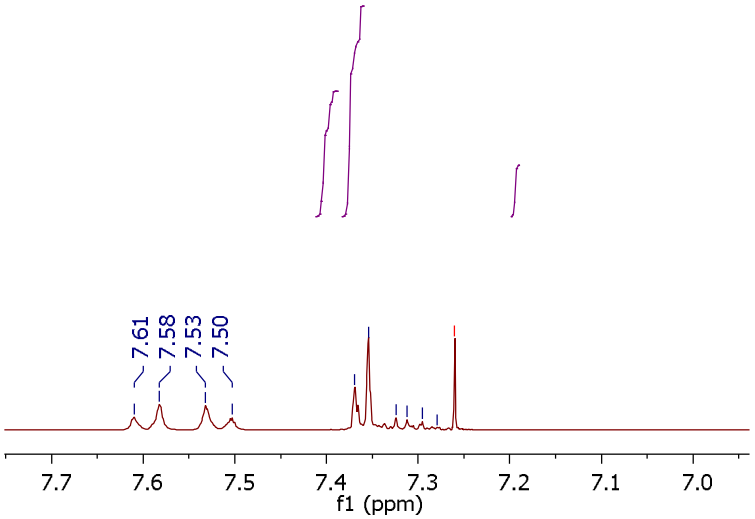
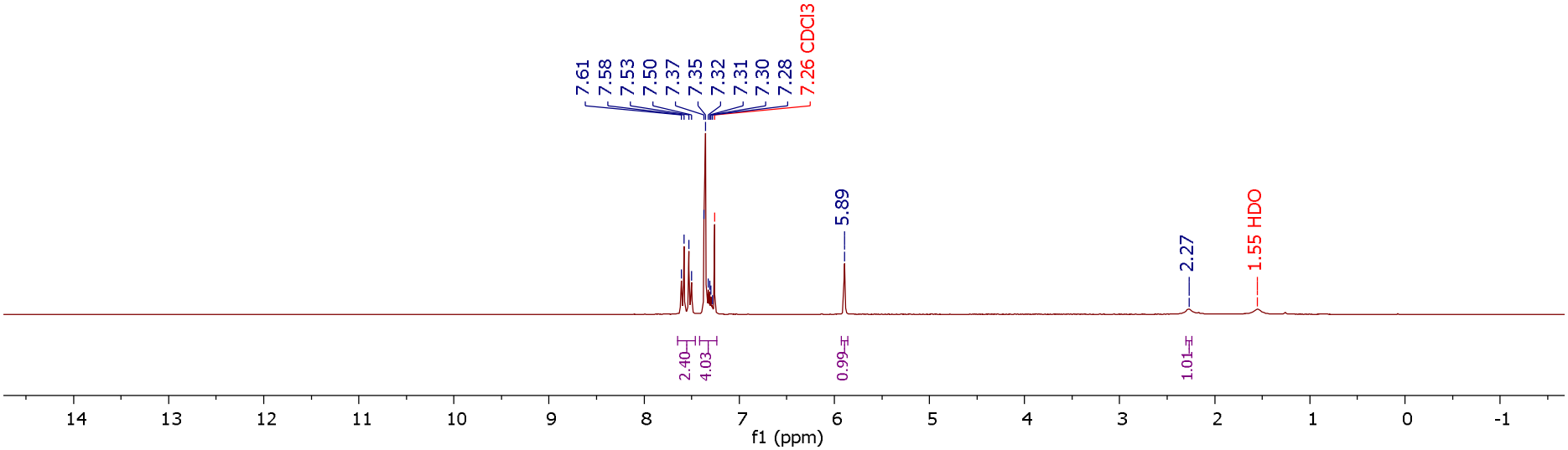
f1 (ppm)


OH
F3C

17c


7.61
7.58
7.53
7.50
7.7
7.6
7.5
7.4
7.3
7.2
7.1
7.0
f1 (ppm)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7.53
7.50
7.37
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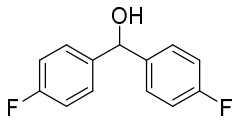
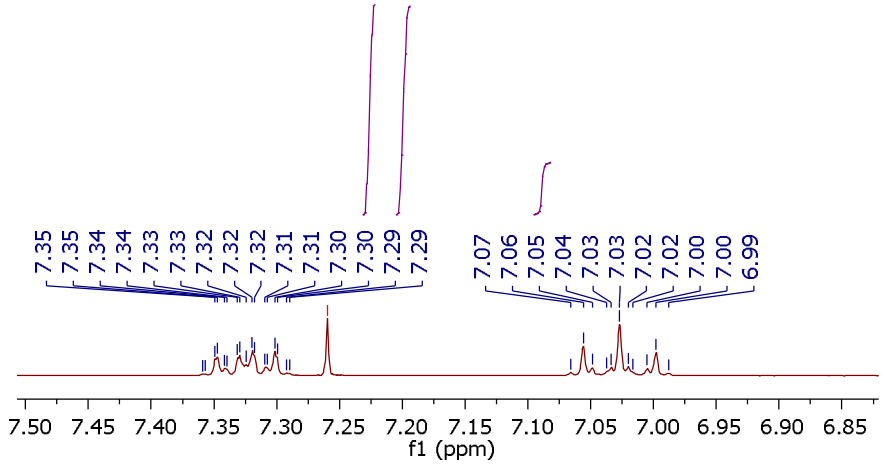
7.31
7.30
7.28
7.26 CDCl3
5.89
2.27
1.55 HDO
2.40
4.03
0.99
1.01
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
f1 (ppm)


OH
F
F

17d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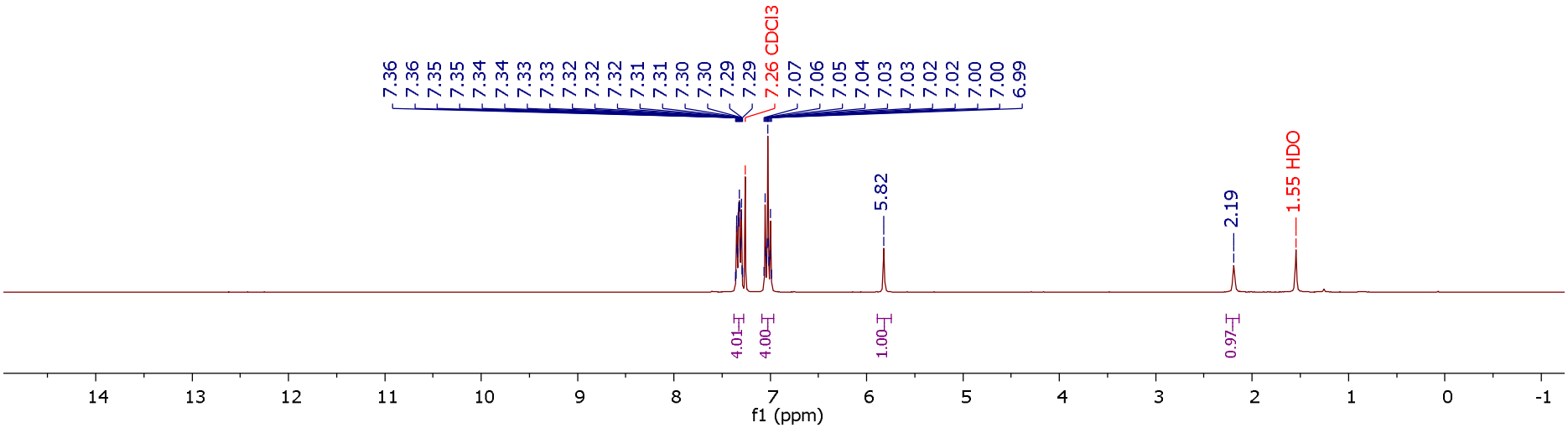
7.07 7.06 7.05 7.04 7.03 7.03 7.02 7.02 7.00 7.00 6.99
7.50 7.45 7.40 7.35 7.30 7.25 7.20 7.15 7.10 7.05 7.00 6.95 6.90 6.85
f1 (ppm)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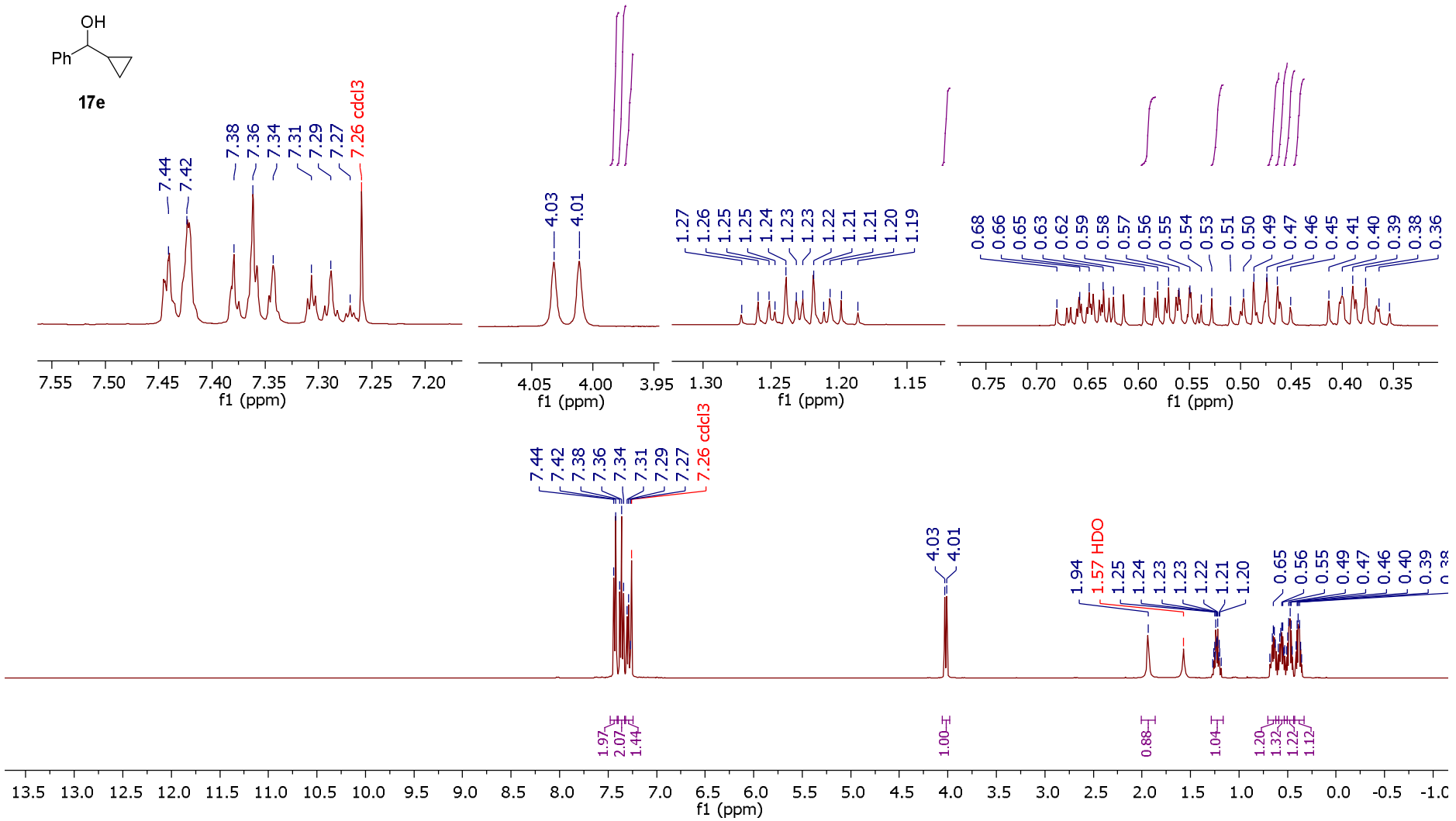
7.26 CDCl3
7.07 7.06 7.05 7.04 7.03 7.03 7.02 7.02 7.00 7.00 6.99
5.82
2.19
1.55 HDO
4.01
4.00
1.00
0.97
14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 -1
f1 (ppm)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Ph
17e
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7.42
7.38
7.36
7.34
7.31
7.29
7.27
7.26 cdcl3
4.03
4.01
1.27
1.26
1.25
1.25
1.24
1.23
1.23
1.22
1.21
1.21
1.20
1.19
0.68
0.66
0.65
0.63
0.62
0.59
0.58
0.57
0.56
0.55
0.54
0.53
0.51
0.50
0.49
0.47
0.46
0.45
0.41
0.40
0.39
0.38
0.36
f1 (ppm)
1.94
1.57 HDO
1.25
1.24
1.23
1.23
1.22
1.21
1.20
0.65
0.56
0.55
0.49
0.47
0.46
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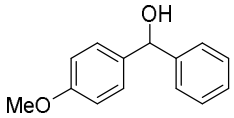
1.22
1.12


OH
MeO

17f

7.37
7.37
7.37
7.36
7.36
7.34
7.34
7.33
7.31
7.31
7.30
7.30
7.30
7.28
7.27
7.27
7.26 CDCl3
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6.88
6.88
6.87
6.86
6.85
6.84
6.84
7.6
7.5
7.4
7.3
7.2
7.1
7.0
6.9
6.8
6.7
6.6
6.5
f1 (ppm)
7.40
7.40
7.39
7.39
7.39
7.38
7.38
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7.37
7.37
7.36
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7.30
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7.28
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7.27
7.27
7.26 CDCl3
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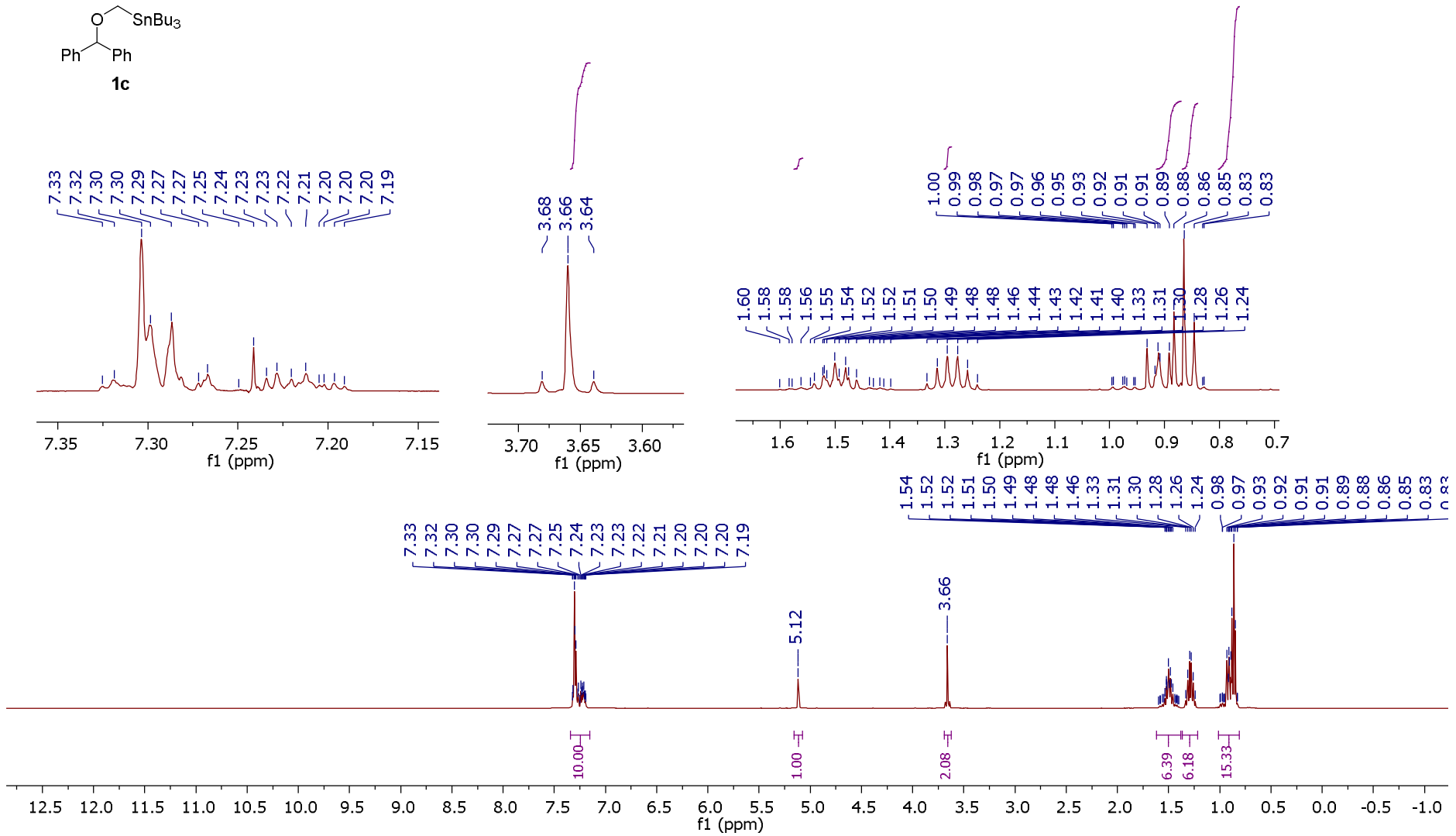
6.88
6.86
6.85
5.82
5.81
3.79
2.16
2.15
2.14
1.55 HDO
6.18
1.99
0.99
2.92
0.91
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
f1 (ppm)


O
SnBu3
Ph
Ph
1c
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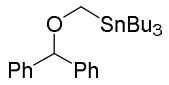
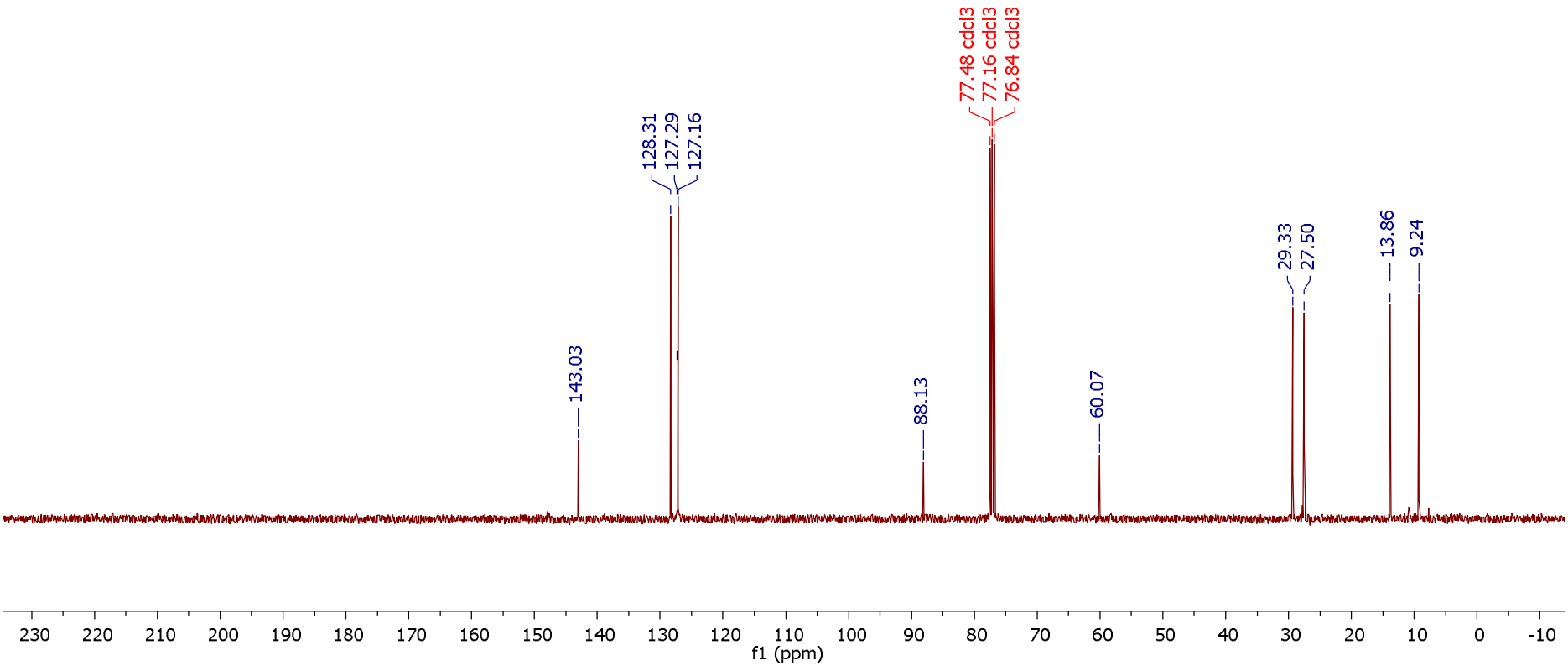
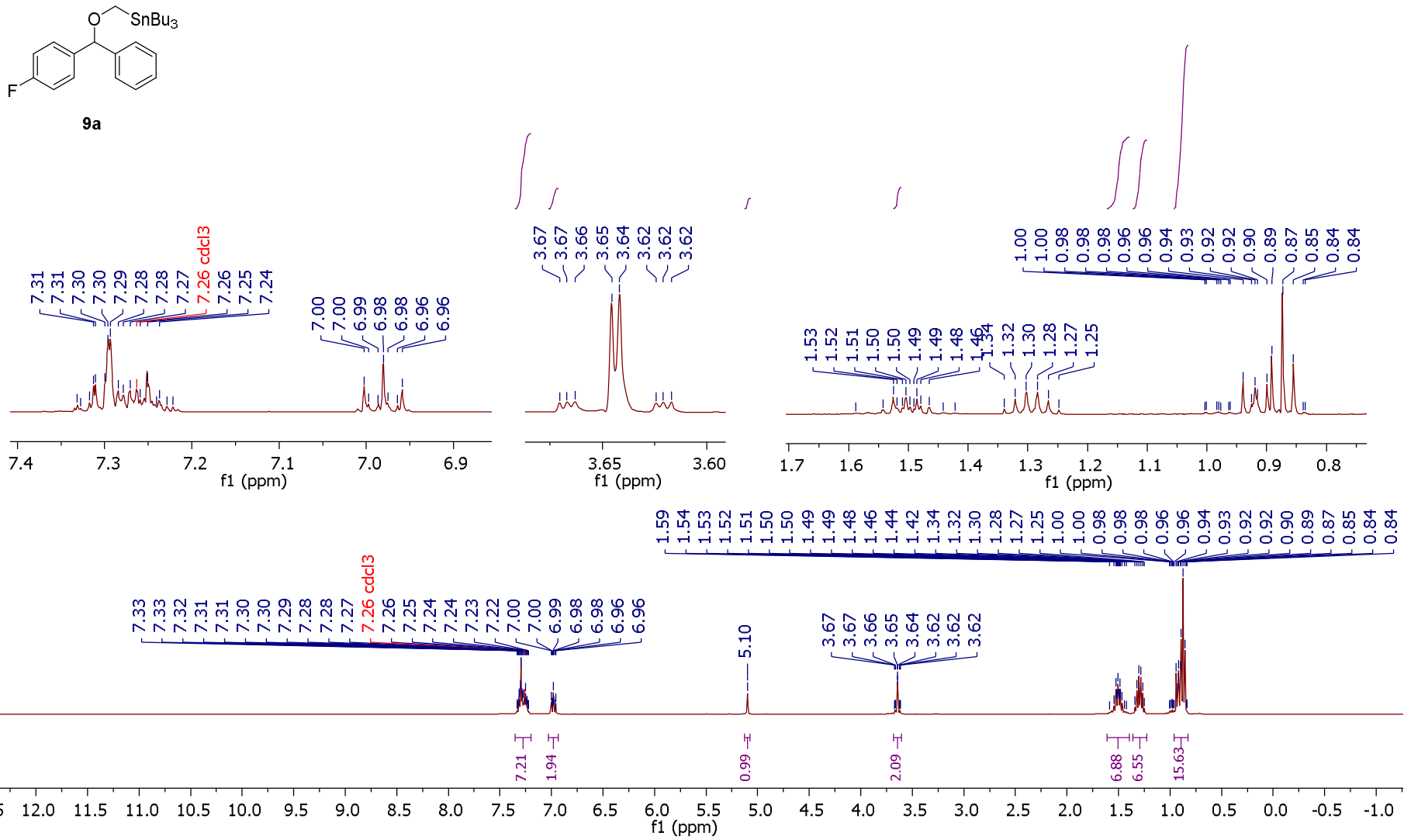
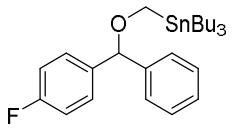
7.35 7.30 7.25 7.20 7.15
f1 (ppm)
3.68 3.66 3.64
3.70 3.65 3.60
f1 (ppm)
1.00 0.99 0.98 0.97 0.97 0.96 0.95 0.93 0.92 0.91 0.91 0.89 0.88 0.86 0.85 0.83 0.83
1.60 1.58 1.58 1.56 1.55 1.54 1.52 1.52 1.51 1.50 1.49 1.48 1.48 1.46 1.44 1.43 1.42 1.41 1.40 1.33 1.31 1.30 1.28 1.26 1.24
1.6 1.5 1.4 1.3 1.2 1.1 1.0 0.9 0.8 0.7
f1 (ppm)
1.54 1.52 1.52 1.51 1.50 1.49 1.48 1.48 1.46 1.33 1.31 1.30 1.28 1.26 1.24 0.98 0.97 0.93 0.92 0.91 0.91 0.89 0.88 0.86 0.85 0.83
7.33 7.32 7.30 7.30 7.29 7.27 7.27 7.25 7.24 7.23 7.23 7.22 7.21 7.20 7.20 7.20 7.19
5.12
3.66
10.00
1.00
2.08
6.39
6.18
15.33
12.5 12.0 11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)


