Supporting Information

Synthesis of 2-trifluoromethylated quinolines from CF_3-enamines

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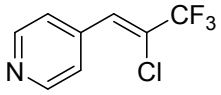
Table of contents

Experimental section

General remarks. ^{1}H, ^{13}C and ^{19}F NMR spectra were recorded on Bruker AVANCE 400.1 MHz spectrometer in $CDCl_3$ at 400.1, 100.6 and 376.5 MHz respectively. Chemical shifts (δ) in ppm are reported with the use of the residual chloroform signals (7.25 for ^{1}H and 77.0 for ^{13}C) as internal reference. The ^{19}F chemical shifts were referenced to C_6F_6, (-162.9 ppm). The coupling constants (*J*) are given in Hertz (Hz). The following abbreviations are used in reporting NMR data: s, singlet; brs, broad singlet; d, doublet; t, triplet; q, quartet; dd, doublet of doublets; ddd, doublet of doublets of doublets; td, triplet of doublets; pt, pseudo-triplet; ptd, pseudo-triplet of doublets;m, multiplet. ESI-MS spectra were measured with an Orbitrap Elite instrument. TLC analysis was performed on "Merck 60 F_{254}" plates. Column chromatography was performed on silica gel. Melting points were determined on an Electrothermal 9100 apparatus. All reagents were of reagent grade and were used as such or were distilled prior to use. Starting α-CF_3-β-aryl enamines **2** were synthesized using previously reported procedures[1] by the reaction of β-halogeno-β-trifluoromethylstyrenes with 2.2 equivalents of lithium pyrrolidide (generated by the reaction of pyrrolidine and n-BuLi, **2a-e**) in THF (method A) or by the reaction with 10 equivalents of pyrrolidine in neat (**2f-k,** method B). 2-Nitrothiophene-3-carbaldehyde[2] and 4-aminonicotinaldehyde[3] were prepared as previously reported.

***(Z)*-4-(2-Chloro-3,3,3-trifluoroprop-1-en-1-yl)pyridine (1j).** Obtained from isonicotinaldehyde



(16.07 g, 150 mmol) by catalytic olefination reaction using procedure used for olefination of picolinaldehyde.[4] Burgundy oil, yield 16.51 g (53%). Mixture of *Z*- and *E*-isomers 82:18. For the mixture of isomers: *Z*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.23

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[1] Muzalevskiy, V. M.; Nenajdenko, V. G.; Rulev, A. Yu.; Ushakov, I. A.; Romanenko, G. V.; Shastin, A. V.; Balenkova, E. S.; Haufe, G. Selective synthesis of α-trifluoromethyl-β-arylenamines or vinylogous guanidinium salts by treatment of β-halo-β-trifluoromethylstyrenes with secondary amines under different conditions. *Tetrahedron* **2009,** *65*, 6991 - 7000.

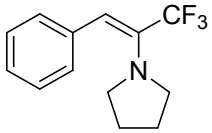
[2] H. R. Snyder, L. A. Carpino, J. F. Zack, and J. F. Mills, Synthesis of the Thieno [3,2-b]pyrrole System, *J. Am. Chem. Soc.,* 1957, **79**, 2556-2559.

[3] J. A. Turner, Regiospecific electrophilic substitution of aminopyridines: ortho lithiation of 2-, 3-, and 4-(pivaloylamino)pyridines, *J. Org. Chem.*, 1983, **48**, 3401-3408.

[4] V. M. Muzalevskiy, A. V. Shastin, E. S. Balenkova, V. G. Nenajdenko, New approach to the synthesis of trifluoromethylvinyl sulfides, *Russ. Chem. Bull*. 2007, **56**, 1526–1533.

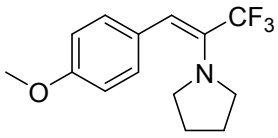
(s, 1H, CH=C), 7.46-7.54 (m, 2H, Py), 8.64-8.74 (m, 2H, Py). $^{13}C\{^1H\}$ NMR (100.6 MHz, $CDCl_3$): δ 120.1 (q, $^1J_{CF}$ = 272.4 Hz, CF_3), 123.3, 123.7 (q, $^2J_{CF}$ = 37.4 Hz, C-CF_3), 128.4 (q, $^3J_{CF}$ = 4.4 Hz, CH=CCF_3), 138.7, 150.2. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -70.4 (d, ^4J = 0.7 Hz, 3F, CF_3). *E*-isomer: ^1H NMR (400.1 MHz, $CDCl_3$): δ 7.09-7.15 (m, 2H, Py), 7.17 (s, 1H, CH=C), 8.58-8.64 (m, 2H, Py). $^{13}C\{^1H\}$ NMR (100.6 MHz, $CDCl_3$): δ 119.8 (q, $^1J_{CF}$ = 274.4 Hz, CF_3), 122.4 (q, $^3J_{CF}$ = 2.0 Hz), 124.2 (q, $^2J_{CF}$ = 38.4 Hz, C-CF_3), 133.9 (q, $^3J_{CF}$ = 2.4 Hz, CH=CCF_3), 140.1, 149.8. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.9. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_8H_6ClF_3N^+$: 208.0135; found: 208.0130.

Synthesis of enamines 2 by the reaction of styrenes 1 with lithium amide of pyrrolidine (method A). A preheated three neck 250 mL round bottomed flask was flushed with argon, charged with dry THF (75 mL), dry pyrrolidine (6.72 mL, 82 mmol) and cooled down to -70 °C. Next, *n*-BuLi (32 mL, 80 mmol, 2.5 M solution of *n*-BuLi in hexane) was added dropwise during 5 min. The cooling bath was removed and the reaction mixture was allowed to warm to -5 – 0 °C. After that the reaction mixture was cooled down to -70 °C and corresponding styrene **1** (40 mmol) was slowly added. The reaction mixture was allowed to warm to room temperature and quenched by water (80 mL). Organic phase was separated and the water phase was extracted with ether (3×20 mL). Combined extracts were washed with water (50 mL), brine (50 mL) and dried over Na_2SO_4. Volatiles were removed in vacuo, and the residue was filtered through a short silica gel pad using hexane-CH_2Cl_2 (3:1).



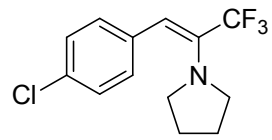
(Z)-1-(3,3,3-Trifluoro-1-phenylprop-1-en-2-yl)pyrrolidine (2a). Obtained from (Z)-(2-chloro-3,3,3-trifluoroprop-1-en-1-yl)benzene **1a** (8.26 g, 40 mmol) by method A. Pale brown oil, yield 8.26 g (86%). ^1H NMR (400.1 MHz, $CDCl_3$): δ 1.85-1.93 (m, 4H, $N(CH_2CH_2)_2$), 3.11-3.18 (m, 4H, $N(CH_2CH_2)_2$), 6.24 (s, 1H, CH=C), 7.23-7. 29 (m, 1H, Ph), 7.35-7.39 (m, 4H, Ph). $^{13}C\{^1H\}$ NMR (100.6 MHz, $CDCl_3$): δ 25.5, 50.2, 110.0 (q, $^3J_{CF}$ = 5.9 Hz, CH=CCF_3), 122.5 (q, $^1J_{CF}$ = 278.8 Hz, CF_3), 136.6 (q, $^2J_{CF}$ = 28.5 Hz, C-CF_3), 126.5, 127.8, 129.3, 135.8.

(Z)-1-(3,3,3-Trifluoro-1-(4-methoxyphenyl)prop-1-en-2-yl)pyrrolidine (2b). Obtained from (Z)-1-(2-



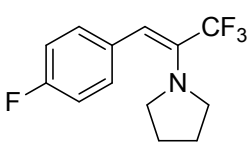
chloro-3,3,3-trifluoroprop-1-en-1-yl)-4-methoxybenzene **1b** (9.46 g, 40 mmol) by method A. Slightly brown oil, yield 9.41 g (87%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.81-1.89 (m, 4H, $N(CH_2C\underline{H}_2)_2$), 3.04-3.11 (m, 4H, $N(\underline{C}H_2CH_2)_2$), 3.84 (s, 3H, OCH_3), 6.21 (s, 1H, CH=C), 6.88 (d, ^{3}J = 8.7 Hz, 2H, Ar), 7.34 (d, ^{3}J = 8.7 Hz, 2H, Ar). $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 25.4, 49.9, 55.1, 112.9 (q, $^{3}J_{CF}$ = 5.1 Hz, $\underline{C}H=CCF_3$), 122.8 (q, $^{1}J_{CF}$ = 279.6 Hz, CF_3), 132.2 (q, $^{2}J_{CF}$ = 27.8 Hz, $\underline{C}$-CF_3), 113.4, 127.9, 130.6, 158.6.

(Z)-1-(1-(4-Chlorophenyl)-3,3,3-trifluoroprop-1-en-2-yl)pyrrolidine (2c). Obtained from (Z)-1-chloro-4-



(2-chloro-3,3,3-trifluoroprop-1-en-1-yl)benzene **1c** (9.64 g, 40 mmol) by method A. Slightly brown oil, yield 7.97 g (72%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.76-1.85 (m, 4H, $N(CH_2C\underline{H}_2)_2$), 3.00-3.07 (m, 4H, $N(C\underline{H}_2CH_2)_2$), 6.06 (s, 1H, CH=C), 7.19 (d, ^{3}J = 8.6 Hz, 2H, Ar), 7.25 (d, ^{3}J = 8.6 Hz, 2H, Ar). $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 25.5, 50.2, 108.2 (q, $^{3}J_{CF}$ = 5.9 Hz, $\underline{C}H=CCF_3$), 122.2 (q, $^{1}J_{CF}$ = 278.8 Hz, CF_3), 134.1 (q, $^{2}J_{CF}$ = 28.5 Hz, $\underline{C}$-CF_3), 127.9, 130.3, 131.8, 134.2. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -64.6.

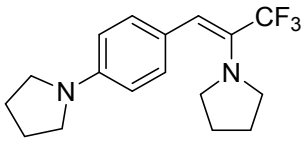
(Z)-1-(3,3,3-Trifluoro-1-(4-fluorophenyl)prop-1-en-2-yl)pyrrolidine (2d). Obtained from (Z)-1-(2-chloro-



3,3,3-trifluoroprop-1-en-1-yl)-4-fluorobenzene **1d** (2.240 g, 10 mmol), pyrrolidine (1.23 mL, 15 mmol, 1.5 equiv.) and n-BuLi (6 mL, 15 mmol, 1.5 equiv.) by method A. Slightly brown oil, yield 1.760 g (68%). Mixture of *Z*- and *E*-isomers 95:5. For the mixture of isomers: *Z*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.76-1.87 (m, 4H, $N(CH_2C\underline{H}_2)_2$), 3.02-3.05 (m, 4H, $N(C\underline{H}_2CH_2)_2$), 6.11 (s, 1H, CH=C), 6.96-7.03 (m, 2H, Ar), 7.25-7.30 (m, 2H, Ar). $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 25.4, 50.1 (q, $^{4}J_{CF}$ = 1.1 Hz, $N(\underline{C}H_2CH_2)_2$), 109.5 (q, $^{3}J_{CF}$ = 5.9 Hz, $\underline{C}H=CCF_3$), 114.7 (d, $^{2}J_{CF}$ = 21.4 Hz), 122.4 (q, $^{1}J_{CF}$ = 279.0 Hz, CF_3), 130.7 (d, $^{3}J_{CF}$ = 7.7 Hz), 131.6 (d, $^{4}J_{CF}$ = 3.5 Hz), 133.5 (dq, $^{2}J_{CF}$ = 26.7 Hz, $\underline{C}$-CF_3), 161.3 (d, $^{1}J_{CF}$ = 246.5 Hz). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -65.5 (s, 3F, CF_3), -115.50…-116.15 (m, 1F, 4-FC_6H_4). HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{13}H_{14}F_4N^+$: 260.1057; found: 260.1060. *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 2.00-2.04 (m, 4H, $N(CH_2C\underline{H}_2)_2$),

3.16-3.19 (m, 4H, N(C$\underline{H}_2$CH$_2$)$_2$) 5.59 (s, 1H, CH=C), 6.91-6.96 (m, 2H, Ar). Other signals are overlapped with those of major isomer. ^{13}C NMR (100.6 MHz, $CDCl_3$): δ 24.7, 49.4 (q, $^4J_{CF}$ = 1.9 Hz, N(C$\underline{H}_2$CH$_2$)$_2$). Other signals are overlapped with those of major isomer or can not be seen in the spectrum due to the low concentration of minor isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -59.5 (s, 3F, CF_3), -117.72…-117.97 (m, 1F, 4-FC_6H_4).

(Z)-1-(3,3,3-Trifluoro-1-(4-(pyrrolidin-1-yl)phenyl)prop-1-en-2-yl)pyrrolidine (2e). Obtained from (Z)-1-

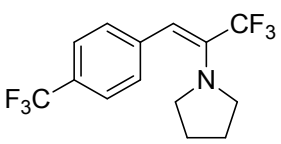


(2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-4-fluorobenzene **1d** (5.78 g, 18 mmol), pyrrolidine (4.42 mL, 54 mmol, 3 equiv.) and n-BuLi (22 mL, 55 mmol, 3 equiv.) by method A. Slightly beige solid, mp 57-58 °C, yield 4.035 g (72%). Mixture of *Z*- and *E*-isomers 97:3. For the mixture of isomers: *Z*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.82-1.90 (m, 4H, N(CH$_2$C$\underline{H}_2$)$_2$), 1.98-2.06 (m, 4H, N(CH$_2$C$\underline{H}_2$)$_2$), 3.07-3.11 (m, 4H, N(C$\underline{H}_2$CH$_2$)$_2$), 3.31-3.34 (m, 4H, N(C$\underline{H}_2$CH$_2$)$_2$), 6.29 (s, 1H, CH=C), 6.53 (d, ^3J = 8.8 Hz, 2H, Ar), 7.38 (d, ^3J = 8.8 Hz, 2H, Ar). ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 25.3, 25.5, 47.5, 49.5, 111.0, 117.3 (q, $^3J_{CF}$ = 6.1 Hz, $\underline{C}$H=CCF_3), 122.0, 123.3 (q, $^1J_{CF}$ = 280.0 Hz, CF_3), 129.8 (q, $^2J_{CF}$ = 27.5 Hz, $\underline{C}$-CF_3), 130.7, 147.0. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -64.7. *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.92-1.95 (m, 4H, N(CH$_2$C$\underline{H}_2$)$_2$), 3.13-3.16 (m, 4H, N(C$\underline{H}_2$CH$_2$)$_2$), 3.28-3.31 (m, 4H, N(C$\underline{H}_2$CH$_2$)$_2$), 5.79 (s, 1H, CH=C), 6.51 (d, ^3J = 8.6 Hz, 2H, Ar), 7.11 (d, ^3J = 8.6 Hz, 2H, Ar). Other signals are overlapped with those of major isomer. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 24.36, 24.42, 45.0, 49.8, 110.9, 130.5 (q, $^2J_{CF}$ = 29.4 Hz, $\underline{C}$-CF_3), 130.9. Other signals are overlapped with those of major isomer or can not be seen in the spectrum due to the low concentration of minor isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -59.8. HRMS (ESI-TOF): m/z [M+H]$^+$ Calcd for $C_{17}H_{22}F_3N_2^+$: 311.1730; found: 311.1723.

Synthesis of enamines 2 by the reaction with pyrrolidine in neat (general procedure, method B). A one neck 25 mL round bottomed flask was charged with dry pyrrolidine (8.5 mL, 100 mmol), cooled down to -18 °C and corresponding styrene **1** (10 mmol) was added in one portion with vigorous stirring. The reaction mixture was stirred at room temperature for 1-3 h until all starting styrene was consumed (TLC

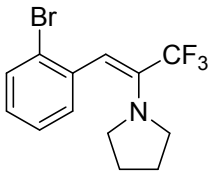
monitoring). The excess of pyrrolidine was evaporated in vacuo, the viscous residue was dissolved in CH_2Cl_2 (50 mL), washed with water (3 × 50 mL) and dried over Na_2SO_4. CH_2Cl_2 was removed in vacuo, and the residue was filtered through a short silica gel pad using hexane or appropriate mixtures of hexane and CH_2Cl_2. The *Z*/*E*-isomers of enamines **3** could not be separated by column chromatography.

1-[(1*Z*)-3,3,3-Trifluoro-1-(4-trifluoromethylphenyl)prop-1-en-2yl]pyrrolidine (2f). Obtained from (Z)-1-



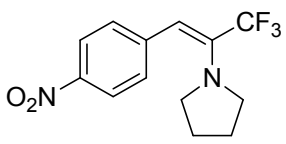
(2-bromo-3,3,3-trifluoroprop-1-en-1-yl)-4-(trifluoromethyl)benzene **1f** (3.962 g, 12.420 mmol) by method B. Colourless oil, yield 3.257 g (85%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.80-1.87 (m, 4H, N($CH_2C\underline{H}_2$)$_2$), 3.04-3.08 (m, 4H, N($C\underline{H}_2CH_2$)$_2$), 6.07 (s, 1H, CH=C), 7.30 (d, ^3J = 8.3 Hz, 2H, Ar), 7.54 (d, ^3J = 8.3 Hz, 2H, Ar)). ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 25.5, 50.6 (q, $^4J_{CF}$ = 1.7 Hz, N($\underline{C}H_2CH_2$)$_2$), 105.9 (q, $^3J_{CF}$ = 6.1 Hz, $\underline{C}$H=CCF_3,), 122.0 (q, $^1J_{CF}$ = 278.6 Hz, CF_3), 124.2 (q, $^1J_{CF}$ = 271.6 Hz, CF_3), 124.6 (q, $^3J_{CF}$ = 3.7 Hz), 127.8 (q, $^2J_{CF}$ = 32.4 Hz, $\underline{C}$-CF_3) 129.1, 135.3 (q, $^2J_{CF}$ = 28.4 Hz, $\underline{C}$-CF_3(Ar)) 139.7 (d, $^4J_{CF}$ = 1.3 Hz). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -65.8 (CF_3), -63.5 (4-$CF_3C_6H_4$). HRMS (ESI-TOF): m/z [M] Calcd for $C_{14}H_{13}F_6N$: 309.0947; found: 309.0943; m/z [M+H]$^+$ Calcd for $C_{14}H_{13}F_6N^+$: 310.1025; found: 310.1020.

(Z)-1-(1-(2-Bromophenyl)-3,3,3-trifluoroprop-1-en-2-yl)pyrrolidine (2g). Obtained from (Z)-1-bromo-2-



(2-bromo-3,3,3-trifluoroprop-1-en-1-yl)benzene **1g** (3.3001 g, 10.005 mmol) by method B. Colorless oil, yield 2.402 g (75%). Mixture of *Z*- and *E*-isomers 90:10. For the mixture of isomers: *Z*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.70-1.75 (m, 4H, N($CH_2C\underline{H}_2$)$_2$), 2.93-2.97 (m, 4H, N($C\underline{H}_2CH_2$)$_2$), 5.93 (s, 1H, C$\underline{H}$=C), 6.98 (td, ^3J = 7.6 Hz, ^4J = 1.6 Hz, 1H, Ar), 7.13 (dd, ^3J = 7.6 Hz, ^4J = 1.4 Hz, 1H, Ar), 7.16-7.22 (m, 1H, Ar), 7.47 (dd, ^3J = 7.9 Hz, ^4J = 0.6 Hz, 1H, Ar). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -65.9. *E*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.88-1.92 (m, 4H, N($CH_2C\underline{H}_2$)$_2$), 3.19-3.22 (m, 4H, N($C\underline{H}_2CH_2$)$_2$), 5.43 (s, 1H, CH=C). Other signals are overlapped with those of major isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -60.3.

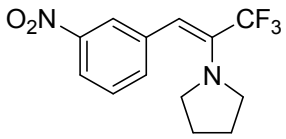
(Z)-1-(3,3,3-Trifluoro-1-(4-nitrophenyl)prop-1-en-2-yl)pyrrolidine (2h). Obtained from (Z)-1-(2-chloro-



3,3,3-trifluoroprop-1-en-1-

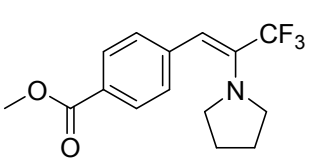
yl)-4-nitrobenzene **1h** (2.516 g, 10.000 mmol) by method B. Orange-yellow crystals, mp 74-77 °C, yield 2.576 g (90%). Mixture of *Z*- and *E*-isomers 96:4. For the mixture of isomers: *Z*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.81-1.91 (m, 4H, $N(CH_2C\underline{H}_2)_2$), 3.07-3.10 (m, 4H, $N(C\underline{H}_2CH_2)_2$), 6.03 (s, 1H, CH=C), 7.26 (d, ^3J = 8.7 Hz, 2H, Ar), 8.14 (d, ^3J = 8.7 Hz, 2H, Ar). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -65.9. *E*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.37 (s, 1H, CH=C), 7.86 (d, ^3J = 8.8 Hz, 2H, Ar), 8.29 (d, ^3J = 8.8 Hz, 2H, Ar). Other signals are overlapped with those of major isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -59.8.

(Z)-1-(3,3,3-Trifluoro-1-(3-nitrophenyl)prop-1-en-2-yl)pyrrolidine (2i). Obtained from (Z)-1-(2-chloro-



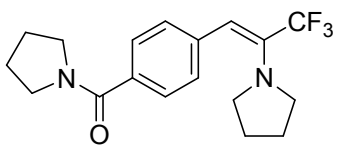
3,3,3-trifluoroprop-1-en-1-yl)-3-nitrobenzene **1i** (6.780 g, 26.949 mmol) by method B. Yellow oil, yield 6.865 g (89%). Mixture of *Z*- and *E*-isomers 97:3. For the mixture of isomers: *Z*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.81-1.90 (m, 4H, $N(CH_2C\underline{H}_2)_2$), 3.05-3.08 (m, 4H, $N(C\underline{H}_2CH_2)_2$), 6.08 (s, 1H, CH=C), 7.46 (td, ^3J = 15.7 Hz, ^3J = 7.8 Hz, 2H, Ar), 8.00 (d, ^3J = 8.0 Hz, 1H, Ar), 8.06 (s, 1H, Ar). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -66.0. *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.94-1.98 (m, 4H, $2NCH_2C\underline{H}_2$), 3.22-3.26 (m, 4H, $2NC\underline{H}_2CH_2$), 5.50 (s, 1H, CH=C). Other signals are overlapped with those of major isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -59.7.

Methyl 4-[(1Z)-3,3,3-trifluoro-2-pyrrolidin-1-ylprop-1-enyl]benzoate (2j). Obtained from methyl (Z)-4-



(2-bromo-3,3,3-trifluoroprop-1-en-1-yl)benzoate **1i** (3090 mg, 10 mmol) by method B by keeping the reaction overnight. Yield 2542 mg (85%); colorless oil; IR (nujol) 1610 (C=C), 1720 (C=O, CO_2Me) cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ 1.82-1.89 (m, 4H, $2NCH_2C\underline{H}_2$), 3.04-3.11 (m, 4H, $2NC\underline{H}_2CH_2$), 3.93 (s, 3H, $CO_2C\underline{H}_3$), 6.10 (s, 1H, $C\underline{H}$=CCF_3), 7.27 (d, *J* = 8.2 Hz, 2H, Ar), 7.98 (d, *J* = 8.2 Hz, 2H, Ar); ^{13}C NMR (100 MHz, $CDCl_3$) δ 25.5 ($2NCH_2\underline{C}H_2$), 50.6 ($2N\underline{C}H_2CH_2$), 52.0 ($CO_2\underline{C}H_3$), 106.4 (q, *J* = 5.9 Hz, $\underline{C}H$=CCF_3), 122.0 (q, *J* = 278.8 Hz, CF_3), 135.2 (q, *J* = 28.5 Hz, $\underline{C}$-CF_3); 127.4, 128.8, 129.0, 140.9 (Ar); 166.9 ($\underline{C}O_2CH_3$).

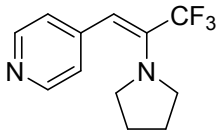
(Z)-Pyrrolidin-1-yl(4-(3,3,3-trifluoro-2-(pyrrolidin-1-yl)prop-1-en-1-yl)phenyl)methanone (2k).



Obtained from methyl (Z)-4-(2-bromo-3,3,3-trifluoroprop-1-en-1-

yl)benzoate **1i** (3.092 g, 10 mmol) by method B by keeping the reaction for 7 days. Yellow oil, yield 2.970 g (88%). Mixture of *Z*- and *E*-isomers 76:24. For the mixture of isomers: *Z*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.75-2.02 (m, 8H, $2N(CH_2C\underline{H}_2)_2$), 3.03-3.06 (m, 4H, $N(C\underline{H}_2CH_2)_2$), 3.43-3.46 (m, 2H, $N(C\underline{H}_2CH_2)_2$), 3.61-3.65 (m, 2H, $N(C\underline{H}_2CH_2)_2$), 6.07 (s, 1H, CH=C), 7.24 (d, ^{3}J = 8.3 Hz, 2H, Ar), 7.45 (d, ^{3}J = 8.3 Hz, 2H, Ar). ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 24.2, 25.3, 26.2, 46.02, 49.4, 50.2 (q, $^{4}J_{CF}$ = 1.3 Hz), 107.5 (q, $^{3}J_{CF}$ = 6.1 Hz, $\underline{C}H=CCF_3$,), 122.0 (q, $^{1}J_{CF}$ = 278.8 Hz, CF_3), 126.50, 128.5, 134.2 (q, $^{2}J_{CF}$ = 28.3 Hz, $\underline{C}$-CF_3), 134.5, 137.3, 169.2. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -65.8. *E*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.19-3.22 (m, 4H, $N(C\underline{H}_2CH_2)_2$), 5.59 (s, 1H, C<u>H</u>=C), 7.18 (d, ^{3}J = 8.2 Hz, 2H, Ar), 7.41 (d, ^{3}J = 8.2 Hz, 2H, Ar). Other signals are overlapped with those of major isomer. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 24.5, 45.98, 49.2 (q, $^{4}J_{CF}$ = 1.9 Hz), 105.6 (q, $^{3}J_{CF}$ = 3.1 Hz, $\underline{C}H=C$), 121.8 (q, $^{1}J_{CF}$ = 277.9 Hz, CF_3), 126.47, 128.6 (q, $^{3}J_{CF}$ = 2.3 Hz), 134.3, 135.3 (q, $^{2}J_{CF}$ = 30.1 Hz, $\underline{C}$-CF_3), 138.3, 169.4. Other signals are overlapped with those of major isomer or can not be seen in the spectrum due to the low concentration of minor isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -59.7. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{18}H_{22}F_3N_2O^+$: 339.1679; found: 339.1681; $[M+Na]^+$ Calcd for $C_{18}H_{21}F_3N_2NaO^+$: 361.1498; found: 361.1496.

4-(3,3,3-Trifluoro-2-(pyrrolidin-1-yl)prop-1-en-2-yl)pyridine (2l). Obtained from 4-[2-Chloro-3,3,3-

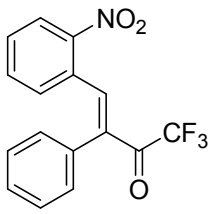


trifluoro-1-propenyl]pyridine **1j** (1.07 g, 4,8 mmol) by method B. Pale brown oil, yield 1.09 g (94%). Mixture of *Z*- and *E*-isomers 74:26. For the mixture of isomers: *Z*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.76-1.84 (m, 4H, $N(CH_2C\underline{H}_2)_2$), 3.02-3.05 (m, 4H, $N(C\underline{H}_2CH_2)_2$), 5.87 (s, 1H, CH=C), 6.97 (d, ^{3}J = 5.9 Hz, 2H, Py), 8.45 (d, ^{3}J = 4.9 Hz, 2H, Py). ^{13}C{1H} NMR (100.6 MHz, $CDCl_3$): δ 25.4, 50.9 (q, $^{4}J_{CF}$ = 1.7 Hz), 102.9 (q, $^{3}J_{CF}$ = 6.3 Hz, $\underline{C}H=CCF_3$), 121.6 (q, $^{1}J_{CF}$ = 278.8 Hz, CF_3), 123.3, 136.5 (q, $^{2}J_{CF}$ = 28.8 Hz, $\underline{C}$-CF_3), 143.7, 149.0. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -65.9. *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.87-1.93 (m, 4H, $N(CH_2C\underline{H}_2)_2$), 3.19-3.23 (m, 4H, $N(C\underline{H}_2CH_2)_2$), 5.33 (s, 1H, CH=C), 7.01(d, ^{3}J = 5.4 Hz, 2H, Py), 8.40 (d, ^{3}J = 4.5 Hz, 2H, Py). ^{13}C{1H} NMR (100.6 MHz, $CDCl_3$): δ 24.8, 49.3 (q, $^{4}J_{CF}$ = 2.7 Hz), 102.0 (q, $^{3}J_{CF}$ = 3.0 Hz, $\underline{C}H=CCF_3$), 121.7 (q, $^{1}J_{CF}$ = 277.9 Hz, CF_3), 123.9, 136.4 (q, $^{2}J_{CF}$ = 30.2 Hz, $\underline{C}$-CF_3), 144.9. Other signals are overlapped with those of major isomer or can not be seen in

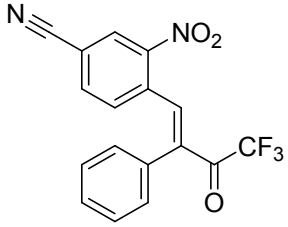
the spectrum due to the low concentration of minor isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -59.8. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{12}H_{14}F_3N_2^+$: 243.1104; found: 243.1106.

Synthesis of α,β-diaryl-CF_3-enones 4 by the reactions of α-CF_3-β-aryl enamines 2 with aromatic aldehydes 3 (general procedure): One-necked 50-mL round bottom flask (or 12 mL vial) was charged with enamine **2** (5 mmol), aromatic aldehyde **3** (5.75 mmol) and glacial acetic acid (10 mL or 5 mL for reaction in vial). Reaction mixture was kept at 80-90 °C under stirring for 6-12 hours until consumption of the aldehyde and corresponding benzyl ketone formed by hydrolisys of enamine (^{1}H NMR control). Volatiles were evaporated in vacuo, the residue was dissolved in CH_2Cl_2 (50 mL), washed with water (2x20 mL) and dried over Na_2SO_4. Volatiles were evaporated *in vacuo*, the residue was purified by column chromatography, using appropriate mixtures of hexane and CH_2Cl_2 or CH_2Cl_2 as eluents.

(*E*)-1,1,1-Trifluoro-4-(2-nitrophenyl)-3-phenylbut-3-en-2-one (4a). Obtained from enamine **2a** (1.206 g, 5.0 mmol) and 2-nitrobenzaldehyde (0.869 g, 5.75 mmol). Yellow oil, yield 1.225 g (76%). Mixture of *E*- and *Z*-isomers 97:3. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 6.93 (d, ^3J = 7.8 Hz, 1H, 2-$NO_2C_6H_4$), 7.02-7.10 (m, 2H, Ph), 7.21-7.30 (m, 3H, Ph), 7.34 (td, ^3J = 7.8 Hz, ^4J = 1.2 Hz, 1H, 2-$NO_2C_6H_4$), 7.41 (td, ^3J = 7.8 Hz, ^4J = 1.2 Hz, 1H, 2-$NO_2C_6H_4$), 8.14 (dd, ^3J = 7.8 Hz, ^4J = 1.2 Hz, 1H, 2-$NO_2C_6H_4$), 8.19 (s, 1H, CH=C). ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 116.5 (q, $^1J_{CF}$ = 292.1 Hz, CF_3), 124.8, 128.4, 128.7, 129.9, 130.1, 130.7, 131.6, 132.1, 133.4, 136.2, 143.3 (q, $^4J_{CF}$ = 3.3 Hz, C=C-C=O), 147.7, 181.1 (q, $^2J_{CF}$ = 34.5, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.3. For admixture of *Z*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.55 (td, ^3J = 8.2 Hz, ^4J = 1.1 Hz, 1H, 2-$NO_2C_6H_4$), 7.61-7.67 (m, 2H, 2-$NO_2C_6H_4$ and CH=C), 8.22 (dd, ^3J = 8.2 Hz, ^4J = 1.1 Hz, 2-$NO_2C_6H_4$). Other signals are overlapped with those of major isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -76.3. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{11}F_3NO_3^+$: 322.0686; found: 322.0679.

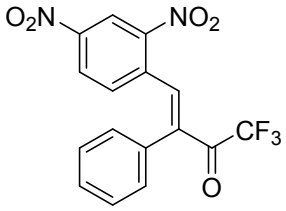


(*E*)-3-Nitro-4-(4,4,4-trifluoro-3-oxo-2-phenylbut-1-en-1-yl)benzonitrile (4b). Obtained from enamine **2a** (1.206 g, 5.0 mmol) and 4-formyl-3-nitrobenzonitrile (1.013 g, 5.75 mmol). Dark orange viscous liquid, yield 1.368 g (79%). Mixture of *E*- and *Z*-isomers 86:14. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.02-7.05 (m, 2H, Ph), 7.07 (d, ^3J = 8.1 Hz, 1H, Ar), 7.26-7.35 (m, 3H, Ph), 7.58 (dd, ^3J = 8.1 Hz, ^4J = 1.5 Hz, 1H, Ar), 8.10 (s, 1H, CH=C), 8.43 (d, ^4J = 1.5 Hz, 1H, Ar). ^{13}C{^{1}H}

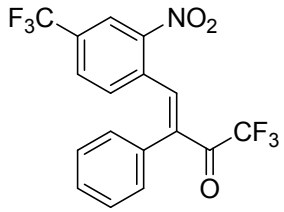


NMR (100.6 MHz, $CDCl_3$): δ 113.9, 115.9, 116.3 (q, $^1J_{CF}$ = 292.0 Hz, CF_3), 128.5, 128.8, 129.4, 130.0, 131.2, 132.9, 135.2, 135.9, 137.9, 140.4 (q, $^4J_{CF}$ = 3.2 Hz, C=C-C=O), 147.7, 180.8 (q, $^2J_{CF}$ = 34.0 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.6. For admixture of *Z*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.39-7.47 (m, 5H, Ph), 7.53 (d, ^3J = 8.0 Hz, 1H, Ar), 7.92 (dd, ^3J = 8.0 Hz, ^4J = 1.5 Hz, 1H, Ar), 8.47 (d, ^4J = 1.5 Hz, 1H, Ar). Other signals are overlapped with those of major isomer. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 113.8, 115.9, 127.1, 128.7, 129.1, 132.4, 133.26, 134.9, 136.6, 139.4, 147.2. Other signals are overlapped with those of major isomer or can not be seen in the spectrum due to the low concentration of minor isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -75.9. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{17}H_{10}F_3N_2O_3^+$: 347.0638; found: 347.0633.

(*E*)-4-(2,4-diNitrophenyl)-1,1,1-trifluoro-3-phenylbut-3-en-2-one (4c). Obtained from enamine **2a** (1.206 g, 5.0 mmol) and 2,4-dinitrobenzaldehyde (1.127 g, 5.75 mmol). Dark orange viscous liquid, yield 1.061 g (58%). Mixture of *E*- and *Z*-isomers 94:6. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.03-7.08 (m, 2H, Ph), 7.17 (d, ^3J = 8.6 Hz, 1H, Ar), 7.25-7.35 (m, 3H, Ph), 8.13 (s, 1H, CH=C), 8.16 (dd, ^3J = 8.6 Hz, ^4J = 2.3 Hz, 1H, Ar), 8.96 (d, ^4J = 2.3 Hz, 1H, Ar). ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 116.3 (q, $^1J_{CF}$ = 291.9 Hz, CF_3), 120.3, 127.3, 128.8, 129.4, 130.0, 131.2, 133.3, 136.8, 138.1, 140.1 (q, $^4J_{CF}$ = 3.2 Hz, C=C-C=O), 147.5, 147.8, 180.8 (q, $^2J_{CF}$ = 35.2 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.8. For admixture of *Z*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.41-7.48 (m, 4H), 7.62 (t, ^4J = 4.0 Hz, 2H, Ph), 8.47 (dd, ^3J = 8.5 Hz, ^4J = 2.3 Hz, 1H, Ar), 8.98 (d, ^4J = 2.3 Hz, 1H, Ar). Other signals are overlapped with those of major isomer. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 115.0 (q, $^1J_{CF}$ = 292.7 Hz, CF_3), 120.5, 120.6, 127.1, 127.9, 128.9, 129.1, 129.4, 132.3, 132.7, 136.6, 139.7, 147.3, 186.0 (q, $^2J_{CF}$ = 36.8 Hz, C=O). Other signals are overlapped with those of major isomer or can not be seen in the spectrum due to the low concentration of minor isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -75.7. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{10}F_3N_2O_5^+$: 367.0536; found: 367.0523.

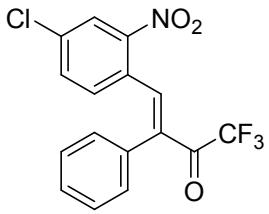


(*E*)-1,1,1-Trifluoro-4-(2-nitro-4-(trifluoromethyl)phenyl)-3-phenylbut-3-en-2-one (4d). Obtained from

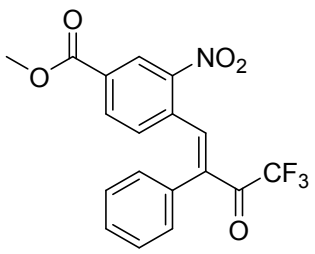


enamine **2a** (0.482 g, 2 mmol) and 2-nitro-4-(trifluoromethyl)benzaldehyde (0.460 g, 2.100 mmol). Orange viscous liquid, yield 0.529 g (68%). Mixture of *E*- and *Z*-isomers 99:1. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.06-7.08 (m, 2H, Ph), 7.12 (d, ^{3}J = 8.2 Hz, 1H, Ar), 7.24-7.33 (m, 3H, Ph), 7.57-7.62 (m, 1H, Ar), 8.16 (s, 1H, CH=C), 8.41 (d, ^{4}J = 0.6 Hz, 1H, Ar). $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 116.5 (q, $^{1}J_{CF}$ = 291.9 Hz, CF_3), 122.2 (q, $^{4}J_{CF}$ = 3.8 Hz, Ar-CF_3), 122.4 (q, $^{1}J_{CF}$ = 272.9 Hz, Ar-CF_3), 128.7, 129.2, 129.8 (q, $^{4}J_{CF}$ = 3.2 Hz, Ar-CF_3), 130.0, 131.5, 132.1 (q, $^{2}J_{CF}$ = 34.5 Hz, Ar-CF_3), 132.8, 134.3, 137.5, 141.1 (q, $^{4}J_{CF}$ = 3.3 Hz, C=C-C=O), 147.7, 181.0 (q, $^{2}J_{CF}$ = 34.9 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.4 ($COCF_3$), -64.2 (Ar-CF_3). For admixture of *Z*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.43-7.48 (m, 5H, Ph), 7.54 (d, ^{3}J = 8.0 Hz, 1H, Ar-CF_3), 7.91 (dd, ^{3}J = 8.0 Hz, ^{4}J = 0.9 Hz, 1H, Ar-CF_3), 8.47 (br s, 1H, Ar-CF_3). Other signals are overlapped with those of major isomer. $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 127.2, 129.9, 132.4, 132.70, 132.71. Other signals are overlapped with those of major isomer or can not be seen in the spectrum due to the low concentration of minor isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -76.0 ($COCF_3$), -64.1 (Ar-CF_3). HRMS (ESI-TOF): m/z $[M+Na]^+$ Calcd for $C_{17}H_9F_6NO_3^+$: 412.0379; found: 412.0391.

(*E*)-4-(4-Cloro-2-nitrophenyl)-1,1,1-trifluoro-3-phenylbut-3-en-2-one (4e). Obtained from enamine **2a**



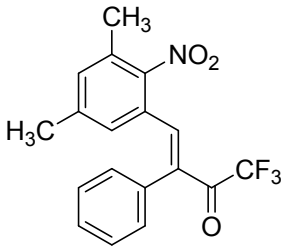
(1.205 g, 5 mmol) and 4-cloro-2-nitrobenzaldehyde (0.978 g, 5.26 mmol). Pale yellow viscous liquid, yield 1.336 g (75%). Mixture of *E*- and *Z*-isomers 97:3. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 6.87 (d, ^{3}J = 8.4 Hz, 1H, Ar), 7.05-7.07 (m, 2H, Ph), 7.24-7.35 (m, 3H, Ph and 1H, Ar), 8.10 (s, 1H, CH=C), 8.13 (d, ^{4}J = 2.0 Hz, 1H, Ar). $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 116.5 (q, $^{1}J_{CF}$ = 291.9 Hz, CF_3), 125.1, 128.7, 129.0, 129.1, 130.1, 131.8, 132.8, 133.5, 135.9, 136.8, 141.6 (q, $^{4}J_{CF}$ = 3.5 Hz, C=C-C=O), 148.1, 181.0 (q, $^{2}J_{CF}$ = 34.8 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.4. For admixture of *Z*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.42-7.50 (m, 5H, Ph), 7.56 (s, 1H, CH=C), 7.64 (dd, ^{3}J = 8.2 Hz, ^{4}J = 2.0 Hz, 1H, Ar), 8.22 (d, ^{4}J = 2.0 Hz, 1H, Ar). Other signals are overlapped with those of major isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -76.1. HRMS (ESI-TOF): m/z $[M+NH_4]^+$ Calcd for $C_{16}H_{13}ClF_3N_2O_3^+$: 373.0561; found: 373.0566.



Methyl-3-nitro-4-[(1*E*)-4,4,4-trifluoro-3-oxo-2-phenylbut-1-en-1-yl]benzoate (4f). Obtained from

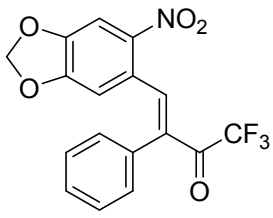
enamine **2a** (1.205 g, 5 mmol) and methyl 4-formyl-3-nitrobenzoate (1.097 g, 2.25 mmol). Yellow viscous liquid, yield 1.321 g (70%). Mixture of *E*- and *Z*-isomers 96:4. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.94 (s, 3H, CH_3), 7.02-7.07 (m, 3H, Ar, Ph), 7.24-7.31 (m, 3H, Ph), 7.98 (dd, ^{3}J = 8.1 Hz, ^{4}J = 1.3 Hz, 1H, Ar), 8.17 (s, 1H, CH=C), 8.77 (d, ^{4}J = 1.3 Hz, 1H, Ar). ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 52.9, 116.5 (q, $^{1}J_{CF}$ = 291.9 Hz, CF_3), 125.9, 128.6, 129.1, 130.1, 131.7, 131.8, 132.1, 133.7, 134.8, 137.2, 141.9 (q, $^{4}J_{CF}$ = 3.1 Hz, C=C-C=O), 147.8, 164.3, 181.0 (q, $^{2}J_{CF}$ = 34.7 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.5. For admixture of *Z*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.44-7.49 (m, 5H, Ph), 7.63 (s, 1H, CH=C), 8.29 (dd, ^{3}J = 7.9 Hz, ^{4}J = 1.4 Hz, 1H, Ar), 8.85 (d, ^{4}J = 1.3 Hz, 1H, Ar). Other signals are overlapped with those of major isomer. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 127.2, 129.2, 129.8. Other signals are overlapped with those of major isomer or can not be seen in the spectrum due to the low concentration of minor isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -76.2. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{18}H_{13}F_3NO_5^+$: 380.0740; found: 380.0731.

(*E*)-4-(3,5-diMethyl-2-nitrophenyl)-1,1,1-trifluoro-3-phenylbut-3-en-2-one (4g). Obtained from



enamine **2a** (1.222 g, 5.065 mmol) and 3,5-dimethyl-2-nitrobenzaldehyde (1.043 g, 5.821 mmol). Light beige solid, mp 56-59 °C, yield 1.132 g (64%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 2.04 (s, 3H, CH_3), 2.35 (s, 3H, CH_3), 6.46 (s, 1H, Ar), 7.00 (s, 1H, Ar), 7.10-7.15 (m, 2H, Ph), 7.27-7.34 (m, 3H, Ph), 7.74 (s, 1H, CH=C). ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 18.3, 20.9, 116.5 (q, $^{1}J_{CF}$ = 292.1 Hz, CF_3), 127.8, 128.5, 128,8, 129.1, 130.0, 131.2, 132.3, 133.3, 137.7, 140.2 (q, $^{4}J_{CF}$ = 2.8 Hz, C=C-C=O), 140.9, 148.6, 181.2 (q, $^{2}J_{CF}$ = 34.4 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.4. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{18}H_{15}F_3NO_3^+$: 350.0999; found: 350.1009.

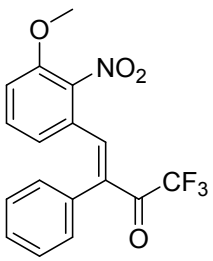
(*E*)-1,1,1-trifluoro-4-(6-nitrobenzo[d][1,3]dioxol-5-yl)-3-phenylbut-3-en-2-one (4h). Obtained from



enamine **2a** (1.257 g, 5.210 mmol) and 6-nitrobenzo[d][1,3]dioxole-5-carbaldehyde (1.169 g, 5.992 mmol). Yellow solid, mp 99-101 °C, yield 1.903 g (77%). Mixture of *E*- and *Z*-isomers 94:6. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 5.97 (s, 2H, CH_2), 6.28 (s, 1H, Ar), 7.06-

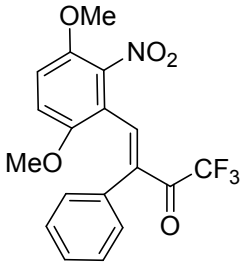
7.14 (m, 2H, Ph), 7.25-7.33 (m, 3H, Ph), 7.57 (s, 1H, Ar), 8.14 (s, 1H, CH=C). $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 103.4, 105.1, 109.6, 116.5 (q, $^{1}J_{CF}$ = 292.2 Hz, CF_3), 127.2, 128.4, 128.7, 130.0, 132.0, 135.2, 142.3, 143.8 (q, $^{4}J_{CF}$ = 3.1 Hz, C=C-C=O), 148.6, 151.8, 180.9 (q, $^{2}J_{CF}$ = 34.3 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.3. For admixture of *Z*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 6.03 (s, 2H, 4,5-O_2CH_2-2-$NO_2C_6H_2$-), 6.25 (s, 1H, 4,5-O_2CH_2-2-$NO_2C_6H_2$-), 7.07-7.10 (m, 2H, Ph), 7.28-7.33 (m, 3H, Ph), 7.61 (s, 1H, 4,5-O_2CH_2-2-$NO_2C_6H_2$-), 8.12 (s, 1H, CH=C). $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 103.5, 105.8, 109.9, 116.8 (q, $^{1}J_{CF}$ = 292.0 Hz, CF_3), 127.2, 128.4, 128.9, 129.6, 133.4, 134.6, 141.5, 146.2 (q, $^{4}J_{CF}$ = 2.8 Hz, C=C-C=O), 148.5, 152.2 ,181.2 (q, $^{2}J_{CF}$ = 33.6 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -76.2. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{17}H_{11}F_3NO_5^+$: 366.0584; found: 366.0595.

(*E*)-1,1,1-trifluoro-4-(3-methoxy-2-nitrophenyl)-3-phenylbut-3-en-2-one (4i). Obtained from enamine



2a (1.206 g, 5.0 mmol) and 3-methoxy-2-nitrobenzaldehyde (1.042 g, 5.75 mmol). Beige viscous liquid, yield 1.054 g (60%). Mixture of *E*- and *Z*-isomers 98:2. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.88 (s, 3H, CH_3), 6.38 (d, ^{3}J = 8.2 Hz, 1H, Ar), 6.95 (d, ^{3}J = 8.2 Hz, 1H, Ar), 7.09 (d, ^{3}J = 8.2 Hz, 1H, Ar), 7.12-7.14 (m, 2H, Ph), 7. 28-7. 35 (m, 3H, Ph), 7.67 (s, 1H, CH=C). $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 56.5, 113.6, 116.4 (q, $^{1}J_{CF}$ = 292.1 Hz, CF_3), 121.8, 128.2, 128.6, 129.0, 129.9, 130.9, 132.0, 138.2 (q, $^{4}J_{CF}$ = 2.9 Hz, C=C-C=O), 138.9, 141.0, 151.1, 181.1 (q, $^{2}J_{CF}$ = 34.4 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.4. For admixture of *Z*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.89 (s, 3H, CH_3), 6.85 (d, ^{3}J = 7.7 Hz, 1H, Ar), 7.38-7.44 (m, 3H, Ph and 1H, CH=C). Other signals are overlapped with those of major isomer. $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 113.6, 115.1 (q, $^{1}J_{CF}$ = 292.8 Hz, CF_3), 121.0, 126.9, 129.1, 129.7, 131.7, 133.9, 140.0, 140.8, 151.3, 187.5 (q, $^{2}J_{CF}$ = 37.0 Hz, C=O). Other signals are overlapped with those of major isomer or can not be seen in the spectrum due to the low concentration of minor isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -76.0. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{17}H_{13}F_3NO_4^+$: 352.0791; found: 352.0791.

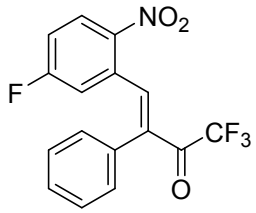
(*E*)-4-(3,6-diMethoxy-2-nitrophenyl)-1,1,1-trifluoro-3-phenylbut-3-en-2-one (4j).



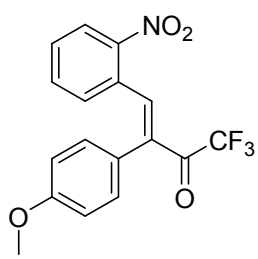
Obtained from enamine **2a** (0.455 g, 1.887 mmol) and 3,6-dimethoxy-2-nitrobenzaldehyde (0.458 g,

2.170 mmol). Yellow solid, mp 92-94 °C, yield 0.489 g (68%). Mixture of *E*- and *Z*-isomers 94:6. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.44 (s, 3H, CH_3), 3.81 (s, 3H, CH_3), 6.76 (d, ^{3}J = 9.2 Hz, 1H, Ar), 6.92 (d, ^{3}J = 9.2 Hz, 1H, Ar), 7.02-7.07 (m, 2H, Ph), 7.19-7.27 (m, 3H, Ph), 7.58 (s, 1H, CH=C). ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 55.7, 56.7, 113.6, 114.2, 116.4 (q, $^{1}J_{CF}$ = 292.1 Hz, CF_3), 117.9, 127.8, 128.7, 129.2 132.8, 136.2 (q, $^{4}J_{CF}$ = 2.9 Hz, C=C-C=O), 140.3, 140.4, 144.8, 149.3, 180.8 (q, $^{2}J_{CF}$ = 34.7 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.3. For admixture of *Z*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 6.97 (d, ^{3}J = 7.5 Hz, 1H, Ar), 7.42-7.38 (m, 3H, Ph). Other signals are overlapped with those of major isomer. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 113.7, 127.7, 128.8, 129.4, 140.3, 144.9. Other signals are overlapped with those of major isomer or can not be seen in the spectrum due to the low concentration of minor isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -74.2. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{18}H_{15}F_3NO_5^+$: 382.0897; found: 382.0897.

(*E*)-1,1,1-Trifluoro-4-(5-fluoro-2-nitrophenyl)-3-phenylbut-3-en-2-one (4k). Obtained from enamine **2a**



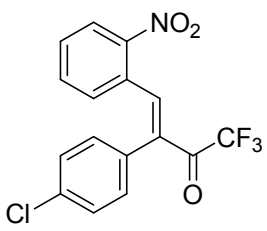
(1.206 g, 5.0 mmol) and 5-fluoro-2-nitrobenzaldehyde (0.972 g, 5.75 mmol). Beige crystals, mp 44-45 °C, yield 1.018 (60%). Mixture of *E*- and *Z*-isomers 99:1. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 6.64 (dd, ^{3}J = 8.7 Hz, ^{4}J = 2.7 Hz, 1H, Ar), 7.07-7.11 (m, 2H, Ph and 1H, Ar), 7.26-7.33 (m, 3H, Ph), 8.17 (s, 1H, CH=C), 8.27 (dd, ^{3}J = 9.2 Hz, ^{3}J = 5.0 Hz, 1H, Ar). ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 116.4 (q, $^{1}J_{CF}$ = 292.0 Hz, CF_3), 116.9 (d, $^{2}J_{CF}$ = 23.4 Hz, Ar), 118.5 (d, $^{2}J_{CF}$ = 25.3 Hz, Ar), 127.7 (d, $^{3}J_{CF}$ = 10.2 Hz, Ar), 128.6, 129.0, 129.9, 131.5, 133.8 (d, $^{3}J_{CF}$ = 9.8 Hz, Ar), 136.7, 141.9 (q, $^{4}J_{CF}$ = 2.8 Hz, C=C-C=O), 143.8 (d, $^{4}J_{CF}$ = 2.8 Hz, Ar), 164.4 (d, $^{1}J_{CF}$ = 258.9 Hz, Ar), 181.0 (q, $^{2}J_{CF}$ = 34.7 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.6 (CF_3), -103.04 - -103.11 (Ar-F). For admixture of *Z*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.43 (br s, 5H, Ph), 7.58 (s,1H, CH=C), 8.25 (dd, ^{3}J = 9.1 Hz, ^{3}J = 5.0 Hz, 1H, Ar). Other signals are overlapped with those of major isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -76.0 (CF_3), -102.41...-102.48 (Ar-F). HRMS (ESI-TOF): m/z $[M+MeOH+NH_4]^+$ Calcd for $C_{17}H_{17}F_4N_2O_4^+$: 389.1119; found: 389.1113.



(*E*)-1,1,1-Trifluoro-3-(4-methoxyphenyl)-4-(2-nitrophenyl)but-3-en-2-one (4l). Obtained from enamine **2b**

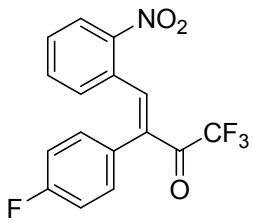
(1.355 g, 5 mmol) and 2-nitrobenzaldehyde (0.801 g, 5.305 mmol). Light yellow solid, mp 86-88 °C, yield 1.482 g (88%). Mixture of *E*- and *Z*-isomers 97:3. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.75 (s, 3H, CH_3), 6.77 (d, ^{3}J = 8.8 Hz, 2H, 4-$MeOC_6H_4$), 6.94-7.01 (m, 2H, 4-$MeOC_6H_4$ and 1H, 2-$NO_2C_6H_4$), 7.37 (td, ^{3}J = 7.8 Hz, ^{4}J = 1.5 Hz, 1H, 2-$NO_2C_6H_4$), 7.42 (td, ^{3}J = 7.8 Hz, ^{4}J = 1.5 Hz, 1H, 2-$NO_2C_6H_4$), 8.11 (s, 1H, CH=C), 8.14 (dd, ^{3}J = 7.8 Hz, ^{4}J = 1.5 Hz, 1H, 2-$NO_2C_6H_4$). $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 55.1, 113.9, 116.6 (q, $^{1}J_{CF}$ = 292.3 Hz, CF_3), 124.1, 124.8, 129.7, 131.0, 131.5, 131.7, 133.4, 136.0, 142.4 (q, $^{4}J_{CF}$ = 2.6 Hz, C=C-C=O), 147.8, 159.8, 181.6 (q, $^{2}J_{CF}$ = 34.3 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -70.2. For admixture of *Z*-isomer: -75.2. HRMS (ESI-TOF): m/z $[M+NH_4]^+$ Calcd for $C_{17}H_{16}F_3N_2O_4^+$: 369.1057; found: 369.1052.

(*E*)-3-(4-Chlorophenyl)-1,1,1-trifluoro-4-(2-nitrophenyl)but-3-en-2-one (4m). Obtained from enamine



2c (1.375 g, 5 mmol) and 2-nitrobenzaldehyde (0.808 g, 5.35 mmol). Pale brown solid, mp 48-50 °C, yield 1.072 g (60%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 6.93 (d, ^{3}J = 7.8 Hz, 1H, 2-$NO_2C_6H_4$), 7.01 (d, ^{3}J = 8.5 Hz, 2H, 4-ClC_6H_4), 7.22 (d, ^{3}J = 8.5 Hz, 2H, 4-ClC_6H_4), 7.40 (td, ^{3}J = 7.7 Hz, ^{4}J = 1.3 Hz, 1H, 2-$NO_2C_6H_4$), 7.46 (td, ^{3}J = 7.7 Hz, ^{4}J = 1.3 Hz, 1H, 2-$NO_2C_6H_4$), 8.16 (dd, ^{3}J = 7.7 Hz, ^{4}J = 1.3 Hz, 1H, 2-$NO_2C_6H_4$), 8.22 (s, 1H, CH=C). $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 116.5 (q, $^{1}J_{CF}$ = 291.9 Hz, CF_3),124.9, 128.8, 130.2, 130.5, 130.6, 131.5, 131.6, 133.7, 134.9, 135.1, 144.0, 147.7, 180.8 (q, $^{2}J_{CF}$ = 34.6 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -70.2. HRMS (ESI-TOF): m/z $[M+Na]^+$ Calcd for $C_{16}H_9ClF_3NO_3Na^+$: 378.0115; found: 378.0109.

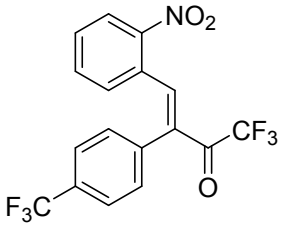
(*E*)-1,1,1-Trifluoro-3-(4-fluorophenyl)-4-(2-nitrophenyl)-but-3-en-2-one (4n). Obtained from enamine



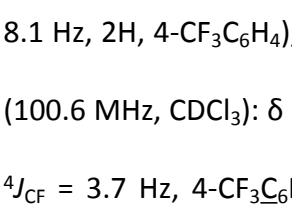
2d (1.036 g, 4 mmol) and 2-nitrobenzaldehyde (0.635 g, 4.205 mmol). Yellow-red viscous oil, yield 1.165 g (86%). Mixture of *E*- and *Z*-isomers 99:1. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 6.90-6.97 (m, 1H, 2-$NO_2C_6H_4$ and 2H, 4-FC_6H_4), 7.02-7.08 (m, 2H, 4-FC_6H_4), 7.36-7.48 (m, 2H, 2-$NO_2C_6H_4$), 8.15 (d, ^{3}J = 8.1 Hz, 1H, 2-$NO_2C_6H_4$), 8.21 (s, 1H, CH=C). $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 115.6 (d, $^{2}J_{CF}$ = 21.7 Hz, 4-FC_6H_4), 116.5 (q, $^{1}J_{CF}$ = 292.1 Hz, CF_3), 124.9, 128.1 (d, $^{4}J_{CF}$ = 3.5 Hz, 4-FC_6H_4), 130.0, 130.6, 131.5, 132.1 (d, $^{3}J_{CF}$ = 8.3 Hz, 4-FC_6H_4), 133.6, 135.2, 143.9 (q, $^{4}J_{CF}$ = 3.3 Hz, C=C-

C=O), 147.7, 162.7 (d, $^{1}J_{CF}$ = 249.3 Hz, C-F), 181.0 (q, $^{2}J_{CF}$ = 34.6 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.2 (CF_3), -112.67 - -113.15 (4-FC_6H_4). For admixture of *Z*-isomer: -76.1 (CF_3), -112.10 - -112.24 (4-F-C_6H_3). HRMS (ESI-TOF): m/z $[M+Na]^+$ Calcd for $C_{16}H_9F_4NO_3Na^+$: 362.0411; found: 362.0414.

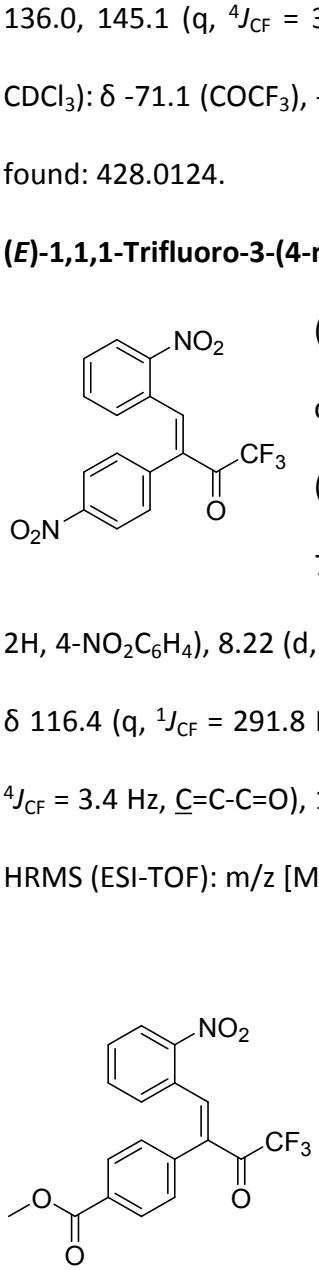
(*E*)-1,1,1-Trifluoro-4-(2-nitrophenyl)-3-(4-trifluoromethylphenyl)but-3-en-2-one (4o). Obtained from enamine **2f** (0.473 g, 1.53 mmol) and 2-nitrobenzaldehyde (0.266 g, 1.759 mmol). Beige viscous liquid, yield 0.316 g (53%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 6.89 (d, ^{3}J = 7.7 Hz, 1H, 2-$NO_2C_6H_4$), 7.20 (d, ^{3}J = 8.1 Hz, 2H, 4-$CF_3C_6H_4$), 7.39 (td, ^{3}J = 7.6 Hz, ^{4}J = 1.2 Hz, 1H, 2-$NO_2C_6H_4$), 7.43-7.50 (m, 1H, 2-$NO_2C_6H_4$), 7.52 (d, ^{3}J = 8.1 Hz, 2H, 4-$CF_3C_6H_4$), 8.19 (dd, ^{3}J = 8.2 Hz, ^{4}J = 1.2 Hz, 1H, 2-$NO_2C_6H_4$), 8.30 (s, 1H, CH=C). ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 116.5 (q, $^{1}J_{CF}$ = 291.8 Hz, CF_3), 123.7 (q, $^{1}J_{CF}$ = 272.3 Hz, 4-$\underline{C}F_3C_6H_4$), 125.0, 125.4 (q, $^{4}J_{CF}$ = 3.7 Hz, 4-$CF_3\underline{C}_6H_4$), 130.2, 130.4, 130.68 (q, $^{2}J_{CF}$ = 32.8 Hz, $\underline{C}$-CF_3), 130.74, 131.4, 133.8, 134.8, 136.0, 145.1 (q, $^{4}J_{CF}$ = 3.2 Hz, $\underline{C}$=C-C=O), 147.6, 180.5 (q, $^{2}J_{CF}$ = 35.0 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.1 ($COCF_3$), -63.8 (4-$CF_3C_6H_4$). HRMS (ESI-TOF): m/z $[M+K]^+$ Calcd for $C_{17}H_9F_6NO_3^+$: 428.0118; found: 428.0124.



(*E*)-1,1,1-Trifluoro-3-(4-nitrophenyl)-4-(2-nitrophenyl)but-3-en-2-one (4p). Obtained from enamine **2h** (0.286 g, 1.0 mmol) and 2-nitrobenzaldehyde (0.174 g, 1.15 mmol). White crystals, mp 129-132 °C, yield 0.282 g (77%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 6.88 (d, ^{3}J = 7.6 Hz, 1H, 2-$NO_2C_6H_4$), 7.27 (d, ^{3}J = 8.7 Hz, 2H, 4-$NO_2C_6H_4$), 7.41 (t, ^{3}J = 7.6 Hz, 1H, 2-$NO_2C_6H_4$), 7.50 (t, ^{3}J = 7.8 Hz, 1H, 2-$NO_2C_6H_4$), 8.12 (d, ^{3}J = 8.7 Hz, 2H, 4-$NO_2C_6H_4$), 8.22 (d, ^{3}J = 8.2 Hz, 1H, 2-$NO_2C_6H_4$), 8.35 (s, 1H, CH=C). ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 116.4 (q, $^{1}J_{CF}$ = 291.8 Hz, CF_3), 123.6, 125.2, 129.9, 130.7, 131.2, 131.4, 133.9, 134.1, 139.0, 145.8 (q, $^{4}J_{CF}$ = 3.4 Hz, $\underline{C}$=C-C=O), 147.5, 147.8, 180.1 (q, $^{2}J_{CF}$ = 35.3 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.2. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{10}F_3N_2O_5^+$: 367.0536; found: 367.0547.

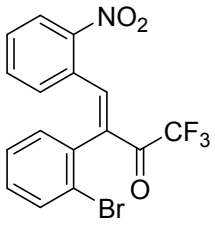


(3*E*)-Methyl 4-(4,4,4-trifluoro-1-(2-nitrophenyl)-3-oxobut-1-en-2-yl)benzoate (4q). Obtained from enamine **2j** (0.748 g, 2.5 mmol) and 2-nitrobenzaldehyde (0.408 g, 2.702 mmol).



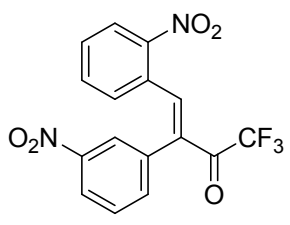
Light yellow crystals, mp 152-153°C, yield 0.597 g (63%). Mixture of *E*- and *Z*-isomers 99.6:0.4. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.85 (s, 3H, CH_3), 6.89 (d, ^{3}J = 7.7 Hz, 1H, 2-$NO_2C_6H_4$), 7.14 (d, ^{3}J = 8.3 Hz, 2H, 4-$CO_2MeC_6H_4$), 7.34 (td, ^{3}J = 7.6 Hz, ^{4}J = 1.1 Hz, 1H, 2-$NO_2C_6H_4$), 7.39-7.45 (m, 1H, 2-$NO_2C_6H_4$), 7.89 (d, ^{3}J = 8.3 Hz, 2H, 4-$CO_2MeC_6H_4$), 8.14 (dd, ^{3}J = 8.2 Hz, ^{4}J = 1.0 Hz, 1H, 2-$NO_2C_6H_4$), 8.26 (s, 1H, CH=C). $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 52.1, 116.4 (q, $^{1}J_{CF}$ = 291.9 Hz, CF_3), 124.9, 129.5, 130.21, 130.25, 130.3, 131.4, 133.6, 135.2, 136.8, 144.5 (q, $^{4}J_{CF}$ = 3.3 Hz, C=C-C=O), 147.5, 166.3, 180.5 (q, $^{2}J_{CF}$ = 34.9 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.2 (d, ^{4}J = 0.9 Hz, 3F, CF_3). For admixture of *Z*-isomer: -76.2. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{18}H_{13}F_3NO_5^+$: 380.0740; found: 380.0744.

(3*E*)-3-(2-bromphenyl)-1,1,1-trifluoro-4-(2-nitrophenyl)but-3-en-2-one (4r).



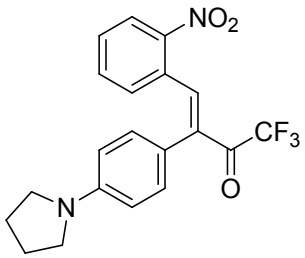
Obtained from enamine **2g (**2.401 g, 7.5 mmol) and 2-nitrobenzaldehyde (1.139 g, 7.537 mmol). Light yellow viscous liquid, yield 1.861 g (62%). Mixture of *E*- and *Z*-isomers 96:4. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 6.92-6.97 (m, 1H, Ar), 7.08 (dd, ^{3}J = 7.3 Hz, ^{4}J = 1.2 Hz, 1H, Ar), 7.11-7.18 (m, 2H, Ar), 7.36-7.49 (m, 2H, Ar), 7.50-7.59 (m, 1H, Ar), 8.15 (dd, ^{3}J = 8.0 Hz, ^{4}J = 1.5 Hz, 1H, Ar), 8.31 (s, 1H, CH=C). $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 116.4 (q, $^{1}J_{CF}$ = 291.8 Hz, CF_3), 124.3, 124.8, 127.7, 130.2, 130.3, 130.45, 130.51, 131.8, 132.6, 133.7, 134.2, 136.1, 144.0 (q, $^{4}J_{CF}$ = 3.1 Hz, C=C-C=O), 147.1, 180.0 (q, $^{2}J_{CF}$ = 34.9 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.9. For admixture of *Z*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.19-7.23 (m, 1H), 7.28-7.35 (m, 2H), 7.60-7.65 (m, 1H), 7.65-7.72 (m, 1H), 8.25 (dd, ^{3}J = 8.3 Hz, ^{4}J = 1.1 Hz, 1H, 2-$NO_2C_6H_4$). Other signals are overlapped with those of major isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -75.3. HRMS (ESI-TOF): m/z $[M+NH_4]^+$ Calcd for $C_{16}H_{13}BrF_3N2O_3^+$: 417.0056, 419.00361; found: 417.0046, 419.0031.

(3*E*)-1,1,1-Trifluoro-3-(3-nitrophenyl)-4-(2-nitrophenyl)-but-3-en-2-one (4s). Obtained from enamine **2i**



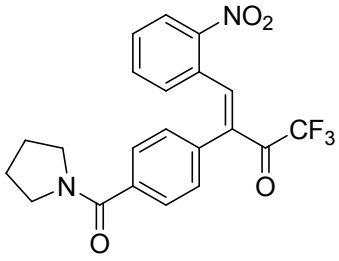
(0.98 g, 3.423 mmol) and 2-nitrobenzaldehyde (0.595 g, 3.936 mmol). Light beige crystals, mp 92-93°C, yield 0.98 g (78%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 6.92 (d, ^{3}J = 7.7 Hz, 1H, 2-$NO_2C_6H_4$), 7.35-7.52 (m, 2H, 2-$NO_2C_6H_4$ and 2H, 3-$NO_2C_6H_4$), 7.99 (*pseudo*-t, ^{4}J ~ 1.9 Hz, 1H, 3-$NO_2C_6H_4$), 8.14 (ddd, ^{3}J = 8.2 Hz, ^{4}J = 2.1 Hz, ^{4}J = 1.1 Hz, 1H, 3-$NO_2C_6H_4$), 8.20 (dd, ^{3}J = 8.1 Hz, ^{4}J = 1.0 Hz, 1H, 2-

$NO_2C_6H_4$), 8.37 (s, 1H, CH=C). $^{13}C\{^1H\}$ NMR (100.6 MHz, $CDCl_3$): δ 116.4 (q, $^1J_{CF}$ = 291.7 Hz, CF_3), 123.7, 125.2, 125.3, 129.6, 129.9, 130.7, 131.3, 133.7, 133.8, 133.9, 136.4, 145.8 (q, $^4J_{CF}$ = 3.5 Hz, C=C-C=O), 147.5, 148.0, 180.2 (q, $^2J_{CF}$ = 35.3 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.14. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{10}F_3N_2O_5^+$: 367.0536; found: 367.0546.



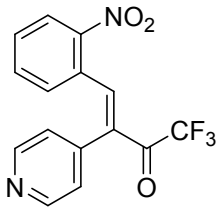
(*E*)-1,1,1-Trifluoro-4-(2-nitrophenyl)-3-(4-(pyrrolidin-1-yl)phenyl)but-3-en-2-one (4t). Obtained from enamine **2e** (1.24 g, 4 mmol) and 2-nitrobenzaldehyde (0.653 g, 4.32 mmol). Dark red viscous oil, yield 1.291 g (83%). Mixture of *E*- and *Z*-isomers 98:2. ^1H NMR (400.1 MHz, $CDCl_3$): δ 1.93-2.01 (m, 4H, $N(CH_2C\underline{H}_2)_2$), 3.22-3.25 (m, 4H, $N(C\underline{H}_2CH_2)_2$), 6.39 (d, ^3J = 8.7 Hz, 2H, Ar), 6.88 (d, ^3J = 8.7 Hz, 2H, Ar), 7.02-7.07 (m, 1H, 2-$NO_2C_6H_4$), 7.34-7.41 (m, 2H, 2-$NO_2C_6H_4$), 7.93 (s, 1H, CH=C), 8.15-8.10 (m, 1H, 2-$NO_2C_6H_4$). $^{13}C\{^1H\}$ NMR (100.6 MHz, $CDCl_3$): δ 25.4, 47.4, 111.3, 116.7 (q, $^1J_{CF}$ = 292.3 Hz, CF_3), 118.2, 124.7, 129.3, 131.4, 131.8, 132.0, 133.3, 136.9, 139.7 (q, $^4J_{CF}$ = 3.5 Hz, C=C-C=O), 147.9, 148.0, 182.6 (q, $^2J_{CF}$ *J* = 33.9 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.4 (d, ^4J = 0.6 Hz, 3F, CF_3). For admixture of *Z*-isomer: -76.5. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{20}H_{18}F_3N_2O_3^+$: 391.1264; found: 391.1255.

(3*E*)-1,1,1-Trifluoro-4-(2-nitrophenyl)-3-(4-(pyrrolidine-1carbonyl)phenyl)but-3-en-2-one (4u).



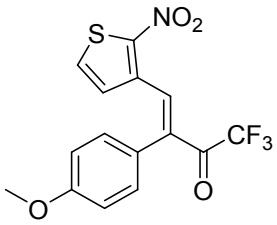
Obtained from enamine **2k** (1.698 g, 5 mmol) and 2-nitrobenzaldehyde (0.757 g, 5.01 mmol). Beige viscous liquid, yield 1.464 g (70%). ^1H NMR (400.1 MHz, $CDCl_3$): δ 1.95-2.14 (m, 4H, $2NCH_2C\underline{H}_2$), 3.52 (br s, 2H, $N(C\underline{H}_2CH_2)_2$), 3.74 (br s, 2H, $N(C\underline{H}_2CH_2)_2$), 6.88 (d, *J* = 7.6 Hz, 1H, 2-$NO_2C_6H_4$), 7.22 (d, *J* = 8.2 Hz, 2H, Ar), 7.36-7.51 (m, 2H, 2-$NO_2C_6H_4$ and 2H, Ar), 8.19 (dd, *J* = 8.2 Hz, *J* = 0.8 Hz, 1H, 2-$NO_2C_6H_4$), 8.35 (s, 1H, CH=C). $^{13}C\{^1H\}$ NMR (100.6 MHz, $CDCl_3$): δ 24.1, 26.1, 46.0, 49.3, 116.3 (q, $^1J_{CF}$ = 292.1 Hz, CF_3), 124.6, 127.0, 129.95, 129.99, 130.1, 131.3, 133.4, 133.5, 135.1, 137.0, 144.0 (q, $^4J_{CF}$ = 3.0 Hz, C=C-C=O), 147.3, 168.5, 180.6 (q, $^2J_{CF}$ = 34.7 Hz, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.2. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{21}H_{18}F_3N_2O_4^+$: 419.1213; found: 419.1219.

(*E*)-1,1,1-Trifluoro-4-(2-nitrophenyl)-3-(pyridine-4-yl)but-3-en-2-one (4v). Obtained from



enamine **2l** (1.017 g, 4.2 mmol) and 2-nitrobenzaldehyde (0.728 g, 4.82 mmol). Dark orange viscous liquid, yield 0.568 g (42%). The compound is quite unstable to form black tar in several days at standing. ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 6.90 (d, ^{3}J = 7.7 Hz, 1H, 2-$NO_2C_6H_4$), 6.97-7.03 (m, 2H, Py), 7.40 (td, ^{3}J = 7.6 Hz, ^{4}J = 1.1 Hz, 1H, 2-$NO_2C_6H_4$), 7.49 (td, ^{3}J = 8.0 Hz, ^{4}J = 0.9 Hz, 1H, 2-$NO_2C_6H_4$), 8.21 (dd, ^{3}J = 8.2 Hz, ^{4}J = 1.1 Hz, 1H, 2-$NO_2C_6H_4$), 8.33 (s, 1H, CH=C), 8.47-8.55 (m, 2H, Py). ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 116.4 (q, $^{1}J_{CF}$ = 291.9 Hz, CF_3), 125.0, 125.1, 129.9, 130.6, 131.2, 133.7, 133.9, 140.5, 145.5 (q, $^{4}J_{CF}$ = 3.3 Hz, C=C-C=O), 147.5, 150.0, 180.0 (q, $^{2}J_{CF}$ = 35.3, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.3 (d, ^{4}J = 0.8 Hz, 3F, CF_3). HRMS (ESI-TOF): m/z [M+H]$^{+}$ Calcd for $C_{15}H_{10}F_3N_2O_3^{+}$: 323.0638; found: 323.0645.

(*E*)-1,1,1-Trifluoro-3-(4-methoxyphenyl)-4-(2-nitrothiophen-3-yl)but-3-en-2-one (4w). Obtained



from enamine **2b** (0.140 g, 0.516 mmol) and 2-nitrothiophene-3-carbaldehyde (0.092 g, 0.59 mmol). Yellow-brown solid, m.p. 125-127 °C, yield 0.103 g (61%). Mixture of *E*- and *Z*-isomers 87:13. For *E*-isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.82 (s, 3H, CH_3), 6.26 (d, ^{3}J = 5.7 Hz, 1H, 2-$NO_2SC_4H_2$), 6.90 (d, ^{3}J = 8.7 Hz, 2H, 4-$MeOC_6H_4$), 7.06 (d, ^{3}J = 8.7 Hz, 2H, 4-$MeOC_6H_4$), 7.19 (d, ^{3}J = 5.7 Hz, 1H, 2-$NO_2SC_4H_2$), 8.37 (s, 1H). ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 55.3, 114.4, 116.6 (q, $^{1}J_{CF}$ = 292.1 Hz, CF_3), 124.5, 128.5, 129.1, 129.5, 131.2, 135.3 (q, $^{4}J_{CF}$ = 3.1 Hz, C=C-C=O), 135.8, 138.2, 160.5, 181.7 (q, $^{2}J_{CF}$ = 34.5, C=O). ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -71.3 (d, ^{4}J = 0.7 Hz, 3F, CF_3). For admixture of *Z*- isomer: ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.85 (s, 3H, CH_3), 6.96 (d, ^{3}J = 8.8 Hz, 2H, 4-$MeOC_6H_4$), 7.34 (d, ^{3}J = 8.8 Hz, 2H, 4-$MeOC_6H_4$), 7.47 (d, ^{3}J = 5.6 Hz, 1H, 2-$NO_2SC_4H_2$), 7.62 (s, 1H). Other signals are overlapped with those of major isomer. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 55.4, 114.7, 124.8, 128.7, 130.8, 136.0, 139.8, 150.8, 161.1. Other signals are overlapped with those of major isomer or can not be seen in the spectrum due to the low concentration of minor

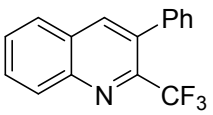
isomer. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -76.0. HRMS (ESI-TOF): m/z $[M+MeOH+NH_4]^+$ Calcd for $C_{16}H_{18}F_3N_2O_5S^+$: 407.0883; found: 407.0832.

Synthesis of quinolines 5 by the reduction of nitro-substituted CF_3-enones 4 (general procedure A).

12 mL vial with a screw cap was charged with ketone **4** (0.5 mmol), glacial acetic acid (1 mL), water (0.1 mL) and Fe powder (0.084 g, 1.5 mmol). Reaction mixture was kept at 80 °C under stirring for 0.5-1 hours until dissolving of Fe powder (after 10-15 min a gas pressure must be released!) and finishing of vigorous reaction. Volatiles were evaporated in vacuo, the residue was dispersed between CH_2Cl_2 (5-10 mL) and 6M HCl (1 mL). The organic phase was separated, washed with water (10 mL) and dried over Na_2SO_4. Volatiles were evaporated *in vacuo*, to give pure quinoline **5**.

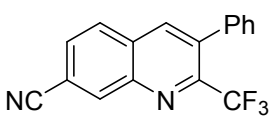
One pot synthesis of quinolines 5 by the reduction of nitro-substituted CF_3-enones 4 starting with enamines 2 (general procedure B from pure enamine; procedure C from crude enamine). The aliquot of the reaction mixture of the synthesis of ketone 4 (~0.5 mmol, 1 mL) was placed into 12 mL vial with a screw cap, water (0.1 mL) and Fe powder (0.084 g, 1.5 mmol) was then added. Reaction mixture was kept at 80 °C under stirring for 0.5-1 hours until dissolving of Fe powder (after 10-15 min a gas pressure must be released!) and finishing of vigorous reaction. Volatiles were evaporated in vacuo, the residue was dispersed between CH_2Cl_2 (5-10 mL) and 6M HCl (1 mL). The organic phase was separated, washed with water (10 mL) and dried over Na_2SO_4. Volatiles were evaporated *in vacuo*, the residue was purified by column chromatography, using appropriate mixtures of hexane and CH_2Cl_2 or CH_2Cl_2 as eluents.

3-Phenyl-2-(trifluoromethyl)quinoline (5a). Obtained from ketone **4a** (0.160 g, 0.5 mmol) by procedure



A or by procedure B (2 mmol). Pale brown solid, m.p. 71-73 °C, yield 0.130 g (95%, A) or 0.420 g (77%, B). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.40-7.48 (m, 5H), 7.67 (ptd, ^3J = 7.6 Hz, ^4J = 1.0 Hz, 1H), 7.81 (ptd, ^3J = 7.7 Hz, ^4J = 1.4 Hz, 1H), 7.86 (d, ^3J = 8.2 Hz, 1H), 8.15 (s, 1H), 8.27 (d, ^3J = 8.6 Hz, 1H) ppm. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 121.8 (q, $^1J_{CF}$ = 276.6 Hz, CF_3), 127.4, 128.0, 128.1, 128.3, 129.0, 129.2 (q, $^4J_{CF}$ = 1.5 Hz), 129.8, 130.6, 133.4, 137.4, 139.7, 145.4 (q, $^2J_{CF}$ = 32.4 Hz), 145.6 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.4 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{11}F_3N^+$: 274.0838; found: 274.0836.

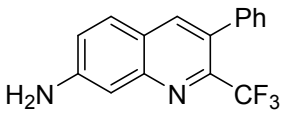
3-Phenyl-2-(trifluoromethyl)quinoline-7-carbonitrile (5b). Obtained from ketone **4d** by procedure B



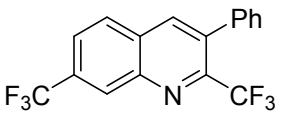
(0.5 mmol). Pale-green

solid, m.p. 145-147 °C, yield 0.096 g (64%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.39-7.41 (m, 2H), 7.45-7.50 (m, 3H), 7.82 (dd, ^{3}J = 8.4 Hz, ^{4}J = 1.5 Hz, 1H), 8.01 (d, ^{3}J = 8.4 Hz, 1H), 8.25 (s, 1H), 8.61 (s, 1H) ppm. $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 114.0, 117.8, 121.2 (q, $^{1}J_{CF}$ = 277.0 Hz, CF_3), 128.2, 128.7, 128.96 (q, $^{4}J_{CF}$ = 1.3 Hz), 129.0, 129.4, 130.1, 135.7, 136.17, 136.25, 139.7, 144.3, 147.4 (q, $^{2}J_{CF}$ = 33.2 Hz) ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -63.0 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{17}H_{10}F_3N_2^+$: 299.0791; found: 299.0789.

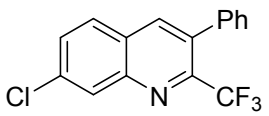
3-Phenyl-2-(trifluoromethyl)quinolin-7-amine (5c). Obtained from ketone **4g** by procedure B (0.5 mmol). Light yellow powder, m.p. 174-175 °C, yield 0.087 g (60%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 4.22 (s, 2H, NH_2), 7.09 (dd, ^{3}J = 8.7 Hz, ^{4}J = 2.0 Hz, 1H), 7.32 (d, ^{4}J = 2.0 Hz, 1H), 7.37-7.46 (m, 5H), 7.65 (d, ^{3}J = 8.7 Hz, 1H), 7.96 (s, 1H) ppm. $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 108.8, 121.2, 121.9 (q, $^{1}J_{CF}$ = 276.6 Hz, CF_3), 122.3, 127.7, 127.9, 128.6, 129.3, 129.8, 137.9, 139.3, 145.4 (q, $^{2}J_{CF}$ = 31.9 Hz), 147.6, 148.7 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.5 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{12}F_3N_2^+$: 289.0947; found: 289.0952.



3-Phenyl-2,7-bis(trifluoromethyl)quinoline (5d). Obtained from ketone **4i** by procedure B (0.5 mmol). White solid, m.p. 88-90 °C, yield 0.133 g (78%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.40-7.44 (m, 2H), 7.47-7.50 (m, 3H), 7.85 (dd, ^{3}J = 8.6 Hz, ^{4}J = 1.5 Hz, 1H), 8.02 (d, ^{3}J = 8.6 Hz, 1H), 8.25 (s, 1H), 8.59 (s, 1H) ppm. $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 121.5 (q, $^{1}J_{CF}$ = 277.0 Hz, CF_3), 123.6 (q, $^{1}J_{CF}$ = 272.6 Hz, CF_3), 124.6 (q, $^{3}J_{CF}$ = 3.0 Hz), 127.9 (q, $^{3}J_{CF}$ = 4.4 Hz), 128.2, 128.5, 128.8, 129.1 (q, $^{4}J_{CF}$ = 1.5 Hz), 129.7, 132.3 (q, $^{2}J_{CF}$ = 33.0 Hz), 135.6, 136.6, 139.7, 144.6, 147.0 (q, $^{2}J_{CF}$ = 33.0 Hz) ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.9 (s, 3F, CF_3), -64.1 (s, 3F, CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{17}H_{10}F_6N^+$: 342.0712; found: 342.0722.

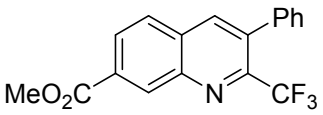


7-Chloro-3-phenyl-2-(trifluoromethyl)quinoline (5e). Obtained from ketone **4d** by procedure B (0.5 mmol). Brown oil, yield 0.120 g (78%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.38-7.42 (m, 2H), 7.44-7.48 (m, 3H), 7.62 (dd, ^{3}J = 8.8 Hz, ^{4}J = 1.9 Hz, 1H), 7.81 (d, ^{3}J = 8.8 Hz, 1H), 8.14 (s, 1H), 8.25 (d, ^{4}J = 1.9 Hz, 1H) ppm. $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 121.5 (q, $^{1}J_{CF}$ = 276.7 Hz, CF_3), 126.6, 128.1, 128.3, 128.6, 128.8,

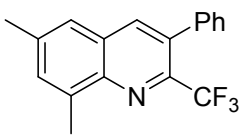


129.1 (q, $^4J_{CF}$ = 1.5 Hz), 130.1, 133.7, 136.5, 136.9, 139.6, 145.8, 146.3 (q, $^2J_{CF}$ = 32.6 Hz) ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.7 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{10}ClF_3N^+$: 308.0448; found: 308.0450.

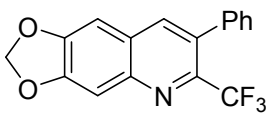
Methyl 3-phenyl-2-(trifluoromethyl)quinoline-7-carboxylate (5f). Obtained from ketone **4k** by procedure B (1 mmol). Pale brown solid, m.p. 92-94 °C, yield 0.221 g (67%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.40-7.43 (m, 2H), 7.46-7.49 (m, 3H), 7.94 (d, ^3J = 8.8 Hz, 1H), 8.21 (s, 1H), 8.28 (dd, ^3J = 8.6 Hz, ^4J = 1.6 Hz, 1H), 8.99 (s, 1H) ppm. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 52.4, 121.5 (q, $^1J_{CF}$ = 276.5 Hz, CF_3), 127.7, 128.0, 128.27, 128.34, 129.0, 130.4, 131.9, 132.4, 135.2, 136.8, 139.4, 144.8, 146.4 (q, $^2J_{CF}$ = 33.3 Hz), 166.1 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.8 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{18}H_{13}F_3NO_2^+$: 332.0893; found: 332.0898.



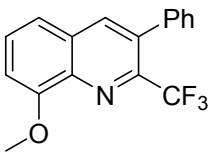
6,8-diMethyl-3-phenyl-2-(trifluoromethyl)quinoline (5g). Obtained from ketone **4b** (0.366 g, 1.049 mmol) by procedure A. White powder, m.p. 70-72 °C, yield 0.302 g (96%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 2.55 (s, 3H, Me), 2.89 (s, 3H, Me), 7.44-7.54 (m, 7H), 8.01 (s, 1H) ppm. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 17.4, 21.7, 122.1 (q, $^1J_{CF}$ = 276.2 Hz, CF_3), 123.9, 127.9, 127.9, 128.4, 129.2 (q, $^4J_{CF}$ = 1.5 Hz), 132.8, 133.1, 137.8, 137.8, 138.8, 138.9, 143.2 (q, $^2J_{CF}$ = 32.4 Hz), 143.4 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.4 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{18}H_{15}F_3N^+$: 302.1151; found: 302.1154.



7-Phenyl-6-(trifluoromethyl)-[1,3]dioxolo[4,5-g]quinoline (5h). Obtained from ketone **4c** (0.183 g, 0.5 mmol) by procedure A. Yellow-brown solid, m.p. 104-107 °C, yield 0.158 g (>99%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 6.17 (s, 2H, CH_2), 7.08 (s, 1H), 7.36-7.40 (m, 2H), 7.41-7.45 (m, 3H), 7.50 (s, 1H), 7.94 (s, 1H) ppm. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 101.9, 102.1, 105.7, 122.0 (q, $^1J_{CF}$ = 276.2 Hz, CF_3), 126.0, 127.9, 129.1, 131.9, 137.5, 138.1, 142.8 (q, $^2J_{CF}$ = 32.4 Hz), 144.0, 149.8, 151.7. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{17}H_{11}F_3NO_2^+$: 318.0736; found: 318.0738.

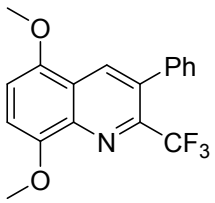


8-Methoxy-3-phenyl-2-(trifluoromethyl)quinoline (5i). Obtained from ketone **4d** by procedure B (0.5 mmol). Yellow-brown solid, m.p.



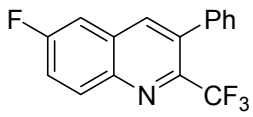
93-95 °C, yield 0.117 g (77%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.12 (d, ^{3}J = 7.7 Hz, 1H), 7.38-7.45 (m, 6H), 7.58 (t, ^{3}J = 7.7 Hz, 1H), 8.12 (s, 1H) ppm. $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 56.2, 118.9, 121.7 (q, $^{1}J_{CF}$ = 276.6 Hz, CF_3), 127.9, 128.1, 129.1 (q, $^{4}J_{CF}$ = 1.3 Hz), 129.47, 129.54, 134.0, 137.2, 137.5, 139.6, 144.0 (q, $^{2}J_{CF}$ = 32.8 Hz), 155.7 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.2 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{17}H_{13}F_3NO^+$: 304.0944; found: 304.0936.

5,8-diMethoxy-3-phenyl-2-(trifluoromethyl)quinoline (5j). Obtained from ketone **4h** by procedure B



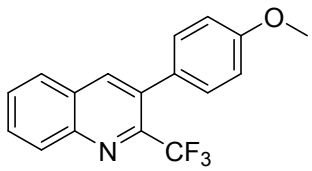
(0.189 mmol). Pale brown solid, m.p. 149-152 °C, yield 0.043 g (68%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.94 (s, 3H, MeO), 4.07 (s, 3H, MeO), 6.87 (d, ^{3}J = 8.5 Hz, 1H), 7.02 (d, ^{3}J = 8.5 Hz, 1H), 7.39-7.47 (m, 5H), 8.56 (s, 1H) ppm. $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 55.8, 56.4, 106.0, 108.1, 121.8 (q, $^{1}J_{CF}$ = 276.4 Hz, CF_3), 121.9, 127.9, 128.0, 129.3 (q, $^{4}J_{CF}$ = 1.3 Hz), 133.3, 135.1, 137.6, 137.9, 144.5 (q, $^{2}J_{CF}$ = 32.8 Hz), 148.3, 149.6 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.3 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{18}H_{15}F_3NO_2^+$: 334.1049; found: 334.1049.

6-Fluoro-3-phenyl-2-(trifluoromethyl)quinoline (5k). Obtained from ketone **4f** by procedure B (0.5



mmol). Pale beige powder, m.p. 120-123 °C, yield 0.103 g (71%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.39-7.42 (m, 2H), 7.44-7.49 (m, 4H), 7.56-7.61 (m, 1H), 8.10 (s, 1H), 8.27 (dd, ^{3}J = 9.3 Hz, ^{3}J = 5.3 Hz, 1H) ppm. $^{13}C\{^{1}H\}$ NMR (100.6 MHz, $CDCl_3$): δ 110.4 (d, $^{2}J_{CF}$ = 22.1 Hz), 121.2 (d, $^{2}J_{CF}$ = 26.2 Hz), 121.7 (q, $^{1}J_{CF}$ = 276.5 Hz, CF_3), 128.1, 128.3, 129.1 (q, $^{4}J_{CF}$ = 1.5 Hz), 129.2 (dq, J_{CF} = 10.6 Hz, J_{CF} = 0.6 Hz), 132.7 (d, J_{CF} = 9.6 Hz), 134.3, 137.0, 139.0 (d, J_{CF} = 5.7 Hz), 142.7, 145.9 (qd, $^{2}J_{CF}$ = 32.6 Hz, $^{6}J_{CF}$ = 3.0 Hz), 161.9 (d, $^{1}J_{CF}$ = 252.3 Hz, CF_3) ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.6 (s, 3F, CF_3), -110.15…-110.21 (m, 1F, F) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{10}F_4N^+$: 292.0744; found: 292.0746.

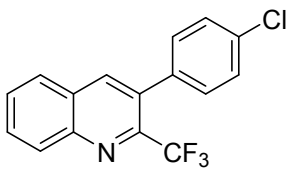
3-(4-Methoxyphenyl)-2-(trifluoromethyl)quinoline (5l). Obtained from ketone **4l** by procedure B (0.5



mmol). Pale beige powder, m.p. 127-128 °C, yield 0.135 g (89%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.86 (s, 3H, MeO), 6.98 (d, ^{3}J = 8.6 Hz, 2H), 7.33 (d, ^{3}J = 8.6 Hz, 2H), 7.66 (pt, ^{3}J = 7.5 Hz, 1H), 7.80 (ptd, ^{3}J = 7.7 Hz, ^{4}J = 1.3 Hz, 1H), 7.85 (d, ^{3}J = 8.1 Hz, 1H), 8.13 (s, 1H), 8.24 (d, ^{3}J = 8.5 Hz,

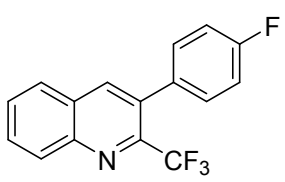
1H) ppm. $^{13}C\{^1H\}$ NMR (100.6 MHz, $CDCl_3$): δ 55.2, 113.4, 121.8 (q, $^1J_{CF}$ = 276.8 Hz, CF_3), 127.3, 128.3, 128.9, 129.6, 129.8, 130.38 (q, $^4J_{CF}$ = 1.5 Hz), 130.40, 133.2, 139.8, 145.4, 145.6 (q, $^2J_{CF}$ = 32.1 Hz), 159.5 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.7 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{17}H_{12}F_3NONa^+$: 326.0763; found: 326.0753.

3-(4-Chlorophenyl)-2-(trifluoromethyl)quinoline (5m). Obtained from ketone **4m** (0.178 g, 0.5 mmol) by



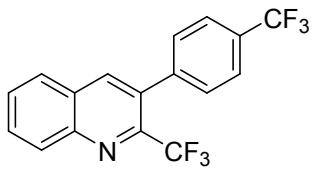
procedure A. Pale brown solid, m.p. 134-136 °C, yield 0.137 g (89%). ^1H NMR (400.1 MHz, $CDCl_3$): δ 7.33 (d, ^3J = 8.3 Hz, 2H), 7.43 (d, ^3J = 8.3 Hz, 2H), 7.69 (pt, ^3J = 7.5 Hz, 1H), 7.83 (pt, ^3J = 7.7 Hz, 1H), 7.88 (d, ^3J = 8.1 Hz, 1H), 8.13 (s, 1H), 8.25 (d, ^3J = 8.5 Hz, 1H) ppm. $^{13}C\{^1H\}$ NMR (100.6 MHz, $CDCl_3$): δ 121.7 (q, $^1J_{CF}$ = 276.6 Hz, CF_3), 127.4, 128.2, 128.3, 129.2, 130.0, 130.6 (q, $^4J_{CF}$ = 1.5 Hz), 130.8, 132.2, 134.4, 135.8, 139.7, 145.2 (q, $^2J_{CF}$ = 32.4 Hz), 145.7 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.5 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{10}ClF_3N^+$: 308.0448; found: 308.0460.

3-(4-Fluorophenyl)-2-(trifluoromethyl)quinoline (5n). Obtained from ketone **4n** by procedure B (0.5



mmol). Pale brown solid, m.p. 103-105 °C, yield 0.124 g (85%). ^1H NMR (400.1 MHz, $CDCl_3$): δ 7.14 (pt, ^3J = 8.6 Hz, 2H), 7.37 (dd, ^3J = 8.4 Hz, ^4J = 5.4 Hz, 2H), 7.69 (pt, ^3J = 7.5 Hz, 1H), 7.83 (ptd, ^3J = 7.7 Hz, ^4J = 1.3 Hz, 1H), 7.88 (d, ^3J = 8.2 Hz, 1H), 8.15 (s, 1H), 8.26 (d, ^3J = 8.5 Hz, 1H) ppm. $^{13}C\{^1H\}$ NMR (100.6 MHz, $CDCl_3$): δ 115.1 (d, $^2J_{CF}$ = 21.8 Hz), 121.7 (q, $^1J_{CF}$ = 276.6 Hz, CF_3), 127.4, 128.3, 129.1, 130.0, 130.8, 131.0 (dq, $^4J_{CF}$ = 8.3 Hz, $^5J_{CF}$ = 1.5 Hz), 132.4, 133.3 (d, $^4J_{CF}$ = 3.5 Hz), 139.8, 145.4 (q, $^2J_{CF}$ = 32.6 Hz), 145.7, 162.7 (d, $^1J_{CF}$ = 247.7 Hz) ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.7 (s, 3F, CF_3), -114.90…-114.98 (m, 1F, F) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{10}F_4N^+$: 292.0744; found: 292.0752.

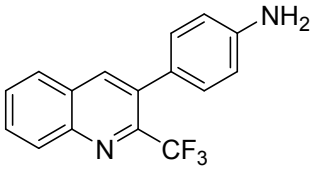
2-(Trifluoromethyl)-3-(4-(trifluoromethyl)phenyl)quinoline (5o). Obtained from ketone **4p** by



procedure B (0.5 mmol). White powder, m.p. 135-138 °C, yield 0.116 g (68%). ^1H NMR (400.1 MHz, $CDCl_3$): δ 7.54 (d, ^3J = 8.2 Hz, 2H), 7.71-7.75 (m, 3H), 7.87 (ptd, ^3J = 7.7 Hz, ^4J = 1.4 Hz, 1H), 7.92 (d, ^3J = 8.2 Hz, 1H), 8.18 (s, 1H), 8.28 (d, ^3J = 8.5 Hz, 1H) ppm. $^{13}C\{^1H\}$ NMR (100.6 MHz,

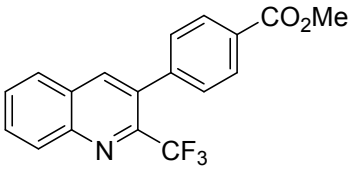
$CDCl_3$): δ 121.6 (q, $^1J_{CF}$ = 276.6 Hz, CF_3), 124.0 (q, $^1J_{CF}$ = 272.2 Hz, CF_3), 125.0 (q, $^3J_{CF}$ = 3.7 Hz), 127.5, 128.1, 129.3, 129.7 (q, $^4J_{CF}$ = 1.1 Hz), 130.0, 130.4 (q, $^2J_{CF}$ = 32.8 Hz), 131.1, 131.9, 139.7, 141.1, 145.0 (q, $^2J_{CF}$ = 32.6 Hz), 145.9 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -61.4 (CF_3), -62.7 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{17}H_{10}F_6N^+$: 342.0712; found: 342.0709.

4-(2-(Trifluoromethyl)quinolin-3-yl)aniline (5p). Obtained from ketone **4r** by procedure B (0.5 mmol).



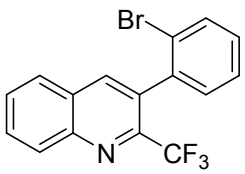
Light yellow powder, m.p. 115-117 °C, yield 0.039 g (27%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.81 (s, 2H, NH_2), 6.76 (d, ^3J = 8.3 Hz, 2H), 7.20 (d, ^3J = 8.3 Hz, 2H), 7.66 (pt, ^3J = 7.5 Hz, 1H), 7.79 (ptd, ^3J = 7.7 Hz, ^4J = 1.3 Hz, 1H), 7.85 (d, ^3J = 8.2 Hz, 1H), 8.14 (s, 1H), 8.24 (d, ^3J = 8.5 Hz, 1H) ppm. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 114.5, 121.9 (q, $^1J_{CF}$ = 276.8 Hz, CF_3), 127.3, 127.4, 128.5, 128.8, 129.9, 130.23, 130.25, 133.7, 139.8, 145.4, 145.8 (q, $^2J_{CF}$ = 32.3 Hz), 146.4 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.7 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{12}F_3N_2^+$: 289.0947; found: 289.0952.

Methyl 4-(2-(trifluoromethyl)quinolin-3-yl)benzoate (5q). Obtained from ketone **4t** by procedure B (0.5 mmol).



Bright yellow crystals, m.p. 136-139 °C, yield 0.098 g (59%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.95 (s, 3H, CO_2Me), 7.48 (d, ^3J = 8.3 Hz, 2H), 7.70 (ptd, ^3J = 7.5 Hz, ^4J = 0.9 Hz, 1H), 7.84 (ptd, ^3J = 7.7 Hz, ^4J = 1.3 Hz, 1H), 7.89 (d, ^3J = 8.1 Hz, 1H), 8.12 (d, ^3J = 8.5 Hz, 2H), 8.16 (s, 1H), 8.26 (d, ^3J = 8.5 Hz, 1H) ppm. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 52.2, 121.6 (q, $^1J_{CF}$ = 276.6 Hz, CF_3), 127.5, 128.1, 129.2, 129.3, 129.4 (q, $^4J_{CF}$ = 1.5 Hz), 129.9, 130.0, 130.9, 132.4, 139.5, 142.0, 145.0 (q, $^2J_{CF}$ = 32.8 Hz), 145.8, 166.7 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.5 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{18}H_{13}F_3NO_2^+$: 332.0893; found: 332.0889.

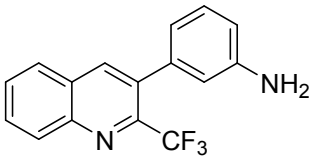
3-(2-Bromophenyl)-2-(trifluoromethyl)quinoline (5r). Obtained from ketone **4d** by procedure C (2.5 mmol).



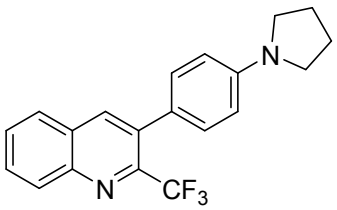
Pale yellow oil, yield 0.403 g (46%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 7.29-7.34 (m, 2H), 7.38-7.42 (m, 1H), 7.68-7.71 (m, 2H), 7.85 (ptd, ^3J = 7.7 Hz, ^4J = 1.0 Hz, 1H), 7.89 (d, ^3J = 8.2 Hz, 1H), 8.14 (s, 1H), 8.28 (d, ^3J = 8.5 Hz, 1H) ppm. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 121.5 (q, $^1J_{CF}$ = 276.8 Hz,

CF_3), 123.9, 126.8, 127.6, 128.1, 129.1, 130.0, 130.9, 131.2 (q, $^4J_{CF}$ = 1.1 Hz), 131.9, 132.5, 137.7, 140.1, 145.3 (q, $^2J_{CF}$ = 32.6 Hz), 146.0 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -64.4 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{10}BrF_3N^+$: 351.9943, 353.9923; found: 351.9941, 353.9922.

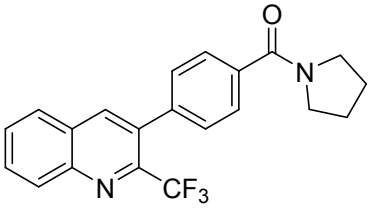
3-(2-(Trifluoromethyl)quinolin-3-yl)aniline (5s). Obtained from ketone **4s** (0.195 g, 0.53 mmol) by procedure A. Light yellow powder, m.p. 70-72 °C, yield 0.062 g (41%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.77 (s, 2H, NH_2), 6.71 (br s, 1H), 6.75-6.79 (m, 2H), 7.21 (d, ^3J = 7.8 Hz, 1H), 7.68 (ptd, ^3J = 7.5 Hz, ^4J = 1.0 Hz, 1H), 7.81 (ptd, ^3J = 7.7 Hz, ^4J = 1.5 Hz, 1H), 7.87 (d, ^3J = 8.3 Hz, 1H), 8.16 (s, 1H), 8.25 (d, ^3J = 8.6 Hz, 1H) ppm. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 114.8, 115.9 (q, $^4J_{CF}$ = 1.1 Hz), 119.7 (q, $^4J_{CF}$ = 1.5 Hz), 121.8 (q, $^1J_{CF}$ = 276.8 Hz, CF_3), 127.4, 128.3, 128.9, 129.0, 129.9, 130.5, 133.7, 138.5, 139.5, 145.4 (q, $^2J_{CF}$ = 32.8 Hz), 145.6, 146.0 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.6 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{12}F_3N_2^+$: 289.0947; found: 289.0954.



3-(4-(Pyrrolidin-1-yl)phenyl)-2-(trifluoromethyl)quinoline (5t). Obtained from ketone **4o** by procedure B (0.5 mmol). Light brown powder, m.p. 212-214 °C, yield 0.112 g (65%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 2.02-2.07 (m, 4H, CH_2), 3.33-3.37 (m, 4H, NCH_2), 6.63 (d, ^3J = 8.5 Hz, 2H), 7.28 (d, ^3J = 8.5 Hz, 2H), 7.65 (pt, ^3J = 7.5 Hz, 1H), 7.78 (ptd, ^3J = 7.7 Hz, ^4J = 1.3 Hz, 1H), 7.85 (d, ^3J = 8.0 Hz, 1H), 8.14 (s, 1H), 8.23 (d, ^3J = 8.5 Hz, 1H) ppm. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 25.5, 47.5, 111.0, 122.0 (q, $^1J_{CF}$ = 276.6 Hz, CF_3), 123.3, 127.3, 128.6, 128.7, 129.8, 130.0, 130.1 (q, $^4J_{CF}$ = 1.5 Hz), 134.2, 139.7, 145.2, 145.9 (q, $^2J_{CF}$ = 31.9 Hz), 147.5 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.7 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{20}H_{18}F_3N_2^+$: 343.1417; found: 343.1423.

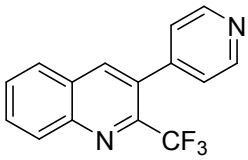


Pyrrolidin-1-yl(4-(2-(trifluoromethyl)quinolin-3-yl)phenyl)methanone (5u). Obtained from ketone **4u** by procedure C (0.758 mmol). Yellow-brown solid, m.p. 132-134 °C, yield 0.195 g (70%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 1.80-1.94 (m, 4H, CH_2), 3.60-3.63 (m, 2H, NCH_2), 3.42-3.45 (m, 2H, NCH_2), 7.37 (d, ^3J = 8.2 Hz, 2H), 7.56 (d, ^3J = 8.2 Hz, 2H),



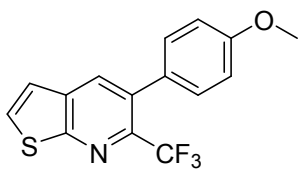
7.60 (ptd, ^3J = 7.5 Hz, ^4J = 1.0 Hz, 1H), 7.74 (ptd, ^3J = 7.7 Hz, ^4J = 1.4 Hz, 1H), 7.80 (d, ^3J = 7.9 Hz, 1H), 8.08 (s, 1H), 8.15 (d, ^3J = 8.6 Hz, 1H) ppm. $^{13}C\{^1H\}$ NMR (100.6 MHz, $CDCl_3$): δ 24.2, 26.2, 46.1, 49.5, 121.5 (q, $^1J_{CF}$ = 276.6 Hz, CF_3), 126.7, 127.3, 128.0, 129.0, 129.6, 130.6, 132.4, 136.6, 138.7, 139.5, 144.8 (q, $^2J_{CF}$ = 32.6 Hz), 145.4, 169.0 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.5 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{21}H_{18}F_3N_2O^+$: 371.1366; found: 371.1361.

3-(Pyridin-4-yl)-2-(trifluoromethyl)quinoline (5v). Obtained from ketone **4v** by procedure C



(~0.87 mmol). Pale brown powder, m.p. 137-139 °C, yield 0.096 g (40%). ^1H NMR (400.1 MHz, $CDCl_3$): δ 7.36 (d, ^3J = 6.0 Hz, 2H, Py), 7.69-7.78 (m, 1H), 7.84-7.90 (m, 1H), 7.92 (d, ^3J = 8.2 Hz, 1H), 8.16 (s, 1H), 8.28 (d, ^3J = 8.5 Hz, 1H), 8.72 (d, ^3J = 6.0 Hz, 2H, Py) ppm. $^{13}C\{^1H\}$ NMR (100.6 MHz, $CDCl_3$): δ 121.5 (q, $^1J_{CF}$ = 276.4 Hz, CF_3), 124.1 (d, $^4J_{CF}$ = 1.5 Hz), 127.5, 128.0, 129.4, 130.0, 130.5, 131.3, 139.4, 144.6 (q, $^2J_{CF}$ = 33.2 Hz), 145.4, 146.0, 149.6 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -62.4 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{15}H_{10}F_3N_2^+$: 275.0791; found: 275.0802.

5-(4-Methoxyphenyl)-6-(trifluoromethyl)thieno[*2,3-b*]pyridine (5w). Obtained from ketone **4w**

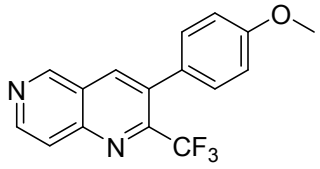


by procedure B (~0.26 mmol). White powder, m.p. 81-82 °C, yield 0.063 g (78%). ^1H NMR (400.1 MHz, $CDCl_3$): δ 3.86 (s, 3H, CH_3), 6.97 (d, ^3J = 8.7 Hz, 2H, 4-$MeOC_6H_4$), 7.29 (d, ^3J = 8.7 Hz, 2H, 4-$MeOC_6H_4$), 7.32 (d, ^3J = 6.0 Hz, 1H), 7.74 (d, ^3J = 6.0 Hz, 1H), 8.03 (s, 1H) ppm. $^{13}C\{^1H\}$ NMR (100.6 MHz, $CDCl_3$): δ 55.3, 113.5, 121.0, 122.1 (q, $^1J_{CF}$ = 275.7 Hz, CF_3), 129.7, 130.4 (q, $^4J_{CF}$ = 1.5 Hz), 131.3, 132.8, 134.2, 134.8, 142.1 (q, $^2J_{CF}$ = 32.6 Hz), 159.0, 159.5 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -61.5 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{15}H_{11}F_3NOS^+$: 310.0508; found: 310.0515.

Synthesis of quinoline 5l by the reaction of enamine 2b with 2-aminobenzaldehyde 3'a generated in situ (procedure D). 12 mL vial with a screw cap was charged with 2-nitrobenzaldehyde (0.075 g, 0.5 mmol), glacial acetic acid (2 mL), water (0.1 mL) and Fe powder (0.084 g, 1.5 mmol). Reaction mixture was kept at 80 °C under stirring for 0.5-1 hours until dissolving of Fe powder (after 10-15 min a gas

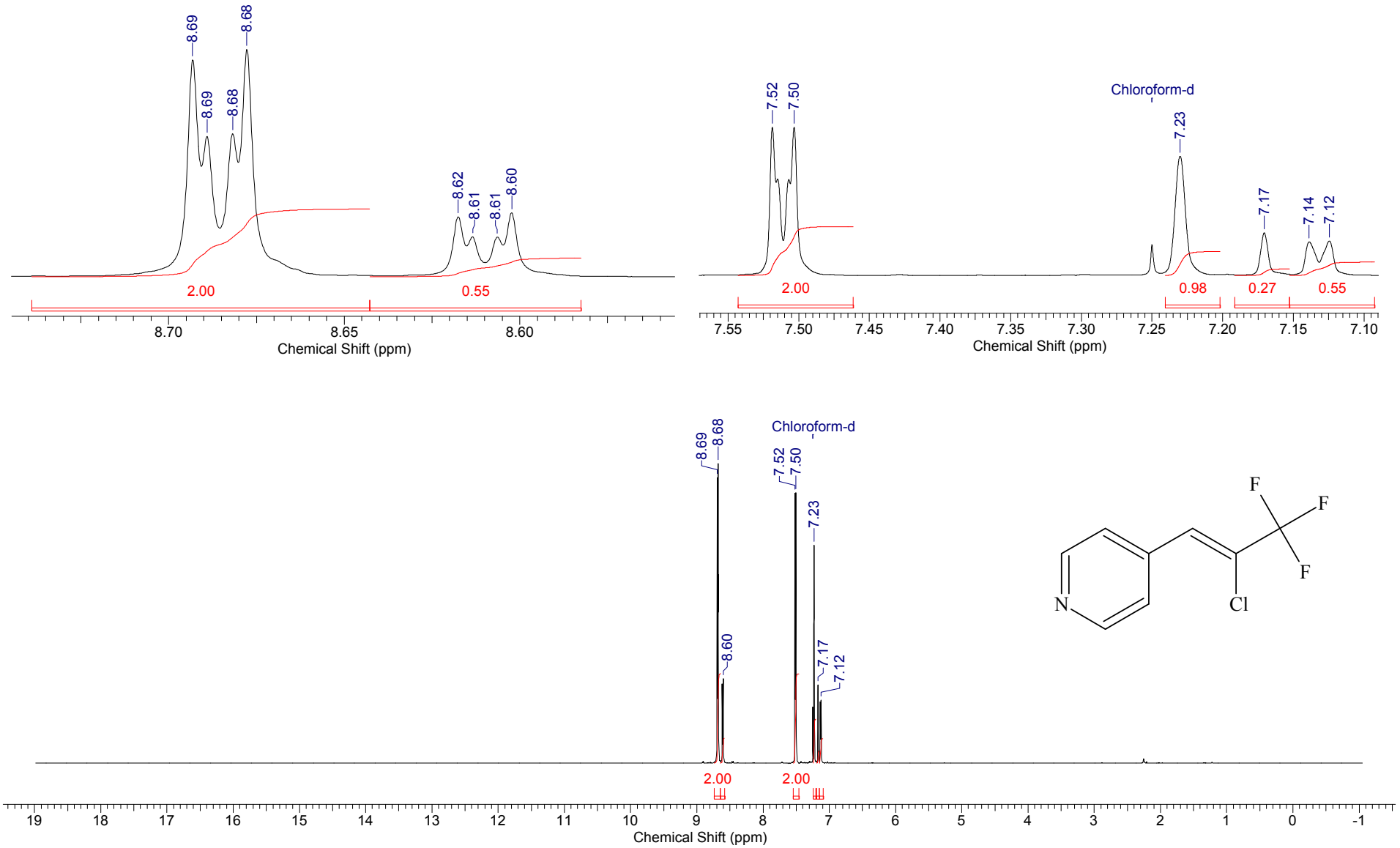
pressure must be released!) and finishing of vigorous reaction Next, enamine **2b** (0.088 g, 0.325 mmol) was added and the reaction mixture was heated at 80-90 °C under stirring for 8 hours. Volatiles were evaporated in vacuo, the residue was dispersed between CH_2Cl_2 (5-10 mL) and 6M HCl (1 mL). Volatiles were evaporated *in vacuo*, the residue was purified by column chromatography, using mixture of hexane and CH_2Cl_2 (1:1) as eluent. Quinoline **5l** was obtained as pale beige powder, yield 0.084 g (85%). For characterization date see above.

Synthesis of 3-(4-methoxyphenyl)-2-(trifluoromethyl)-1,6-naphthyridine (5x) by the reaction of enamine 2b with 4-aminonicotinaldehyde. 12 mL vial with a screw cap was charged with



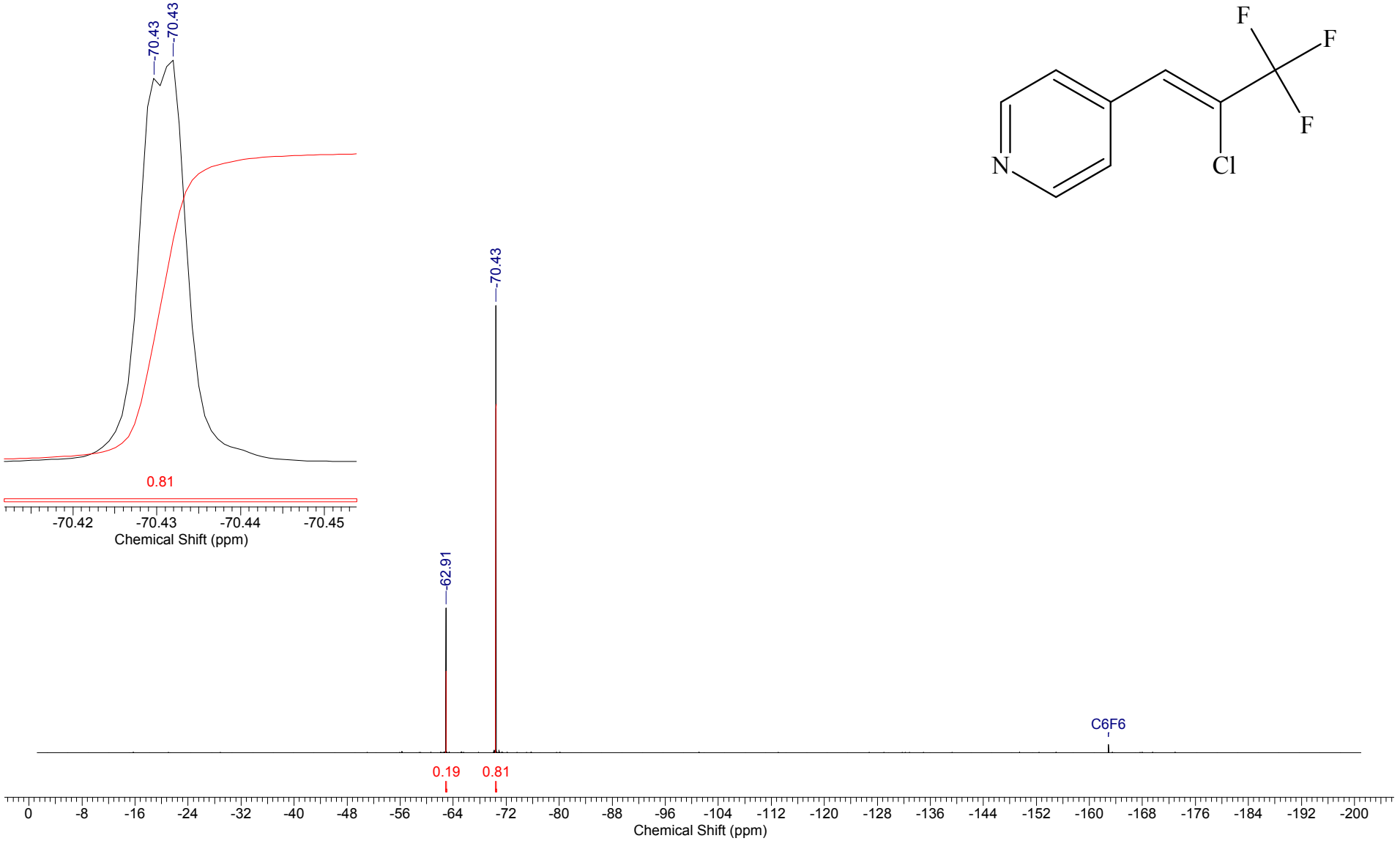
enamine **2b** (0.086 g, 0.32 mmol), 4-aminonicotinaldehyde (0.039 g, 0.32 mmol) and glacial acetic acid (2 mL). Reaction mixture was kept at 80-90 °C under stirring for 12 hours (^{1}H NMR control). Volatiles were evaporated in vacuo, the residue was purified by column chromatography, using mixture of CH_2Cl_2 and MeOH (100:1) as eluent. Pale brown oil, yield 0.082 g (84%). ^{1}H NMR (400.1 MHz, $CDCl_3$): δ 3.85 (s, 3H), 6.98 (d, ^3J = 8.7 Hz, 2H), 7.31 (d, ^3J = 8.7 Hz, 2H), 8.04 (d, ^3J = 6.0 Hz, 1H), 8.28 (s, 1H), 8.83 (d, ^3J = 6.0 Hz, 1H), 9.34 (d, ^3J = 0.8 Hz, 1H) ppm. ^{13}C{^{1}H} NMR (100.6 MHz, $CDCl_3$): δ 55.3, 113.7, 121.2 (q, $^1J_{CF}$ = 277.4 Hz, CF_3), 122.1, 123.4, 128.5, 130.3 (q, $^4J_{CF}$ = 1.7 Hz), 135.1, 139.6, 147.5, 147.6, 150.0 (q, $^2J_{CF}$ = 32.8 Hz), 152.7, 159.8 ppm. ^{19}F NMR (376.5 MHz, $CDCl_3$): δ -63.2 (CF_3) ppm. HRMS (ESI-TOF): m/z $[M+H]^+$ Calcd for $C_{16}H_{12}F_3N_2O^+$: 305.0896; found: 305.0896.

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	17 Feb 2021 17:42:24
File Name	C:\DOCS\OUTPUT_301\2021\02.ô åâðàëü\SZA-223-59.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



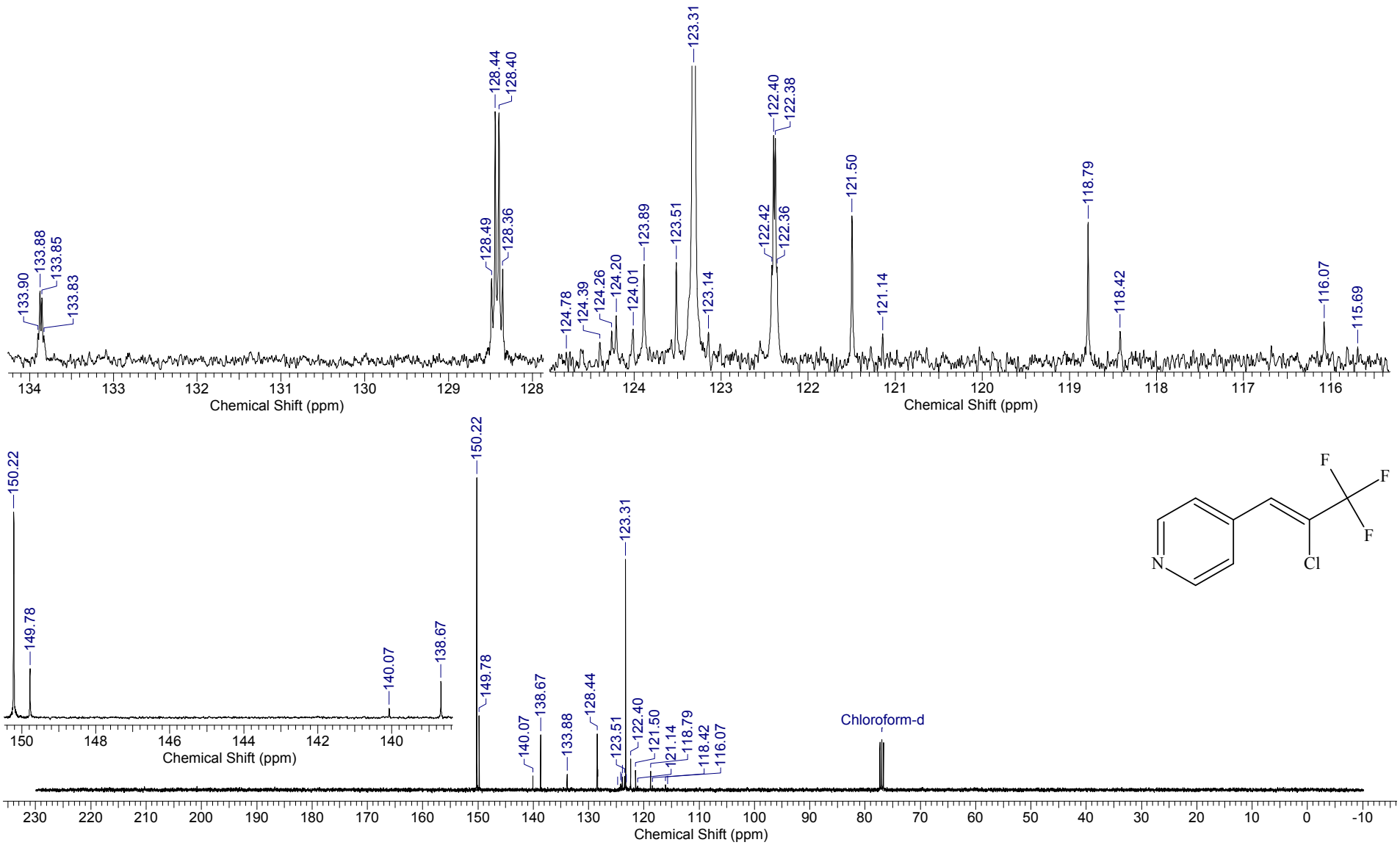
^{1}H NMR spectrum of **1j** (400.1 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 82:18

Acquisition Time (sec)	1.7433	***Comment***	Imported from UXNMR.			***Date***	12 Feb 2021 15:58:54
File Name	C:\DOCS\OUTPUT_301\2021\02.ô åâðàëü\SZA-223-31.F_005001r					***Frequency (MHz)***	376.50
Nucleus	19F	***Number of Transients***	9	***Original Points Count***	131072	***Points Count***	262144
Pulse Sequence	zgflqn	***Solvent***	ACETONITRILE-D3			***Sweep Width (Hz)***	75187.97
Temperature (degree C)	27.000						



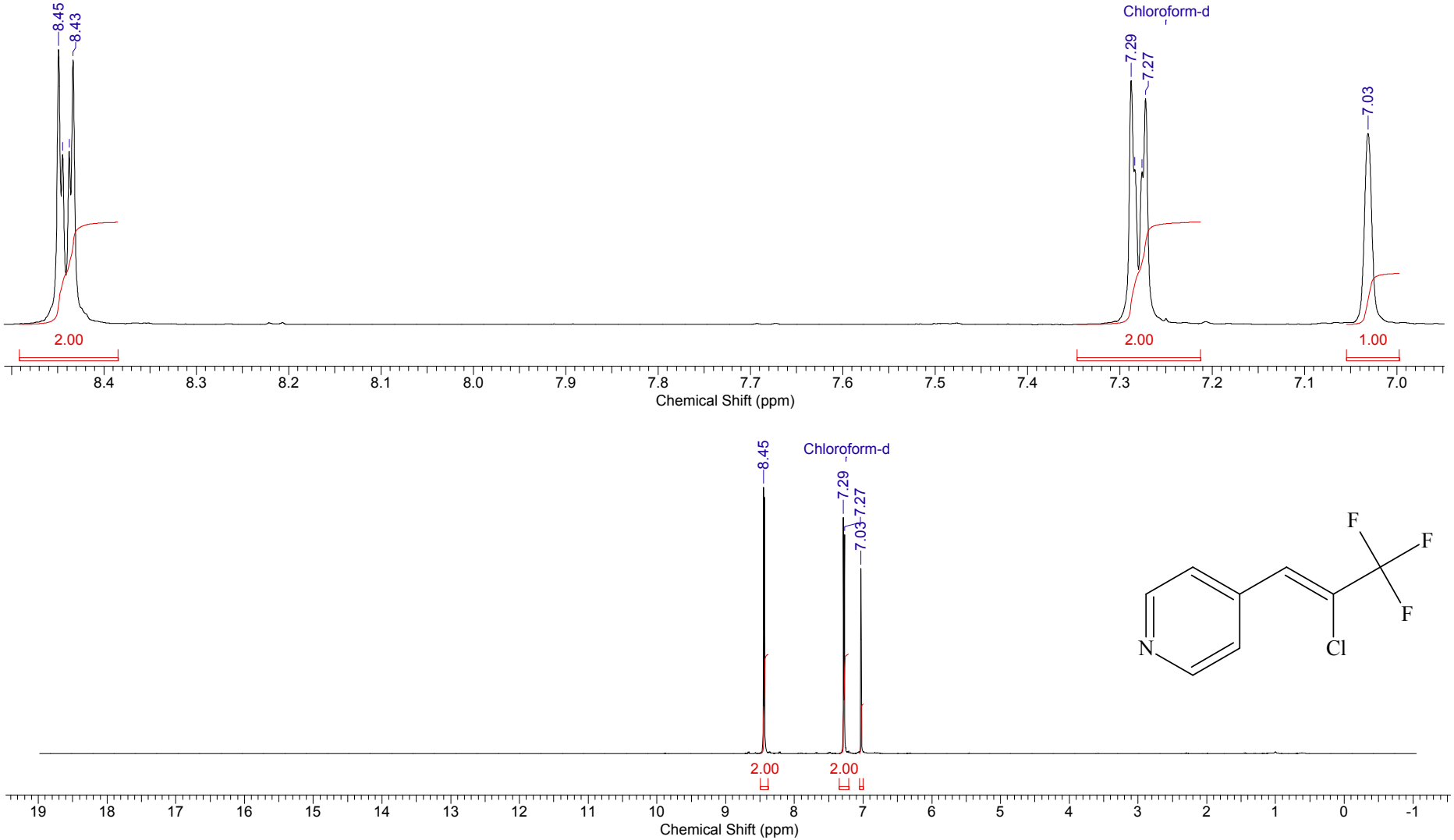
^{19}F NMR spectrum of **1j** (376.5 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 82:18

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	16 Feb 2021 14:37:44
File Name	C:\DOCS\OUTPUT_301\2021\02.ô åâðàëü\SZA-223-6.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	58	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



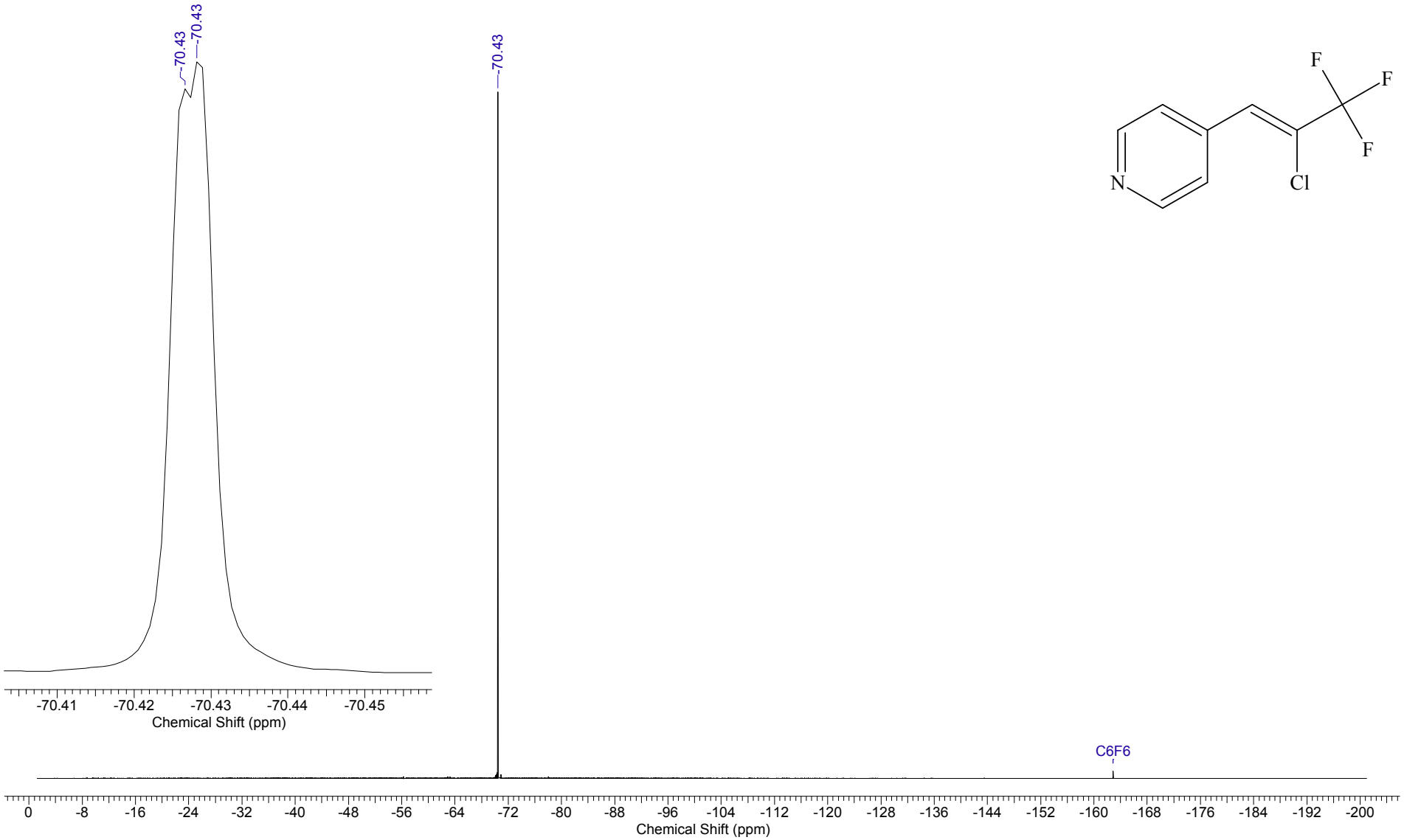
^{13}C NMR spectrum of **1j** (100.6 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 82:18

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	09 Mar 2021 14:28:52
File Name	C:\DOCS\OUTPUT_301\2021\03.ì àðð\SZA-223.H_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	4	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



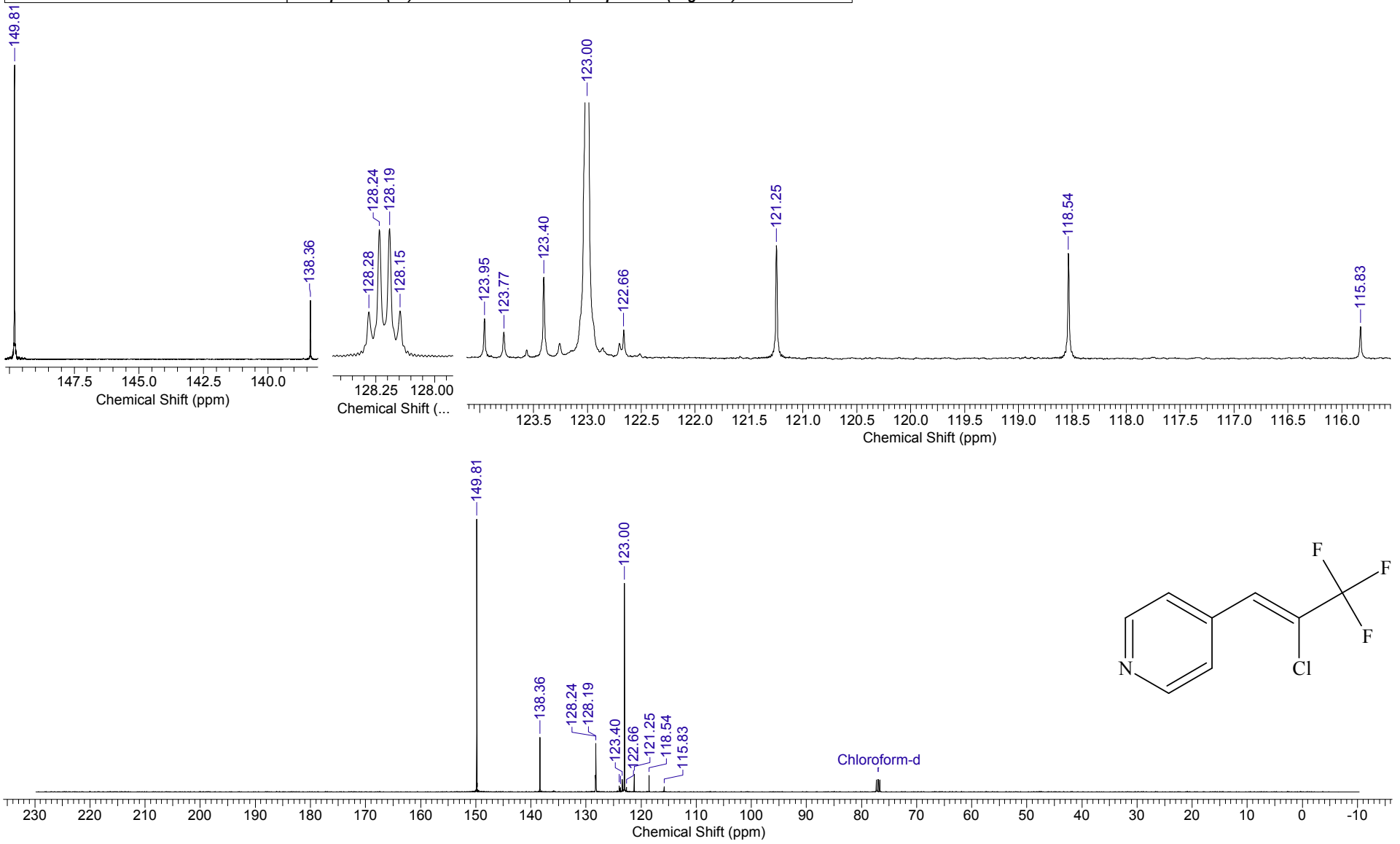
^{1}H NMR spectrum of **1j** (400.1 MHz, $CDCl_3$). Pure *Z*-isomer

Acquisition Time (sec)	1.7433	***Comment***	Imported from UXNMR.			***Date***	05 Mar 2021 15:56:00
File Name	C:\DOCS\OUTPUT_301\2021\03.ì àðò\SZA-223.F_005001r			***Frequency (MHz)***	376.50	***Nucleus***	19F
Number of Transients	16	***Original Points Count***	131072	***Points Count***	262144	***Pulse Sequence***	zgflqn
Solvent	DMSO-D6	***Sweep Width (Hz)***	75187.97	***Temperature (degree C)***	27.000		



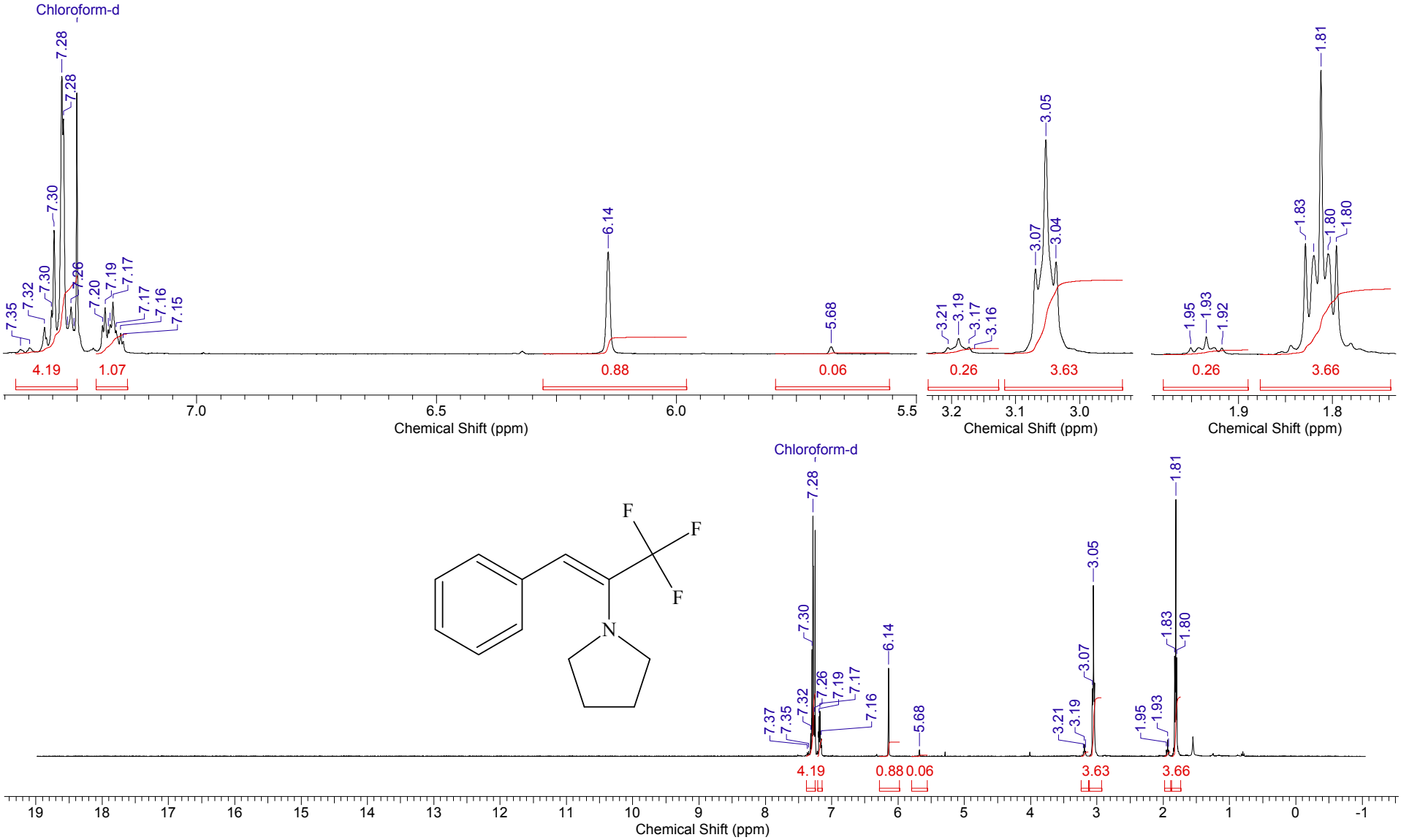
^{19}F NMR spectrum of **1j** (376.5 MHz, $CDCl_3$). Pure *Z*-isomer

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	09 Mar 2021 14:56:06
File Name	C:\DOCS\OUTPUT_301\2021\03.l àðð\SZA-223.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	663	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000		



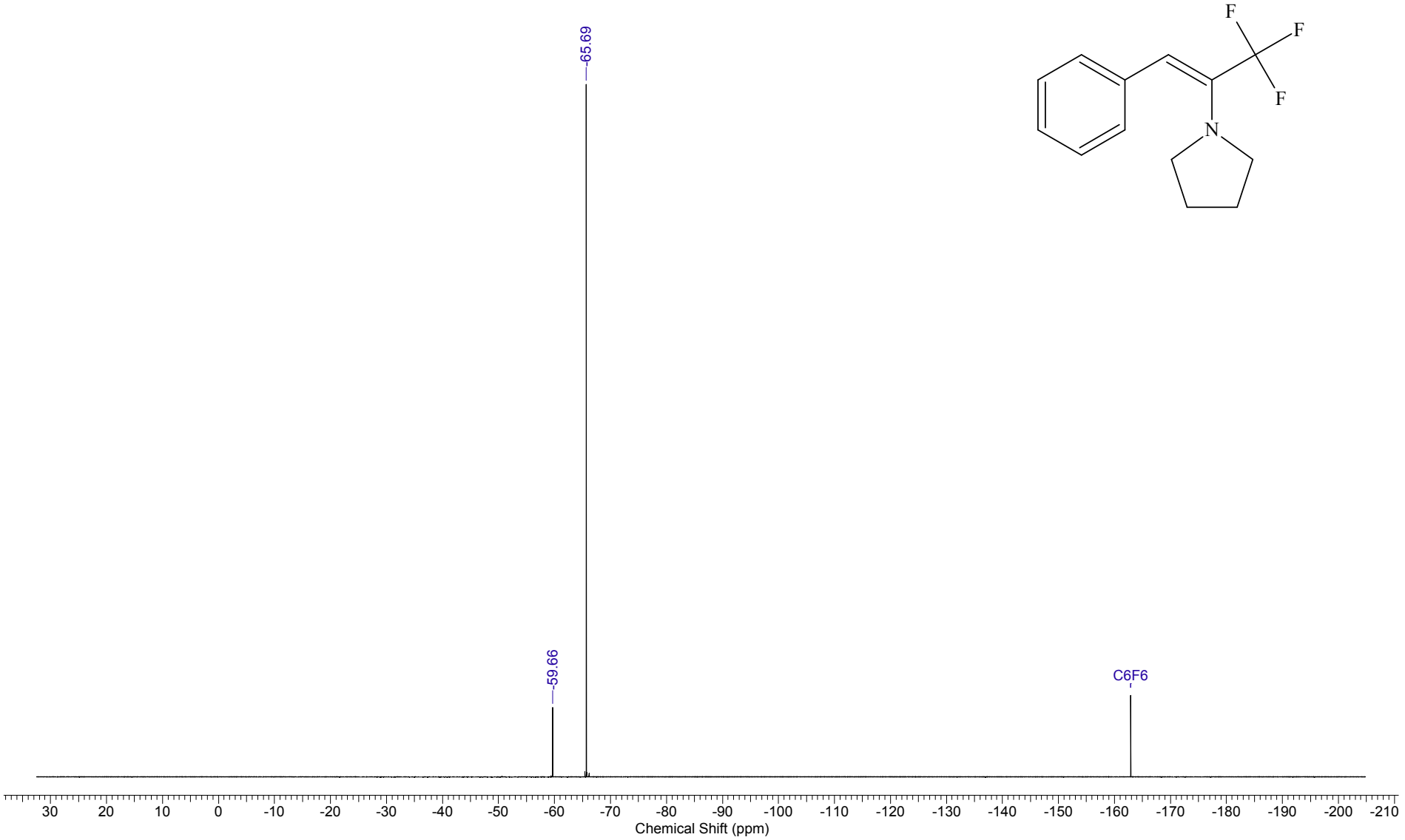
^{13}C NMR spectrum of **1j** (100.6 MHz, $CDCl_3$). Pure *Z*-isomer

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	31 Jul 2020 13:38:50
File Name	C:\DOCS\OUTPUT_301\2020\07.èþ ëü\BM-1909.H_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	4	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



^{1}H NMR spectrum of **2a** (400.1 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 94:6

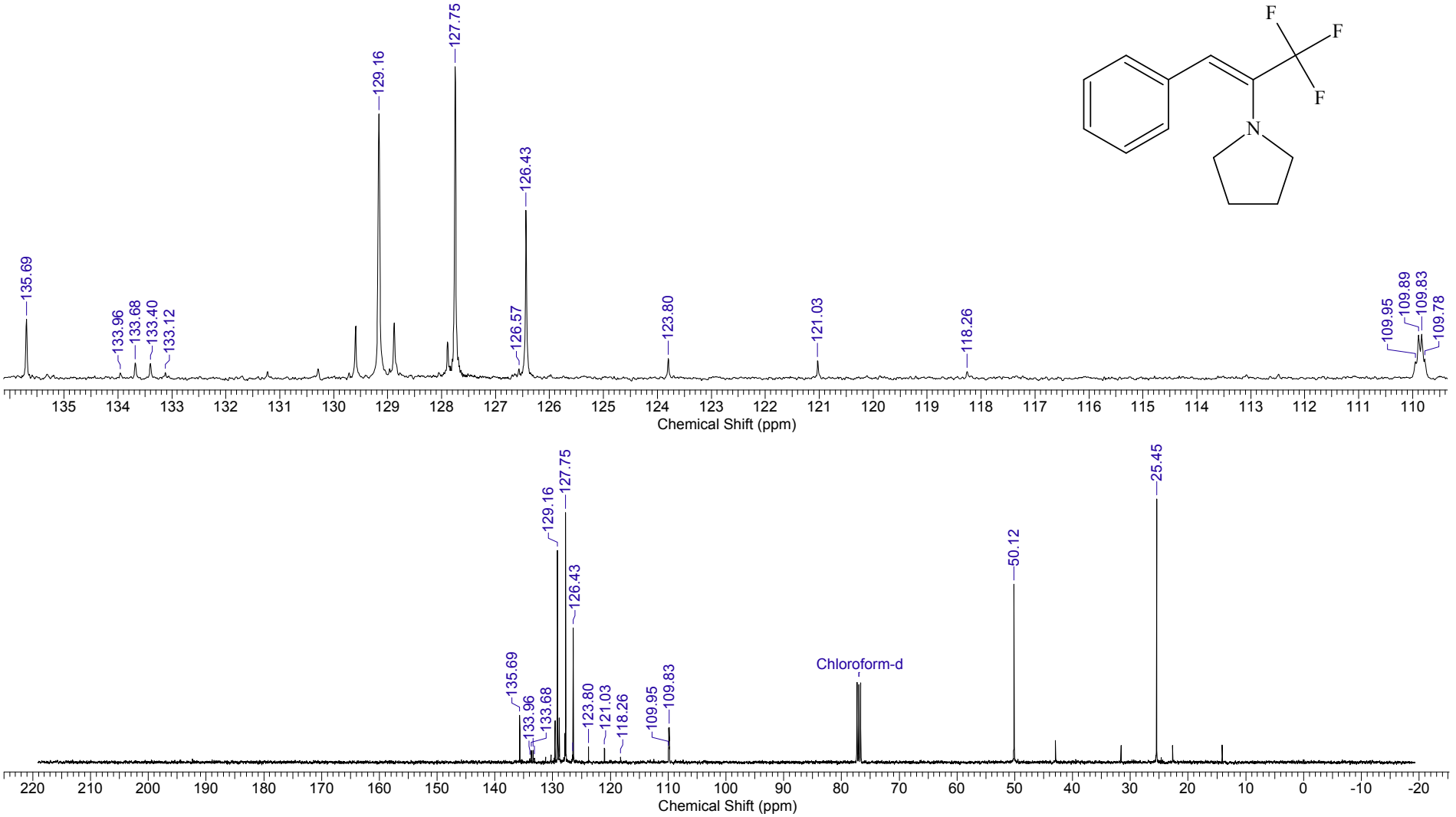
Acquisition Time (sec)	0.7340	***Date***	Apr 29 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.04.29\BM-1558_20190429_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	4	***Original Points Count***	65536
Points Count	65536	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	22.000				



^{19}F NMR spectrum of **2a** (376.5 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 94:6

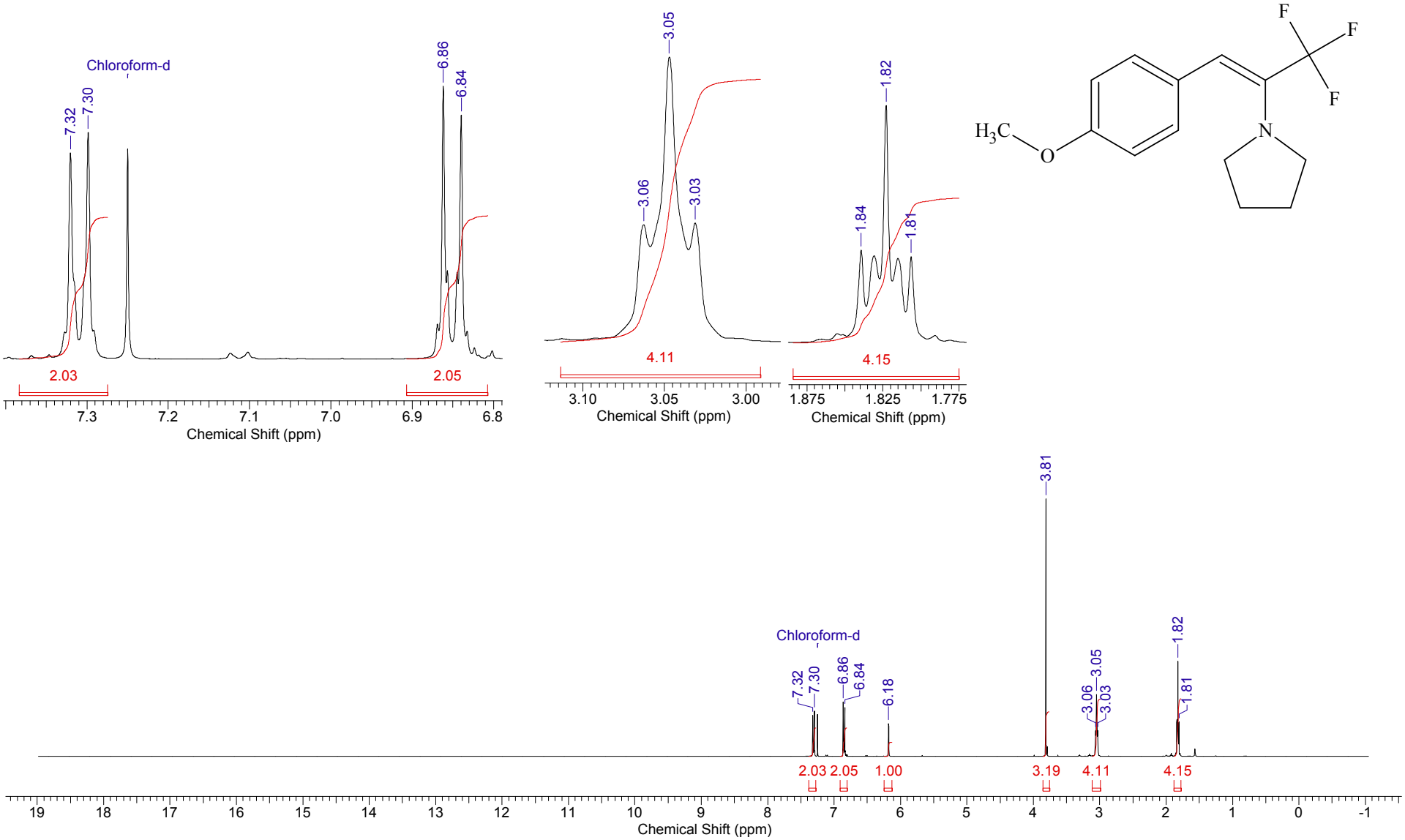
FW	241.2522	***Formula***	$C_{13}H_{14}F_3N$

Acquisition Time (sec)	0.3999	***Date***	13 Sep 2006 15:52:00				
File Name	F:\COMP_PRAK\DOCS\OUTPUT_301\2006\VI-000-6\VI043C6_001001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	106	***Original Points Count***	9591	***Points Count***	32768
Pulse Sequence	zgpg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	23980.81
Temperature (degree C)	20.660						



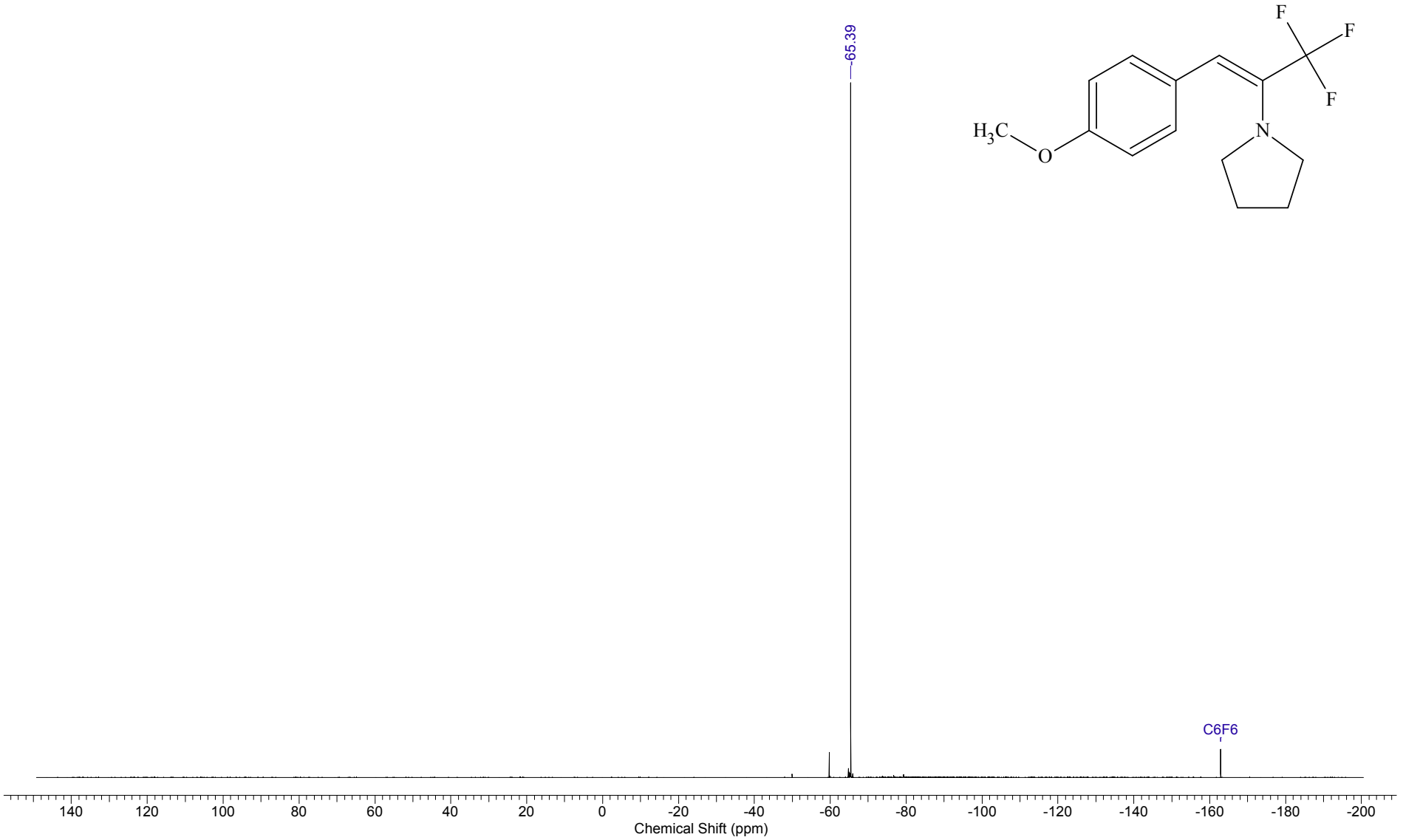
^{13}C NMR spectrum of **2a** (100.6 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 94:6

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	26 Jul 2019 21:47:44
File Name	C:\Users\BM-1\Downloads\bm190726\BM-1680_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	8	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



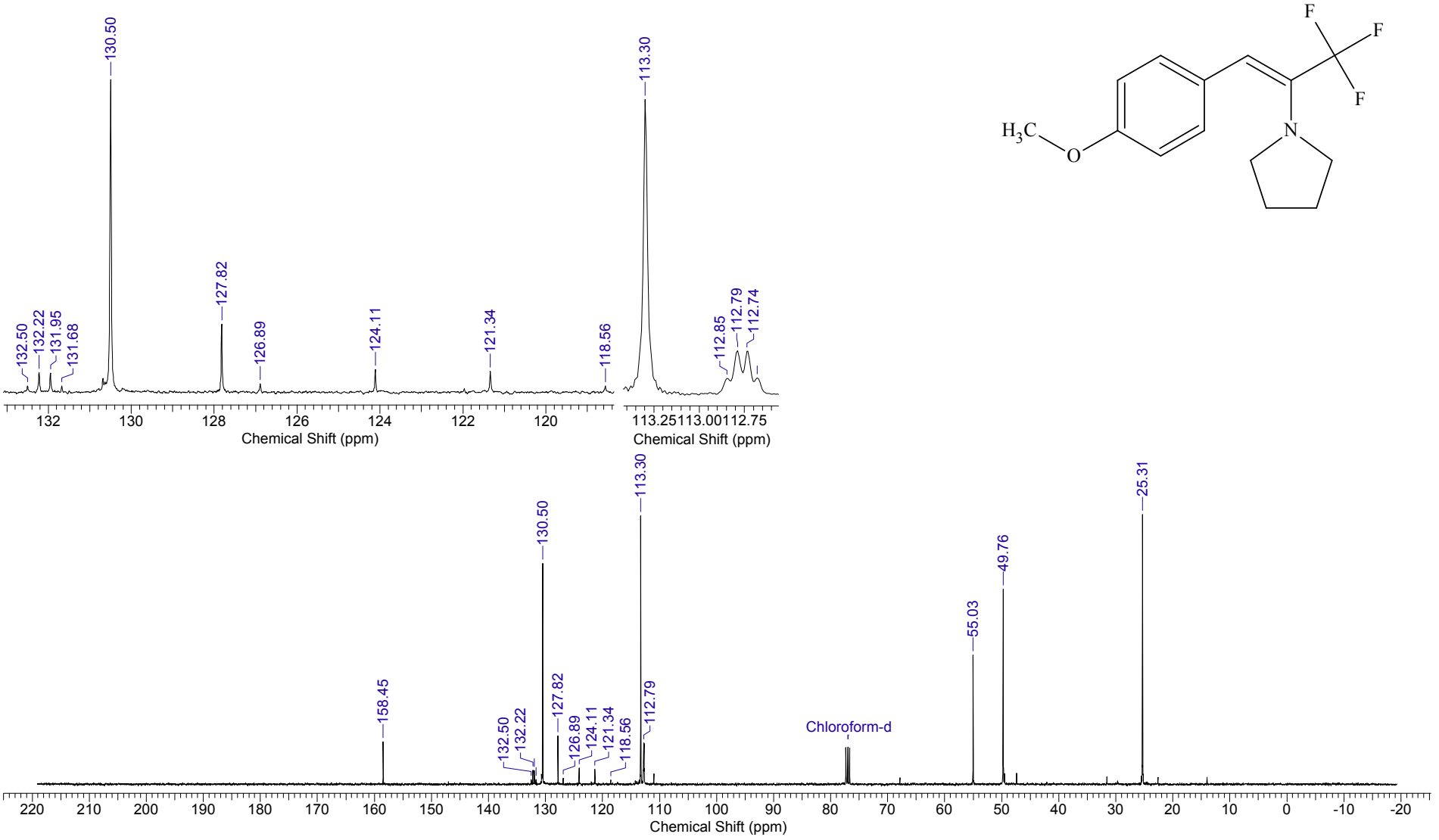
^{1}H NMR spectrum of **2b** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.9923	***Date***	Sep 5 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.05\BM-1680-F_20190905_01\FLUORINE_01		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	262144
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	131578.95	***Temperature (degree C)***	22.000				



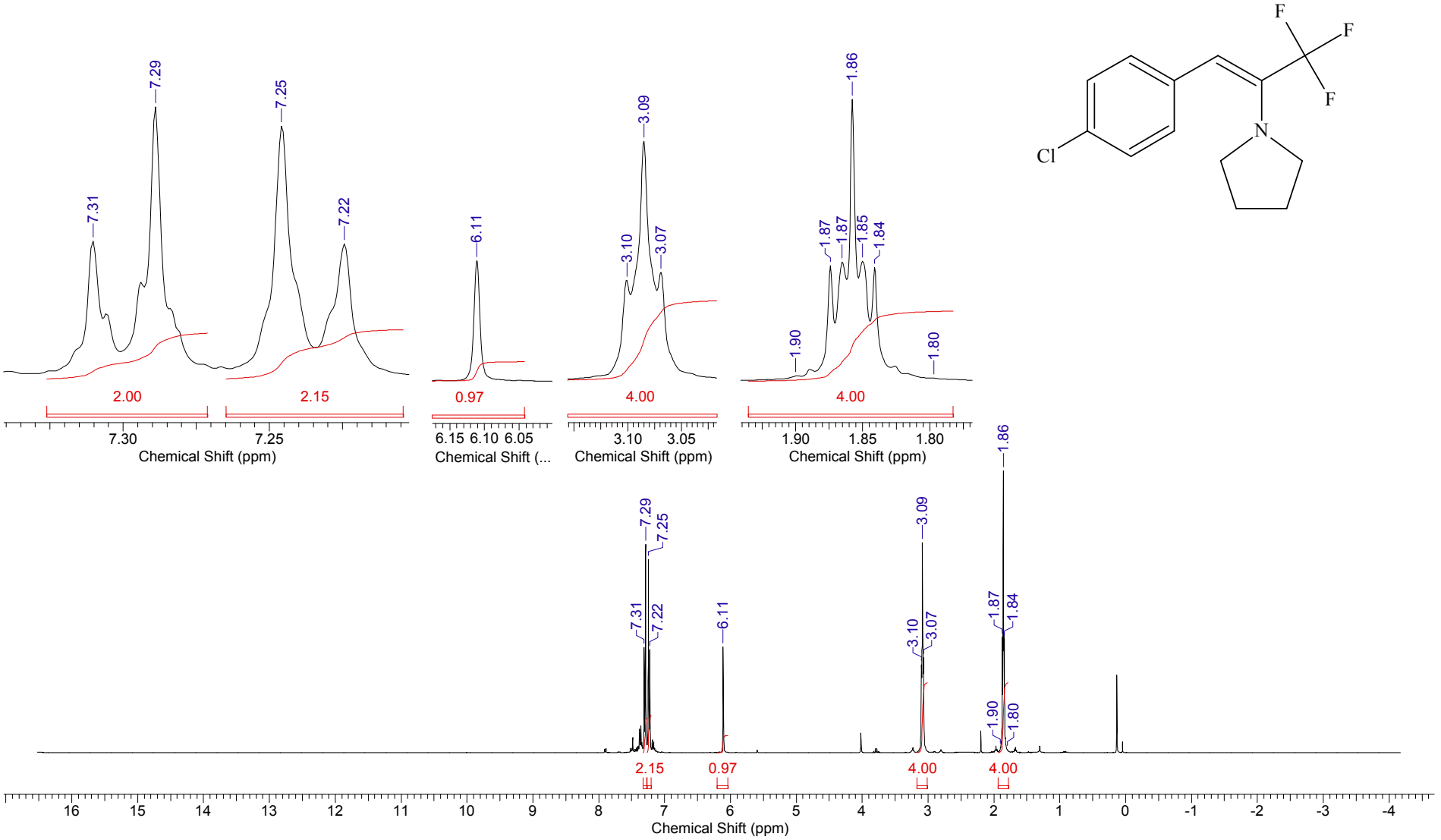
^{19}F NMR spectrum of **2b** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.3999	***Date***	16 Sep 2006 12:15:58				
File Name	F:\COMP_PRAK\DOCS\OUTPUT_301\2006\VI-000-6\VI062C6_001001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	86	***Original Points Count***	9591	***Points Count***	32768
Pulse Sequence	zgpg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	23980.81
Temperature (degree C)	24.160						



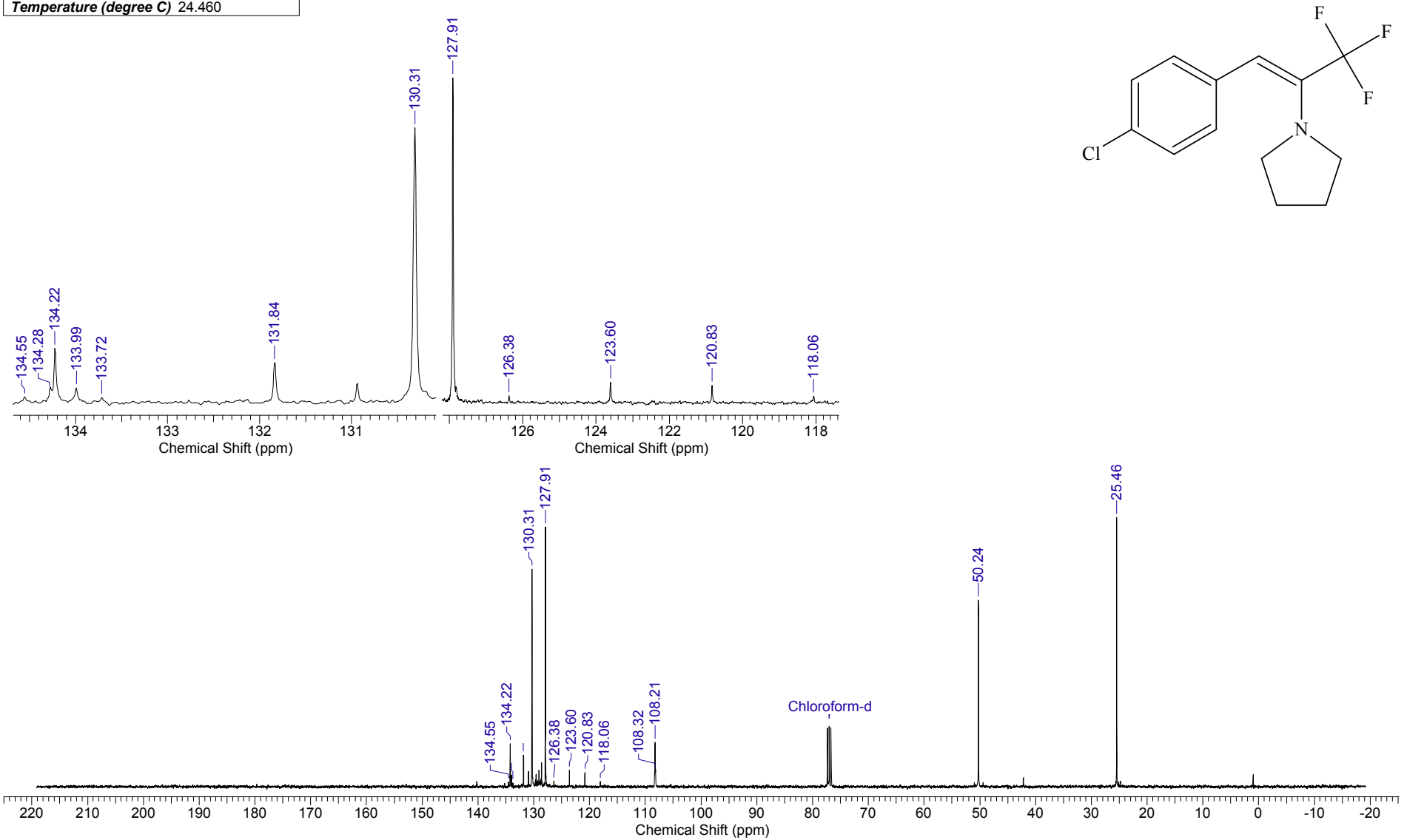
^{13}C NMR spectrum of **2b** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	3.9584	***Comment***	Imported from UXNMR.			***Date***	19 Nov 2005 06:56:00
File Name	F:\COMP_PRAK\DOCS\OUTPUT_301\2005\VK-000-5\VK071H5_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	16	***Original Points Count***	32768	***Points Count***	32768
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8278.15
Temperature (degree C)	24.260						



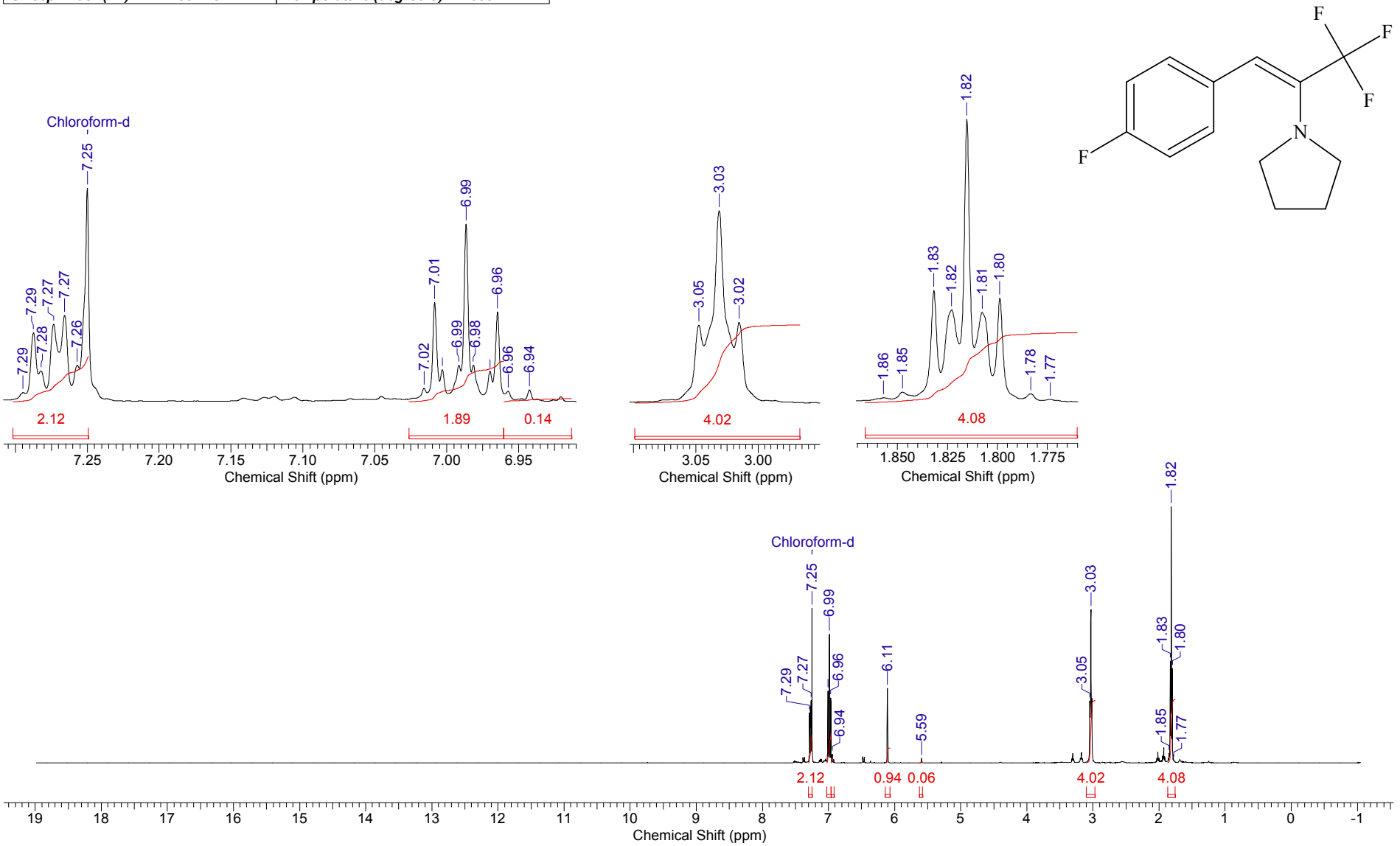
^{1}H NMR spectrum of **2c** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	0.3999	***Comment***	Imported from UXNMR.			***Date***	19 Nov 2005 07:04:00
File Name	F:\COMP_PRAK\DOCS\OUTPUT_301\2005\VK-000-5\VK072C5_001001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	187	***Original Points Count***	9591	***Points Count***	32768
Pulse Sequence	zgpg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	23980.81
Temperature (degree C)	24.460						