O
SnBu3
Ph
Ph

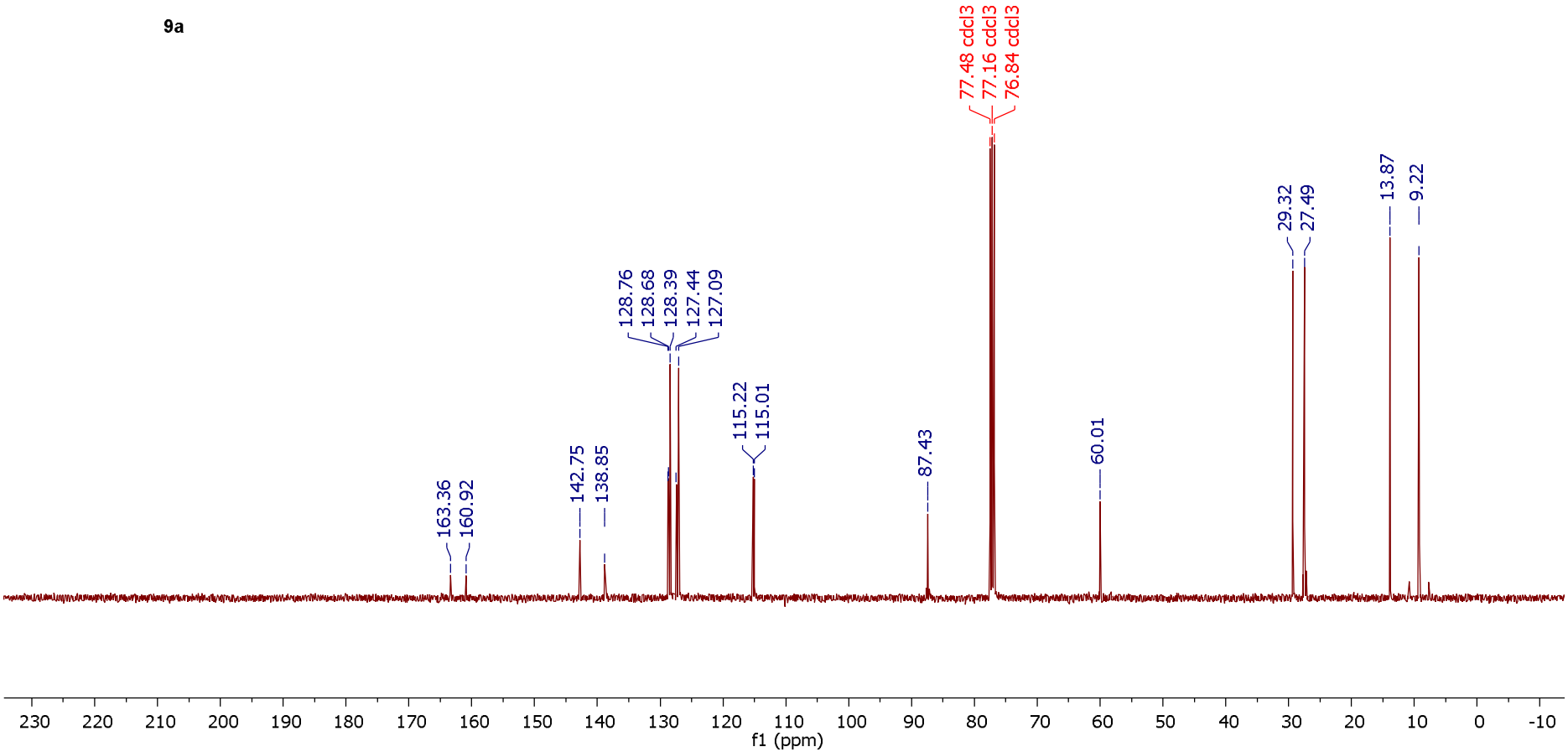
1c

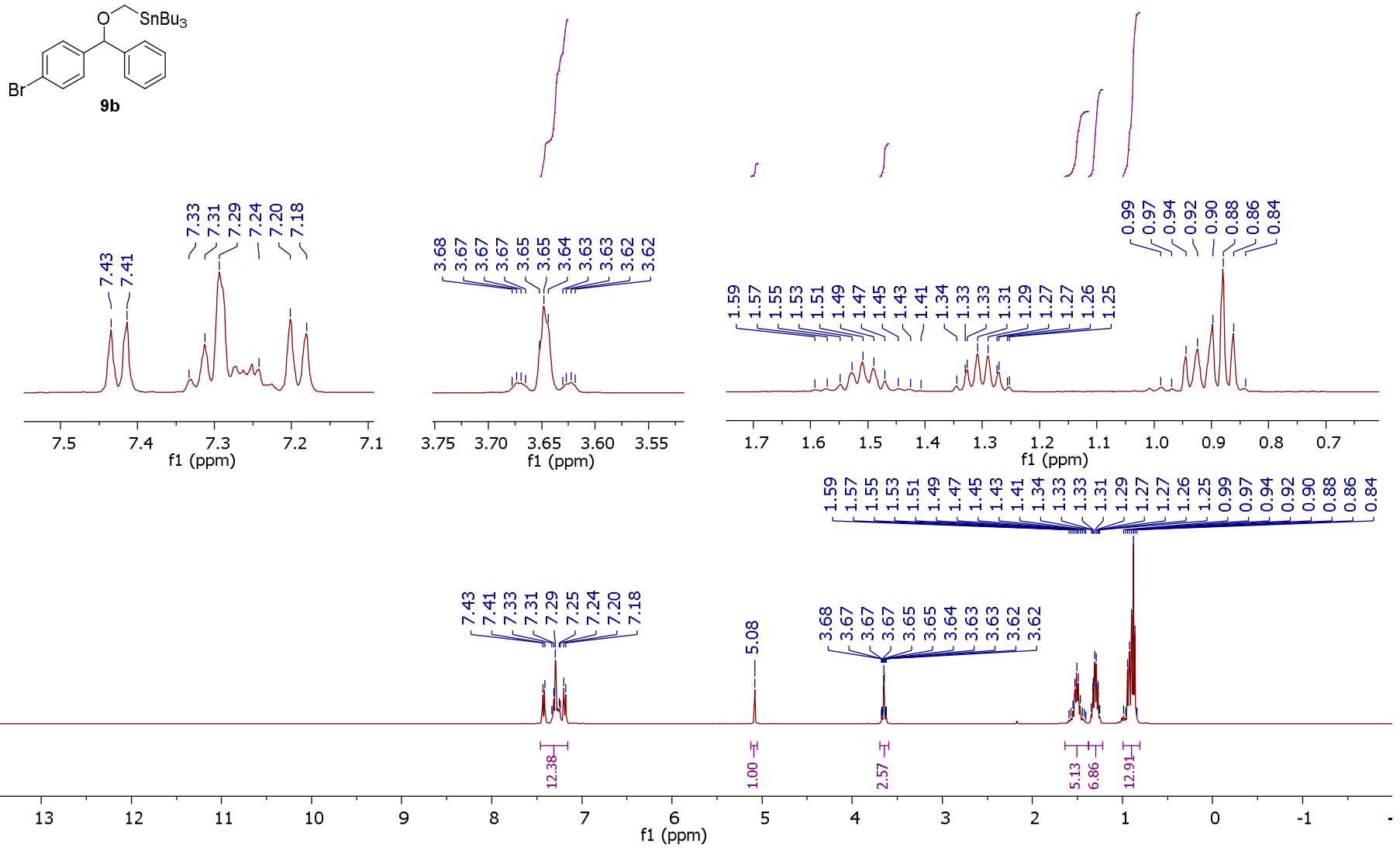

143.03
128.31
127.29
127.16
88.13
77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
60.07
29.33
27.50
13.86
9.24
230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

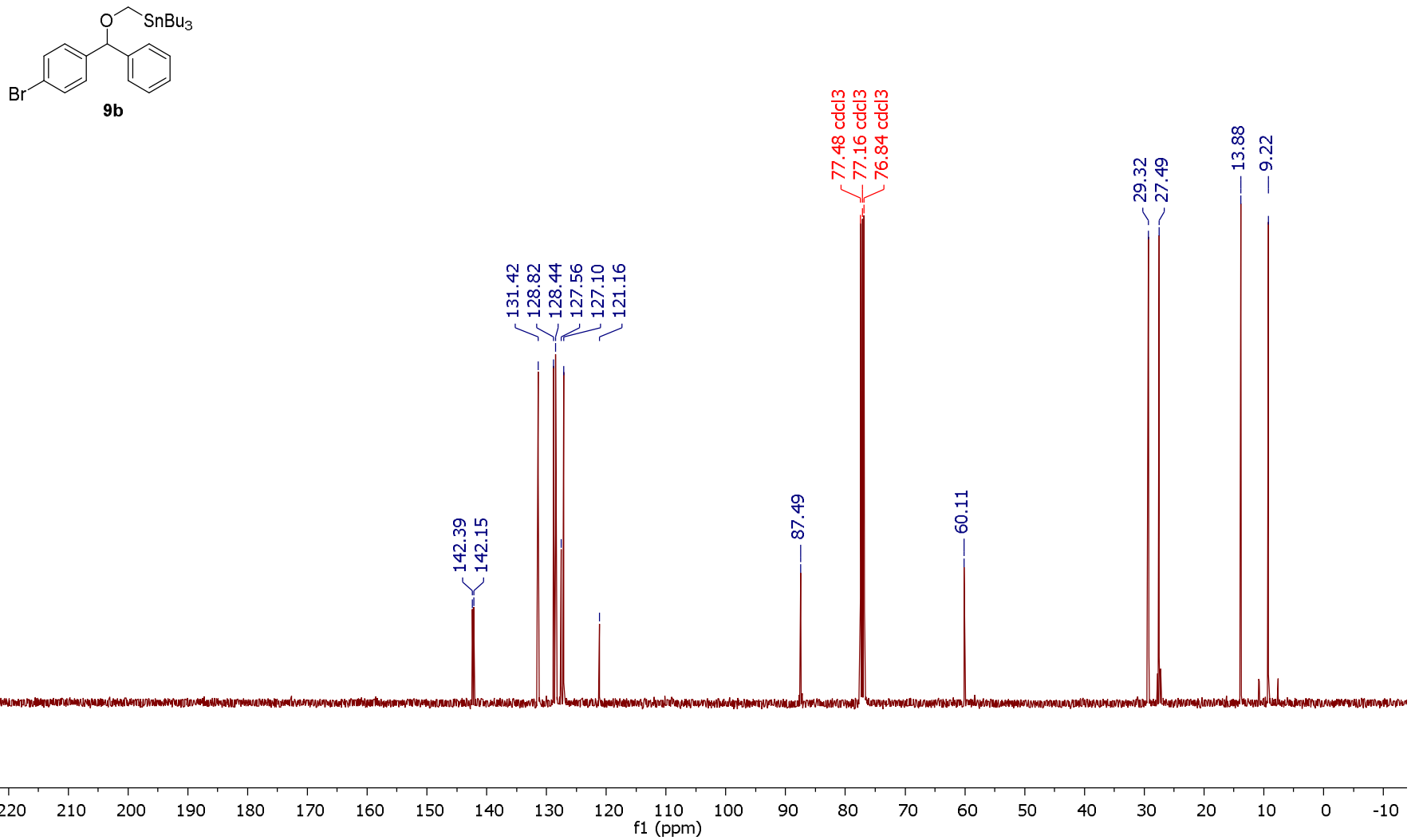

O
SnBu3
F
9a
7.26 cdcl3
f1 (ppm)
5.10
12.5 12.0 11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
7.21
1.94
0.99
2.09
6.88
6.55
15.63

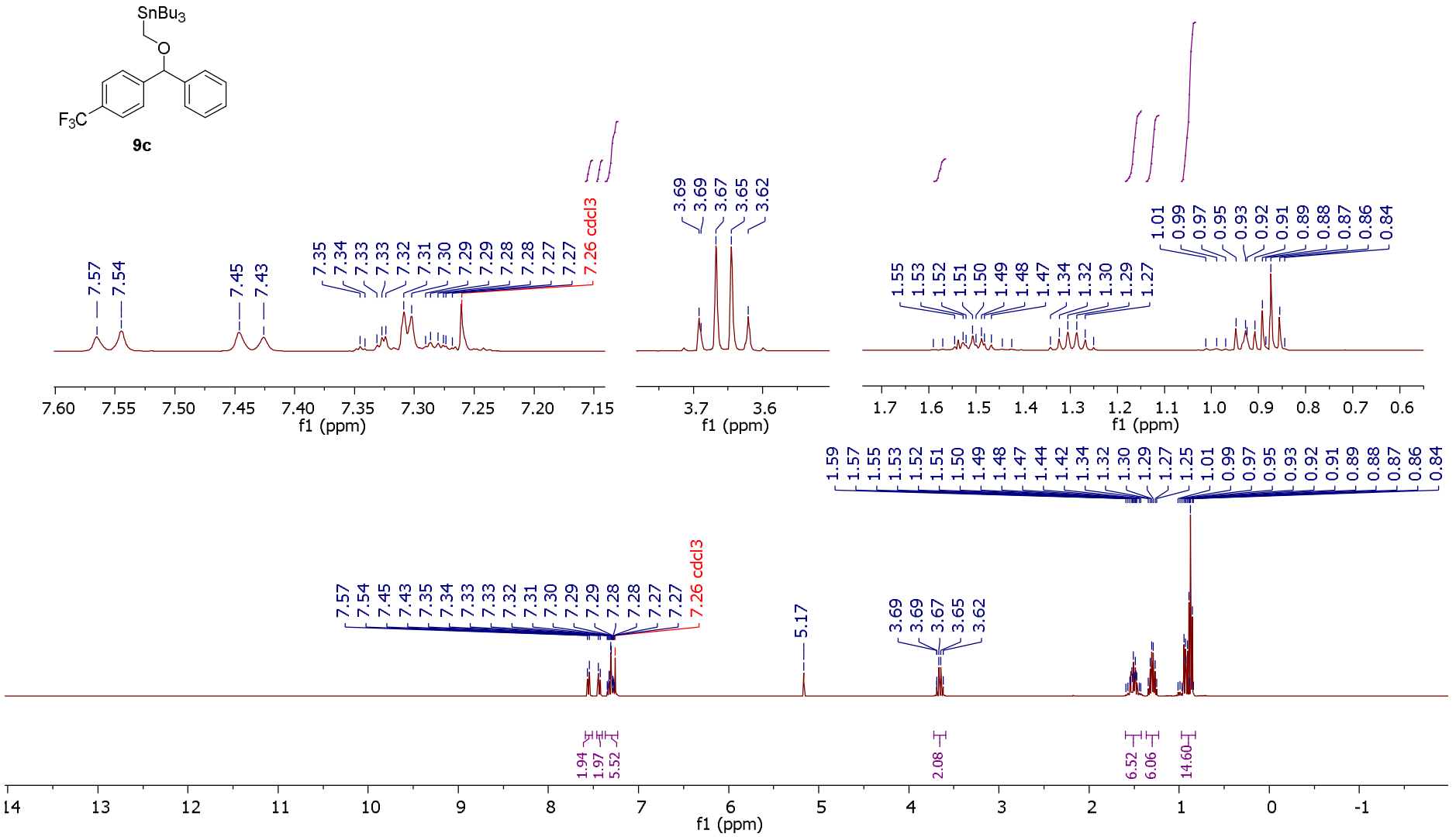

O
SnBu3
F

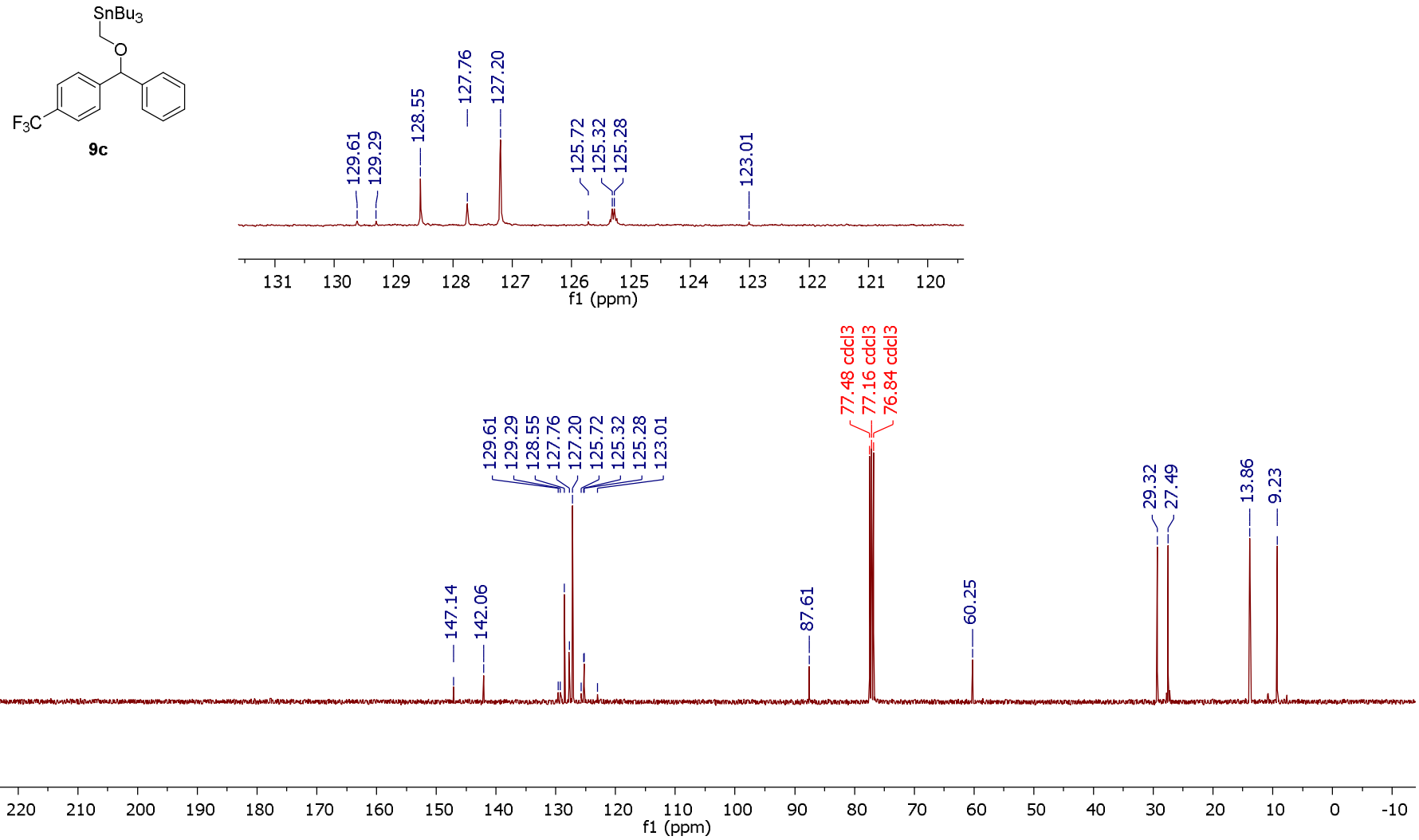
9a

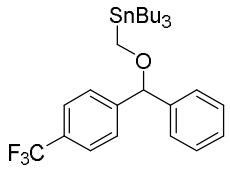

77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
29.32
27.49
13.87
9.22
128.76
128.68
128.39
127.44
127.09
115.22
115.01
142.75
138.85
163.36
160.92
87.43
60.01
230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)


O
SnBu3
Br
9b
7.43
7.41
7.33
7.31
7.29
7.24
7.20
7.18
3.68
3.67
3.67
3.67
3.65
3.65
3.64
3.63
3.63
3.62
3.62
1.59
1.57
1.55
1.53
1.51
1.49
1.47
1.45
1.43
1.41
1.34
1.33
1.33
1.31
1.29
1.27
1.27
1.26
1.25
0.99
0.97
0.94
0.92
0.90
0.88
0.86
0.84
5.08
12.38
1.00
2.57
5.13
6.86
12.91
f1 (ppm)

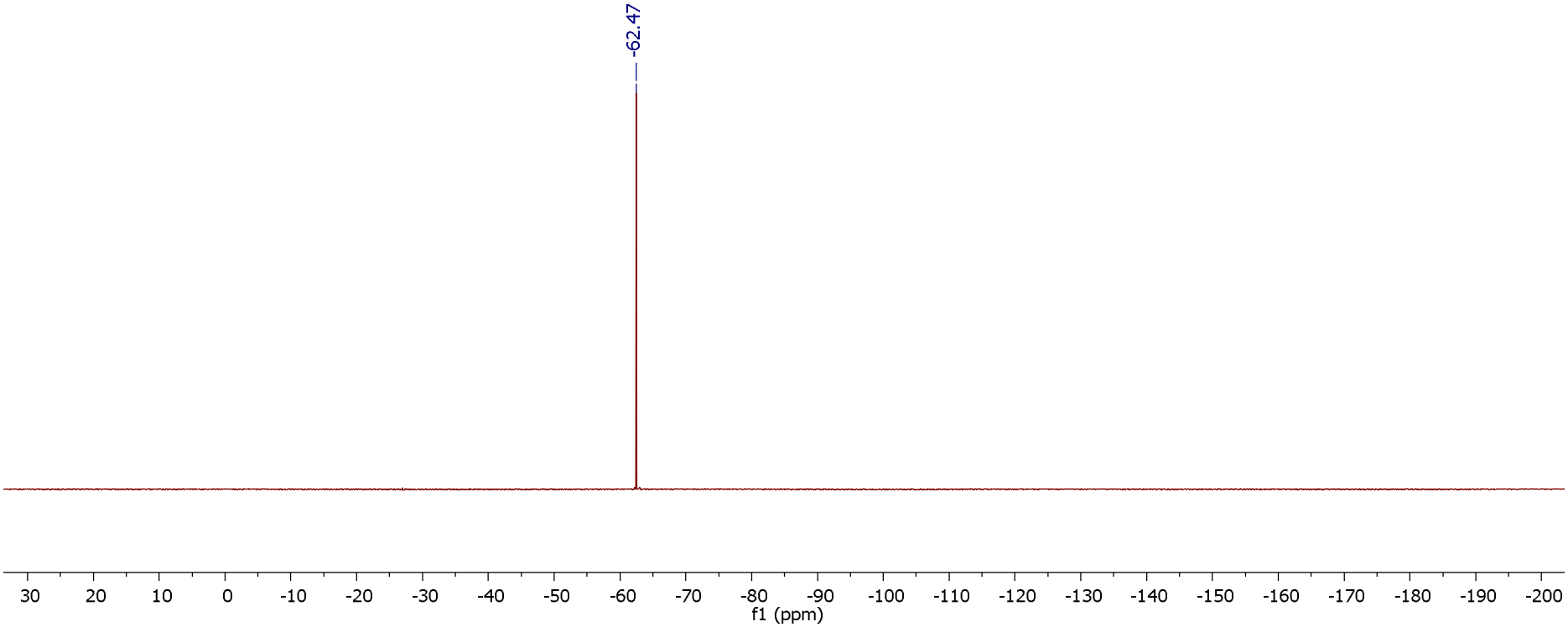

O
SnBu3
Br
9b
142.39
142.15
131.42
128.82
128.44
127.56
127.10
121.16
87.49
77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
60.11
29.32
27.49
13.88
9.22
230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