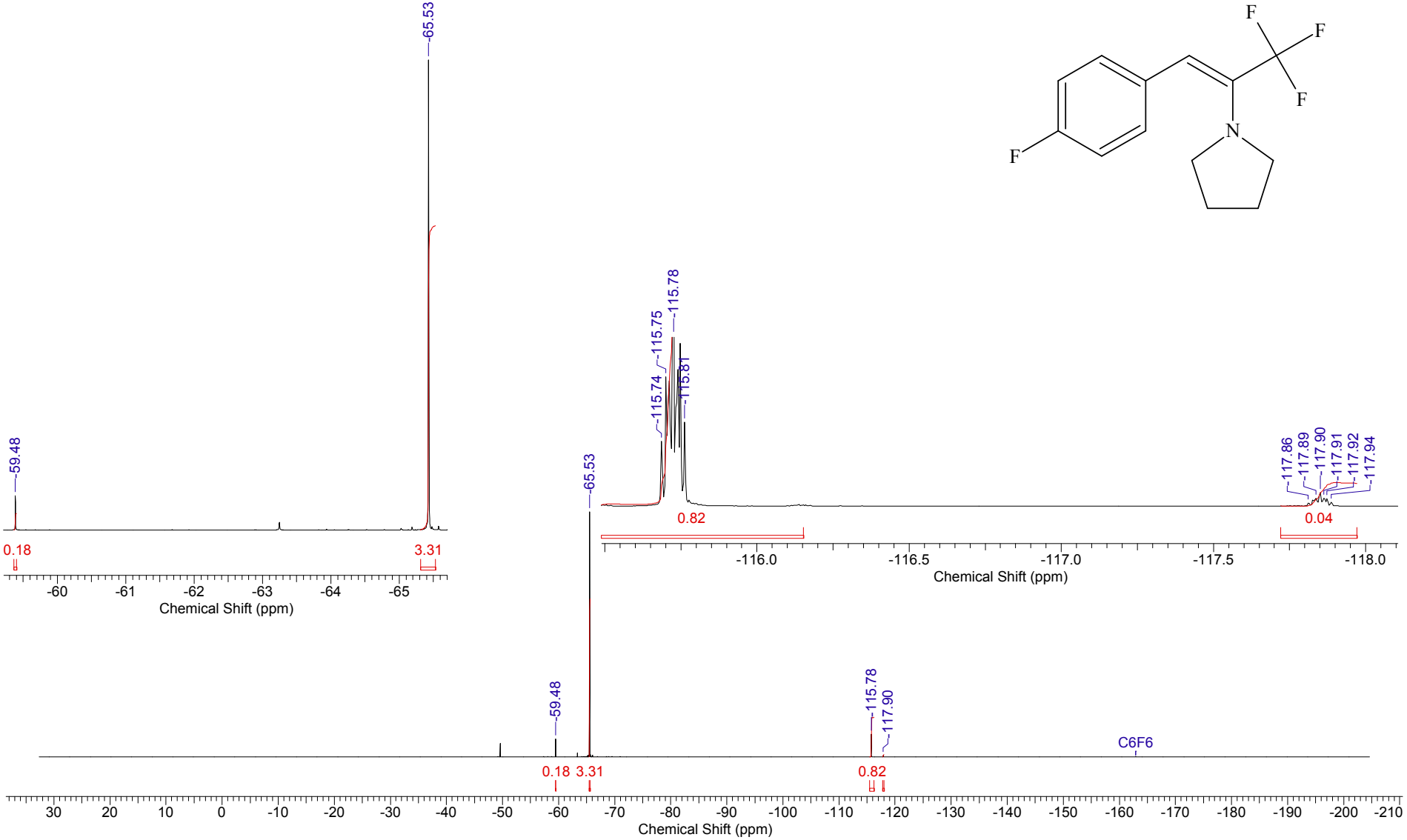
^{13}C NMR spectrum of **2c** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	07 Mar 2020 10:44:40
File Name	C:\DOCS\BM\BM-1877\BM-1877_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H	***Number of Transients***	8
Original Points Count	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	8012.82	***Temperature (degree C)***	27.000						



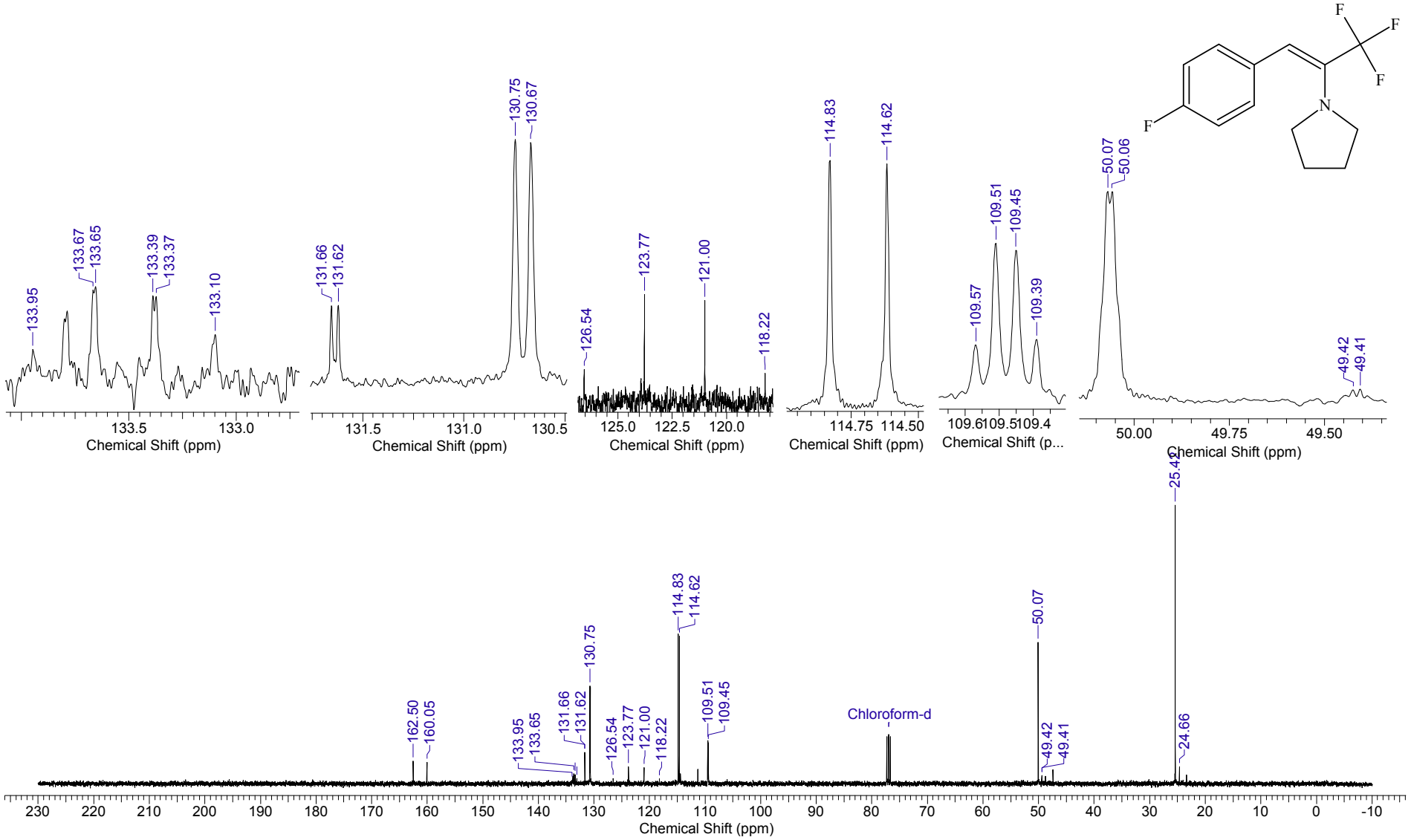
^{1}H NMR spectrum of **2d** (400.1 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 95:5

Acquisition Time (sec)	0.7340	***Date***	Mar 10 2020	***File Name***	C:\DOCS\OUTPUT_301\F19\2020.03.10\bm1877-f_20200310_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	100	***Original Points Count***	65536
Points Count	65536	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	22.000				



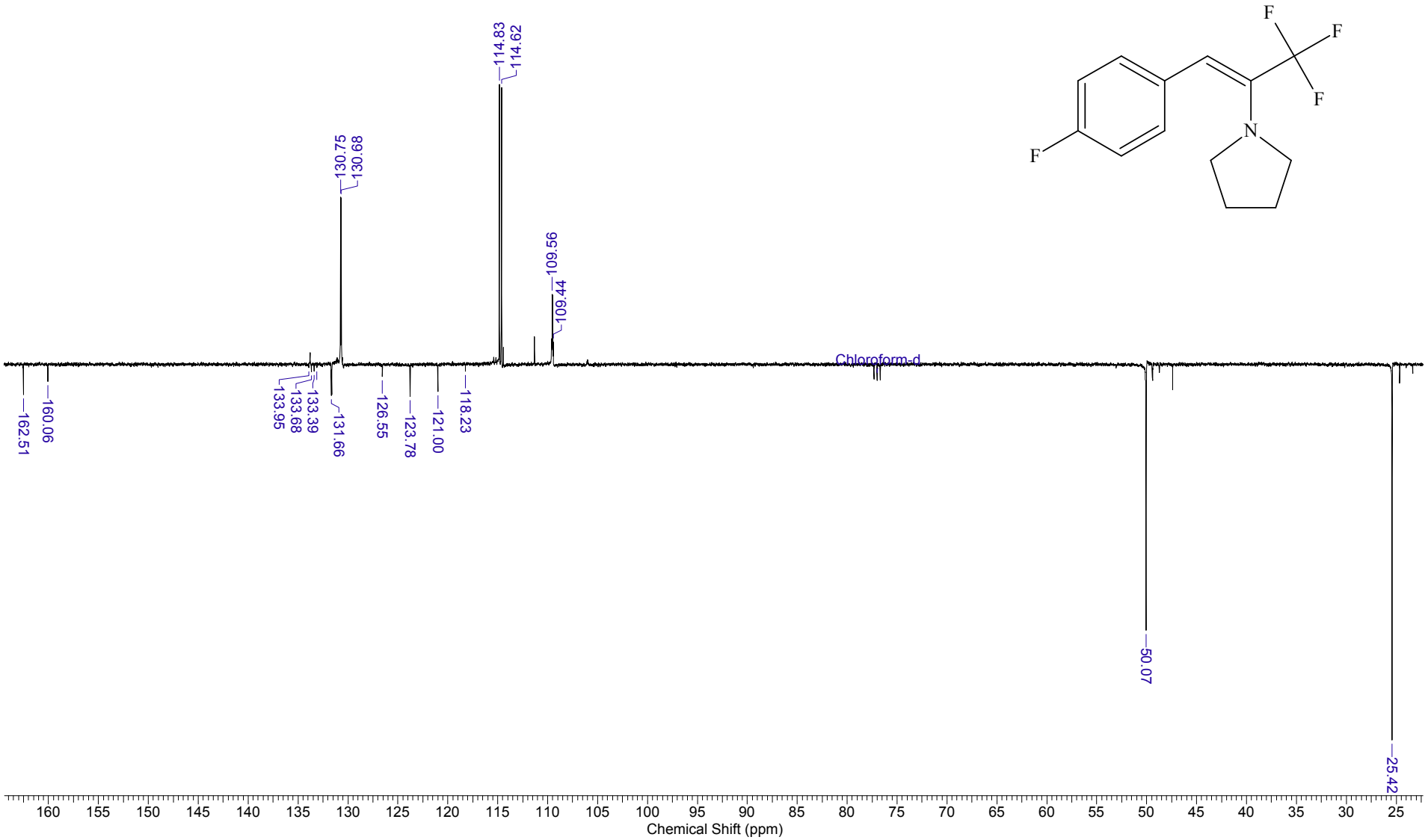
^{19}F NMR spectrum of **2d** (376.5 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 95:5

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	07 Mar 2020 19:59:30
File Name	C:\DOCS\BM\BM-1877-C\BM-1877_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C	***Number of Transients***	24
Original Points Count	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	24154.59	***Temperature (degree C)***	27.000						



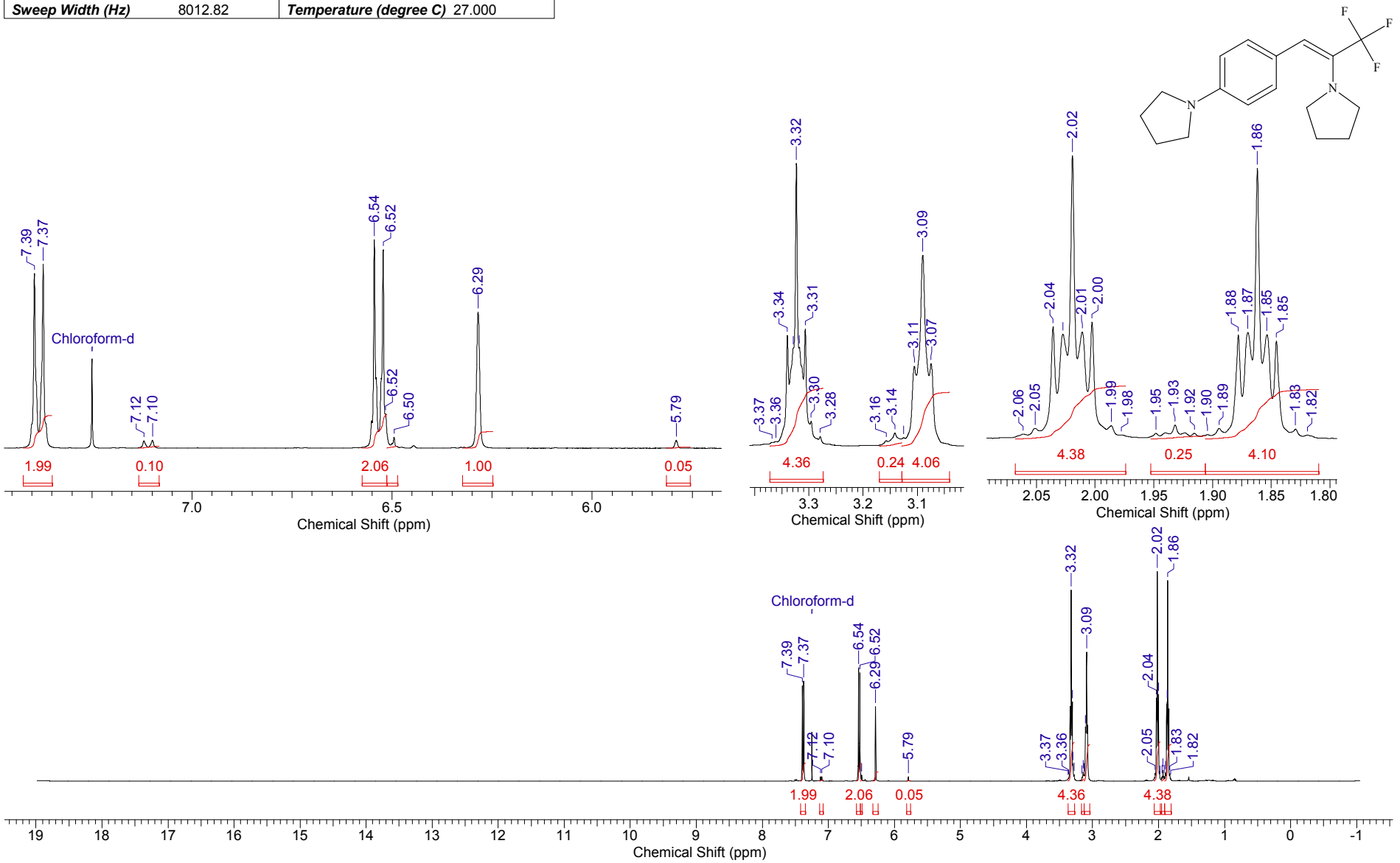
^{13}C NMR spectrum of **2d** (100.6 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 95:5

Acquisition Time (sec)	1.3664	***Comment***	Imported from UXNMR.			***Date***	11 Mar 2020 17:33:44
File Name	C:\DOCS\OUTPUT_301\2020\03.l àðò\BM-1877.APT_004001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	67	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	jmod	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	23980.81
Temperature (degree C)	27.000						



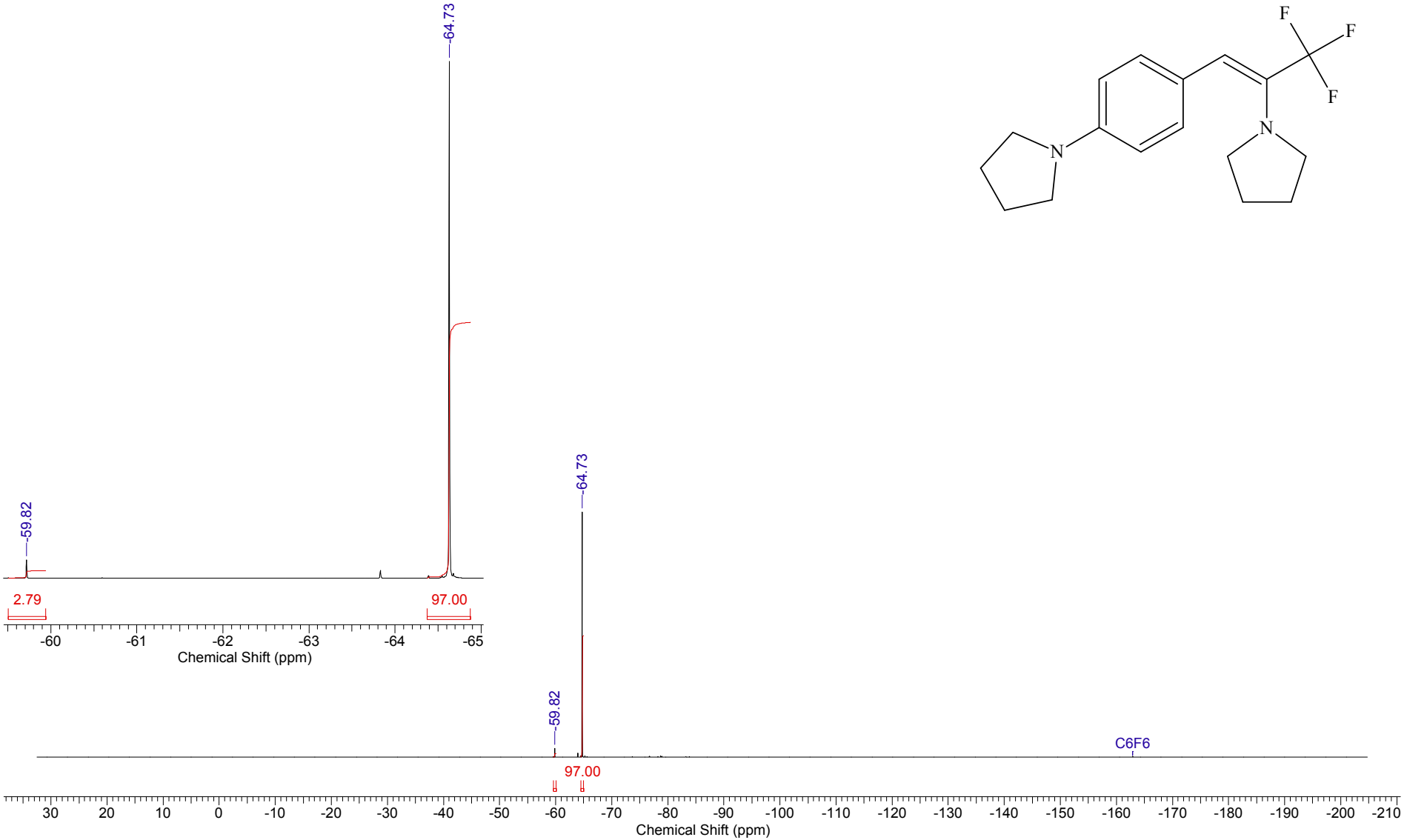
^{13}C APT NMR spectrum of **2d** (100.6 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 95:5

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	22 Feb 2020 11:24:08
File Name	C:\DOCS\BM\BM-1860-4\BM-1860-4_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H ***Number of Transients*** 8
Original Points Count	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	CHLOROFORM-D
Sweep Width (Hz)	8012.82	***Temperature (degree C)***	27.000				



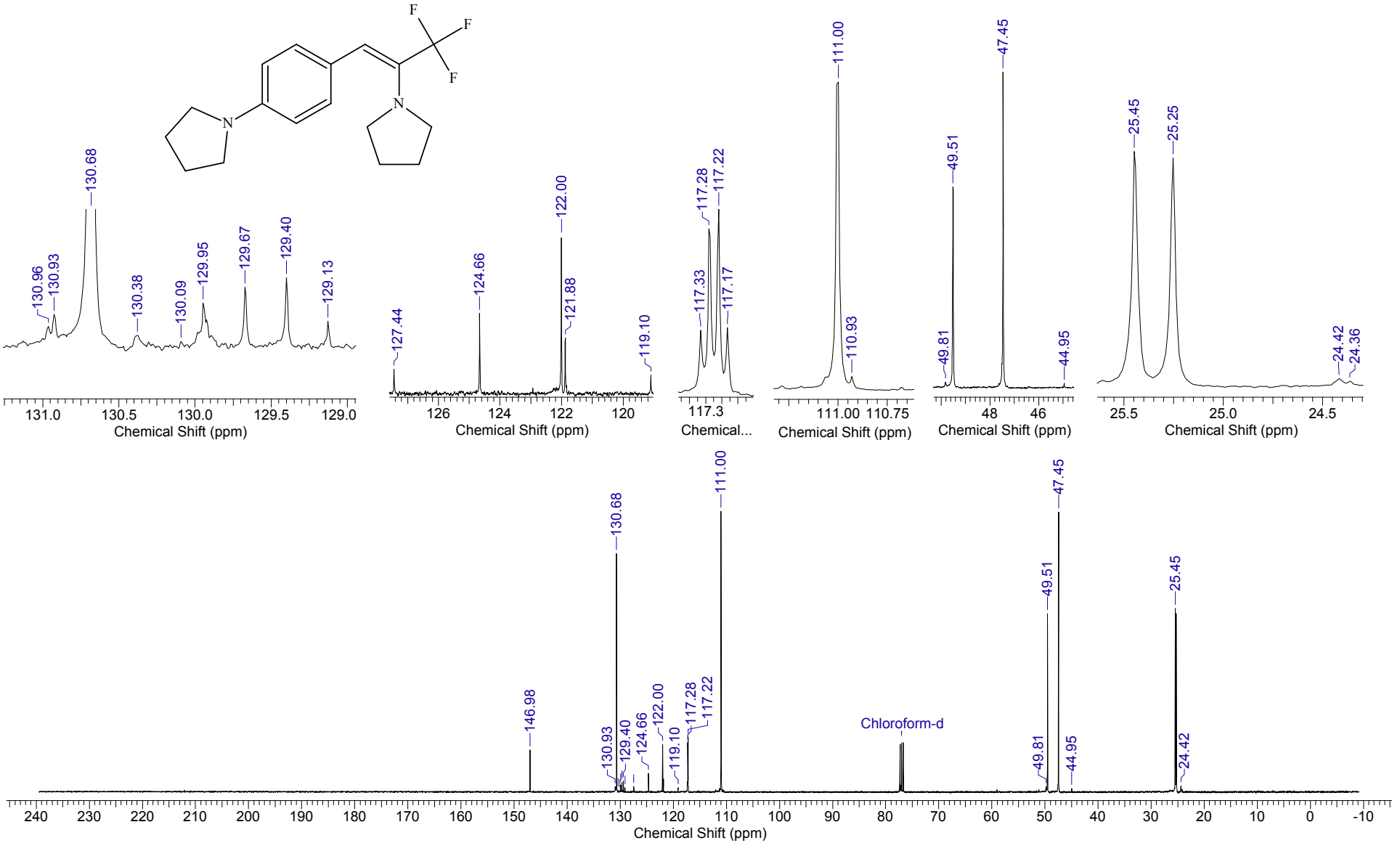
^{1}H NMR spectrum of **2e** (400.1 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 97:3

Acquisition Time (sec)	0.7340	***Date***	Feb 25 2020	***File Name***	C:\DOCS\OUTPUT_301\F19\2020.02.25\bm1860-4-f_20200225_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	10000	***Original Points Count***	65536
Points Count	65536	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	30.000				



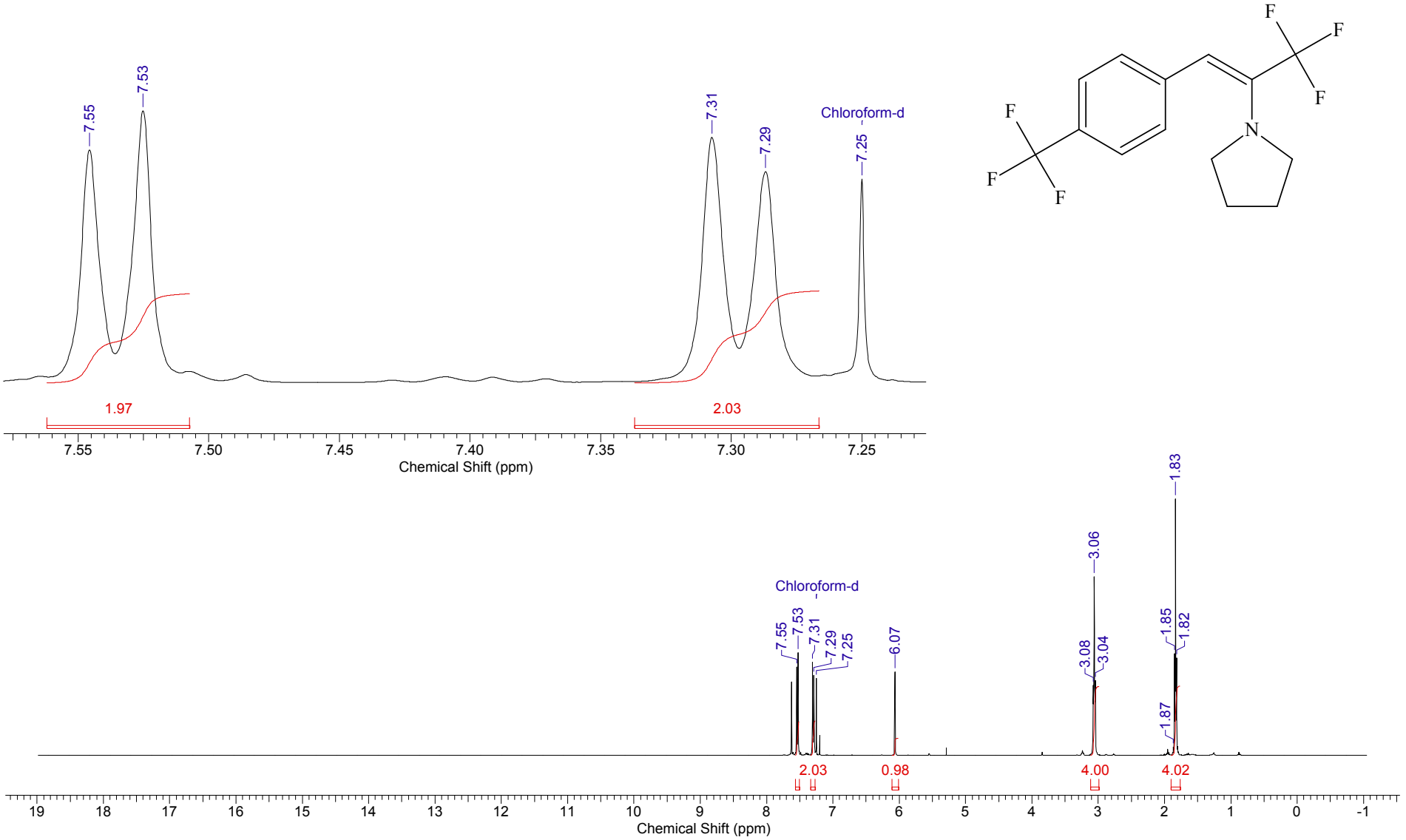
^{19}F NMR spectrum of **2e** (376.5 MHz $CDCl_3$). Mixture of *Z*- and *E*-isomers 97:3

Acquisition Time (sec)	1.3107	***Date***	Feb 25 2020	***File Name***	C:\DOCS\OUTPUT_301\F19\2020.02.25\bm1860-4-c_20200225_01\CARBON_01		
Frequency (MHz)	100.58	***Nucleus***	13C	***Original Points Count***	32768	***Points Count***	32768
Pulse Sequence	s2pul	***Solvent***	acetone	***Sweep Width (Hz)***	25000.00	***Temperature (degree C)***	30.000



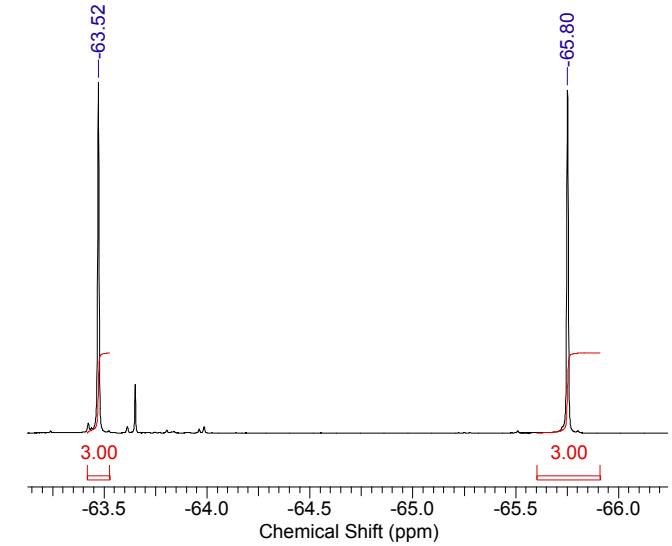
^{13}C NMR spectrum of **2e** (100.6 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 97:3

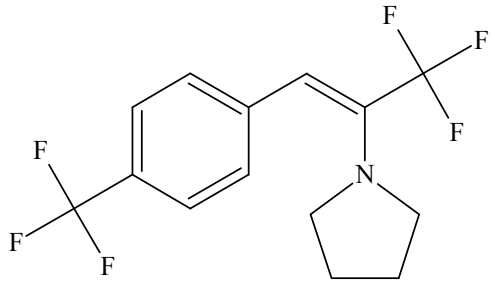
Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	29 Feb 2020 10:34:52	
File Name	C:\DOCS\BM\BM-SZA-181\BM-SZA-181_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H	***Number of Transients*** 8
Original Points Count	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	CHLOROFORM-D	
Sweep Width (Hz)	8012.82	***Temperature (degree C)***	27.000					

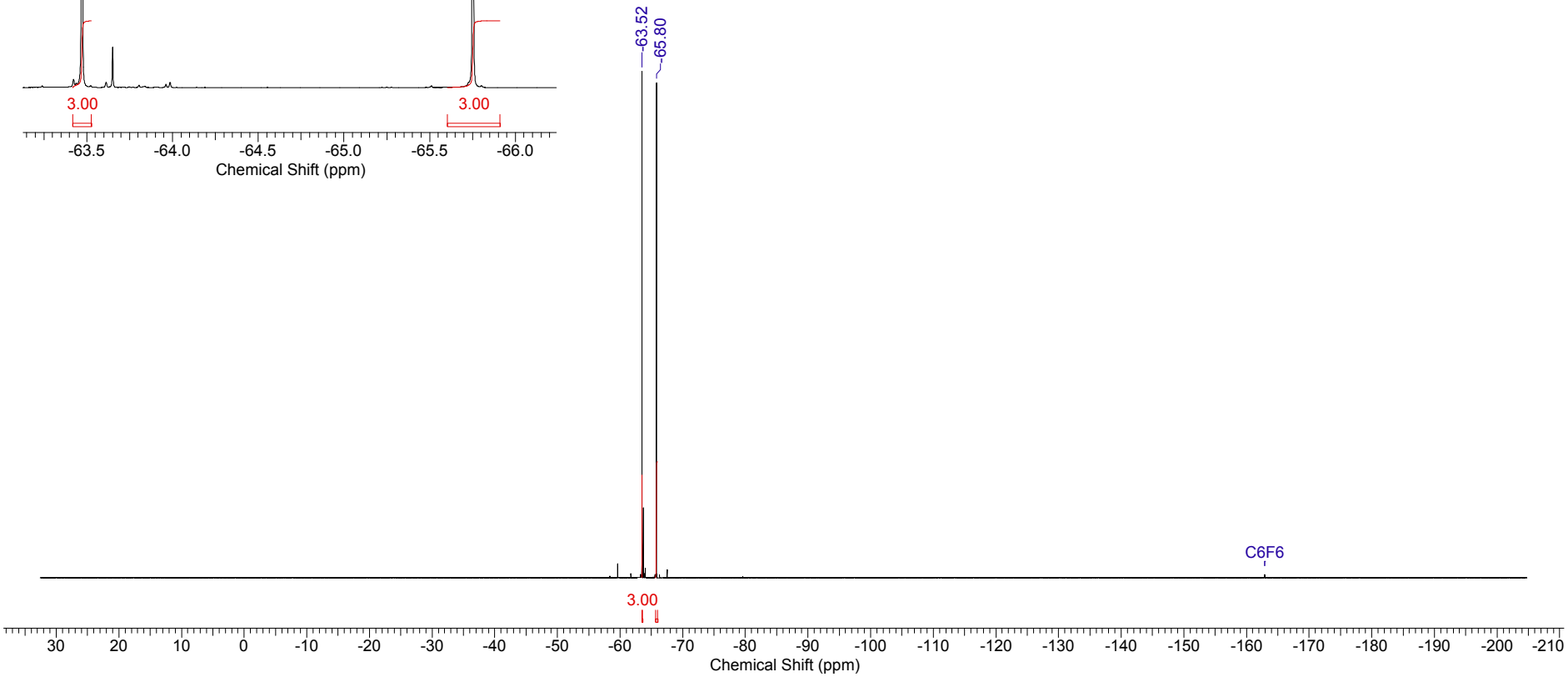


^{1}H NMR spectrum of **2f** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.5000	***Date***	Mar 2 2020	***File Name***	C:\DOCS\OUTPUT_301\F19\2020.03.02\BM-SZA-181_20200302_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	16	***Original Points Count***	133929
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	30.000				

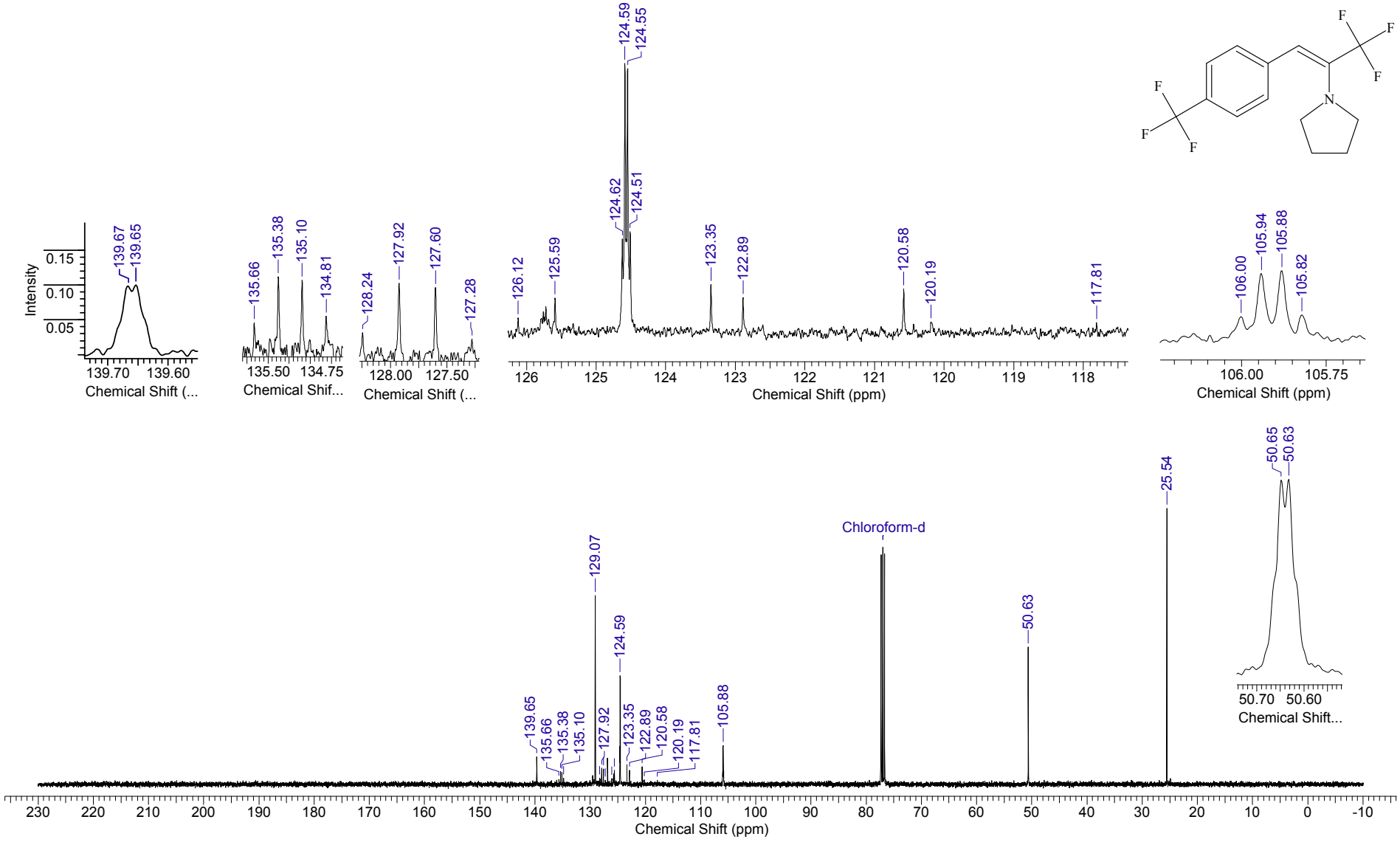






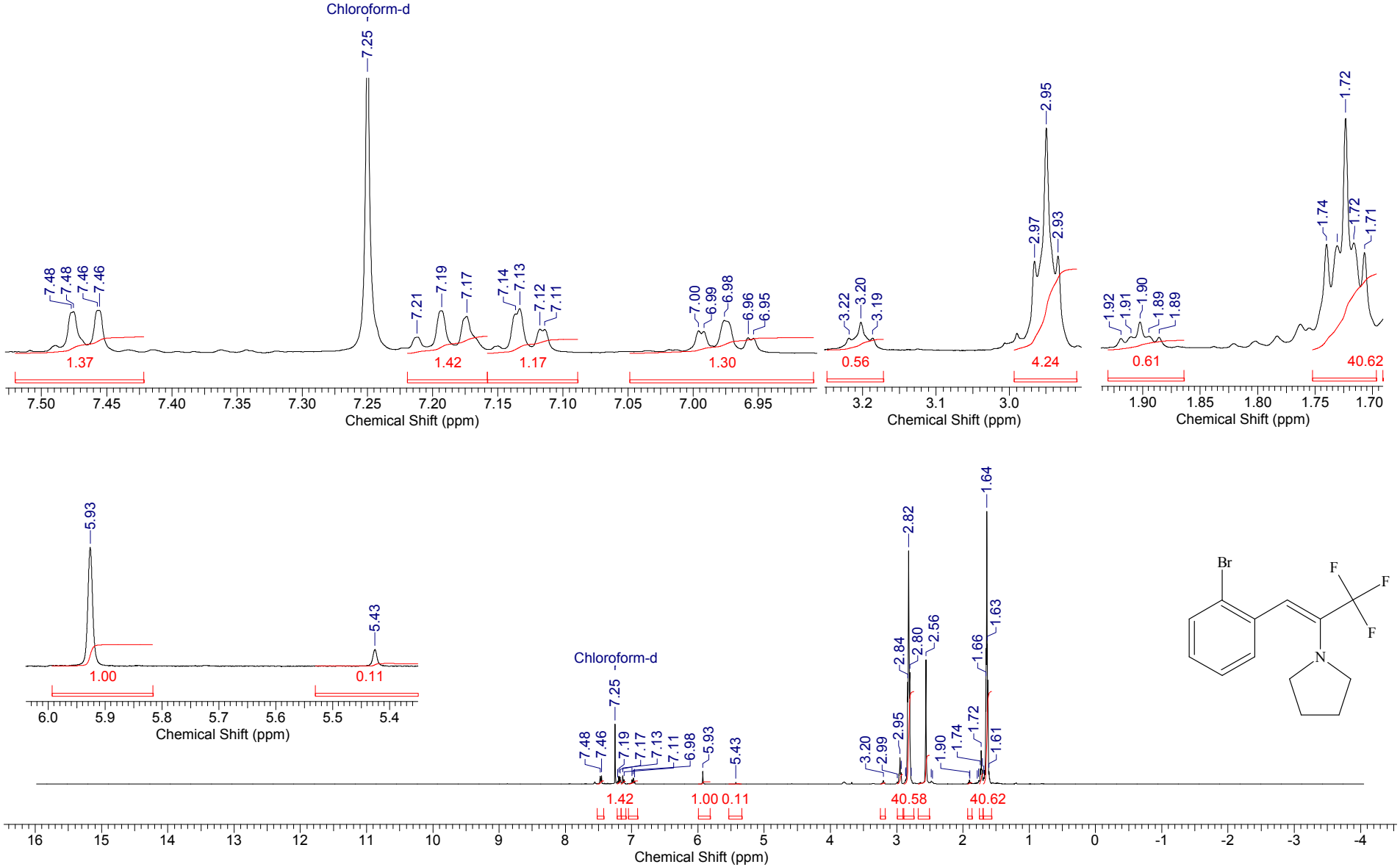
^{19}F NMR spectrum of **2f** (376.5 MHz $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	03 Mar 2020 15:22:48
File Name	C:\DOCS\OUTPUT_301\2020\03.ì àðò\BM-SZA-181.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	405	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



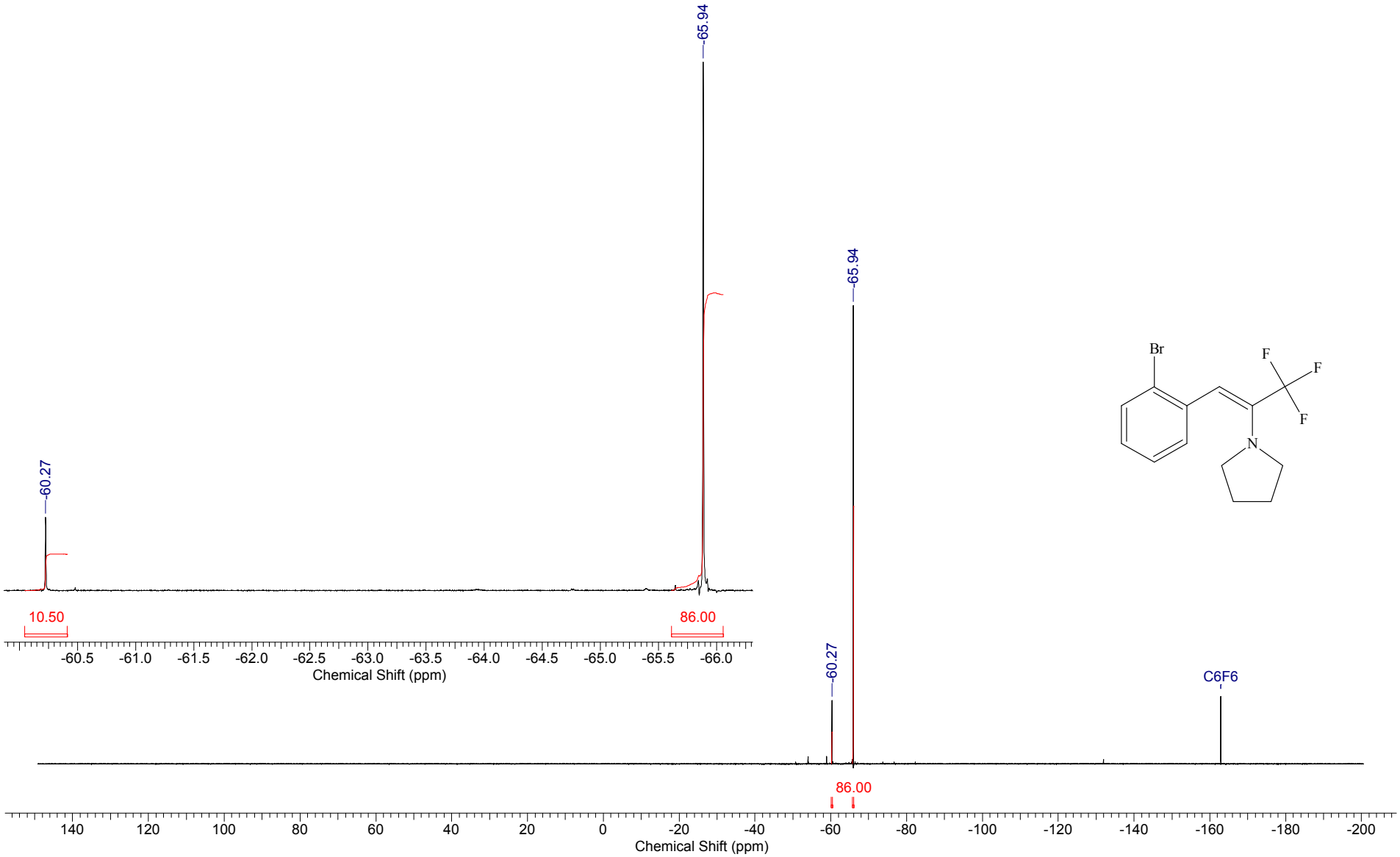
^{13}C NMR spectrum of **2f** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	04 Jul 2019 14:32:12
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\SZA-137.H_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	4	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



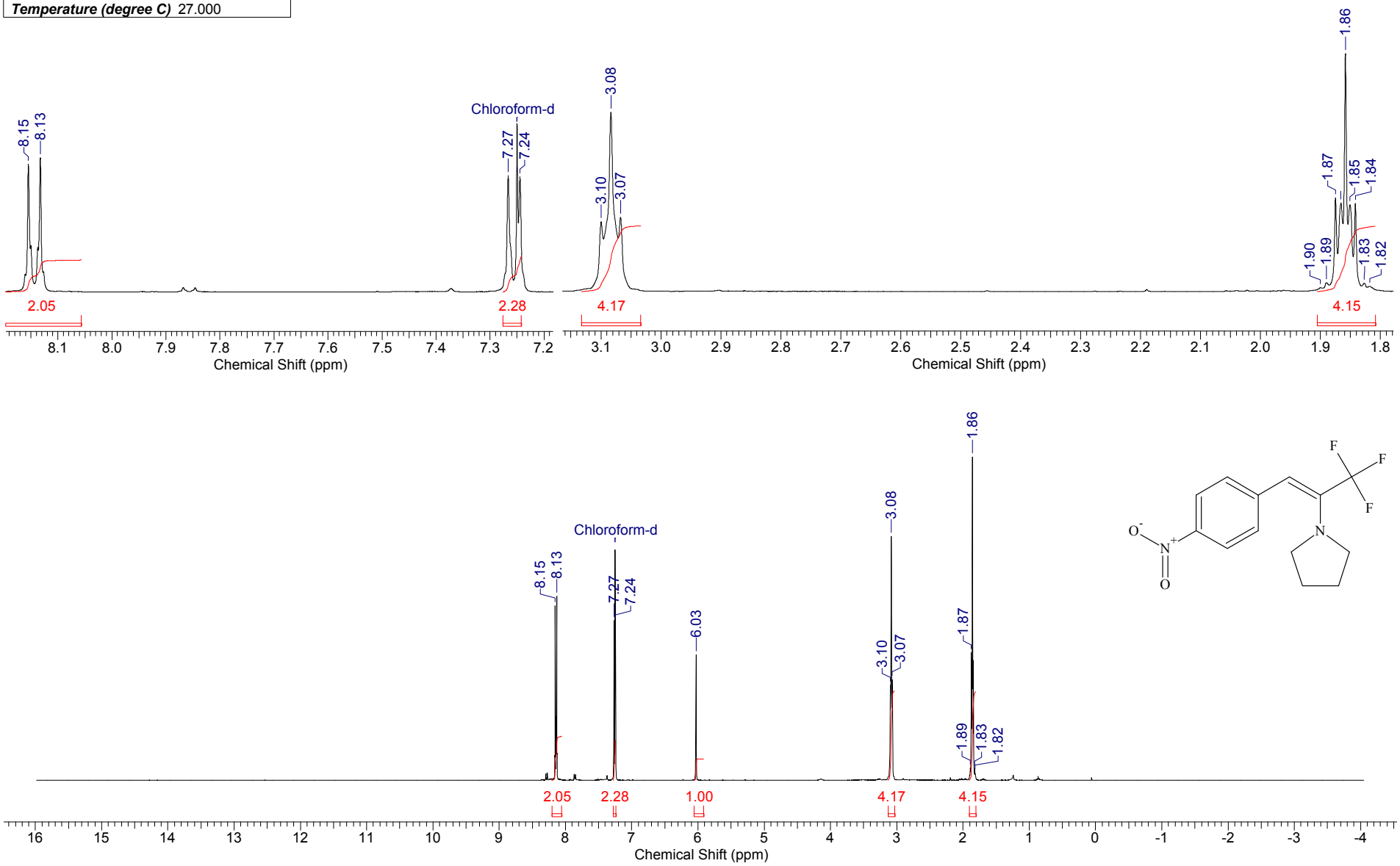
^{1}H NMR spectrum of crude **2g** (400.1 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 90:10

Acquisition Time (sec)	1.7826	***Date***	Jul 4 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.07.04\SZA-137-F_20190704_01\FLUORINE_01		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	234550
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	131578.95	***Temperature (degree C)***	25.000				



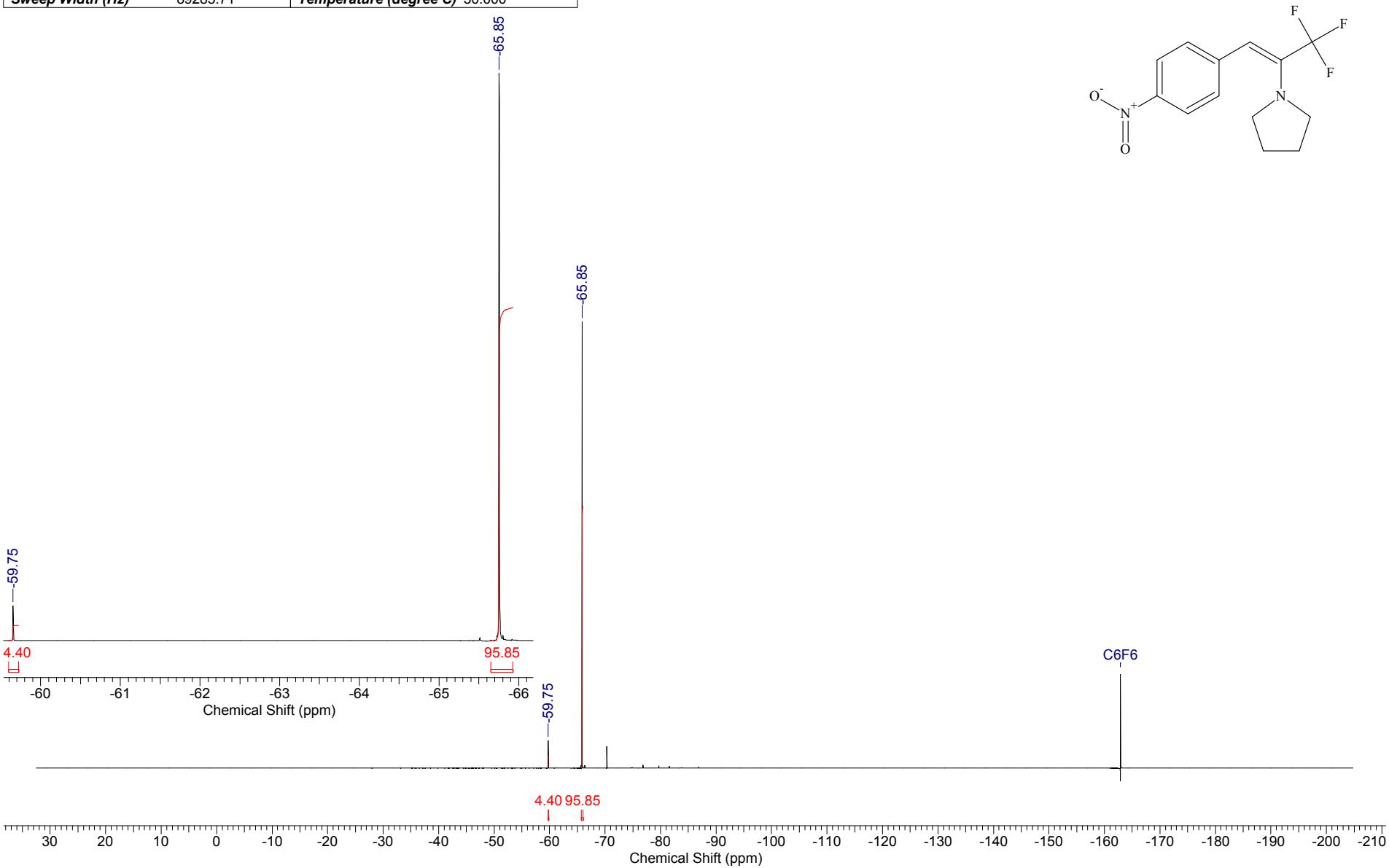
^{19}F NMR spectrum of crude **2g** (376.5 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 90:10

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	26 Apr 2019 15:29:28
File Name	C:\DOCS\OUTPUT_301\2019\04.àï ðåëü\SZA-097-1a.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



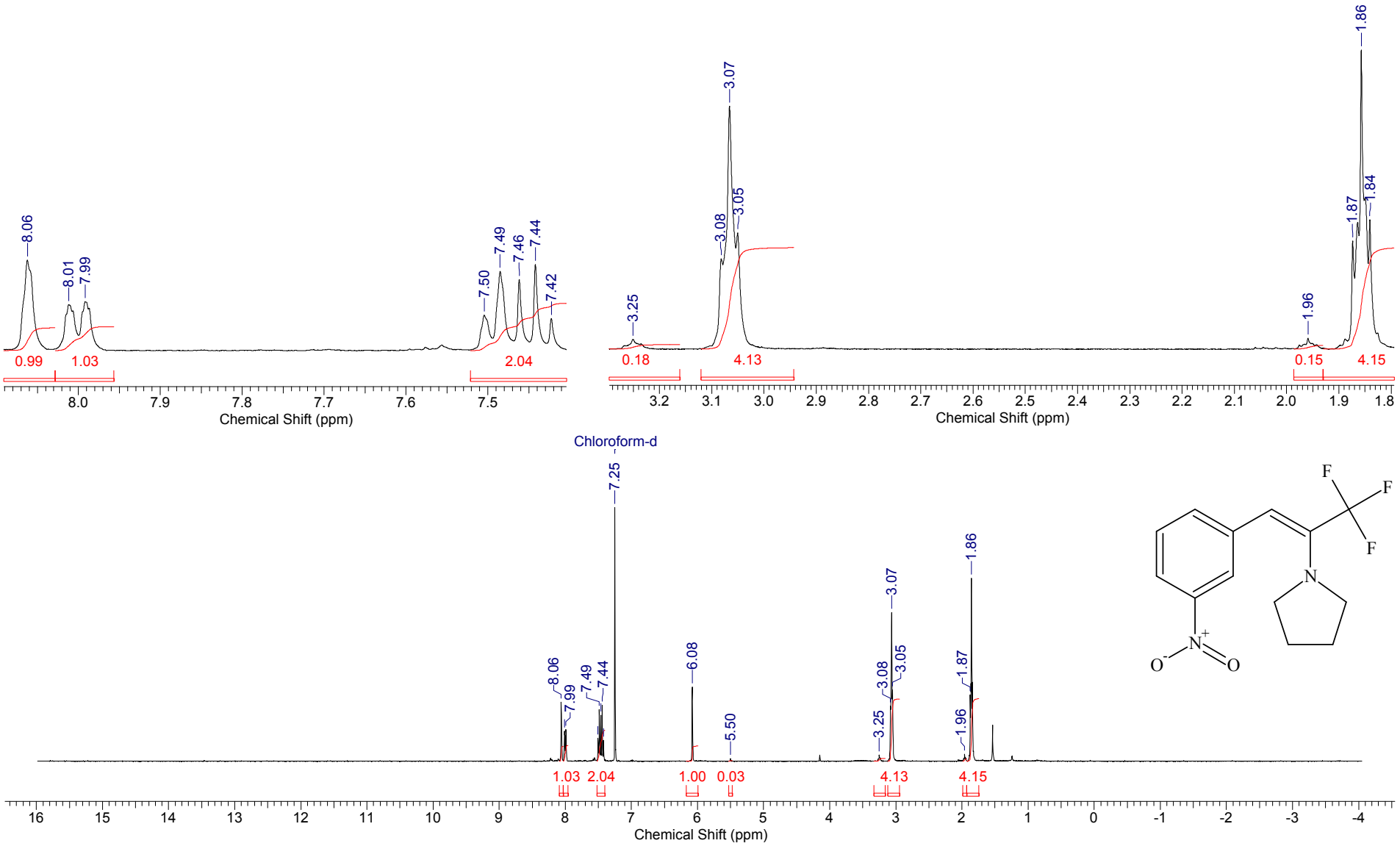
^{1}H NMR spectrum of **2h** (400.1 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 96:4

Acquisition Time (sec)	0.7340	***Date***	Apr 30 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.04.30\sza097-1a-f_20190430_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	100	***Original Points Count***	65536
Points Count	65536	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	30.000				



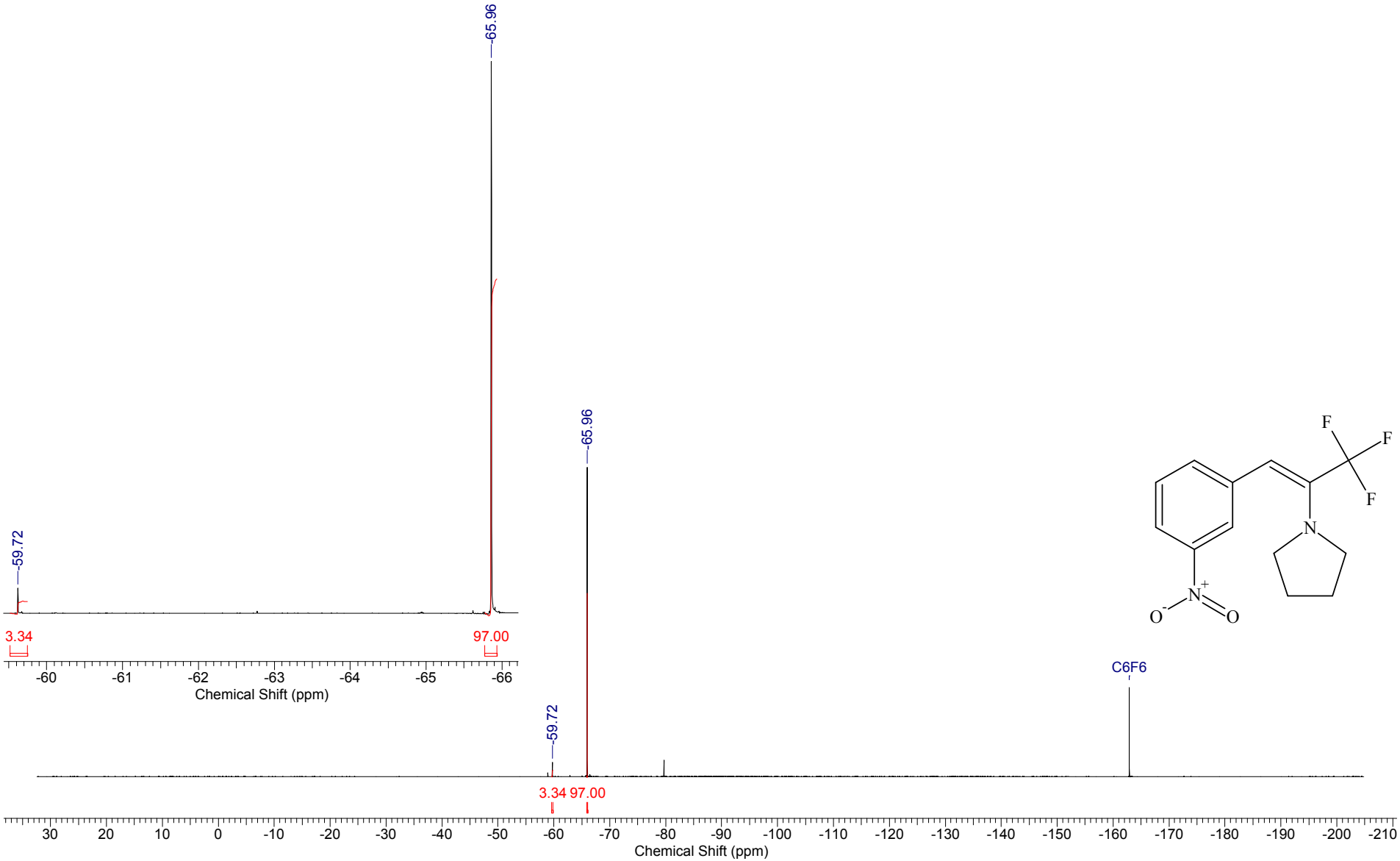
^{19}F NMR spectrum of **2h** (376.5 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 96:4

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	26 Apr 2019 15:15:16
File Name	C:\DOCS\OUTPUT_301\2019\04.àï ðåëü\SZA-99.H_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	4	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



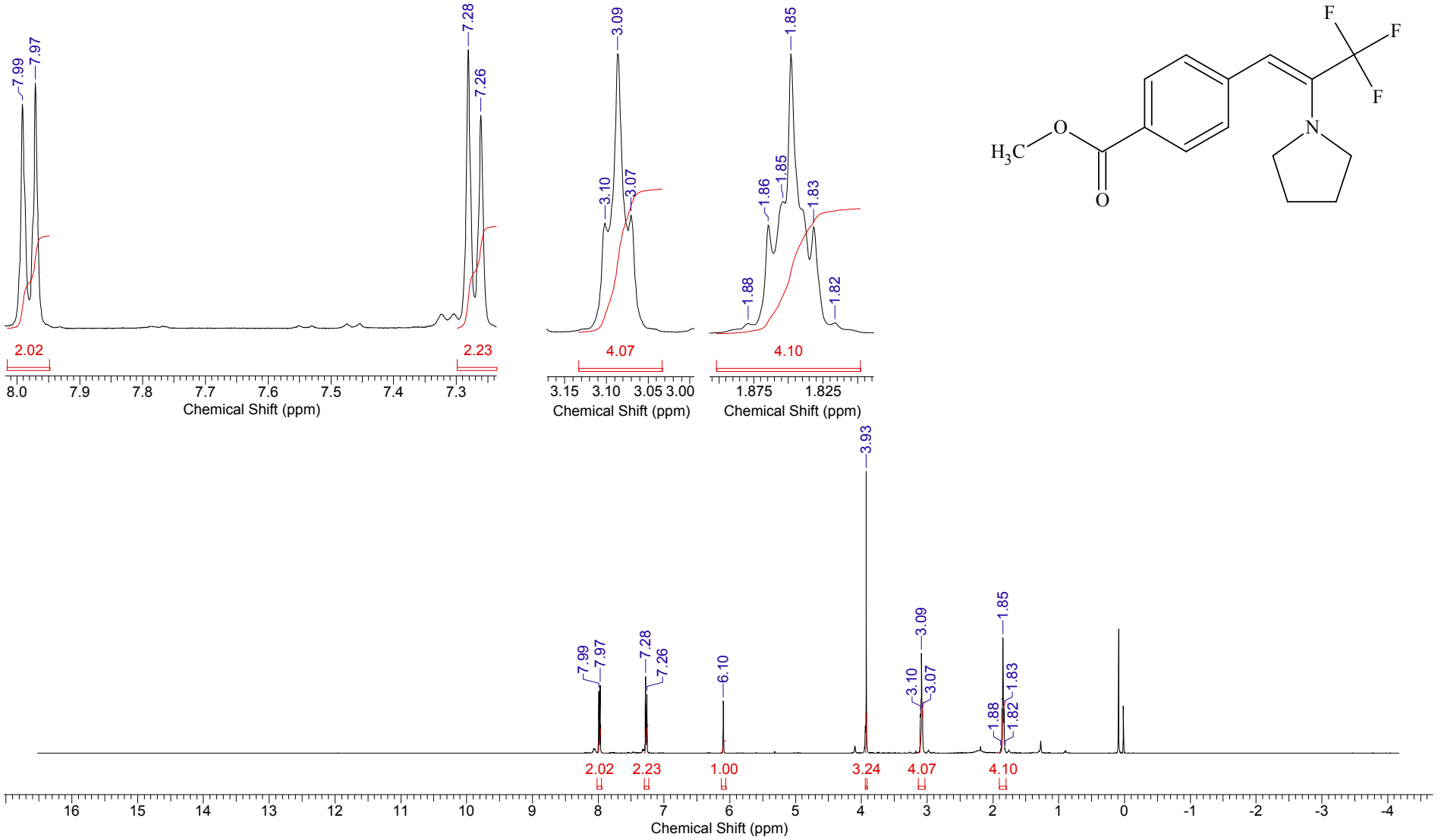
^{1}H NMR spectrum of **2i** (400.1 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 97:3

Acquisition Time (sec)	0.7340	***Date***	Apr 30 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.04.30\sza99-f_20190430_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	100	***Original Points Count***	65536
Points Count	65536	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	30.000				



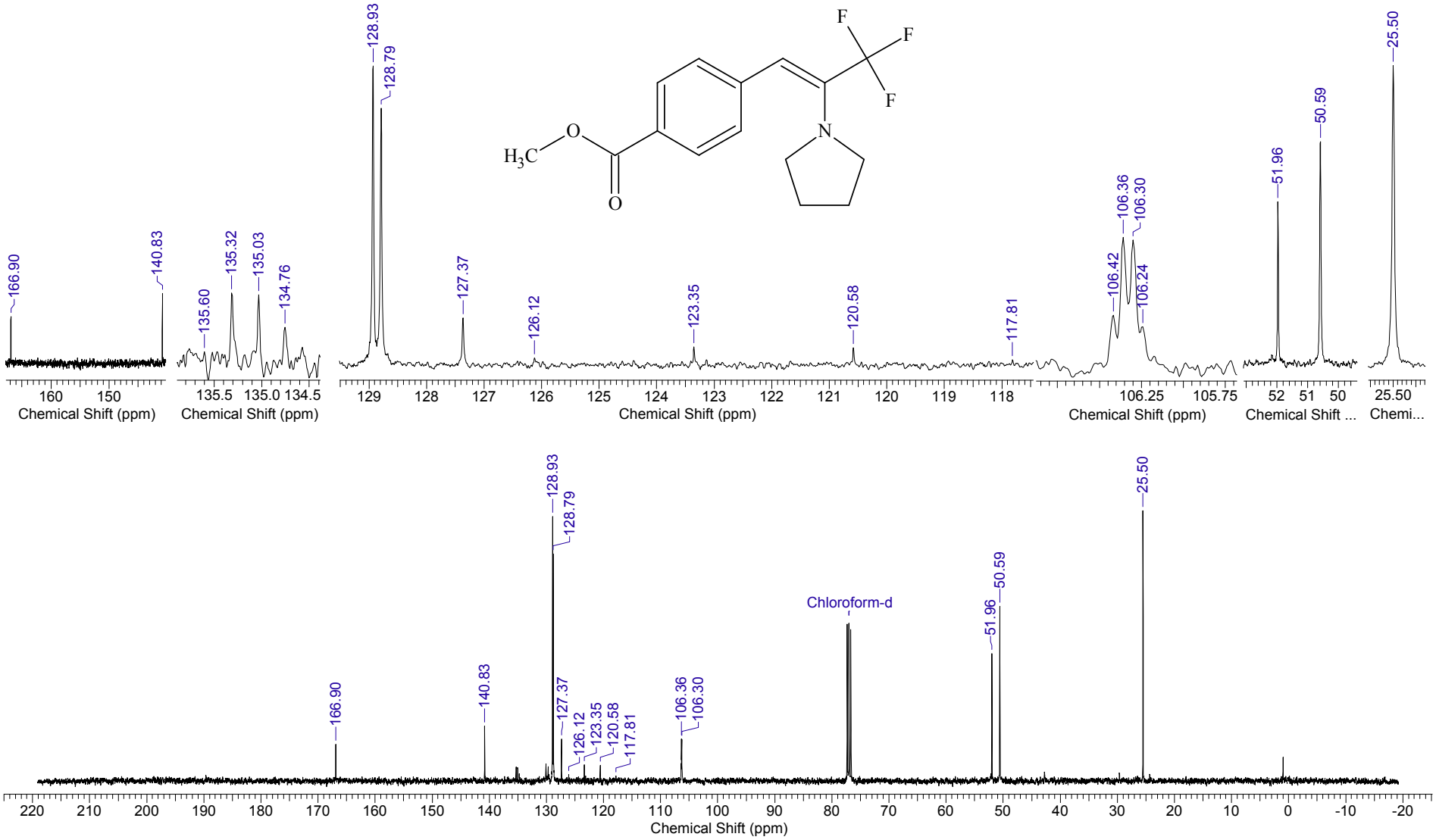
^{19}F NMR spectrum of **2i** (376.5 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 97:3

Acquisition Time (sec)	3.9584	***Comment***	Imported from UXNMR.			***Date***	16 Sep 2006 06:28:00
File Name	F:\COMP_PRAK\DOCS\OUTPUT_301\2006\VI-000-6\VI055H6_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	10	***Original Points Count***	32768	***Points Count***	32768
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8278.15
Temperature (degree C)	22.660						



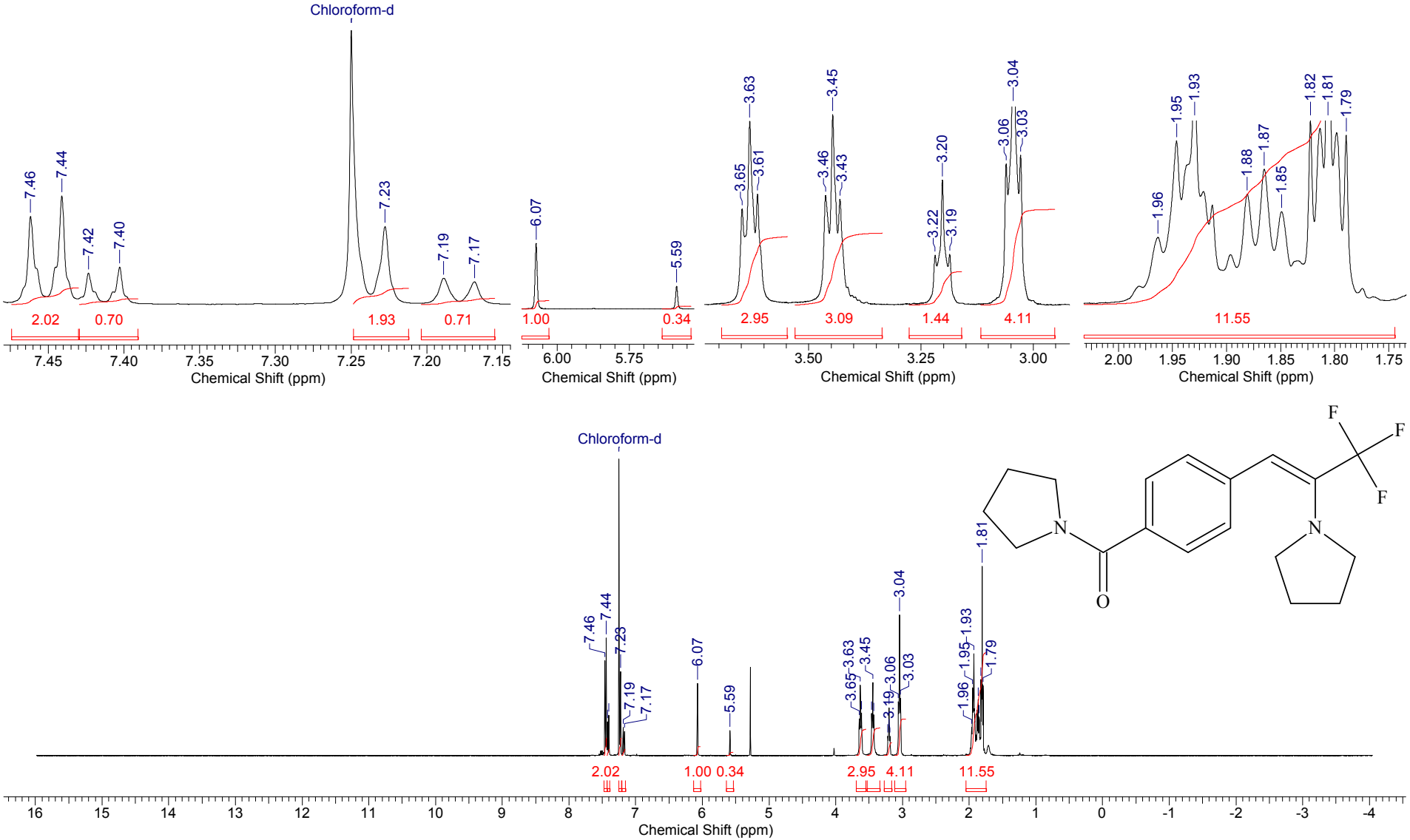
^{1}H NMR spectrum of **2j** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	0.3999	***Date***	16 Sep 2006 12:26:30				
File Name	F:\COMP_PRAK\DOCS\OUTPUT_301\2006\VI-000-6\VI065C6_001001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	128	***Original Points Count***	9591	***Points Count***	32768
Pulse Sequence	zgpg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	23980.81
Temperature (degree C)	23.960						



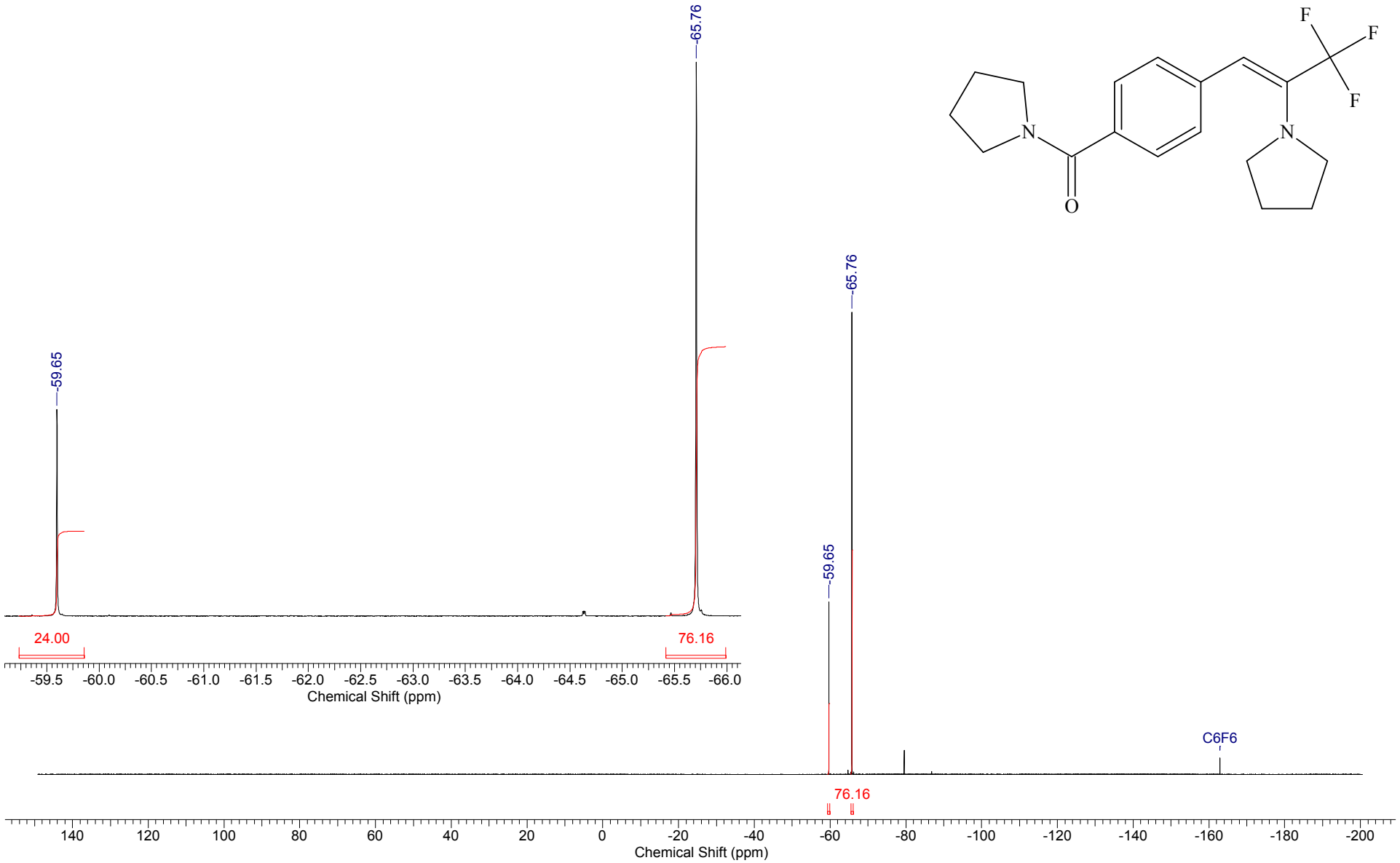
^{13}C NMR spectrum of **2j** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	02 Oct 2019 17:15:16
File Name	C:\DOCS\OUTPUT_301\2019\10.î êòÿáðü\SZA-133-2.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



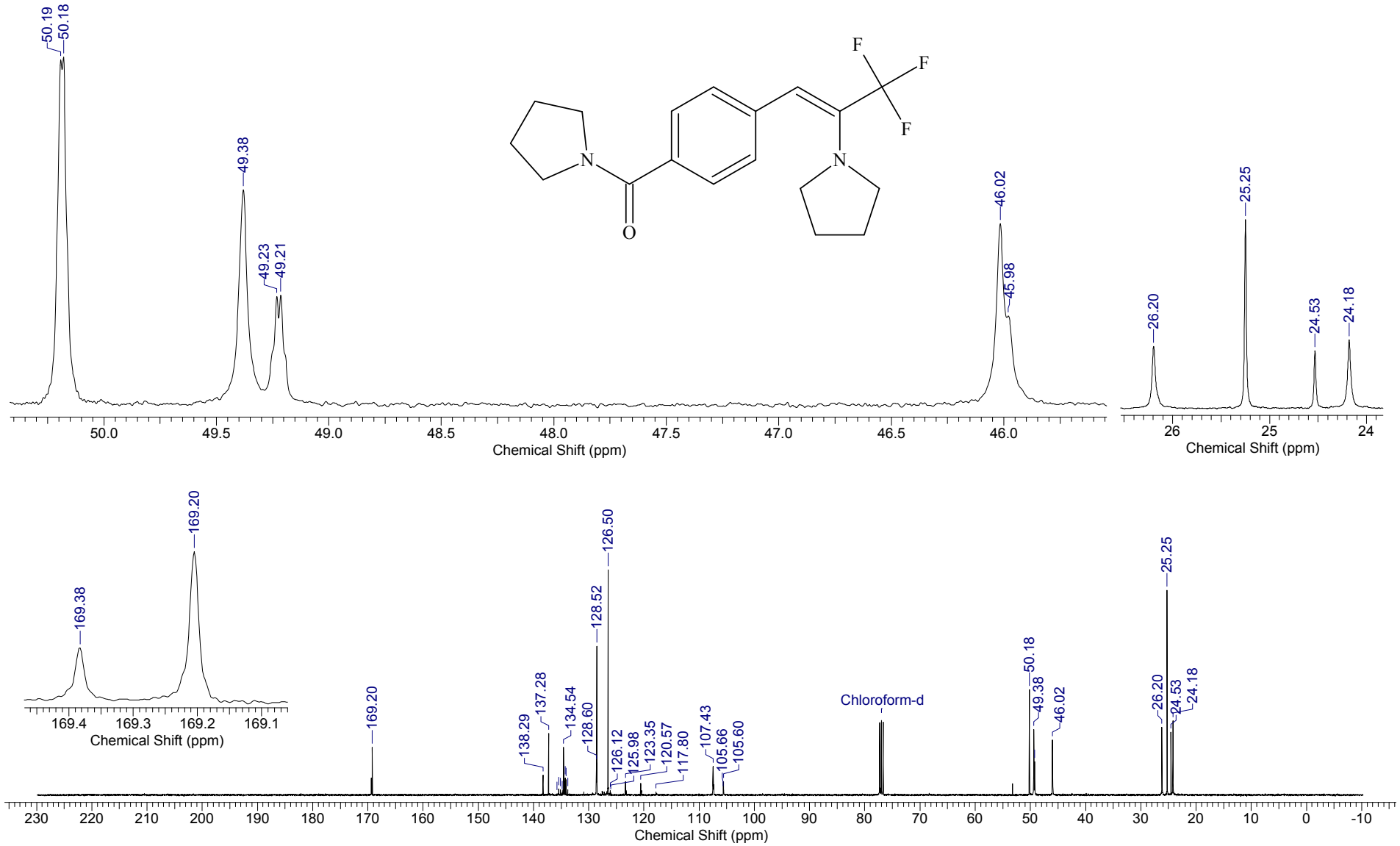
^{1}H NMR spectrum of **2k** (400.1 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 76:24

Acquisition Time (sec)	1.5729	***Date***	Oct 3 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.10.03\SZA-133-2-F_20191003_01\FLUORINE_01		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	206956
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	131578.95	***Temperature (degree C)***	20.000				



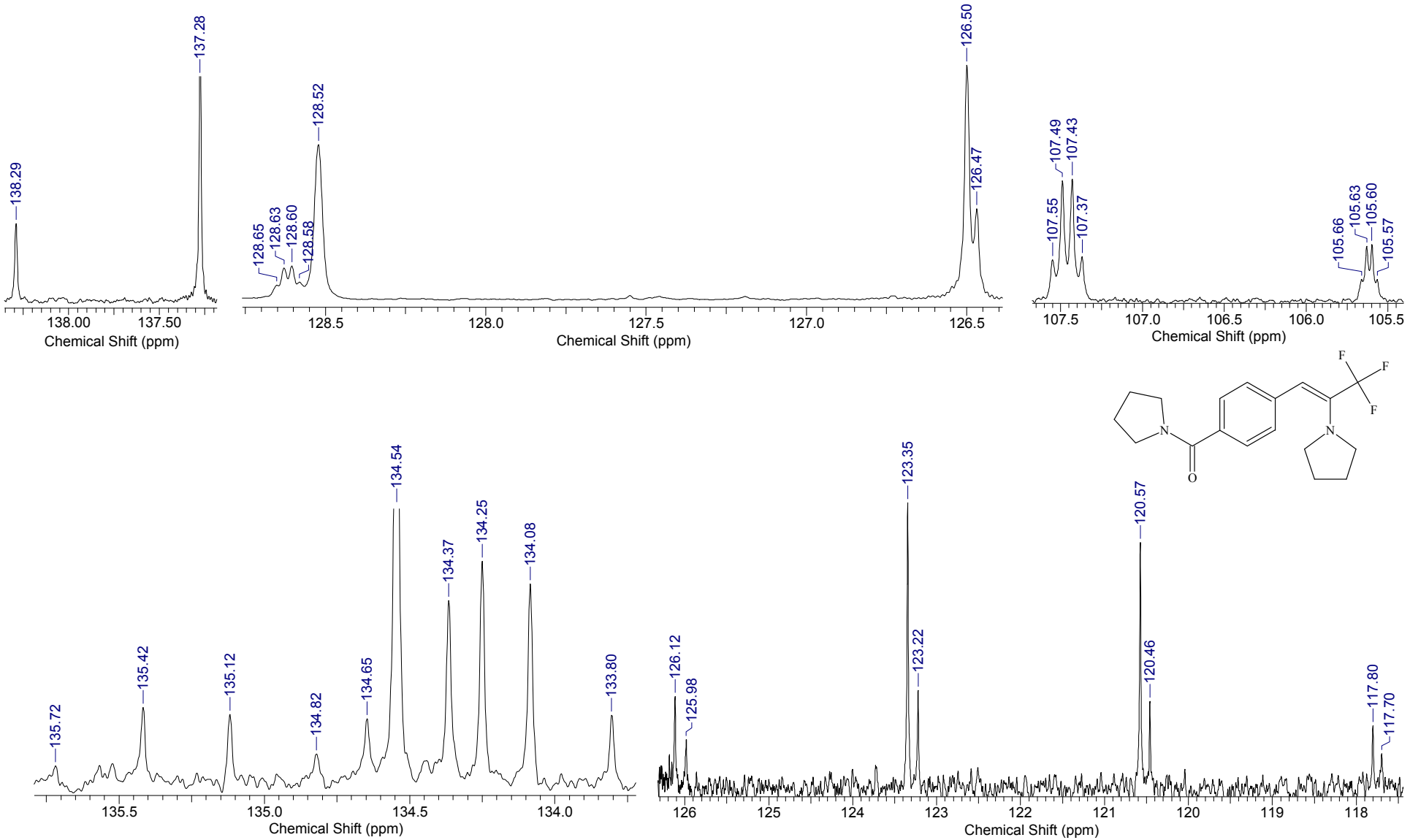
^{19}F NMR spectrum of **2k** (376.5 MHz $CDCl_3$). Mixture of *Z*- and *E*-isomers 76:24

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	03 Oct 2019 11:40:42
File Name	C:\DOCS\OUTPUT_301\2019\10.î êòÿáðü\SZA-133-2.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	529	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59
Temperature (degree C)	27.000						