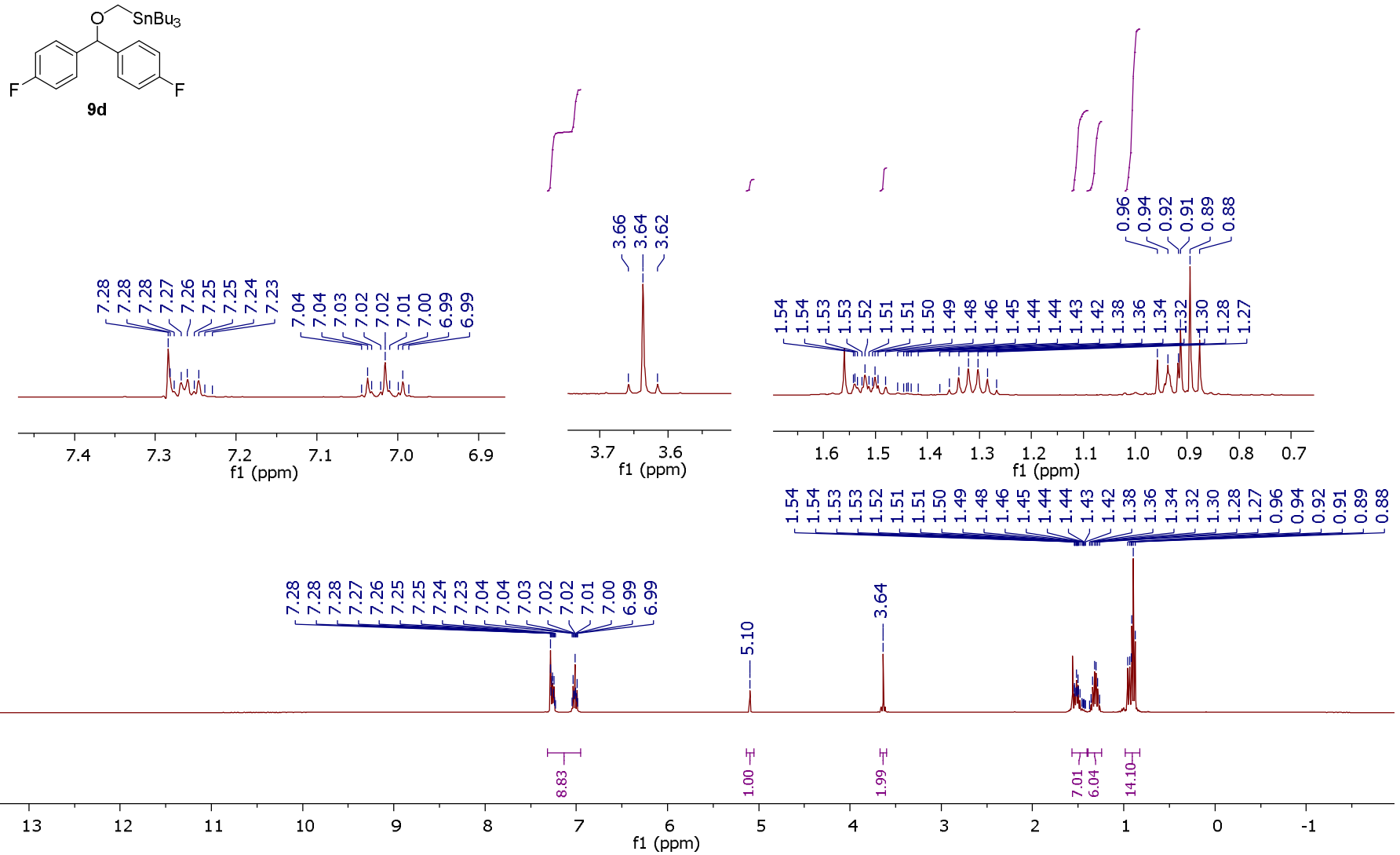

SnBu3
O
F3C
9c
7.57
7.54
7.45
7.43
7.35
7.34
7.33
7.33
7.32
7.31
7.30
7.29
7.29
7.28
7.28
7.27
7.27
7.26 cdcl3
3.69
3.69
3.67
3.65
3.62
1.55
1.53
1.52
1.51
1.50
1.49
1.48
1.47
1.34
1.32
1.30
1.29
1.27
1.01
0.99
0.97
0.95
0.93
0.92
0.91
0.89
0.88
0.87
0.86
0.84
f1 (ppm)
5.17
1.94
1.97
5.52
2.08
6.52
6.06
14.60

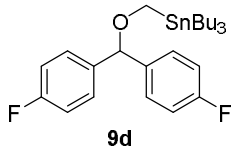

SnBu3
O
F3C
9c
129.61
129.29
128.55
127.76
127.20
125.72
125.32
125.28
123.01
f1 (ppm)
77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
147.14
142.06
87.61
60.25
29.32
27.49
13.86
9.23
f1 (ppm)


SnBu3
O
F3C

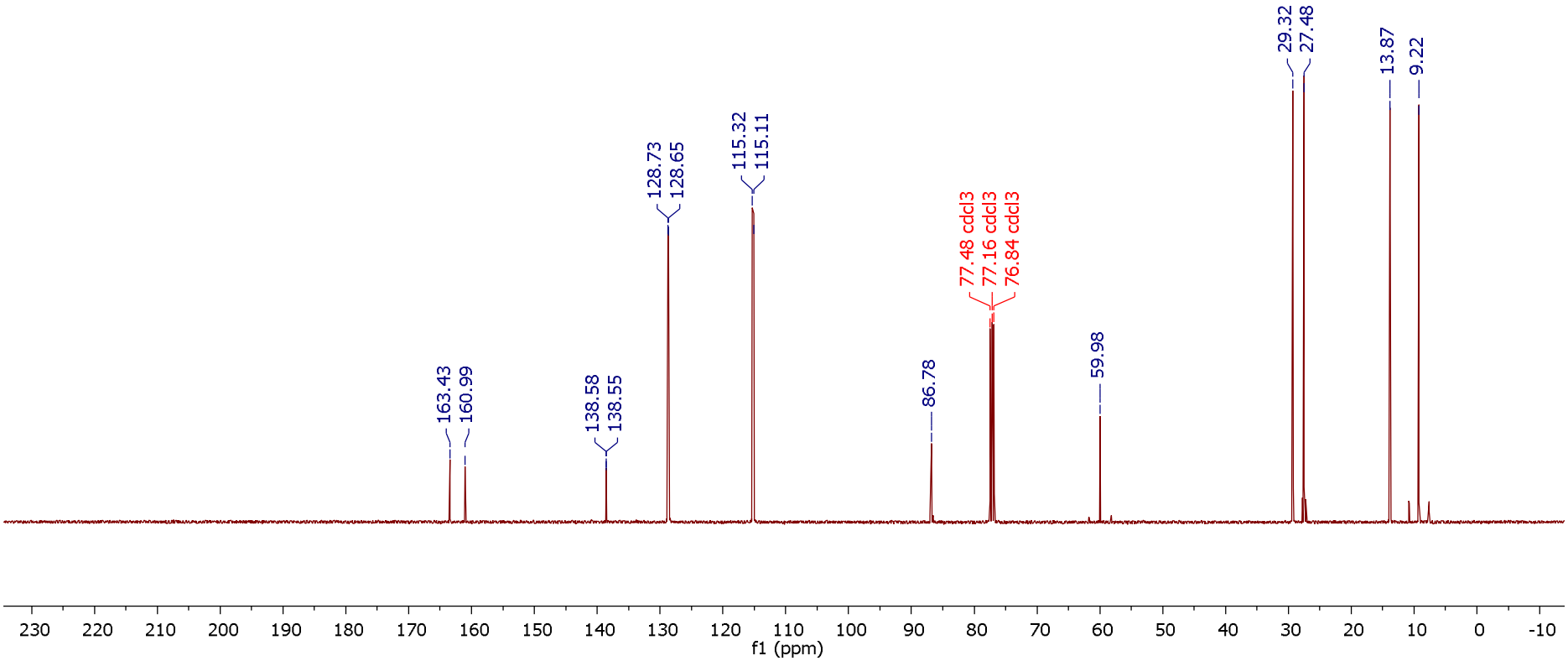
9c

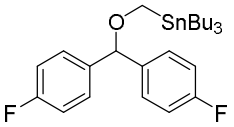

-62.47
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
f1 (ppm)


O
SnBu3
F
F
9d
7.28
7.28
7.28
7.27
7.26
7.25
7.25
7.24
7.23
7.04
7.04
7.03
7.02
7.02
7.01
7.00
6.99
6.99
3.66
3.64
3.62
1.54
1.54
1.53
1.53
1.52
1.51
1.51
1.50
1.49
1.48
1.46
1.45
1.44
1.44
1.43
1.42
1.38
1.36
1.34
1.32
1.30
1.28
1.27
0.96
0.94
0.92
0.91
0.89
0.88
5.10
8.83
1.00
1.99
7.01
6.04
14.10
f1 (ppm)

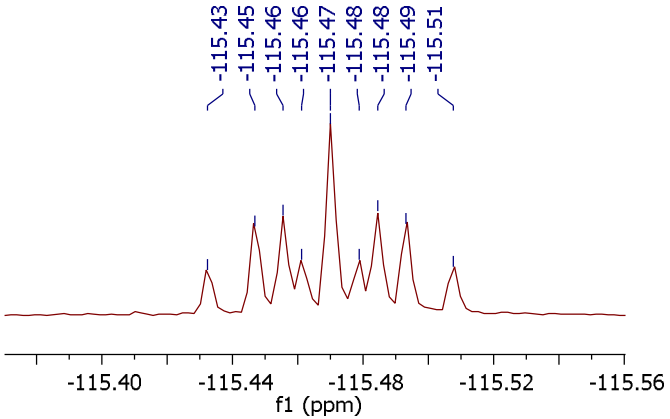

O
SnBu3
F
F

9d

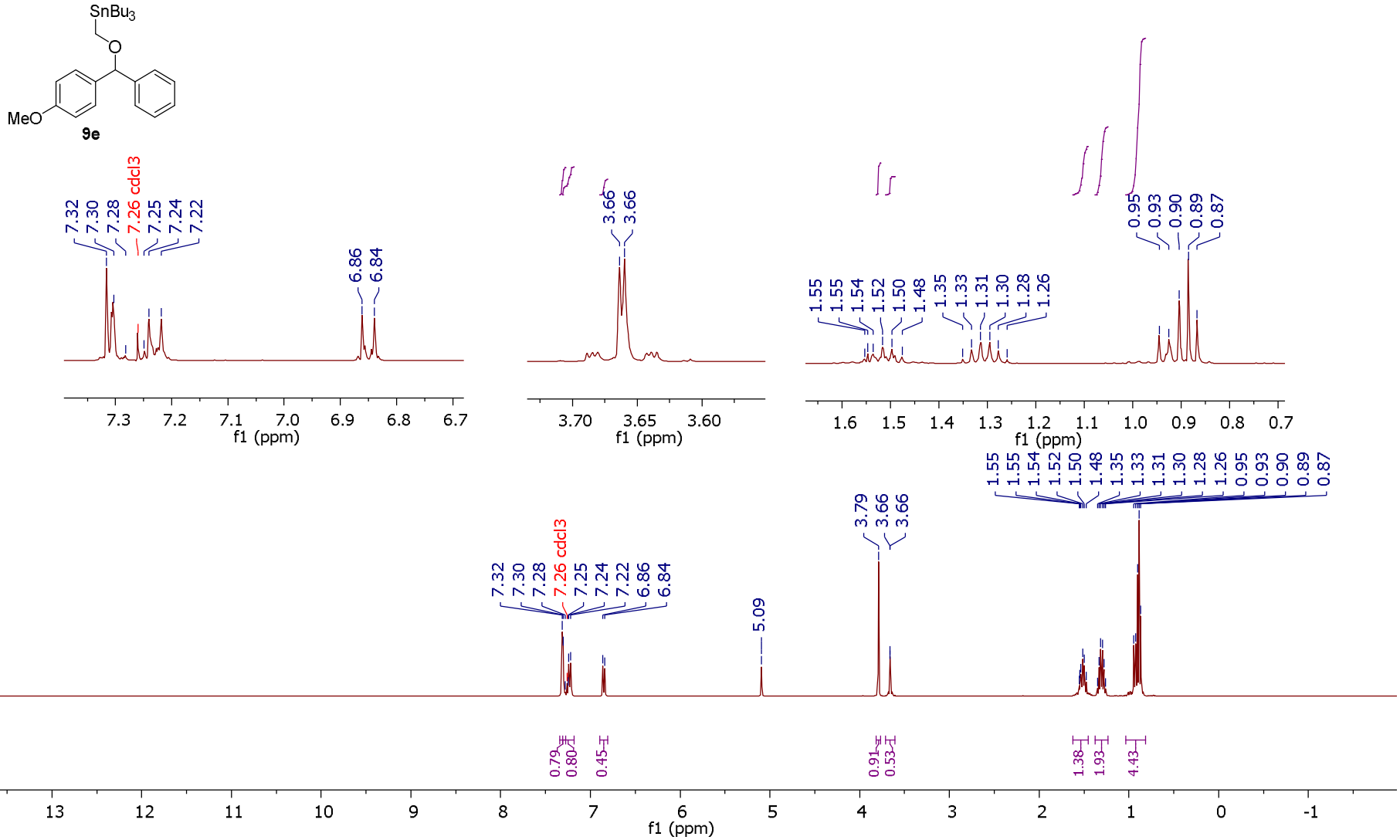

163.43
160.99
138.58
138.55
128.73
128.65
115.32
115.11
86.78
77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
59.98
29.32
27.48
13.87
9.22
230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

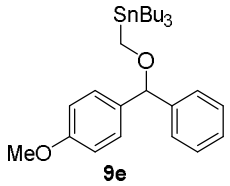

O
SnBu3
F
F

9d

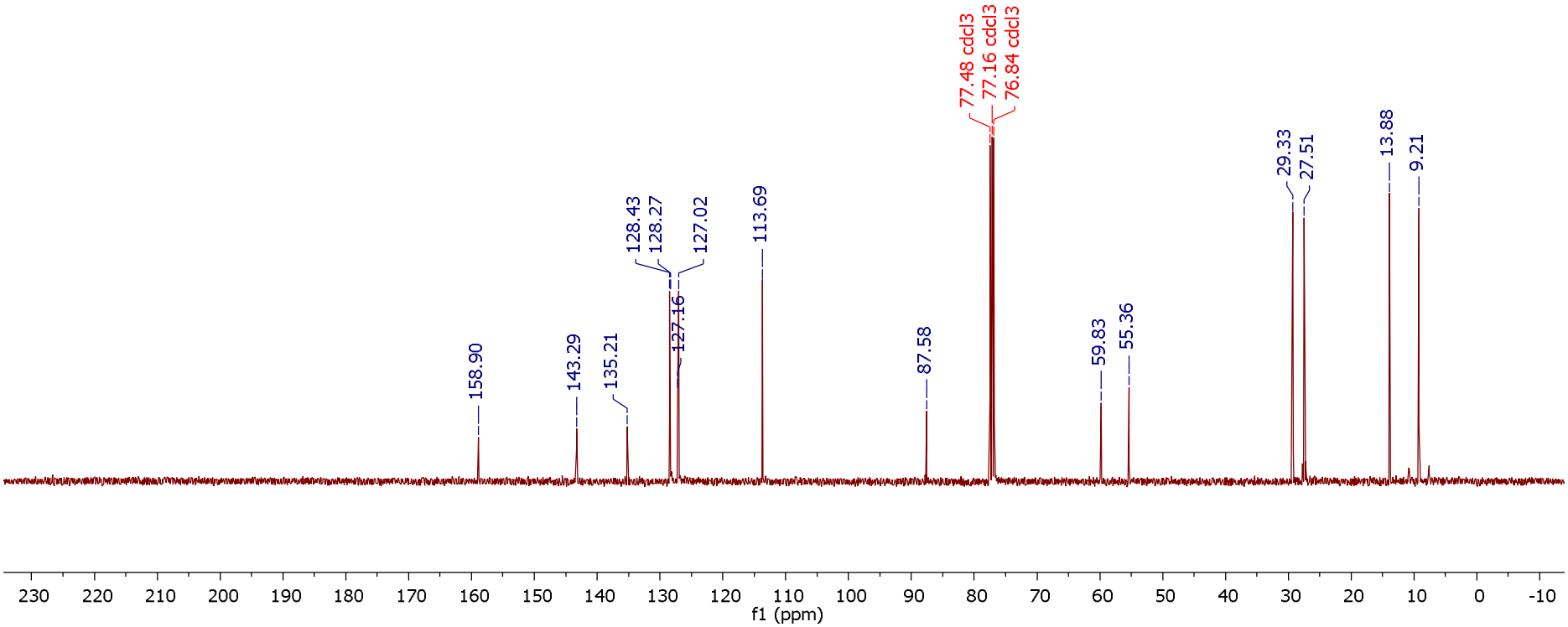

-115.43
-115.45
-115.46
-115.46
-115.47
-115.48
-115.48
-115.49
-115.51
-115.40
-115.44
-115.48
-115.52
-115.56
f1 (ppm)

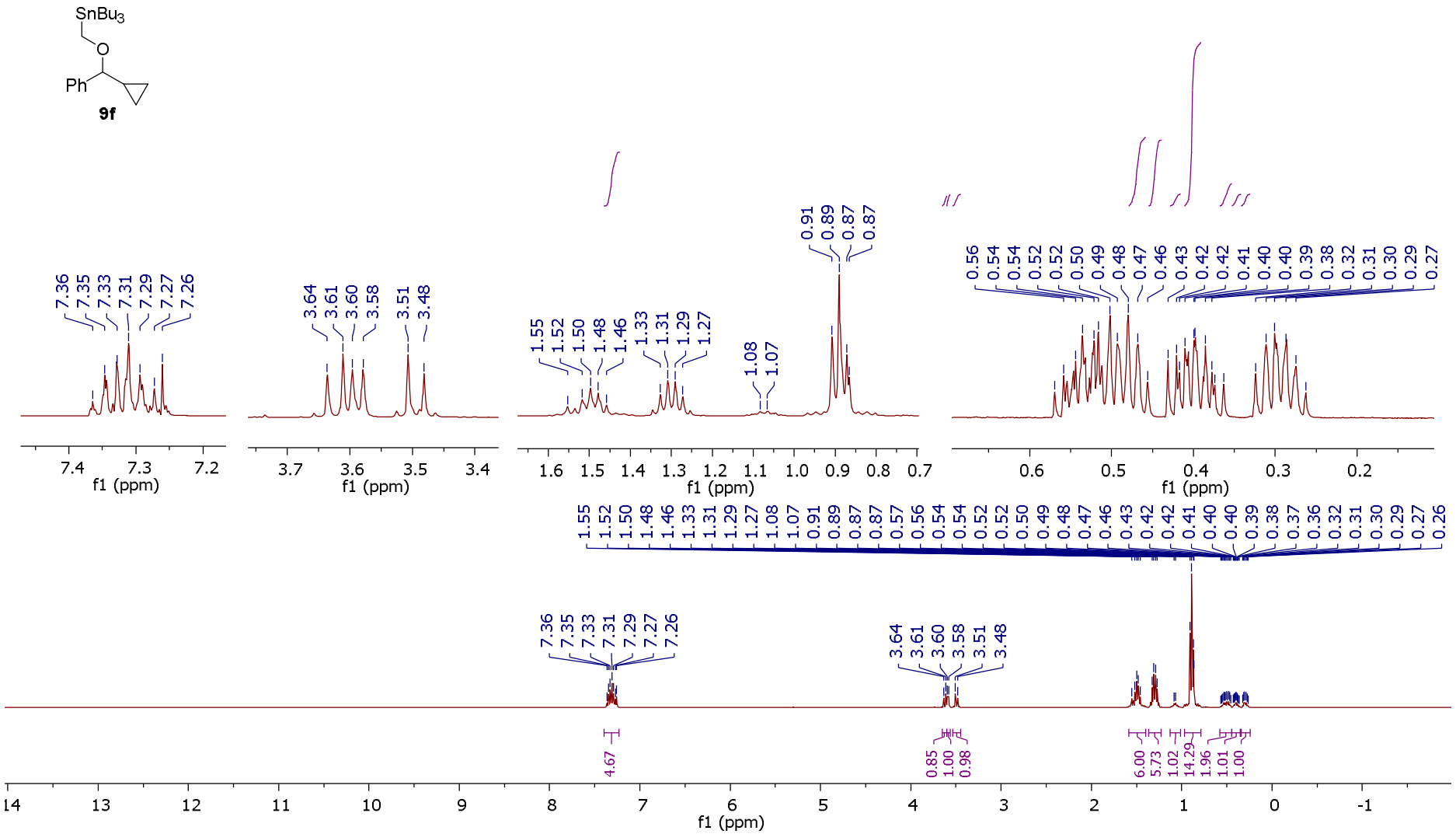
-115.47
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
f1 (ppm)

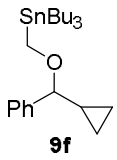

SnBu3
O
MeO
9e
7.32
7.30
7.28
7.26 cdcl3
7.25
7.24
7.22
6.86
6.84
3.66
3.66
1.55
1.55
1.54
1.52
1.50
1.48
1.35
1.33
1.31
1.30
1.28
1.26
0.95
0.93
0.90
0.89
0.87
f1 (ppm)
5.09
3.79
0.79
0.80
0.45
0.91
0.53
1.38
1.93
4.43


SnBu3
O
MeO

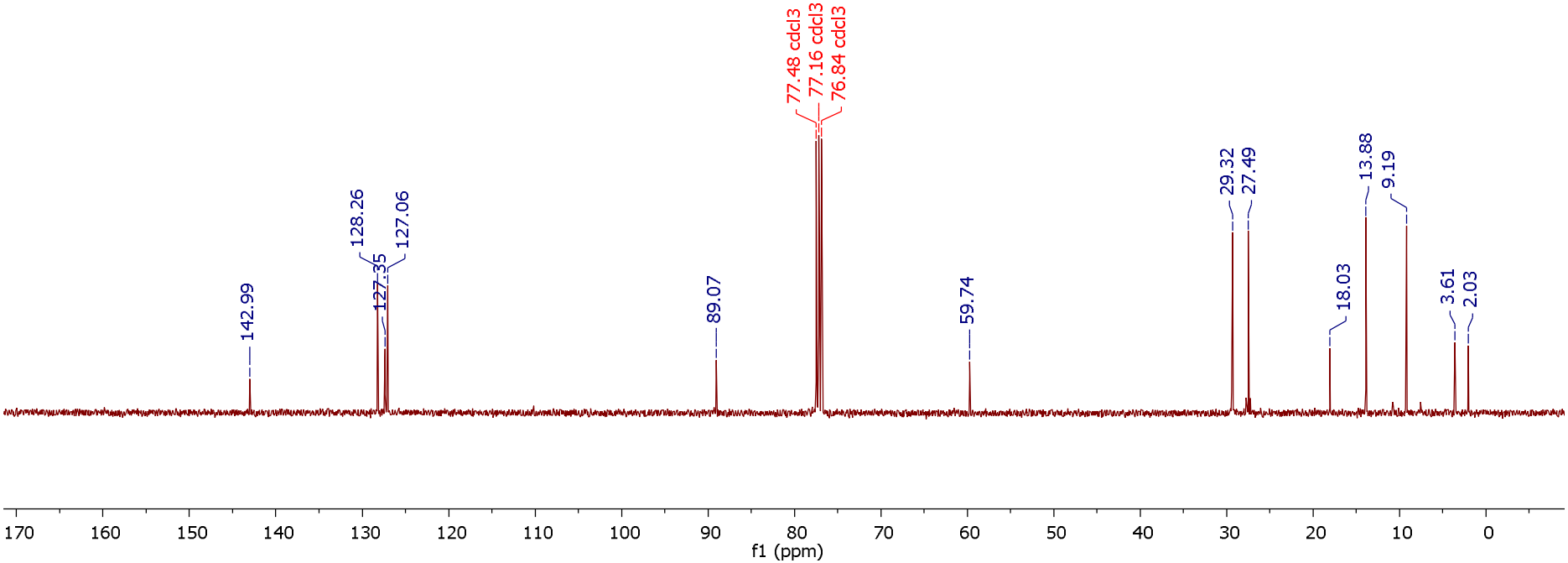
9e

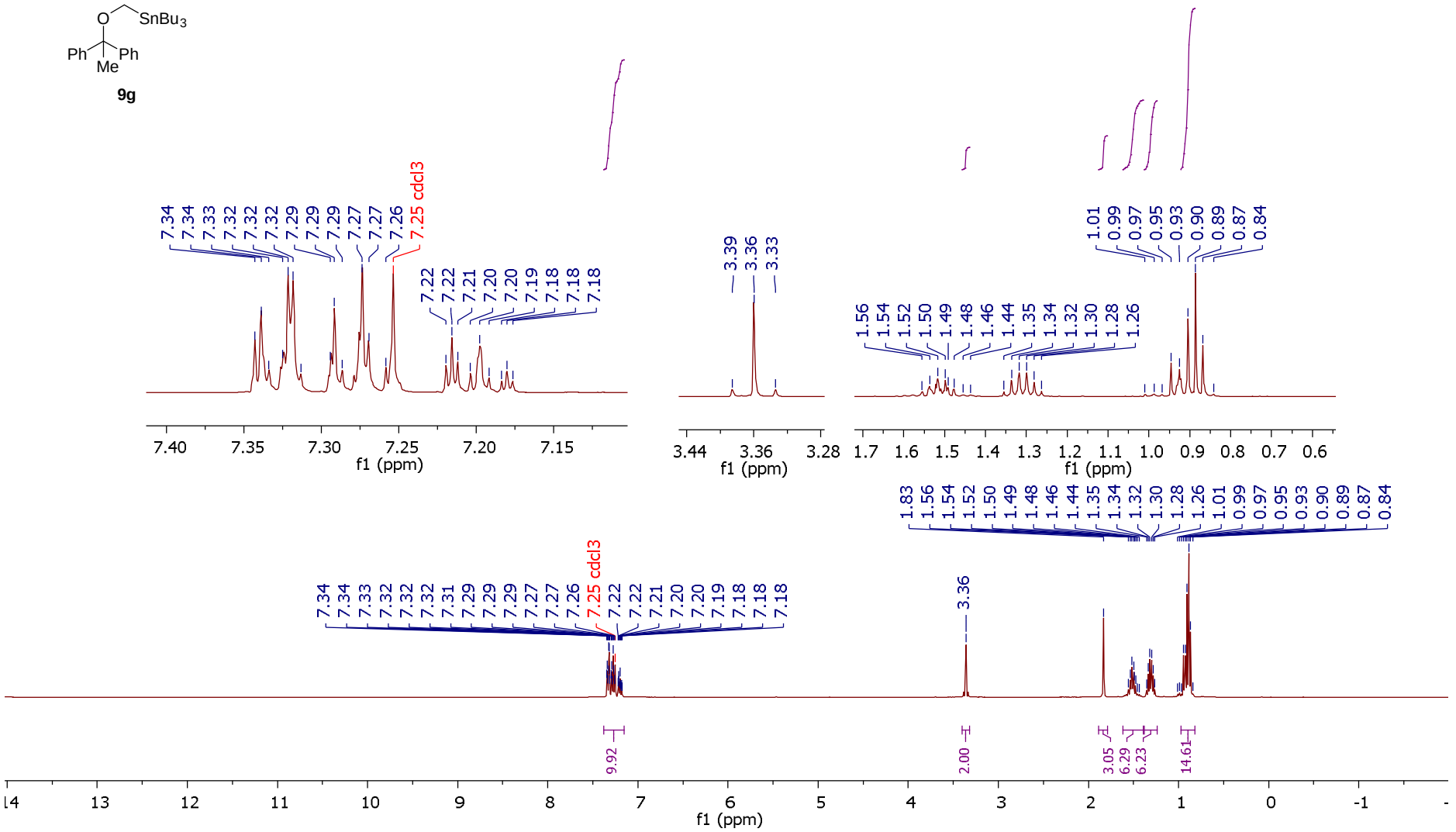

158.90
143.29
135.21
128.43
128.27
127.16
127.02
113.69
87.58
77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
59.83
55.36
29.33
27.51
13.88
9.21
230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

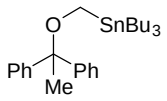

SnBu3
O
Ph
9f
7.36 7.35 7.33 7.31 7.29 7.27 7.26
3.64 3.61 3.60 3.58 3.51 3.48
1.55 1.52 1.50 1.48 1.46 1.33 1.31 1.29 1.27 1.08 1.07 0.91 0.89 0.87 0.87
0.56 0.54 0.54 0.52 0.52 0.50 0.49 0.48 0.47 0.46 0.43 0.42 0.42 0.41 0.40 0.40 0.39 0.38 0.32 0.31 0.30 0.29 0.27
f1 (ppm)
4.67
0.85
1.00
0.98
6.00
5.73
1.02
14.29
1.96
1.01
1.00


SnBu3
O
Ph

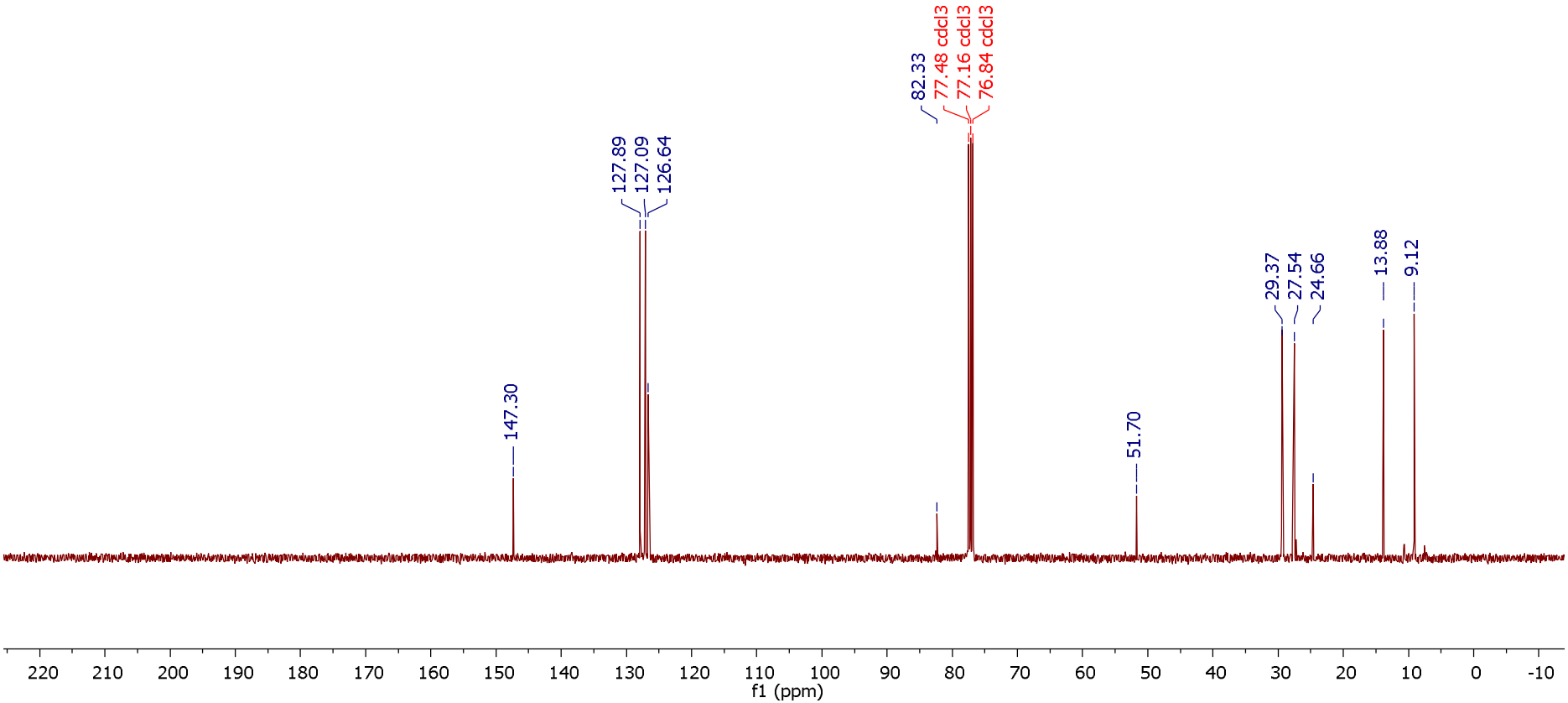
9f

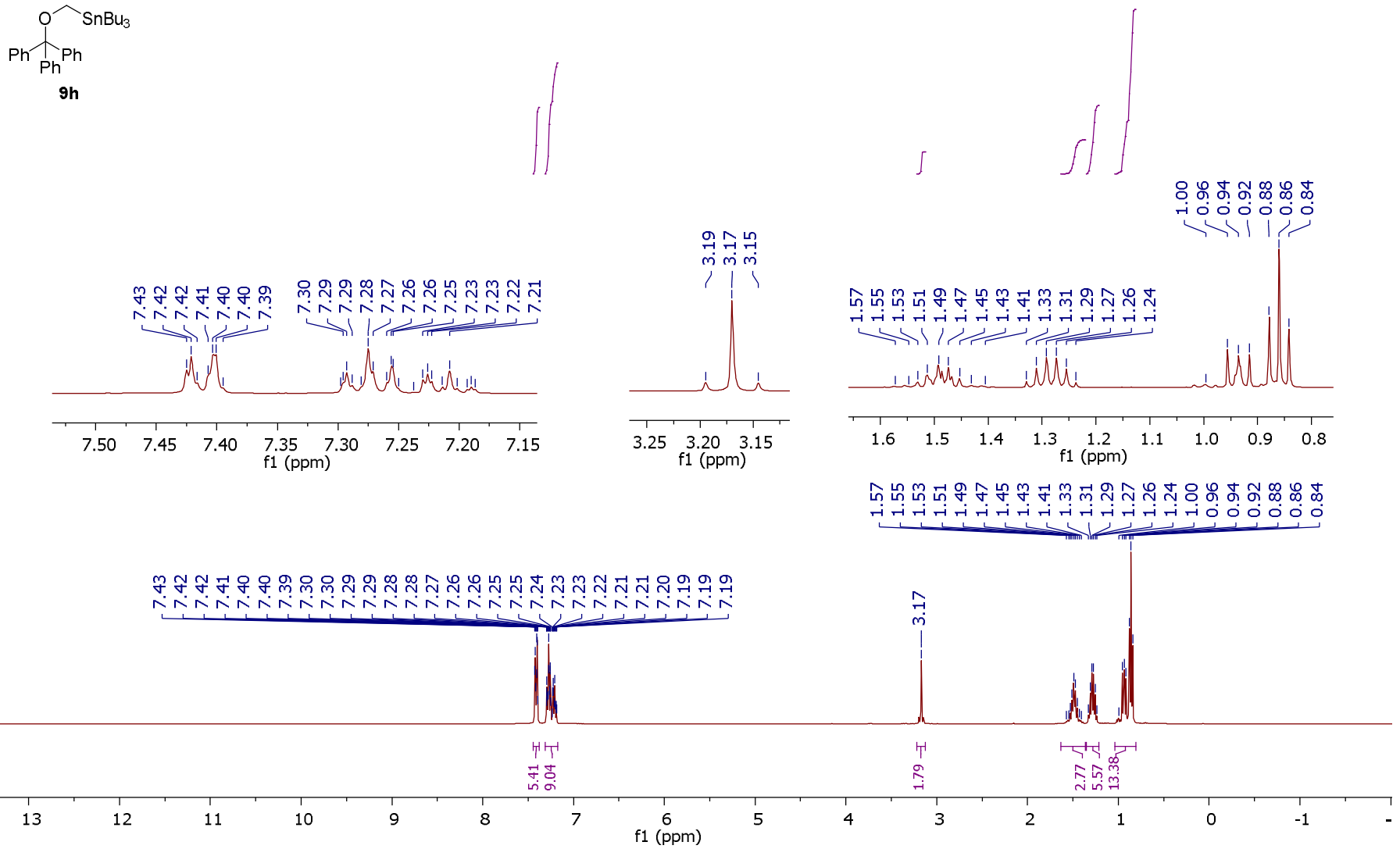

142.99
128.26
127.35
127.06
89.07
77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
59.74
29.32
27.49
18.03
13.88
9.19
3.61
2.03
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)

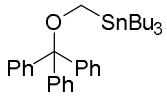

O
SnBu3
Ph
Ph
Me
9g
7.34 7.34 7.33 7.32 7.32 7.32 7.29 7.29 7.29 7.27 7.27 7.26 7.25 cdcl3 7.22 7.22 7.21 7.20 7.20 7.19 7.18 7.18 7.18
3.39 3.36 3.33
1.56 1.54 1.52 1.50 1.49 1.48 1.46 1.44 1.35 1.34 1.32 1.30 1.28 1.26
1.01 0.99 0.97 0.95 0.93 0.90 0.89 0.87 0.84
7.40 7.35 7.30 7.25 7.20 7.15
f1 (ppm)
3.44 3.36 3.28
f1 (ppm)
1.7 1.6 1.5 1.4 1.3 1.2 1.1 1.0 0.9 0.8 0.7 0.6
f1 (ppm)
1.83 1.56 1.54 1.52 1.50 1.49 1.48 1.46 1.44 1.35 1.34 1.32 1.30 1.28 1.26 1.01 0.99 0.97 0.95 0.93 0.90 0.89 0.87 0.84
7.34 7.34 7.33 7.32 7.32 7.32 7.31 7.29 7.29 7.29 7.27 7.27 7.26 7.25 cdcl3 7.22 7.22 7.21 7.20 7.20 7.19 7.18 7.18 7.18
3.36
9.92
2.00
3.05
6.29
6.23
14.61
14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 -1
f1 (ppm)


O
SnBu3
Ph
Ph
Me

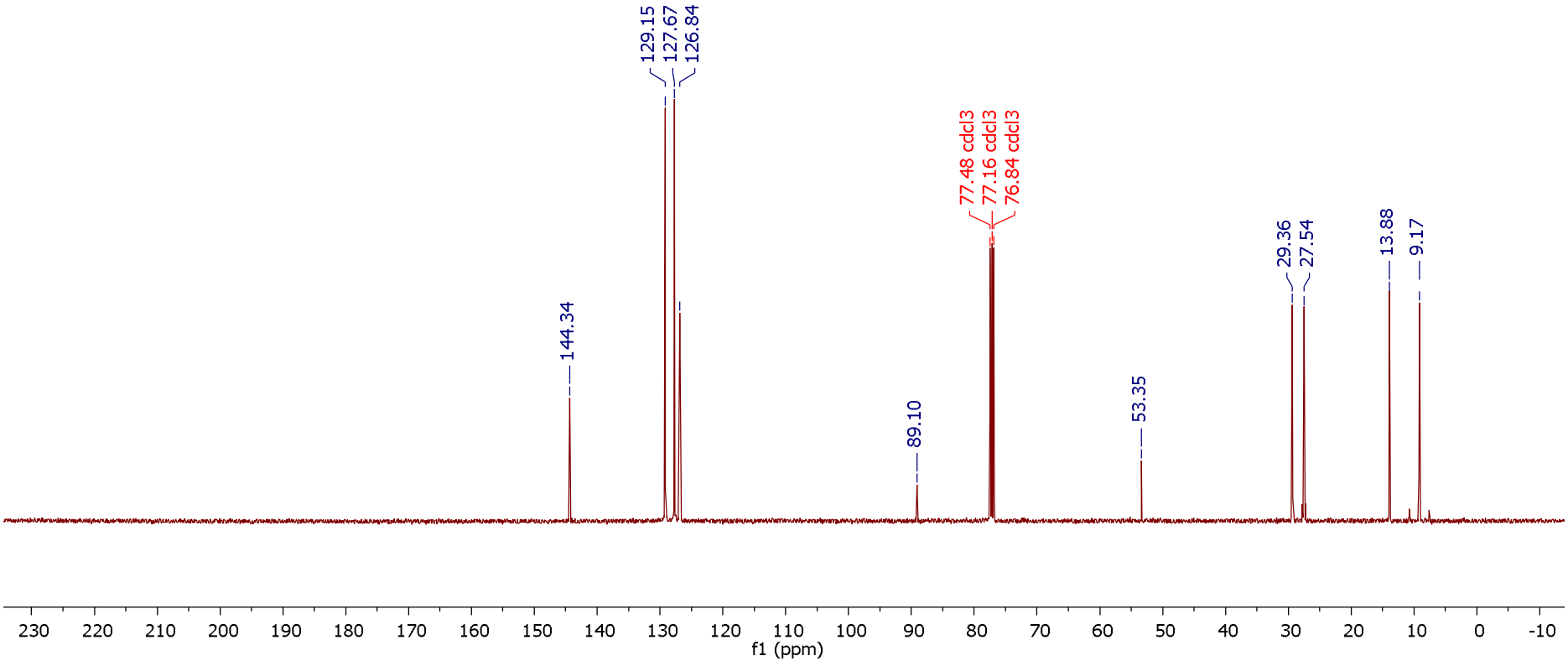
9g

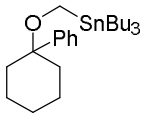

147.30
127.89
127.09
126.64
82.33
77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
51.70
29.37
27.54
24.66
13.88
9.12
220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)


O
SnBu3
Ph
Ph
Ph
9h
7.43 7.42 7.42 7.41 7.40 7.40 7.39 7.30 7.29 7.29 7.28 7.27 7.26 7.26 7.25 7.23 7.23 7.22 7.21
7.50 7.45 7.40 7.35 7.30 7.25 7.20 7.15
f1 (ppm)
3.19 3.17 3.15
3.25 3.20 3.15
f1 (ppm)
1.57 1.55 1.53 1.51 1.49 1.47 1.45 1.43 1.41 1.33 1.31 1.29 1.27 1.26 1.24
1.00 0.96 0.94 0.92 0.88 0.86 0.84
1.6 1.5 1.4 1.3 1.2 1.1 1.0 0.9 0.8
f1 (ppm)
7.43 7.42 7.42 7.41 7.40 7.40 7.39 7.30 7.30 7.29 7.29 7.28 7.28 7.27 7.26 7.26 7.25 7.25 7.24 7.23 7.23 7.22 7.21 7.21 7.20 7.19 7.19 7.19
3.17
1.57 1.55 1.53 1.51 1.49 1.47 1.45 1.43 1.41 1.33 1.31 1.29 1.27 1.26 1.24 1.00 0.96 0.94 0.92 0.88 0.86 0.84
5.41
9.04
1.79
2.77
5.57
13.38
14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 -1
f1 (ppm)


O
SnBu3
Ph
Ph
Ph

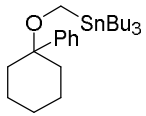
9h


129.15
127.67
126.84
77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
144.34
89.10
53.35
29.36
27.54
13.88
9.17
230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

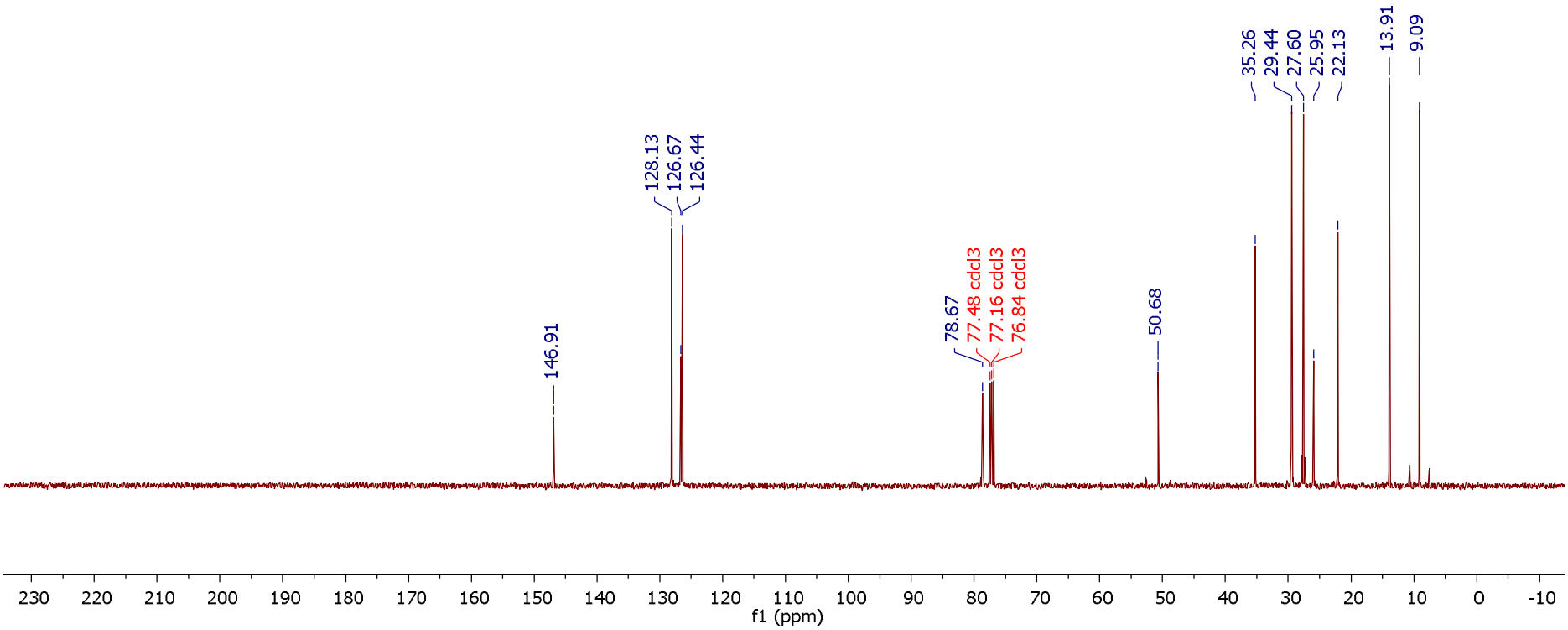

O
SnBu3
Ph

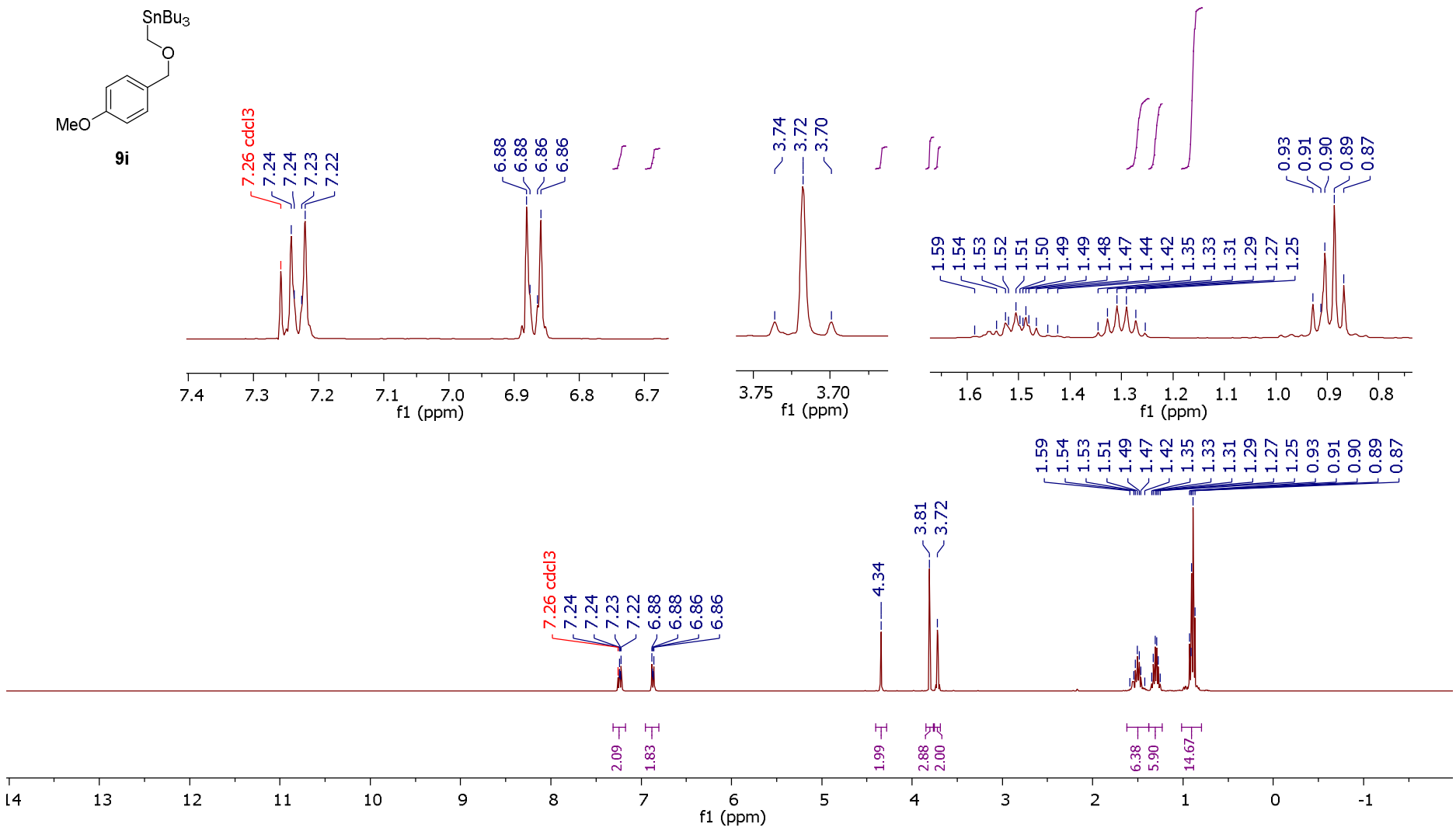
9i

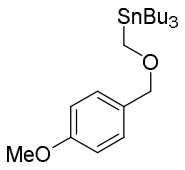
7.43
7.42
7.41
7.38
7.36
7.34
7.28
7.27
7.26
7.24
7.50 7.45 7.40 7.35 7.30 7.25 7.20 7.15
f1 (ppm)
3.23
3.20
3.18
3.3 3.2 3.1
f1 (ppm)
1.03
1.01
0.99
0.96
0.95
0.94
0.94
0.92
0.92
0.90
0.88
0.86
2.12
2.09
1.75
1.73
1.65
1.61
1.60
1.58
1.40
1.38
1.36
1.34
1.33
1.31
1.29
1.28
1.27
1.25
1.24
1.23
2.0 1.5 1.0
f1 (ppm)
2.12
2.09
1.75
1.73
1.65
1.61
1.60
1.58
1.40
1.38
1.36
1.34
1.33
1.31
1.29
1.28
1.27
1.25
1.24
1.23
1.21
1.03
1.01
0.99
0.96
0.95
0.94
0.94
0.92
0.92
0.90
0.88
0.86
7.43
7.42
7.41
7.38
7.36
7.34
7.28
7.27
7.26
7.24
3.20
4.91
2.00
2.08
3.21
10.28
6.84
14.80
.4 13 12 11 10 9 8 7 6 5 4 3 2 1 0 -1 -
f1 (ppm)