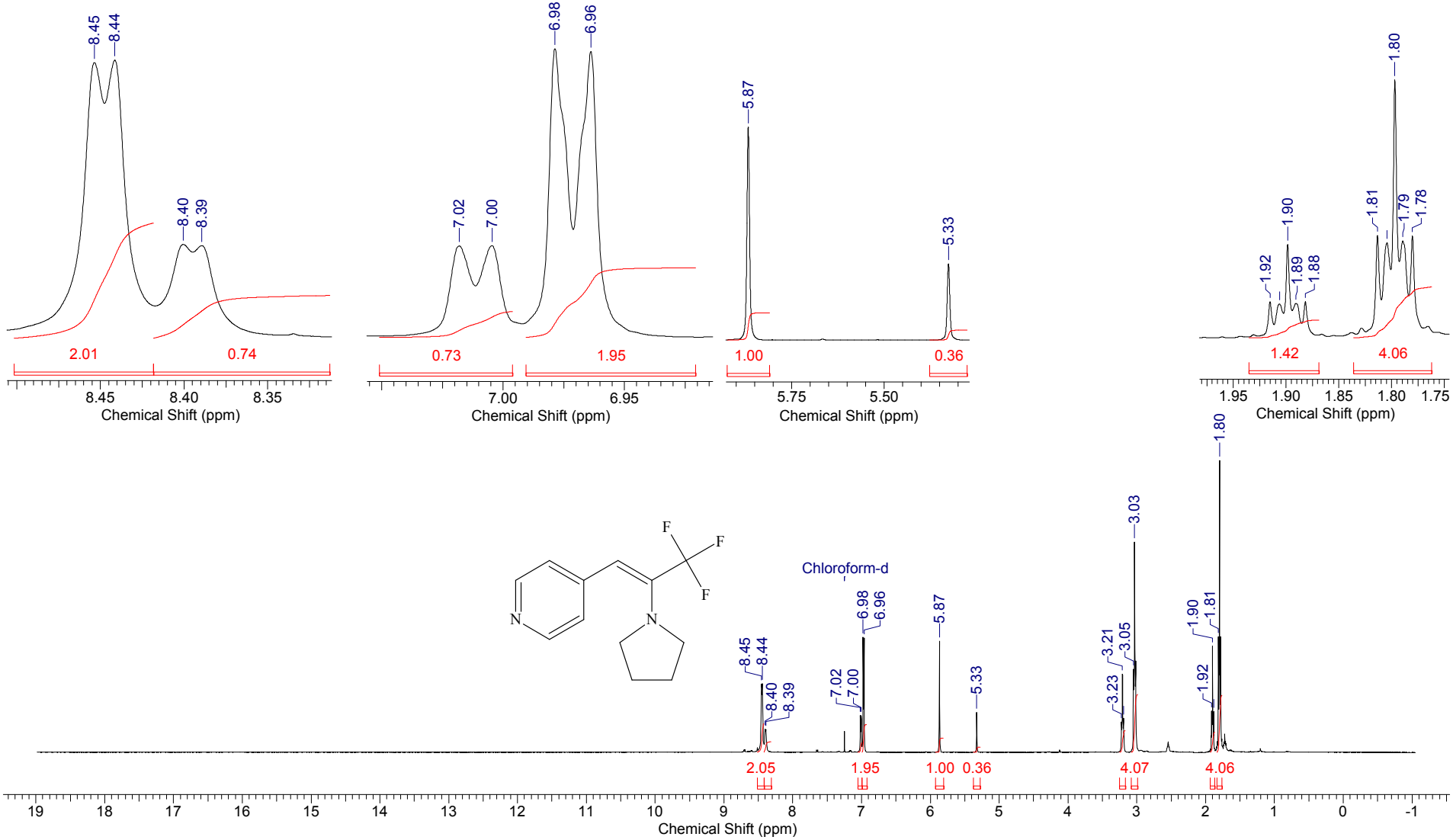
^{13}C NMR spectrum of **2k** (100.6 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 76:24

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	03 Oct 2019 11:40:42
File Name	C:\DOCS\OUTPUT_301\2019\10.î êòÿáðü\SZA-133-2.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	529	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59
Temperature (degree C)	27.000						



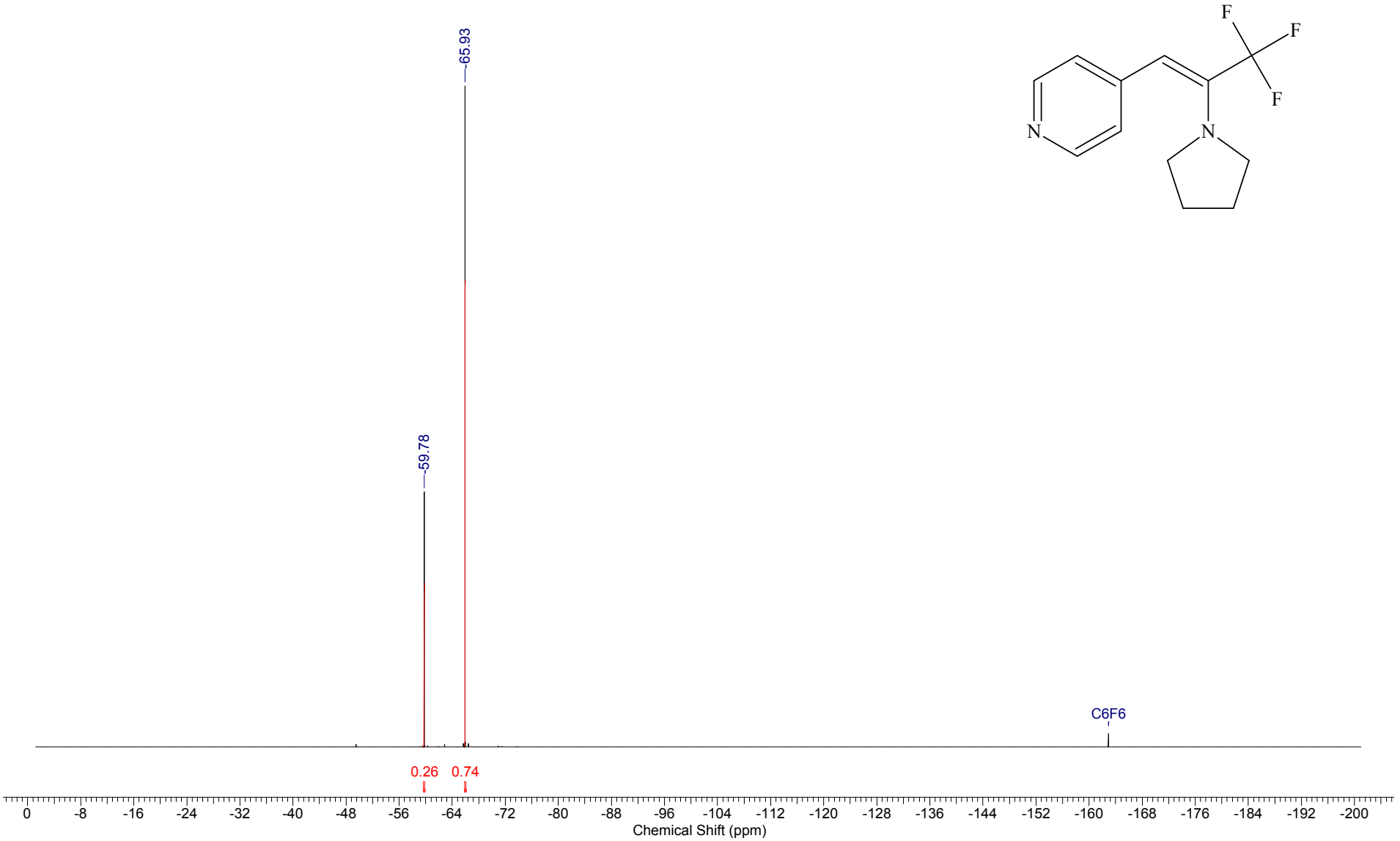
^{13}C NMR spectrum of **2k** (100.6 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 76:24

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	17 Feb 2021 17:40:12
File Name	C:\DOCS\OUTPUT_301\2021\02.ô åâðàëü\SZA-225.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



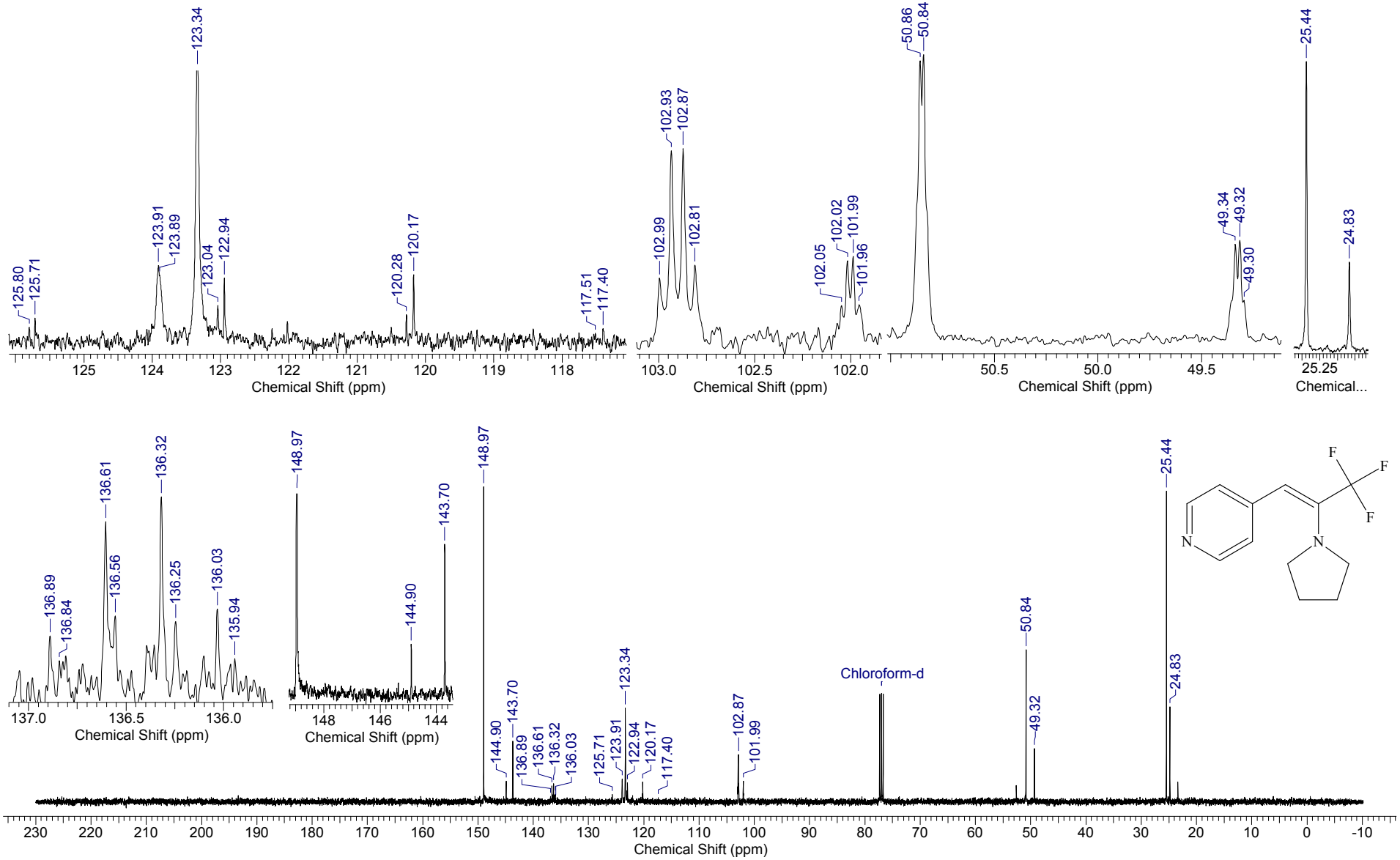
^{1}H NMR spectrum of **2l** (400.1 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 74:26

Acquisition Time (sec)	1.7433	***Comment***	Imported from UXNMR.			***Date***	18 Feb 2021 12:55:02
File Name	C:\DOCS\OUTPUT_301\2021\02.ô åâðàëü\SZA-225.F_005001r					***Frequency (MHz)***	376.50
Nucleus	19F	***Number of Transients***	16	***Original Points Count***	131072	***Points Count***	262144
Pulse Sequence	zgflqn	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	75187.97
Temperature (degree C)	27.000						



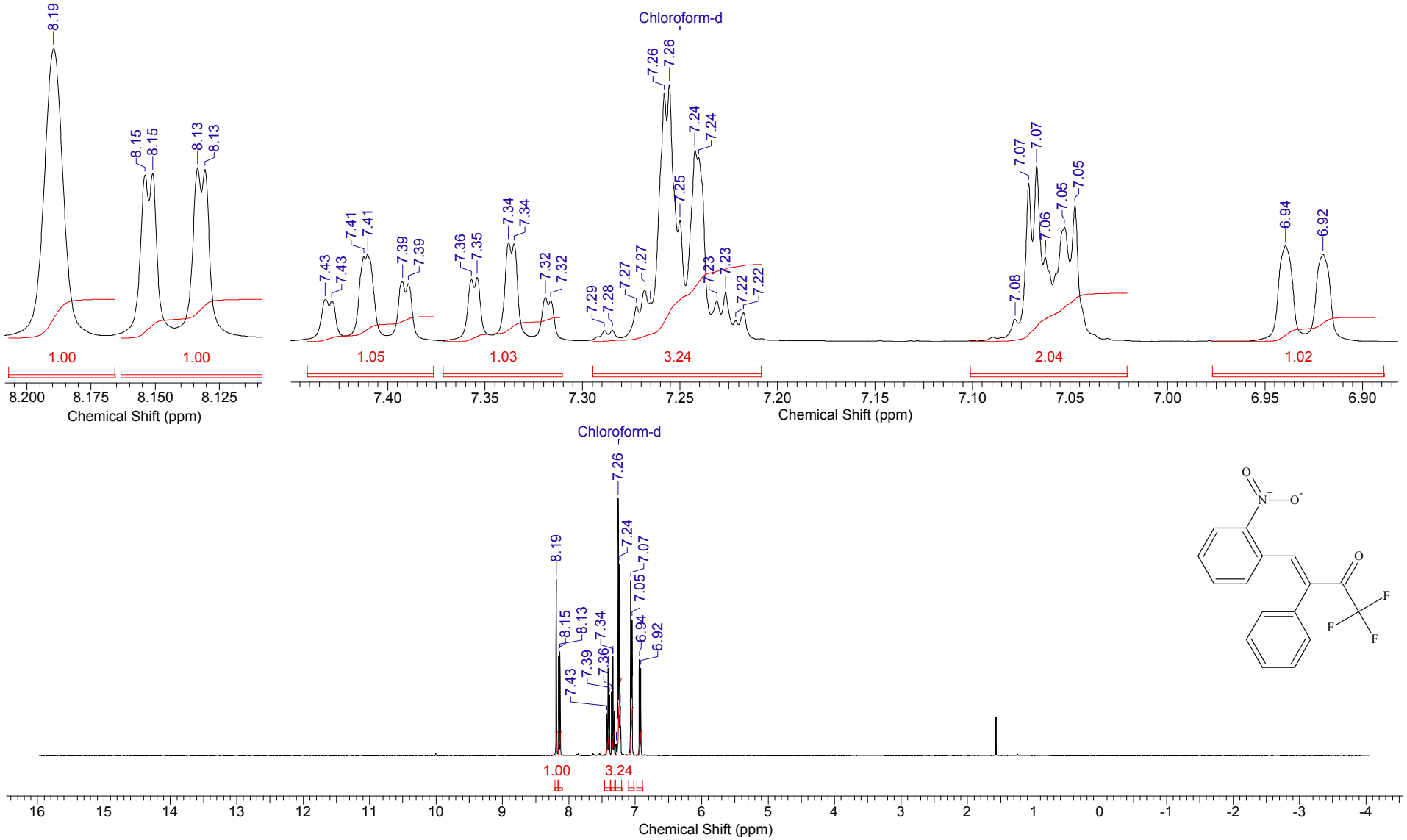
^{19}F NMR spectrum of **2l** (376.5 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 74:26

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	18 Feb 2021 12:16:36
File Name	C:\DOCS\OUTPUT_301\2021\02.ô åâðàëü\SZA-225.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	155	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



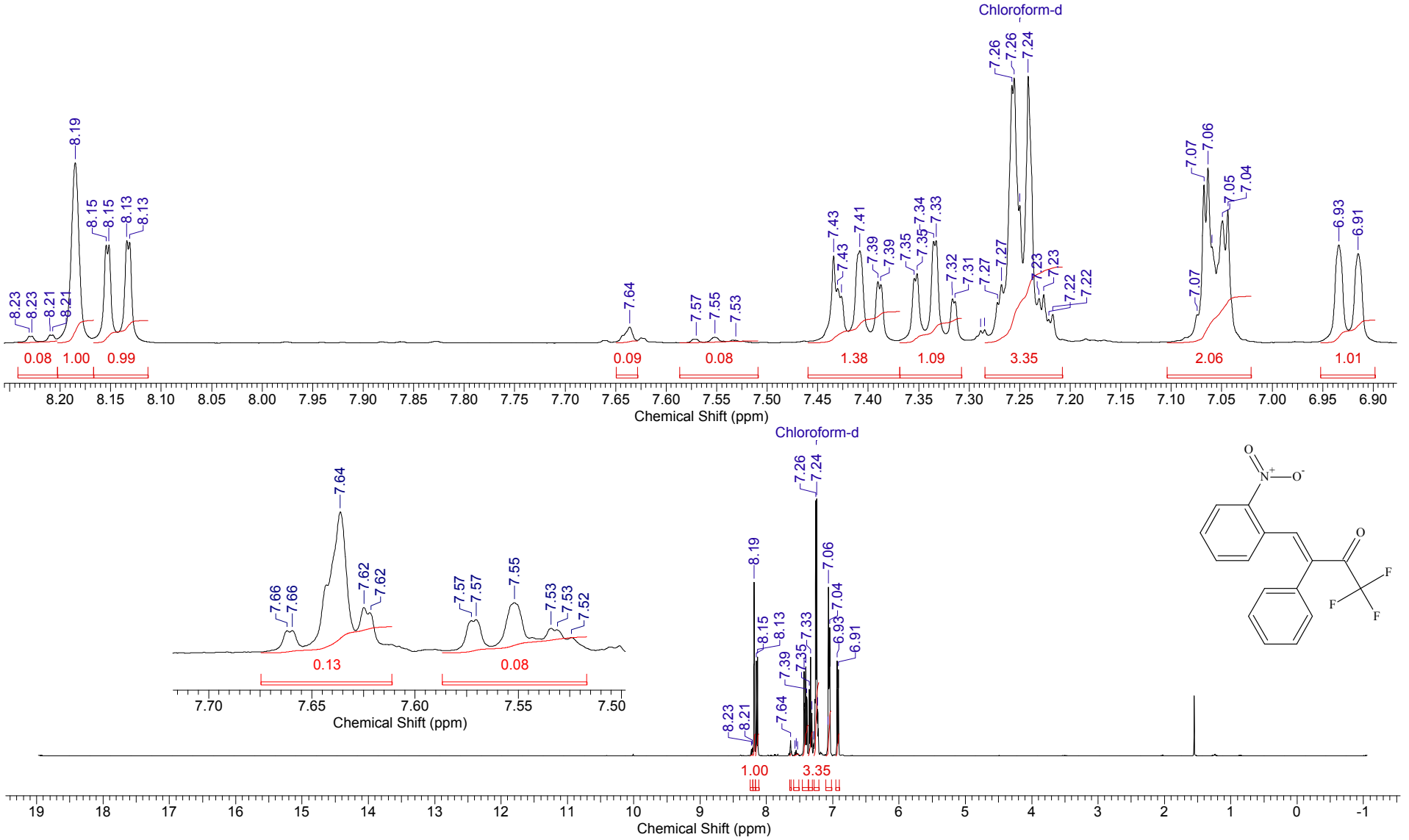
^{13}C NMR spectrum of **2l** (100.6 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 74:26

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	15 May 2019 17:31:30
File Name	C:\DOCS\OUTPUT_301\2019\05.I àé\BM-1560-2.H_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	4	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



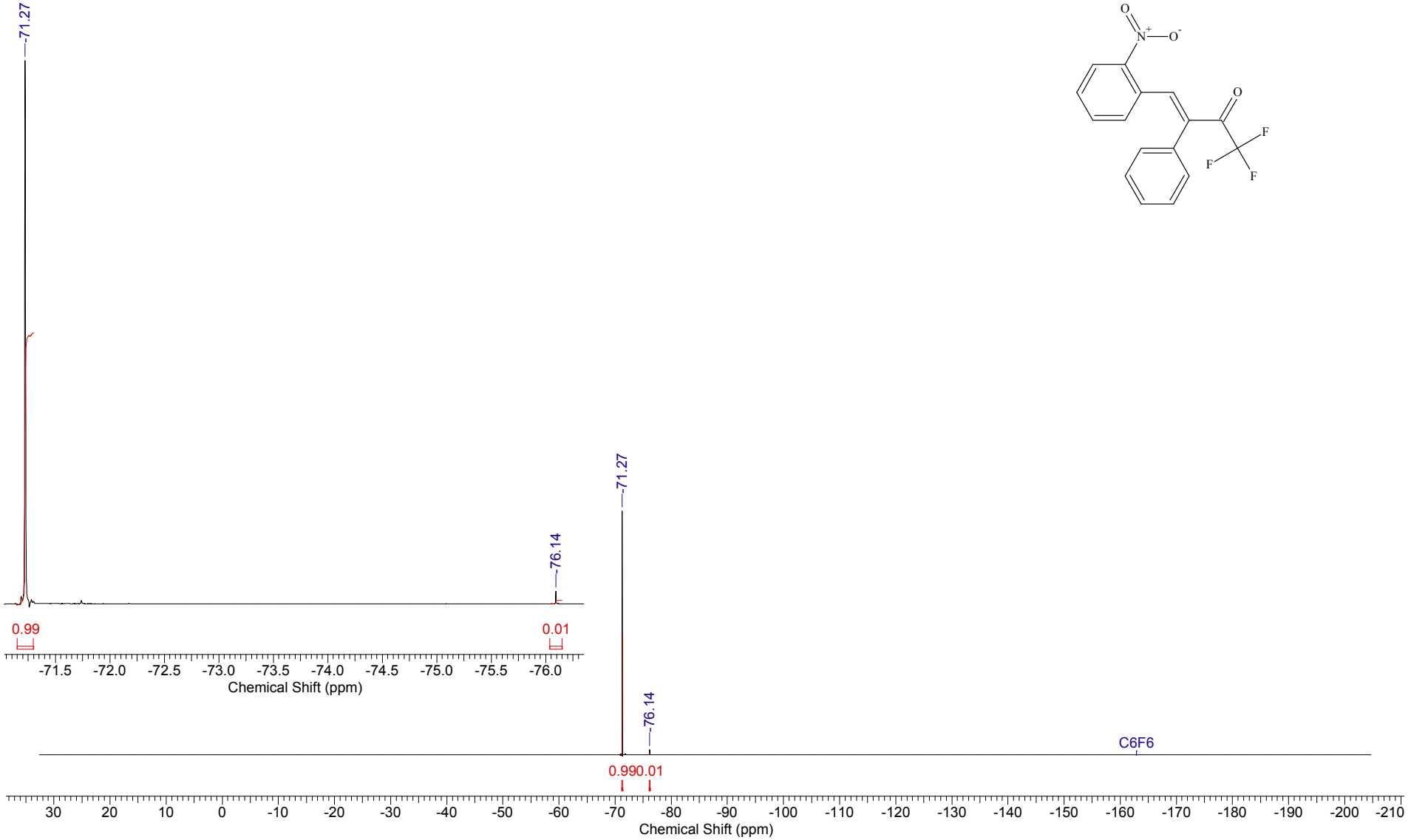
^{1}H NMR spectrum of **4a** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	15 May 2019 21:11:32
File Name	C:\DOCS\BM\BM-1560-1\BM-1560-1_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Original Points Count	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	CHLOROFORM-D
Sweep Width (Hz)	8012.82	***Temperature (degree C)***	27.000				



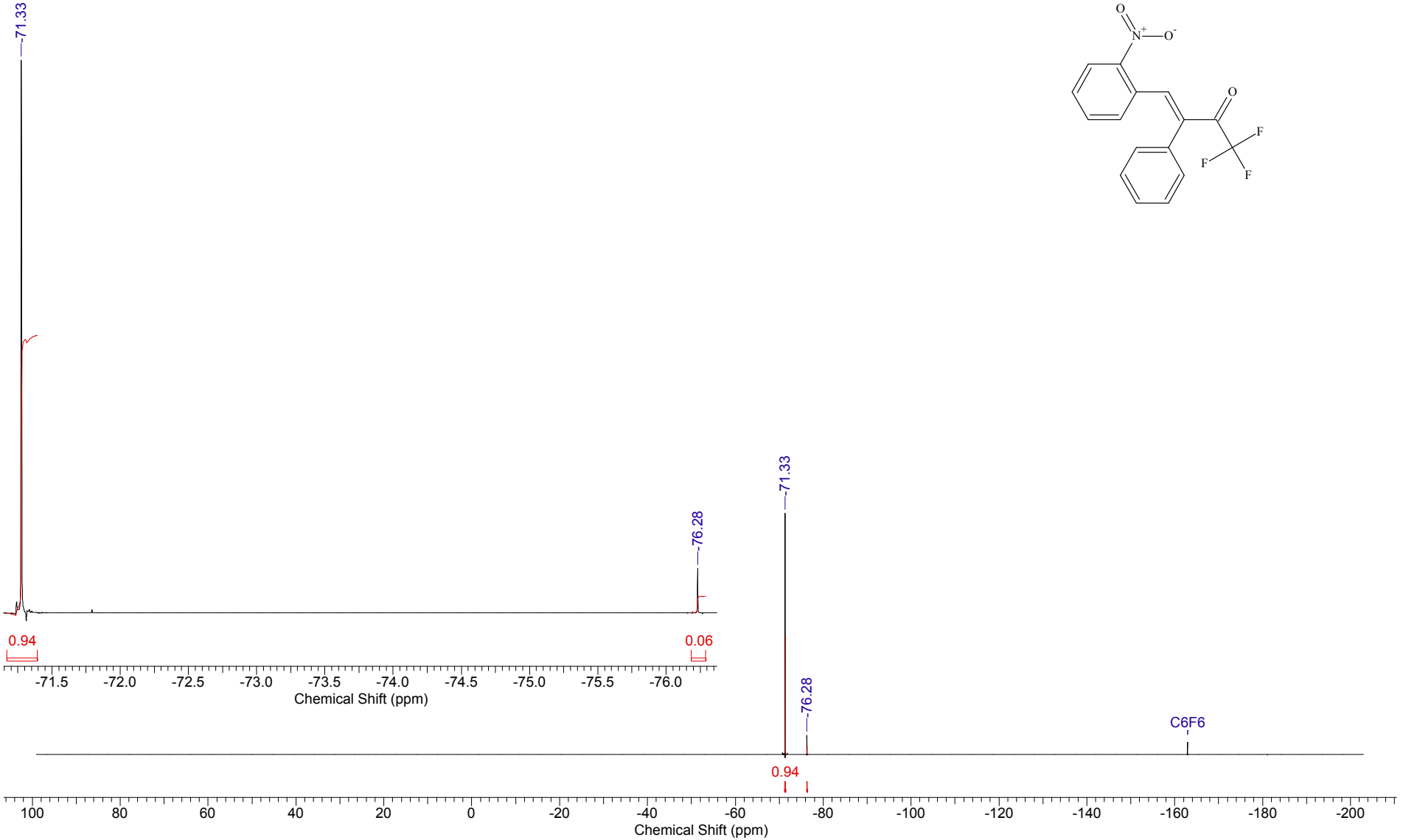
^{1}H NMR spectrum of **4a** (400.1 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	1.0000	***Comment***	STANDARD FLUORINE PARAMETERS			***Date***	May 17 2019
File Name	C:\DOCS\OUTPUT_301\F19\2019.05.17\BM-1560-2_20190517_01\FLUORINE_01					***Frequency (MHz)***	376.31
Nucleus	19F	***Number of Transients***	16	***Original Points Count***	89286	***Points Count***	131072
Pulse Sequence	s2pul	***Solvent***	CHLOROFORM-D	***Sweep Width (Hz)***	89285.71	***Temperature (degree C)***	30.000



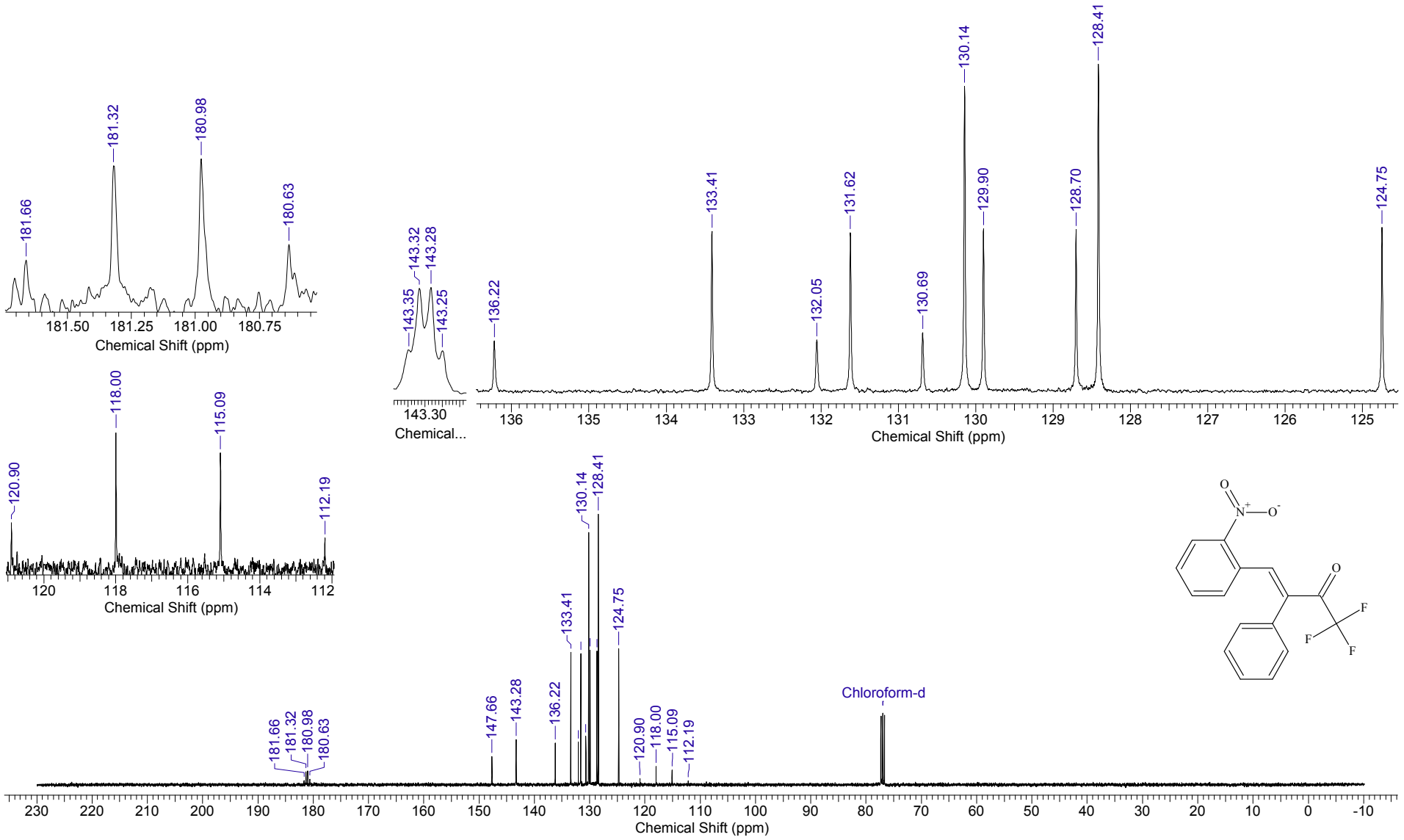
^{19}F NMR spectrum of **4a** (376.5 MHz, $CDCl_3$). Mixture of *Z*- and *E*-isomers 99:1

Acquisition Time (sec)	2.3069	***Date***	May 16 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.05.16\BM-1560-1-F_20190516_01\FLUORINE_01		
Frequency (MHz)	376.32	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	262144
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	113636.37	***Temperature (degree C)***	22.000				



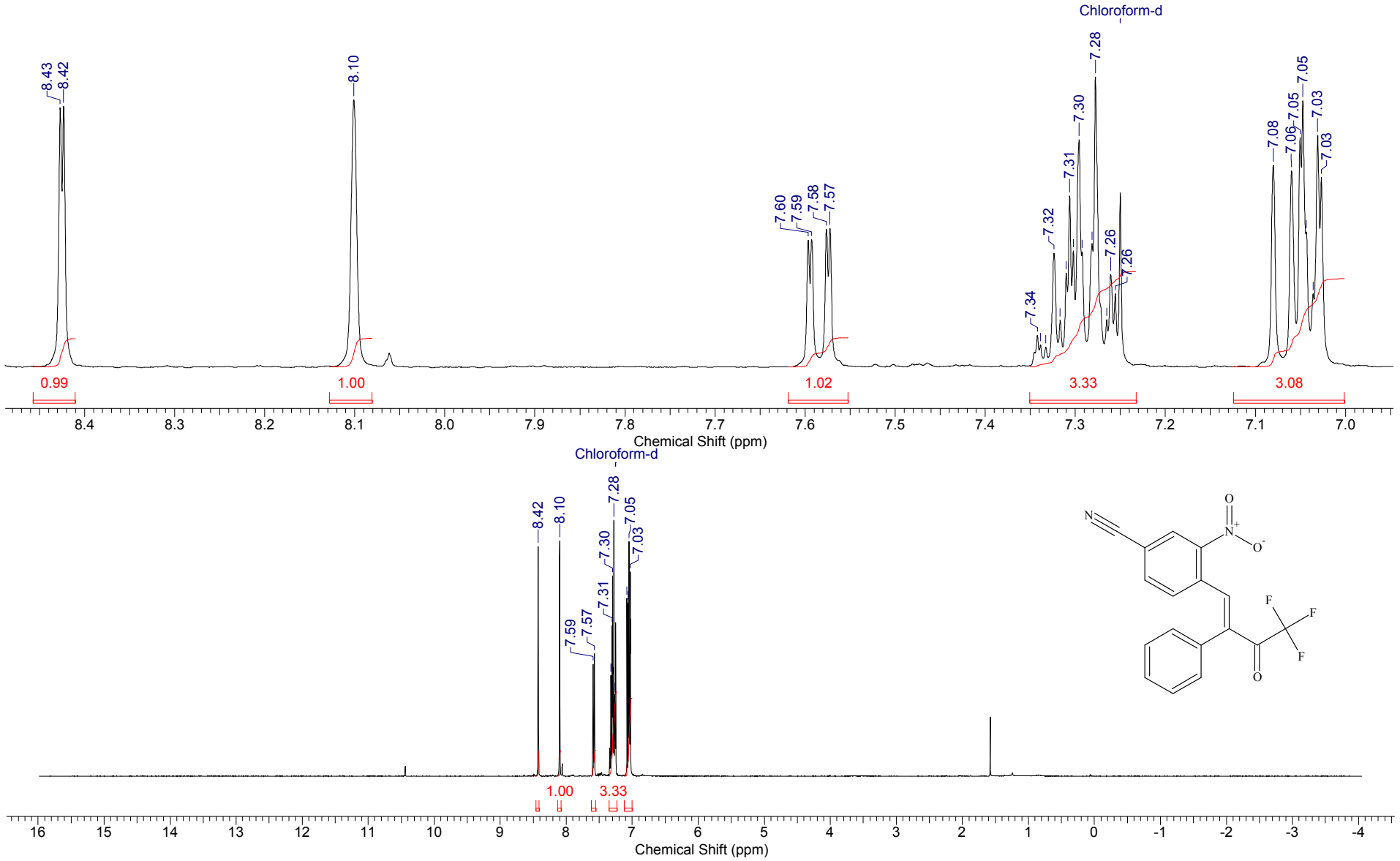
^{19}F NMR spectrum of **4a** (376.5 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	16 May 2019 11:13:58
File Name	C:\DOCS\OUTPUT_301\2019\05.l àé\BM-1560-2.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	129	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



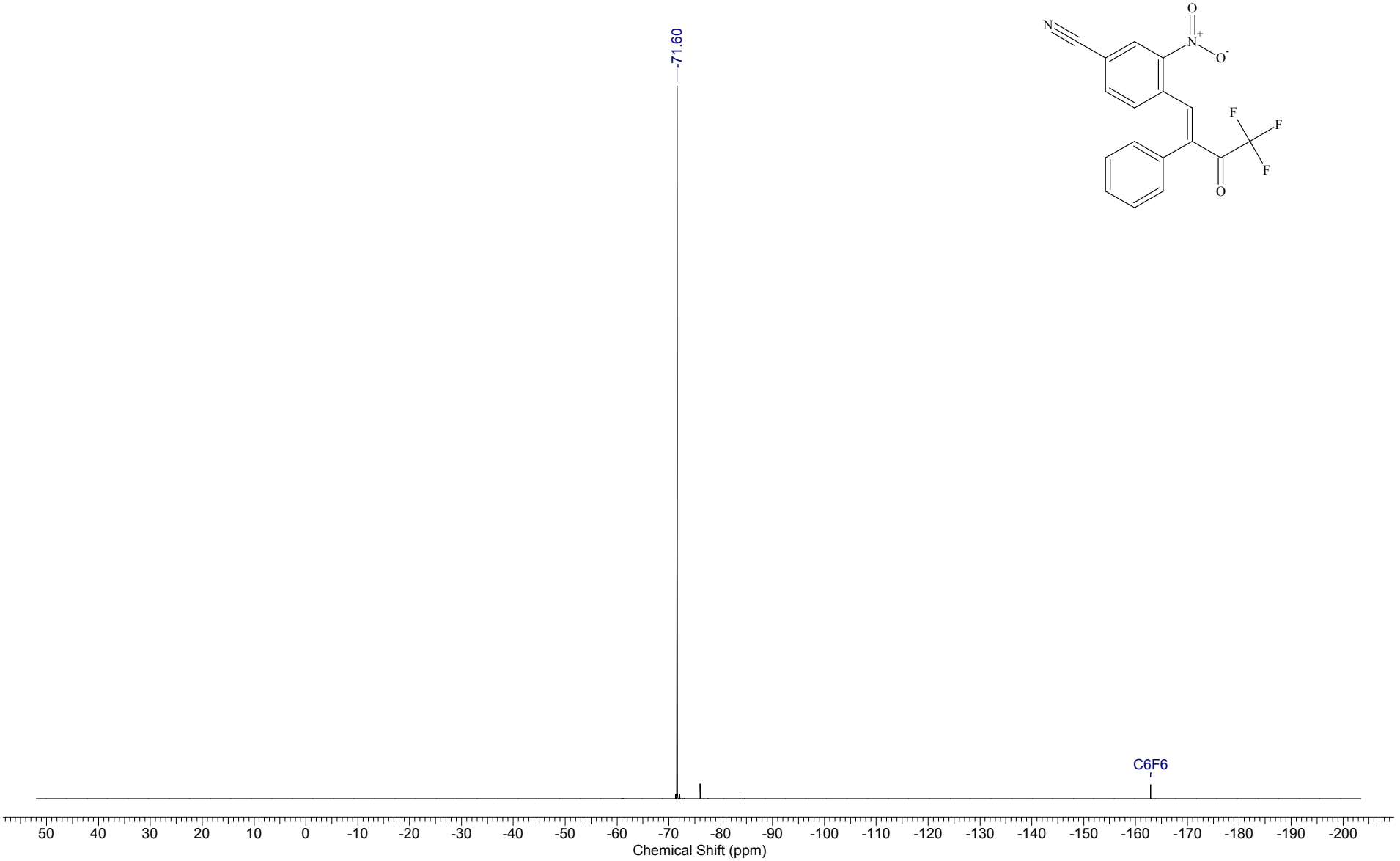
^{13}C NMR spectrum of **4a** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	04 Jun 2019 14:19:54
File Name	G:\ß Ì Ð\04.06.2019\SZA-108.H_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H ***Number of Transients*** 4
Original Points Count	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	CHLOROFORM-D
Sweep Width (Hz)	8012.82	***Temperature (degree C)***	27.000				



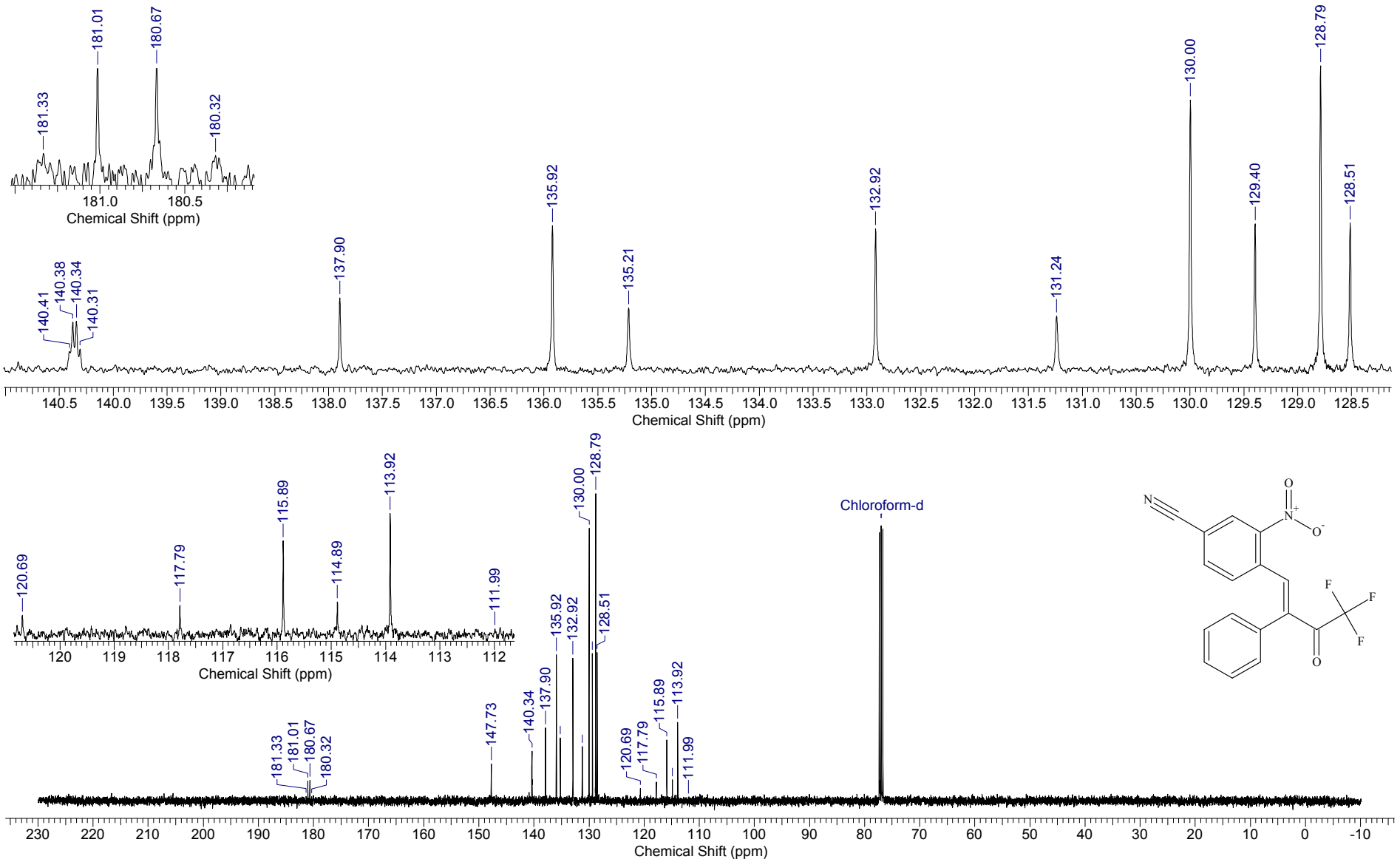
^{1}H NMR spectrum of **4b** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.7826	***Date***	Jun 6 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.06.06\SZA-108a-F_20190606_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	171402
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	96153.84	***Temperature (degree C)***	21.000				



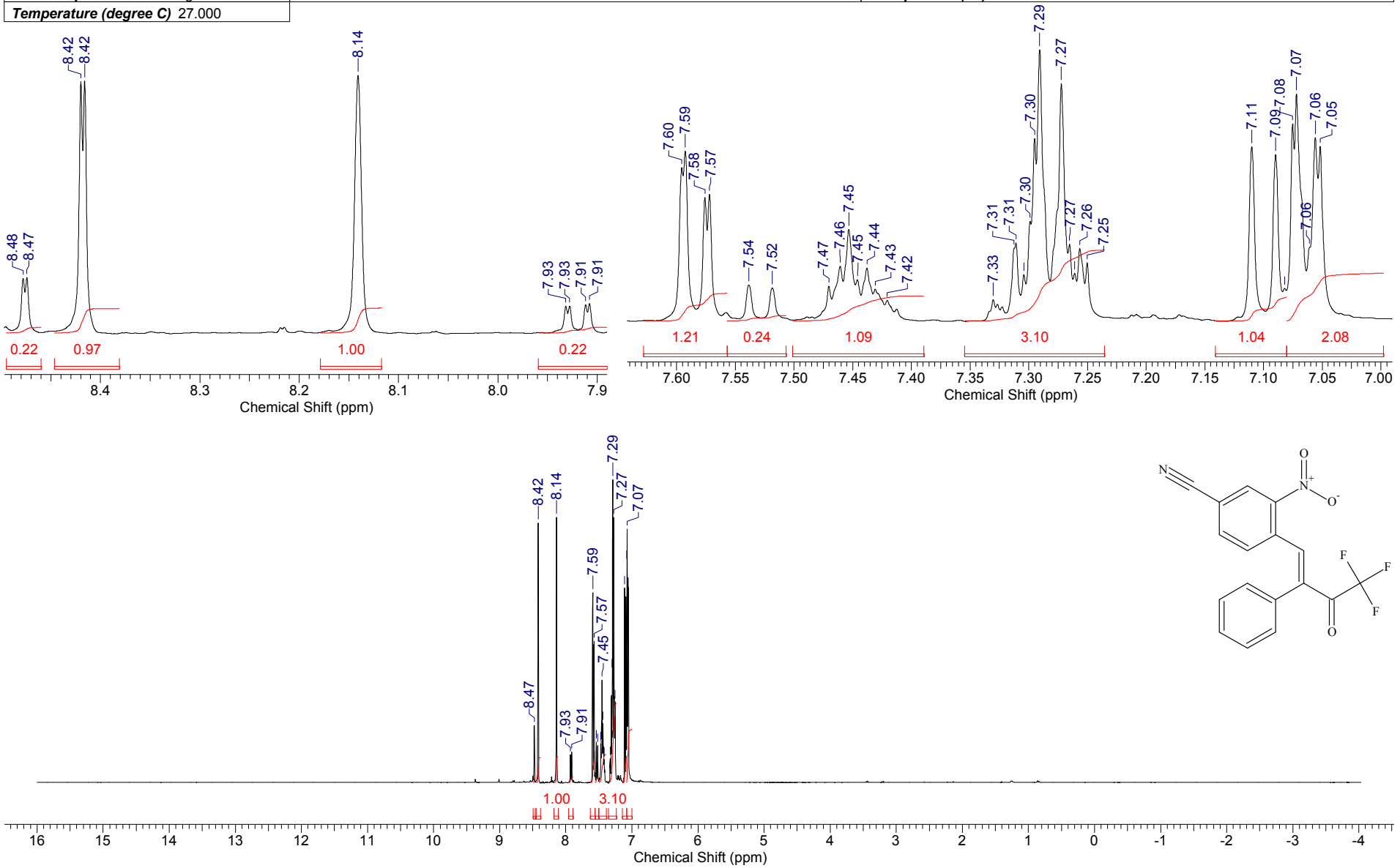
^{19}F NMR spectrum of **4b** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	05 Jun 2019 17:24:56
File Name	C:\DOCS\OUTPUT_301\2019\06.èþ í ü\SZA-108.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	313	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



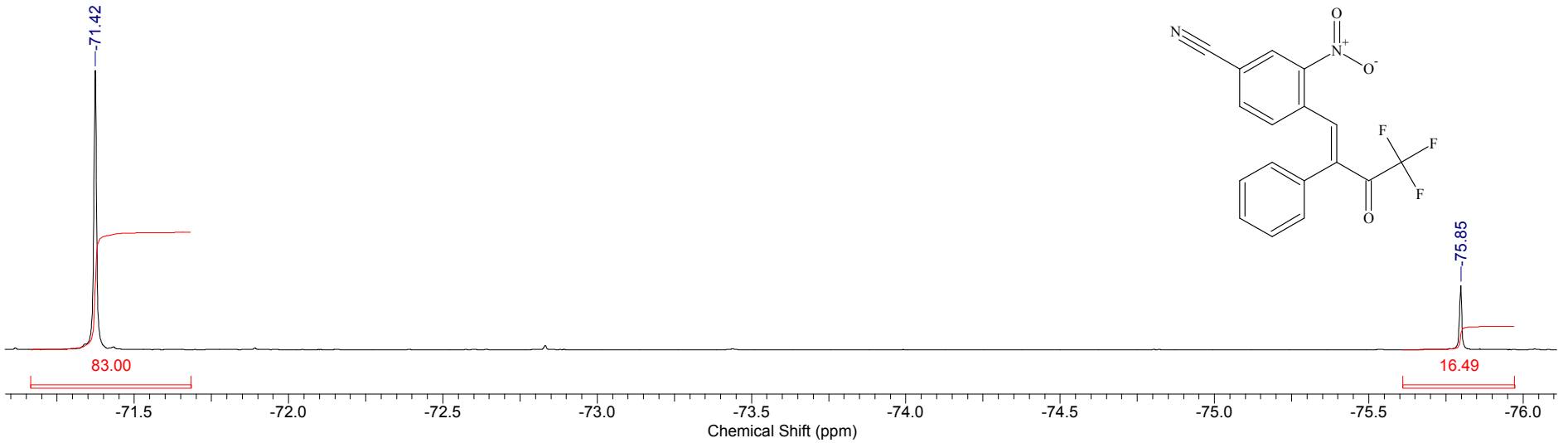
^{13}C NMR spectrum of **4b** (100.6 MHz, $CDCl_3$)

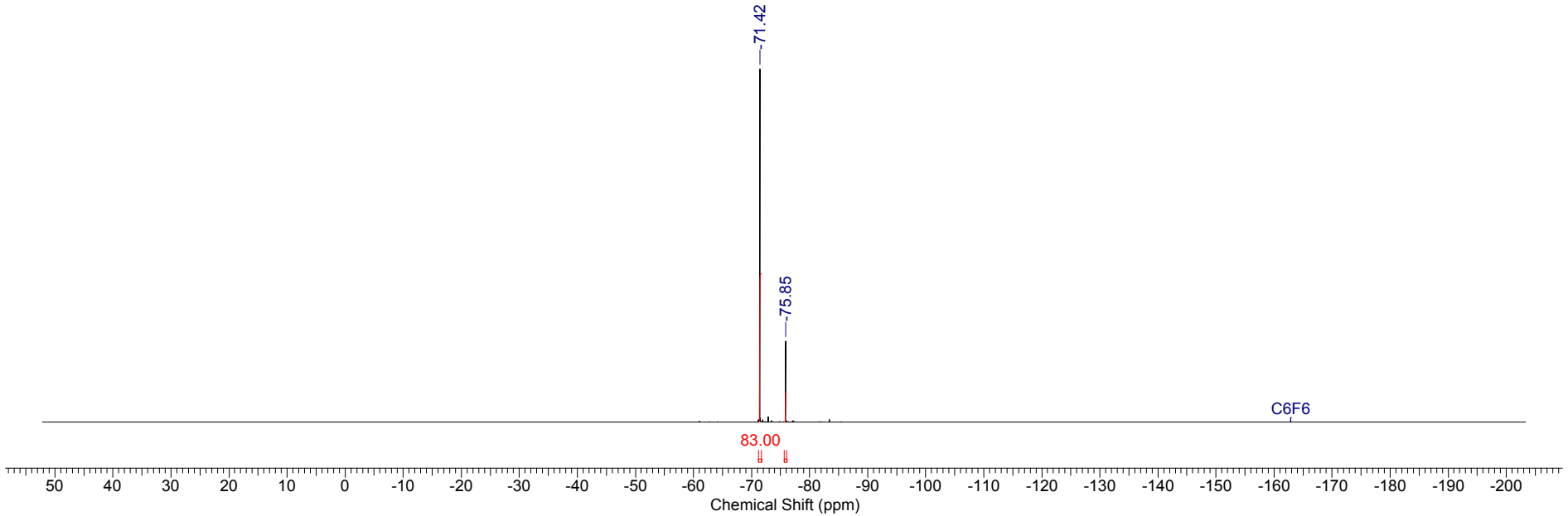
Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	25 Jun 2019 14:04:22
File Name	C:\DOCS\OUTPUT_301\2019\06.èþ í ü\SZA-108-5-6.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



^{1}H NMR spectrum of **4b** (400.1 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

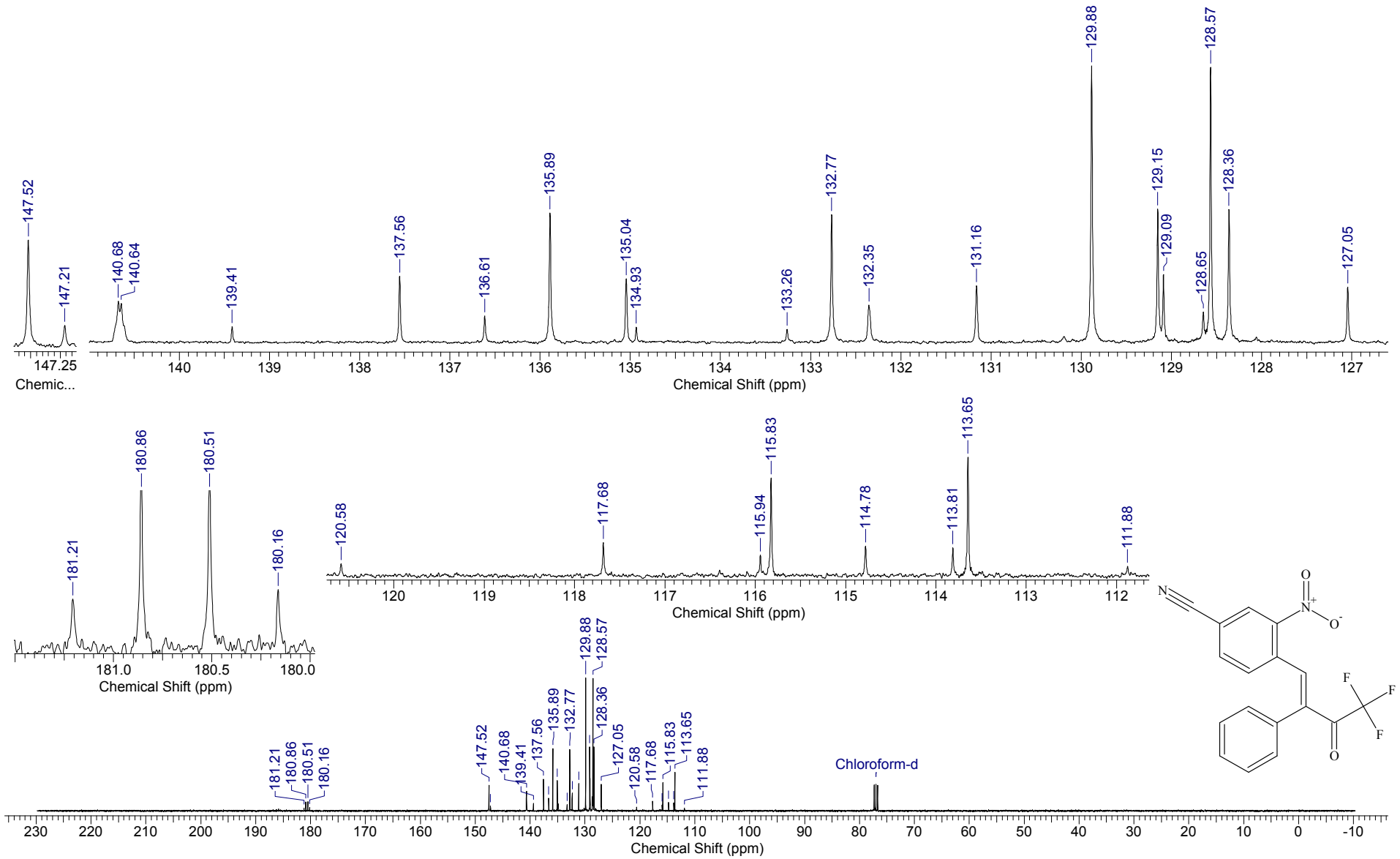
Acquisition Time (sec)	1.7826	***Date***	Jun 27 2019	***File Name***	C:\Users\BM-1\Downloads\2019.06.27\2019.06.27\SZA-108-5-6-F_20190627_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	171402
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	96153.84	***Temperature (degree C)***	22.000				





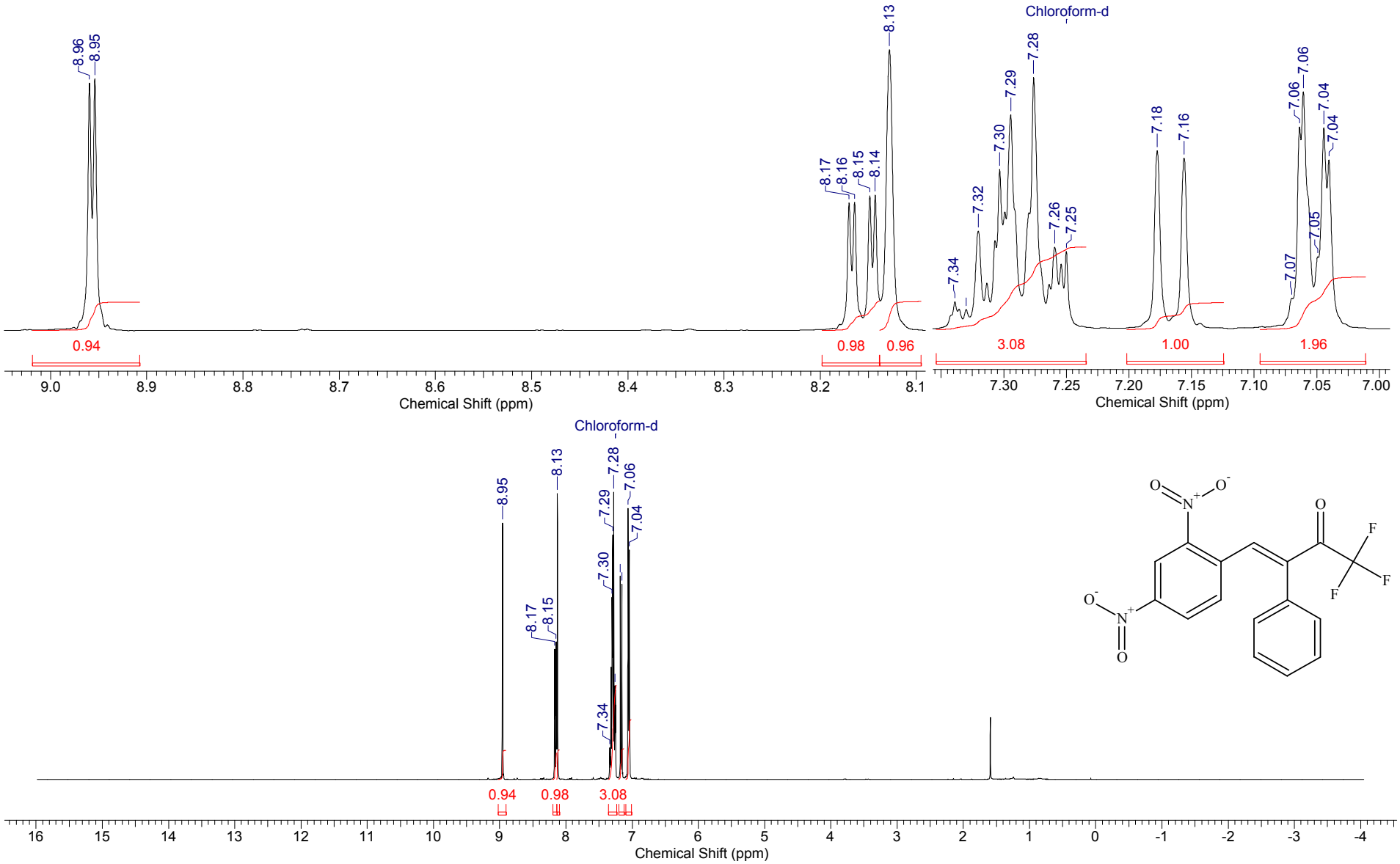
^{19}F NMR spectrum of **4b** (376.5 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	25 Jun 2019 14:10:34
File Name	C:\DOCS\OUTPUT_301\2019\06.èþ í ü\SZA-108-5-6.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	97	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



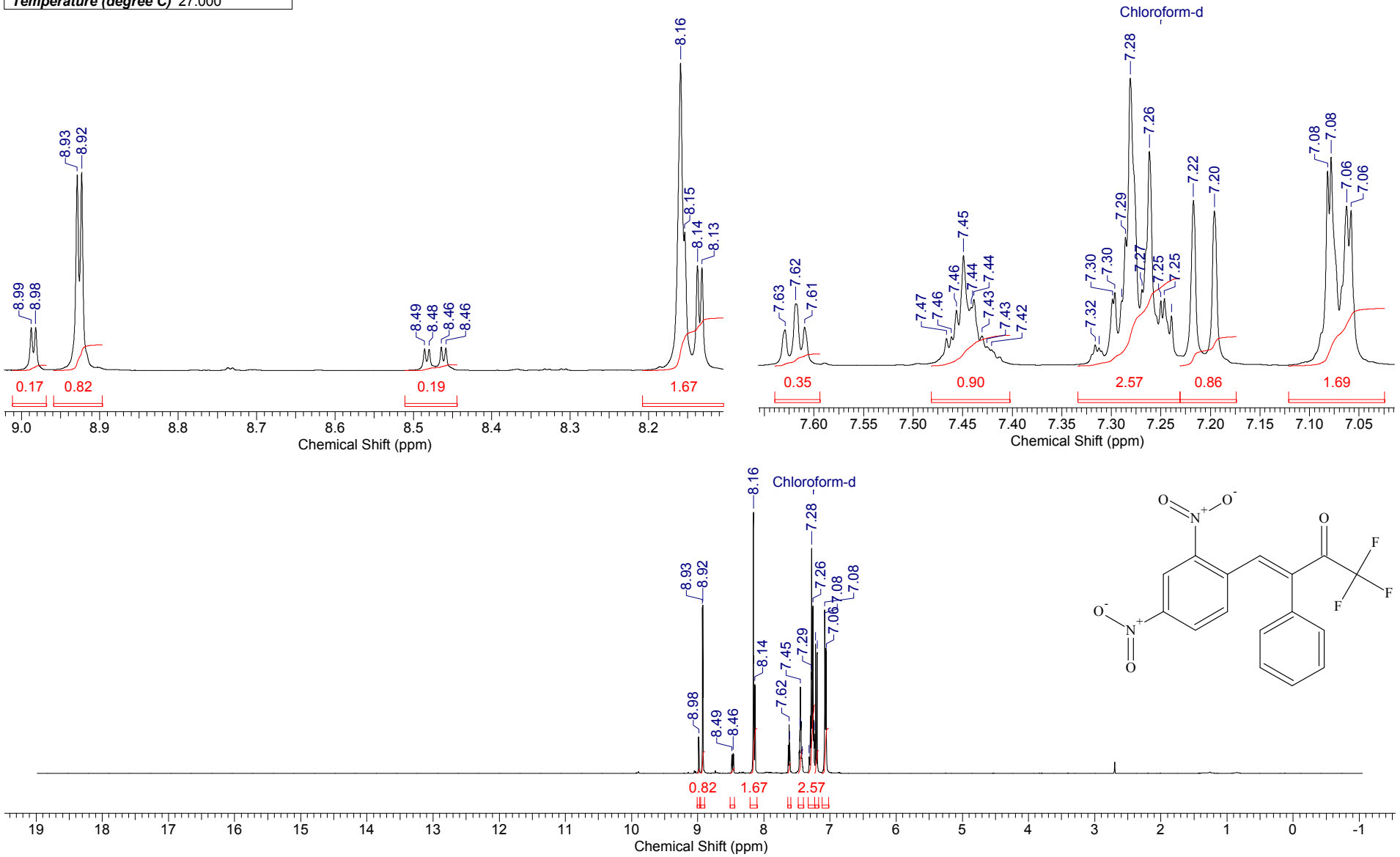
^{13}C NMR spectrum of **4b** (100.6 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	14 Jun 2019 15:25:50
File Name	C:\Users\BM-1\Downloads\SZA 13-14.06.19\SZA 13-14.06.19\SZA-121.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



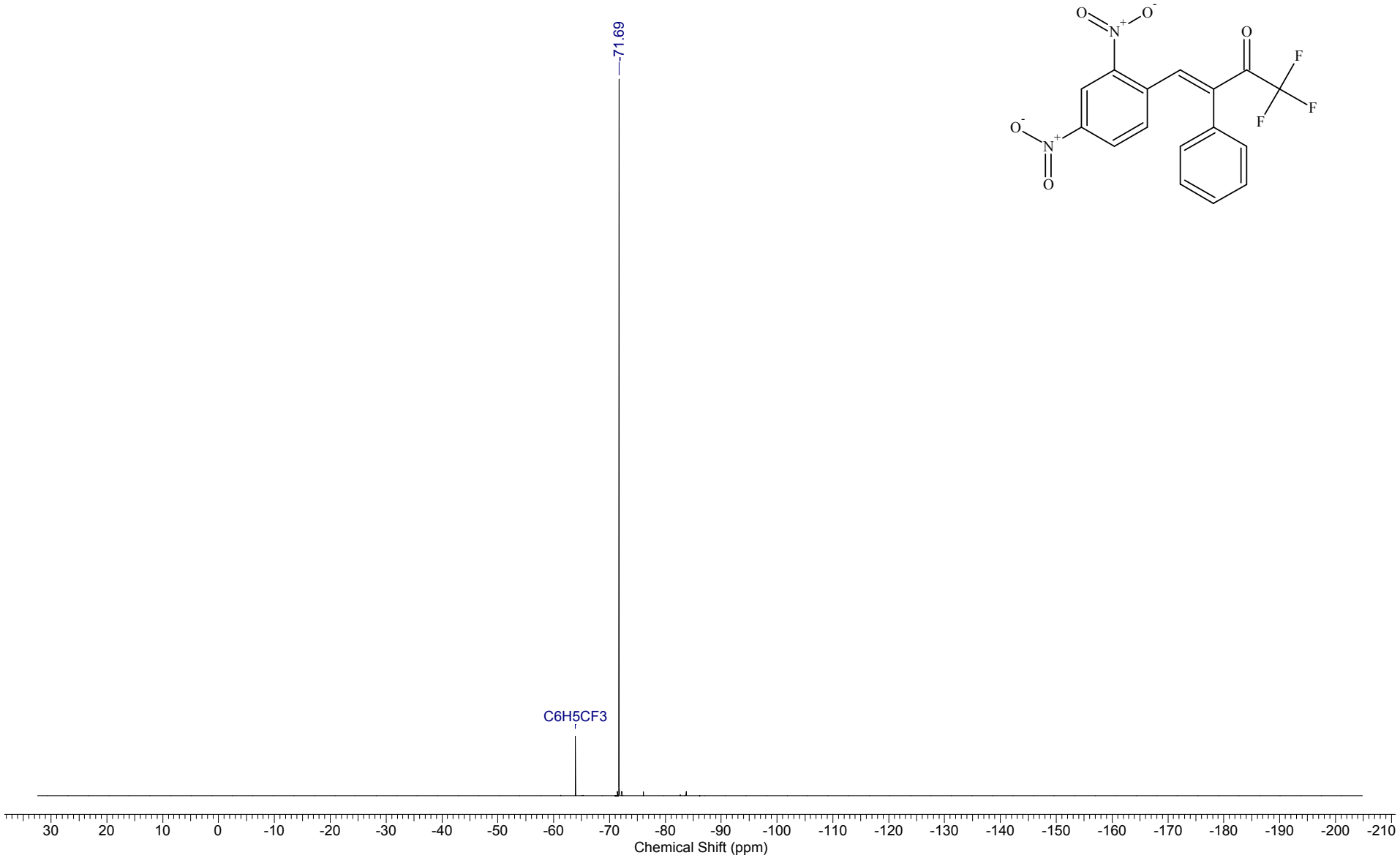
^{1}H NMR spectrum of **4c** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	23 Jan 2020 11:43:20
File Name	C:\DOCS\OUTPUT_301\2020\01.ÿí âàðü\SZA-121-3-6p.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



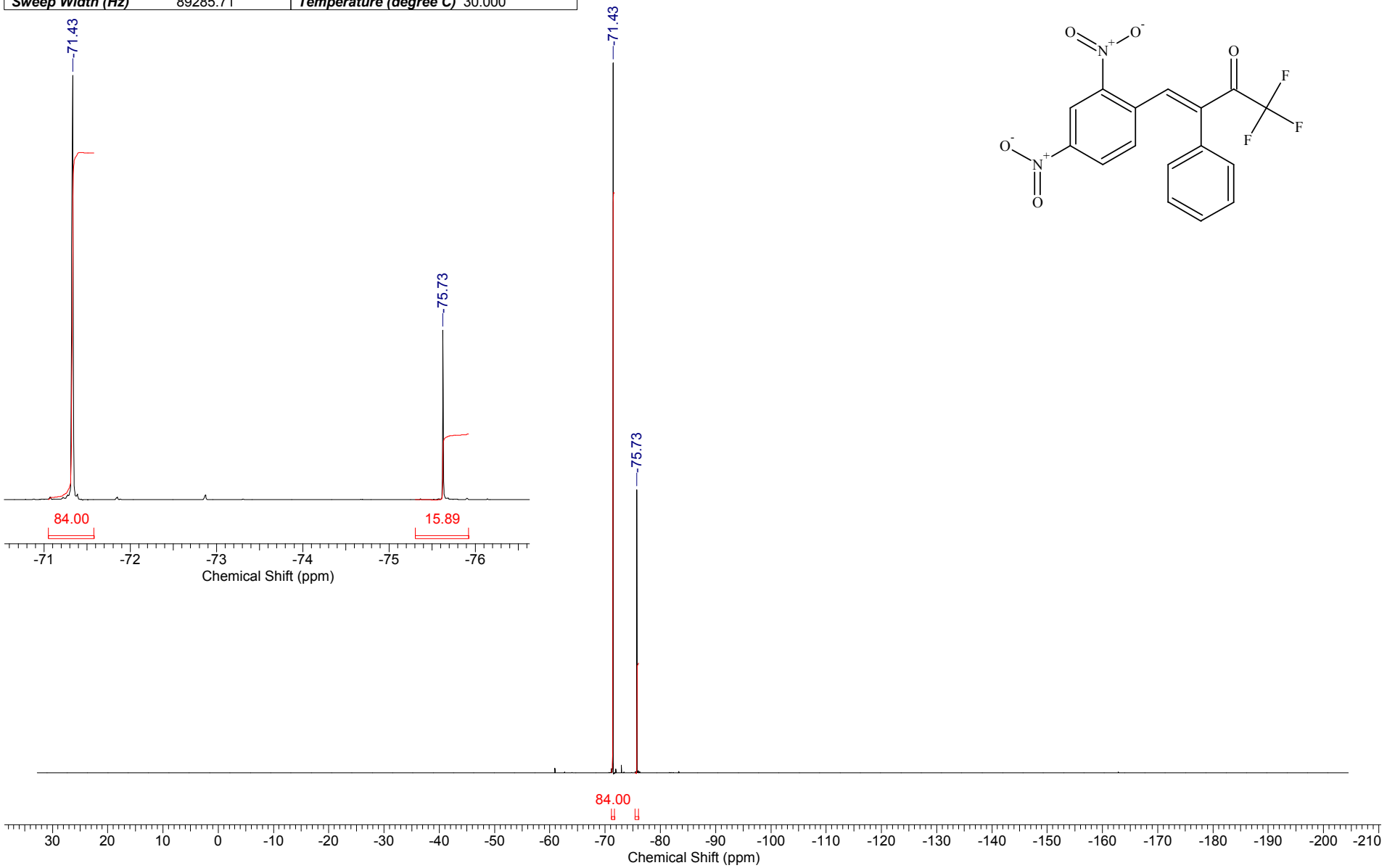
^{1}H NMR spectrum of **4c** (400.1 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	0.7340	***Date***	Jun 18 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.06.18\sza121-f_20190618_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	10000	***Original Points Count***	65536
Points Count	65536	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	50.000				



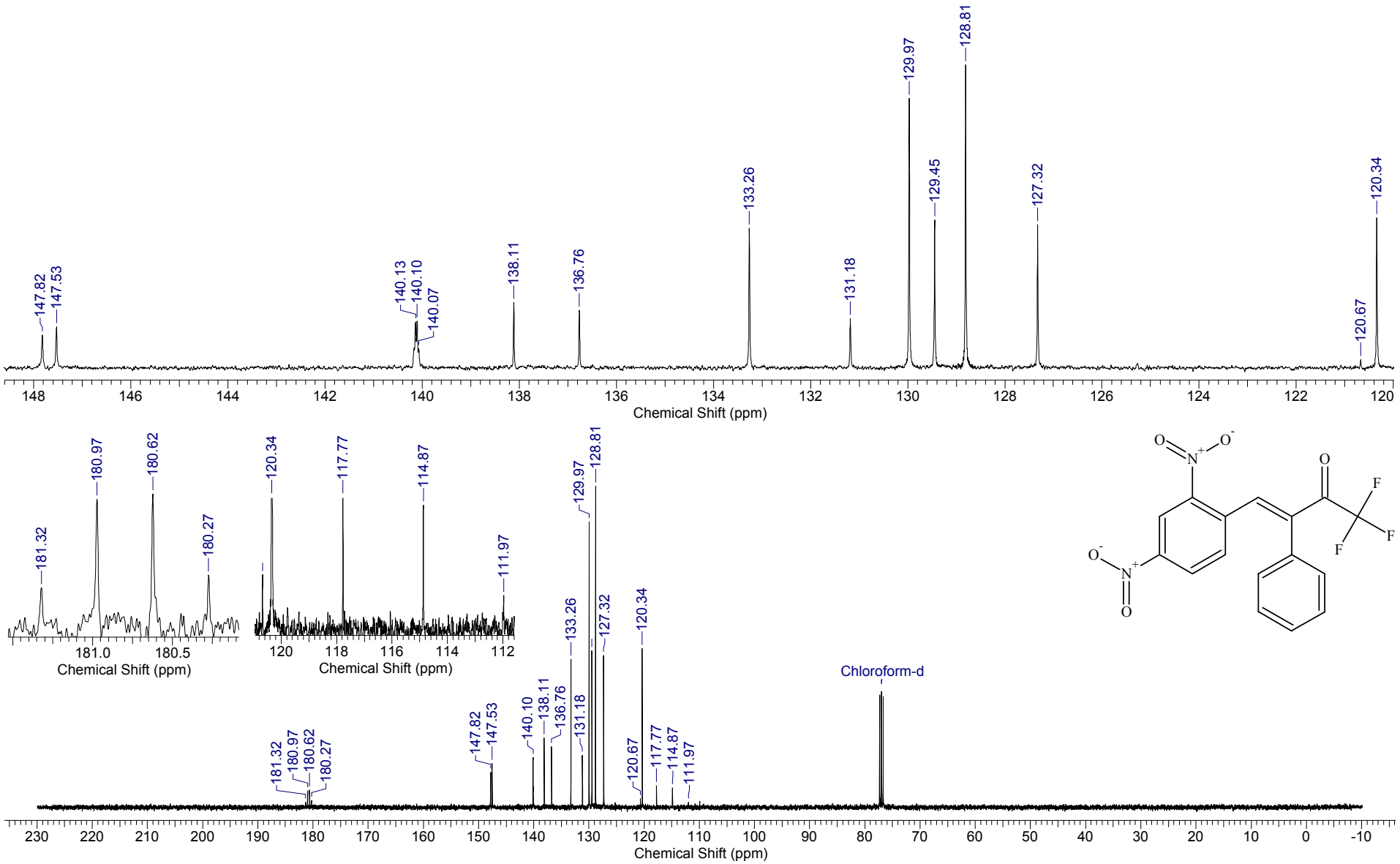
^{19}F NMR spectrum of **4c** (376.5 MHz $CDCl_3$)

Acquisition Time (sec)	0.7340	***Date***	Jan 24 2020	***File Name***	C:\DOCS\OUTPUT_301\F19\2020.01.24\SZA-121-3-6p_20200124_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	16	***Original Points Count***	65536
Points Count	65536	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	30.000				



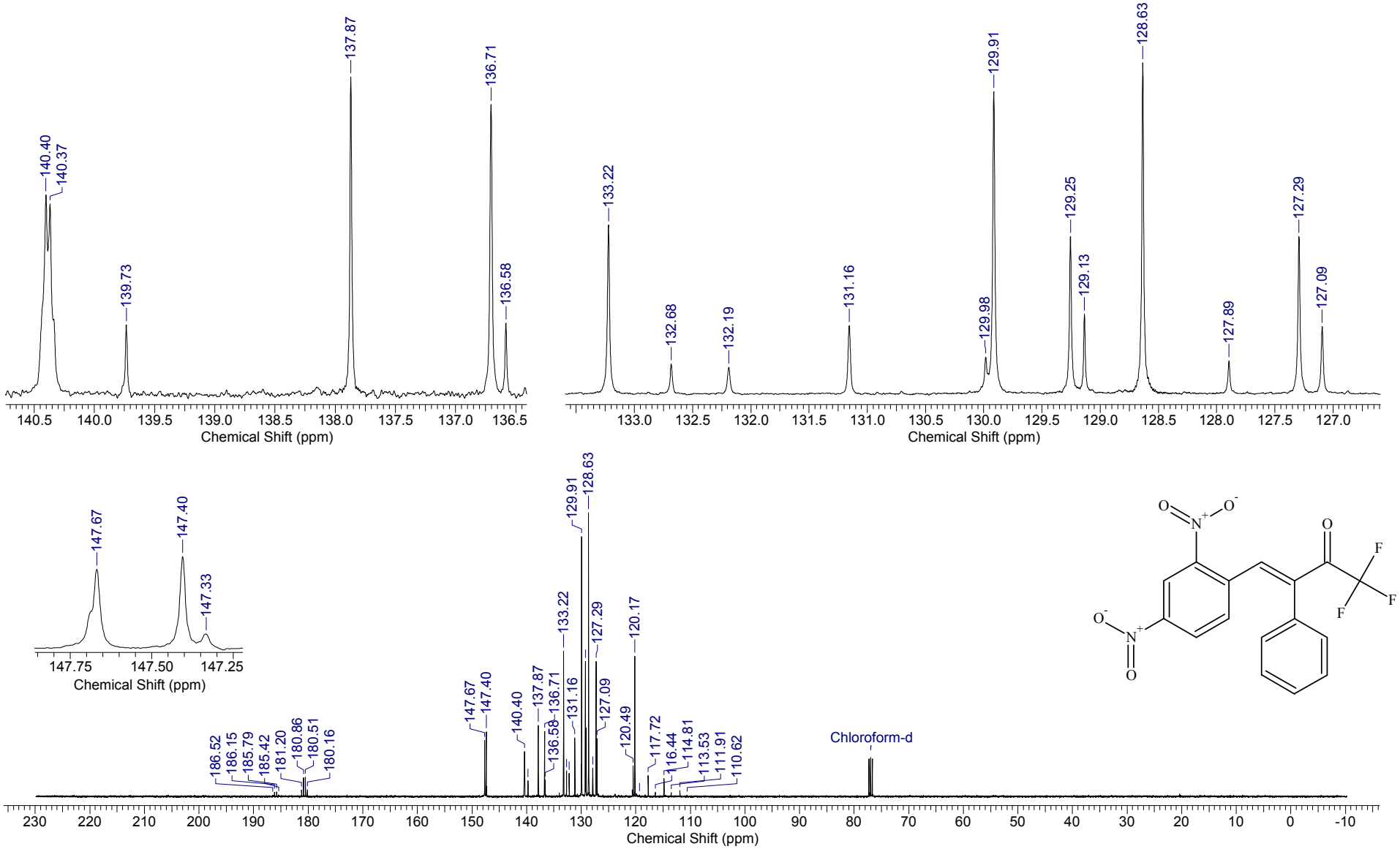
^{19}F NMR spectrum of **4c** (376.5 MHz $CDCl_3$). Signals of minor Z-isomer are also shown

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	17 Jun 2019 15:32:10
File Name	C:\Users\BM-1\Downloads\SZA 17.06.19\SZA 17.06.19\SZA-121.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	105	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



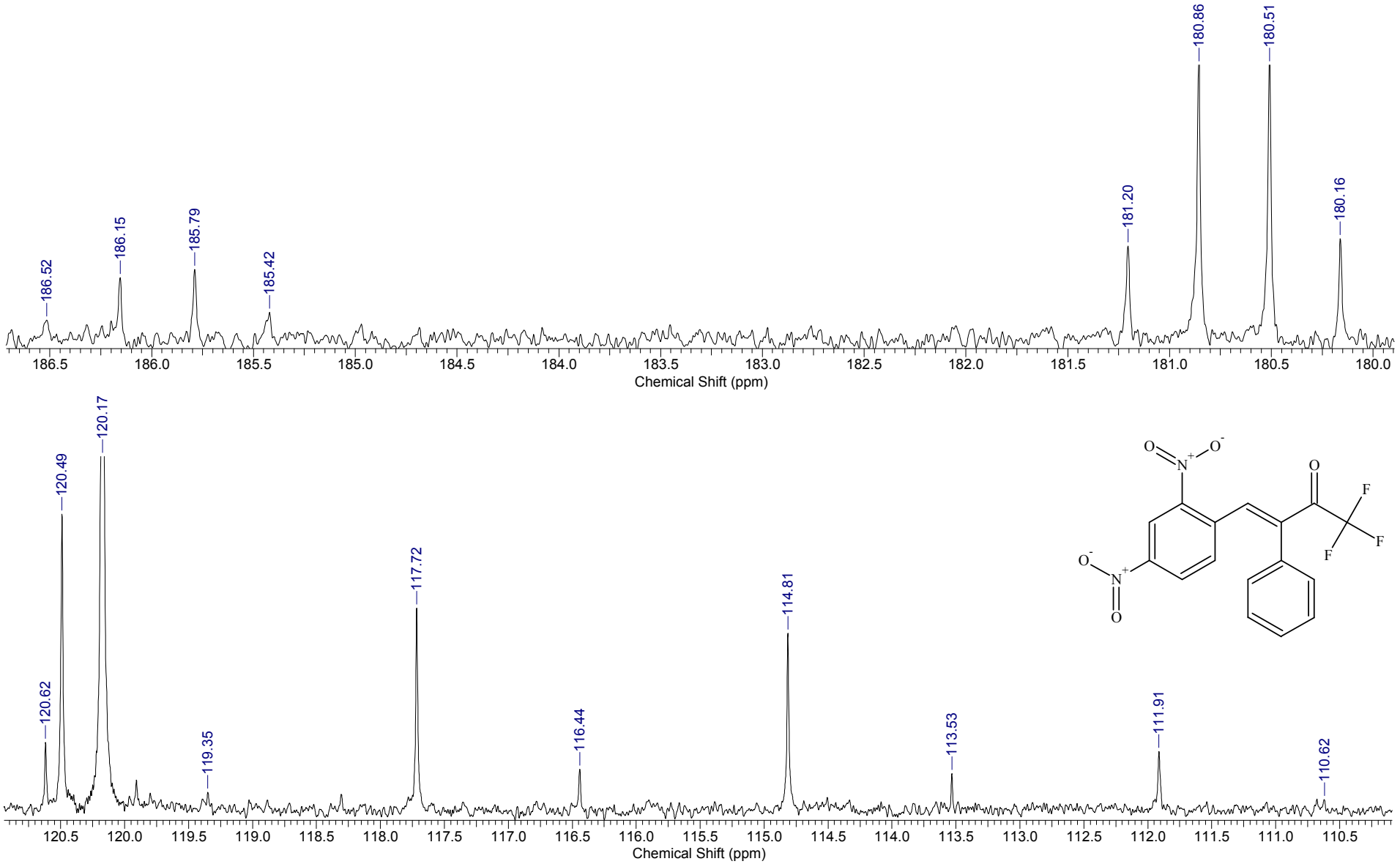
^{13}C NMR spectrum of **4c** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	23 Jan 2020 11:52:38
File Name	C:\DOCS\OUTPUT_301\2020\01.ÿí âàðü\SZA-121-3-6p.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	169	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