O
Ph
SnBu3

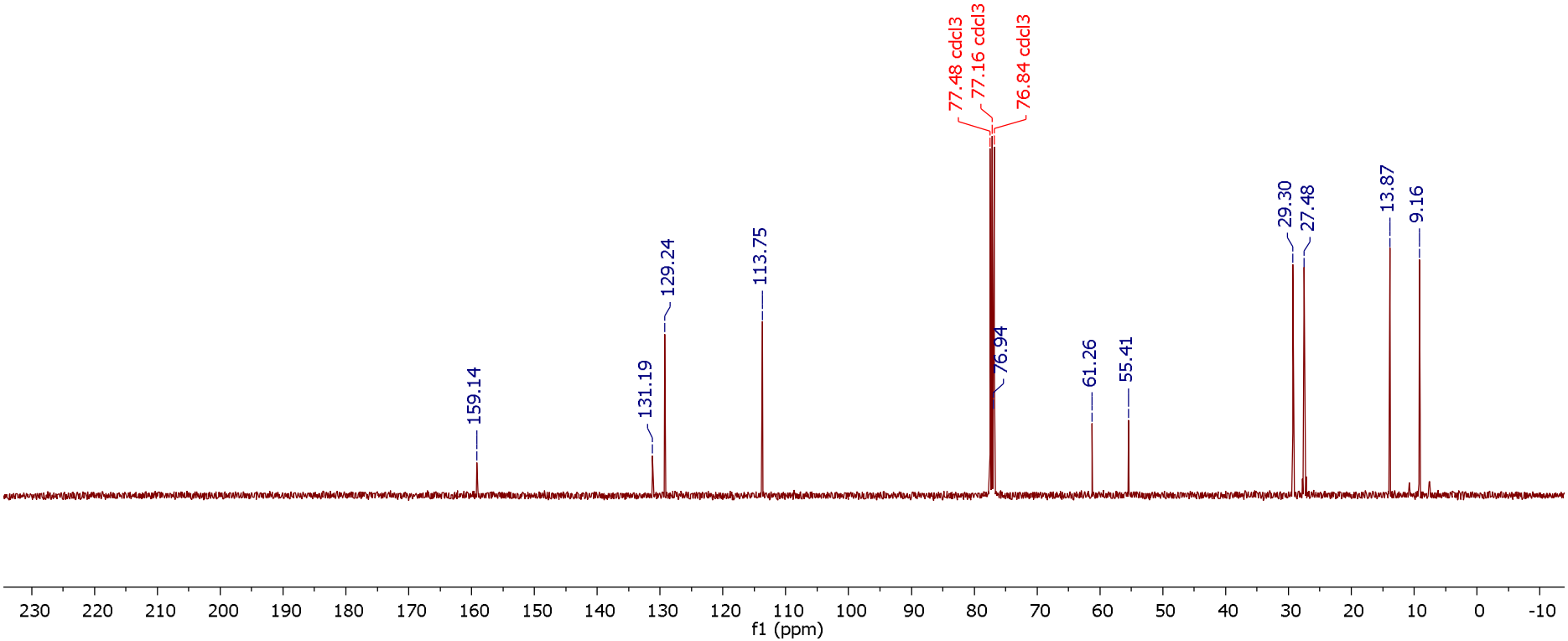
9i

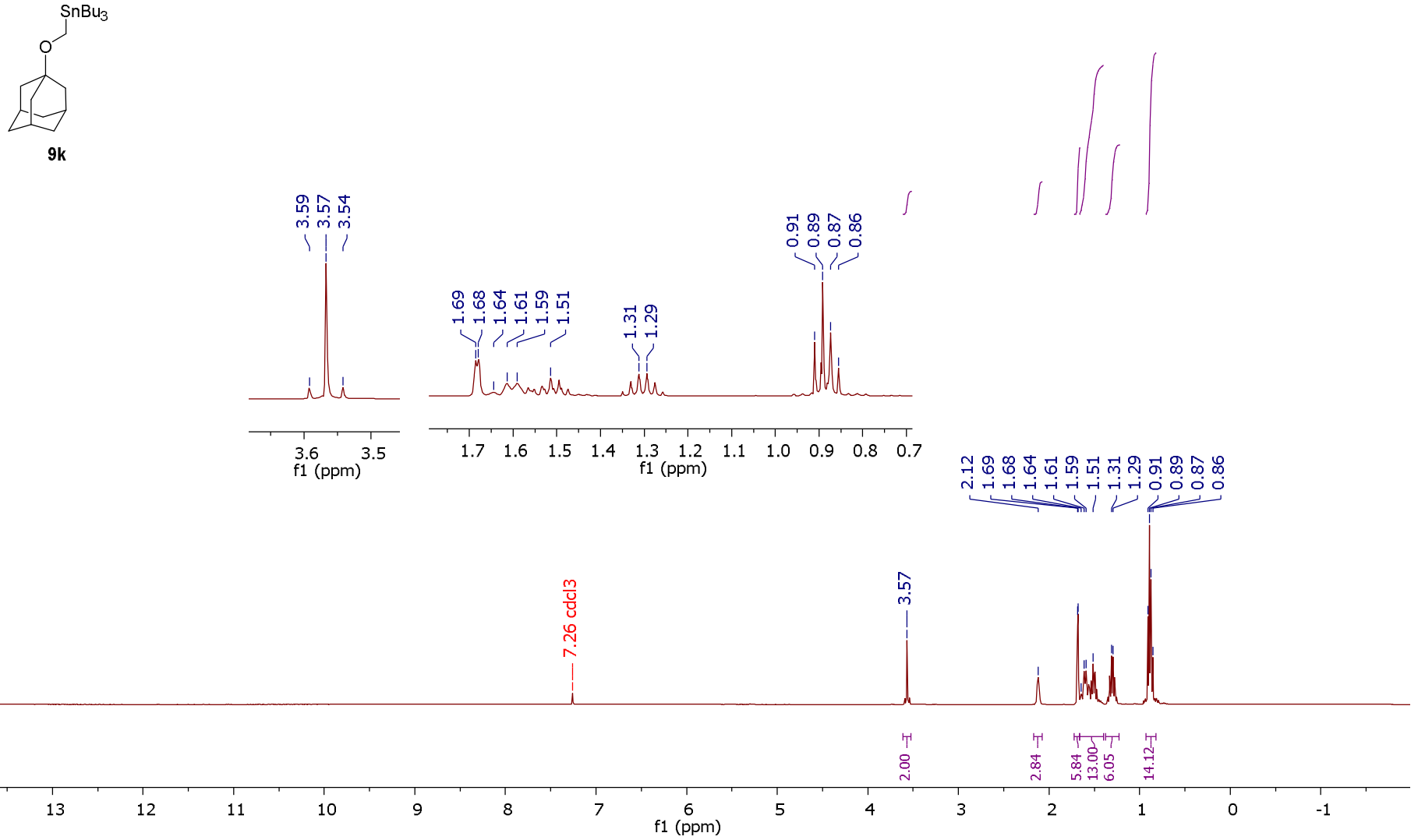

146.91
128.13
126.67
126.44
78.67
77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
50.68
35.26
29.44
27.60
25.95
22.13
13.91
9.09
230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

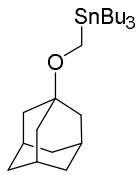

SnBu3
O
MeO
9i
7.26 cdcl3
7.24
7.24
7.23
7.22
6.88
6.88
6.86
6.86
3.74
3.72
3.70
0.93
0.91
0.90
0.89
0.87
1.59
1.54
1.53
1.52
1.51
1.50
1.49
1.49
1.48
1.47
1.44
1.42
1.35
1.33
1.31
1.29
1.27
1.25
f1 (ppm)
4.34
3.81
3.72
2.09
1.83
1.99
2.88
2.00
6.38
5.90
14.67


SnBu3
O
MeO

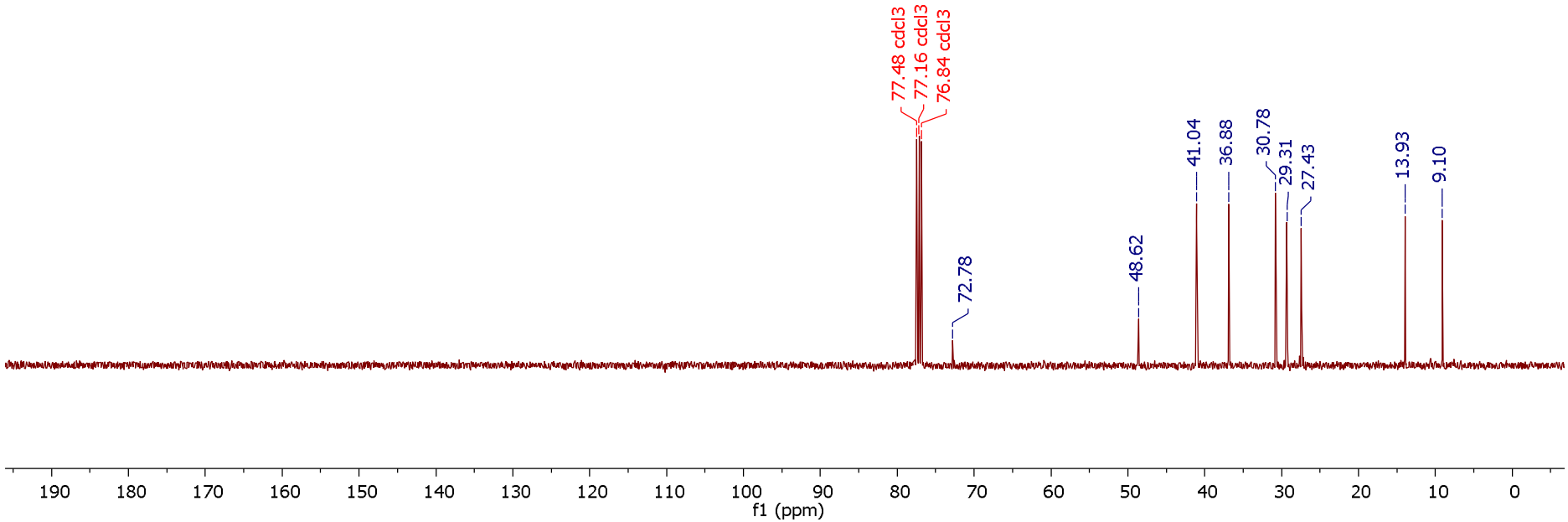
9i

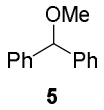

77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
159.14
131.19
129.24
113.75
76.94
61.26
55.41
29.30
27.48
13.87
9.16
230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)


SnBu3
O
9k
3.59
3.57
3.54
3.6
3.5
f1 (ppm)
1.69
1.68
1.64
1.61
1.59
1.51
1.31
1.29
0.91
0.89
0.87
0.86
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
f1 (ppm)
2.12
7.26 cdcl3
3.57
2.00
2.84
5.84
13.00
6.05
14.12
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
f1 (ppm)


SnBu3
O

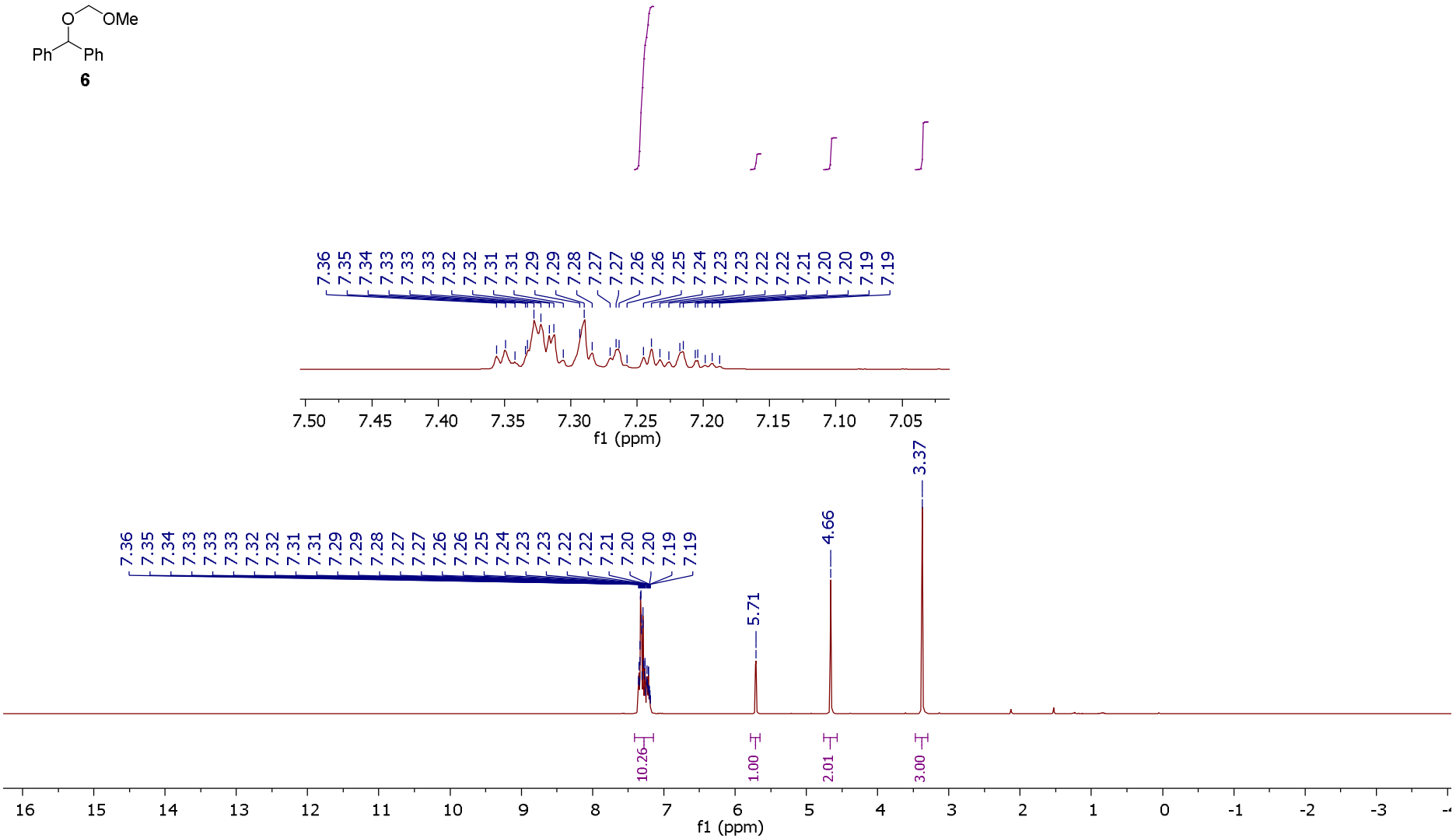
9k

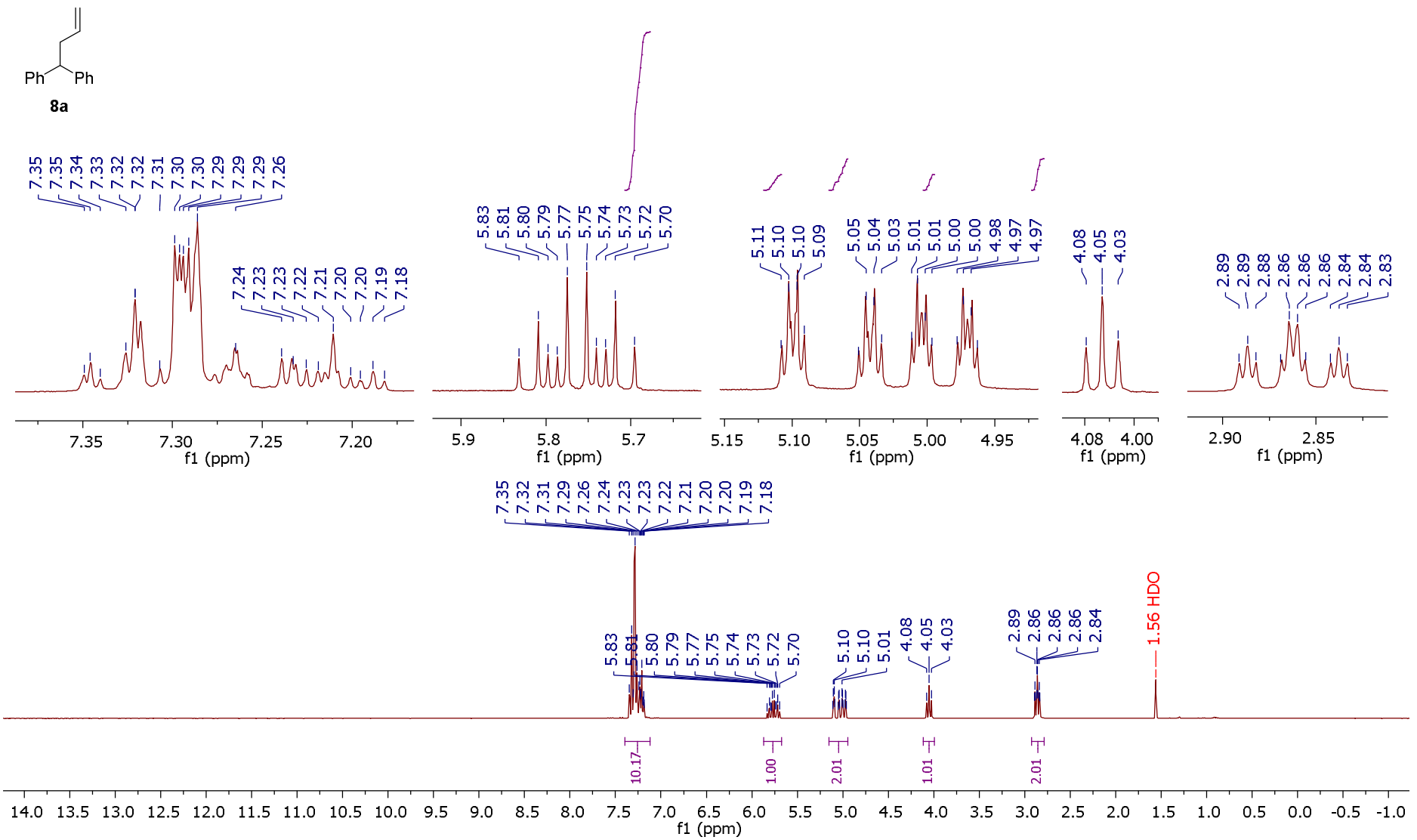

77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
72.78
48.62
41.04
36.88
30.78
29.31
27.43
13.93
9.10
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)

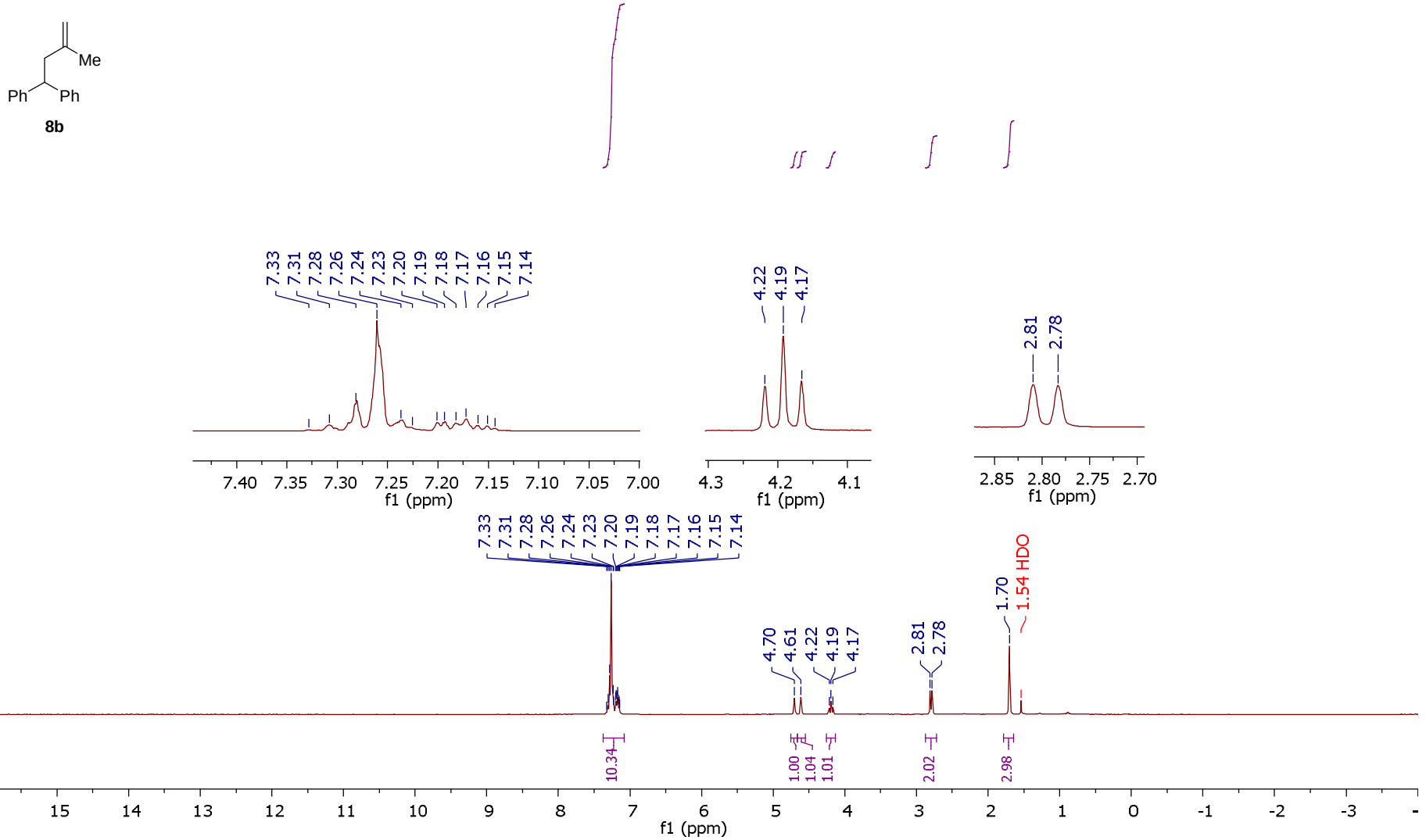

OMe
Ph
Ph

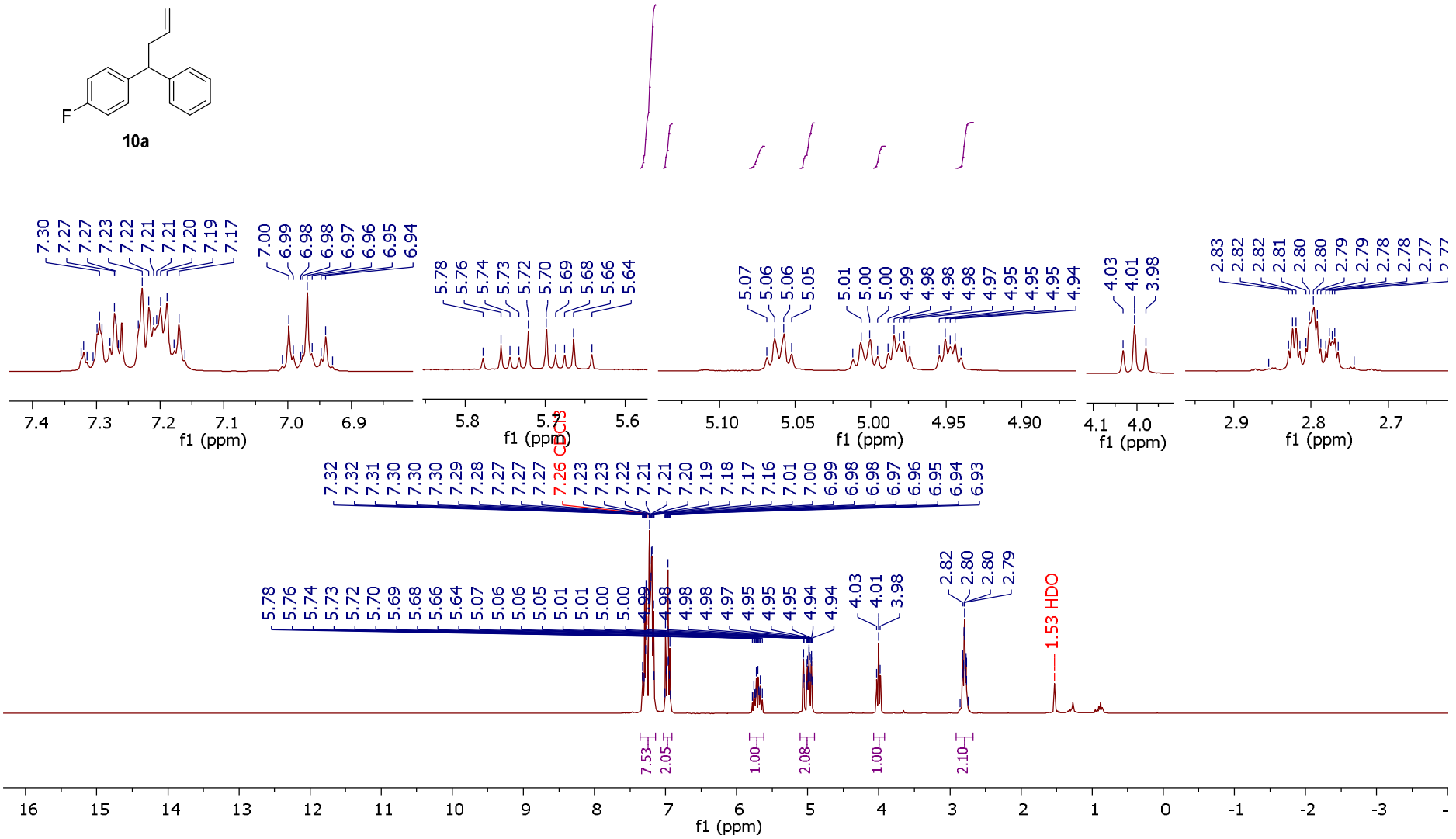
5

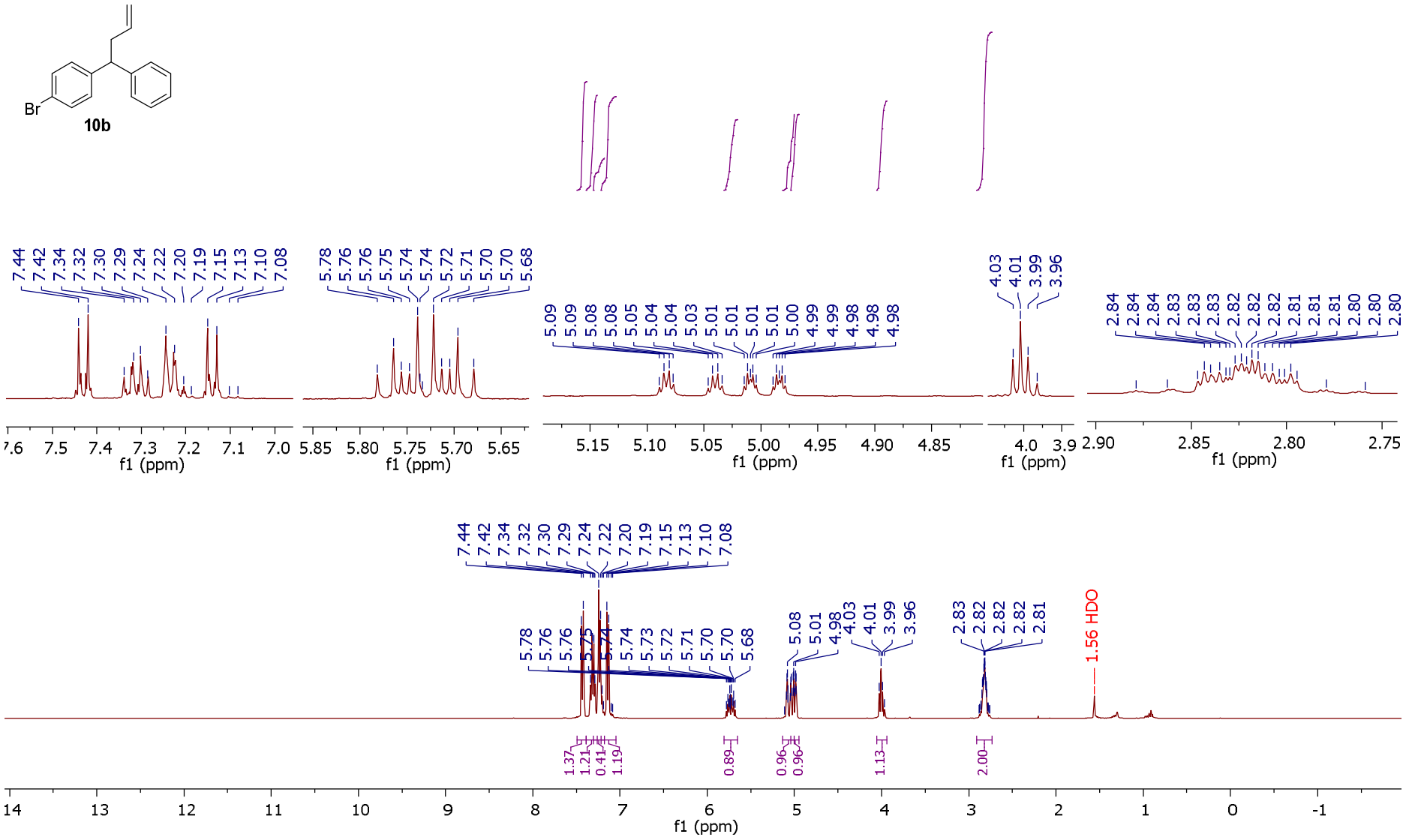
7.35
7.34
7.34
7.32
7.32
7.31
7.30
7.30
7.29
7.28
7.27
7.27
7.26
7.26
7.25
7.24
7.23
7.23
7.22
7.22
7.21
7.20
7.20
7.19
7.55
7.50
7.45
7.40
7.35
7.30
7.25
7.20
7.15
7.10
f1 (ppm)
3.36
5.22
10.42
1.01
2.91
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
f1 (ppm)

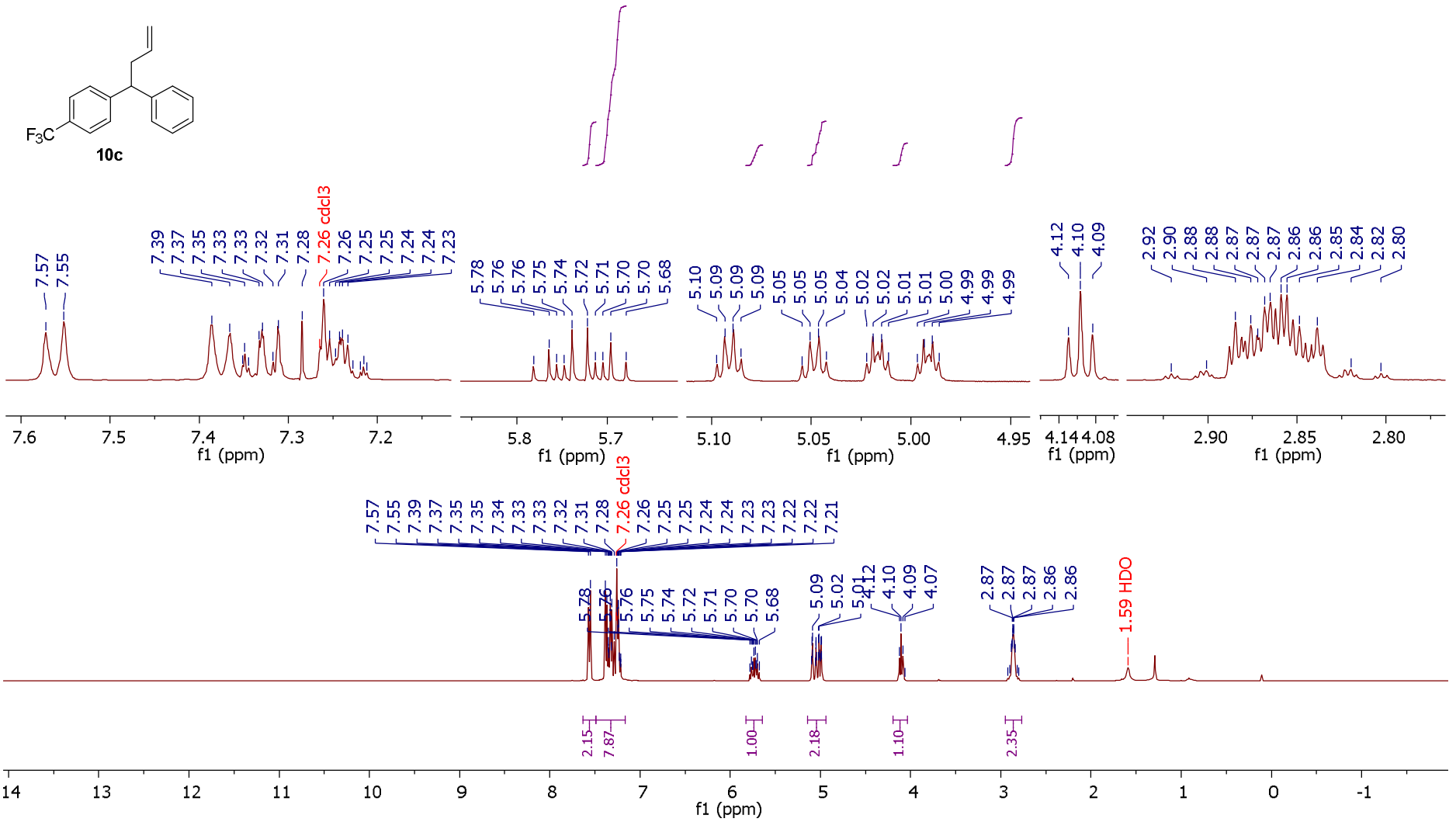

O
OMe
Ph
Ph
6
7.36 7.35 7.34 7.33 7.33 7.33 7.32 7.32 7.31 7.31 7.29 7.29 7.28 7.27 7.27 7.26 7.26 7.25 7.24 7.23 7.23 7.22 7.22 7.21 7.20 7.20 7.19 7.19
7.50 7.45 7.40 7.35 7.30 7.25 7.20 7.15 7.10 7.05
f1 (ppm)
3.37
4.66
5.71
10.26
1.00
2.01
3.00
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 -1 -2 -3
f1 (ppm)

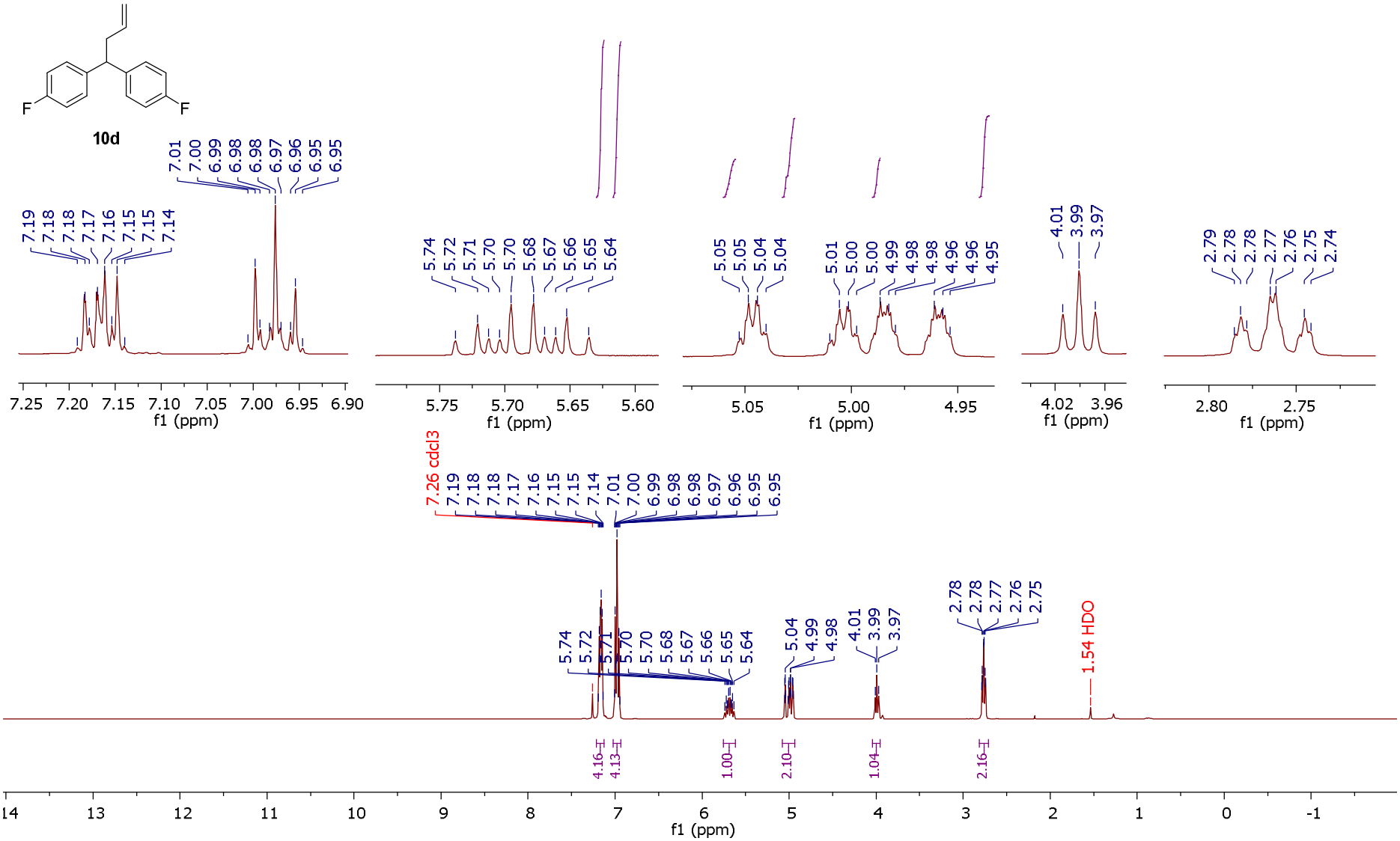

Ph
Ph
8a
7.35 7.35 7.34 7.33 7.32 7.32 7.31 7.30 7.30 7.29 7.29 7.29 7.26
7.24 7.23 7.23 7.22 7.21 7.20 7.20 7.19 7.18
5.83 5.81 5.80 5.79 5.77 5.75 5.74 5.73 5.72 5.70
5.11 5.10 5.10 5.09 5.05 5.04 5.03 5.01 5.01 5.00 5.00 4.98 4.97 4.97
4.08 4.05 4.03
2.89 2.89 2.88 2.86 2.86 2.86 2.84 2.84 2.83
f1 (ppm)
1.56 HDO
10.17
1.00
2.01
1.01
2.01

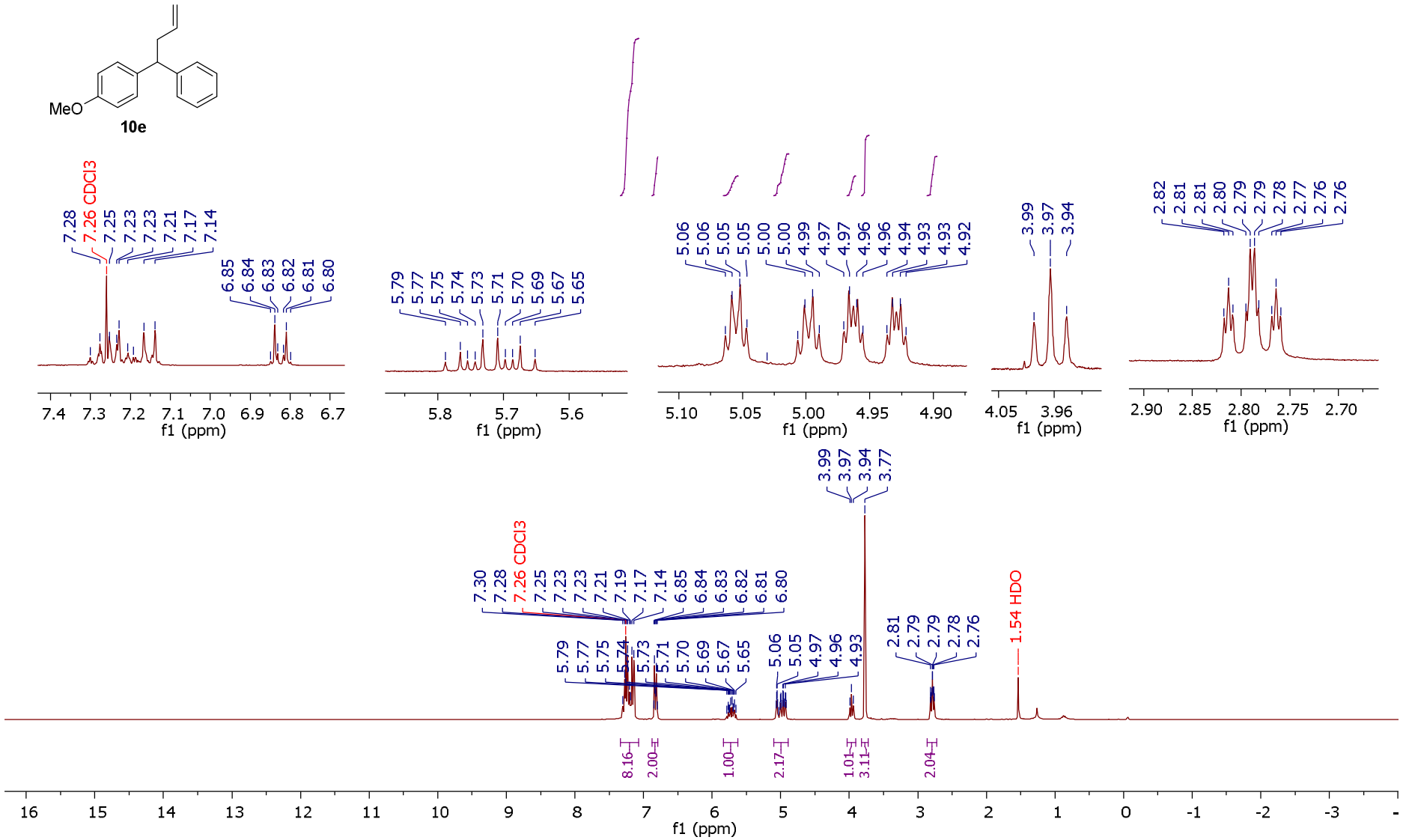

Me
Ph
Ph
8b
7.33
7.31
7.28
7.26
7.24
7.23
7.20
7.19
7.18
7.17
7.16
7.15
7.14
4.22
4.19
4.17
2.81
2.78
1.70
1.54 HDO
4.70
4.61
10.34
1.00
1.04
1.01
2.02
2.98
f1 (ppm)

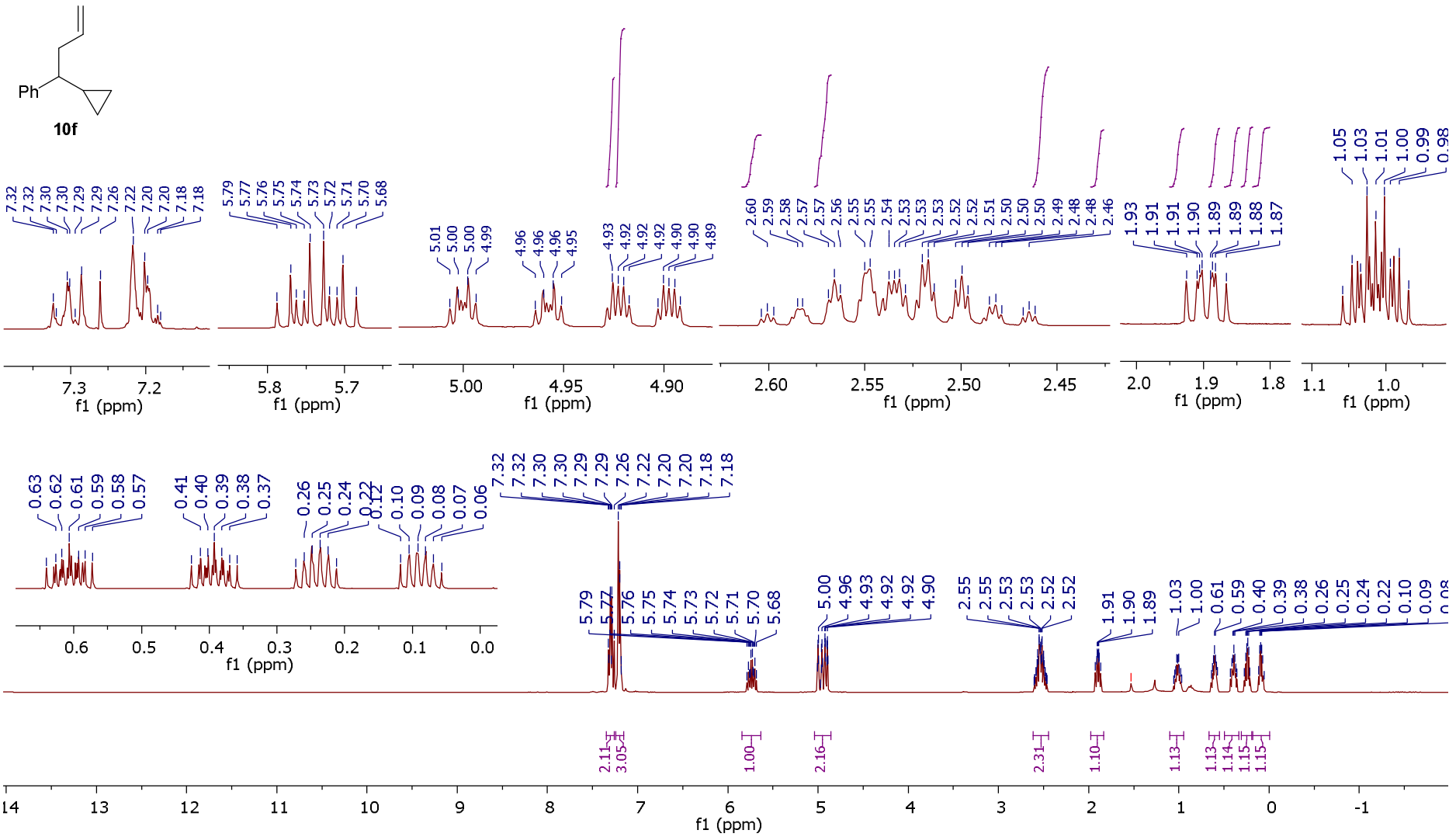

F
10a
7.30 7.27 7.27 7.23 7.22 7.21 7.21 7.20 7.19 7.17
7.00 6.99 6.98 6.98 6.97 6.96 6.95 6.94
5.78 5.76 5.74 5.73 5.72 5.70 5.69 5.68 5.66 5.64
5.07 5.06 5.06 5.05 5.01 5.00 5.00 4.99 4.98 4.98 4.98 4.97 4.95 4.95 4.94
4.03 4.01 3.98
2.83 2.82 2.82 2.81 2.80 2.80 2.79 2.79 2.78 2.78 2.77
f1 (ppm)
7.32 7.32 7.31 7.30 7.30 7.30 7.29 7.28 7.27 7.27 7.27 7.26 CDCl3 7.23 7.23 7.22 7.21 7.21 7.20 7.19 7.18 7.17 7.16 7.01 7.00 6.99 6.98 6.98 6.97 6.96 6.95 6.94 6.93
5.78 5.76 5.74 5.73 5.72 5.70 5.69 5.68 5.66 5.64 5.07 5.06 5.06 5.05 5.01 5.01 5.00 5.00 4.99 4.98 4.98 4.98 4.97 4.95 4.95 4.95 4.94 4.94
4.03 4.01 3.98
2.82 2.80 2.80 2.79
1.53 HDO
7.53 2.05 1.00 2.08 1.00 2.10
f1 (ppm)

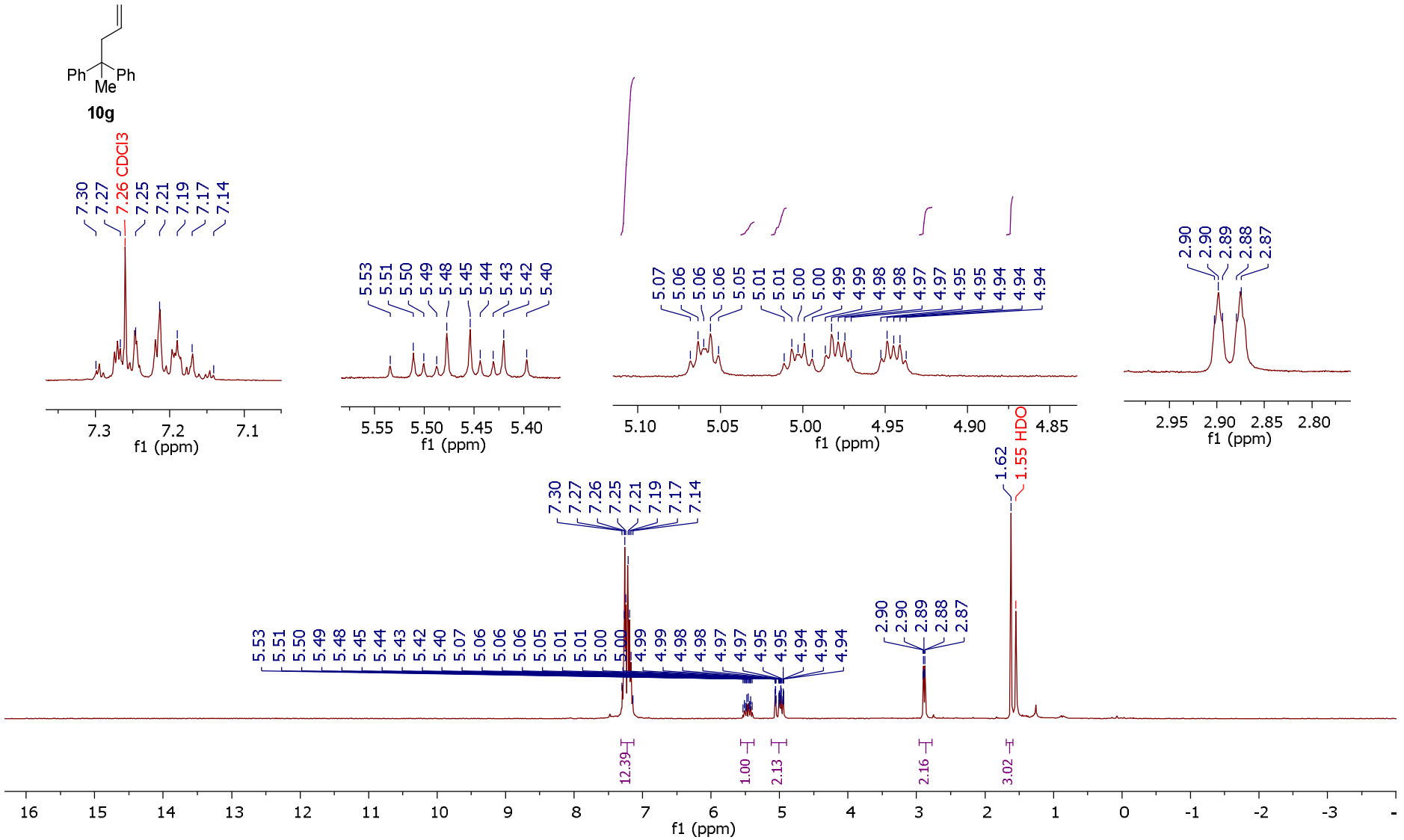

Br
10b
7.44 7.42 7.34 7.32 7.30 7.29 7.24 7.22 7.20 7.19 7.15 7.13 7.10 7.08
5.78 5.76 5.76 5.75 5.74 5.74 5.72 5.71 5.70 5.70 5.68
5.09 5.09 5.08 5.08 5.05 5.04 5.04 5.03 5.01 5.01 5.01 5.01 5.00 4.99 4.99 4.98 4.98
4.03 4.01 3.99 3.96
2.84 2.84 2.84 2.83 2.83 2.83 2.82 2.82 2.82 2.81 2.81 2.80 2.80 2.80
f1 (ppm)
1.56 HDO
1.37 1.21 0.41 1.19 0.89 0.96 0.96 1.13 2.00