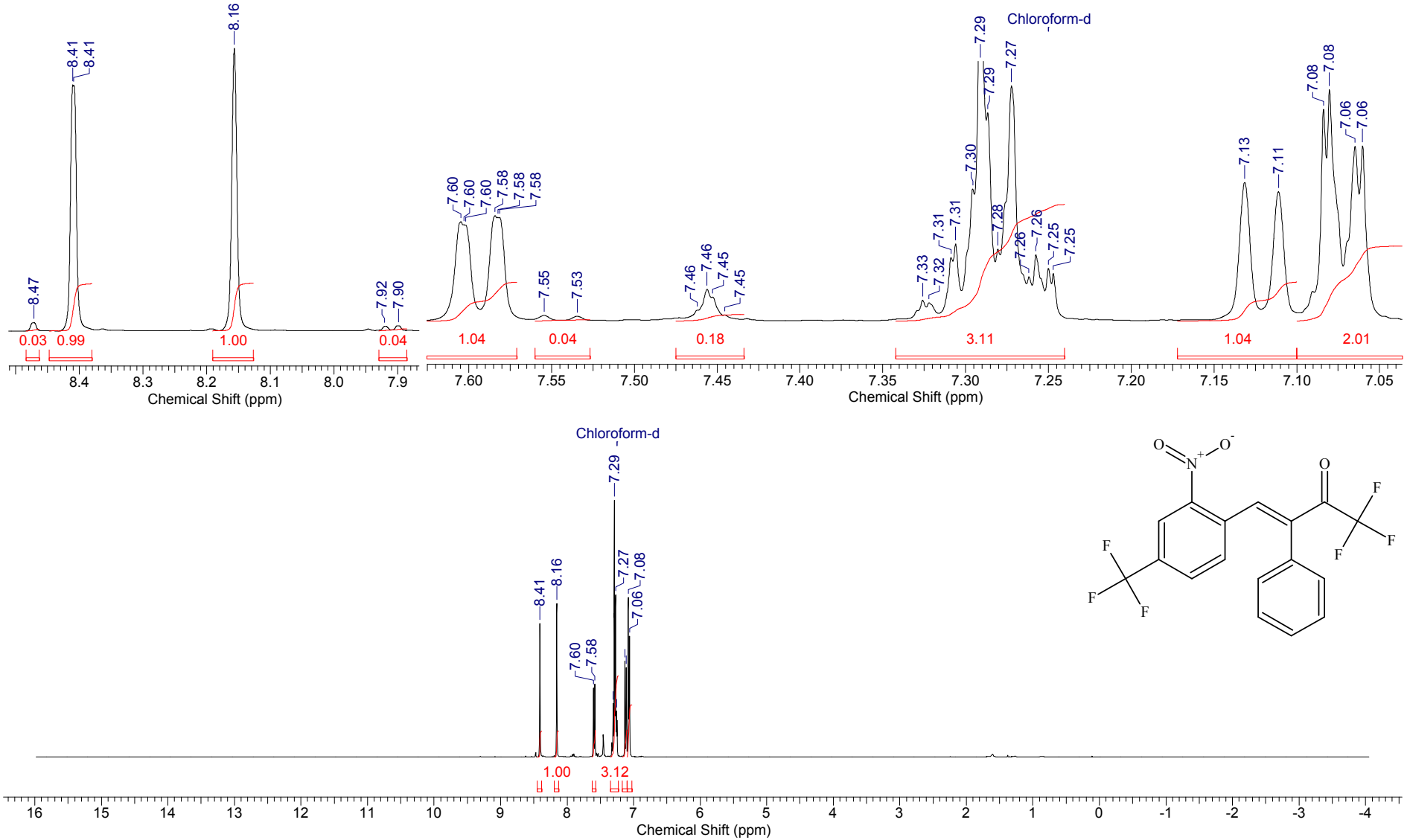
^{13}C NMR spectrum of **4c** (100.6 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	23 Jan 2020 11:52:38
File Name	C:\DOCS\OUTPUT_301\2020\01.ÿí åàðü\SZA-121-3-6p.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	169	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



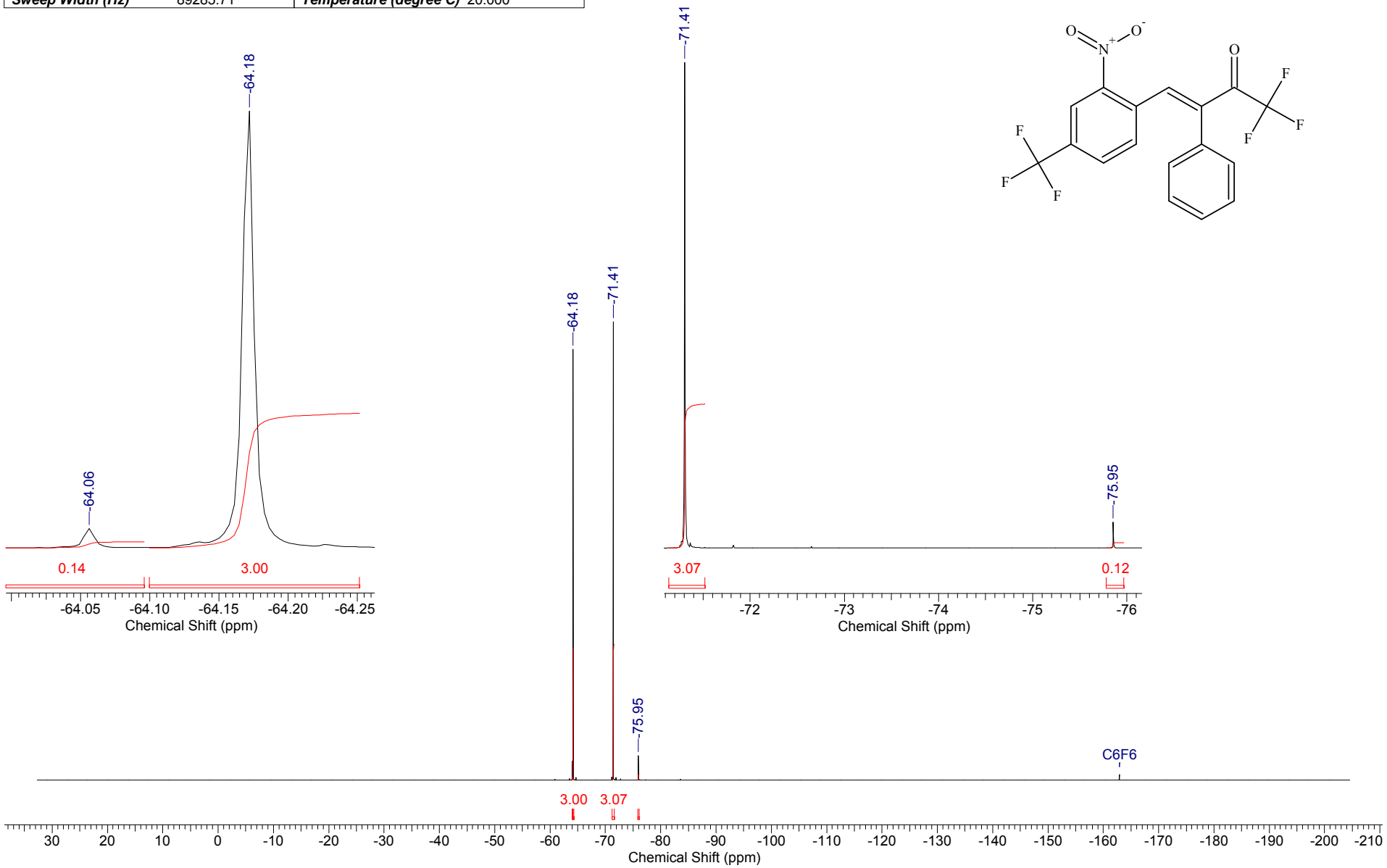
^{13}C NMR spectrum of **4c** (100.6 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	03 Sep 2019 14:47:22
File Name	C:\Users\BM-1\Downloads\03.09.2-19\03.09.2-19\SZA-BM-1585-4(2).H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



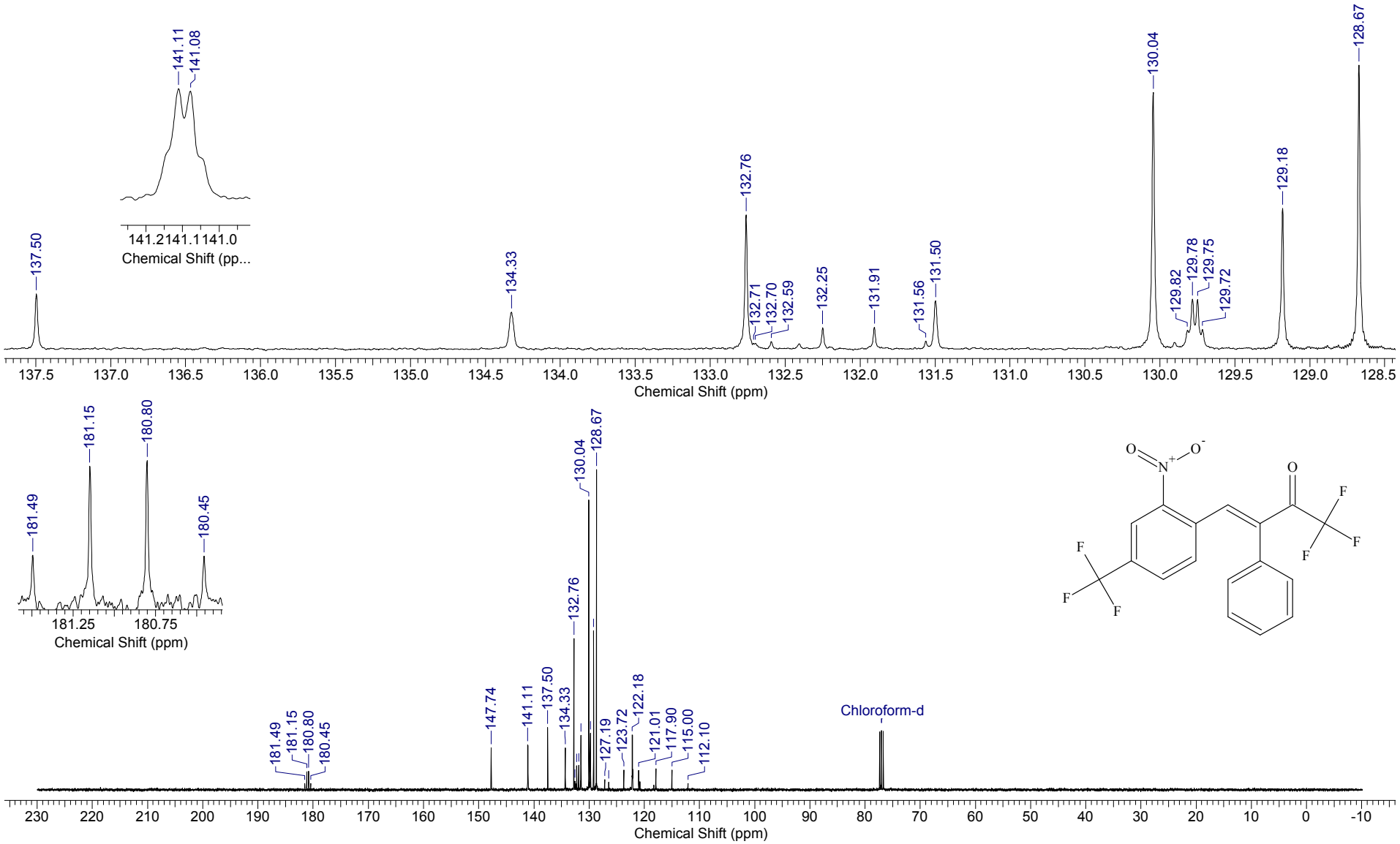
^{1}H NMR spectrum of **4d** (400.1 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown

Acquisition Time (sec)	0.7340	***Date***	Sep 10 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.10\sza-bm-1585-4-f_20190910_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	1000	***Original Points Count***	65536
Points Count	65536	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	20.000				



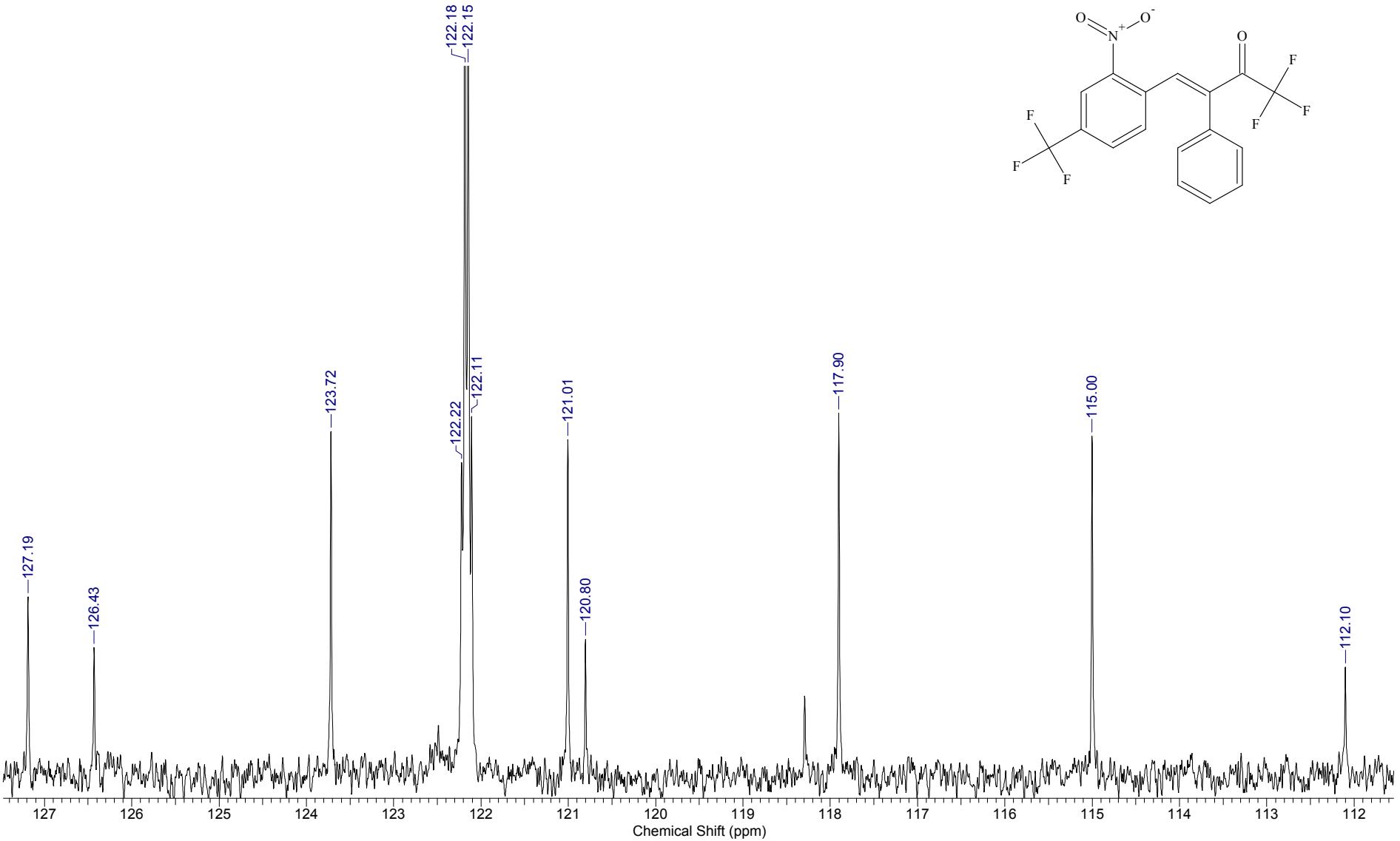
^{19}F NMR spectrum of **4d** (376.5 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	03 Sep 2019 14:53:12
File Name	C:\Users\BM-1\Downloads\03.09.2-19\03.09.2-19\SZA-BM-1585.4.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	129	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59
Temperature (degree C)	27.000						



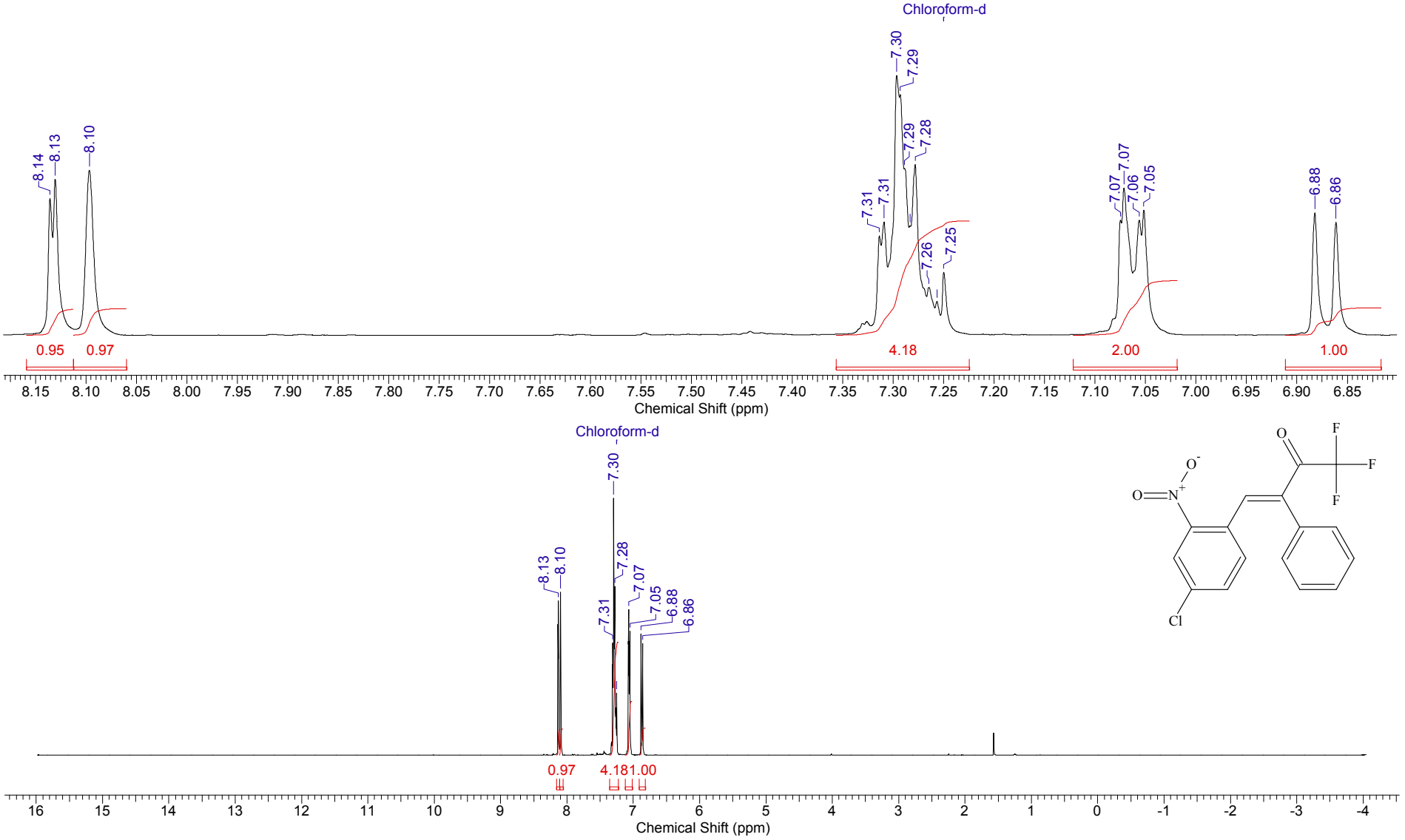
^{13}C NMR spectrum of **4d** (100.6 MHz, $CDCl_3$).

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	03 Sep 2019 14:53:12
File Name	C:\Users\BM-1\Downloads\03.09.2-19\03.09.2-19\SZA-BM-1585.4.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	129	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59
Temperature (degree C)	27.000						



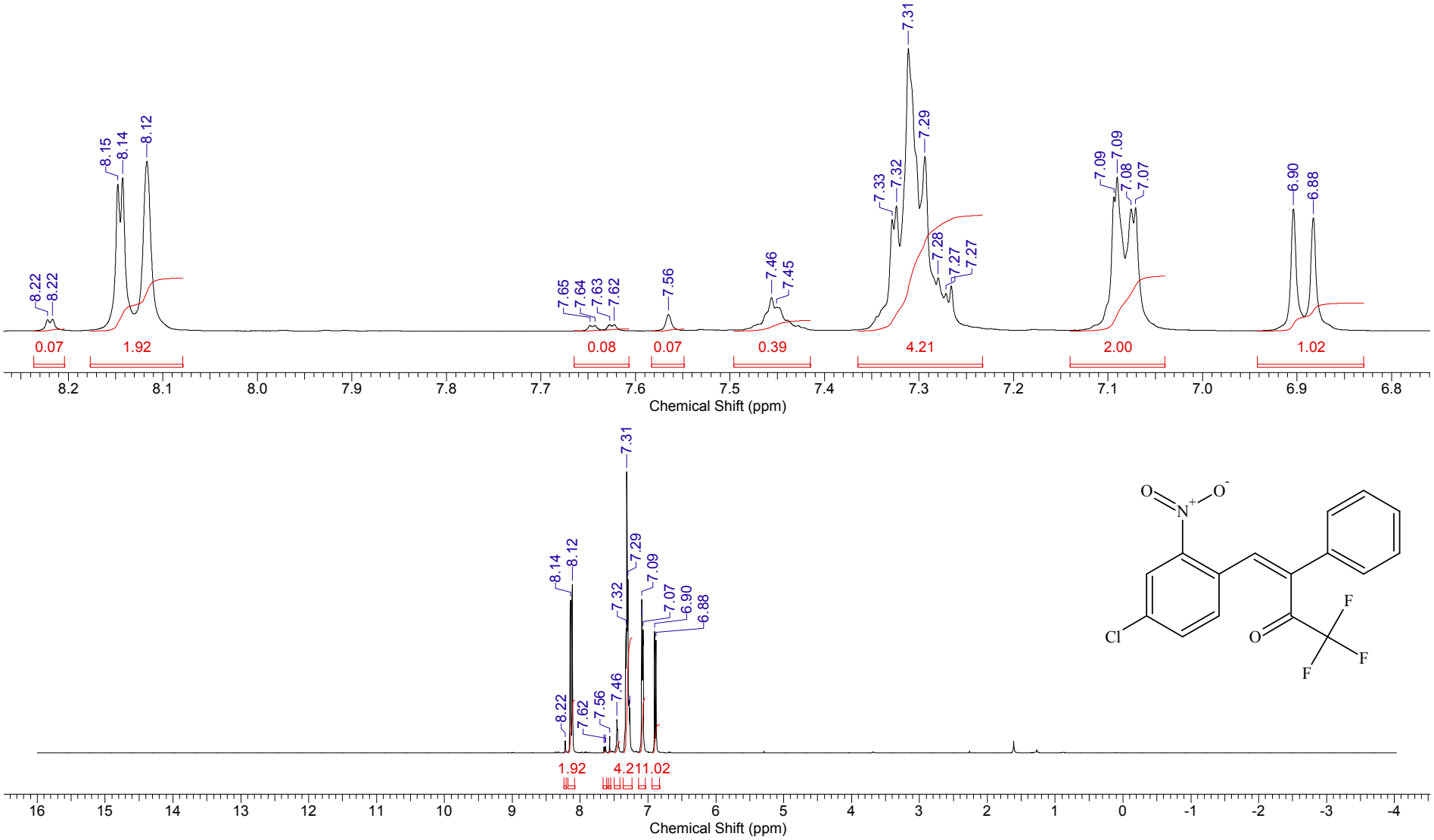
^{13}C NMR spectrum of **4d** (100.6 MHz, $CDCl_3$).

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	27 May 2019 15:21:12
File Name	C:\DOCS\OUTPUT_301\2019\05.ì àé\BM-1580-2.H_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	4	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



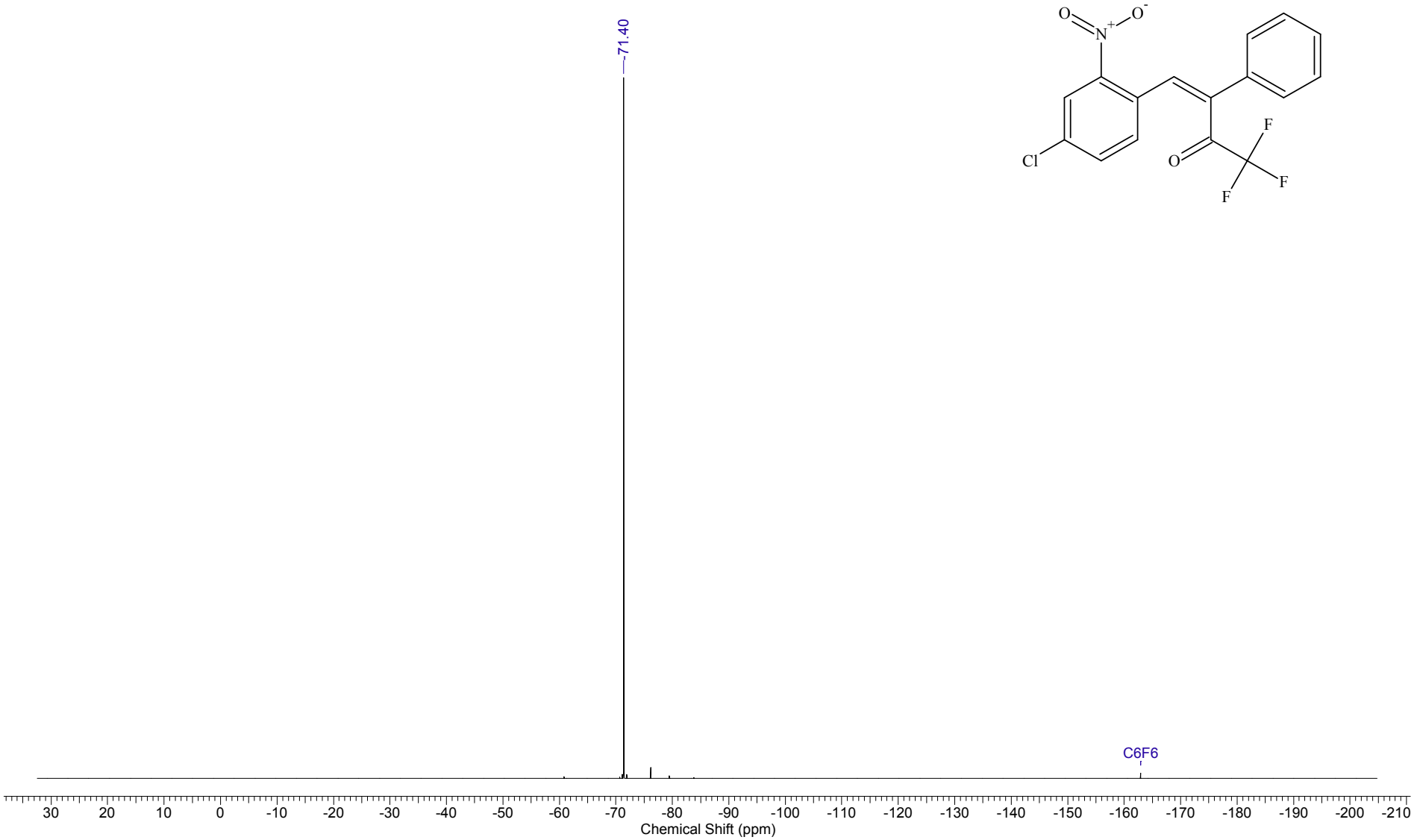
^{1}H NMR spectrum of **4e** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	28 May 2019 14:29:02
File Name	C:\DOCS\OUTPUT_301\2019\05.ì àé\BM-1580-1p.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



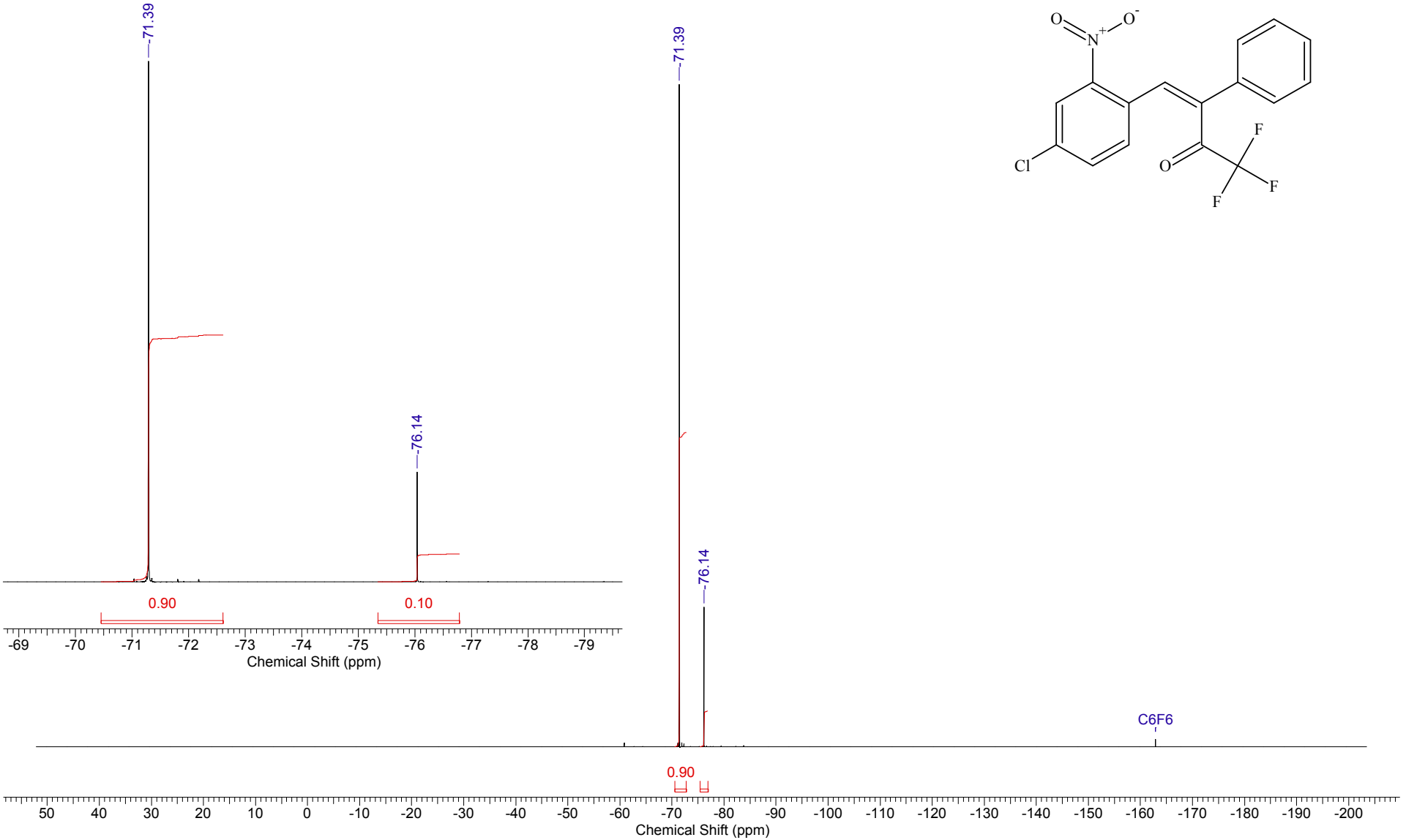
^{1}H NMR spectrum of **4e** (400.1 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	0.7340	***Date***	May 28 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.05.28\bm1580-2-f_20190528_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	100	***Original Points Count***	65536
Points Count	65536	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	22.000				



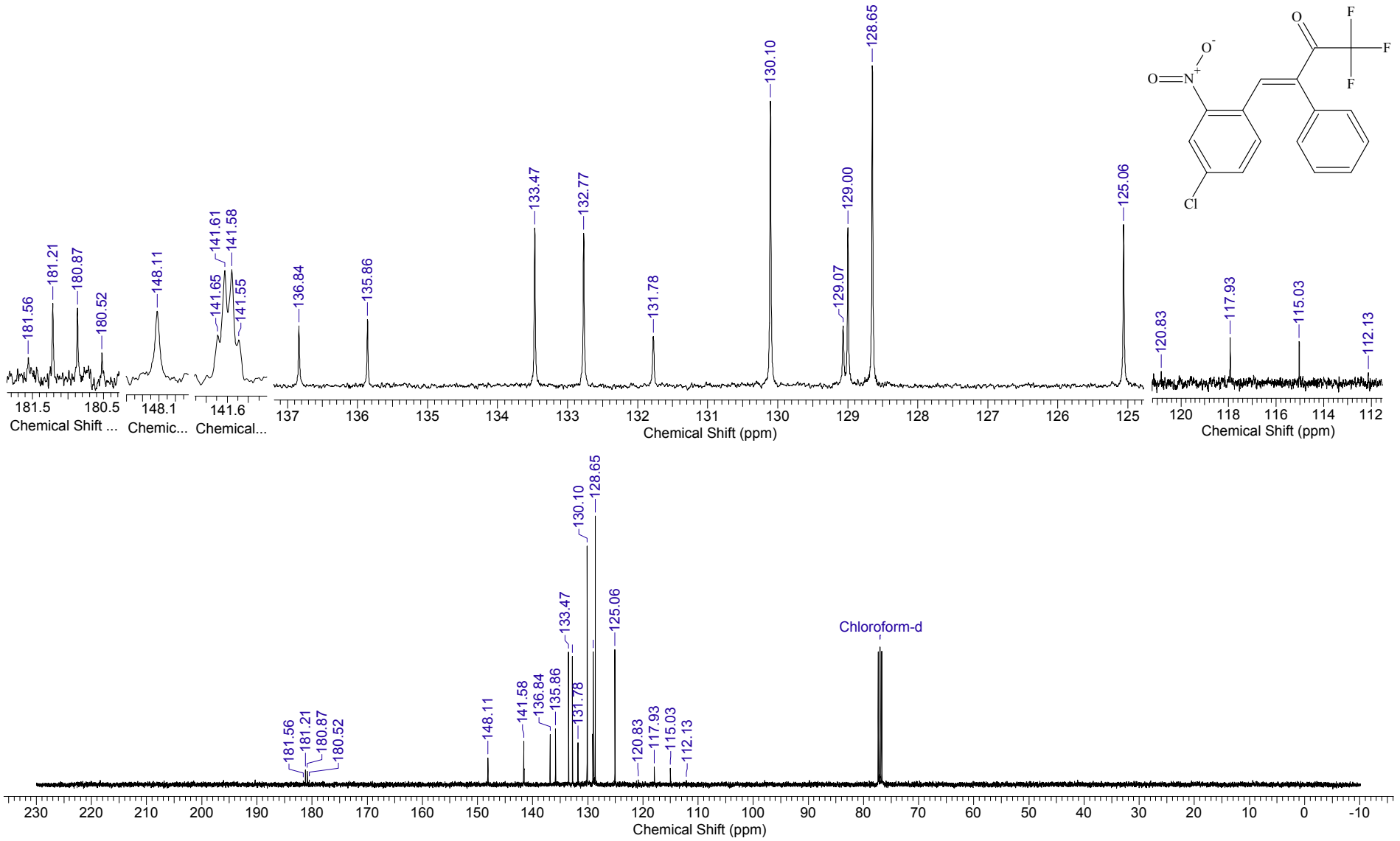
^{19}F NMR spectrum of **4e** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	1.7826	***Date***	May 30 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.05.30\BM-1580-1P-F_20190530_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	171402
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	96153.84	***Temperature (degree C)***	21.000				



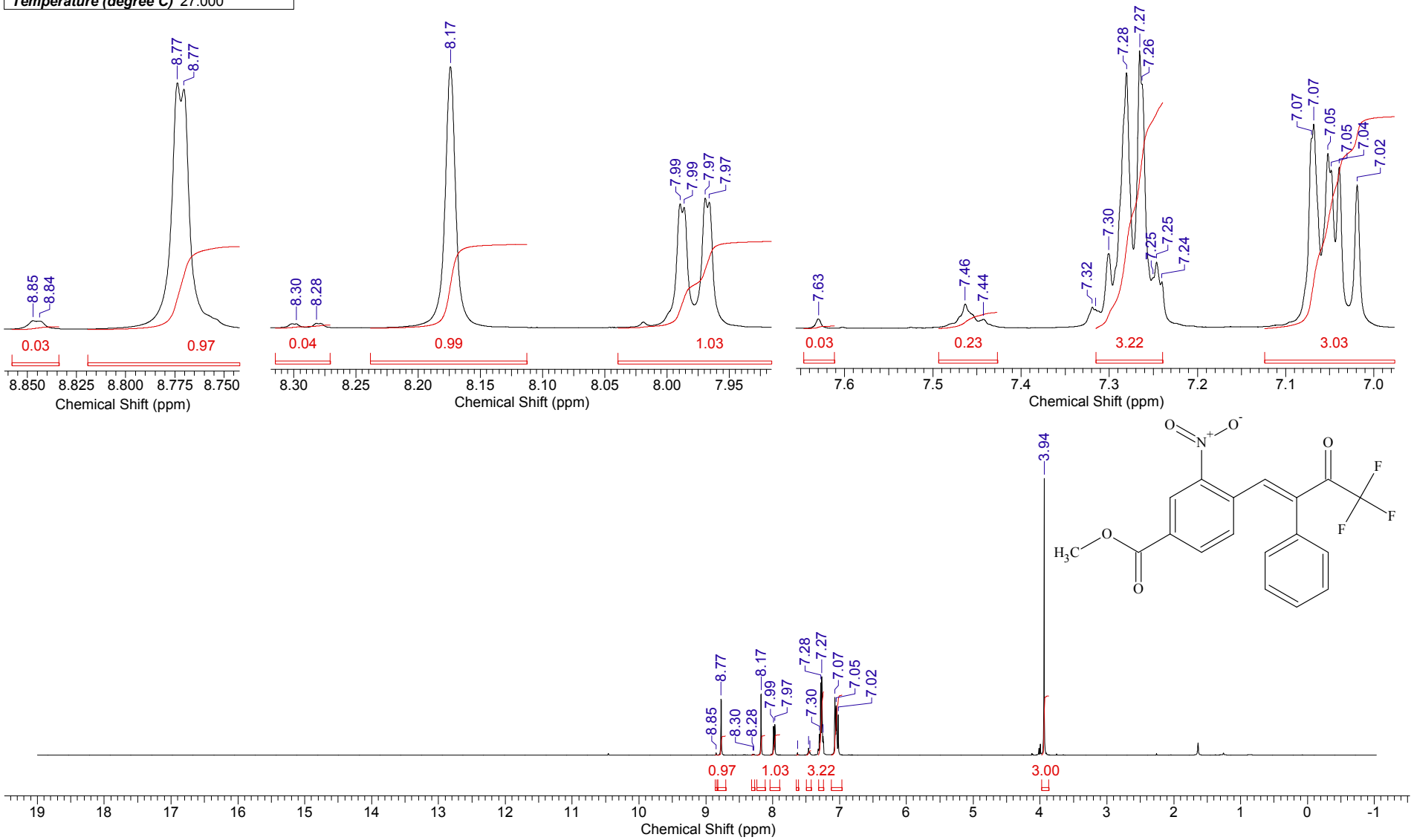
^{19}F NMR spectrum of **4e** (376.5 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	27 May 2019 15:27:14
File Name	C:\DOCS\OUTPUT_301\2019\05.ì àé\BM-1580-2.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	113	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



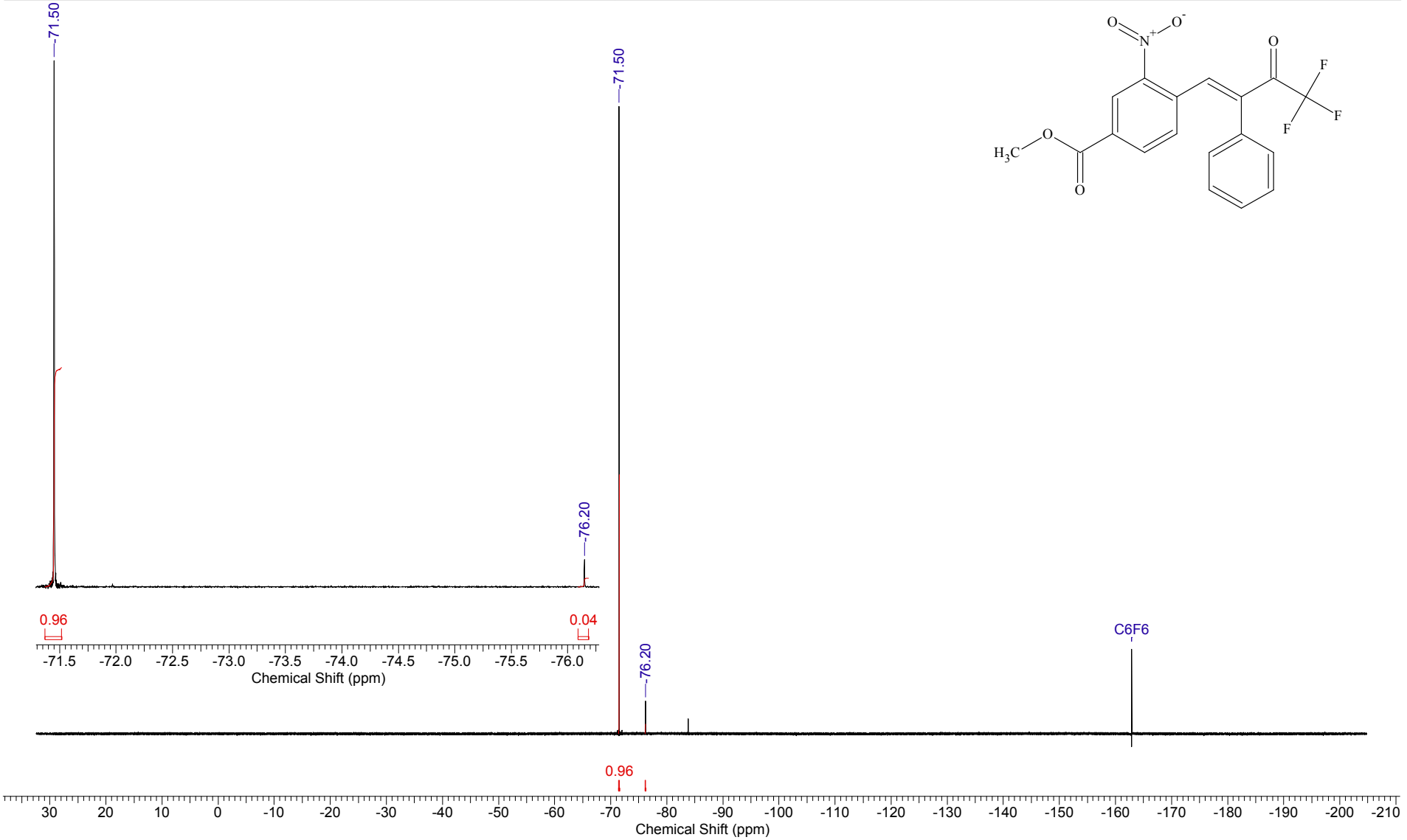
^{13}C NMR spectrum of **4e** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	24 Jul 2019 17:38:00
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\190724\BM-1584_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	8	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



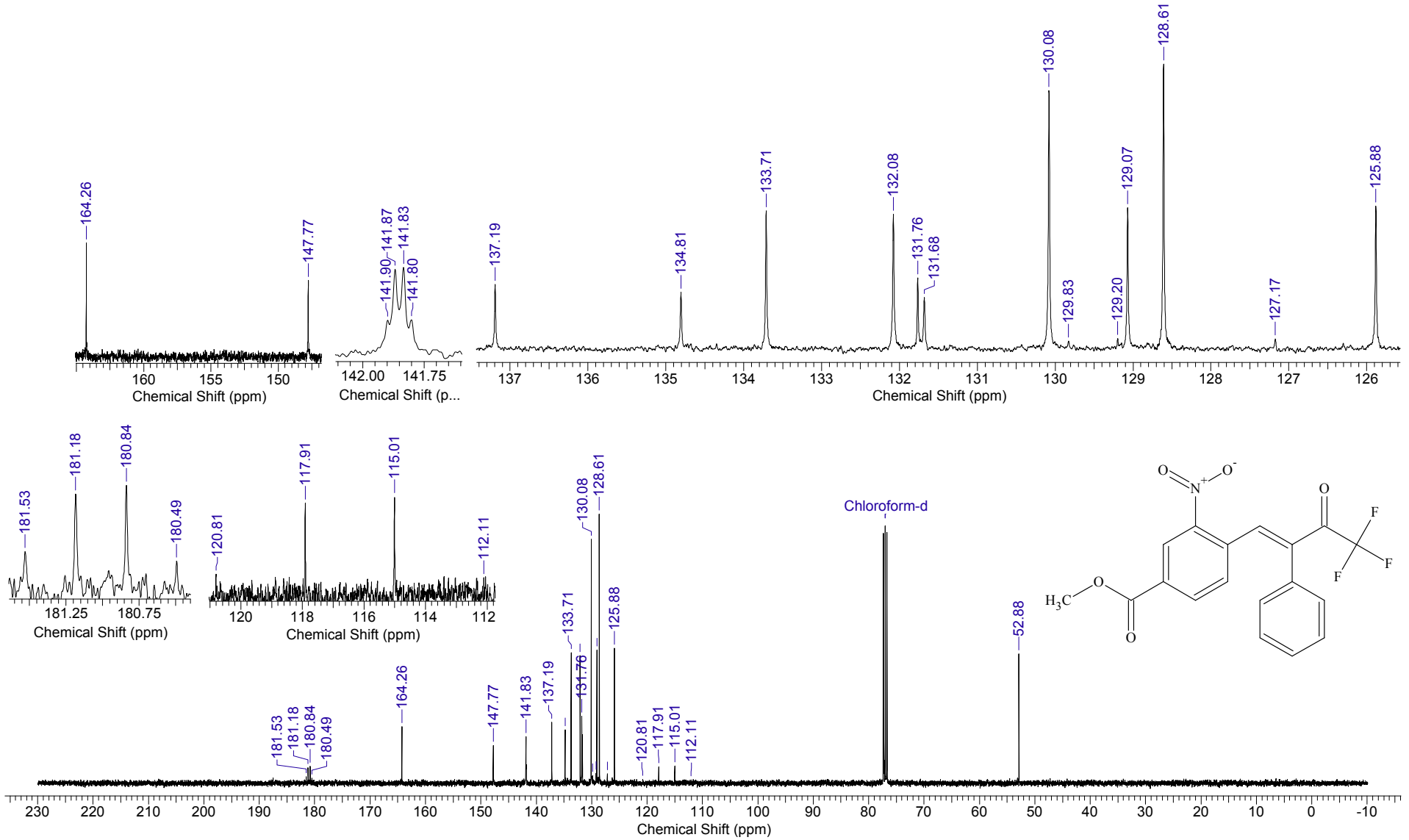
^{1}H NMR spectrum of **4f** (400.1 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	1.0000	***Comment***	STANDARD FLUORINE PARAMETERS			***Date***	Sep 13 2019
File Name	C:\DOCS\OUTPUT_301\F19\2019.09.13\BM-1584-09_20190913_01\FLUORINE_01					***Frequency (MHz)***	376.31
Nucleus	19F	***Number of Transients***	4	***Original Points Count***	89286	***Points Count***	131072
Pulse Sequence	s2pul	***Solvent***	CHLOROFORM-D	***Sweep Width (Hz)***	89285.71	***Temperature (degree C)***	20.000



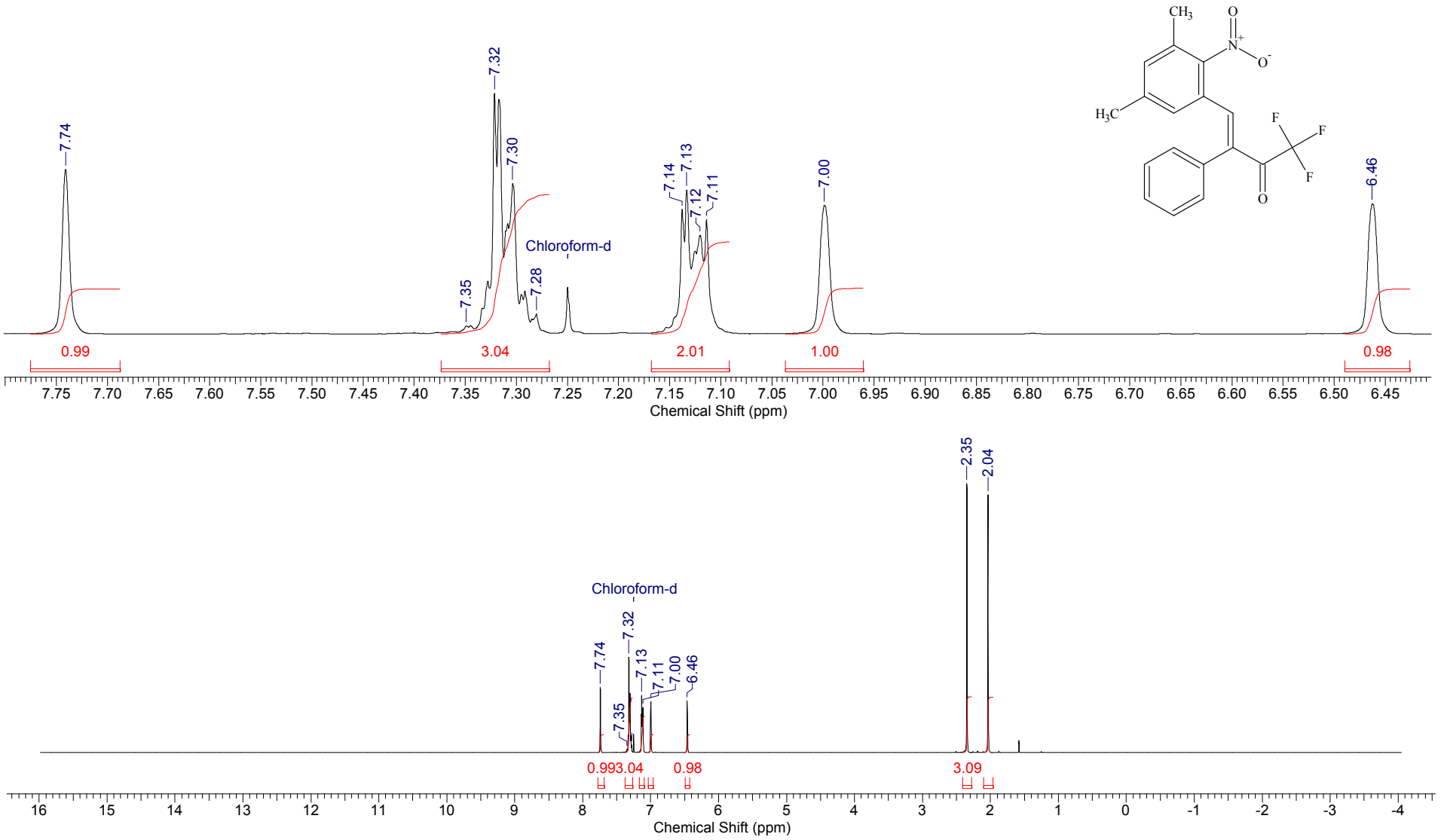
^{19}F NMR spectrum of **4f** (376.5 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	24 Jul 2019 17:56:20
File Name	I:\SPEC_2019_H,C\07.èþ ëü\190724\BM-1584_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	351	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



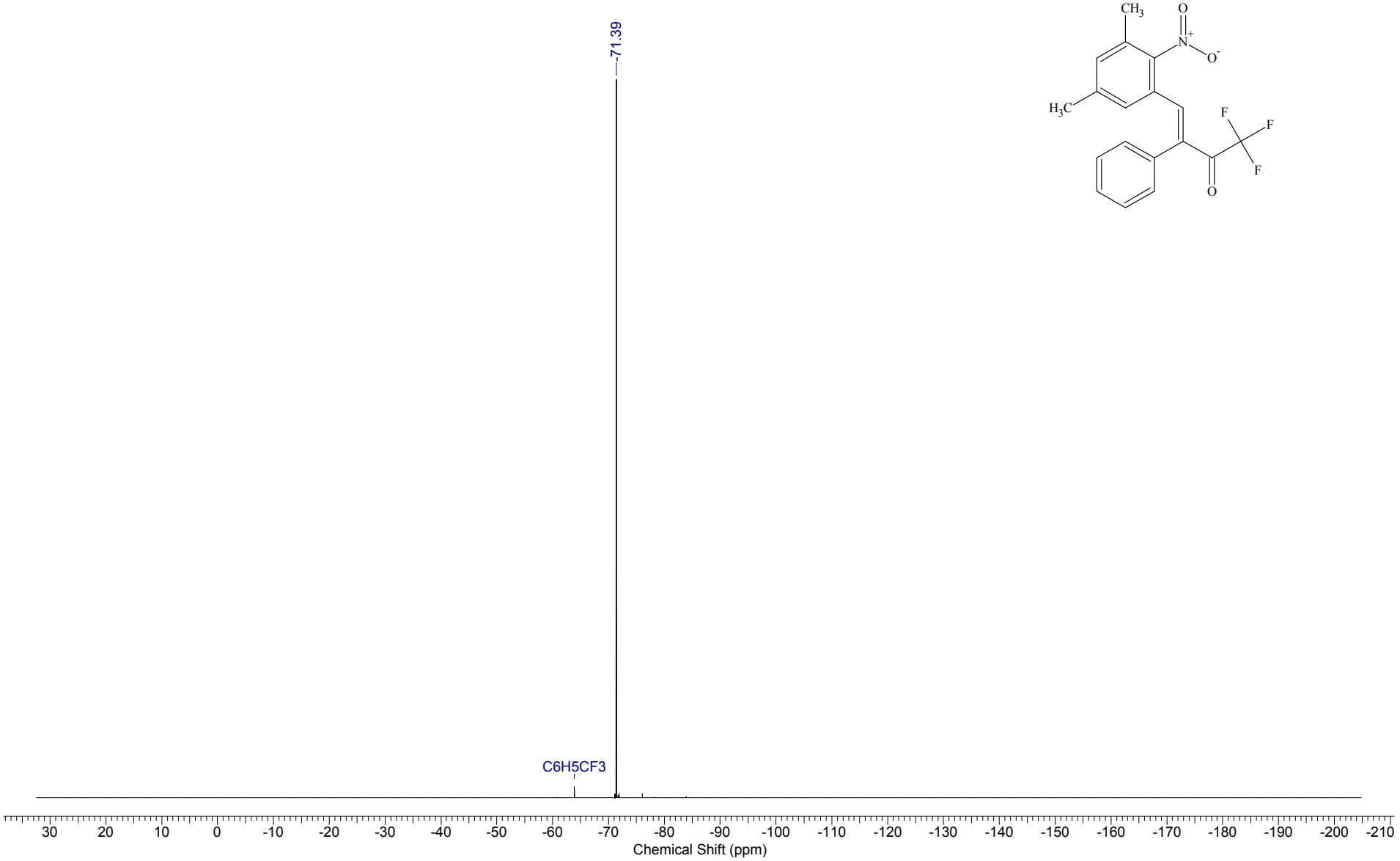
^{13}C NMR spectrum of **4f** (100.6 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	08 May 2019 17:10:02
File Name	C:\Users\BM-1\Downloads\noname01\SZA-102.H_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	4	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



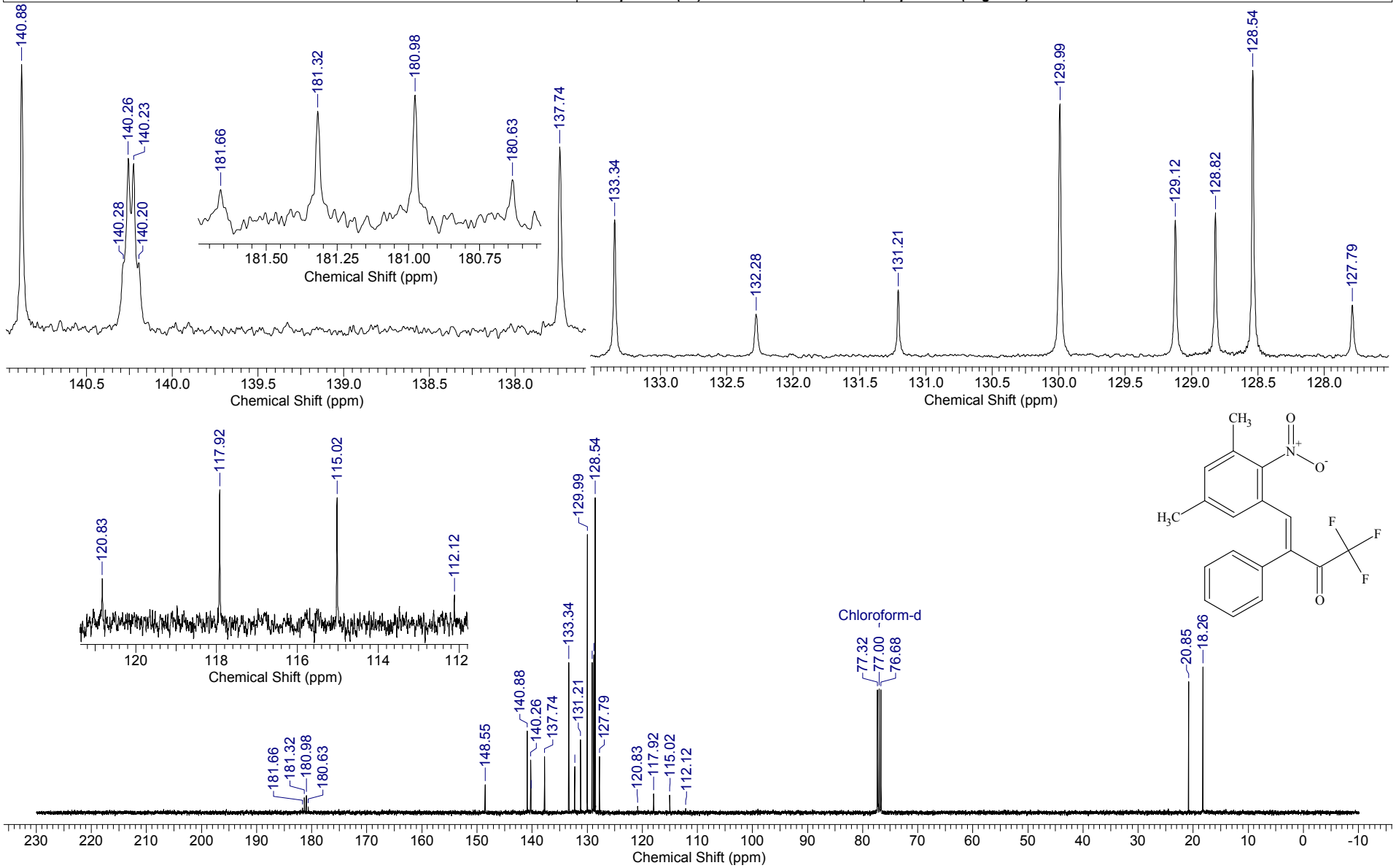
^{1}H NMR spectrum of **4g** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	0.7340	***Comment***	STANDARD FLUORINE PARAMETERS			***Date***	May 14 2019
File Name	C:\DOCS\OUTPUT_301\F19\2019.05.14\sza102-f_20190514_01\FLUORINE_01					***Frequency (MHz)***	376.31
Nucleus	19F	***Number of Transients***	100	***Original Points Count***	65536	***Points Count***	65536
Pulse Sequence	s2pul	***Solvent***	CHLOROFORM-D	***Sweep Width (Hz)***	89285.71	***Temperature (degree C)***	30.000



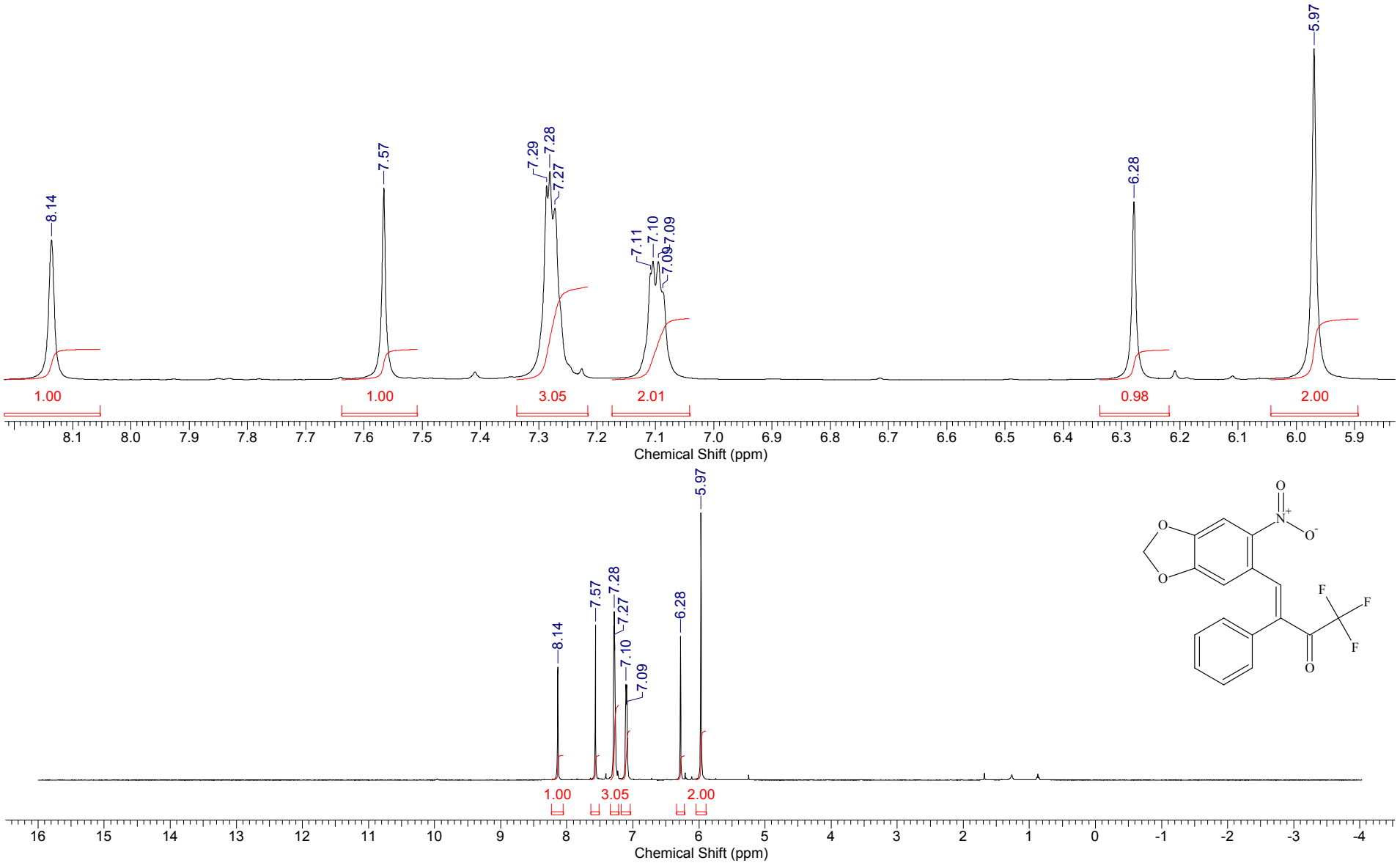
^{19}F NMR spectrum of **4g** (376.5 MHz $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	13 May 2019 15:16:28
File Name	C:\DOCS\OUTPUT_301\2019\05.ì àé\SZA-102.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	163	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



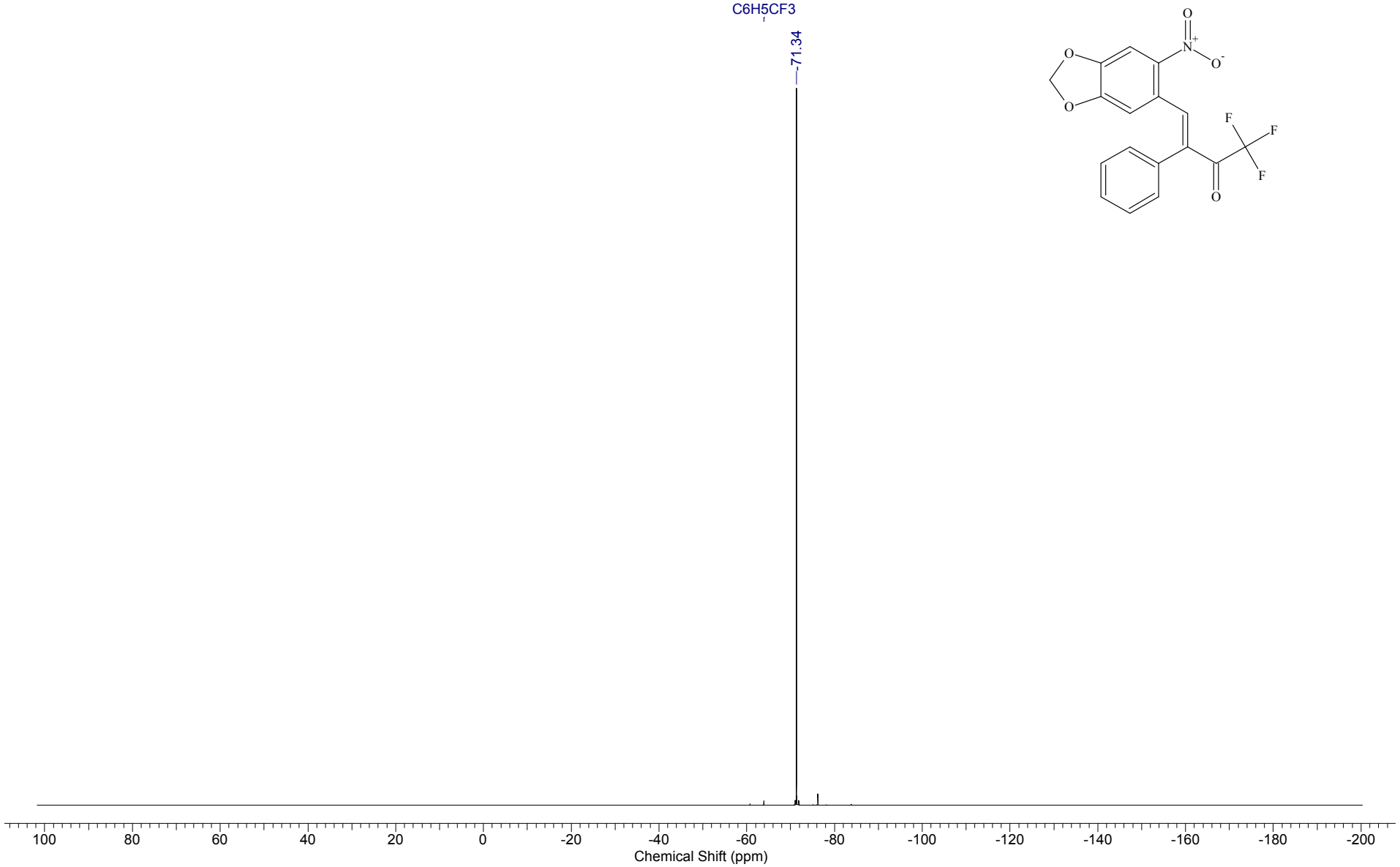
^{13}C NMR spectrum of **4g** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	14 May 2019 14:28:26
File Name	C:\DOCS\OUTPUT_301\2019\05.ì àé\SZA-103.H_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	4	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



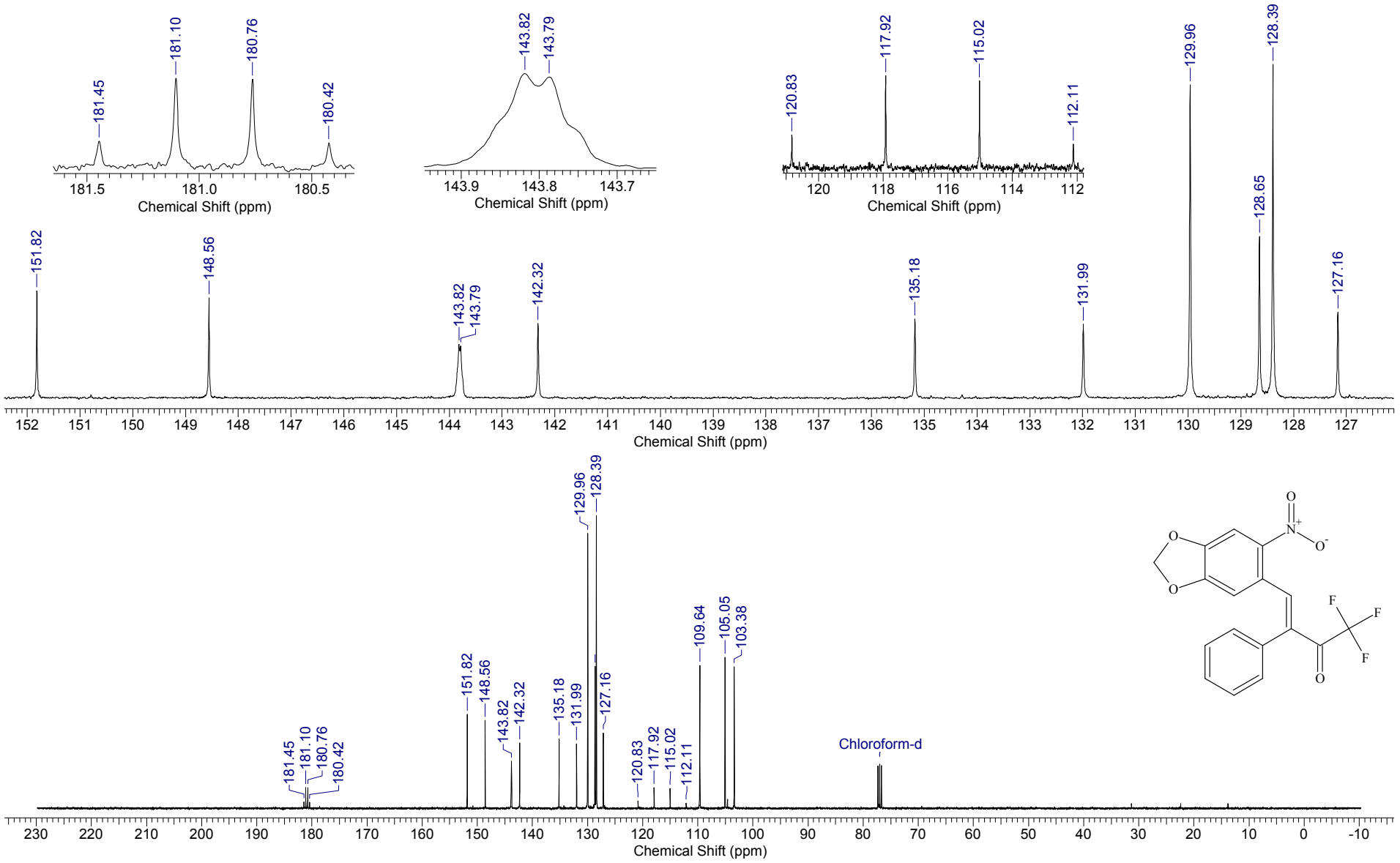
^{1}H NMR spectrum of **4h** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.7826	***Date***	May 16 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.05.16\SZA-103-F_20190516_01\FLUORINE_01		
Frequency (MHz)	376.32	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	202566
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	113636.37	***Temperature (degree C)***	22.000				



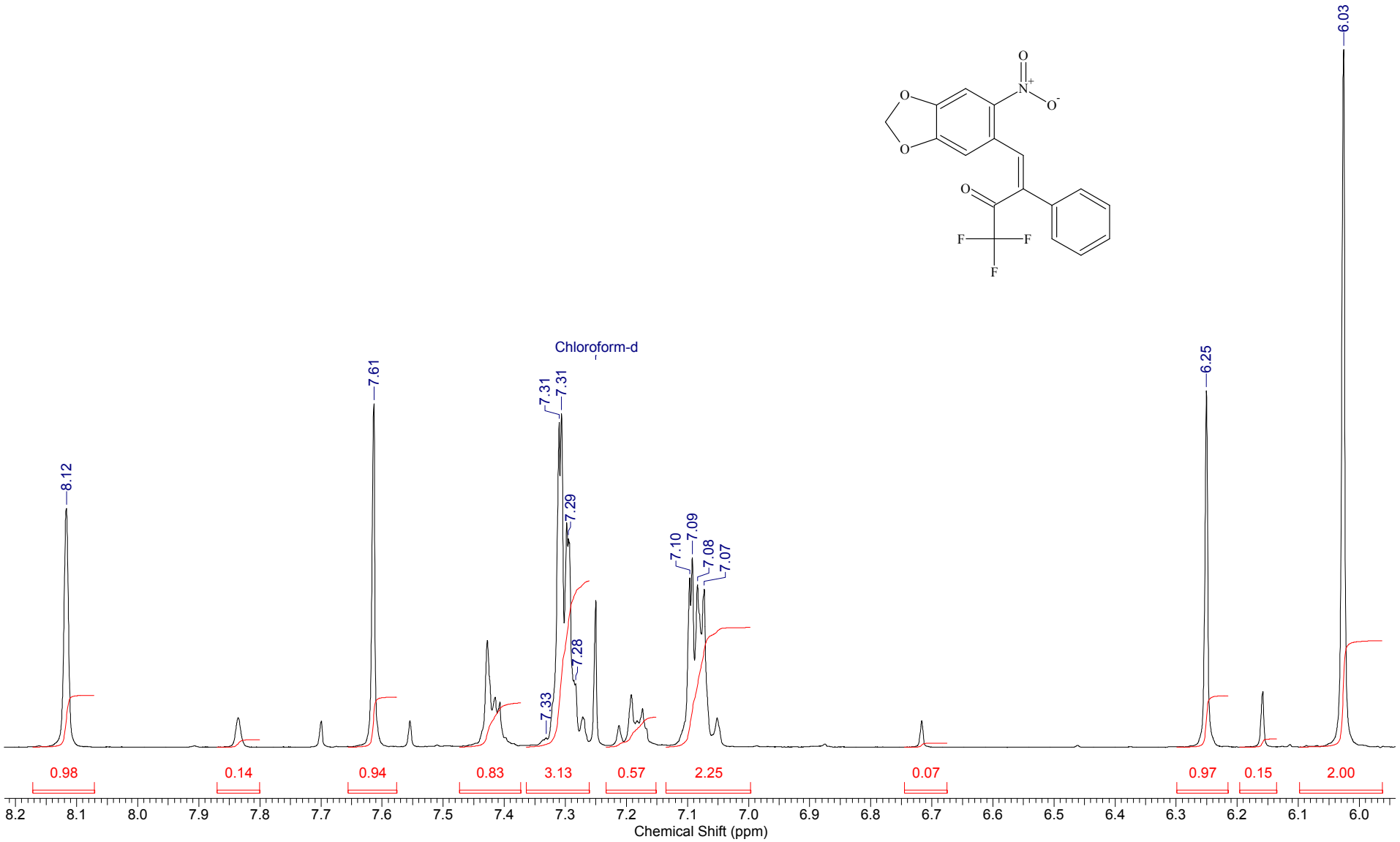
^{19}F NMR spectrum of **4h** (376.5 MHz $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	14 May 2019 14:35:16
File Name	C:\DOCS\OUTPUT_301\2019\05.ì àé\SZA-103.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	133	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000		



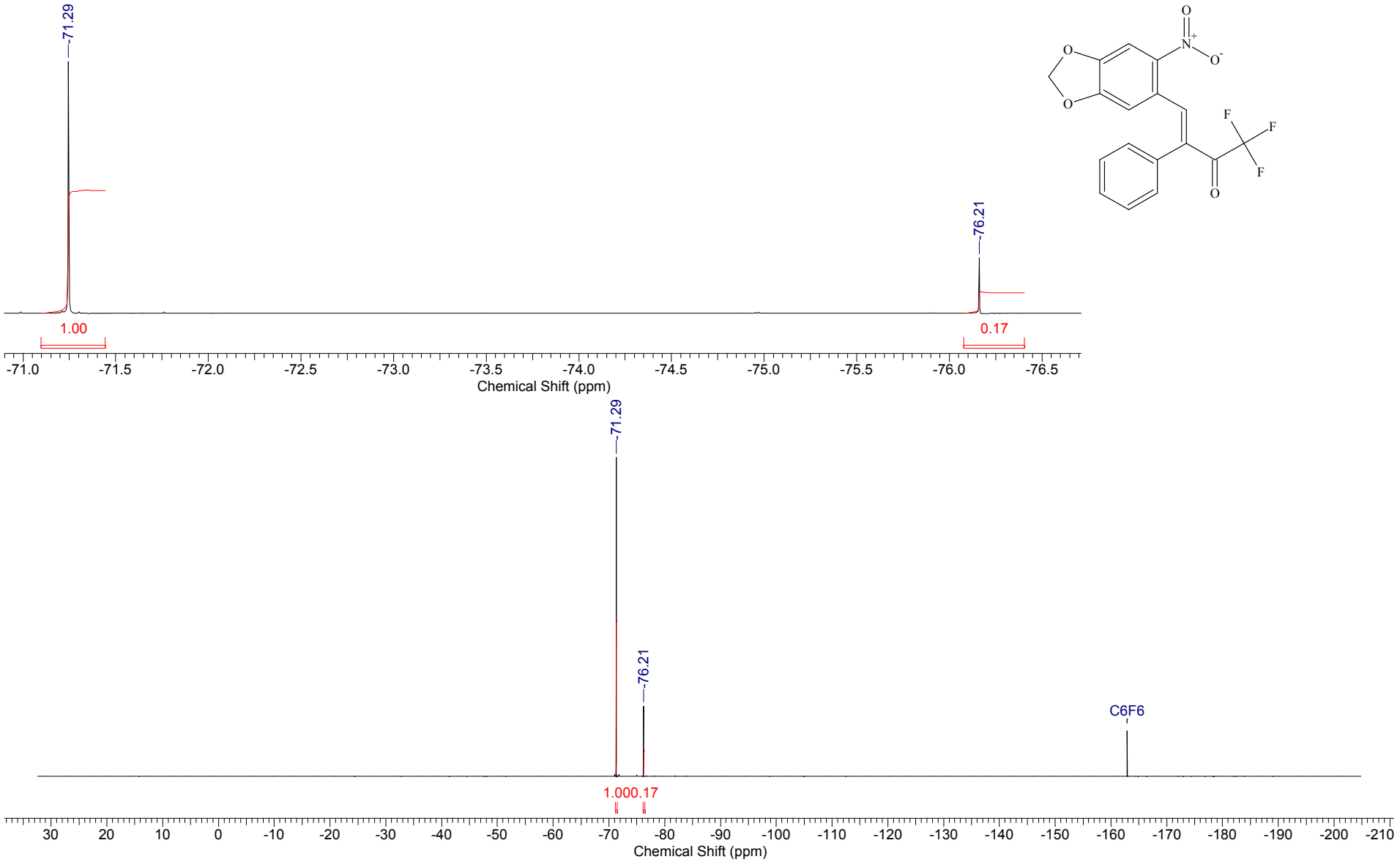
^{13}C NMR spectrum of **4h** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	01 Jul 2019 15:04:48
File Name	I:\SPEC_2019_H,C\07.èþ ëü\SZA-103-3.H_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H	***Number of Transients***	4
Original Points Count	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	8012.82	***Temperature (degree C)***	27.000						



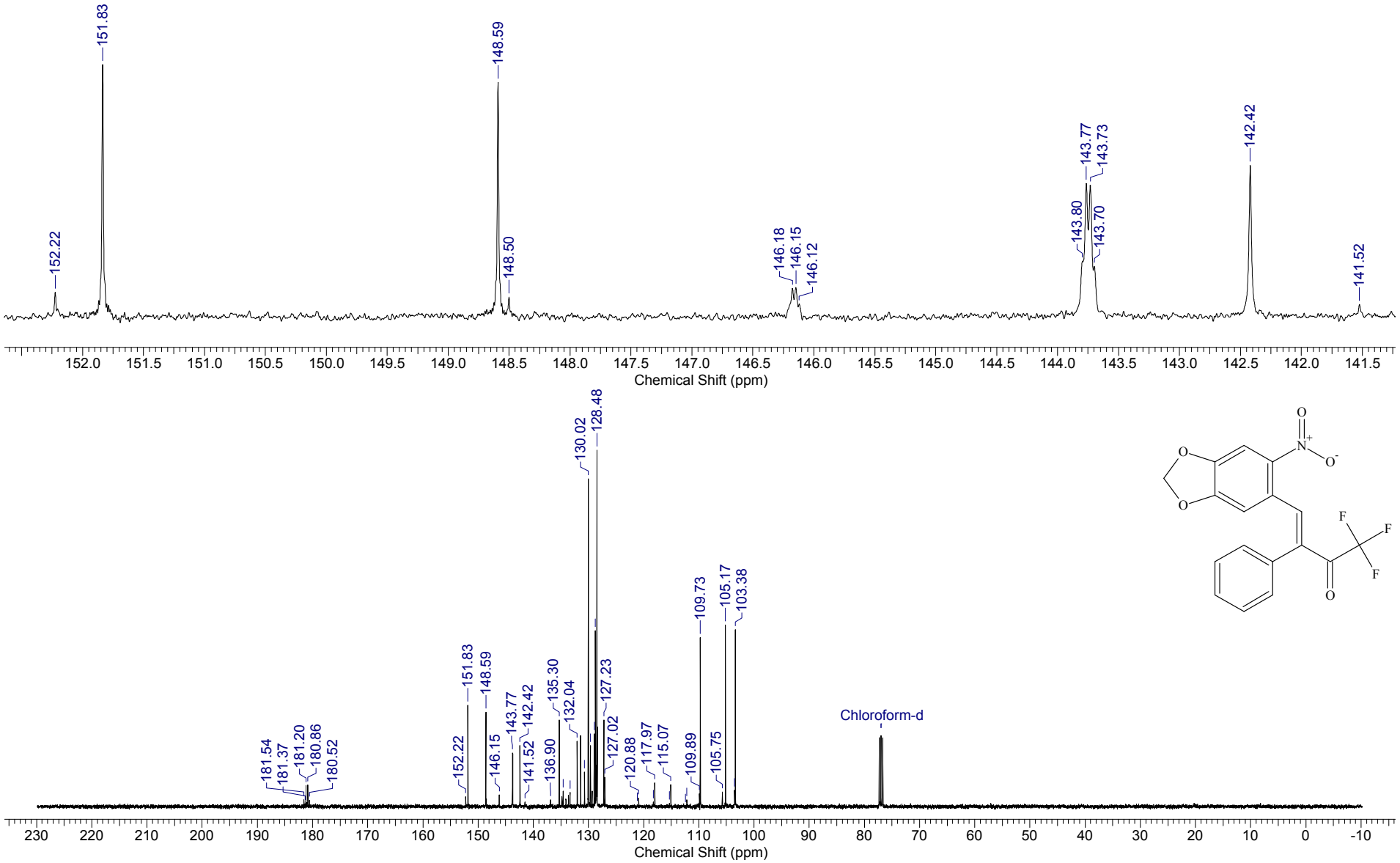
^{1}H NMR spectrum of **4h** (400.1 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	0.7340	***Date***	Jul 2 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.07.02\sza103-5-6-f_20190702_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	1000	***Original Points Count***	65536
Points Count	65536	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	25.000				



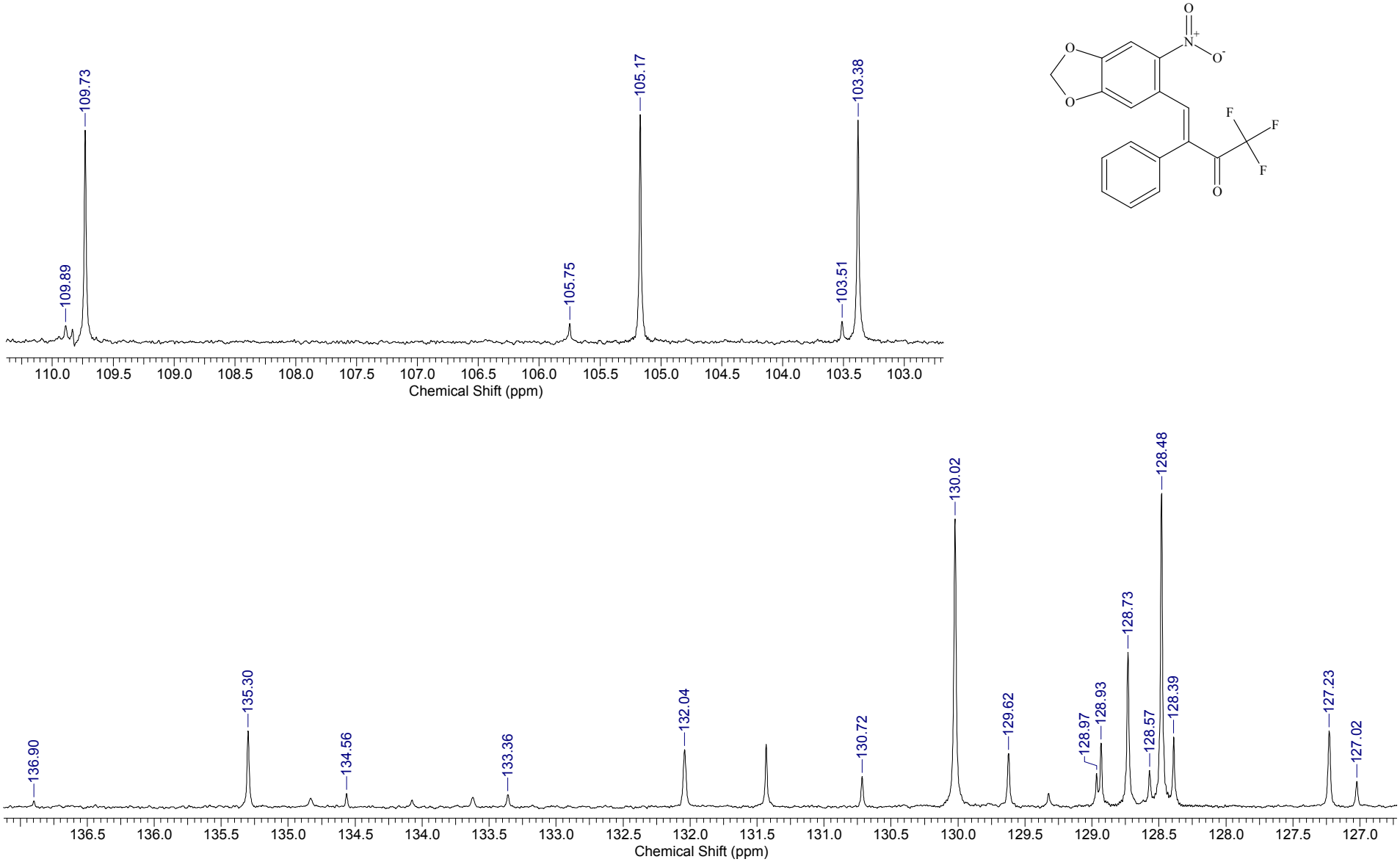
^{19}F NMR spectrum of **4h** (376.5 MHz $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	03 Jul 2019 17:44:28
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\SZA-103-3.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	105	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



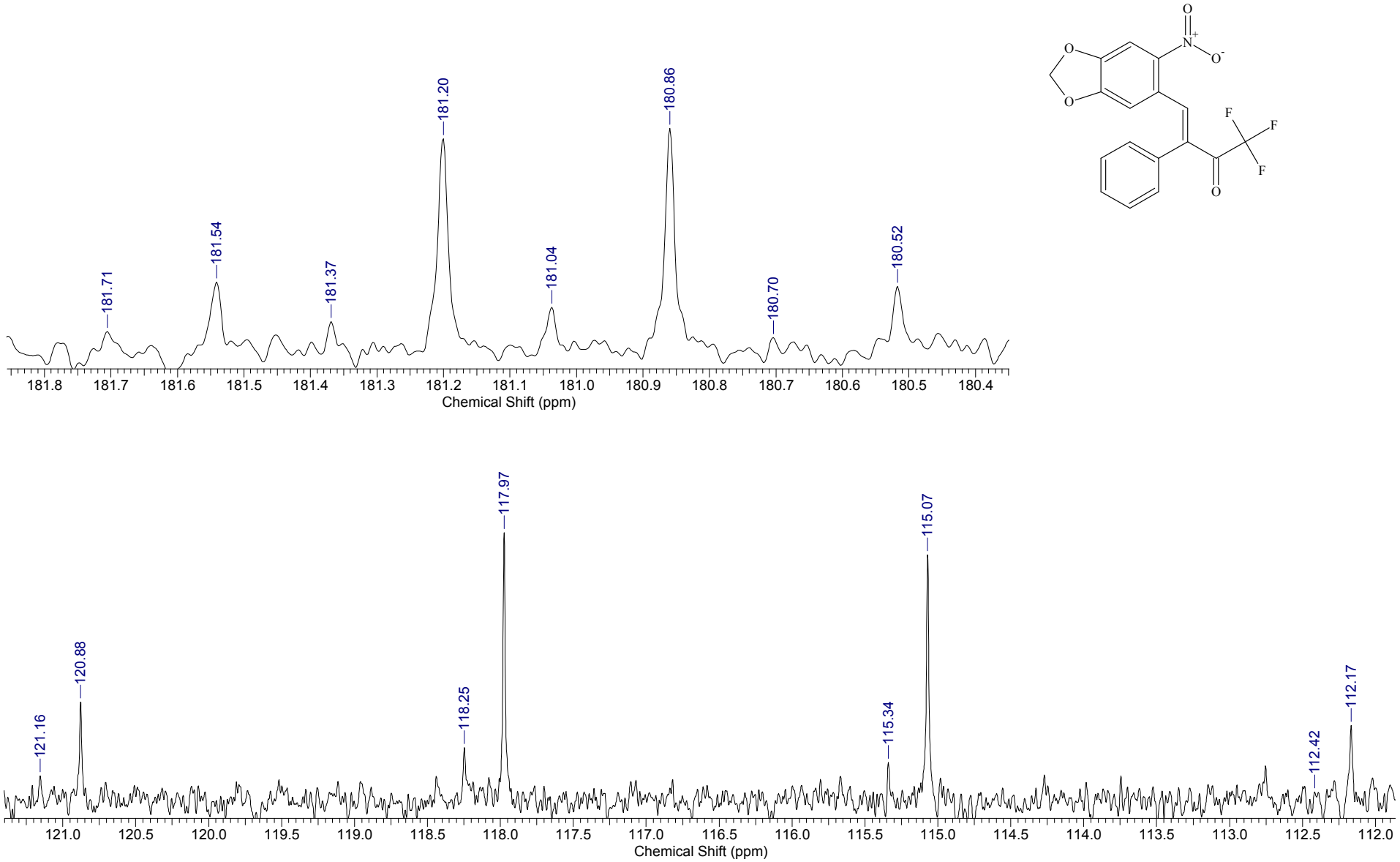
^{13}C NMR spectrum of **4h** (100.6 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	03 Jul 2019 17:44:28
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\SZA-103-3.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	105	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



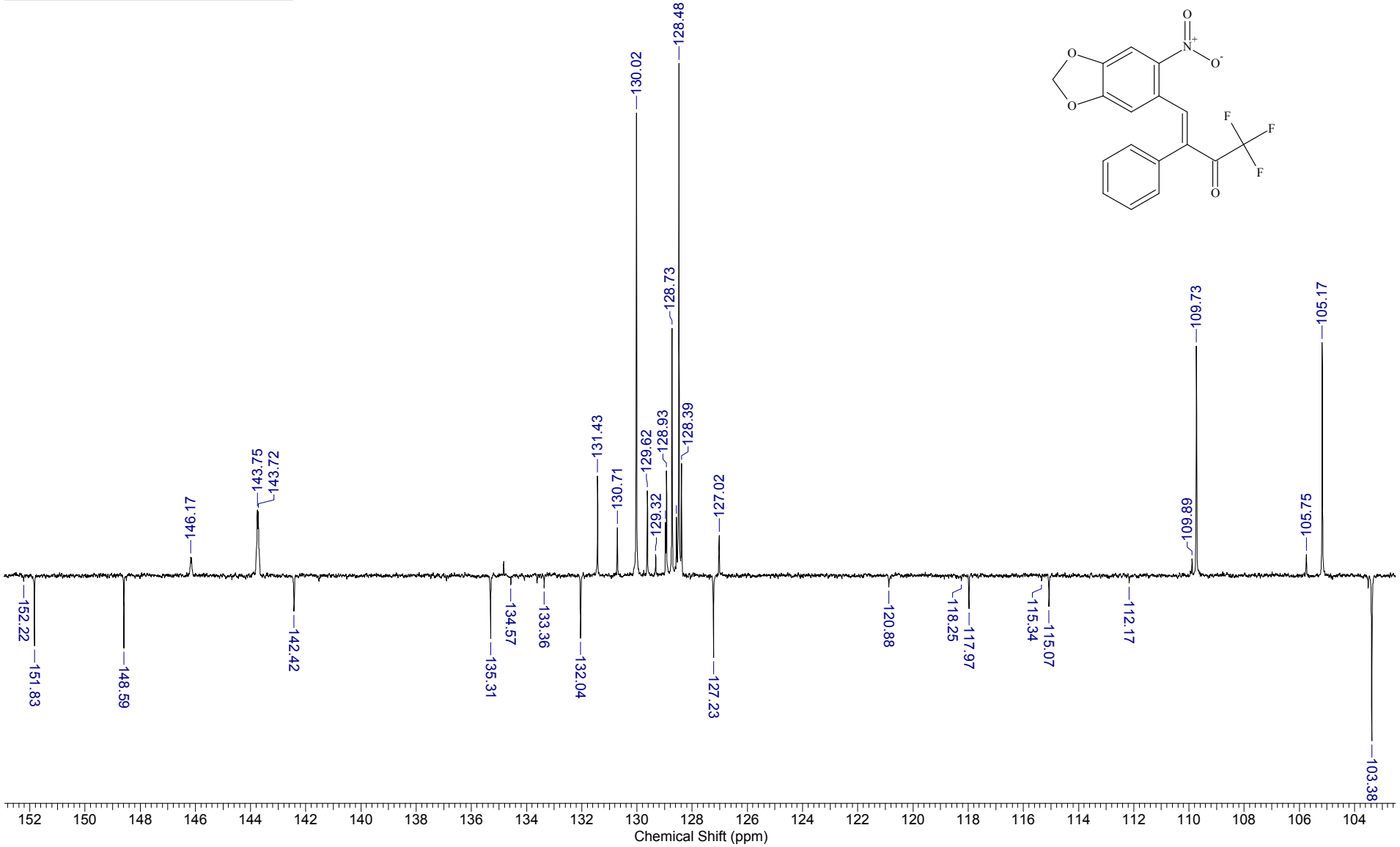
^{13}C NMR spectrum of **4h** (100.6 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	03 Jul 2019 17:44:28
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\SZA-103-3.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	105	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



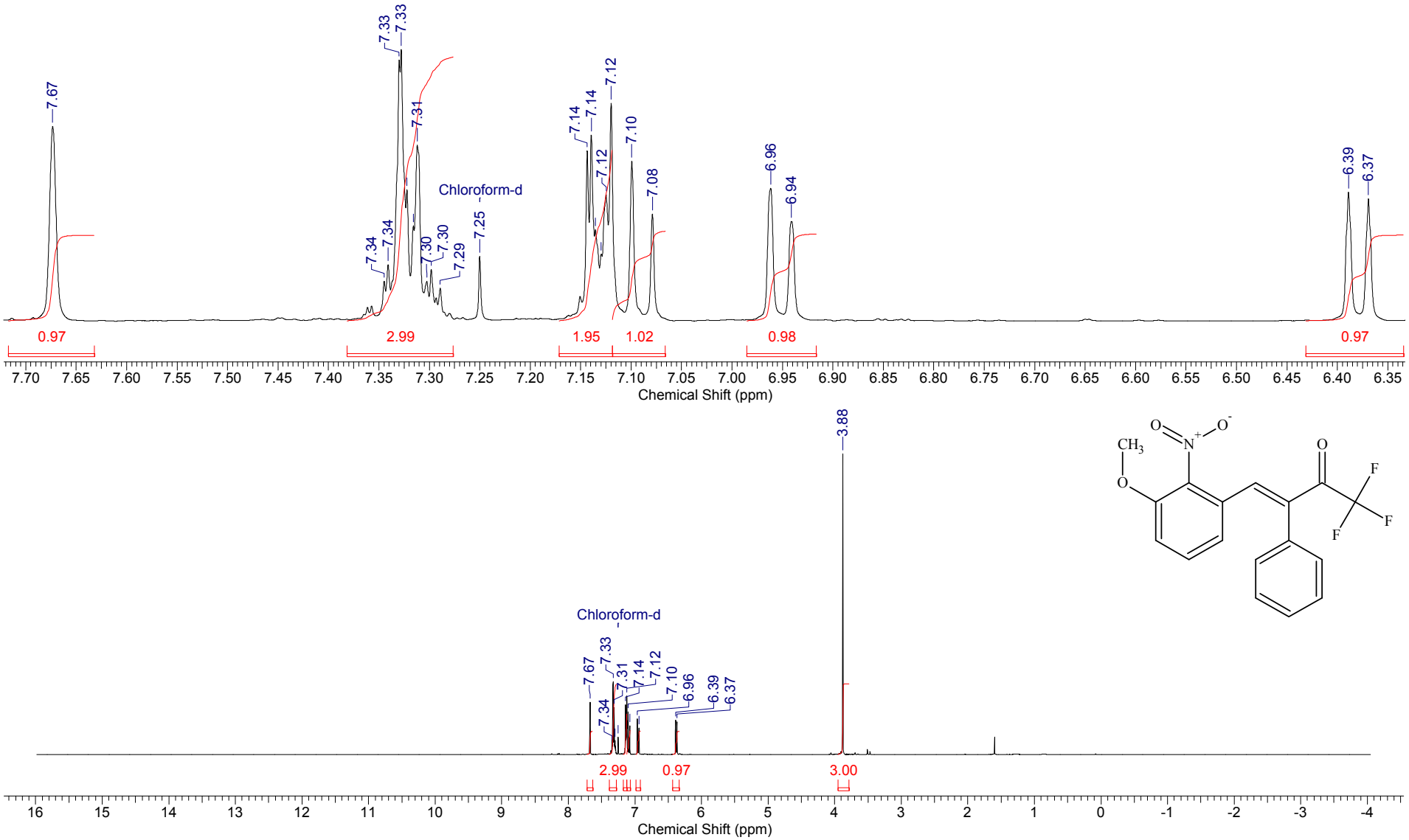
^{13}C NMR spectrum of **4h** (100.6 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	1.3664	***Comment***	Imported from UXNMR.			***Date***	04 Jul 2019 11:38:22
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\SZA-103-3.APT_004001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	29	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	jmod	***Solvent***	ACETONITRILE-D3			***Sweep Width (Hz)***	23980.81
Temperature (degree C)	27.000						



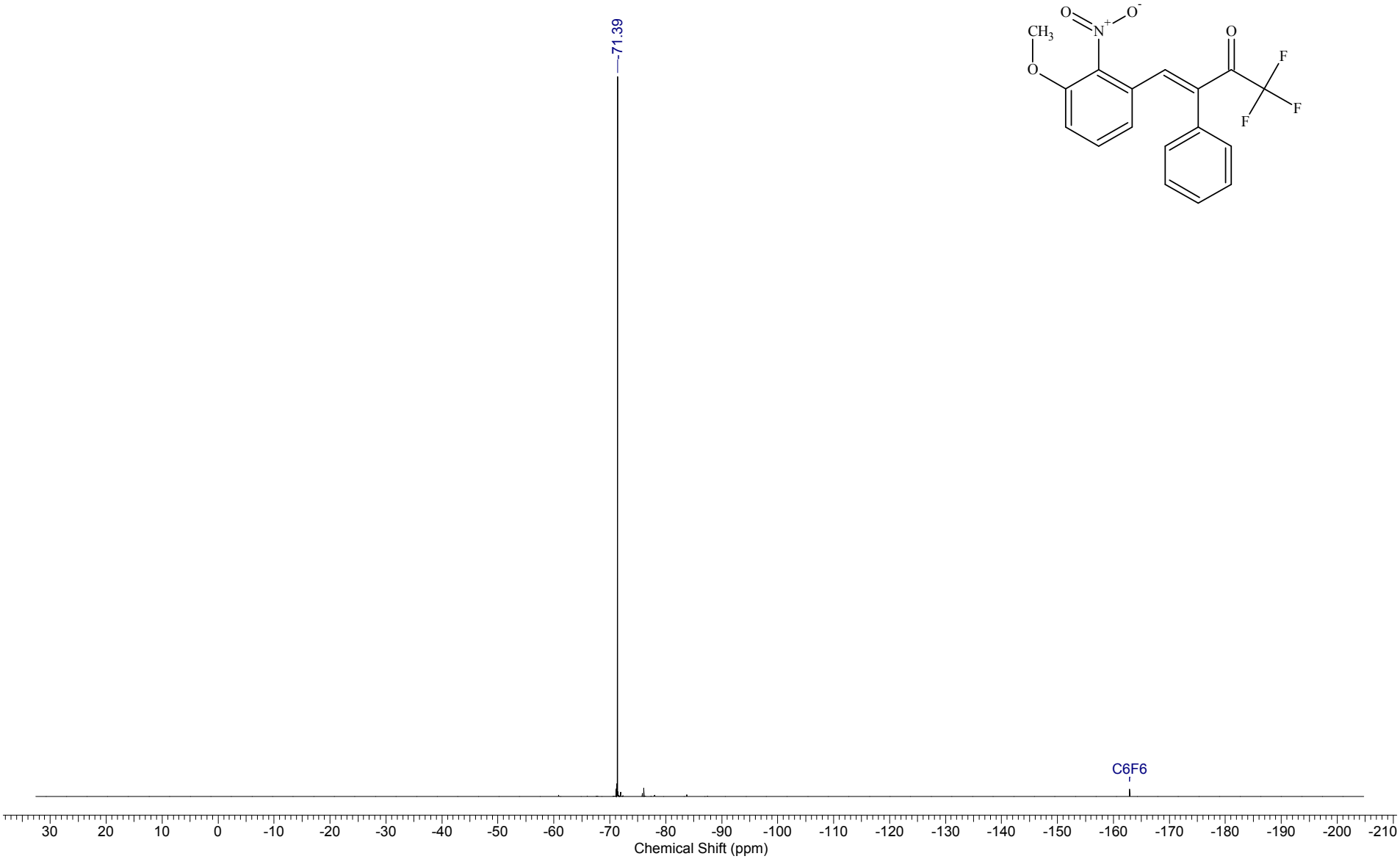
^{13}C APT NMR spectrum of **4h** (100.6 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	31 May 2019 15:26:58
File Name	C:\DOCS\OUTPUT_301\2019\05.ì àé\SZA-106.H_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	4	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



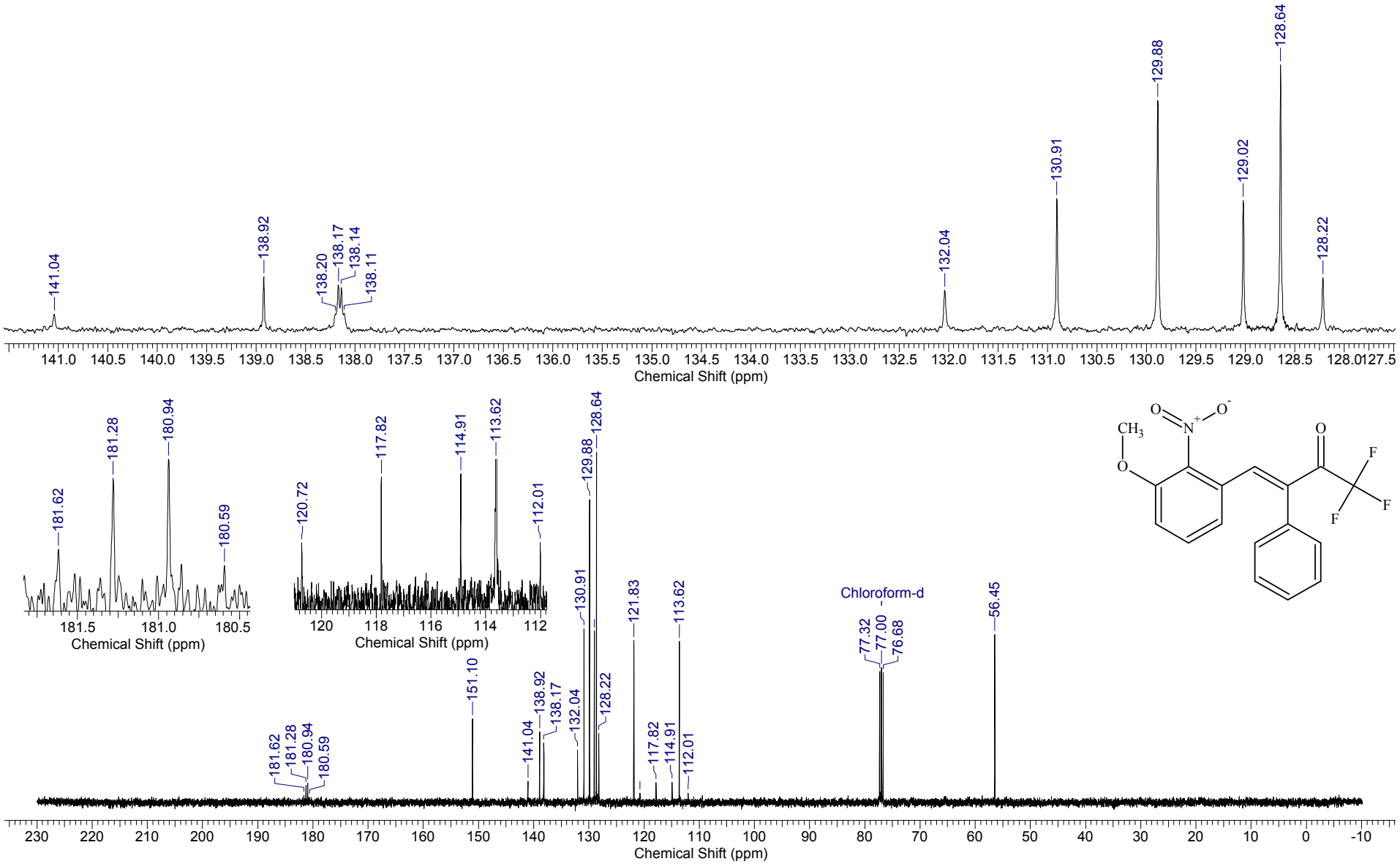
^{1}H NMR spectrum of **4i** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.0000	***Date***	Jun 3 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.06.03\SZA-106_20190603_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	89286
Points Count	131072	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	21.000				



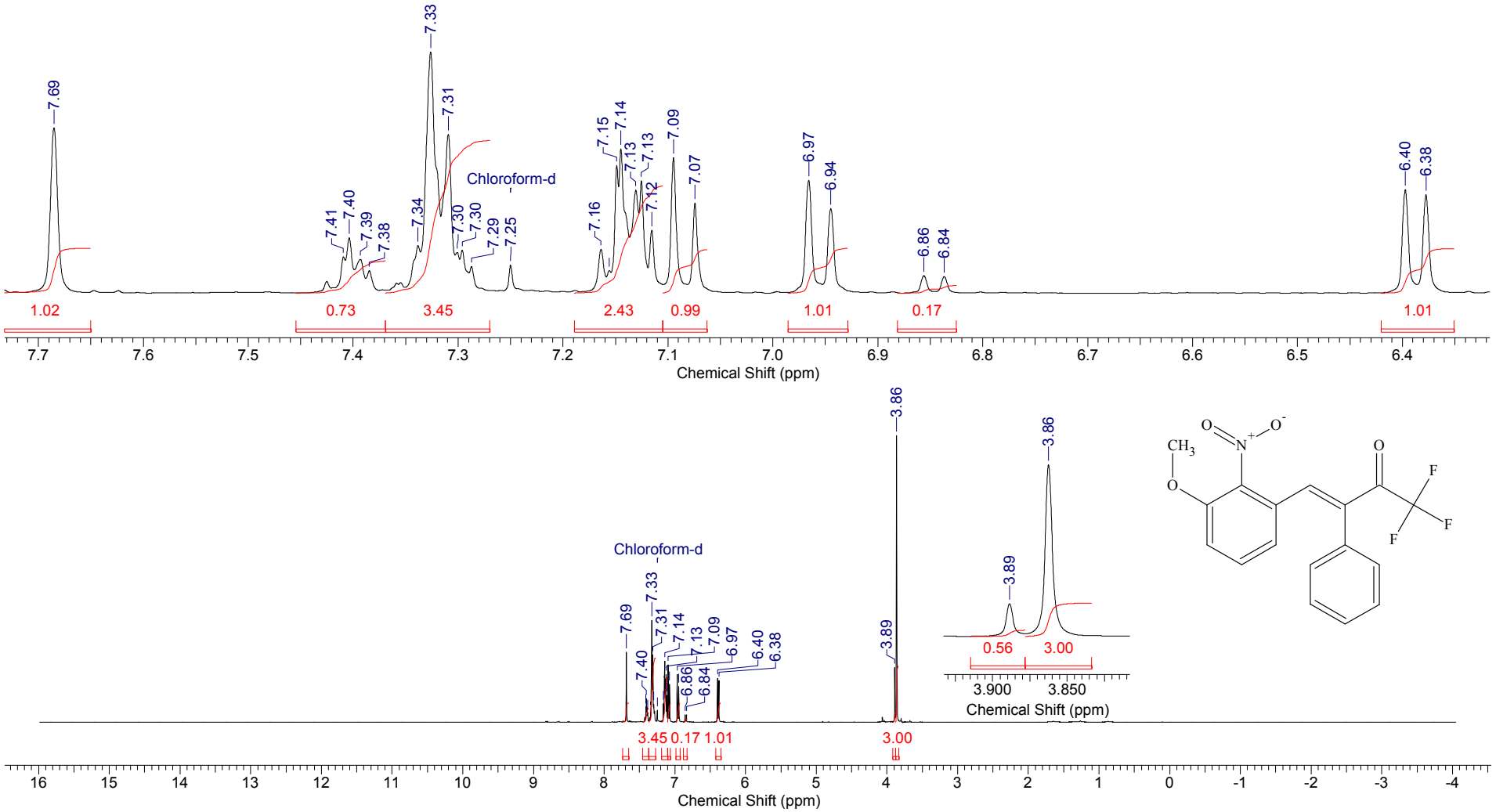
^{19}F NMR spectrum of **4i** (376.5 MHz $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	01 Jun 2019 13:58:44
File Name	C:\DOCS\OUTPUT_301\2019\06.èþ í ü\SZA-106.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	48	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



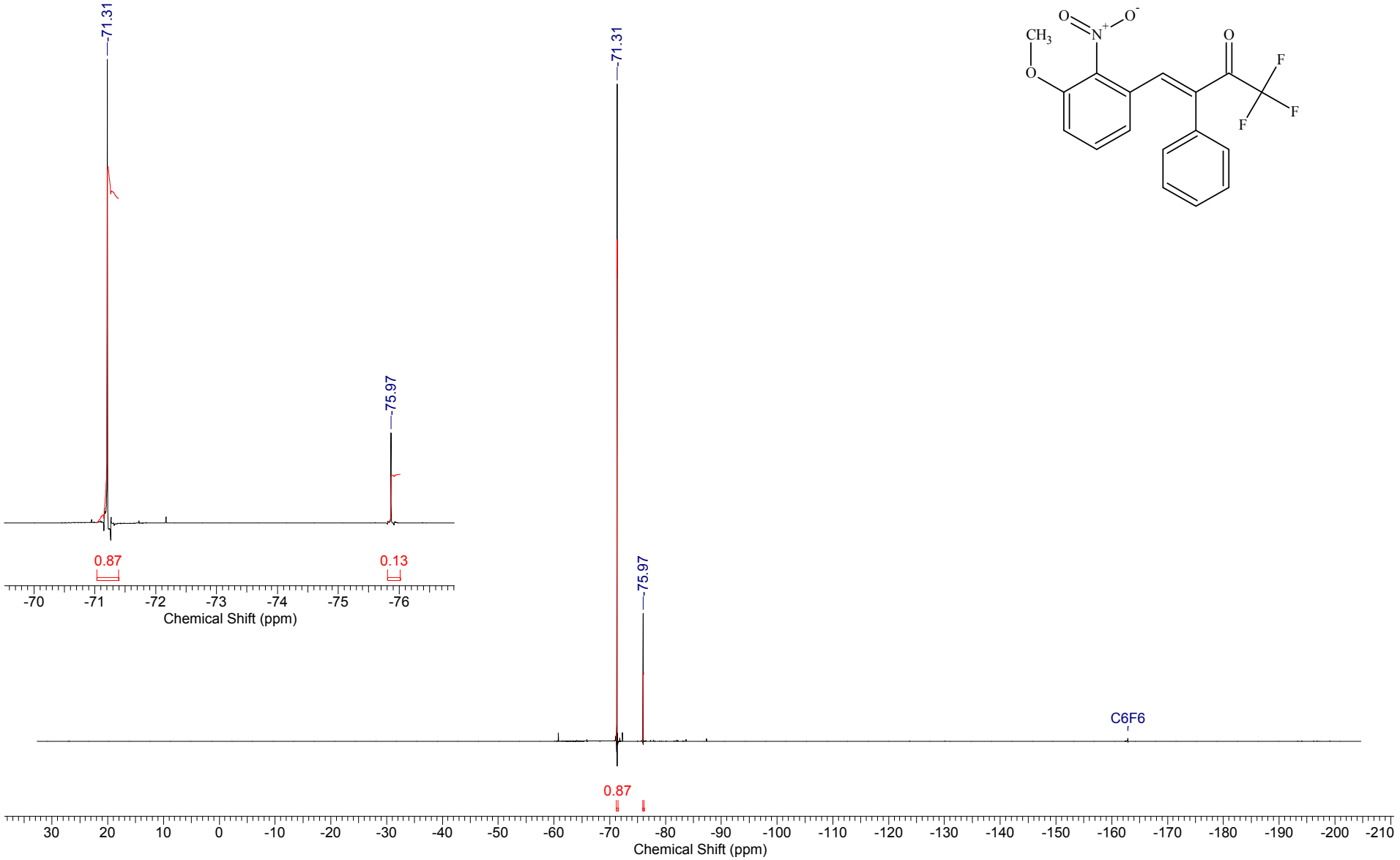
^{13}C NMR spectrum of **4i** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	07 Jun 2019 15:39:24
File Name	C:\DOCS\OUTPUT_301\2019\06.èþ í ü\SZA-106-3-5.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



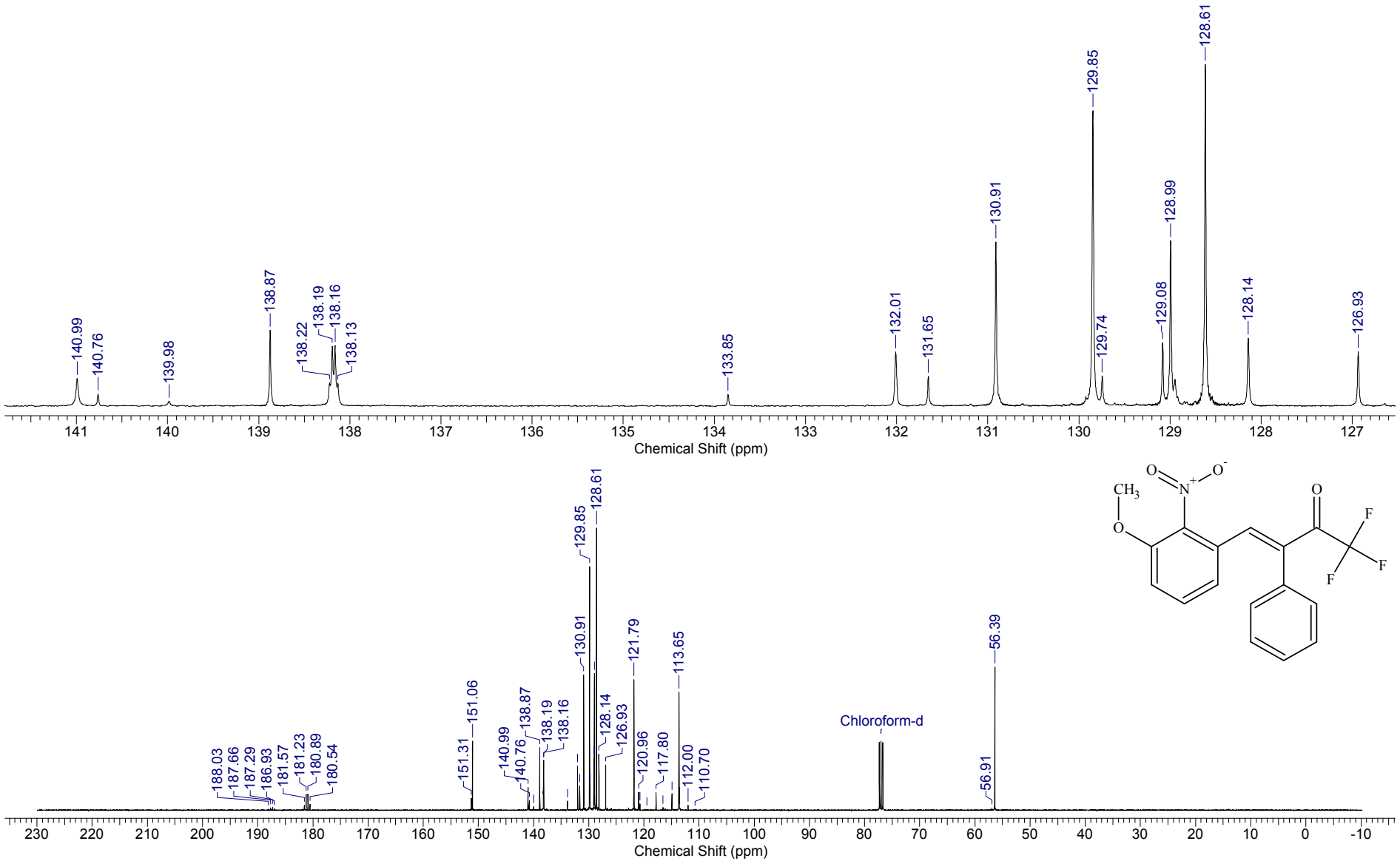
^{1}H NMR spectrum of **4i** (400.1 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	0.7340	***Date***	Jun 14 2019				
File Name	C:\Users\BM-1\Downloads\SZA 13-14.06.19\SZA 13-14.06.19\SZA-106-3-5_20190614_01\FLUORINE_01					***Frequency (MHz)***	376.31
Nucleus	19F	***Number of Transients***	16	***Original Points Count***	65536	***Points Count***	65536
Pulse Sequence	s2pul	***Solvent***	CHLOROFORM-D	***Sweep Width (Hz)***	89285.71	***Temperature (degree C)***	21.000



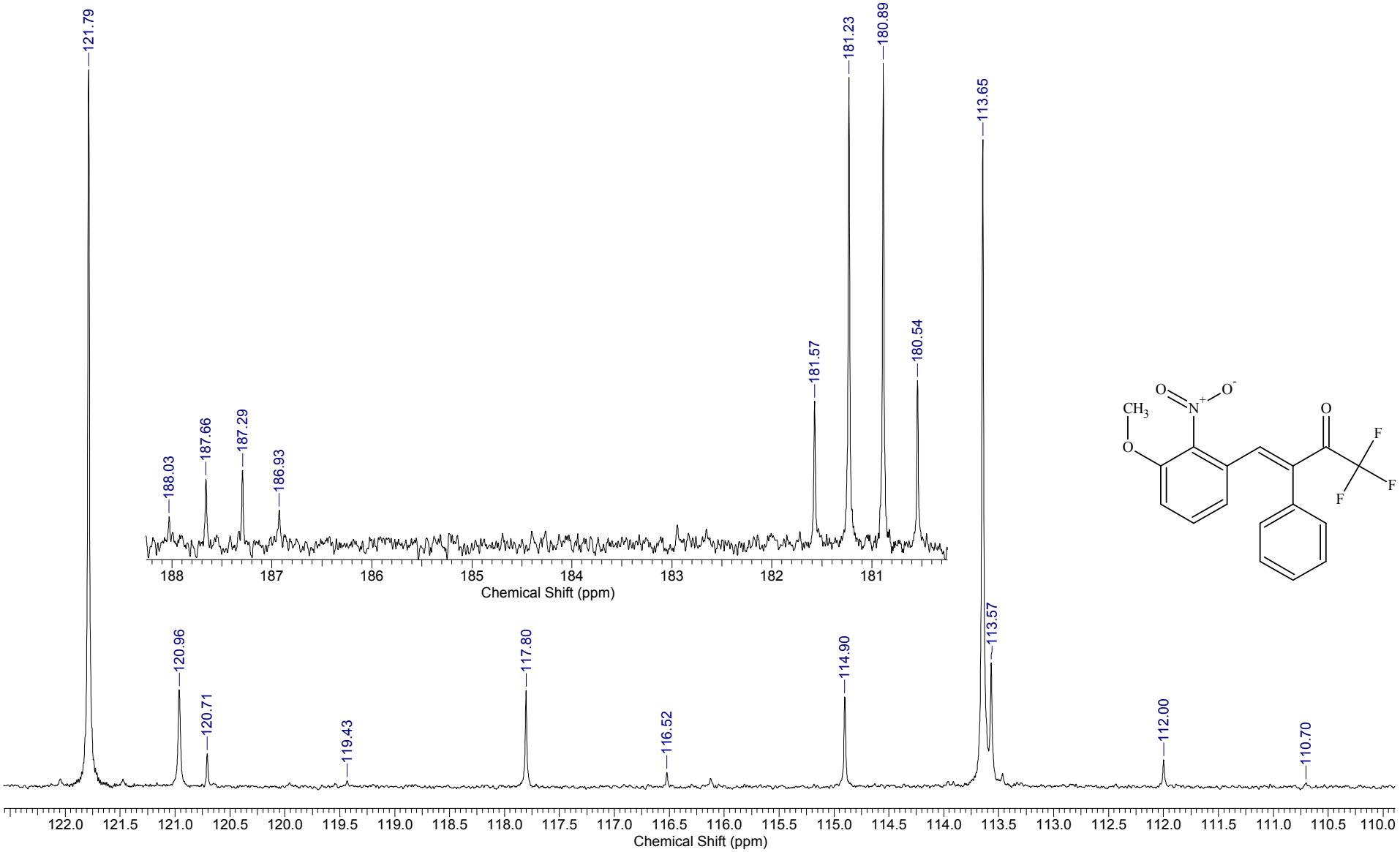
^{19}F NMR spectrum of **4i** (376.5 MHz $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	08 Jun 2019 14:07:32
File Name	C:\Users\BM-1\Downloads\SZA-106-3-5\SZA-106-3-5_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	1402	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



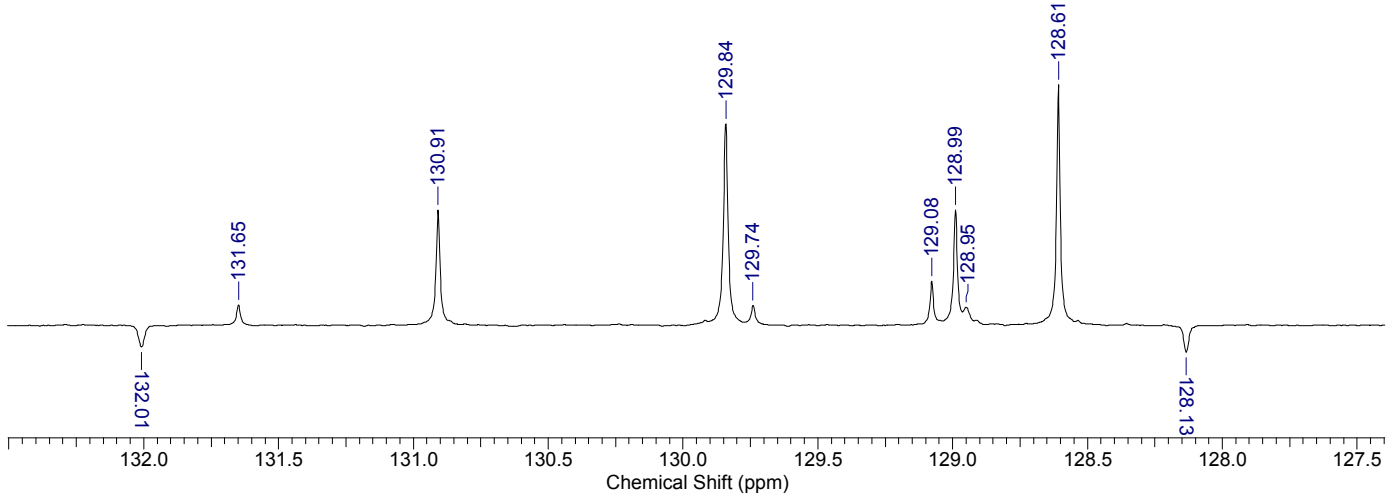
^{13}C NMR spectrum of **4i** (100.6 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

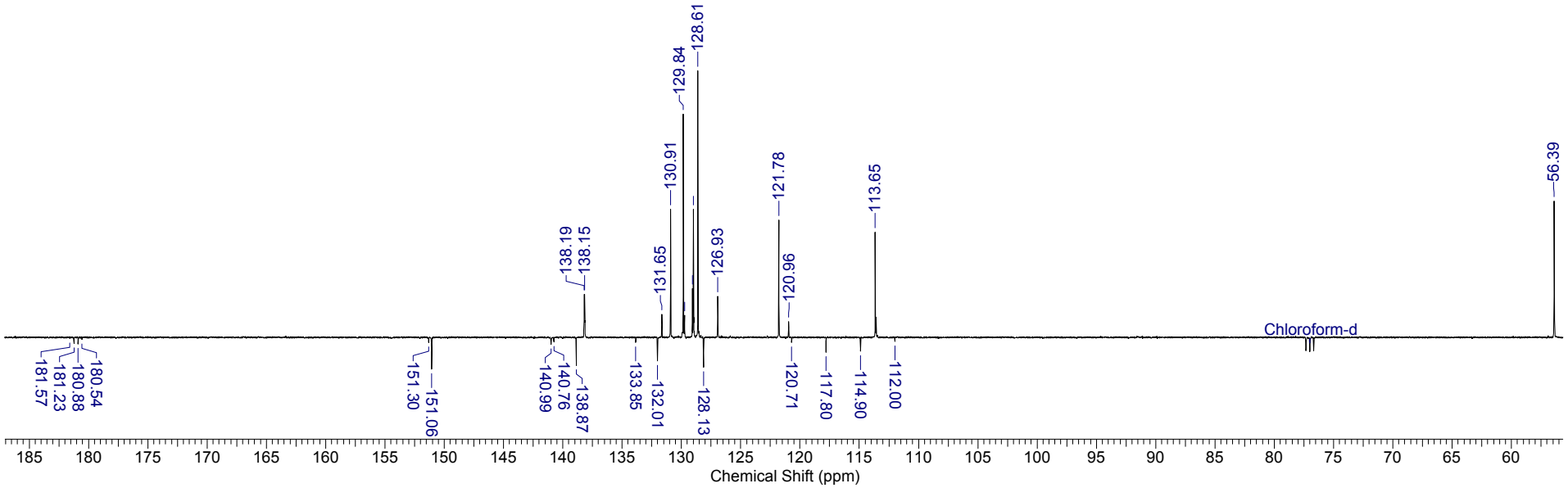
Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	08 Jun 2019 14:07:32
File Name	C:\Users\BM-1\Downloads\SZA-106-3-5\SZA-106-3-5_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	1402	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



^{13}C NMR spectrum of **4i** (100.6 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

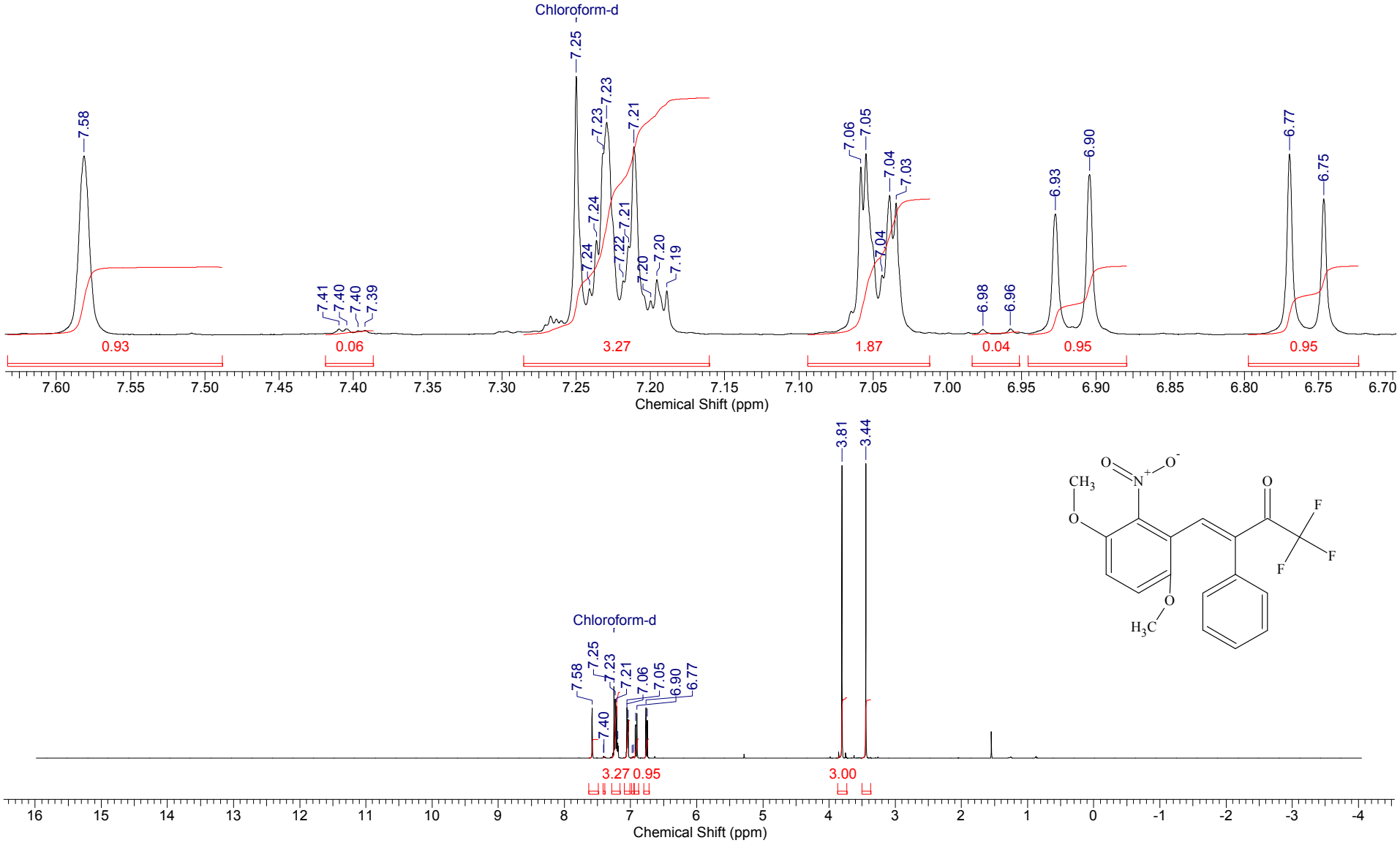
Acquisition Time (sec)	1.3664	***Comment***	Imported from UXNMR.			***Date***	13 Jun 2019 11:48:42
File Name	C:\Users\BM-1\Downloads\SZA 13-14.06.19\SZA 13-14.06.19\SZA-106-3-5.APT_004001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	121	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	jmod	***Solvent***	ACETONITRILE-D3			***Sweep Width (Hz)***	23980.81
Temperature (degree C)	27.000						





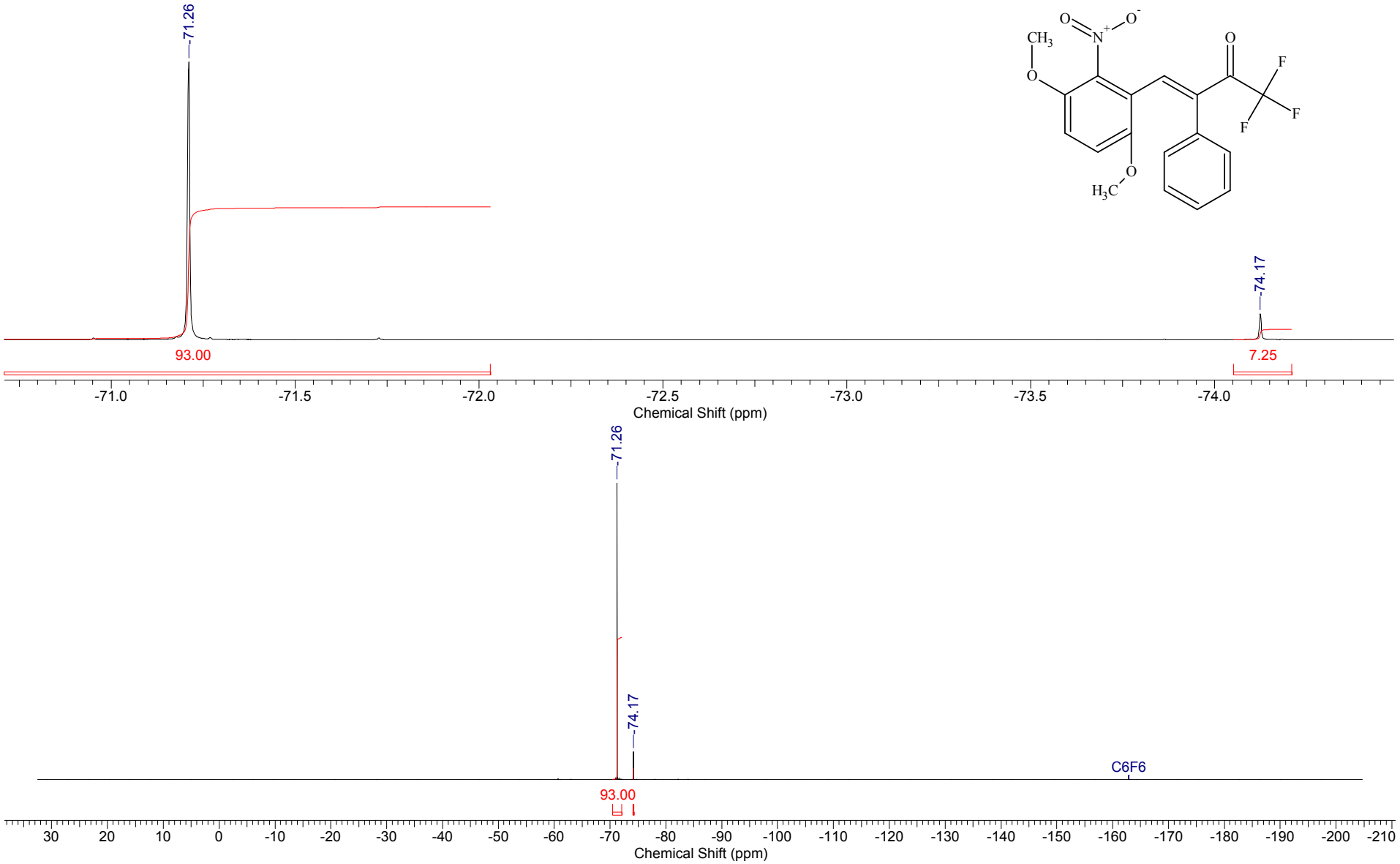
^{13}C APT NMR spectrum of **4i** (100.6 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	20 Jun 2019 12:48:56
File Name	C:\DOCS\OUTPUT_301\2019\06.èþ í ü\SZA-124-5-6.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



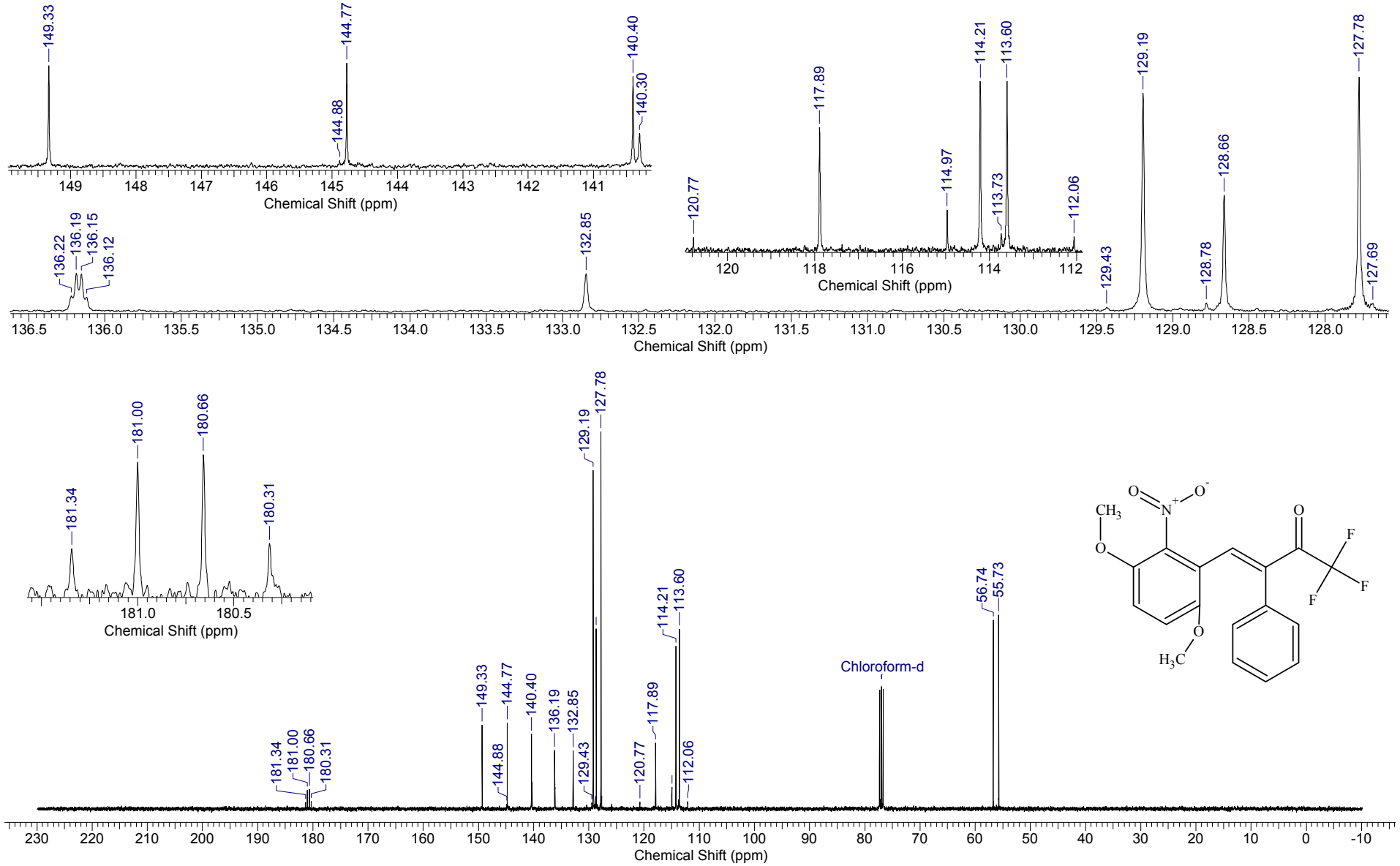
^{1}H NMR spectrum of **4j** (400.1 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	1.5000	***Date***	Jun 24 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.06.24\SZA-124-56_20190624_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	16	***Original Points Count***	133929
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	30.000				



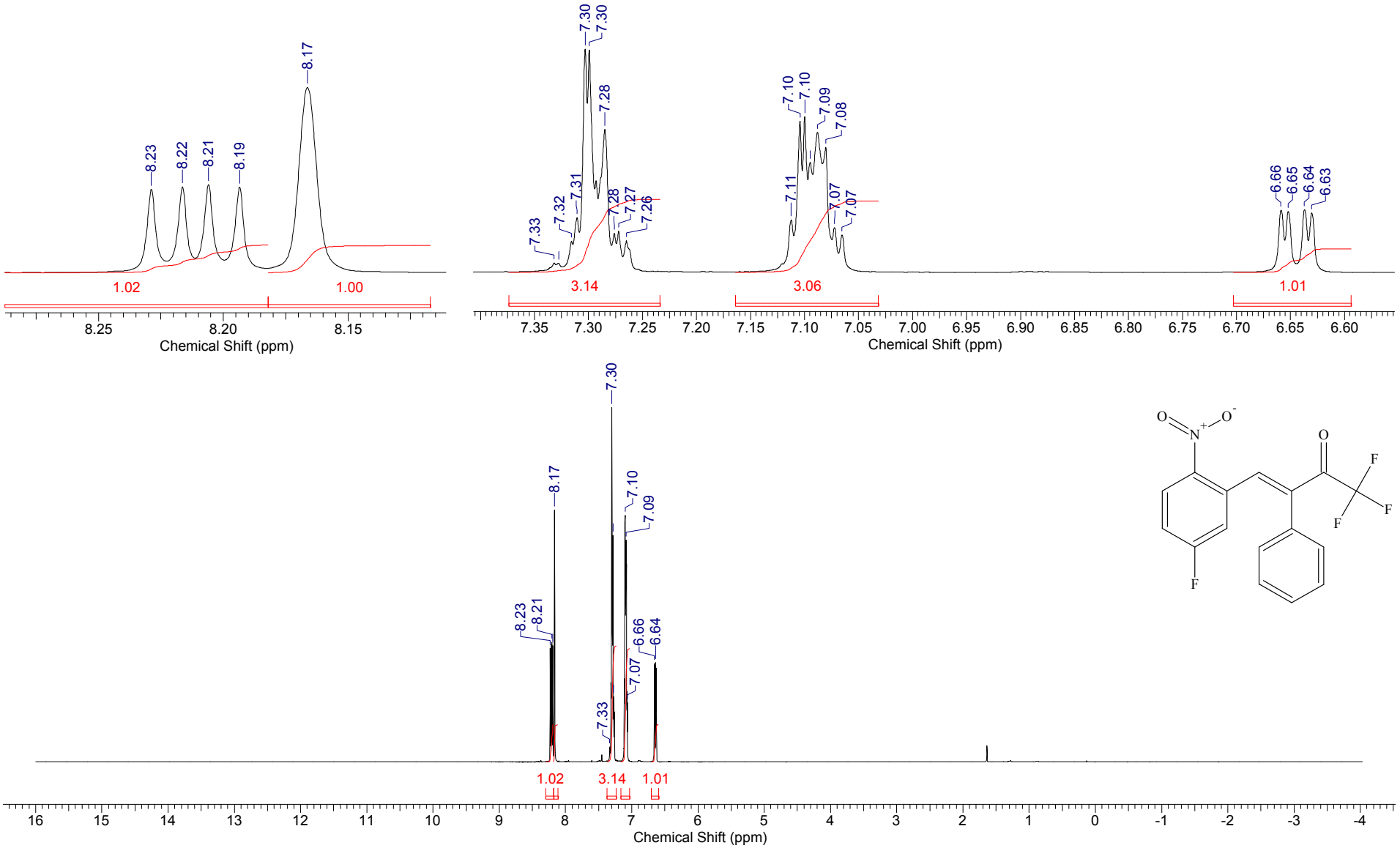
^{19}F NMR spectrum of **4j** (376.5 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	21 Jun 2019 15:33:16
File Name	C:\DOCS\OUTPUT_301\2019\06.èþ í ü\SZA-124-5-6.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	233	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



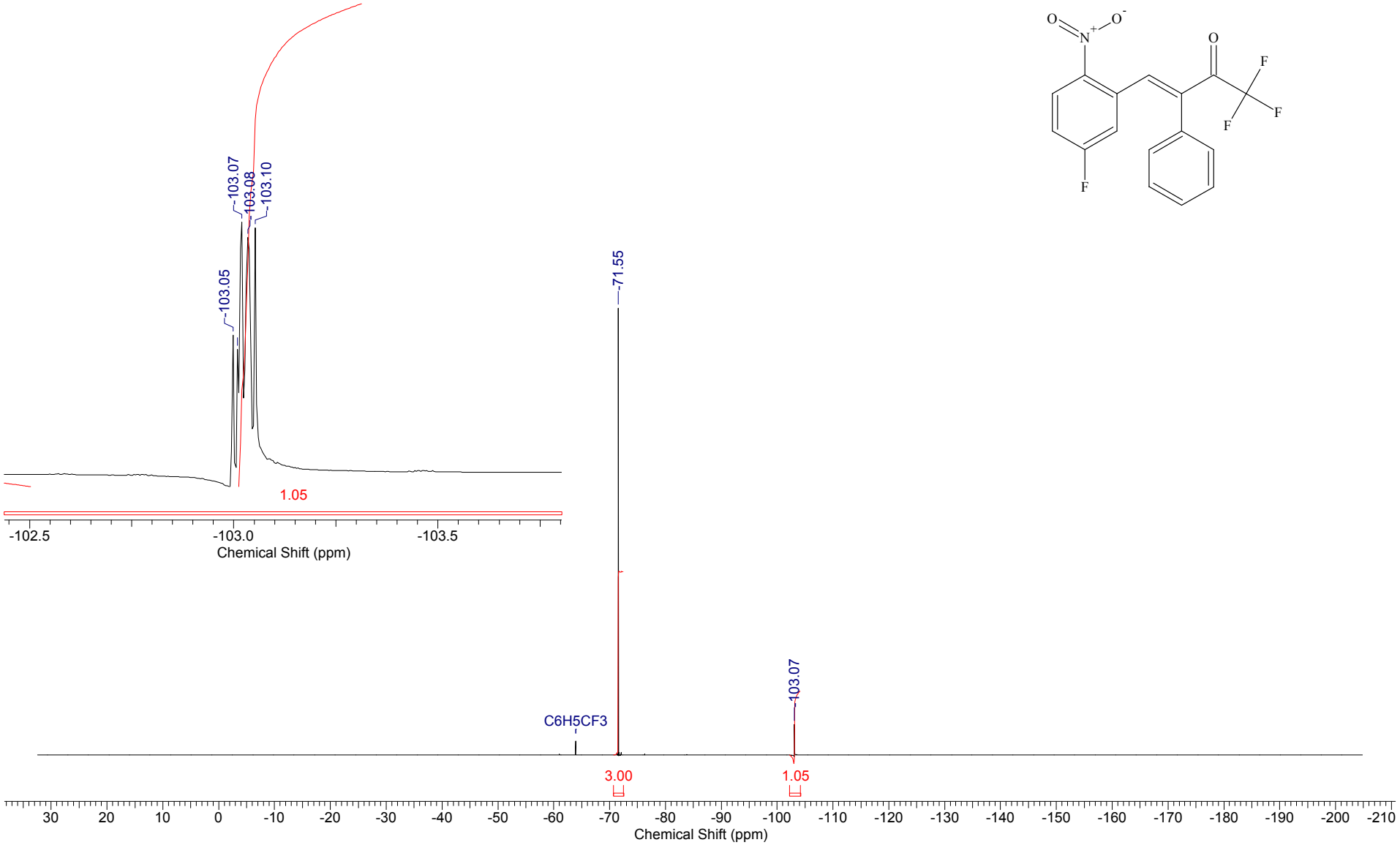
^{13}C NMR spectrum of **4j** (100.6 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown.

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	11 Jun 2019 14:24:38
File Name	C:\Users\BM-1\Downloads\SZA 11.06.19\SZA 11.06.19\SZA-120.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



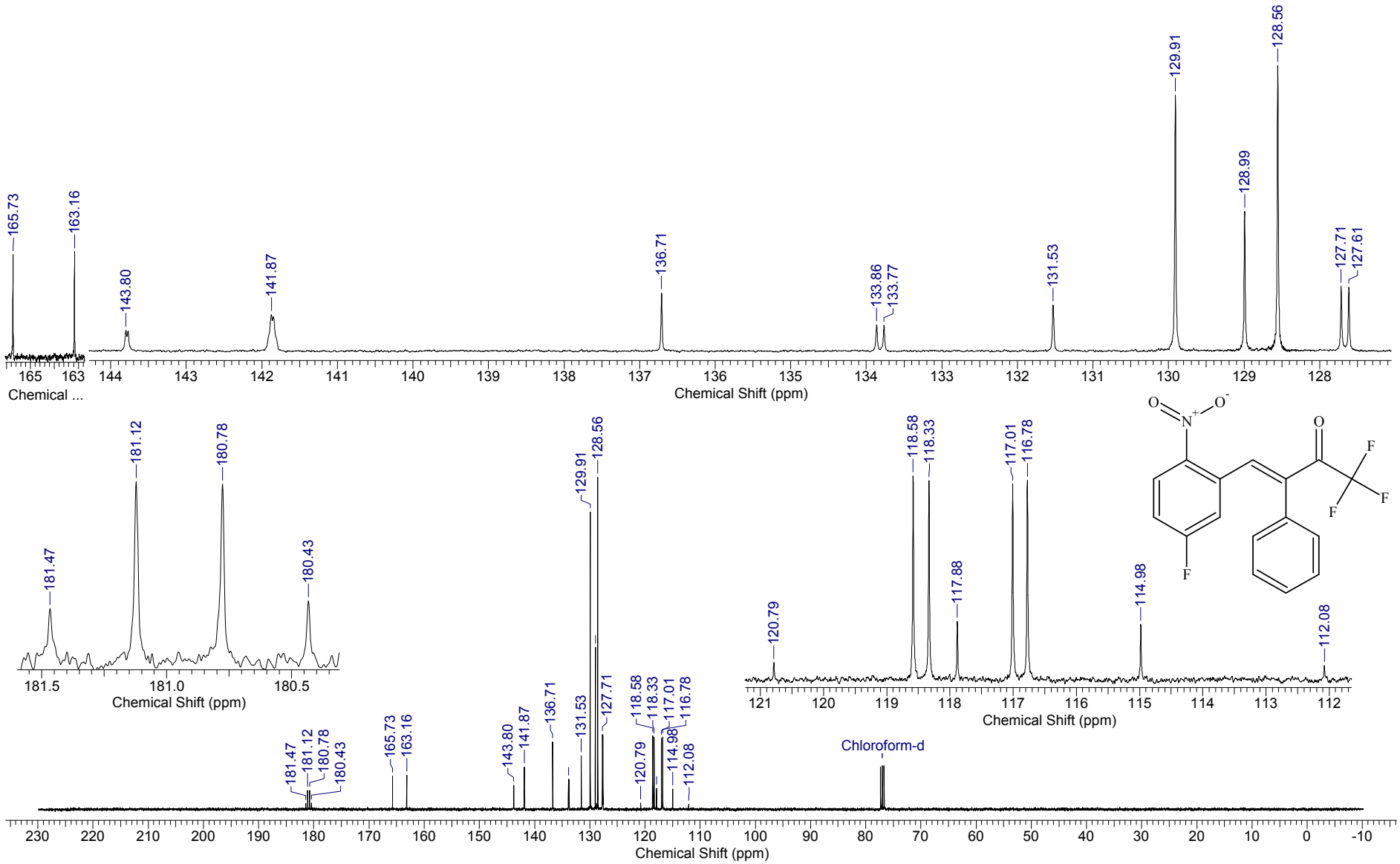
^{1}H NMR spectrum of **4k** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	0.7340	***Date***	Jun 14 2019				
File Name	C:\Users\BM-1\Downloads\SZA 13-14.06.19\SZA 13-14.06.19\SZA-120_20190614_01\FLUORINE_01					***Frequency (MHz)***	376.31
Nucleus	19F	***Number of Transients***	16	***Original Points Count***	65536	***Points Count***	65536
Pulse Sequence	s2pul	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	89285.71
Temperature (degree C)	21.000						



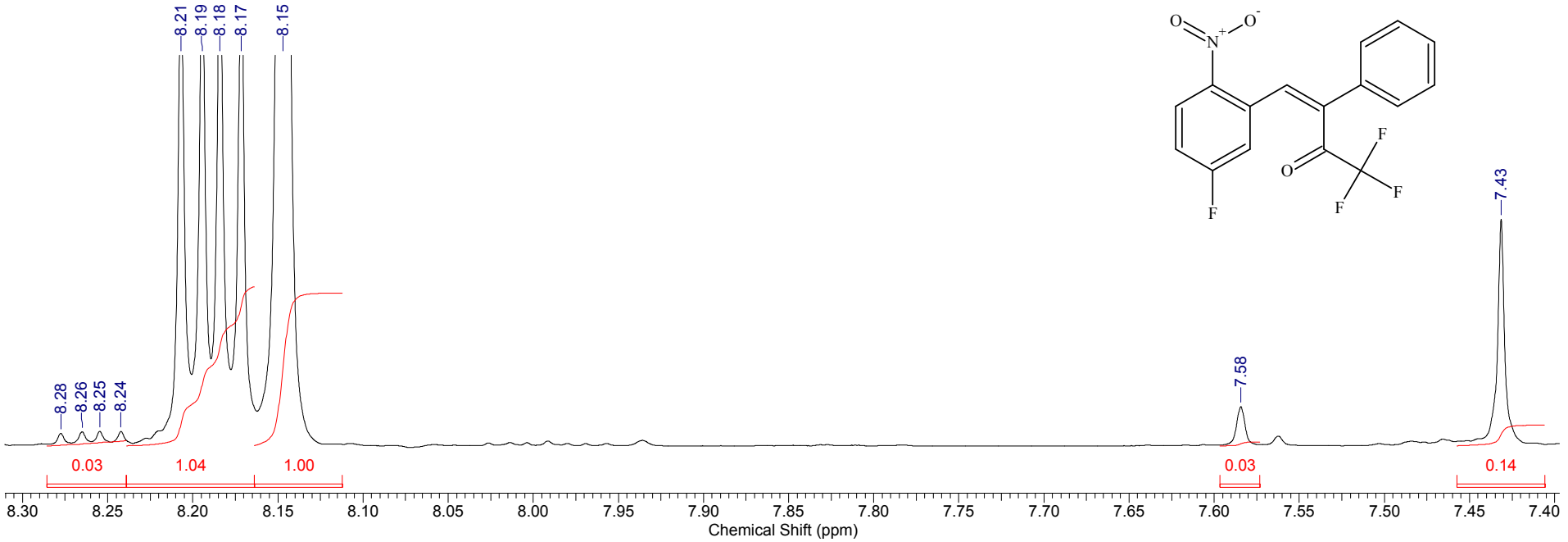
^{19}F NMR spectrum of **4k** (376.5 MHz $CDCl_3$)

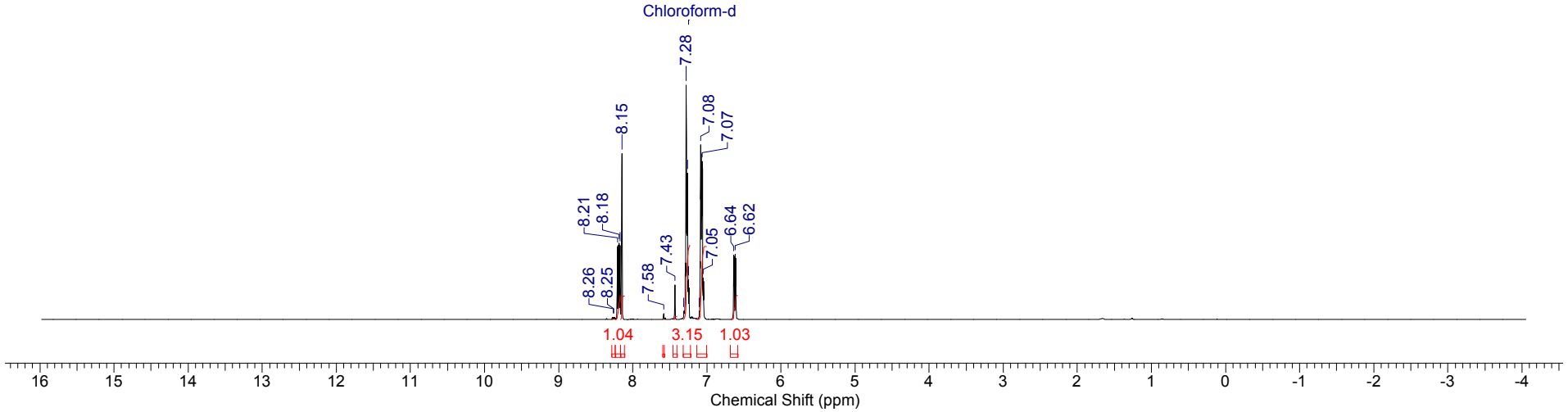
Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	13 Jun 2019 12:03:46
File Name	C:\Users\BM-1\Downloads\SZA 13-14.06.19\SZA 13-14.06.19\SZA-120.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	73	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



^{13}C NMR spectrum of **4k** (100.6 MHz, $CDCl_3$)

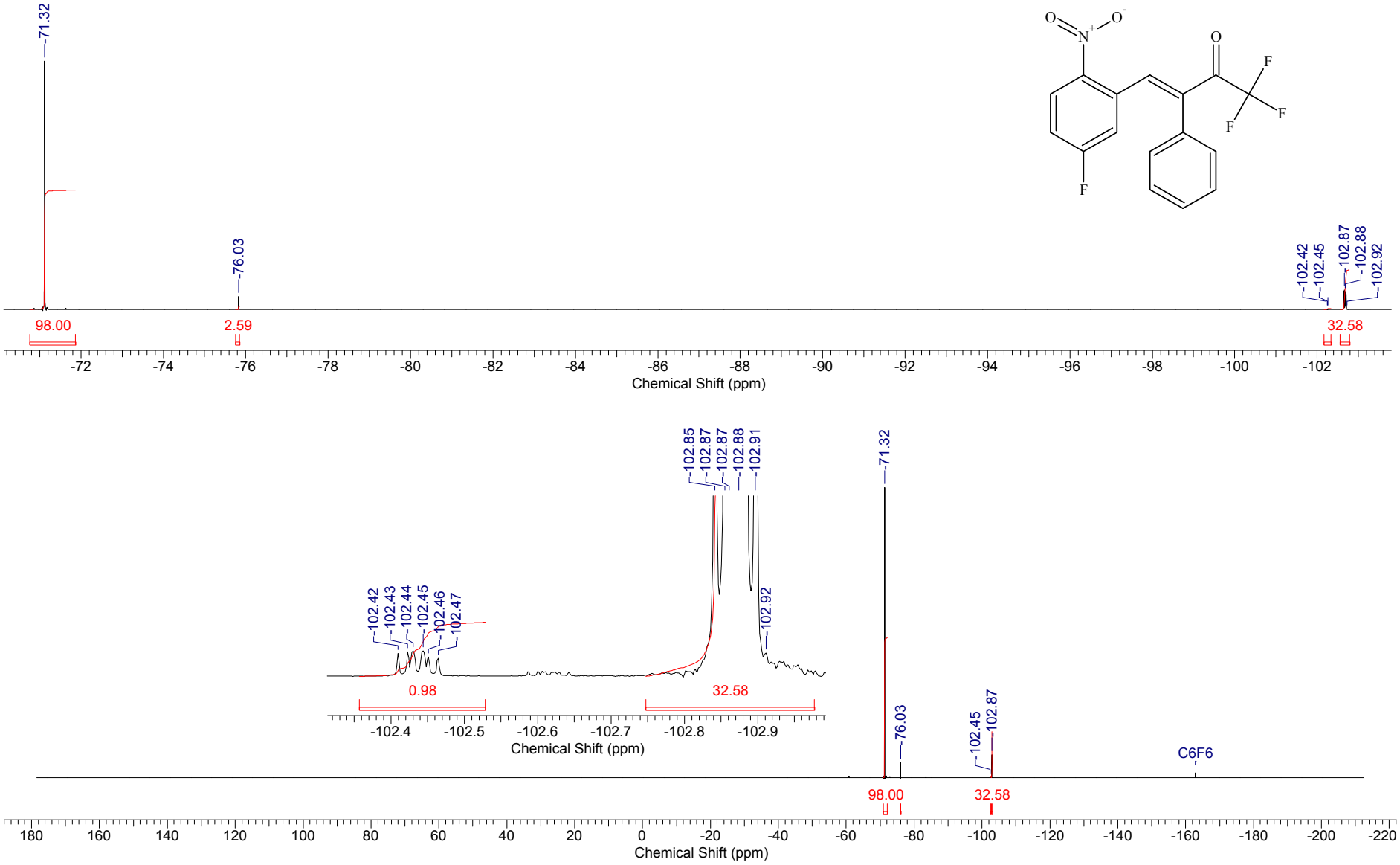
Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	17 Jun 2019 15:47:06
File Name	C:\Users\BM-1\Downloads\SZA 17.06.19\SZA 17.06.19\SZA-120-2-3.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	Acetone	***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000





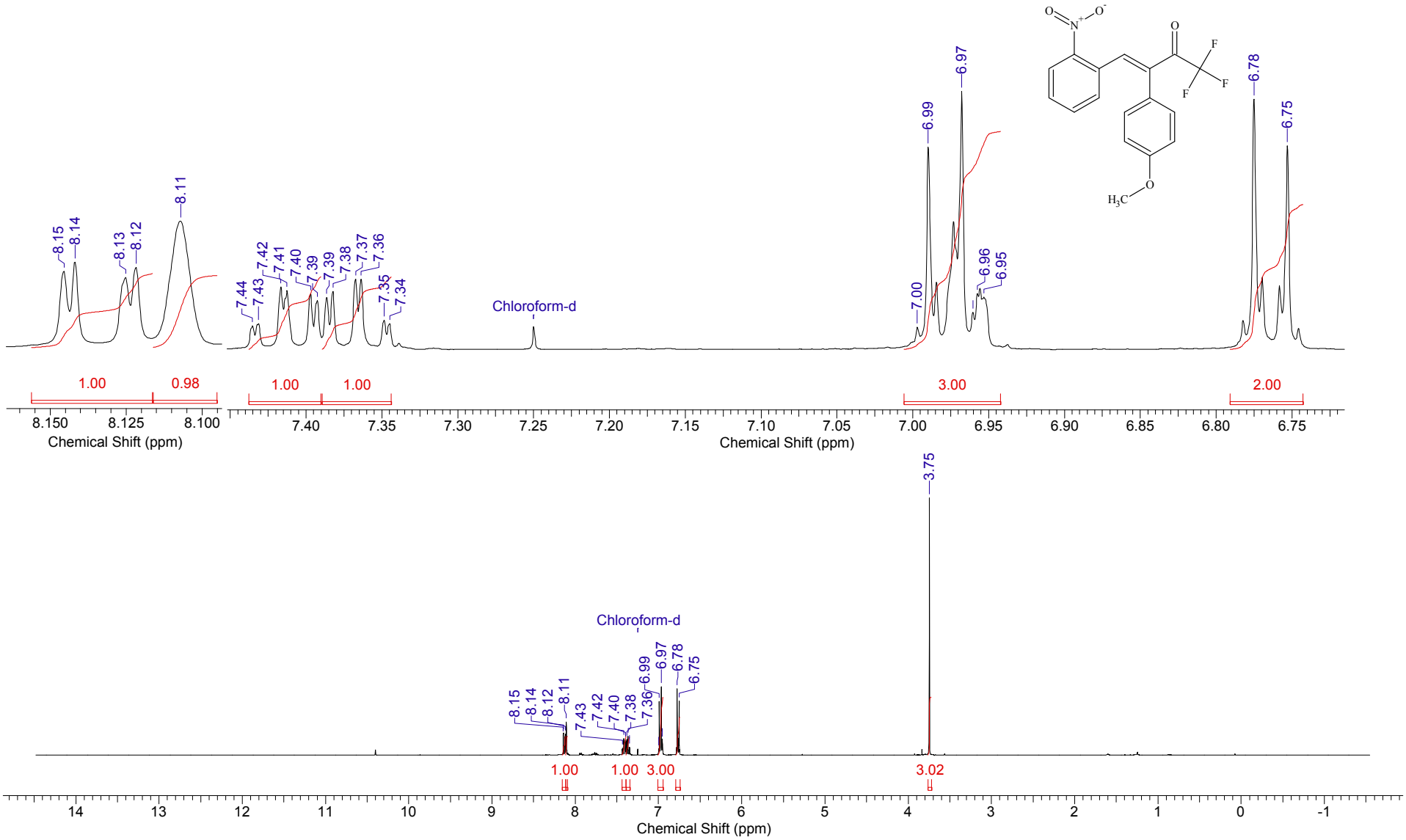
^{1}H NMR spectrum of **4k** (400.1 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown

Acquisition Time (sec)	1.7826	***Date***	Jun 20 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.06.20\SZA-120-2-3-F_20190620_01\FLUORINE_01		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	262144
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	147058.83	***Temperature (degree C)***	55.000				



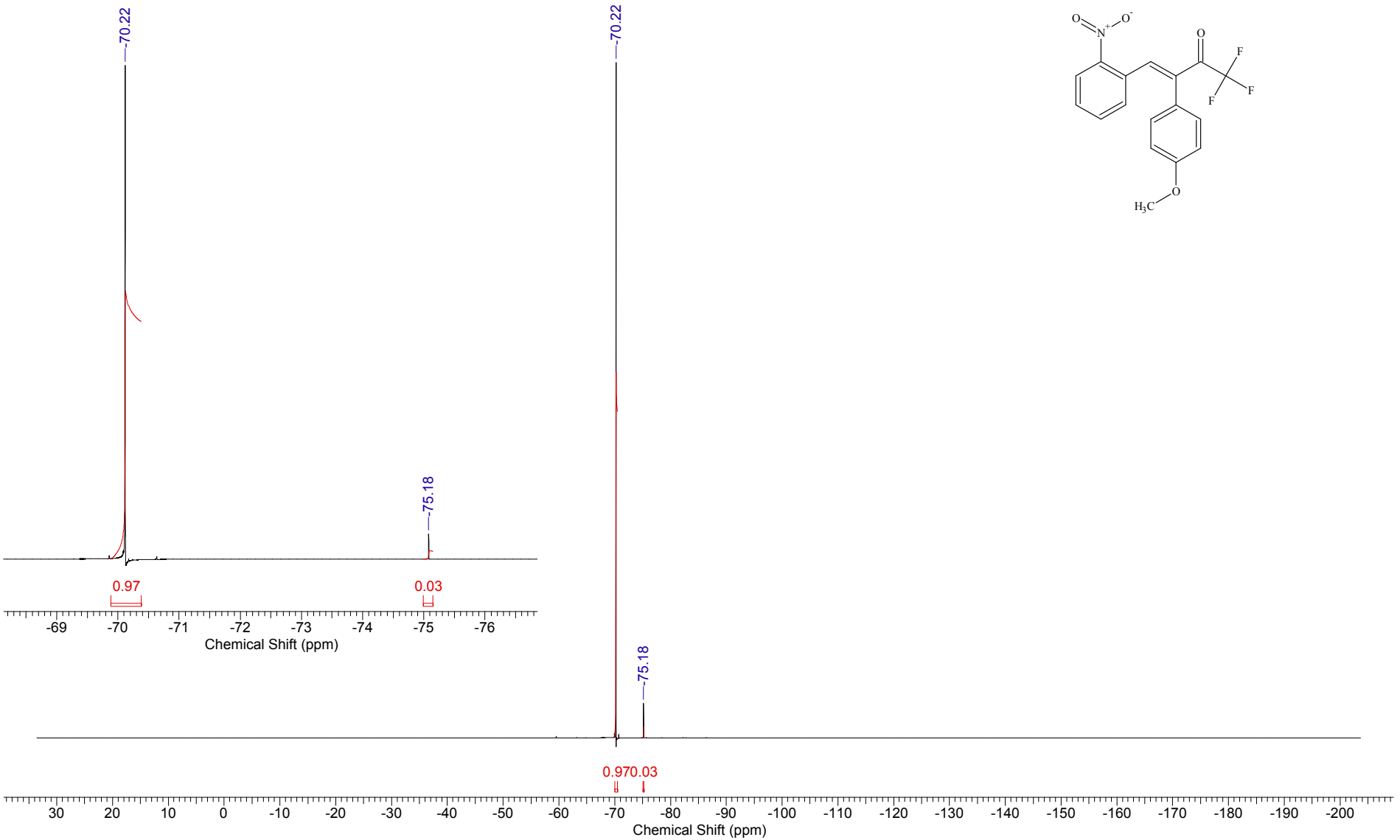
^{19}F NMR spectrum of **4k** (376.5 MHz $CDCl_3$). Signals of minor Z-isomer are also shown

Acquisition Time (sec)	2.5559	***Comment***	Imported from UXNMR.			***Date***	11 Apr 2013 20:02:18
File Name	C:\BM_DATA\SPECTRA\2013\04.àï ðåëü\VP-186.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	16384	***Points Count***	65536
Pulse Sequence	zg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	6410.26	***Temperature (degree C)***	24.560



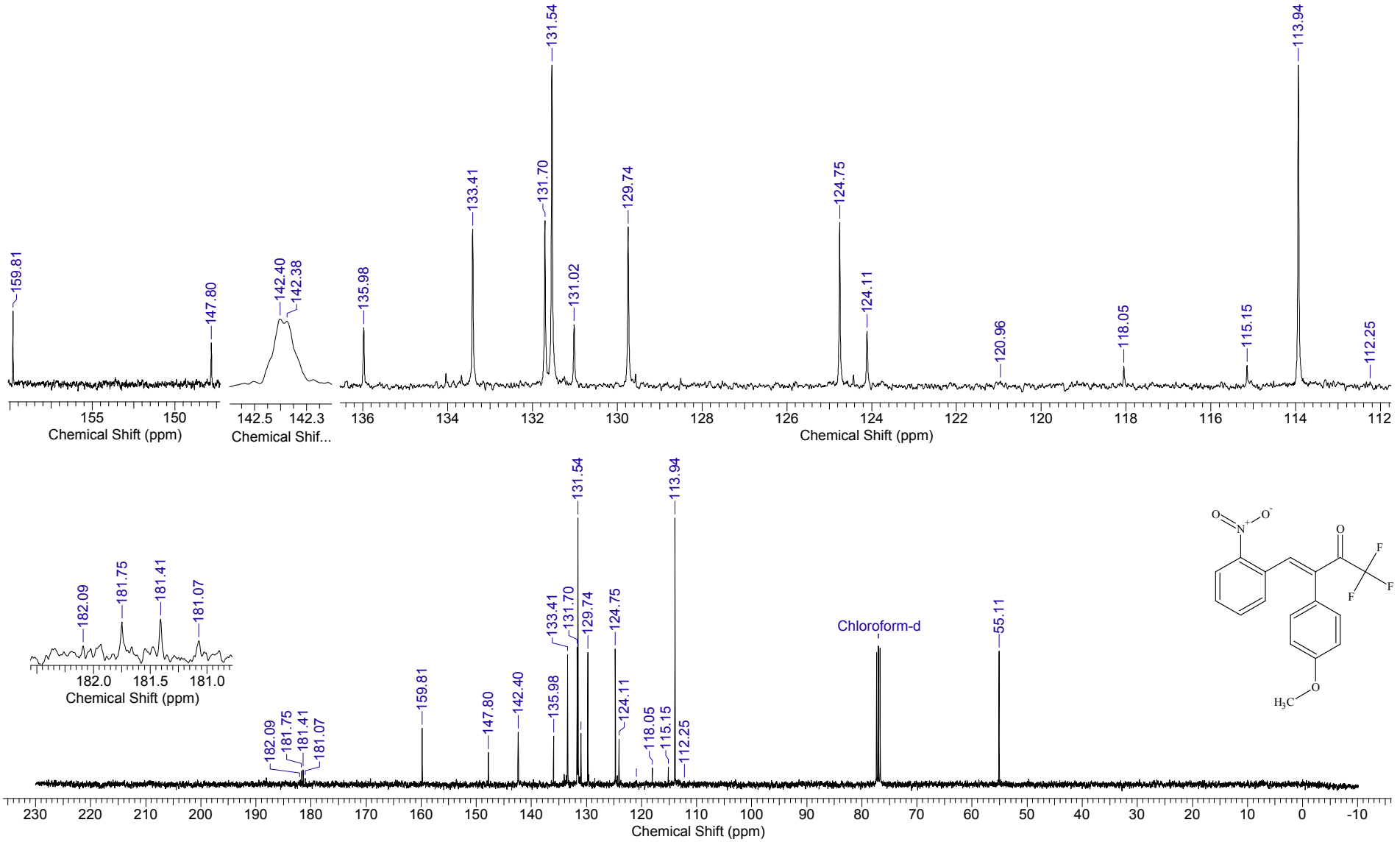
^{1}H NMR spectrum of **4l** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	2.0000	***Date***	Apr 19 2013	***File Name***	C:\BM_DATA\SPECTRA\19F\2013.04.19\VP-186_2_20130419_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	32	***Original Points Count***	178571
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	28.000				



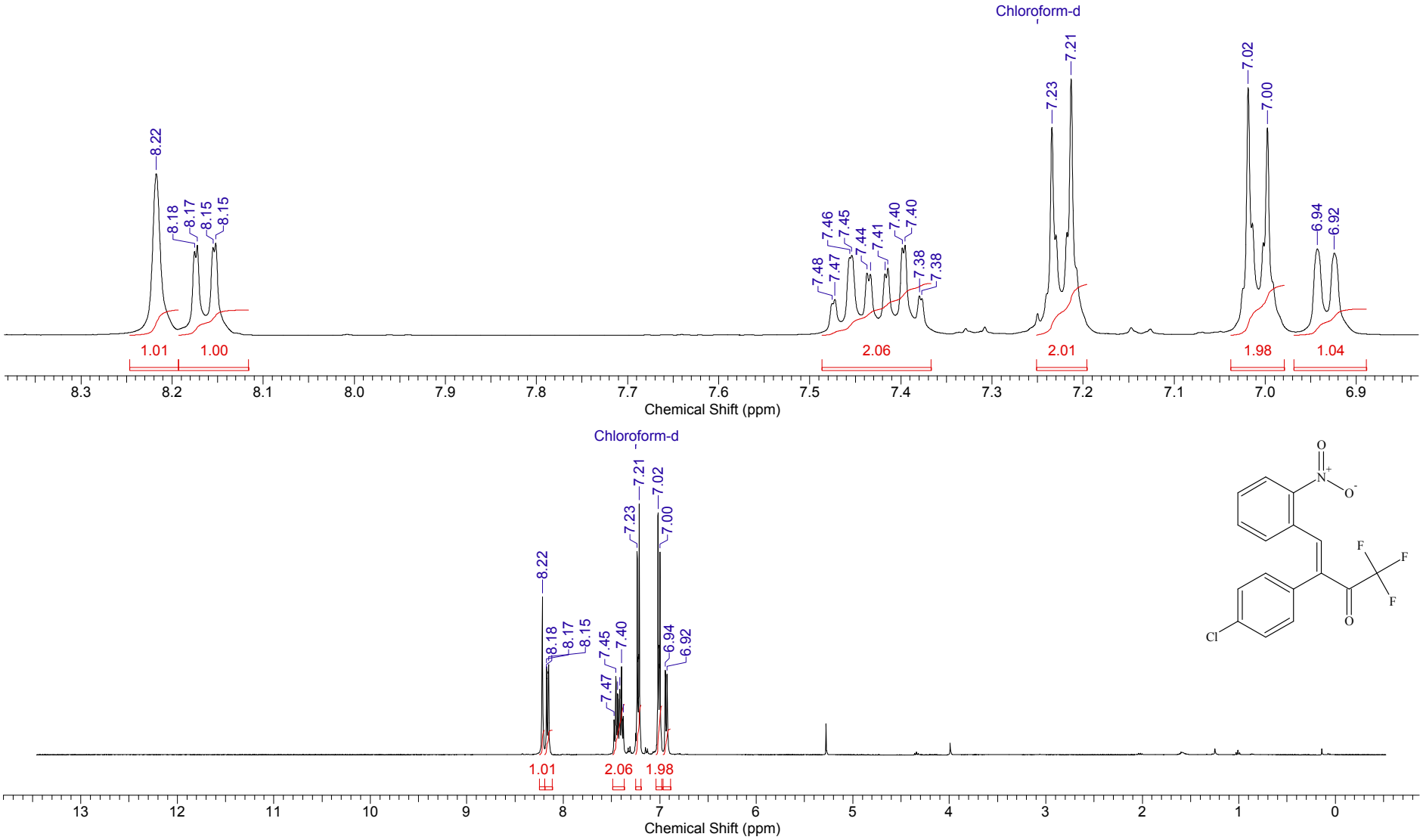
^{19}F NMR spectrum of **4l** (376.5 MHz $CDCl_3$). Signals of minor Z-isomer are also shown