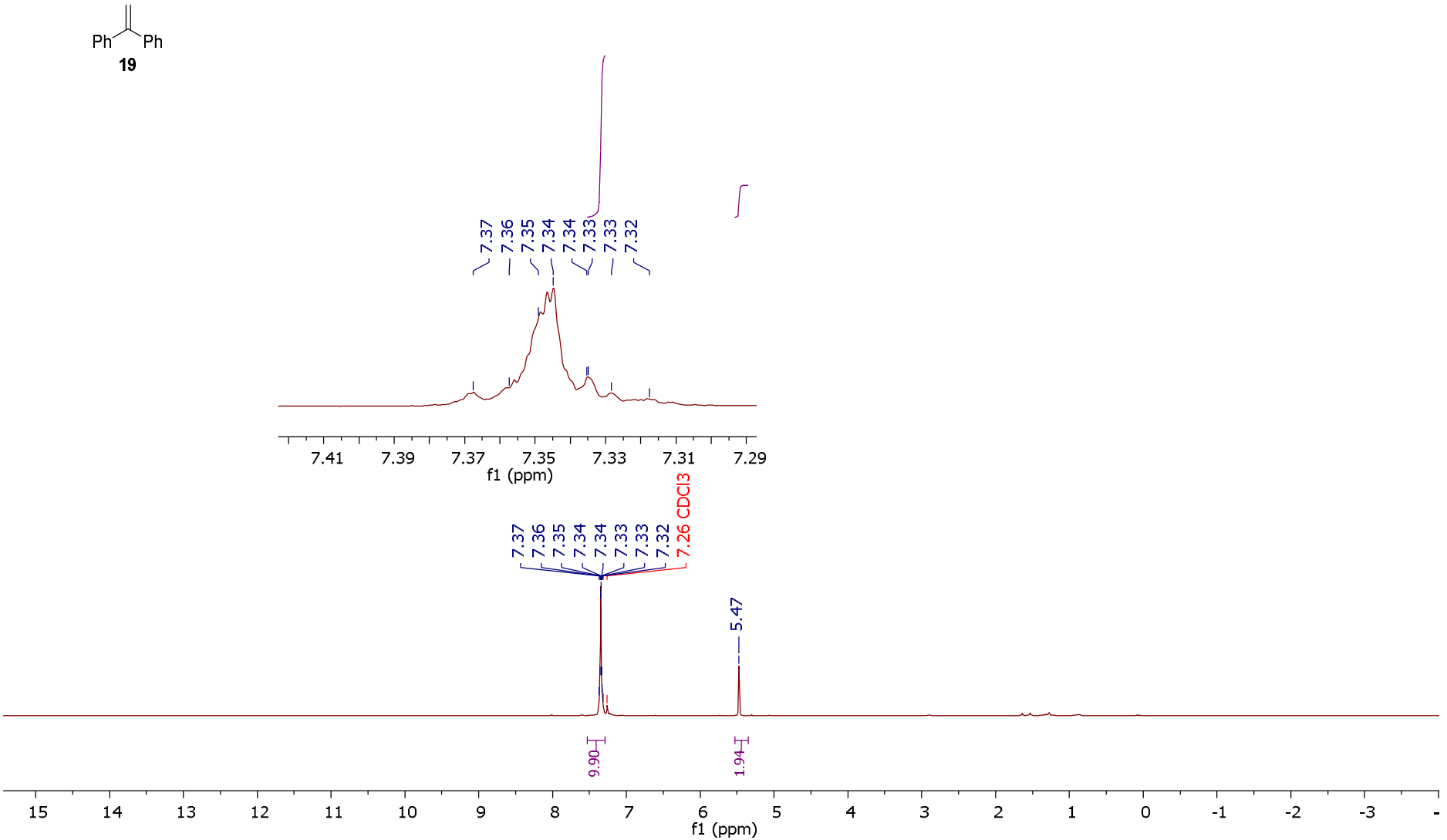

F3C
10c
7.57
7.55
7.39
7.37
7.35
7.33
7.33
7.32
7.31
7.28
7.26 cdcl3
7.26
7.25
7.25
7.24
7.24
7.23
5.78
5.76
5.76
5.75
5.74
5.72
5.71
5.70
5.70
5.68
5.10
5.09
5.09
5.09
5.05
5.05
5.05
5.04
5.02
5.02
5.01
5.01
5.00
4.99
4.99
4.99
4.12
4.10
4.09
2.92
2.90
2.88
2.88
2.87
2.87
2.87
2.86
2.86
2.85
2.84
2.82
2.80
f1 (ppm)
7.21
7.22
7.22
7.23
7.23
7.24
7.24
7.25
7.25
7.26
7.26 cdcl3
7.28
7.31
7.32
7.33
7.33
7.34
7.35
7.35
7.37
7.39
7.55
7.57
4.07
4.09
4.10
4.12
5.01
5.02
5.09
2.86
2.86
2.87
2.87
2.87
1.59 HDO
2.15
7.87
1.00
2.18
1.10
2.35
f1 (ppm)


F
F
10d
7.01 7.00 6.99 6.98 6.98 6.97 6.96 6.95 6.95
7.19 7.18 7.18 7.17 7.16 7.15 7.15 7.14
5.74 5.72 5.71 5.70 5.70 5.68 5.67 5.66 5.65 5.64
5.05 5.05 5.04 5.04 5.01 5.00 5.00 4.99 4.98 4.98 4.96 4.96 4.95
4.01 3.99 3.97
2.79 2.78 2.78 2.77 2.76 2.75 2.74
7.25 7.20 7.15 7.10 7.05 7.00 6.95 6.90
f1 (ppm)
5.75 5.70 5.65 5.60
f1 (ppm)
5.05 5.00 4.95
f1 (ppm)
4.02 3.96
f1 (ppm)
2.80 2.75
f1 (ppm)
7.26 cdcl3
7.19 7.18 7.18 7.17 7.16 7.15 7.15 7.14 7.01 7.00 6.99 6.98 6.98 6.97 6.96 6.95 6.95
5.74 5.72 5.71 5.70 5.70 5.68 5.67 5.66 5.65 5.64
5.04 4.99 4.98
4.01 3.99 3.97
2.78 2.78 2.77 2.76 2.75
1.54 HDO
4.16 4.13 1.00 2.10 1.04 2.16
14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 -1
f1 (ppm)

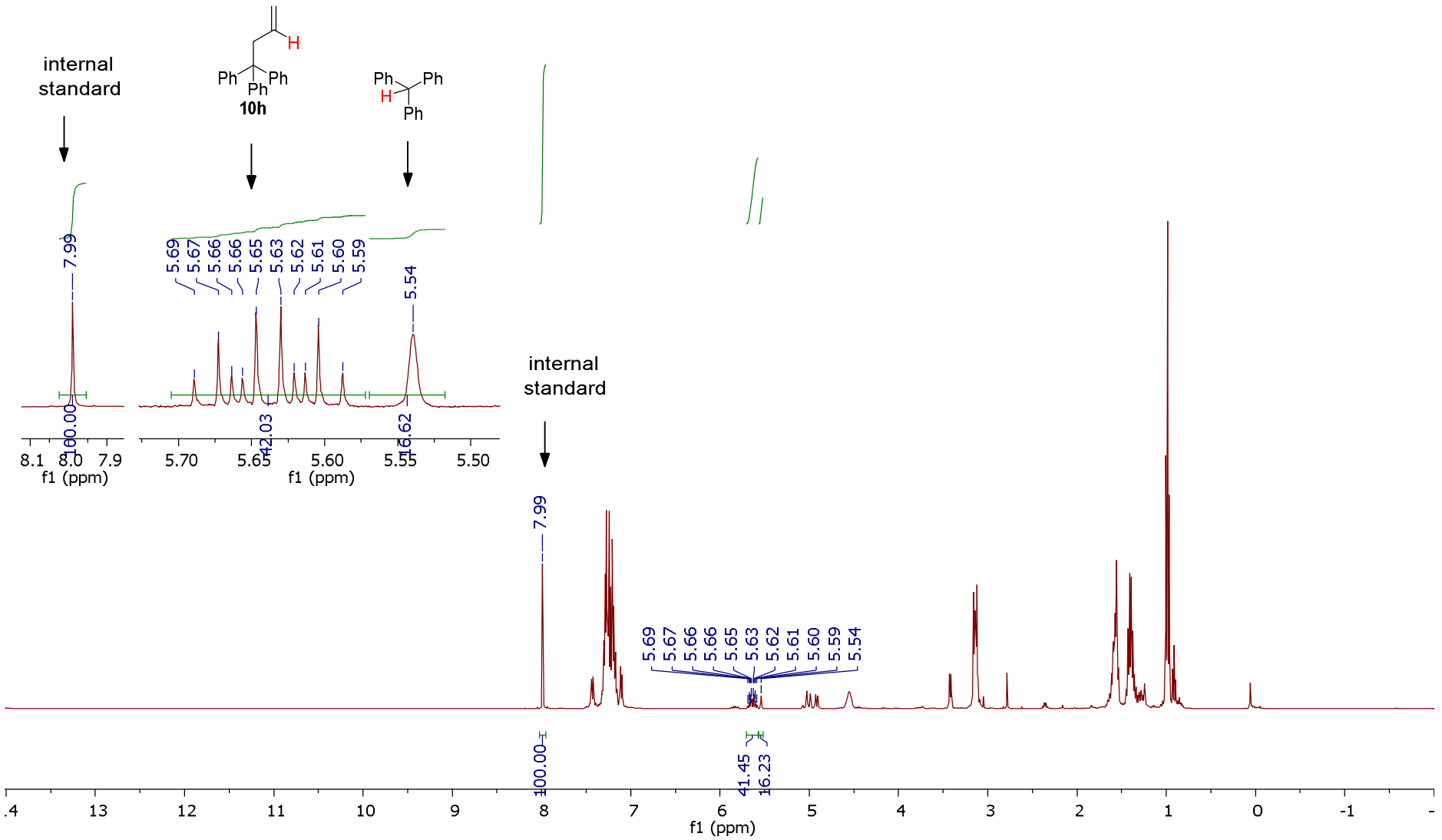

MeO
10e
7.28
7.26 CDCl3
7.25
7.23
7.23
7.21
7.17
7.14
6.85
6.84
6.83
6.82
6.81
6.80
5.79
5.77
5.75
5.74
5.73
5.71
5.70
5.69
5.67
5.65
5.06
5.06
5.05
5.05
5.00
5.00
4.99
4.97
4.97
4.96
4.96
4.94
4.93
4.93
4.92
3.99
3.97
3.94
2.82
2.81
2.81
2.80
2.79
2.79
2.78
2.77
2.76
2.76
f1 (ppm)
3.77
7.30
1.54 HDO
2.81
2.79
2.79
2.78
2.76
4.97
4.96
4.93
5.06
5.05
8.16
2.00
1.00
2.17
1.01
3.11
2.04

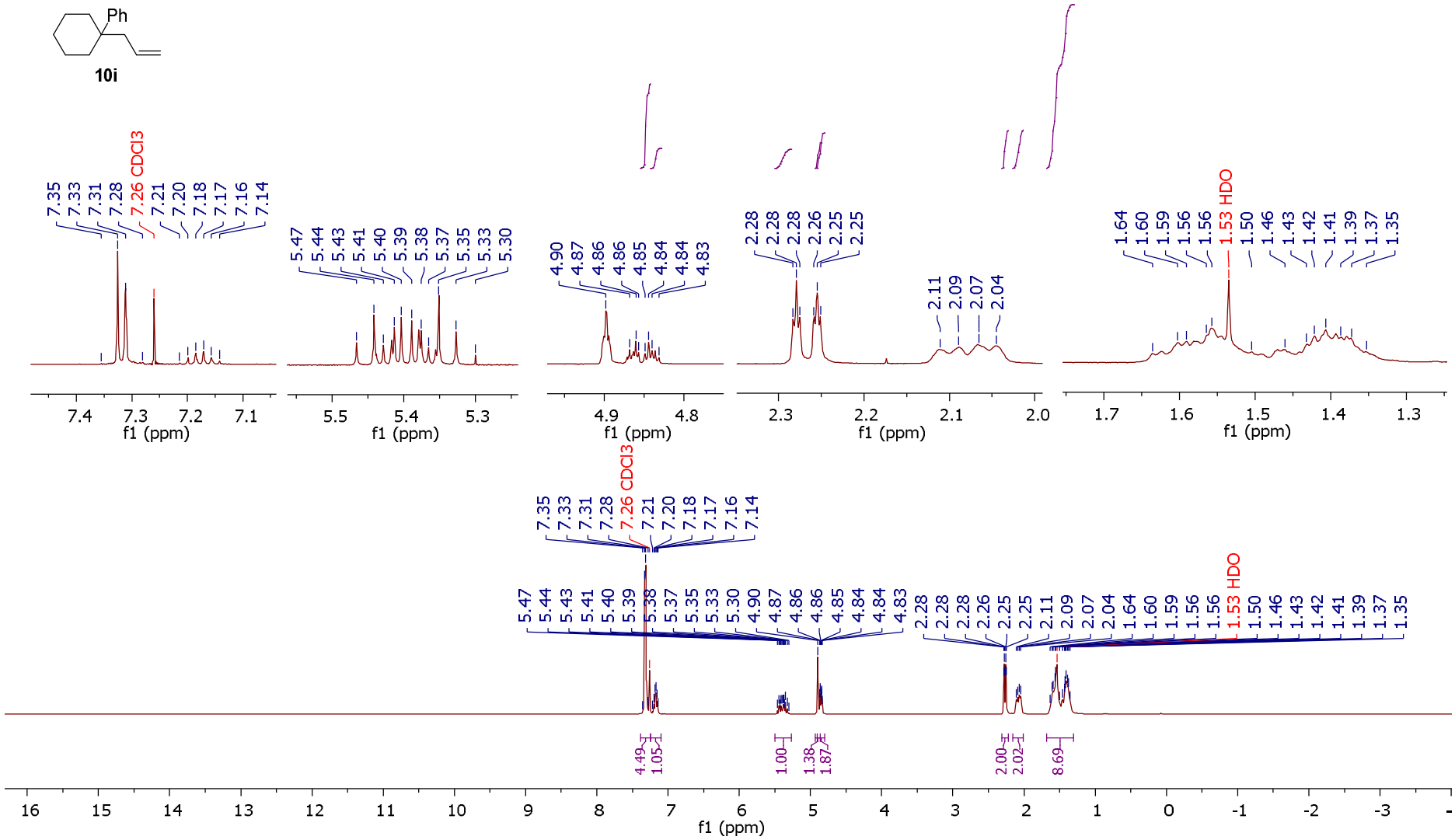

Ph
10f
f1 (ppm)

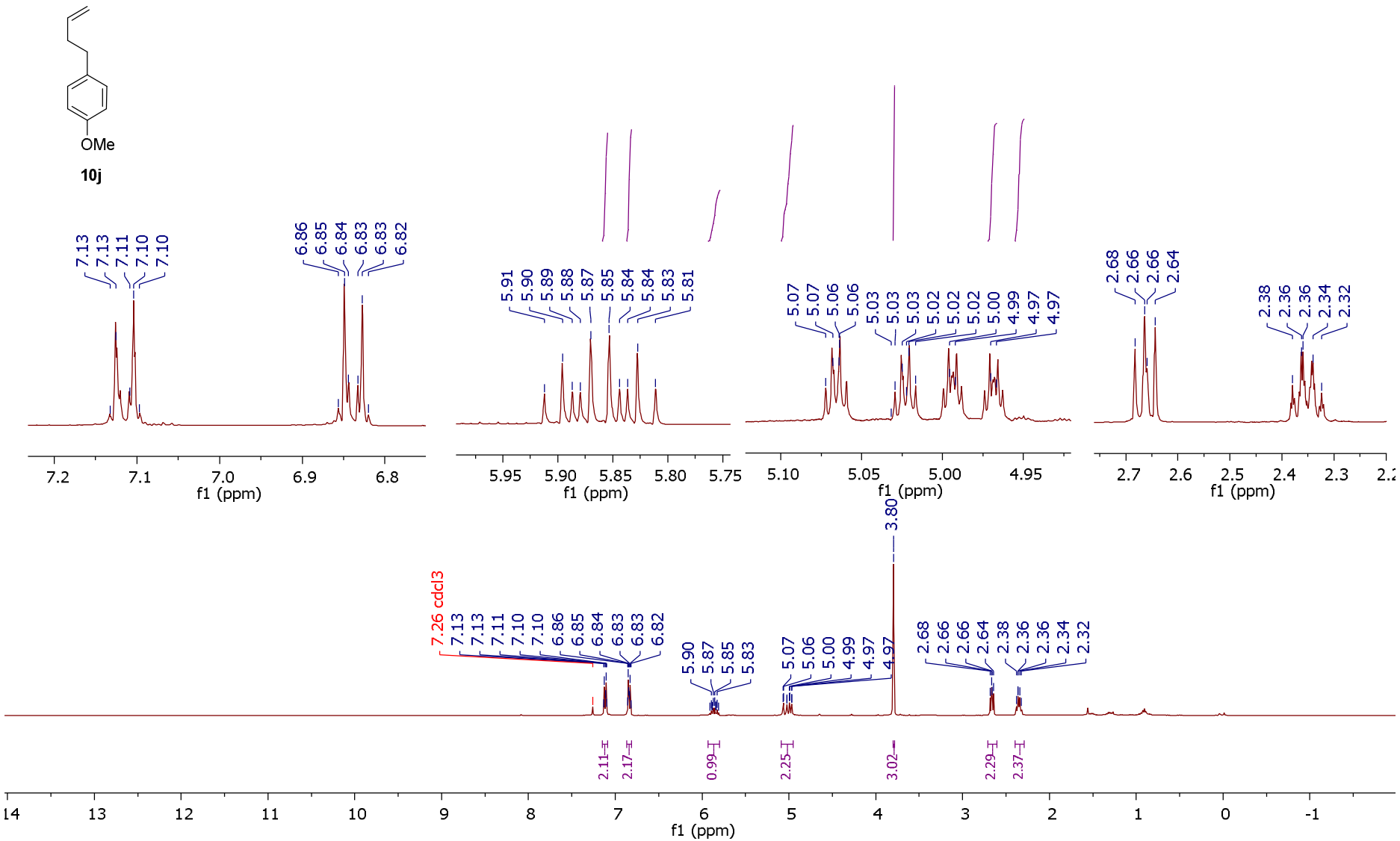

Ph
Ph
Me
10g
7.30
7.27
7.26 CDCl3
7.25
7.21
7.19
7.17
7.14
f1 (ppm)
5.53
5.51
5.50
5.49
5.48
5.45
5.44
5.43
5.42
5.40
5.07
5.06
5.06
5.06
5.05
5.01
5.01
5.00
5.00
4.99
4.99
4.98
4.98
4.97
4.97
4.95
4.95
4.94
4.94
4.94
2.90
2.90
2.89
2.88
2.87
1.62
1.55 HDO
12.39
1.00
2.13
2.16
3.02

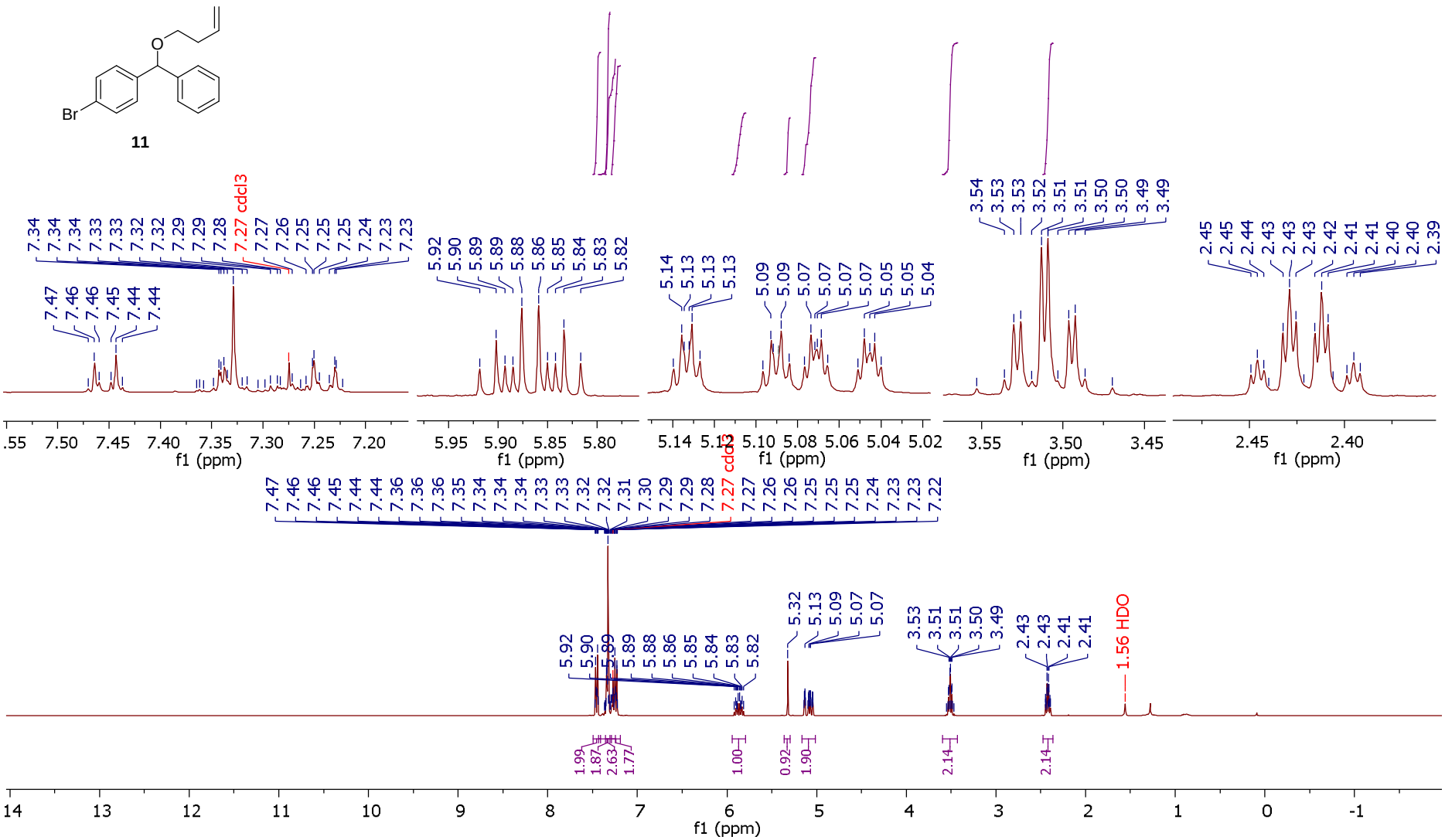

Ph
Ph
19
7.37
7.36
7.35
7.34
7.34
7.33
7.33
7.32
7.41
7.39
7.37
7.35
7.33
7.31
7.29
f1 (ppm)
7.37
7.36
7.35
7.34
7.34
7.33
7.33
7.32
7.26 CDCl3
5.47
9.90
1.94
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
f1 (ppm)