Acquisition Time (sec)	0.4999	***Comment***	Imported from UXNMR.			***Date***	11 Apr 2013 20:06:50
File Name	C:\BM_DATA\SPECTRA\2013\04.àï ðåëü\VP-186.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	76	***Original Points Count***	12076	***Points Count***	65536	***Pulse Sequence***	zgpg30
Solvent	DEUTERIUM OXIDE			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	24.460



^{13}C NMR spectrum of **4l** (100.6 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown

Acquisition Time (sec)	2.9295	***Comment***	Imported from UXNMR.			***Date***	12 Jan 2013 07:23:00
File Name	C:\BM_DATA\SPECTRA\2013\01.ÿí âàðü\VP-165.2.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	10	***Original Points Count***	16384	***Points Count***	65536
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	5592.84
Temperature (degree C)	25.560						

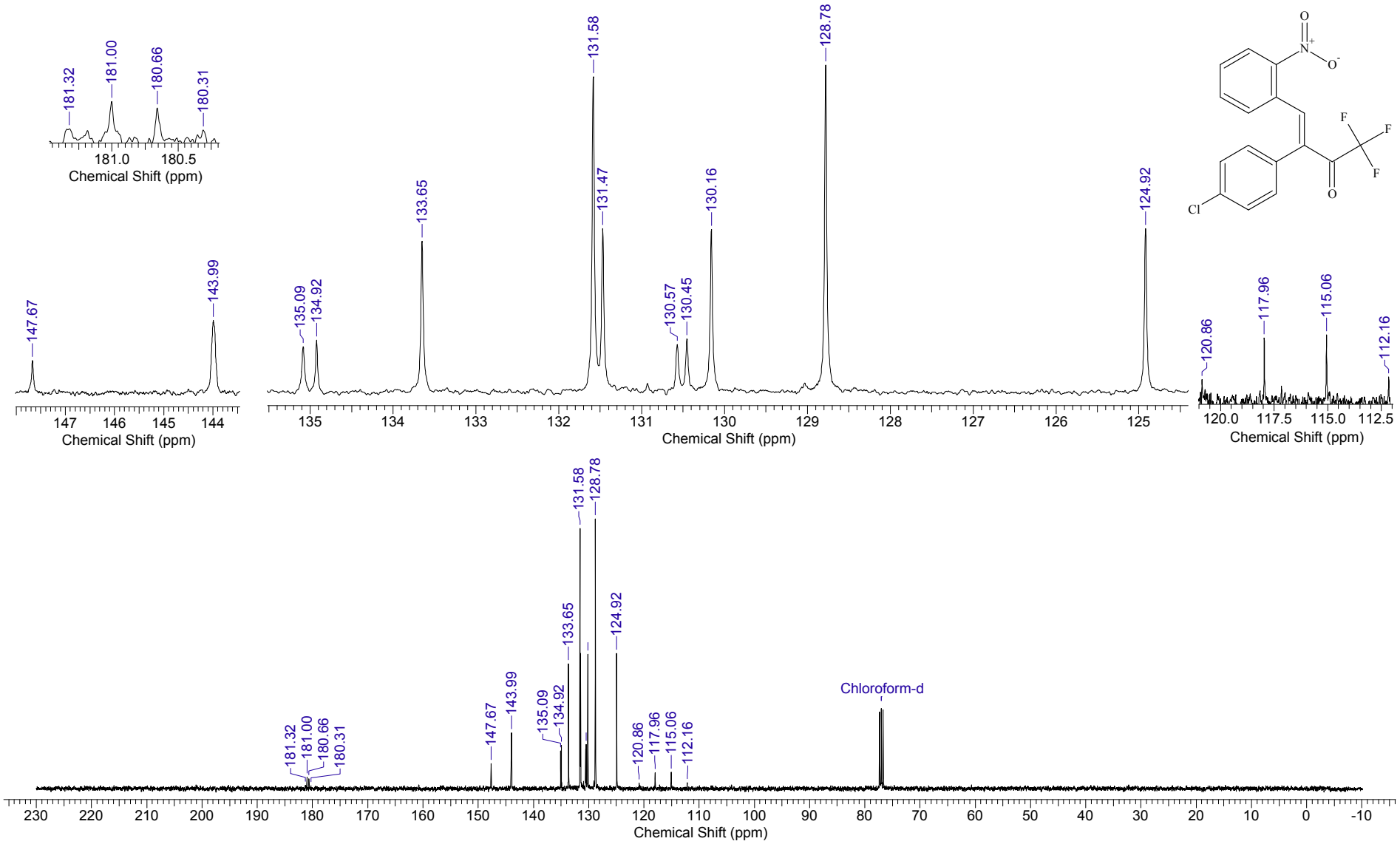


^{1}H NMR spectrum of **4m** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	0.7569	***Comment***	STANDARD PROTON PARAMETERS	***Date***	Jan 22 2013
File Name	C:\BM_DATA\SPECTRA\19F\2013.01.22\vp-165-2	***Frequency (MHz)***	376.26	***Nucleus***	19F
Number of Transients	16	***Original Points Count***	65536	***Points Count***	65536	***Pulse Sequence***	s2pul
Solvent	CHLOROFORM-D	***Sweep Width (Hz)***	86580.09	***Temperature (degree C)***	30.000

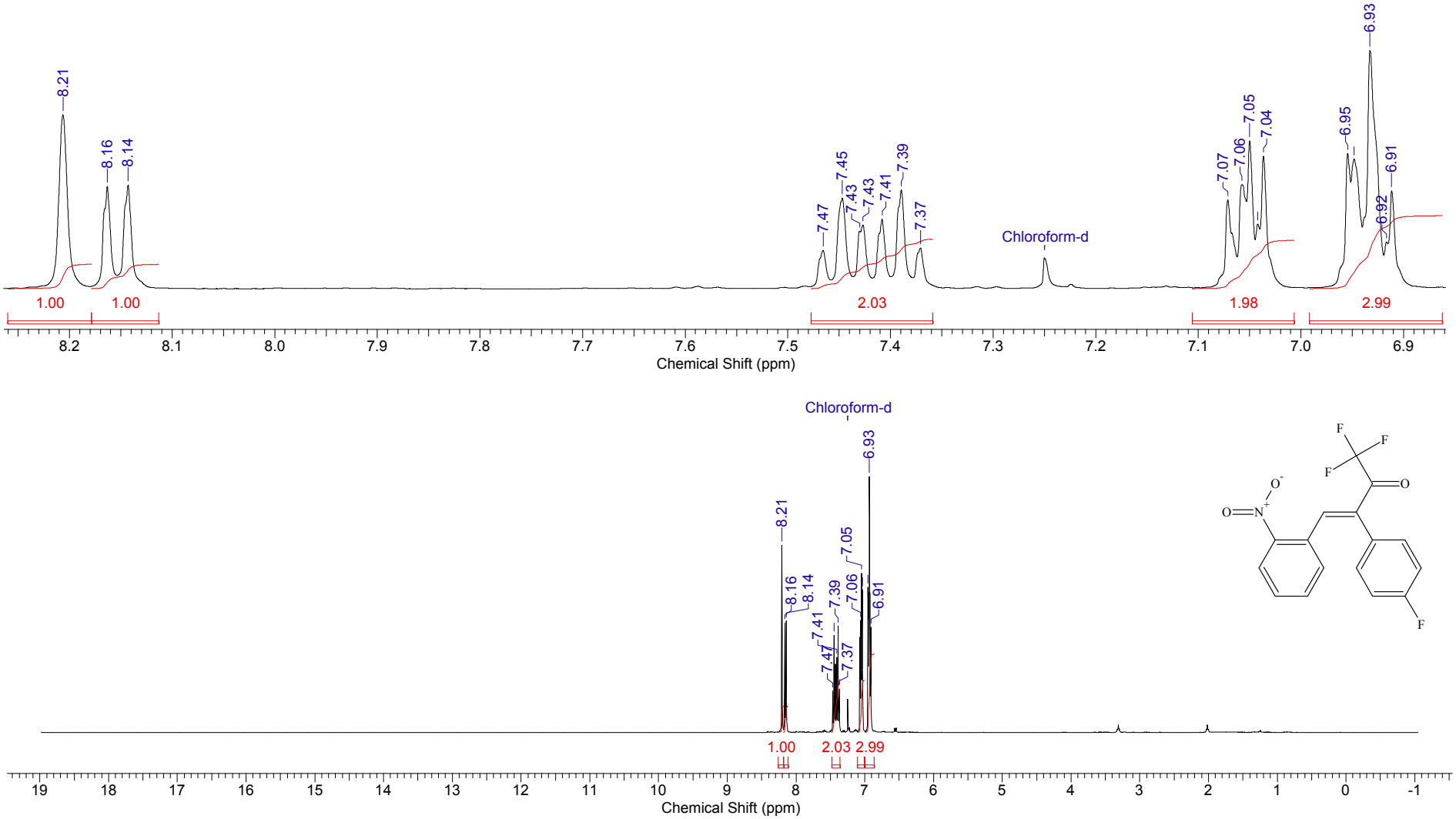
^{19}F NMR spectrum of **4m** (376.5 MHz $CDCl_3$)

Acquisition Time (sec)	0.4999	***Comment***	Imported from UXNMR.			***Date***	12 Jan 2013 07:27:00
File Name	C:\BM_DATA\SPECTRA\2013\01.ÿí âàðü\VP-165.2.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	160	***Original Points Count***	12076	***Points Count***	65536
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	25.560



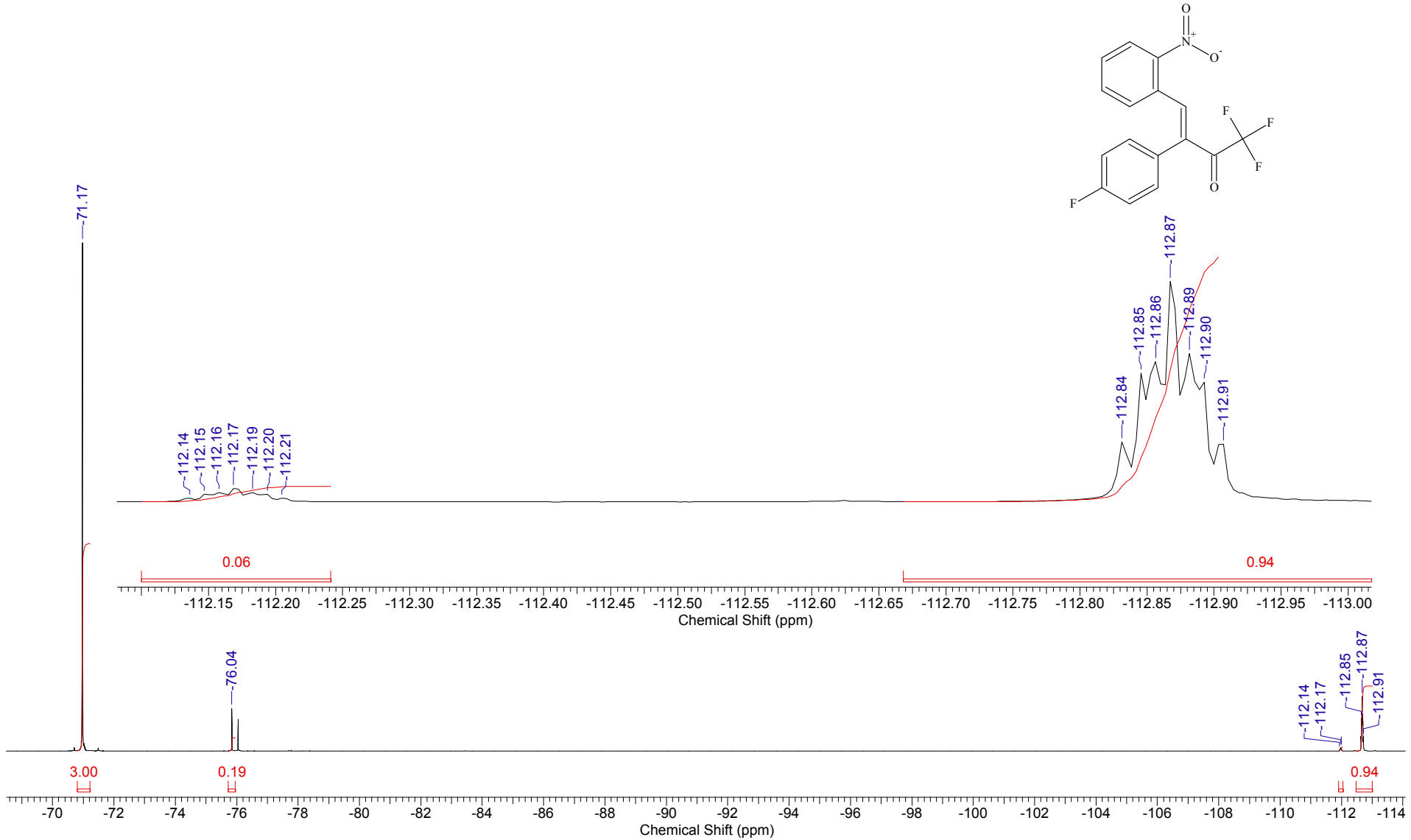
^{13}C NMR spectrum of **4m** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	20 Mar 2020 15:37:14
File Name	C:\DOCS\OUTPUT_301\2020\03.ì àðò\BM-1861-2p.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



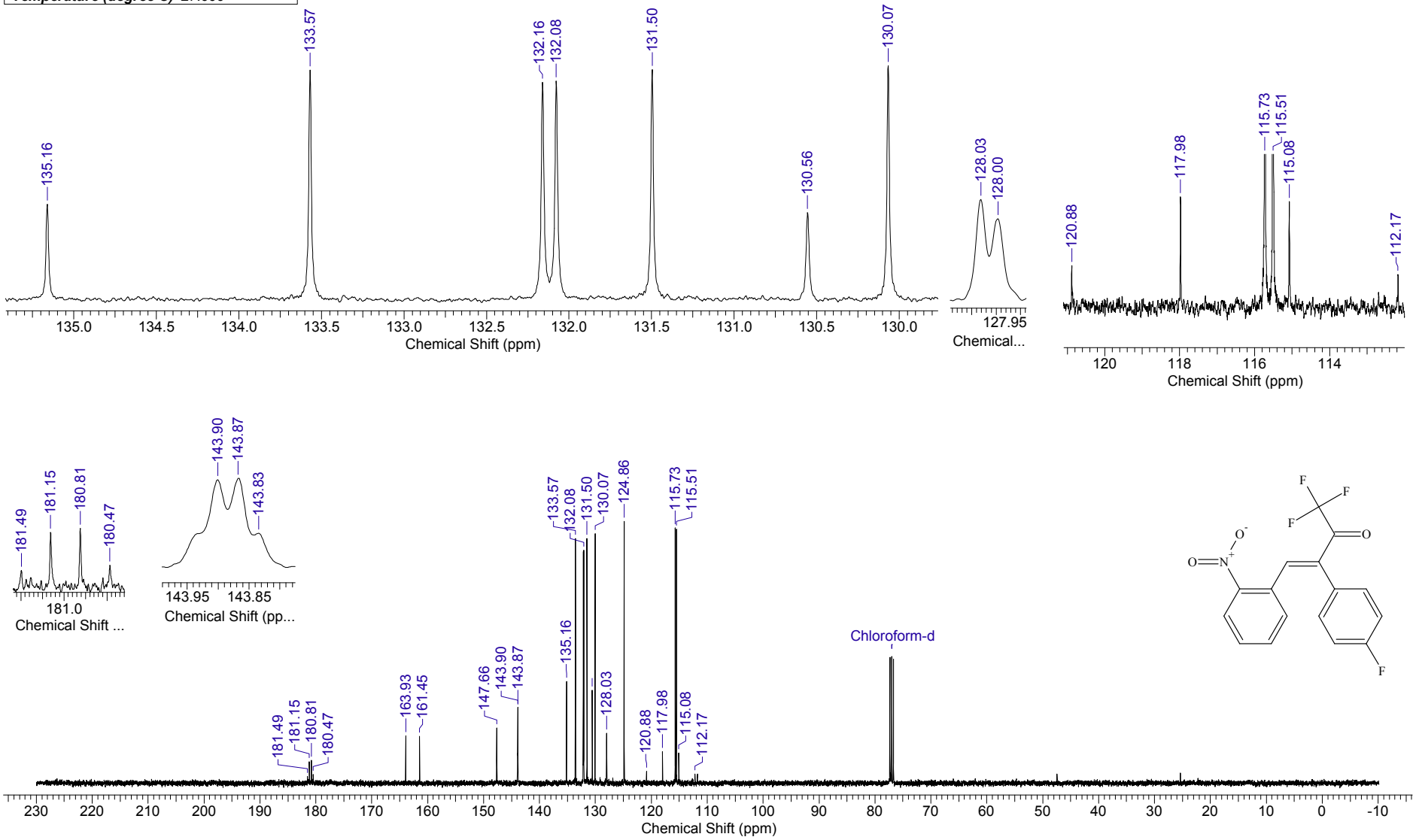
^{1}H NMR spectrum of **4n** (400.1 MHz, $CDCl_3$).

Acquisition Time (sec)	0.7340	***Date***	Mar 20 2020	***File Name***	C:\DOCS\OUTPUT_301\F19\2020.03.20\SZA-BM-181-3-4_20200320_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	16	***Original Points Count***	65536
Points Count	65536	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	30.000				



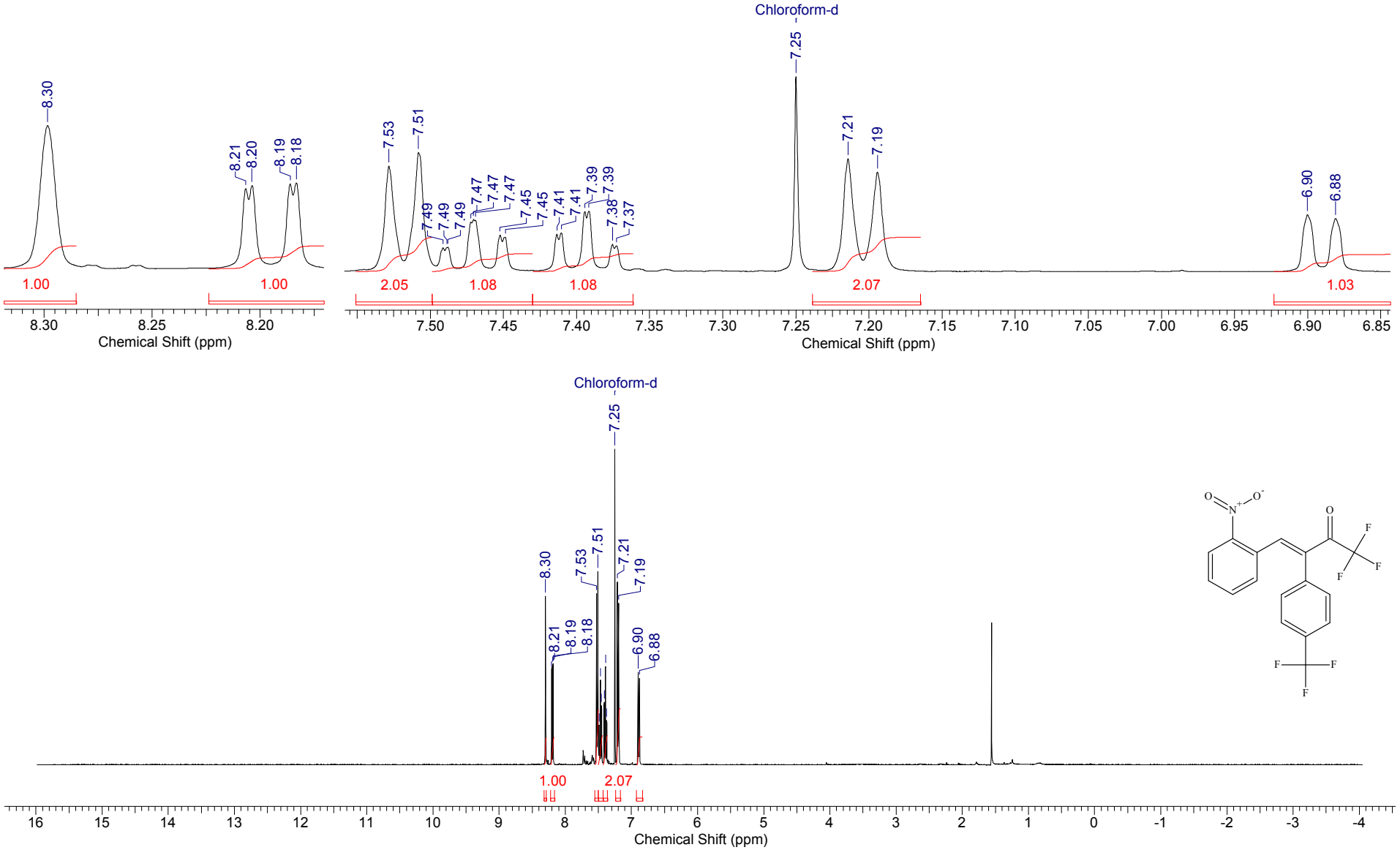
^{19}F NMR spectrum of **4n** (376.5 MHz $CDCl_3$). Signals of minor Z-isomer are marked

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	20 Mar 2020 15:42:20
File Name	C:\DOCS\OUTPUT_301\2020\03.ì àðò\BM-1861-2p.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	97	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59
Temperature (degree C)	27.000						



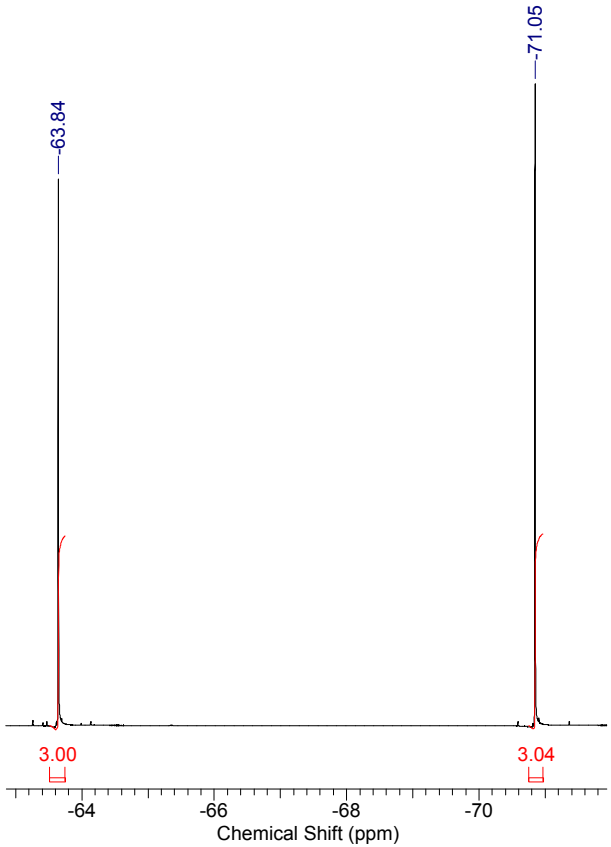
^{13}C NMR spectrum of **4n** (100.6 MHz, $CDCl_3$)

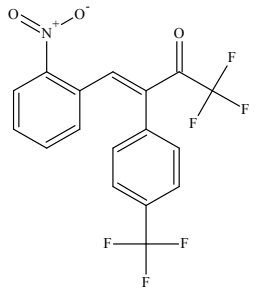
Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	08 Jul 2019 15:06:10
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\SZA-134.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000

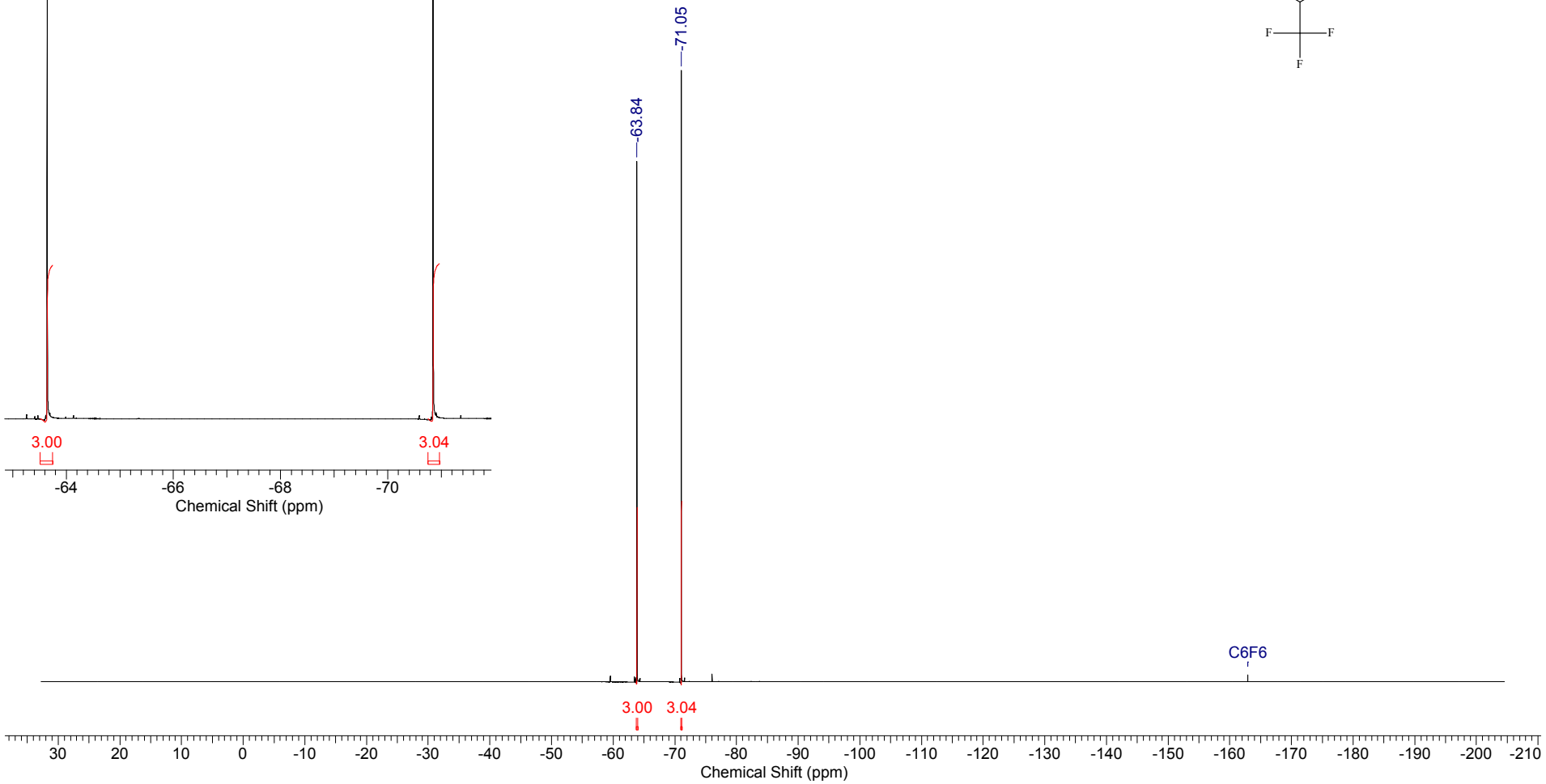


^{1}H NMR spectrum of **4o** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.5000	***Date***	Jul 8 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.07.08\SZA-134-4-5_20190708_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	16	***Original Points Count***	133929
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	25.000				

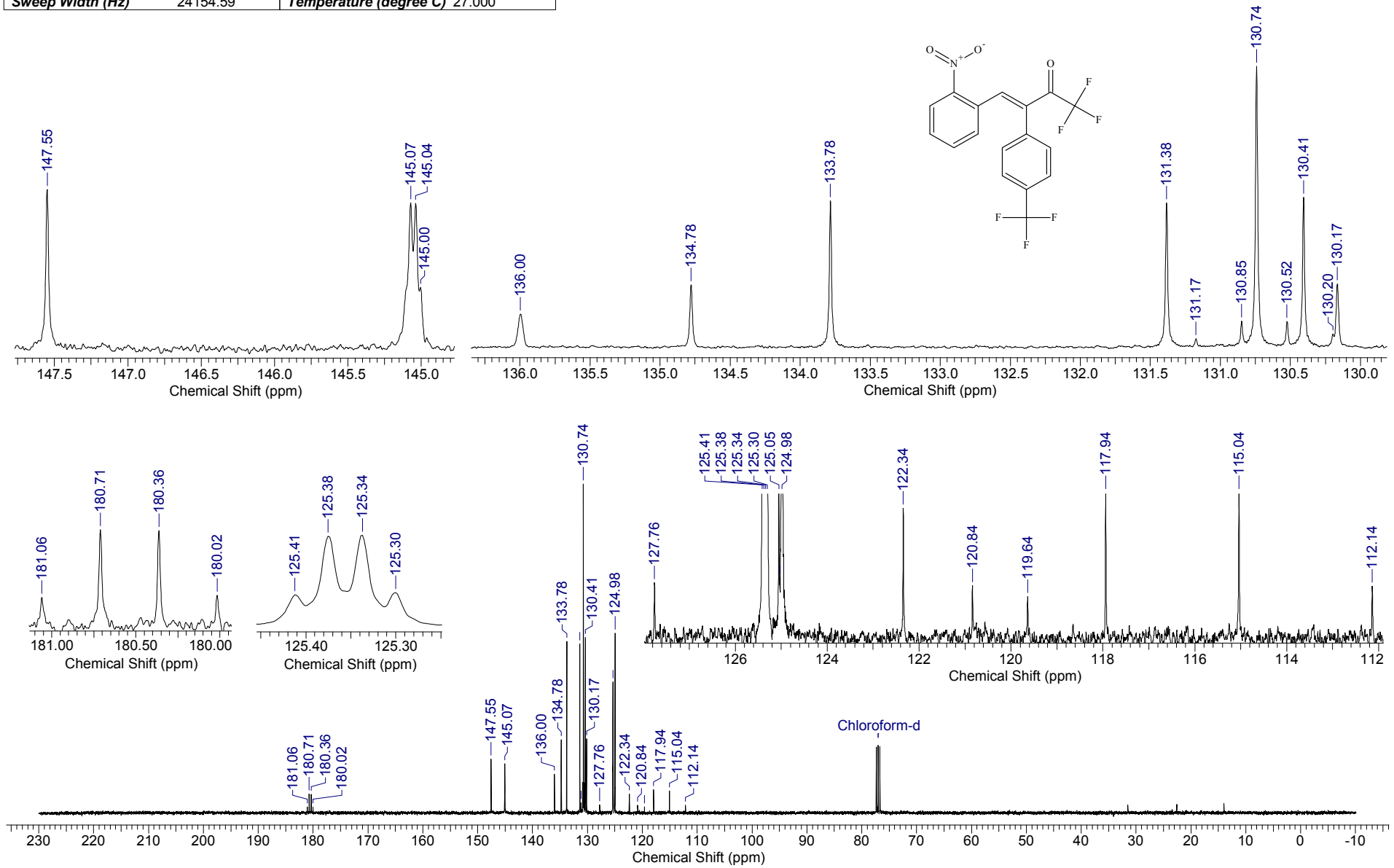






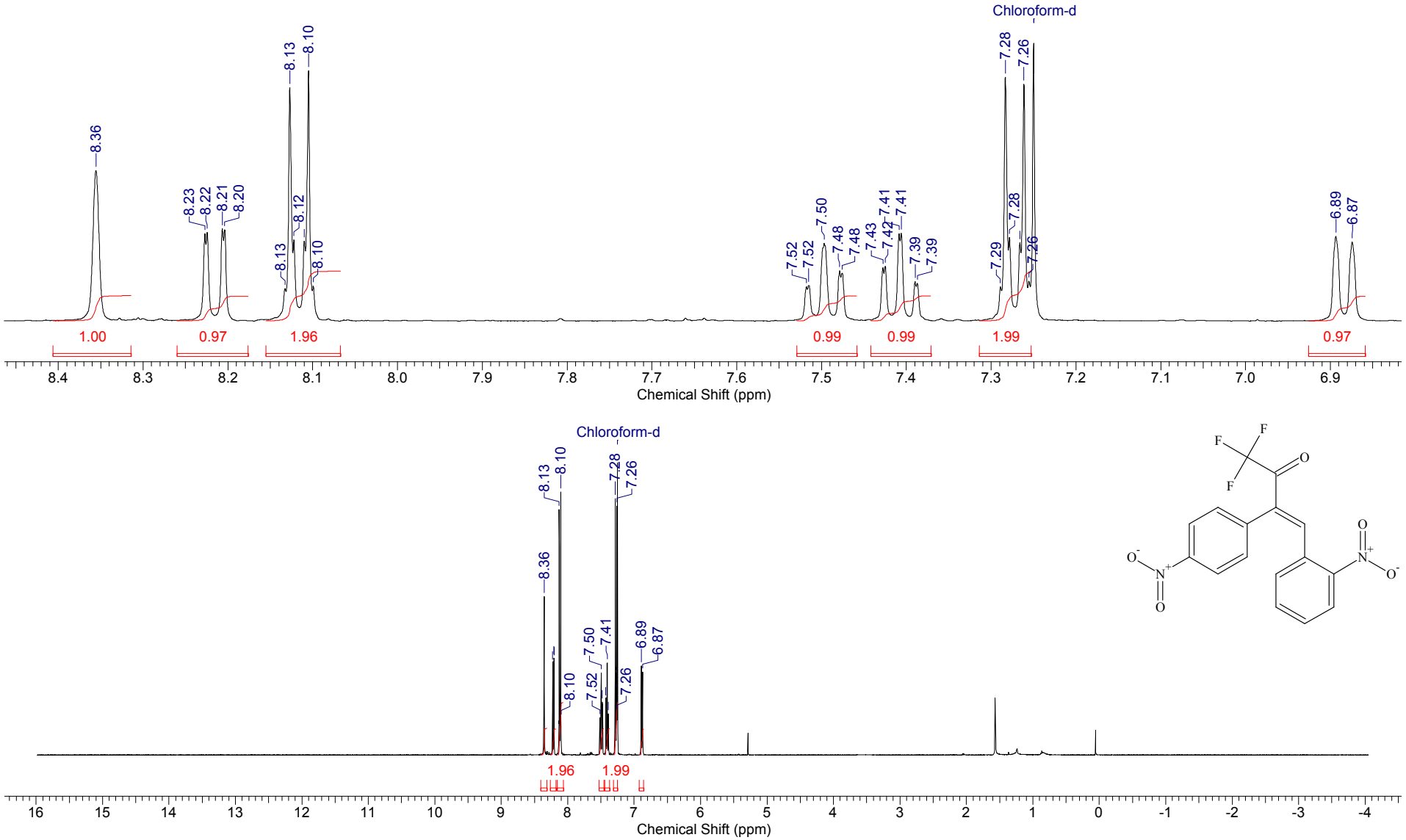
^{19}F NMR spectrum of **4o** (376.5 MHz $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	06 Jul 2019 13:52:38
File Name	C:\DOCS\BM\190706\SZA-134-4-5_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C	***Number of Transients***	96
Original Points Count	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	24154.59	***Temperature (degree C)***	27.000						



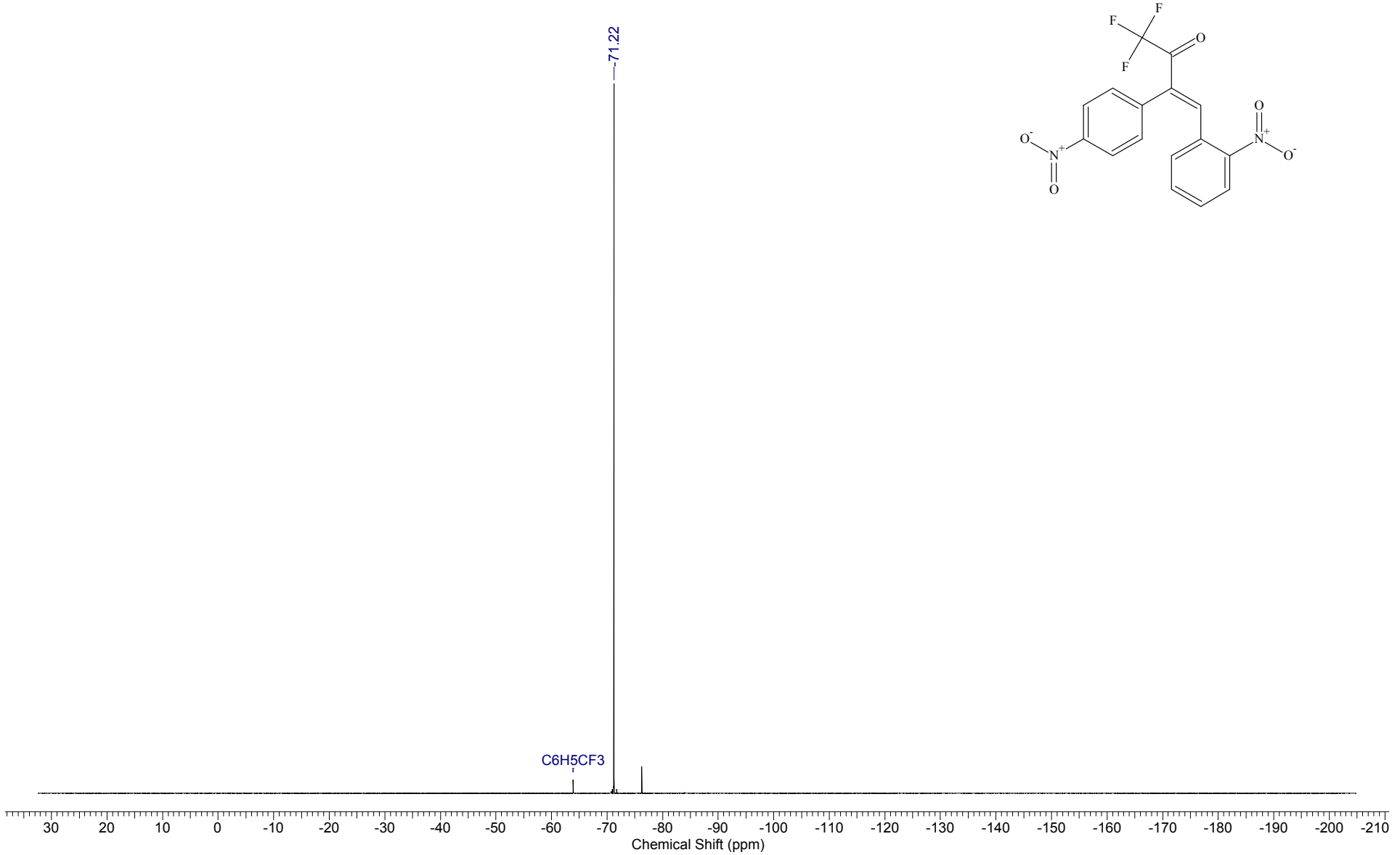
^{13}C NMR spectrum of **4o** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	02 Jul 2019 14:05:30
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\SZA-125-5-9.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



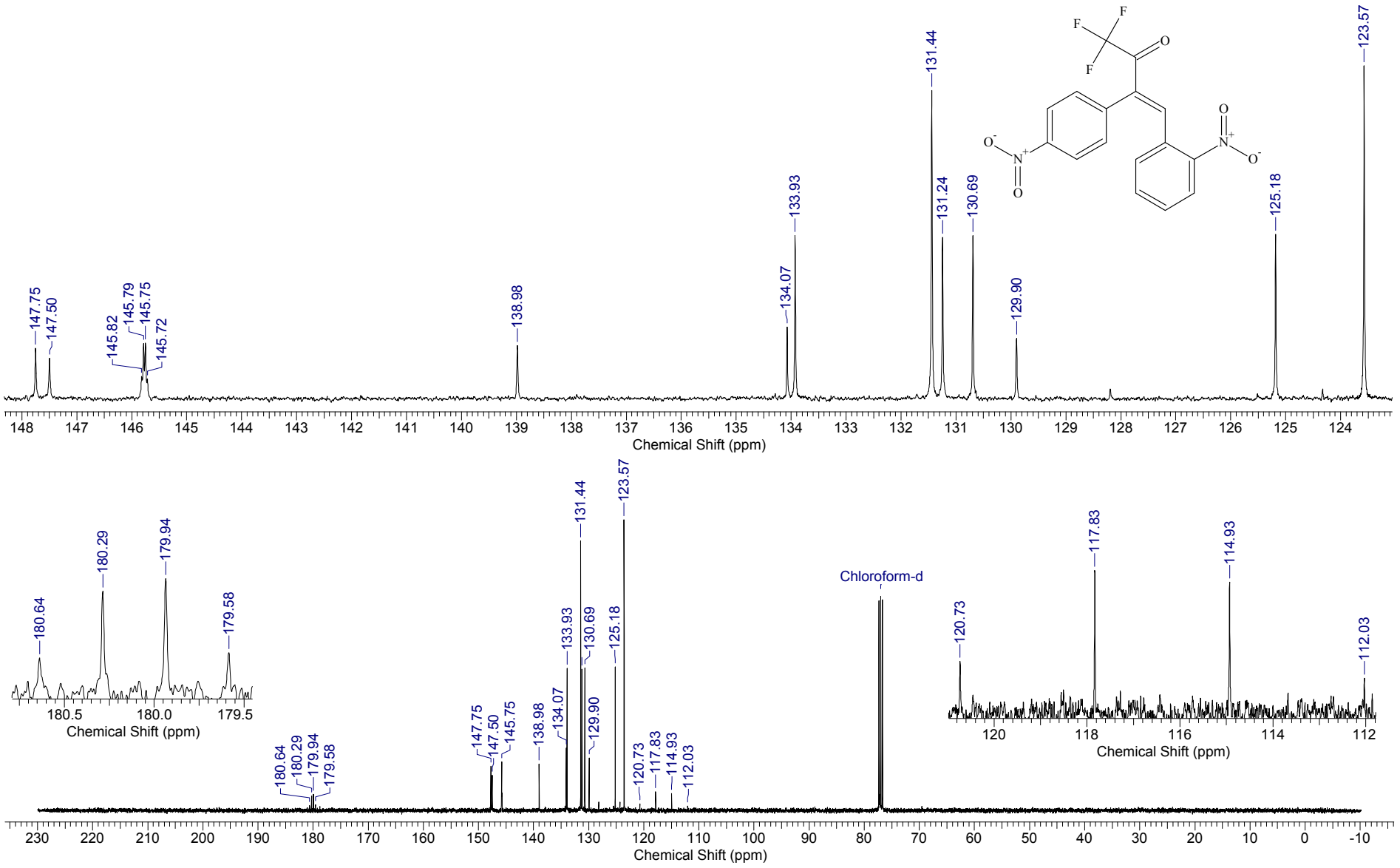
^{1}H NMR spectrum of **4p** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.0000	***Date***	May 13 2019	***File Name***	C:\Users\BM-1\Downloads\F19\SZA-100_20190513_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	16	***Original Points Count***	89286
Points Count	131072	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	30.000				



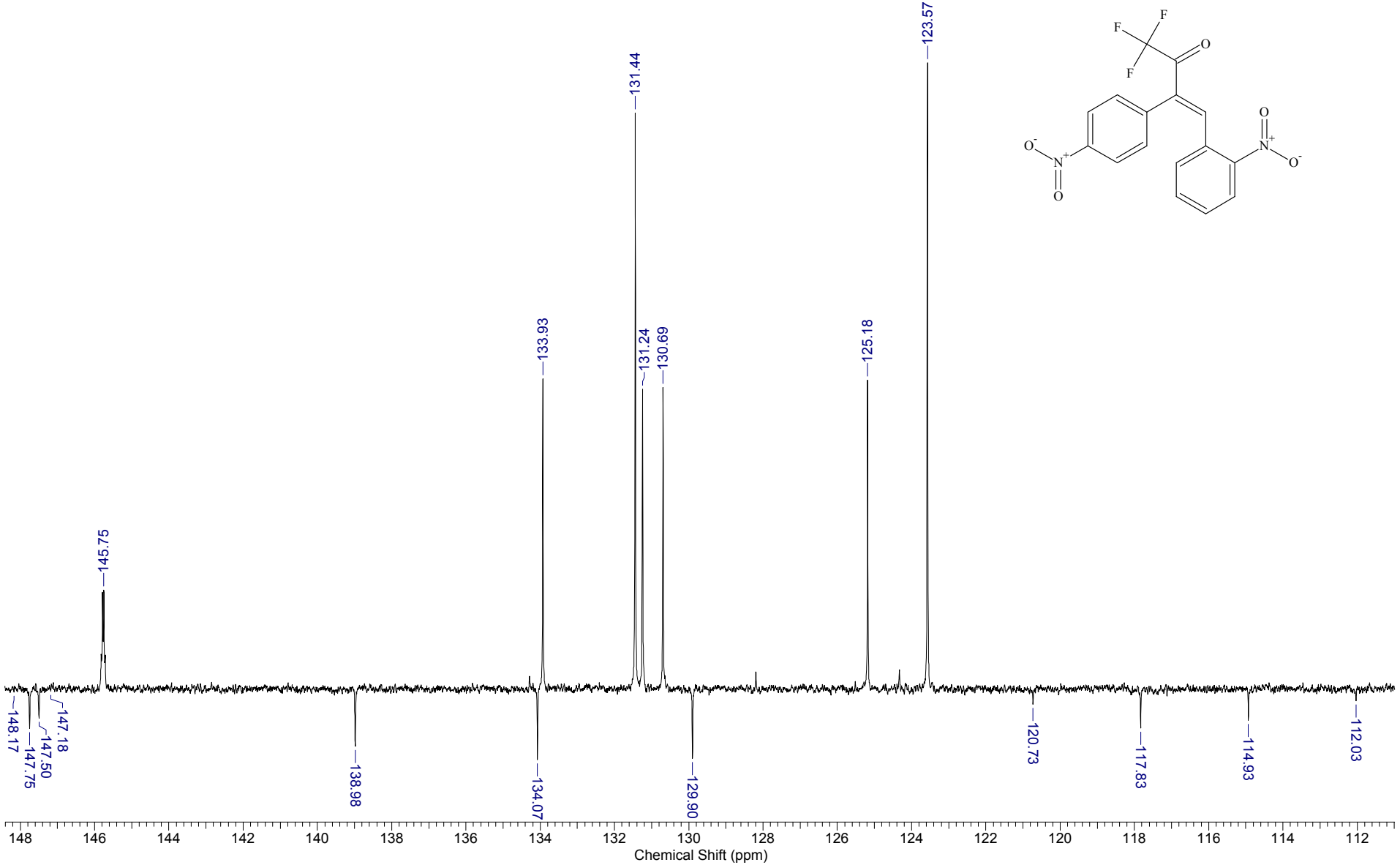
^{19}F NMR spectrum of **4p** (376.5 MHz $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	07 May 2019 14:52:36
File Name	C:\BM_DATA\DOCS\2019.05.07\SZA-100.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	418	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



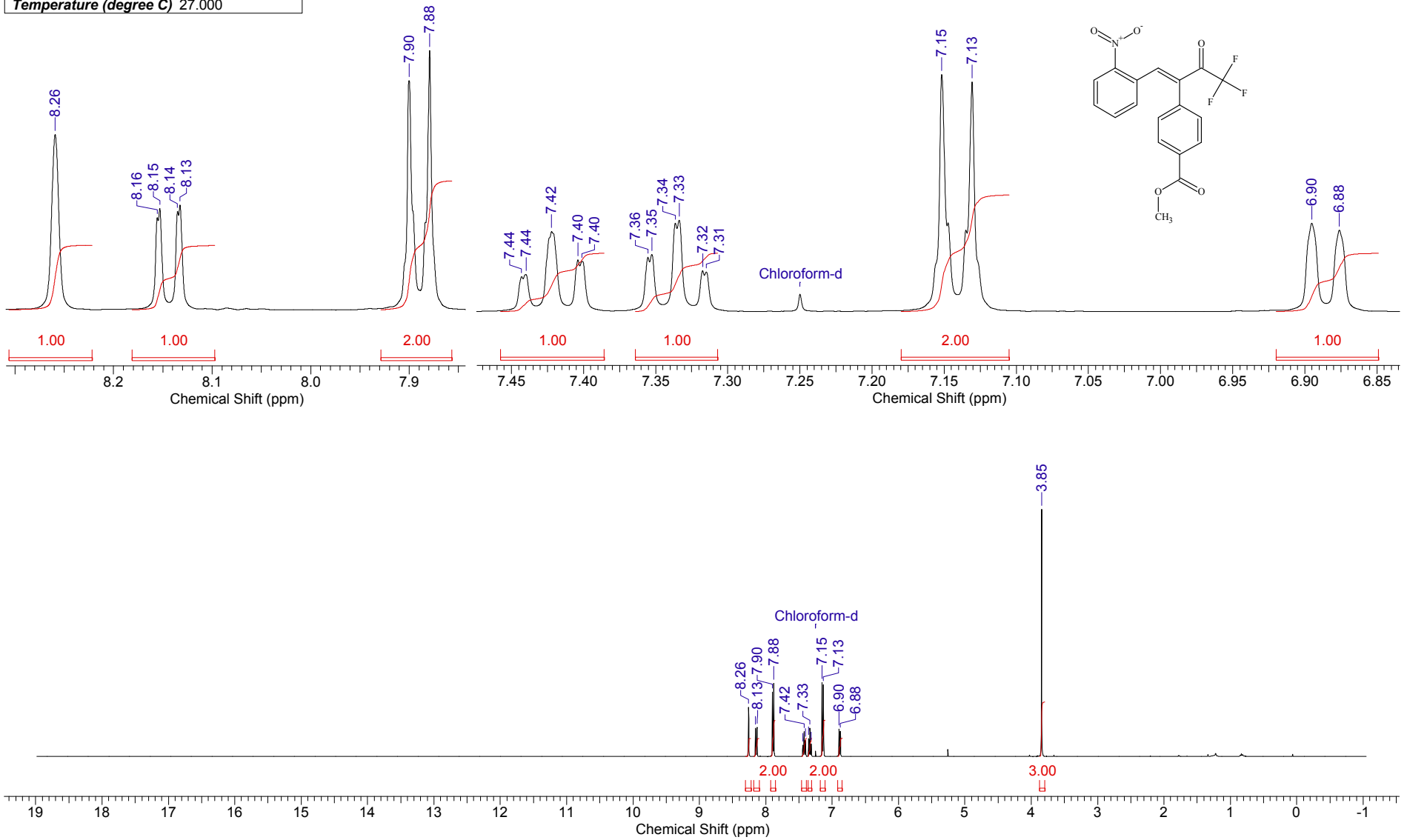
^{13}C NMR spectrum of **4p** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	1.3664	***Comment***	Imported from UXNMR.			***Date***	08 May 2019 17:47:12
File Name	C:\Users\BM-1\Downloads\noname01\SZA-100.APT_004001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	93	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	jmod
Solvent	ACETONITRILE-D3			***Sweep Width (Hz)***	23980.81	***Temperature (degree C)***	27.000



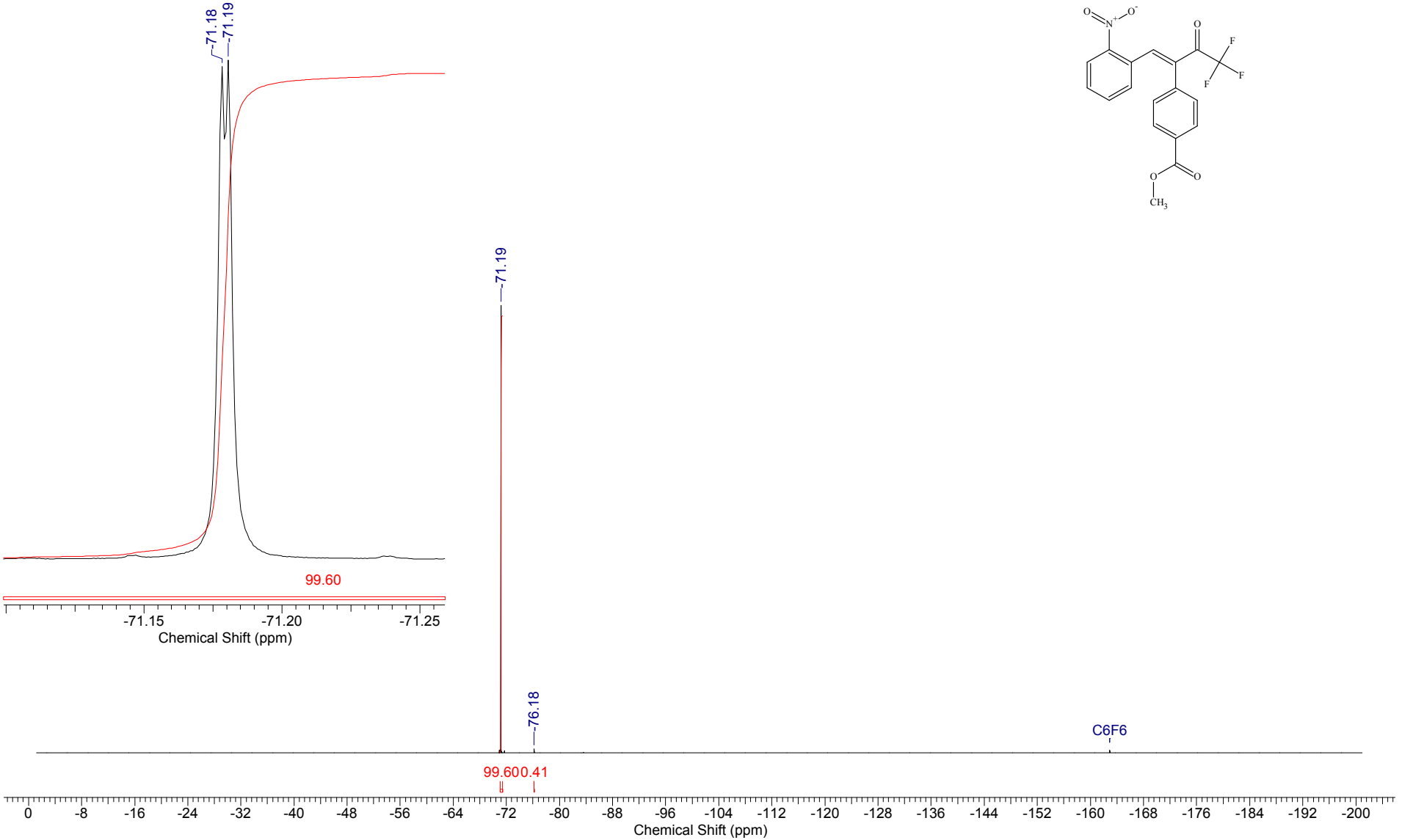
^{13}C APT NMR spectrum of **4p** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	07 Oct 2020 17:25:18
File Name	C:\Users\BM-1\Downloads\NMR SZA-BM 07.10.2020\SZA-BM-1871-17.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



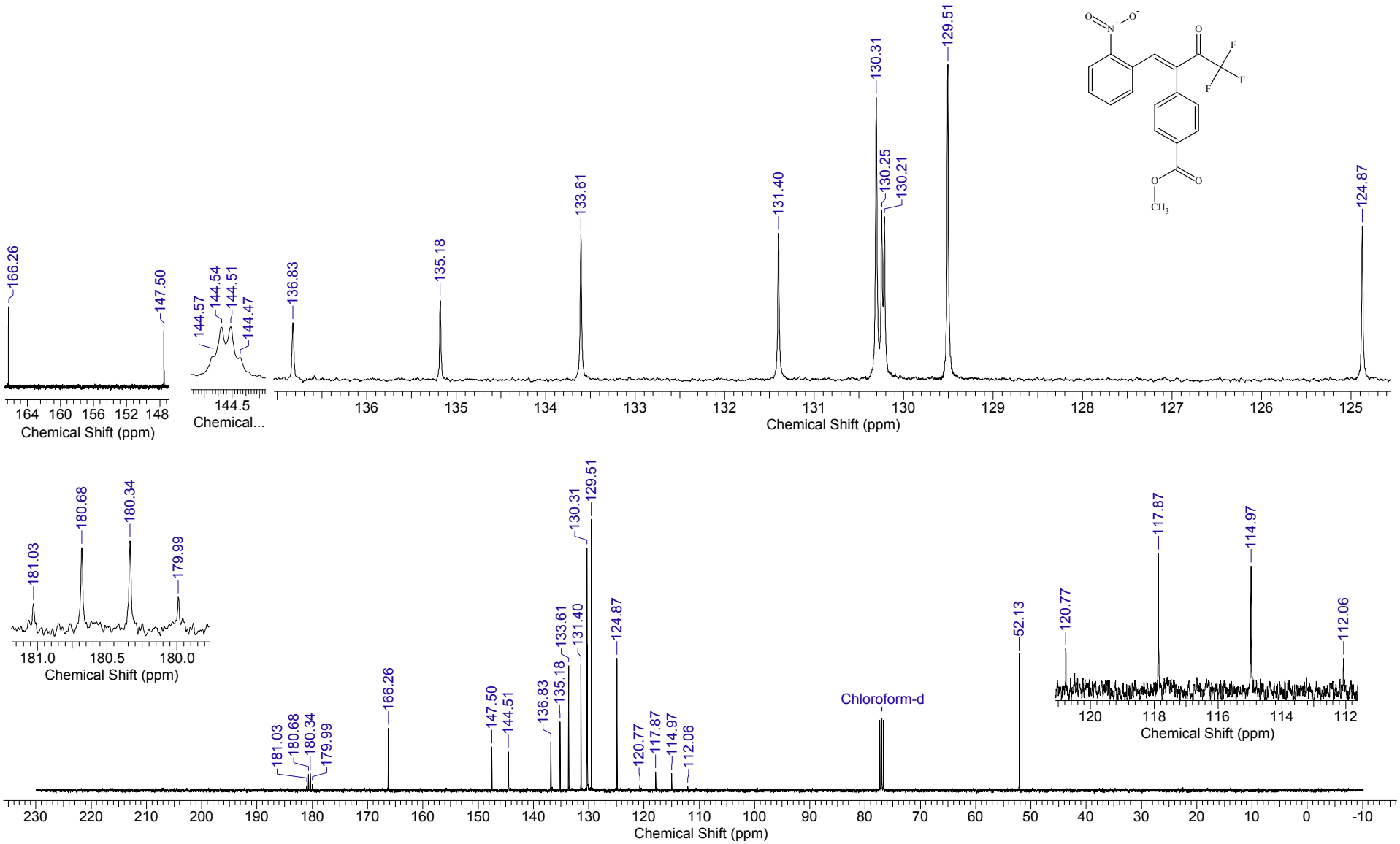
^{1}H NMR spectrum of **4q** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.7433	***Comment***	Imported from UXNMR.			***Date***	08 Oct 2020 12:41:14
File Name	C:\BM_DATA\DOCS\08.10.20\08.10.20\SZA-BM-1871-17.F_005001r					***Frequency (MHz)***	376.50
Nucleus	19F	***Number of Transients***	16	***Original Points Count***	131072	***Points Count***	262144
Pulse Sequence	zgflqn	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	75187.97
Temperature (degree C)	27.000						



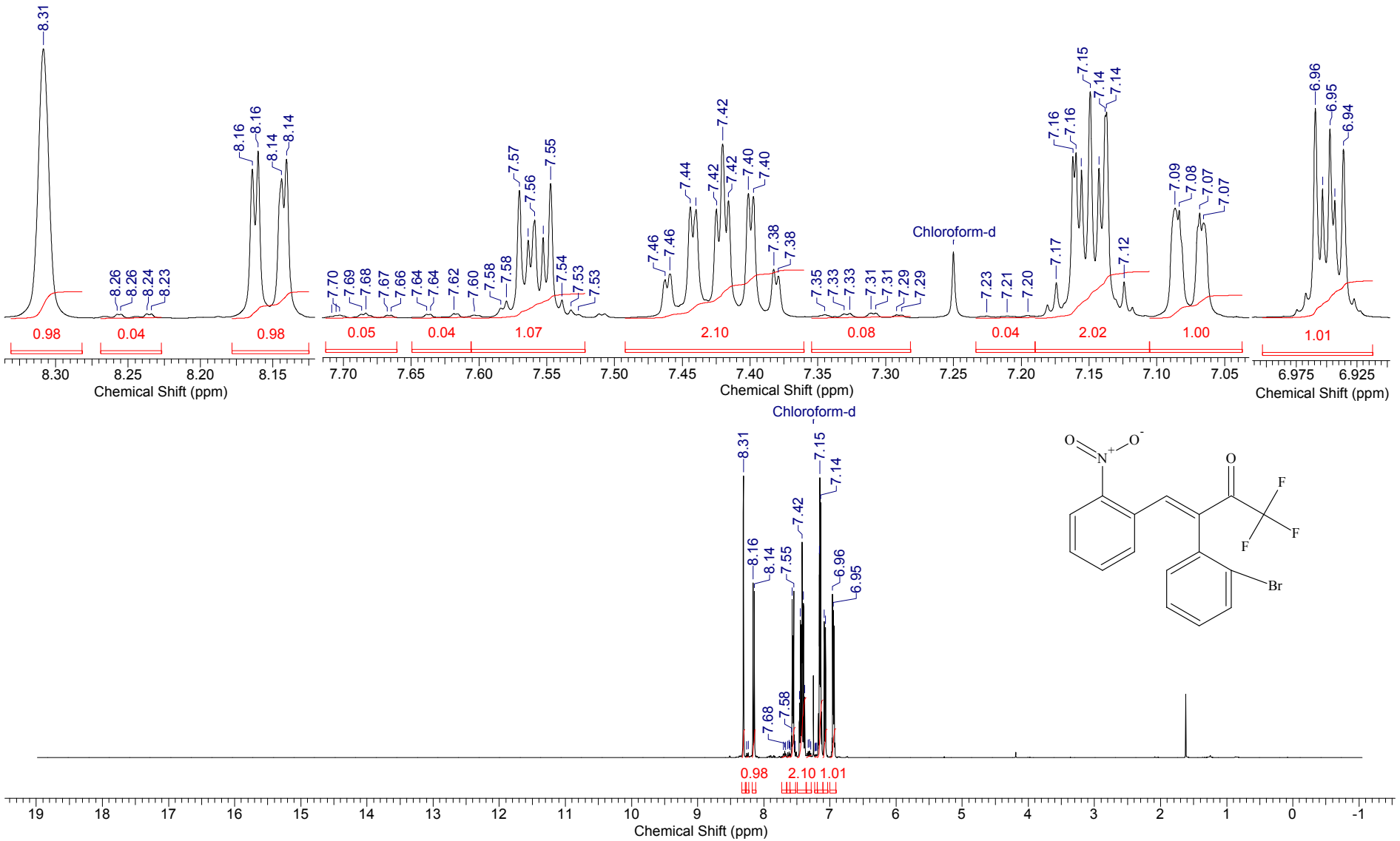
^{19}F NMR spectrum of **4q** (376.5 MHz $CDCl_3$). Signals of minor Z-isomer are also shown

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	08 Oct 2020 11:43:10
File Name	C:\BM_DATA\DOCS\08.10.20\08.10.20\SZA-BM-1871-17.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	100	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	BENZENE-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



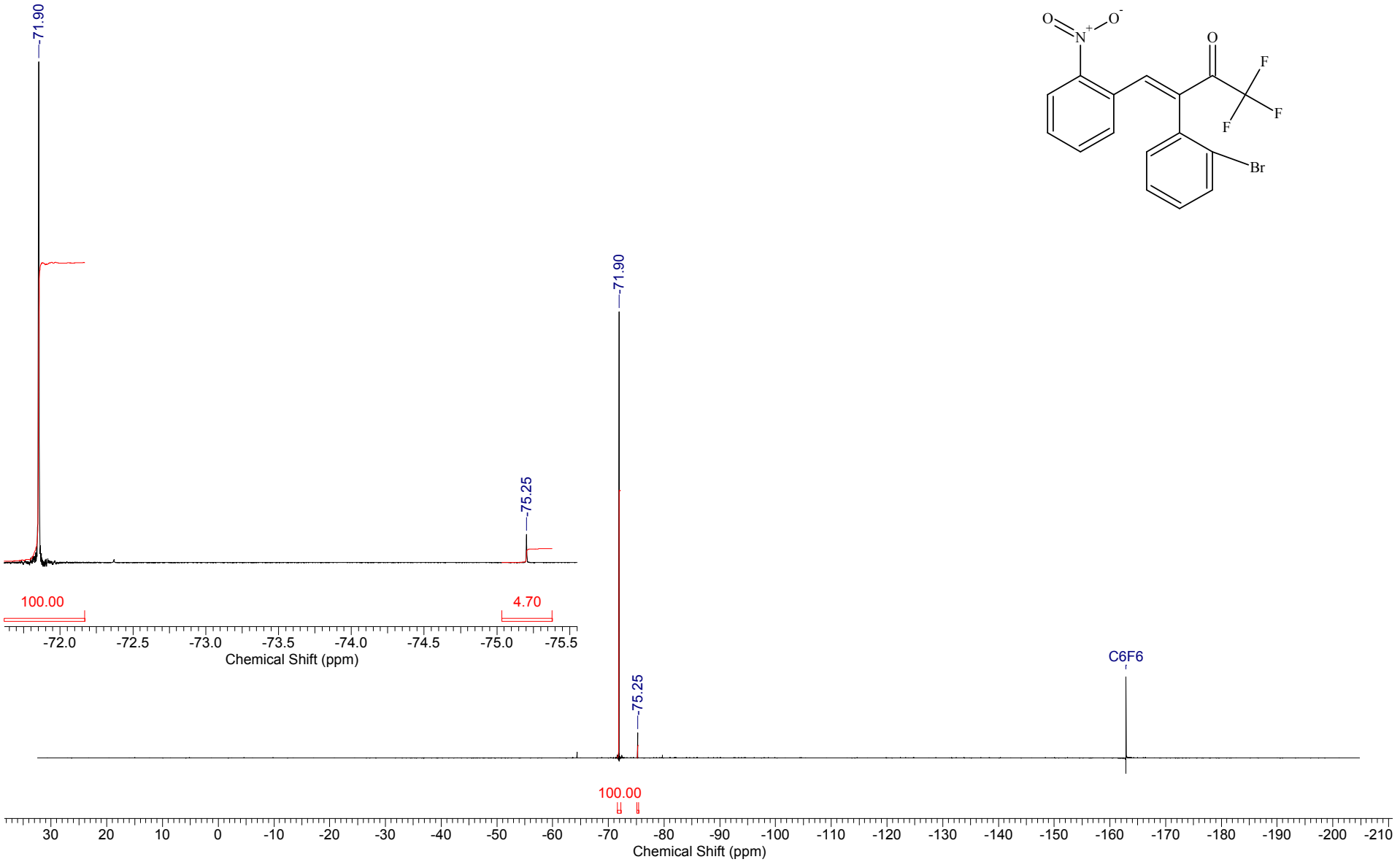
^{13}C NMR spectrum of **4q** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	23 Jul 2019 16:07:28
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\190723\SZA-141-3p_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	8	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



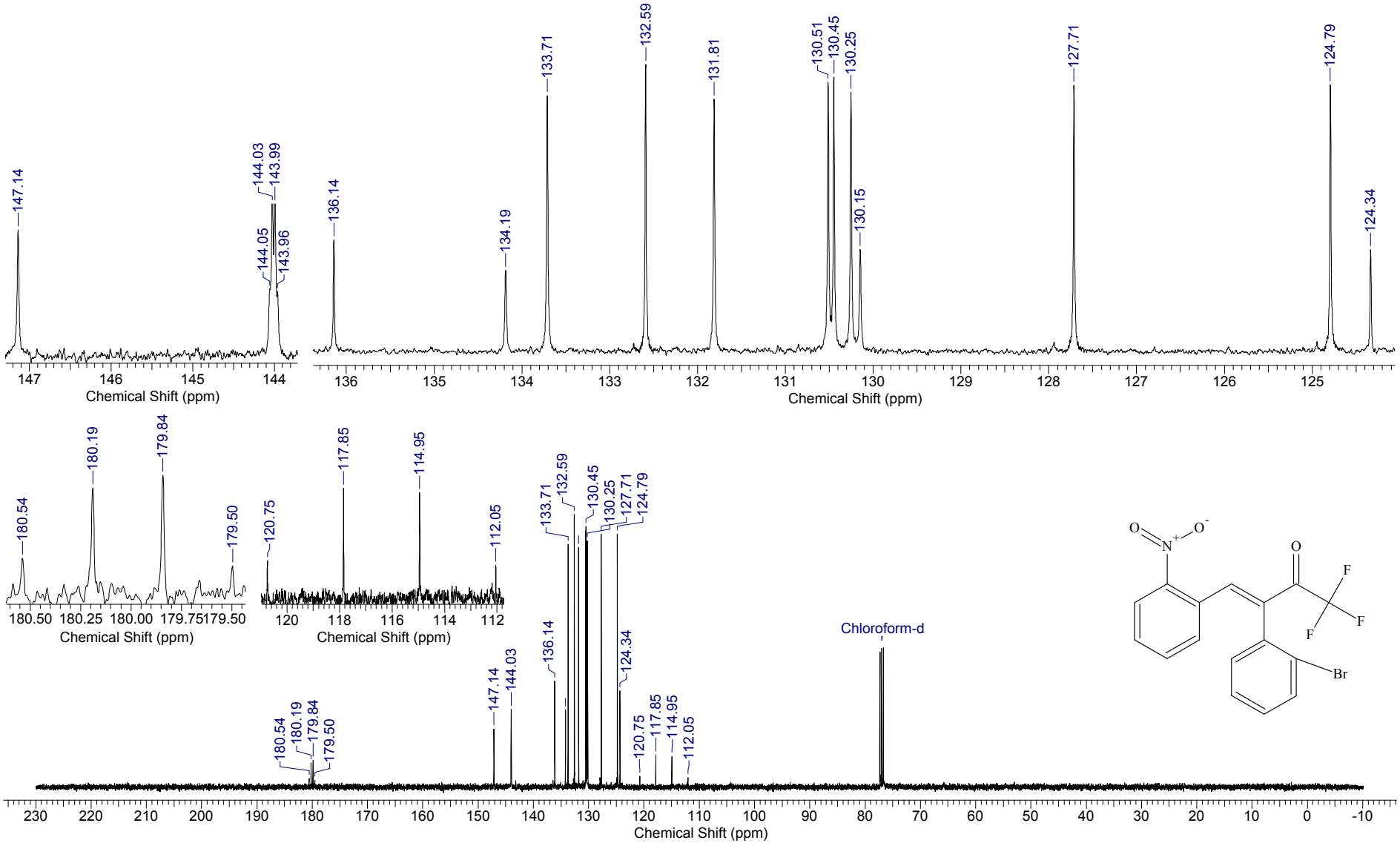
^{1}H NMR spectrum of **4r** (400.1 MHz, $CDCl_3$). Signals of minor Z-isomer are also shown

Acquisition Time (sec)	1.0000	***Date***	Sep 6 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.06\SZA-141-3p_20190906_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	4	***Original Points Count***	89286
Points Count	131072	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	22.000				



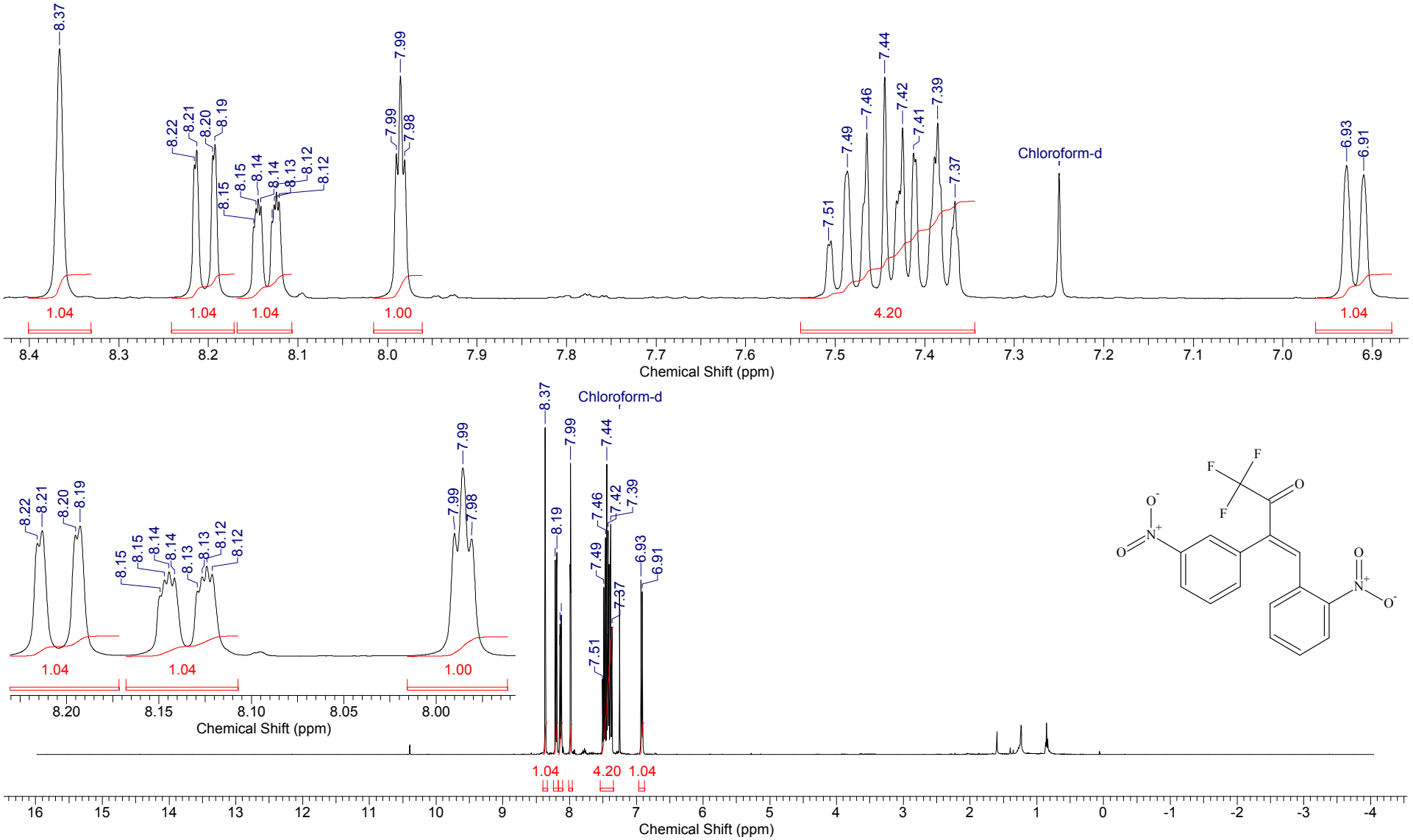
^{19}F NMR spectrum of **4r** (376.5 MHz $CDCl_3$). Signals of minor Z-isomer are also shown

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	23 Jul 2019 16:12:58
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\190723\SZA-141-3p_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	119	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59
Temperature (degree C)	27.000						



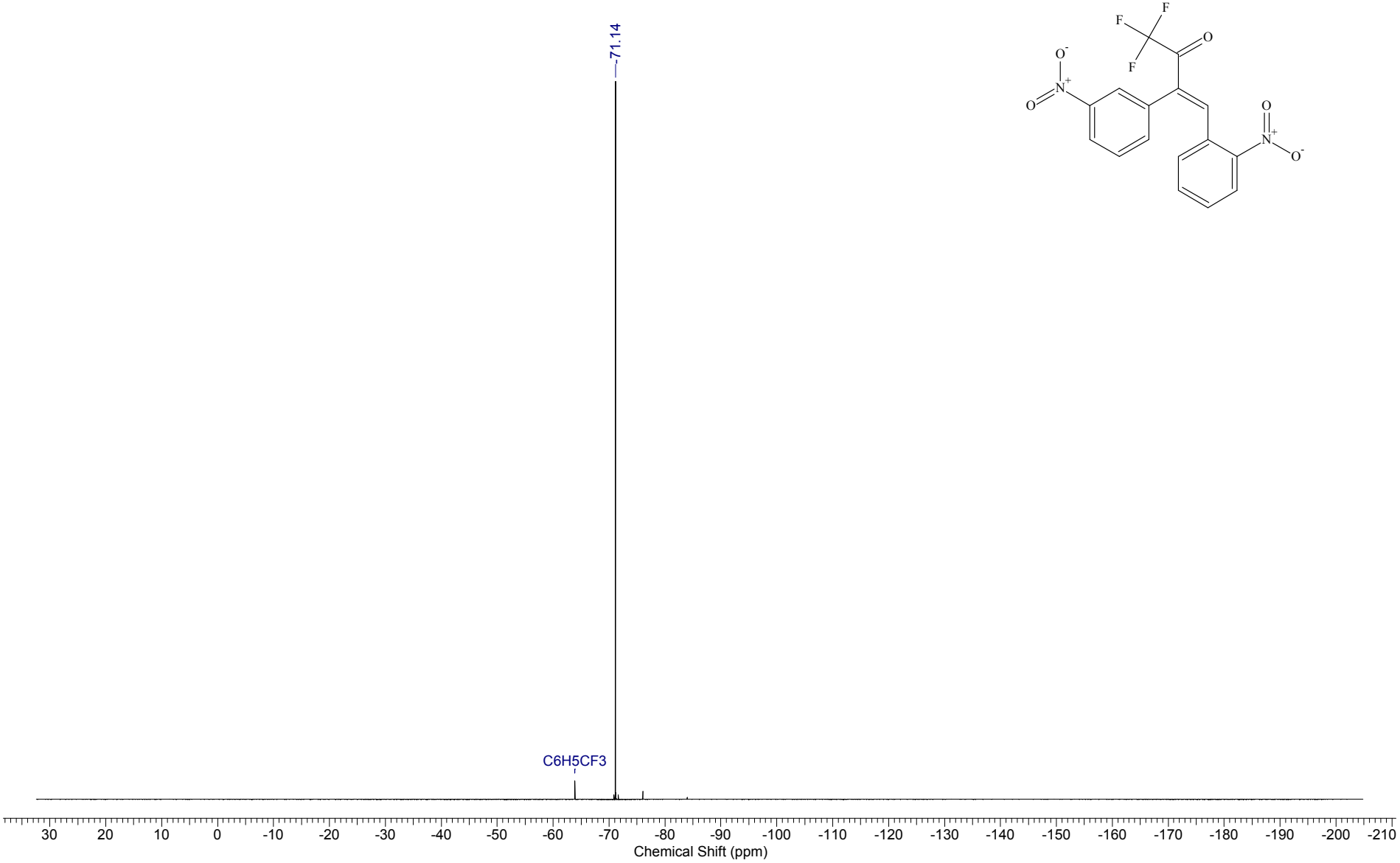
^{13}C NMR spectrum of **4r** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	07 May 2019 14:34:44
File Name	C:\BM_DATA\DOCS\2019.05.07\SZA-101.H_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	4	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



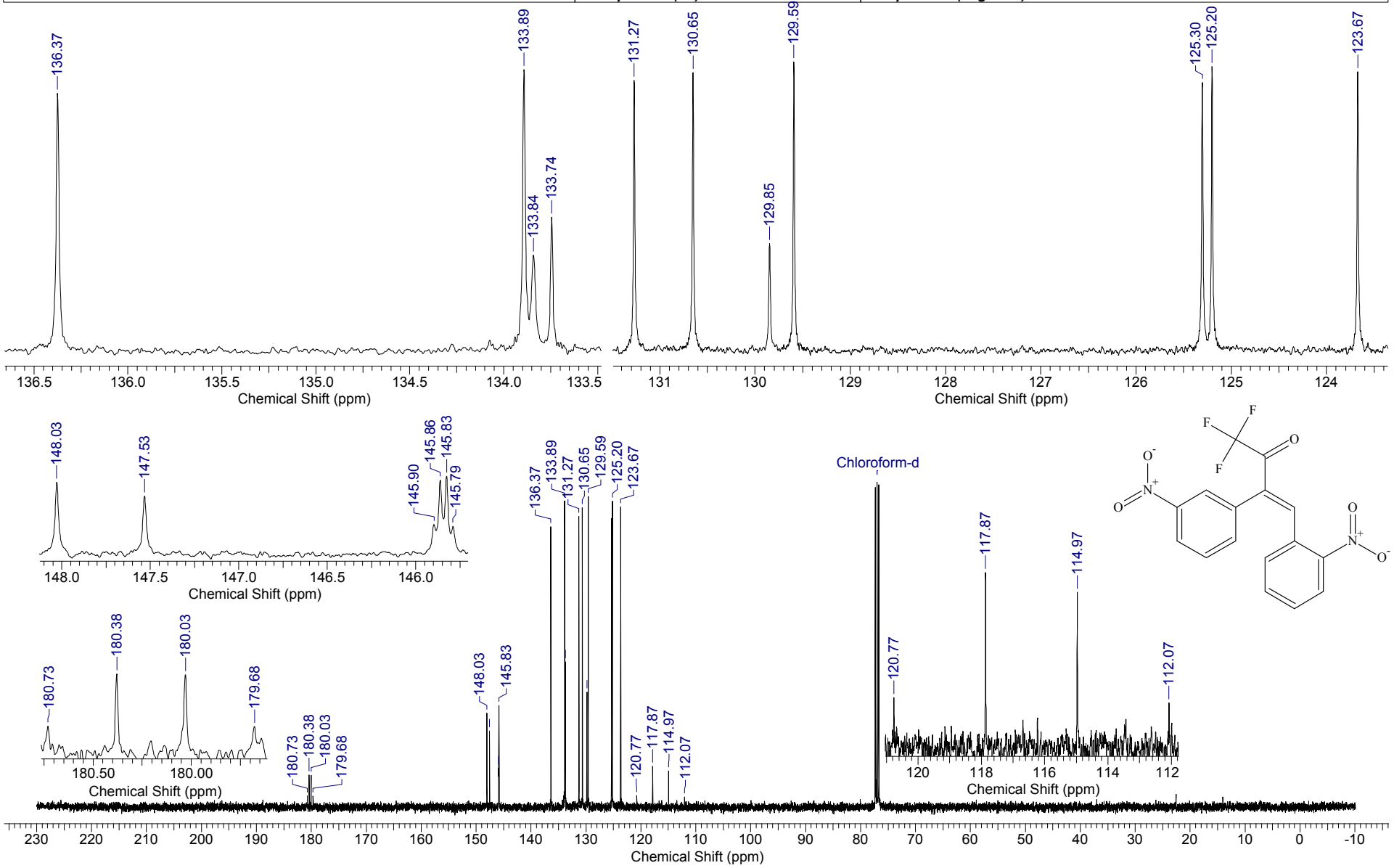
^{1}H NMR spectrum of **4s** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.0000	***Date***	May 13 2019	***File Name***	C:\Users\BM-1\Downloads\F19\SZA-101_20190513_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	16	***Original Points Count***	89286
Points Count	131072	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	30.000				



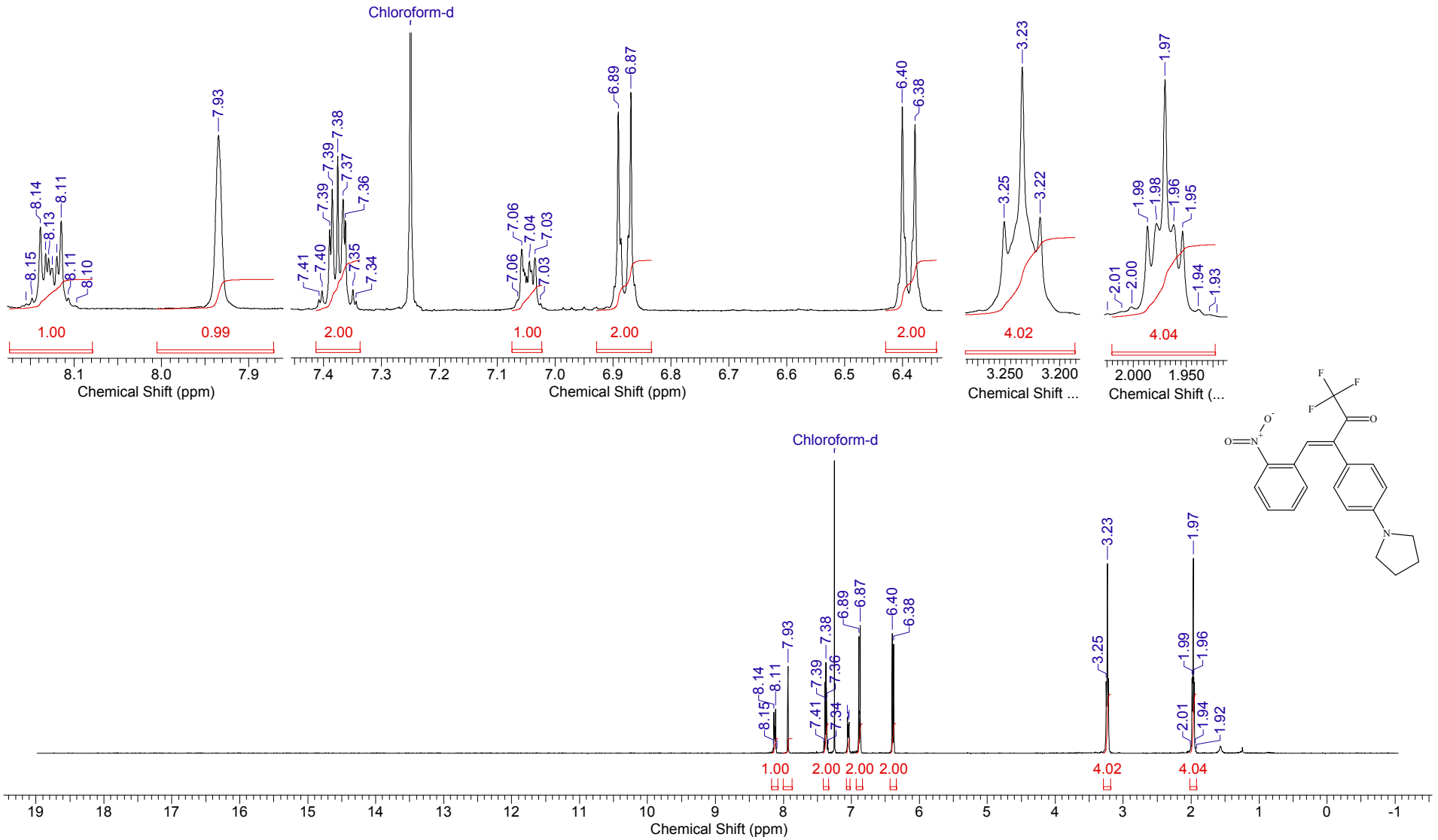
^{19}F NMR spectrum of **4s** (376.5 MHz $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	08 May 2019 17:27:04
File Name	C:\Users\BM-1\Downloads\noname01\SZA-101.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	265	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