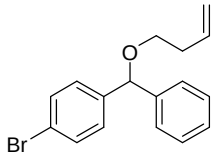
Crude ^{1}H NMR of reaction mixture after electrolysis of tributyl((trityloxy)methyl)stannane (**9h**)



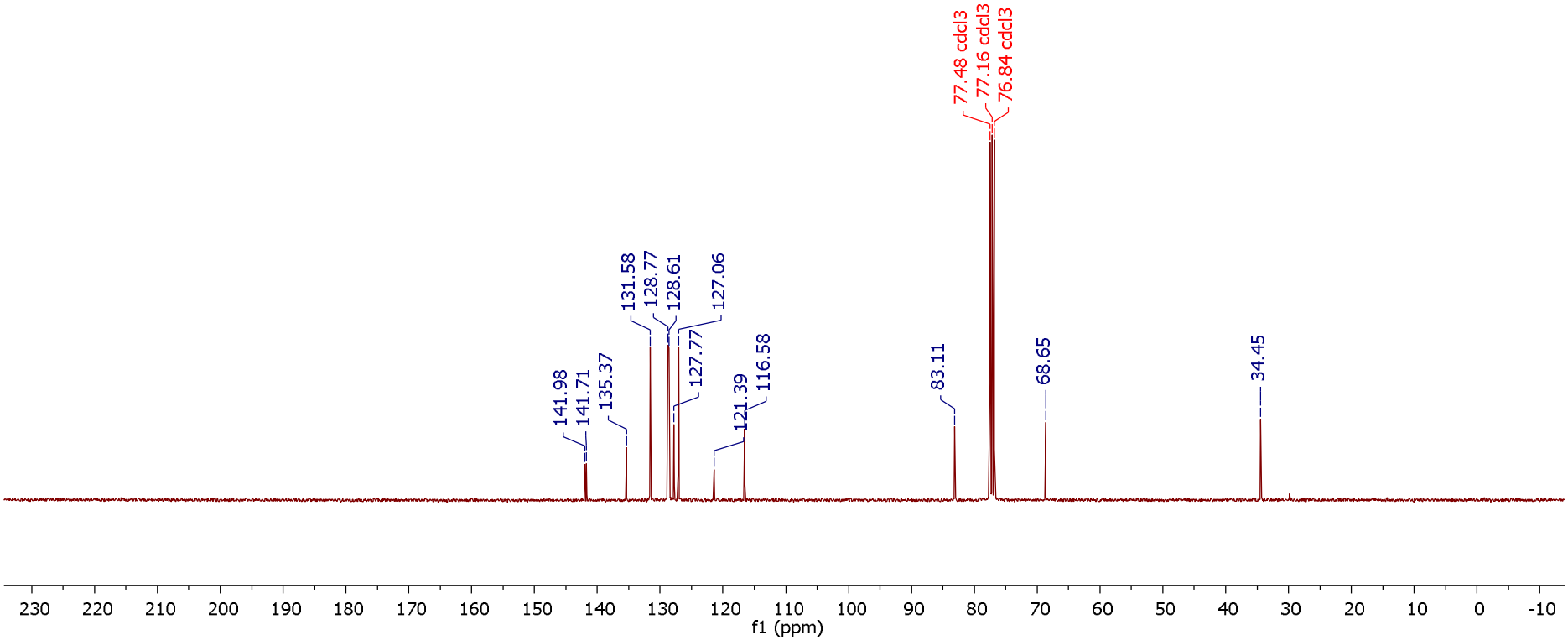

Ph
10i
7.35
7.33
7.31
7.28
7.26 CDCl3
7.21
7.20
7.18
7.17
7.16
7.14
5.47
5.44
5.43
5.41
5.40
5.39
5.38
5.37
5.35
5.33
5.30
4.90
4.87
4.86
4.86
4.85
4.84
4.84
4.83
2.28
2.28
2.28
2.26
2.25
2.25
2.11
2.09
2.07
2.04
1.64
1.60
1.59
1.56
1.56
1.53 HDO
1.50
1.46
1.43
1.42
1.41
1.39
1.37
1.35
f1 (ppm)
4.49
1.05
1.00
1.38
1.87
2.00
2.02
8.69


OMe
10j
7.13
7.13
7.11
7.10
7.10
6.86
6.85
6.84
6.83
6.83
6.82
5.91
5.90
5.89
5.88
5.87
5.85
5.84
5.84
5.83
5.81
5.07
5.07
5.06
5.06
5.03
5.03
5.03
5.02
5.02
5.00
4.99
4.97
4.97
2.68
2.66
2.66
2.64
2.38
2.36
2.36
2.34
2.32
f1 (ppm)
7.26 cdcl3
3.80
2.11
2.17
0.99
2.25
3.02
2.29
2.37


Br
O
11
7.27 cdcl3
1.56 HDO
f1 (ppm)


O
Br

11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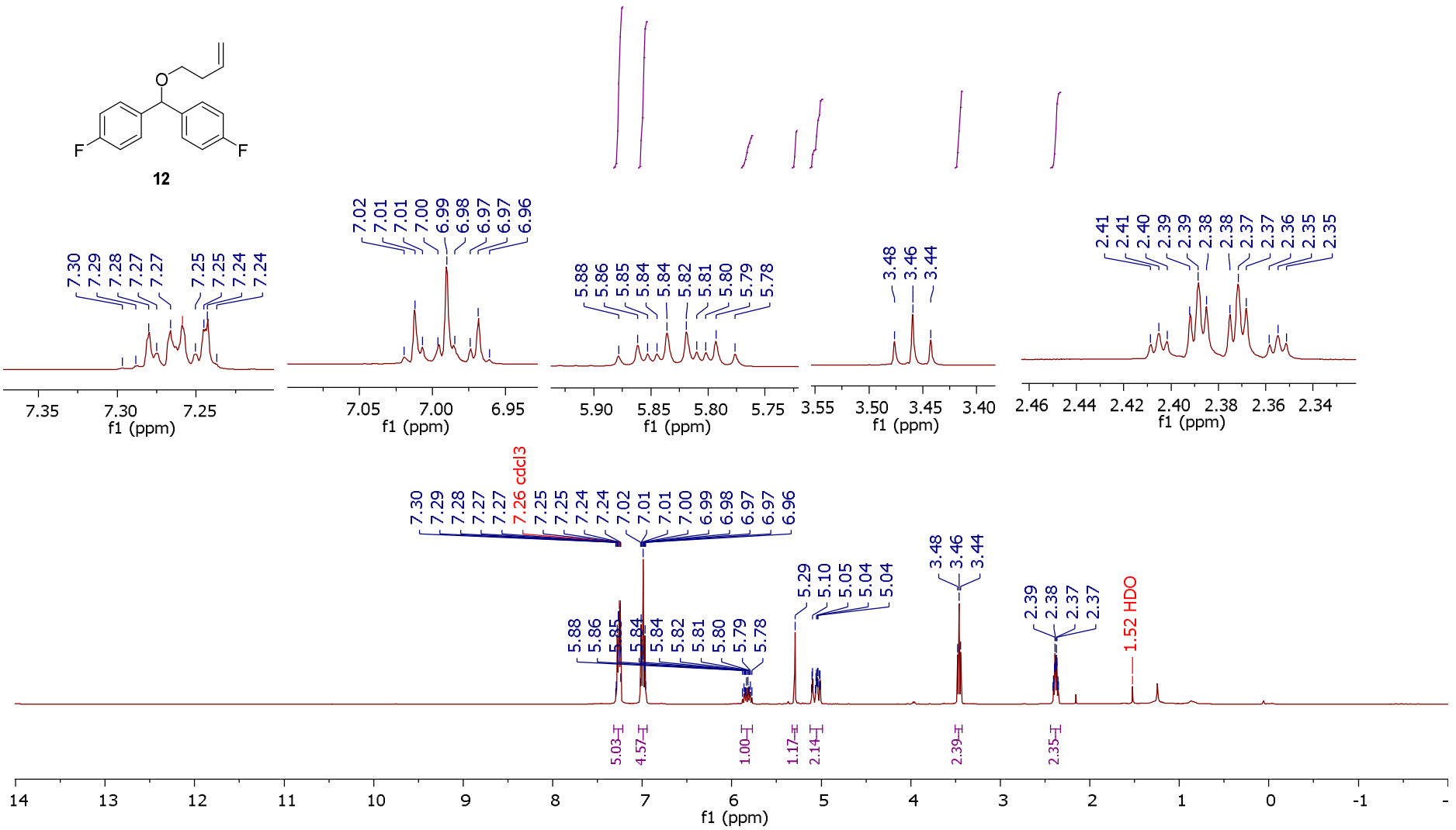
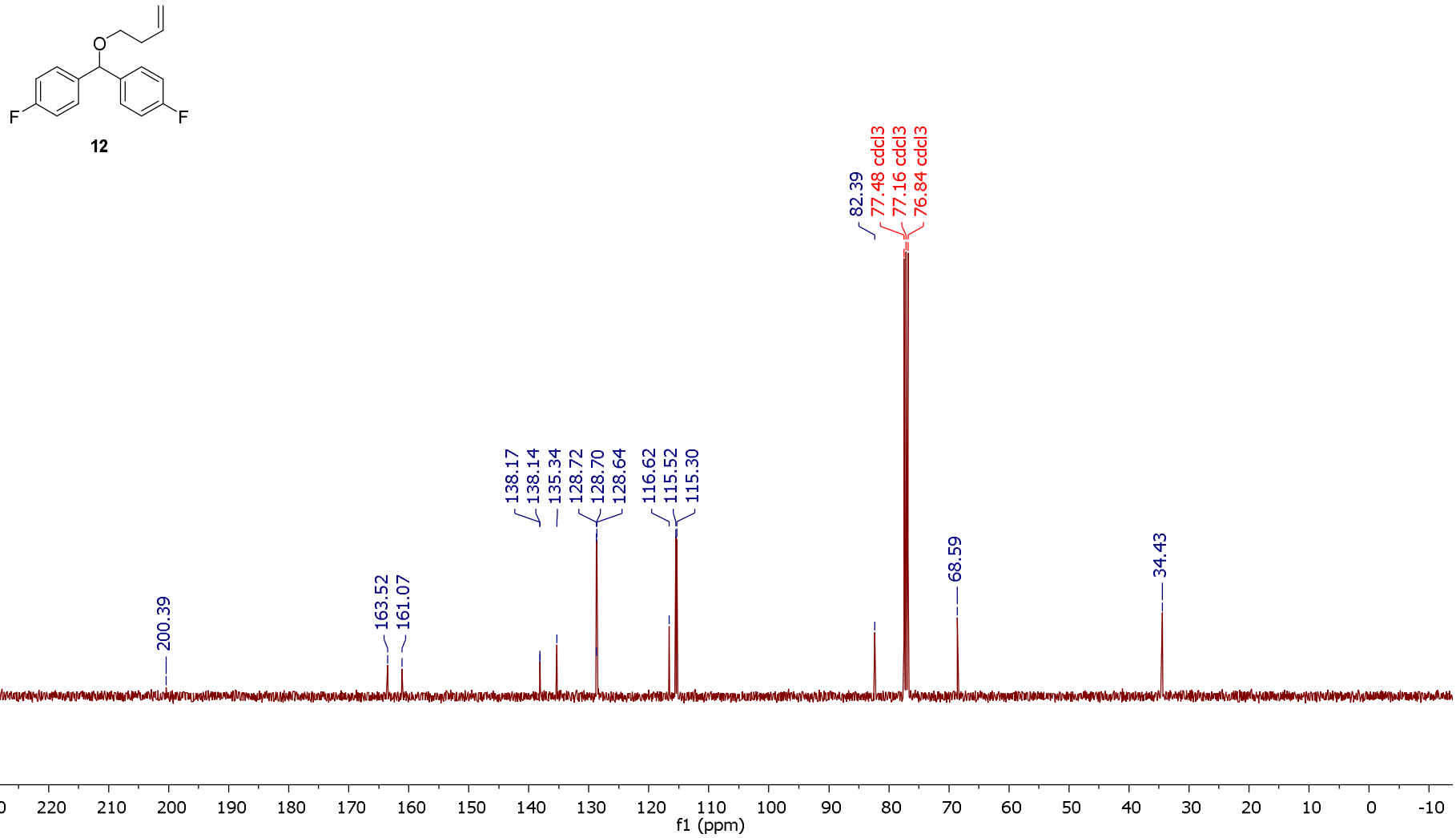
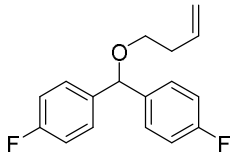
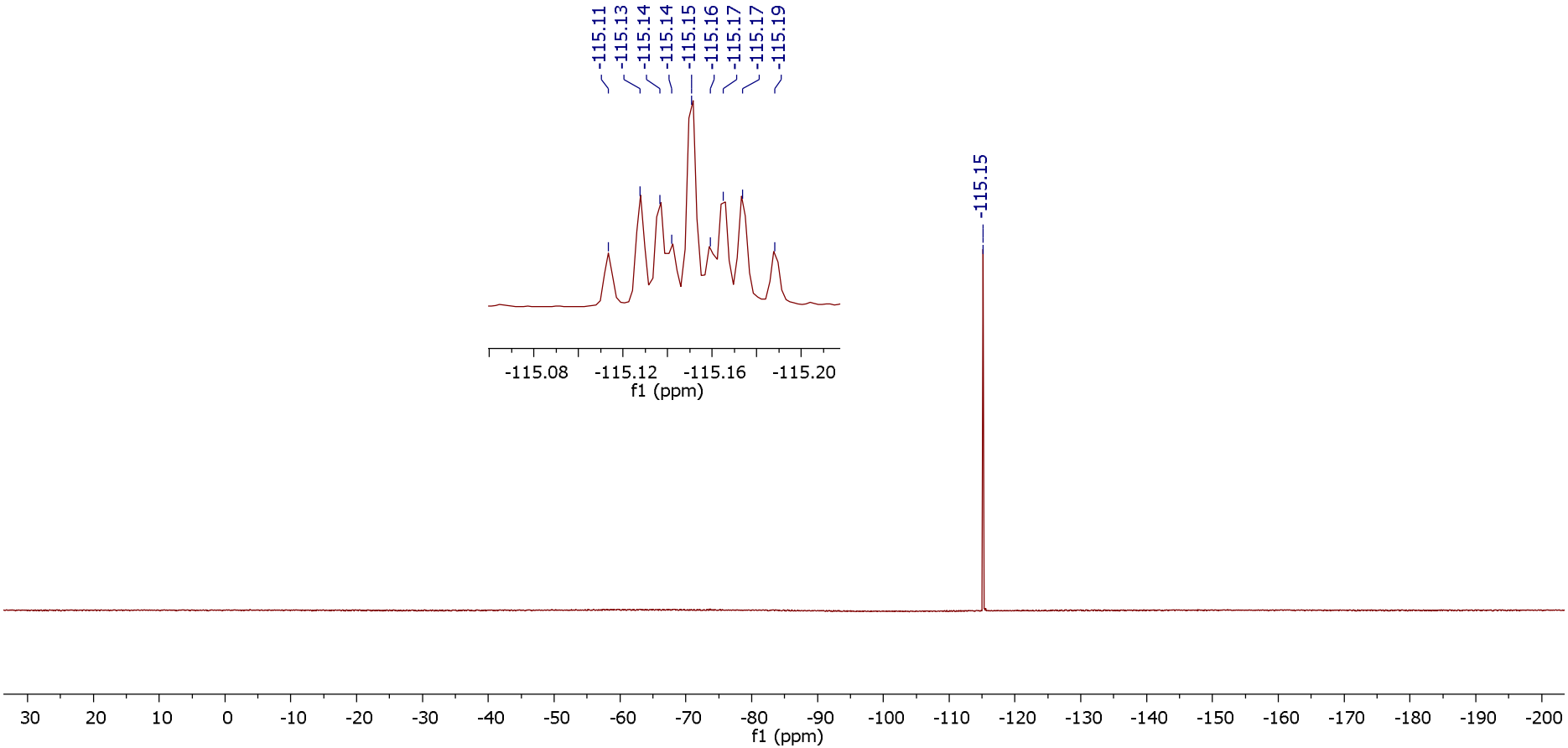
77.16 cdcl3
76.84 cdcl3
131.58
128.77
128.61
127.06
127.77
141.98
141.71
135.37
121.39
116.58
83.11
68.65
34.45
230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

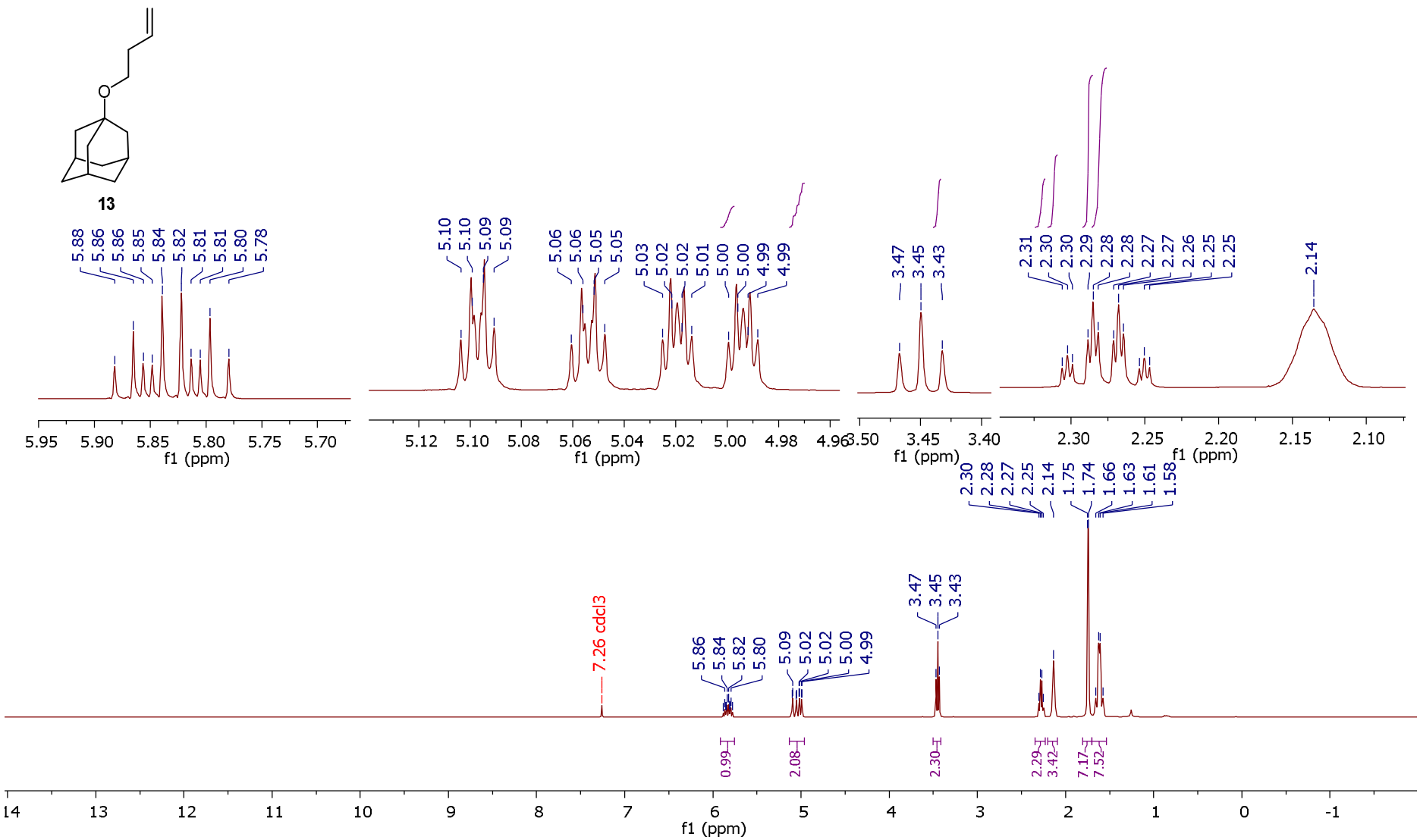

O
F
F
12
7.30 7.29 7.28 7.27 7.27 7.25 7.25 7.24 7.24
7.02 7.01 7.01 7.00 6.99 6.98 6.97 6.97 6.96
5.88 5.86 5.85 5.84 5.84 5.82 5.81 5.80 5.79 5.78
3.48 3.46 3.44
2.41 2.41 2.40 2.39 2.39 2.38 2.38 2.37 2.37 2.36 2.35 2.35
f1 (ppm)
7.26 cddl3
5.29 5.10 5.05 5.04 5.04
2.39 2.38 2.37 2.37
1.52 HDO
5.03 4.57 1.00 1.17 2.14 2.39 2.35

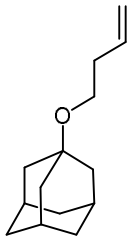

O
F
F
12
82.39
77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
138.17
138.14
135.34
128.72
128.70
128.64
116.62
115.52
115.30
68.59
34.43
200.39
163.52
161.07
230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)


O
F
F

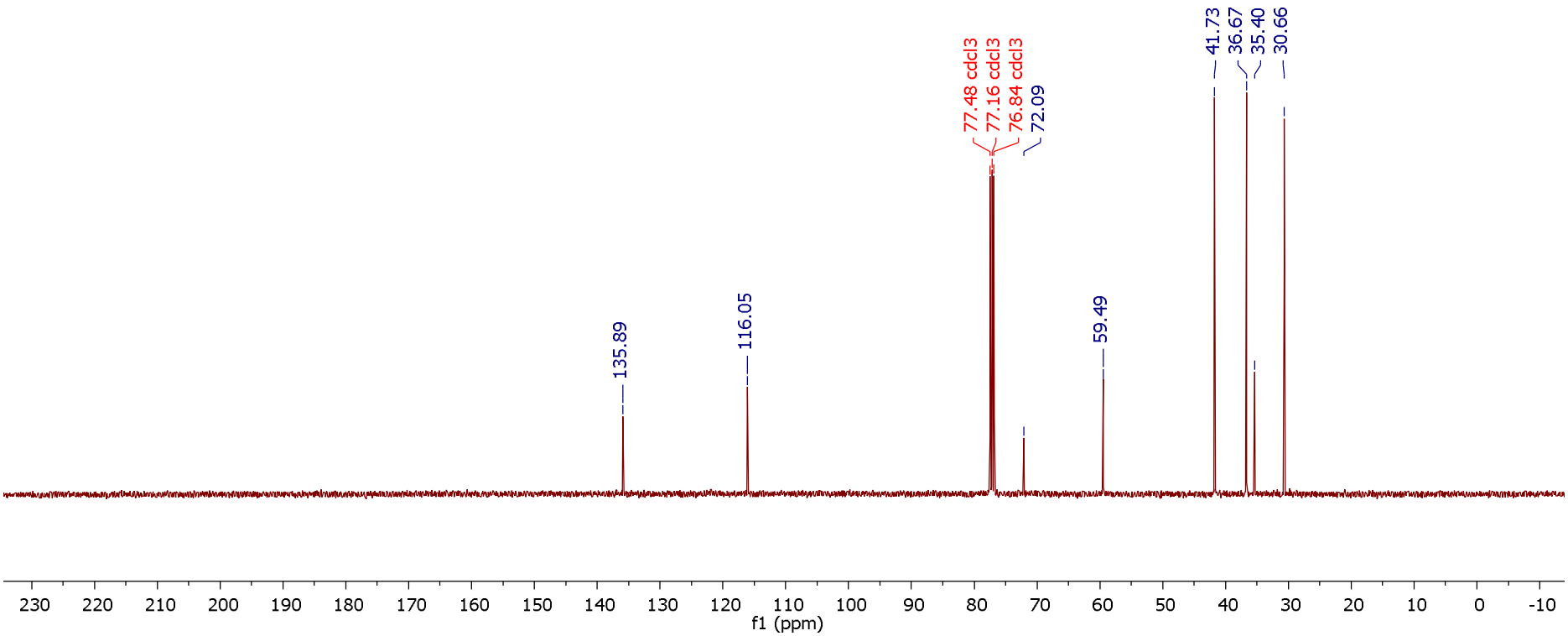
12


-115.11
-115.13
-115.14
-115.14
-115.15
-115.16
-115.17
-115.17
-115.19
-115.08
-115.12
-115.16
-115.20
f1 (ppm)
-115.15
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
f1 (ppm)


13
5.88
5.86
5.86
5.85
5.84
5.82
5.81
5.81
5.80
5.78
5.10
5.10
5.09
5.09
5.06
5.06
5.05
5.05
5.03
5.02
5.02
5.01
5.00
5.00
4.99
4.99
3.47
3.45
3.43
2.31
2.30
2.30
2.29
2.28
2.28
2.27
2.27
2.26
2.25
2.25
2.14
f1 (ppm)
7.26 cdcl3
2.30
2.28
2.27
2.25
2.14
1.75
1.74
1.66
1.63
1.61
1.58
0.99
2.08
2.30
2.29
3.42
7.17
7.52



13


77.48 cdcl3
77.16 cdcl3
76.84 cdcl3
72.09
41.73
36.67
35.40
30.66
135.89
116.05
59.49
230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)