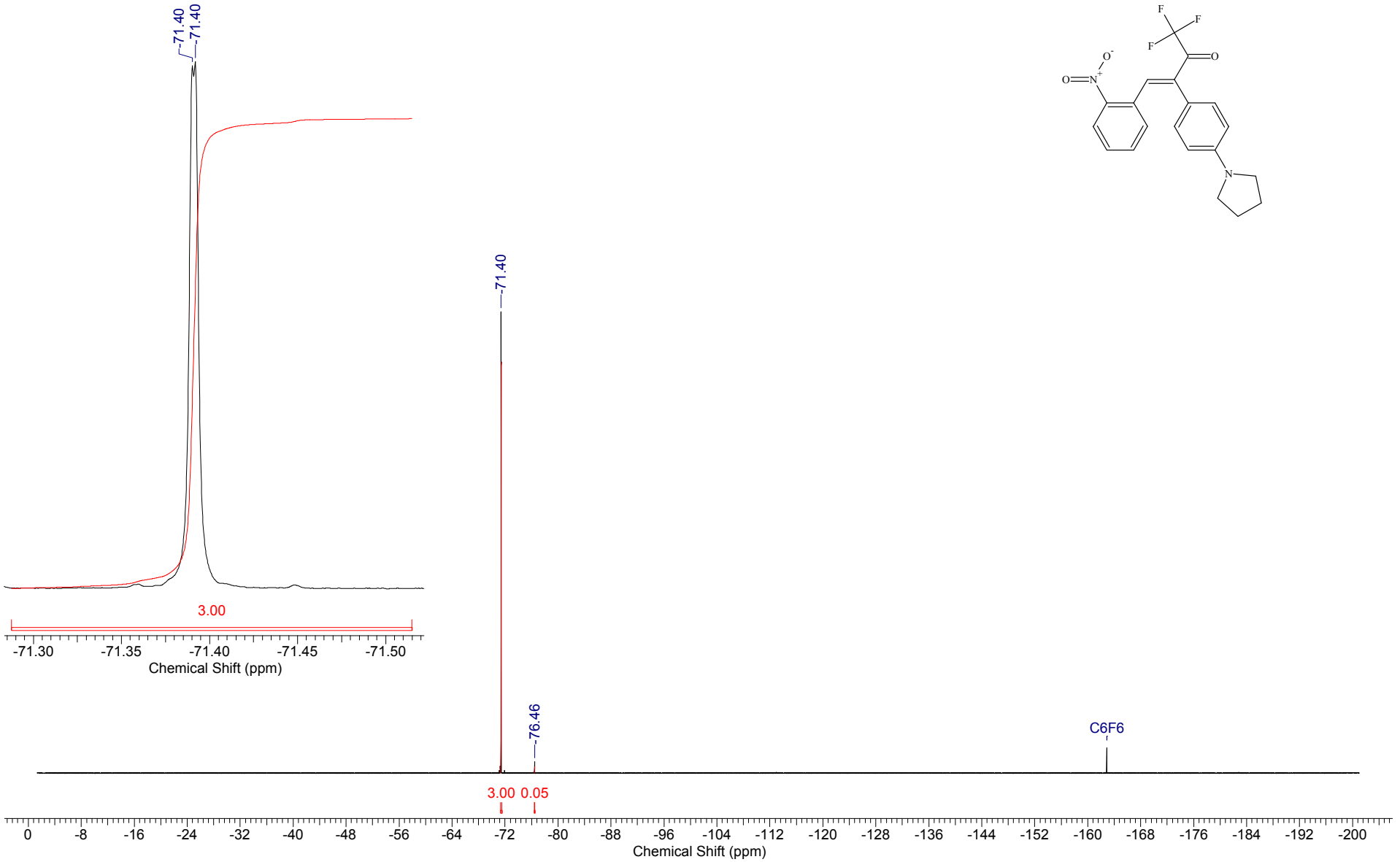
^{13}C NMR spectrum of **4s** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	20 Mar 2020 15:35:10
File Name	C:\DOCS\OUTPUT_301\2020\03.l àðð\BM-1861-3p.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



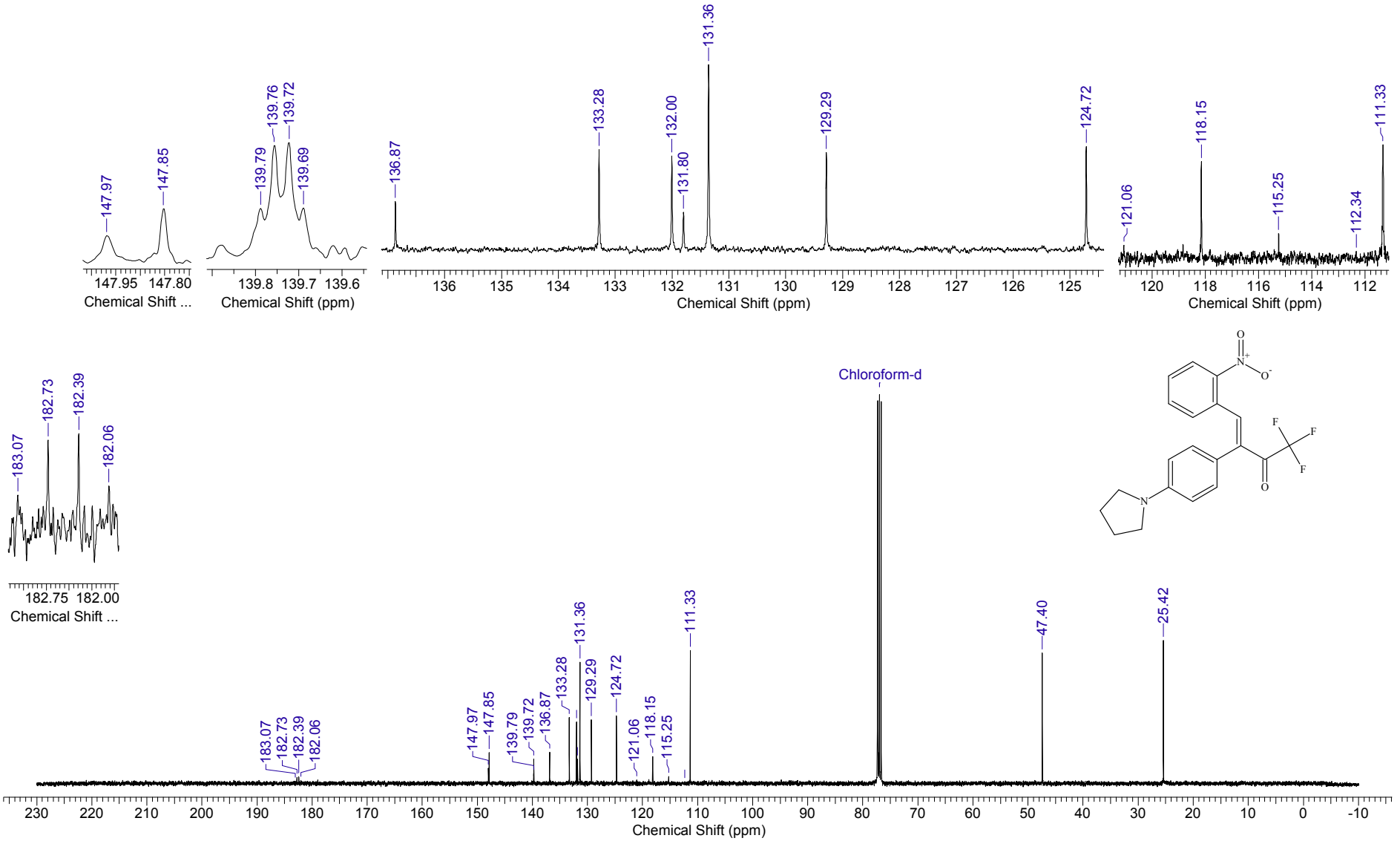
^{1}H NMR spectrum of **4t** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.7433	***Comment***	Imported from UXNMR.			***Date***	08 Jul 2020 21:01:42		
File Name	C:\DOCS\BM\200708\BM-1861-3p_005001r			***Frequency (MHz)***	376.50	***Nucleus***	19F	***Number of Transients***	16
Original Points Count	131072	***Points Count***	1048576	***Pulse Sequence***	zgflqn	***Solvent***	BENZENE-D6	***Sweep Width (Hz)***	75187.97
Temperature (degree C)	27.000								



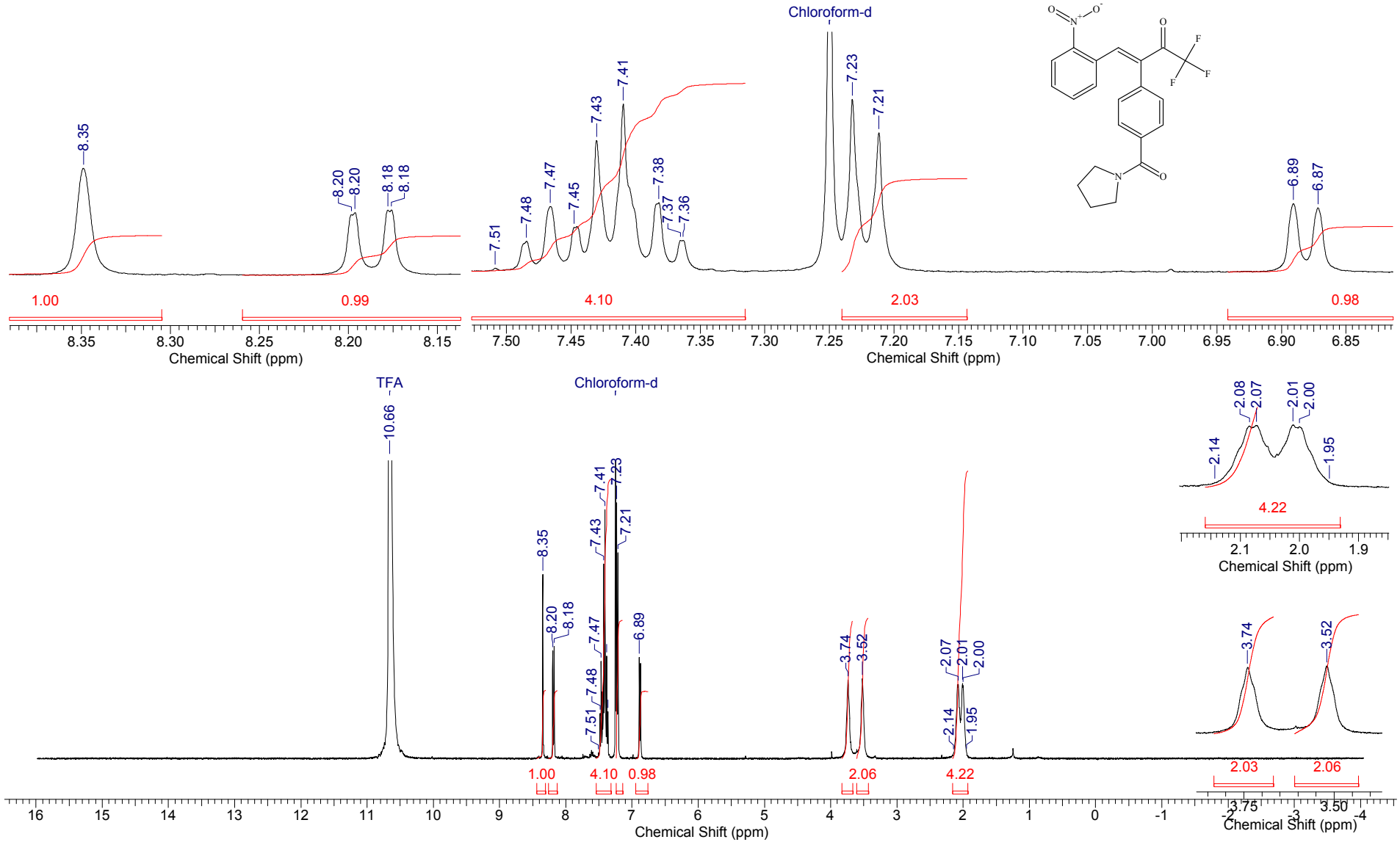
^{19}F NMR spectrum of **4t** (376.5 MHz $CDCl_3$). Signals of minor Z-isomer are also shown

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	21 Mar 2020 12:24:56
File Name	C:\BM_DATA\DOCS\BM-1861-3p\BM-1861-3p_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	1576	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



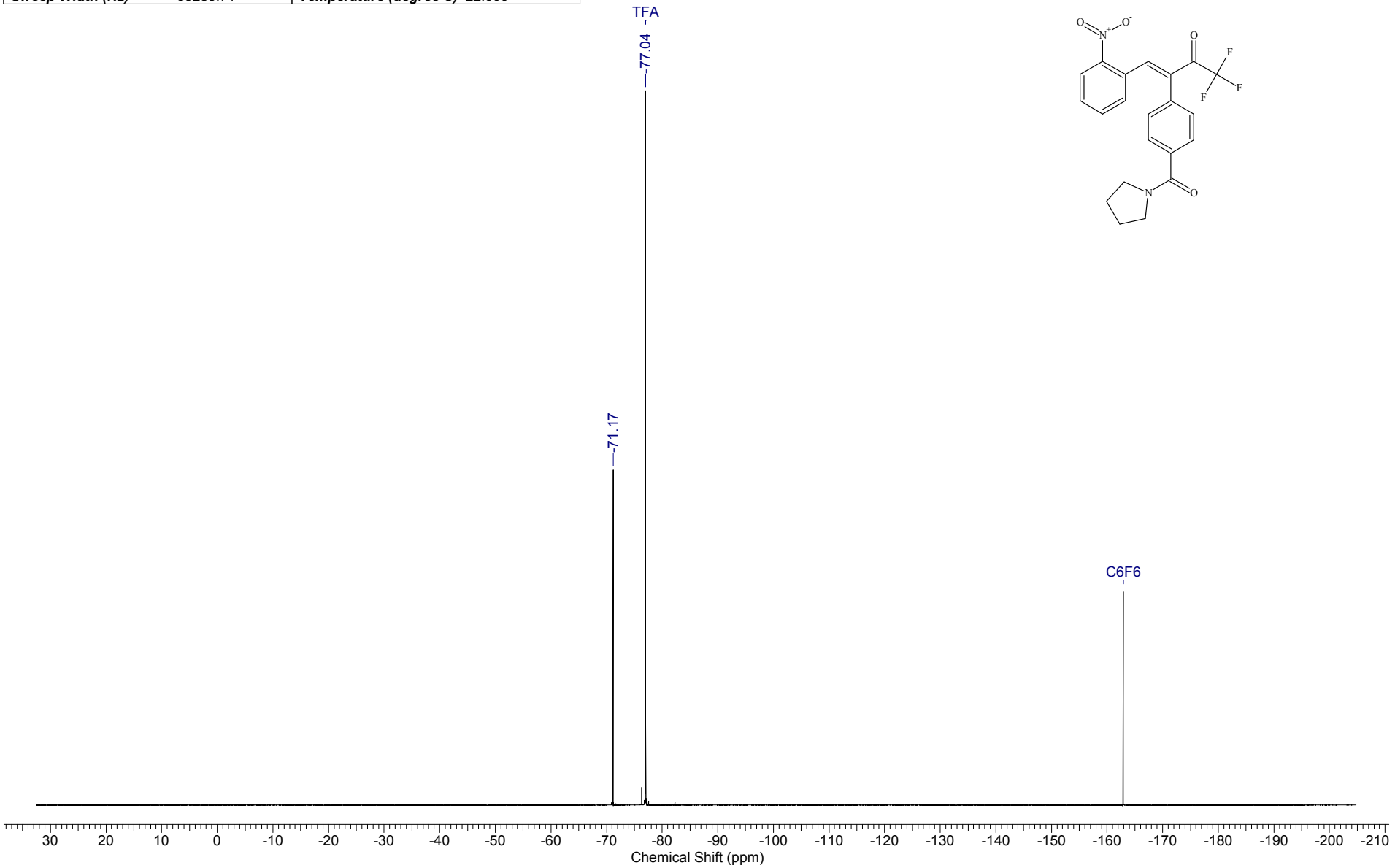
^{13}C NMR spectrum of **4t** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	18 Jul 2019 14:53:22
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\SZA-140-40-F.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



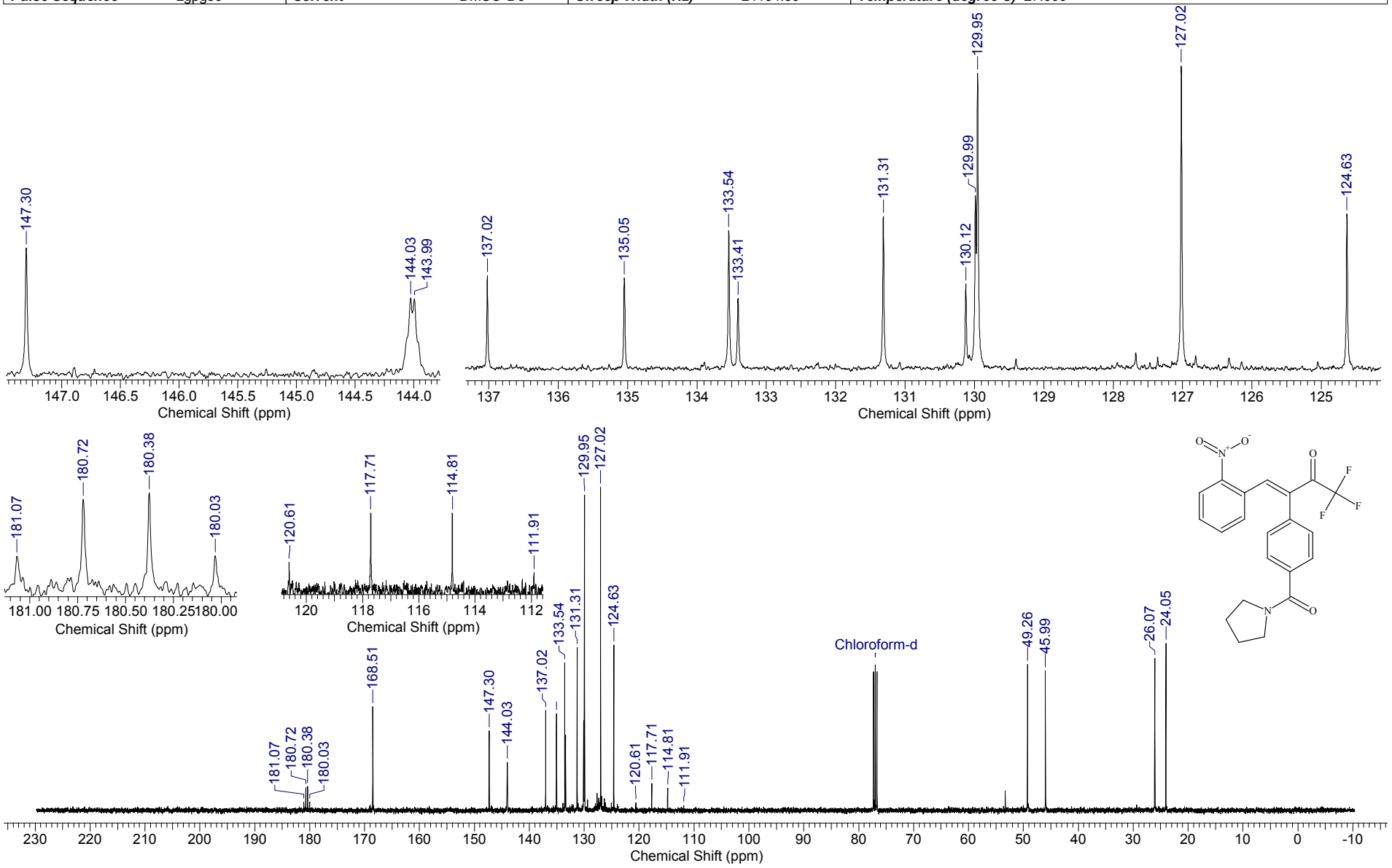
^{1}H NMR spectrum of **4u** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.0000	***Date***	Sep 6 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.06\SZA-140-40-F_20190906_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	4	***Original Points Count***	89286
Points Count	131072	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	22.000				



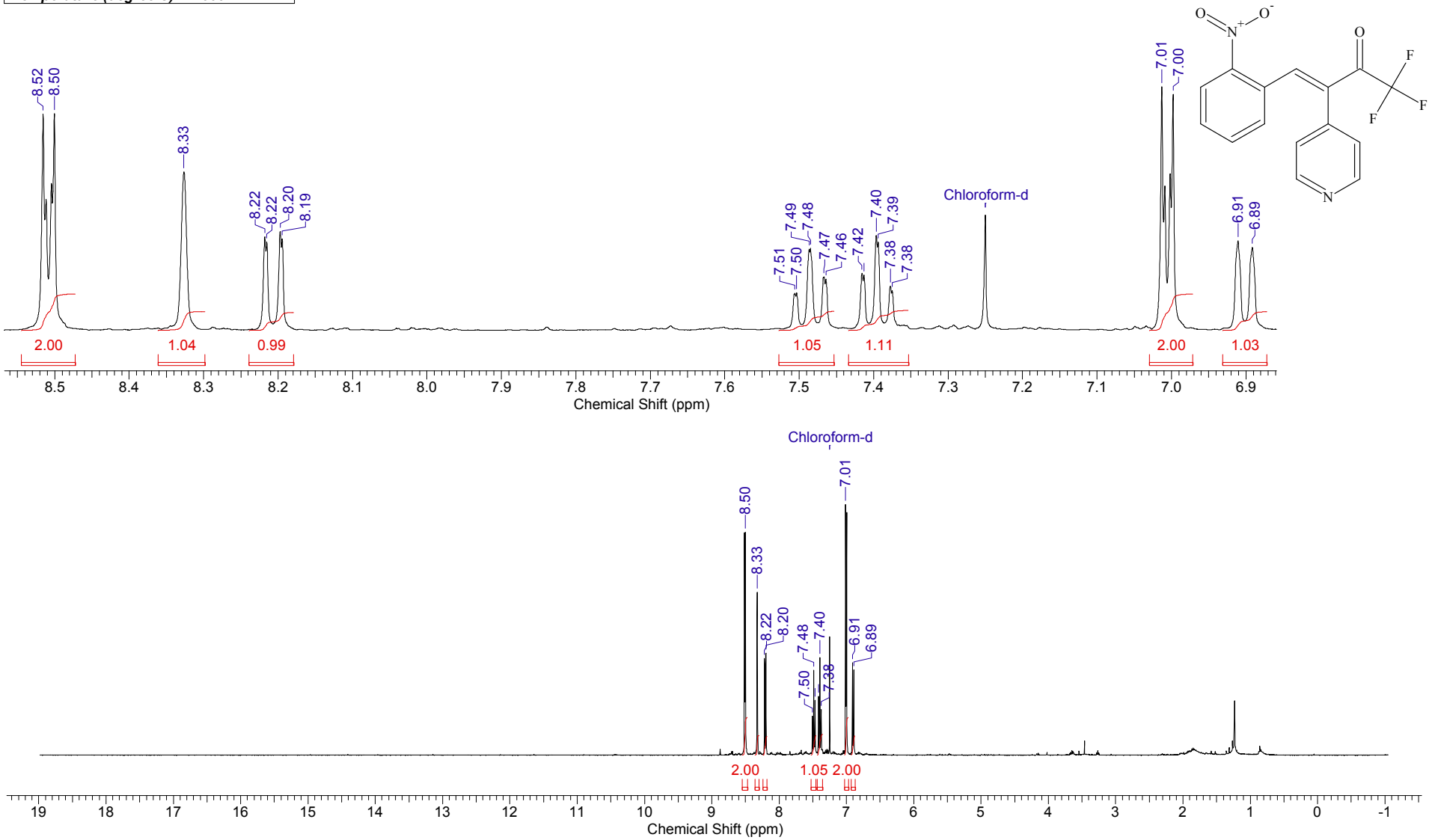
^{19}F NMR spectrum of **4u** (376.5 MHz $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	16 Jul 2019 14:59:54
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\SZA-140-40.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	97	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



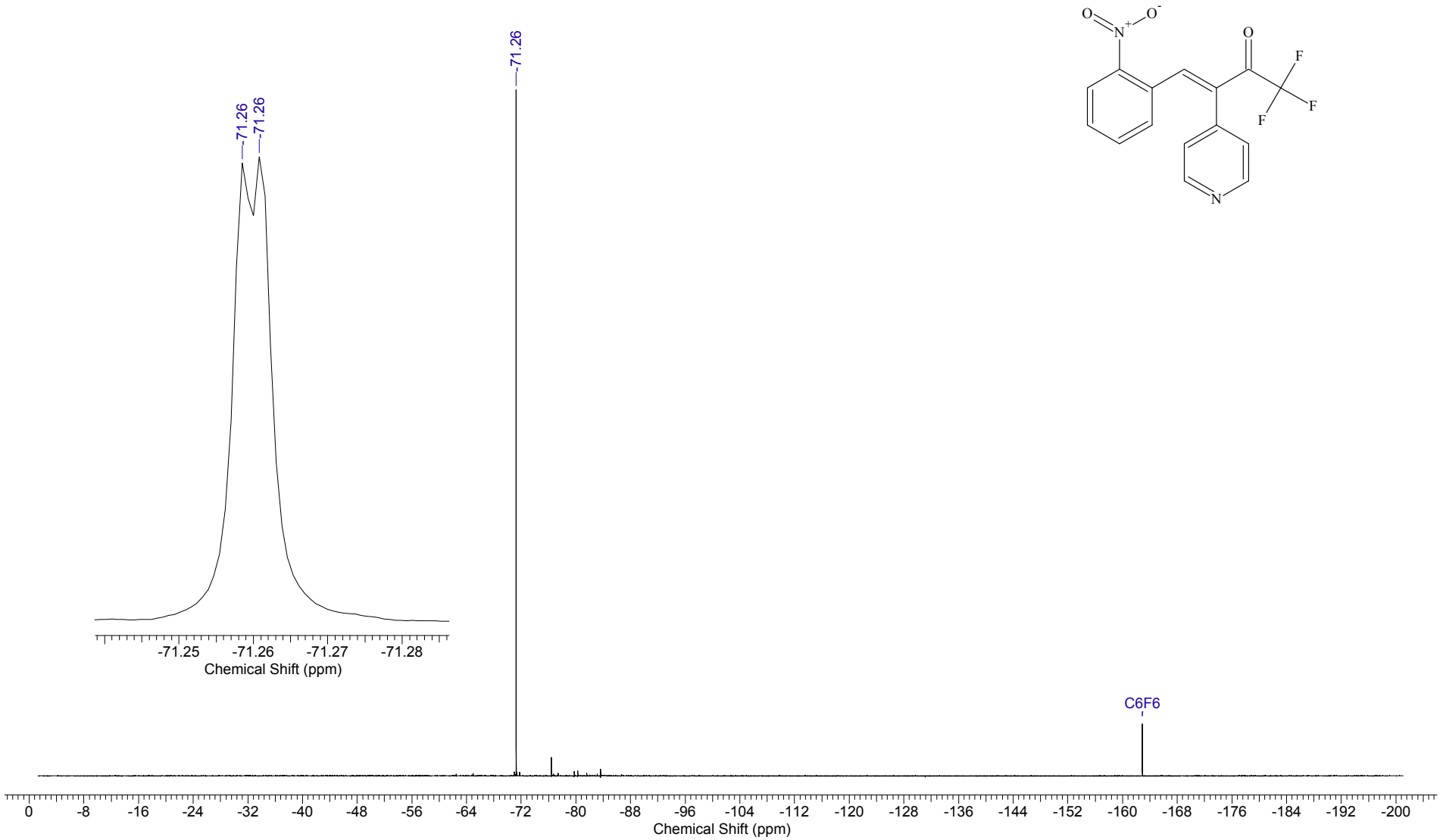
^{13}C NMR spectrum of **4u** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	02 Mar 2021 14:43:50
File Name	C:\DOCS\OUTPUT_301\2021\03.ì àðò\SZA-226-31.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



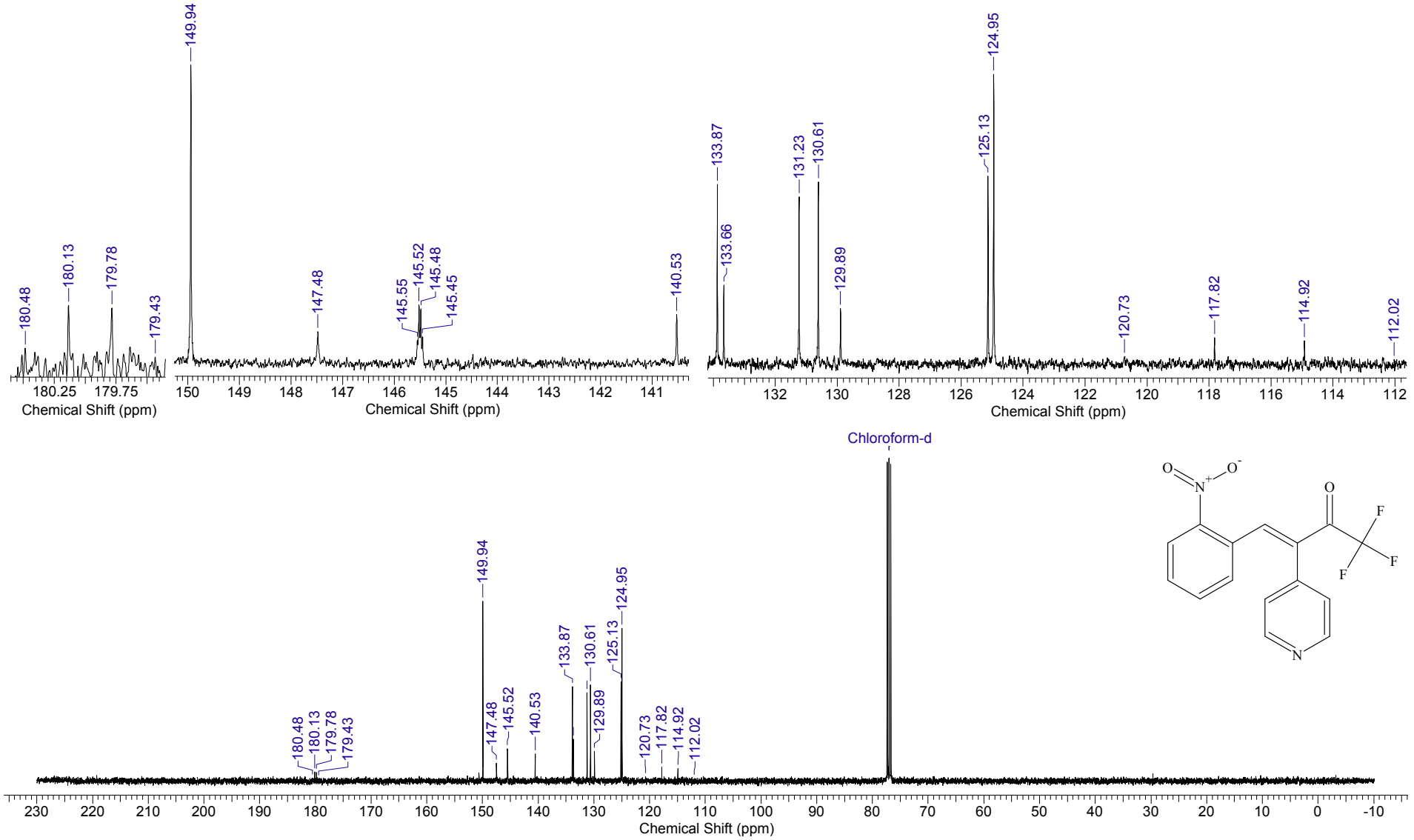
^{1}H NMR spectrum of crude **4v** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.7433	***Comment***	Imported from UXNMR.			***Date***	02 Mar 2021 15:56:08
File Name	C:\DOCS\OUTPUT_301\2021\03.ì àðò\SZA-226-31.F_005001r					***Frequency (MHz)***	376.50
Nucleus	19F	***Number of Transients***	12	***Original Points Count***	131072	***Points Count***	262144
Pulse Sequence	zgflqn	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	75187.97
Temperature (degree C)	27.000						



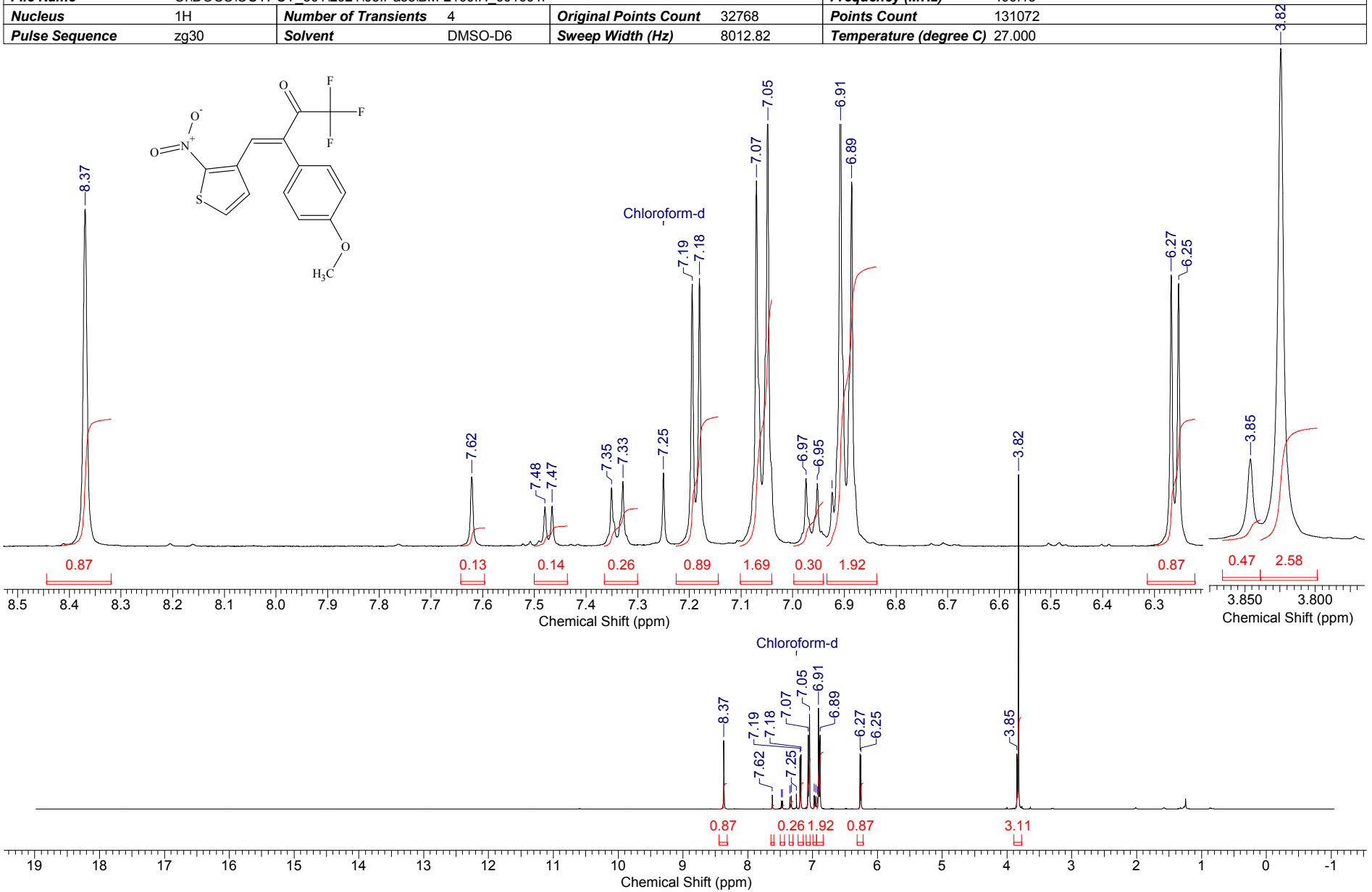
^{19}F NMR spectrum of crude **4v** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	03 Mar 2021 18:01:14
File Name	C:\DOCS\OUTPUT_301\2021\03.l àðð\SZA-226-31.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	361	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



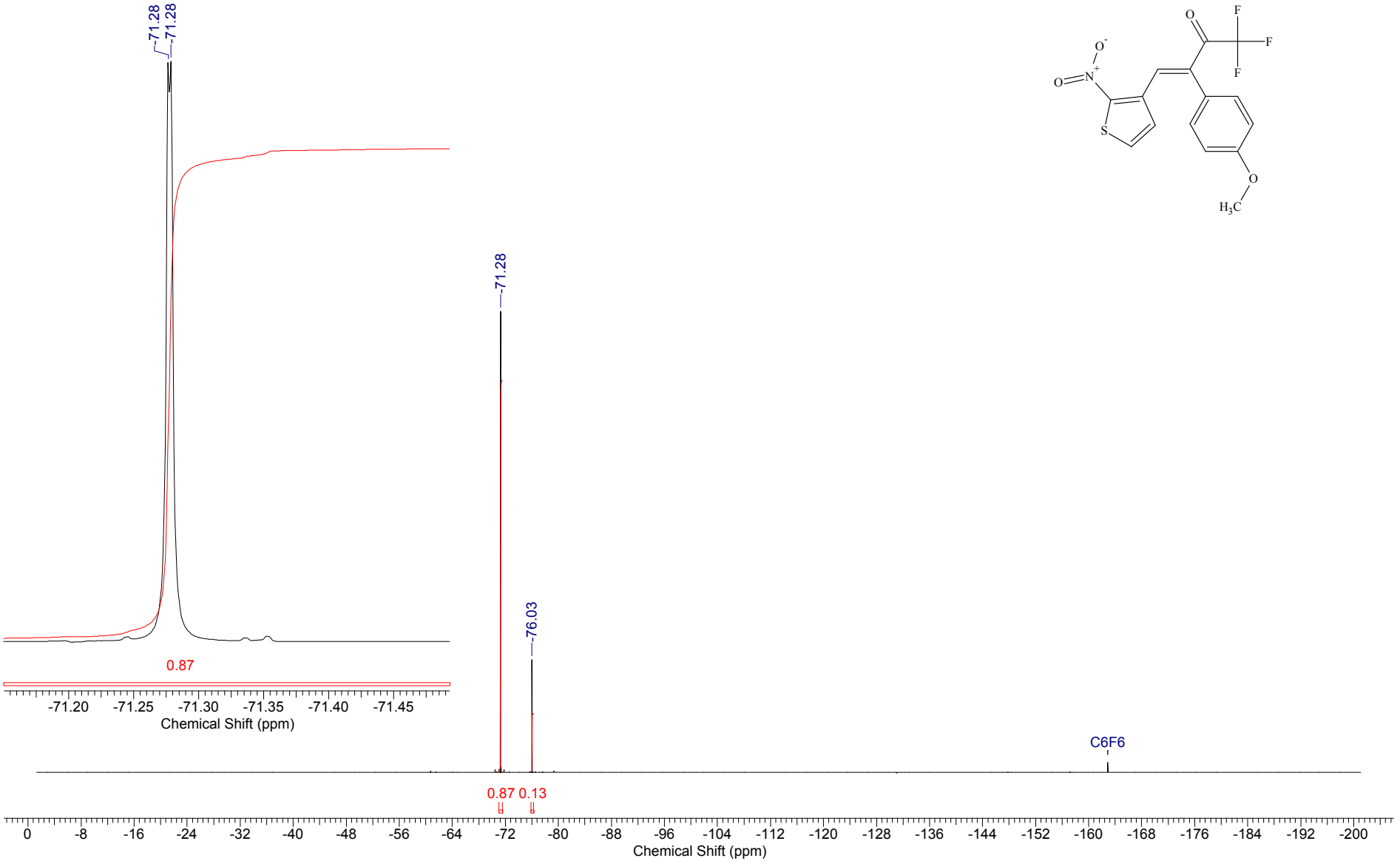
^{13}C NMR spectrum of crude **4v** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	10 Mar 2021 17:43:24
File Name	C:\DOCS\OUTPUT_301\2021\03.ì àðò\BM-2100.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



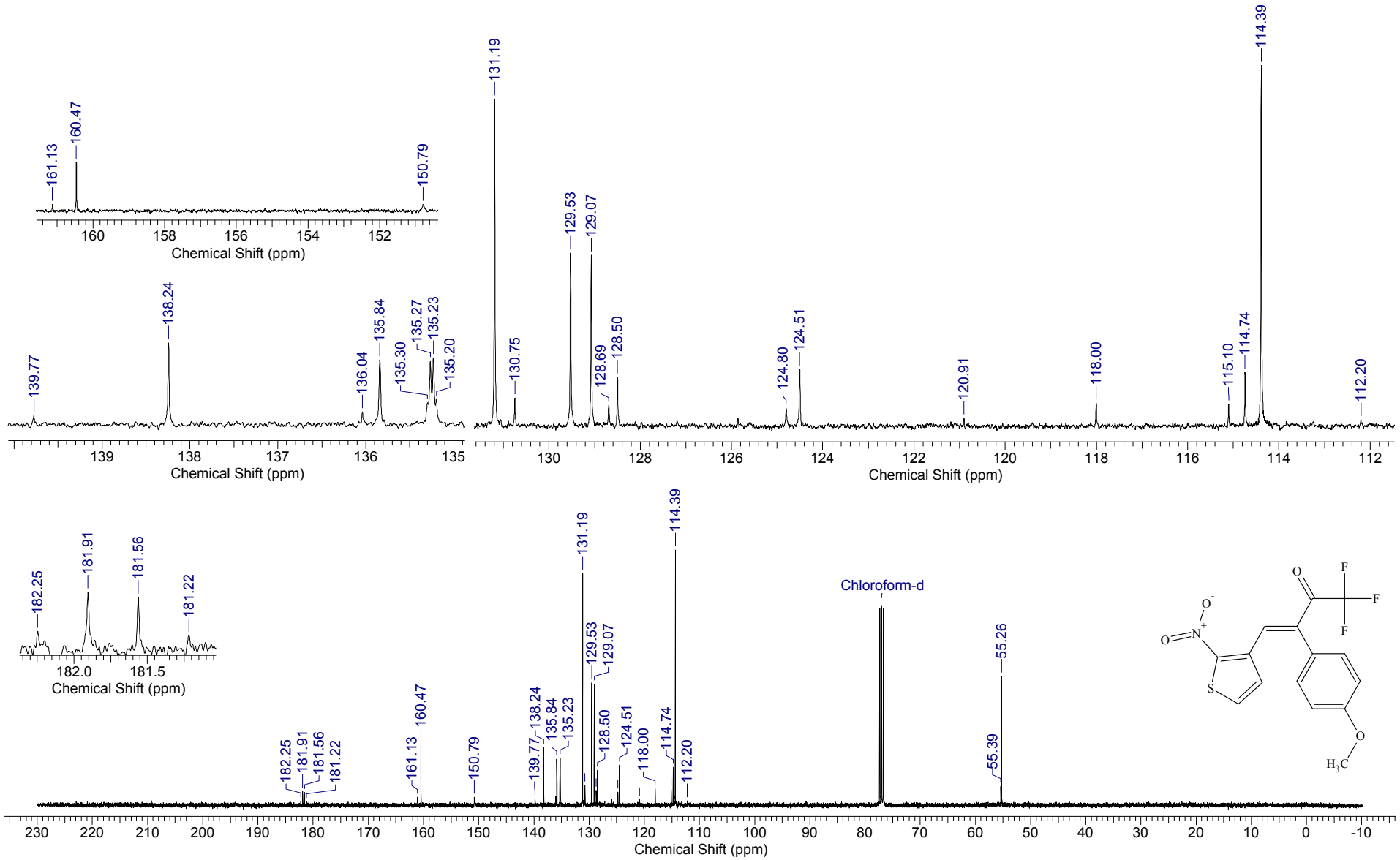
^{1}H NMR spectrum of **4w** (400.1 MHz, $CDCl_3$). Mixture of *E*- and *Z*-isomers 87:13

Acquisition Time (sec)	1.7433	***Comment***	Imported from UXNMR.			***Date***	11 Mar 2021 13:01:58
File Name	C:\DOCS\OUTPUT_301\2021\03.ì àðò\BM-2100.F_005001r			***Frequency (MHz)***	376.50	***Nucleus***	19F
Number of Transients	12	***Original Points Count***	131072	***Points Count***	262144	***Pulse Sequence***	zgflqn
Solvent	DMSO-D6	***Sweep Width (Hz)***	75187.97	***Temperature (degree C)***	27.000		



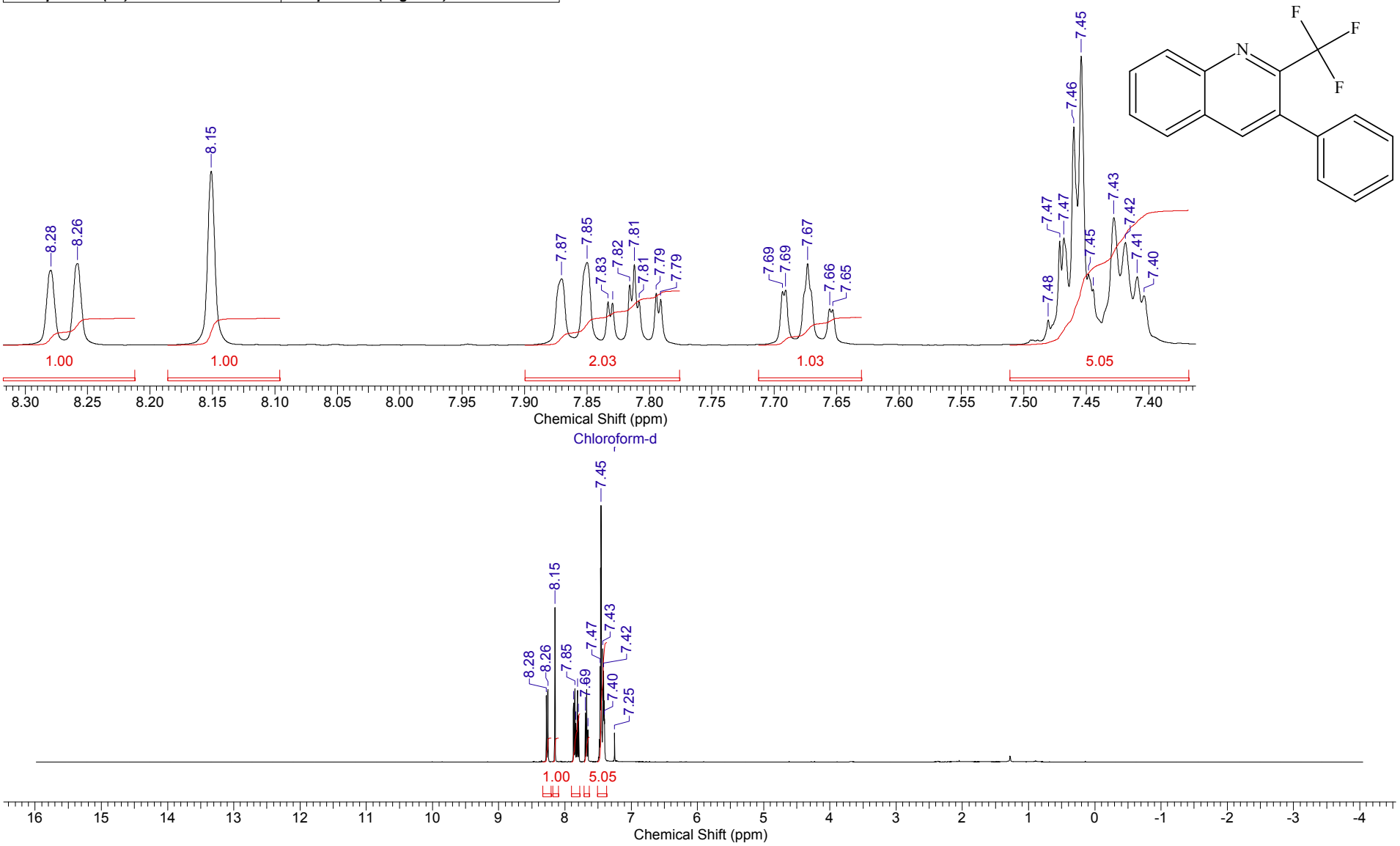
^{19}F NMR spectrum of **4w** (376.5 MHz, $CDCl_3$). Mixture of *E*- and *Z*-isomers 87:13

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	10 Mar 2021 17:59:14
File Name	C:\DOCS\OUTPUT_301\2021\03.ì àðò\BM-2100.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	401	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000		



^{13}C NMR spectrum of **4w** (100.6 MHz, $CDCl_3$). Mixture of *E*- and *Z*-isomers 87:13

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	18 May 2019 13:40:02		
File Name	C:\DOCS\OUTPUT_301\2019\05.ì àé\BM-1573=R.H_001001r					***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	4	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	MeOD
Sweep Width (Hz)	8012.82	***Temperature (degree C)***	27.000						

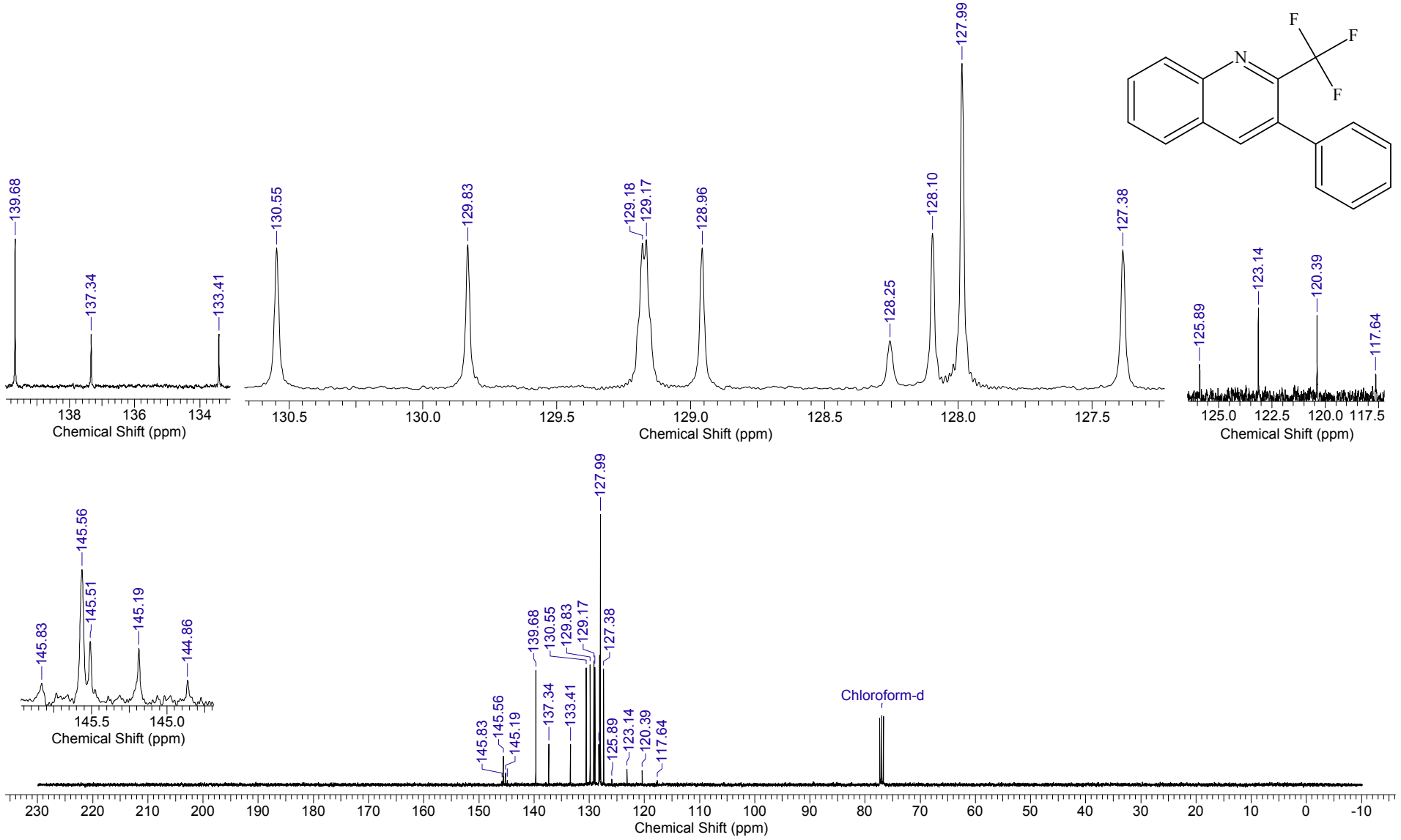


^{1}H NMR spectrum of **5a** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	0.7340	***Date***	May 21 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.05.21\bm1573-f_20190521_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	100	***Original Points Count***	65536
Points Count	65536	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	30.000				

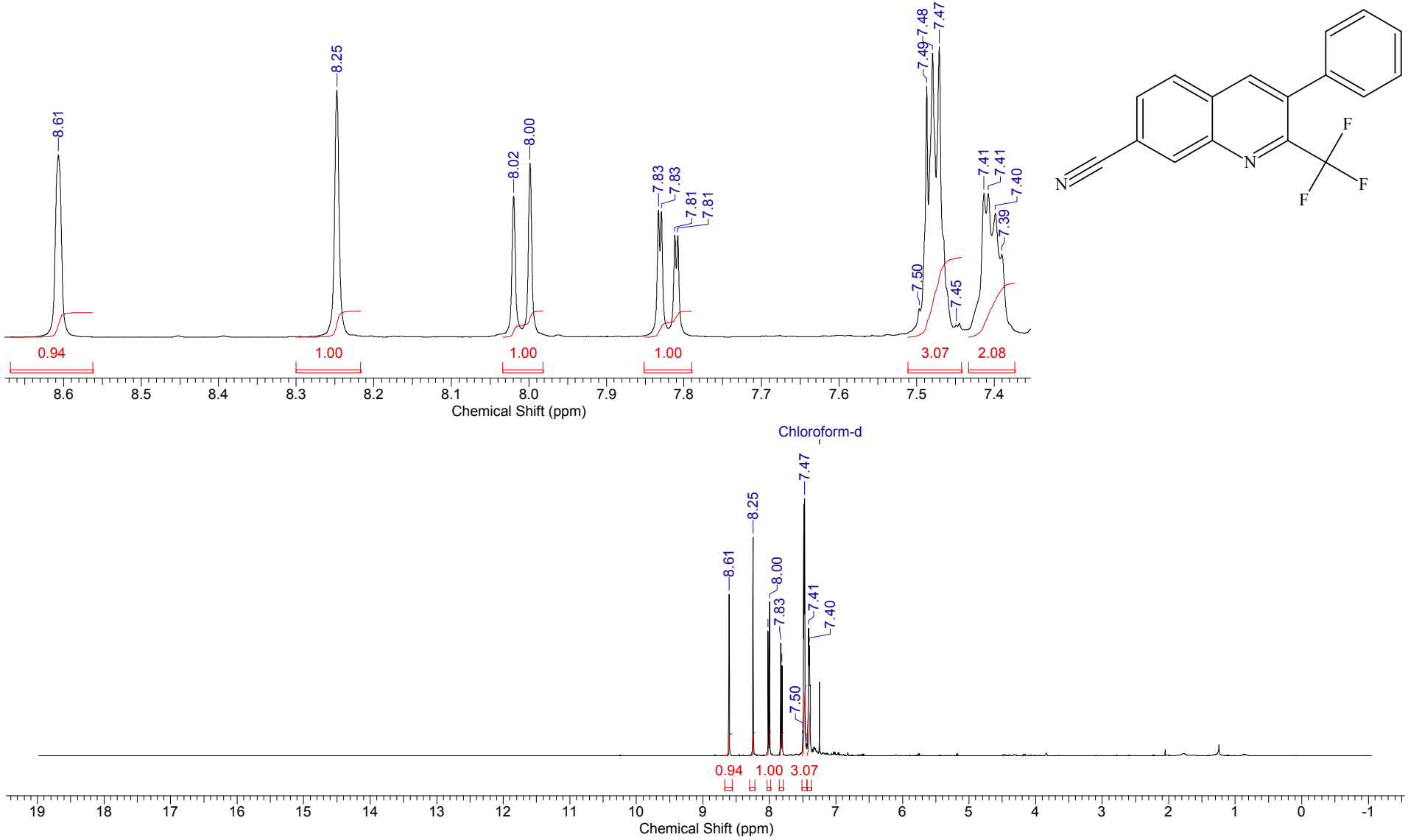
^{19}F NMR spectrum of **5a** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	18 May 2019 13:45:22
File Name	C:\DOCS\OUTPUT_301\2019\05.l àé\BM-1573-R.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	80	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



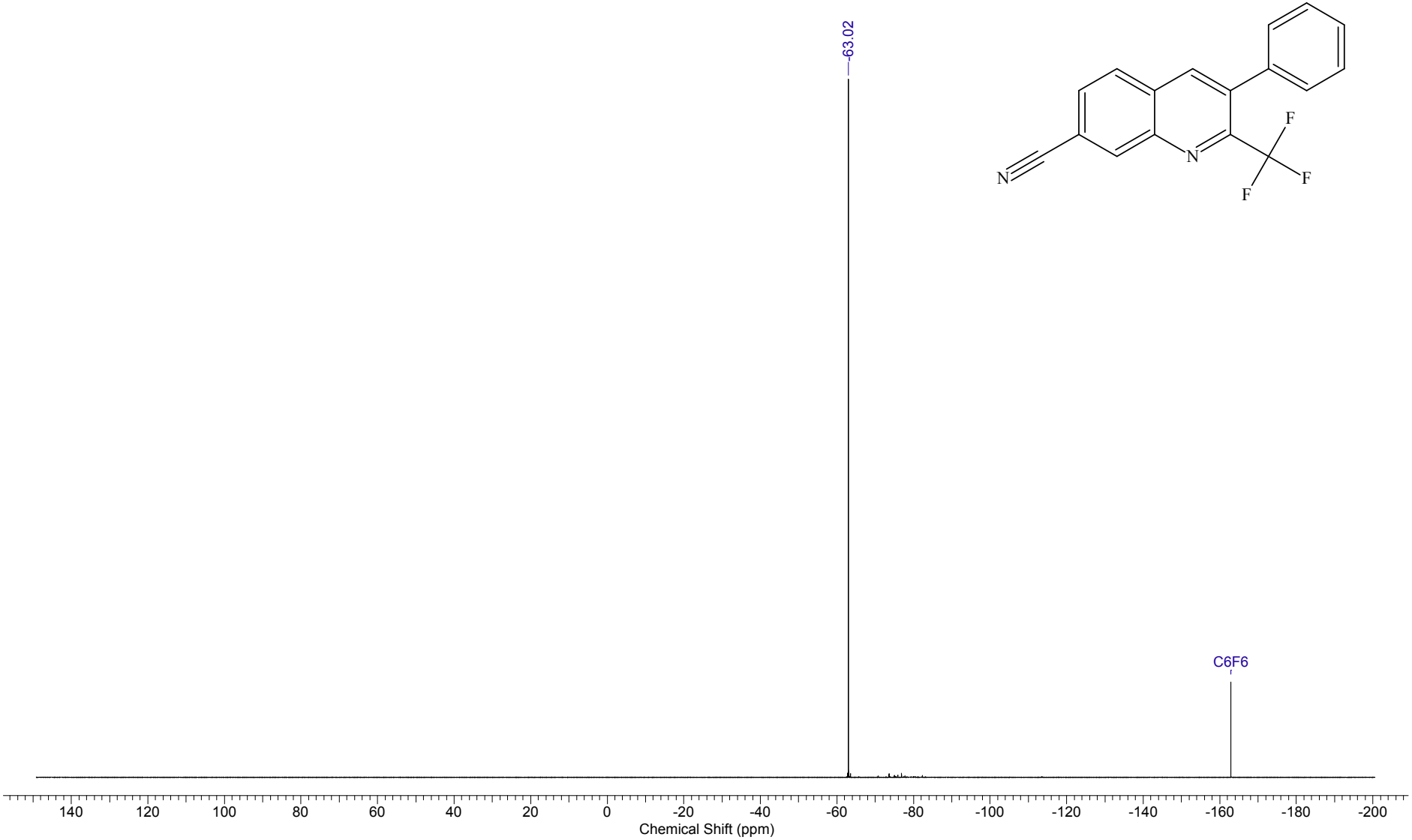
^{13}C NMR spectrum of **5a** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	31 Jul 2019 22:41:08
File Name	C:\Users\BM-1\Downloads\bm190731\BM-1674_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	8	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



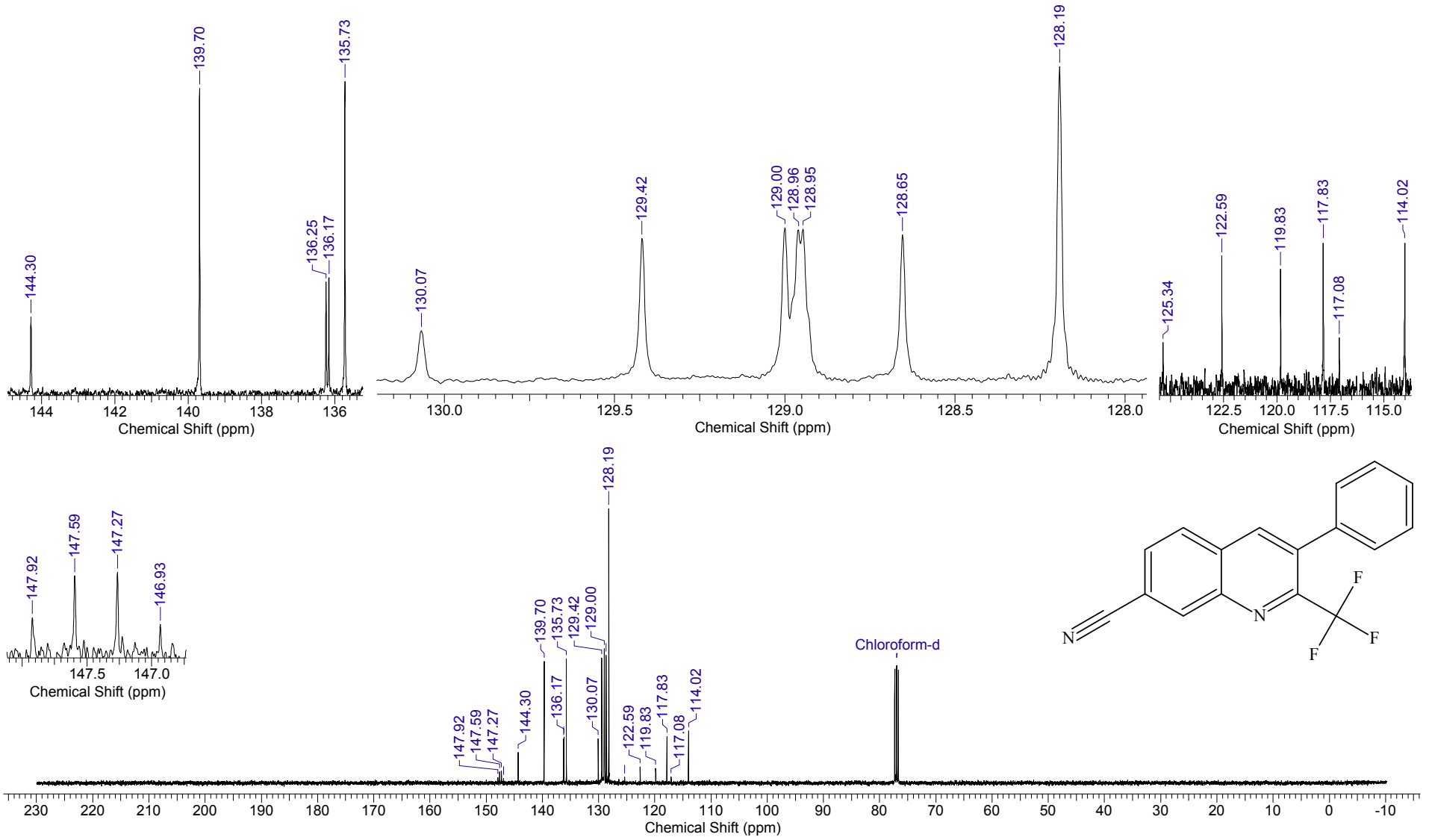
^{1}H NMR spectrum of **5b** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.9923	***Date***	Sep 5 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.05\BM-1674-F_20190905_01\FLUORINE_01		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	262144
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	131578.95	***Temperature (degree C)***	22.000				



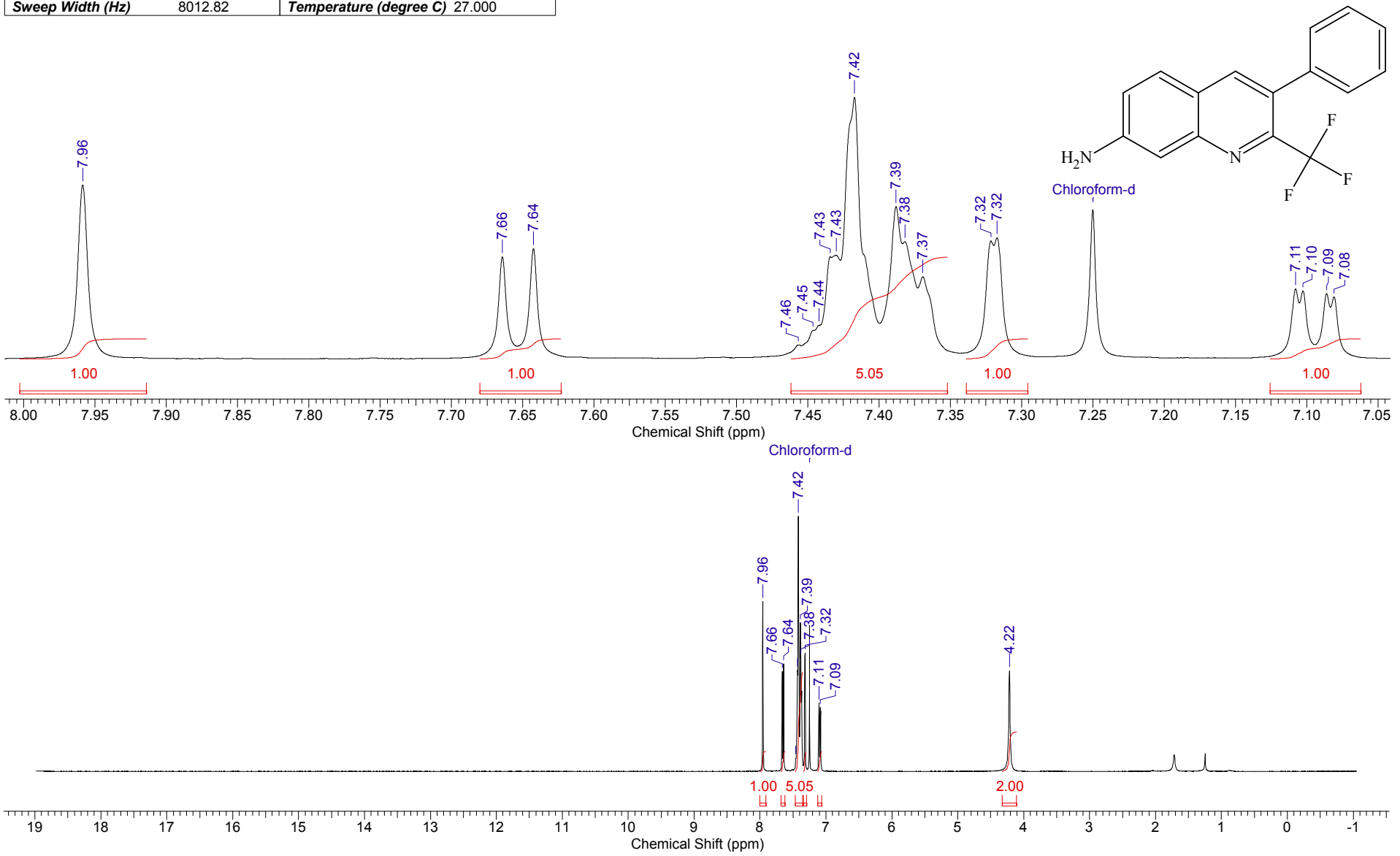
^{19}F NMR spectrum of **5b** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	31 Jul 2019 22:47:00
File Name	C:\Users\BM-1\Downloads\bm190731\BM-1674_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	176	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



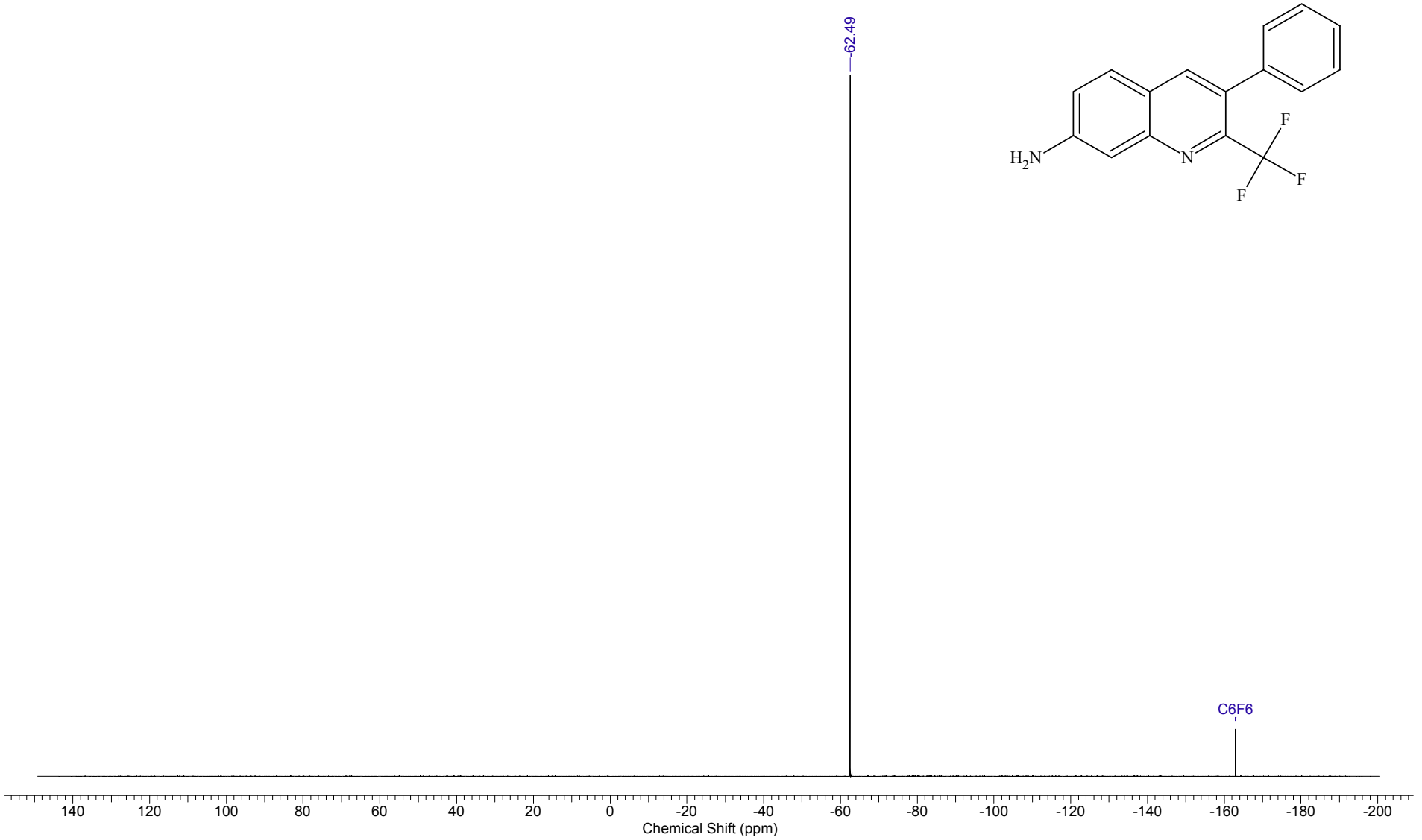
^{13}C NMR spectrum of **5b** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	09 Aug 2019 21:22:18
File Name	C:\DOCS\BM\bm190809\BM-1673-1-d_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Original Points Count	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	CHLOROFORM-D
Sweep Width (Hz)	8012.82	***Temperature (degree C)***	27.000				



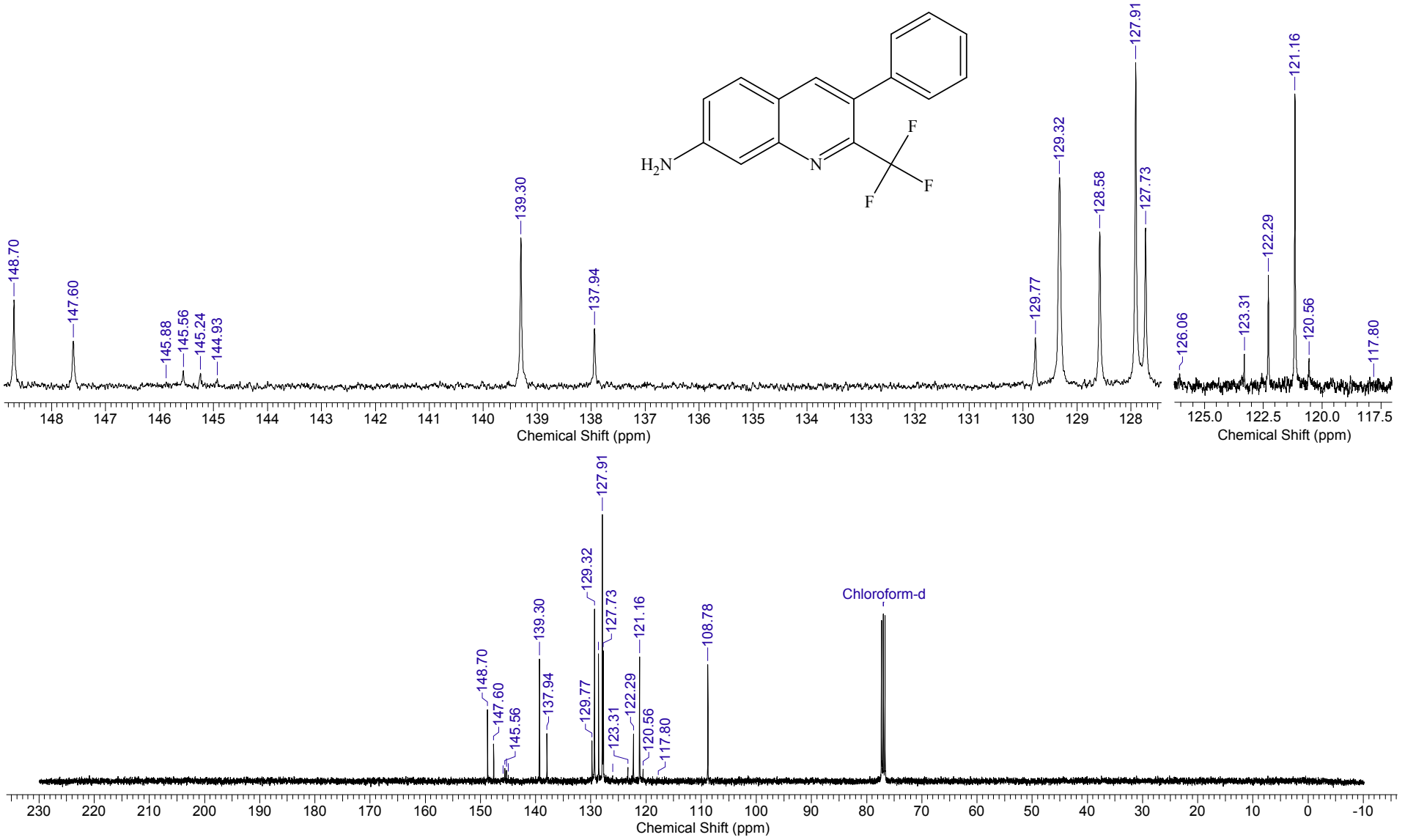
^{1}H NMR spectrum of **5c** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.9923	***Date***	Sep 5 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.05\BM-1673-1d-F_20190905_01\FLUORINE_01		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	262144
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	131578.95	***Temperature (degree C)***	22.000				



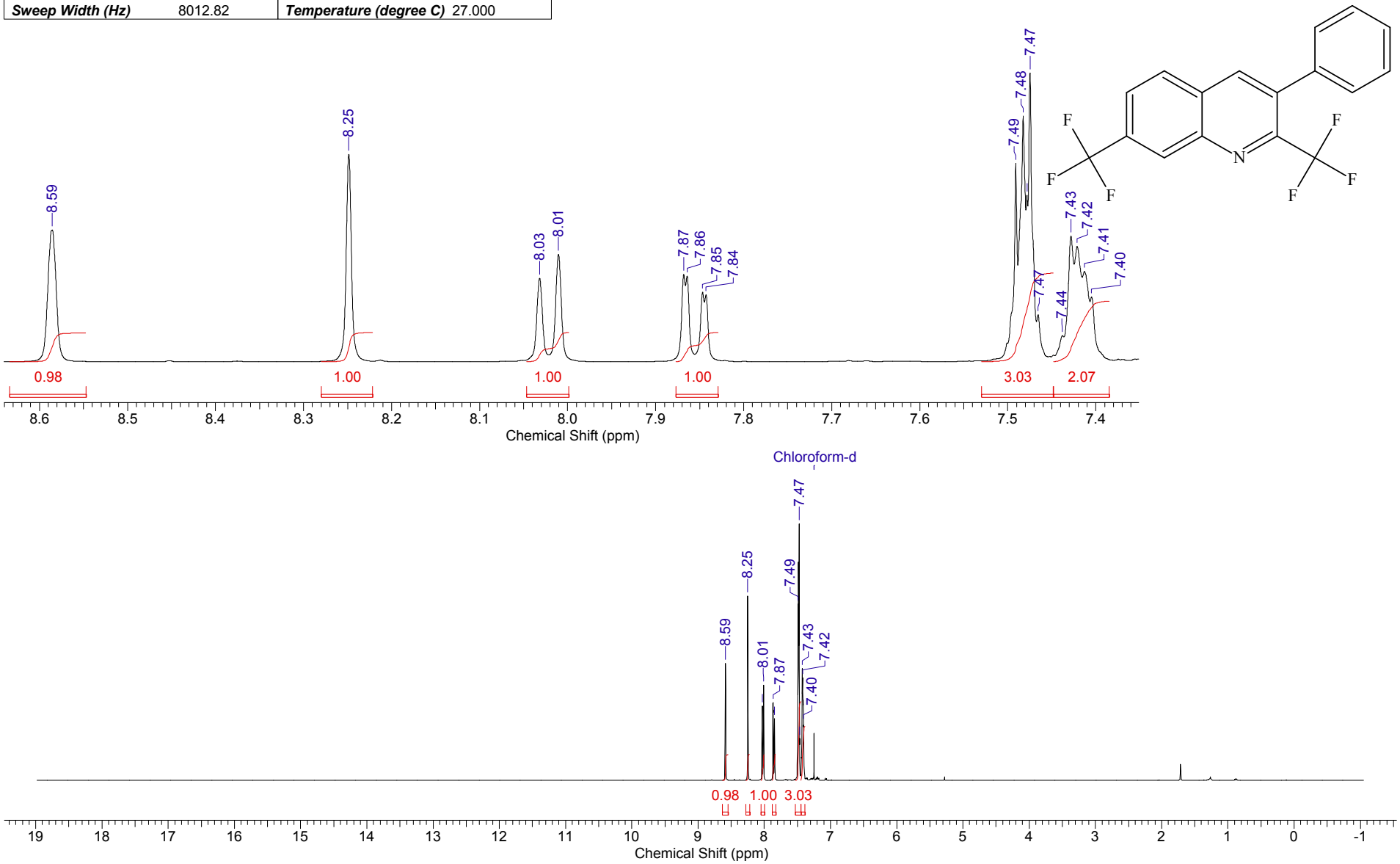
^{19}F NMR spectrum of **5c** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	05 Aug 2019 21:34:52
File Name	C:\Users\BM-1\Downloads\bm190805\BM-1673-1_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	536	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



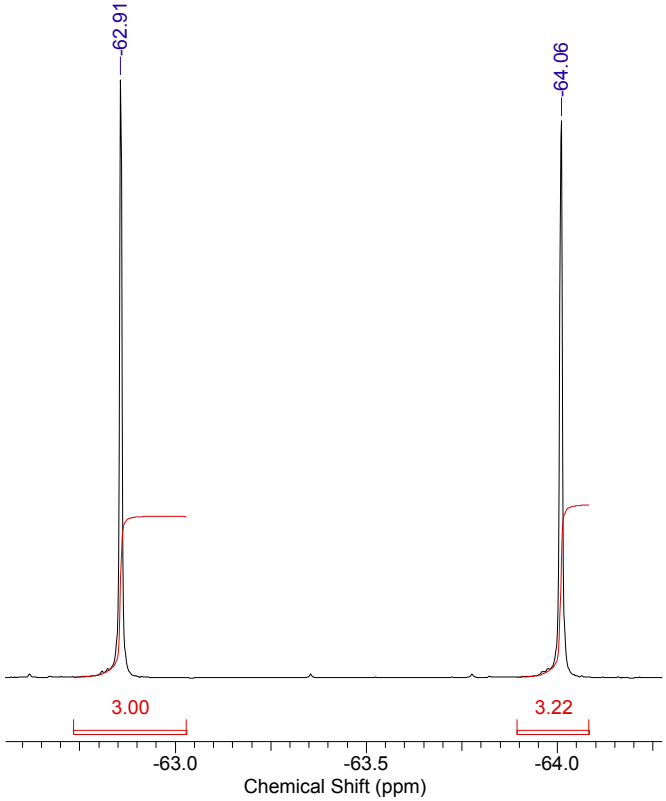
^{13}C NMR spectrum of **5c** (100.6 MHz, $CDCl_3$)

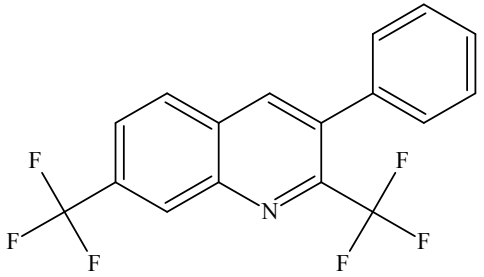
Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	03 Aug 2019 21:22:42
File Name	C:\DOCS\BM\190803\BM-1693-2_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H	***Number of Transients***	8
Original Points Count	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	8012.82	***Temperature (degree C)***	27.000						

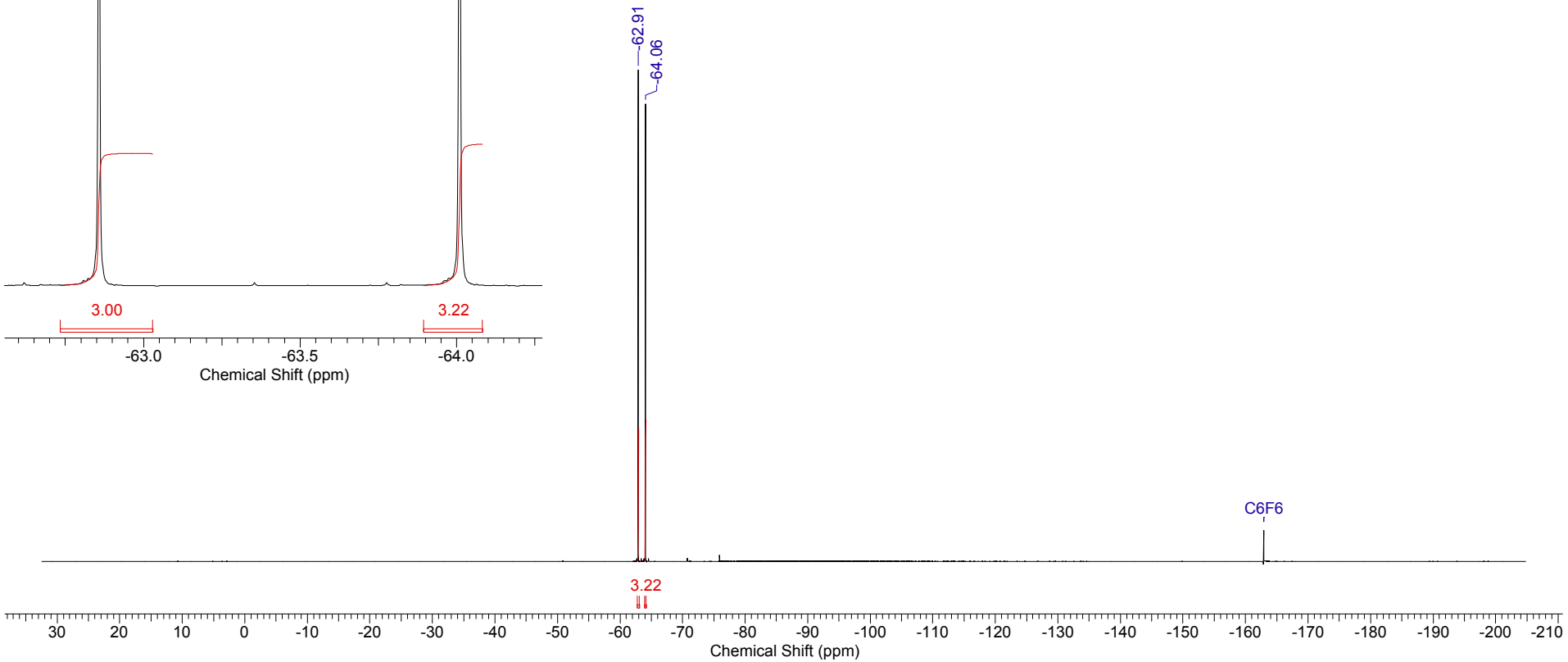


^{1}H NMR spectrum of **5d** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.0000	***Date***	Sep 6 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.06\BM-1693-2_20190906_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	4	***Original Points Count***	89286
Points Count	131072	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	22.000				

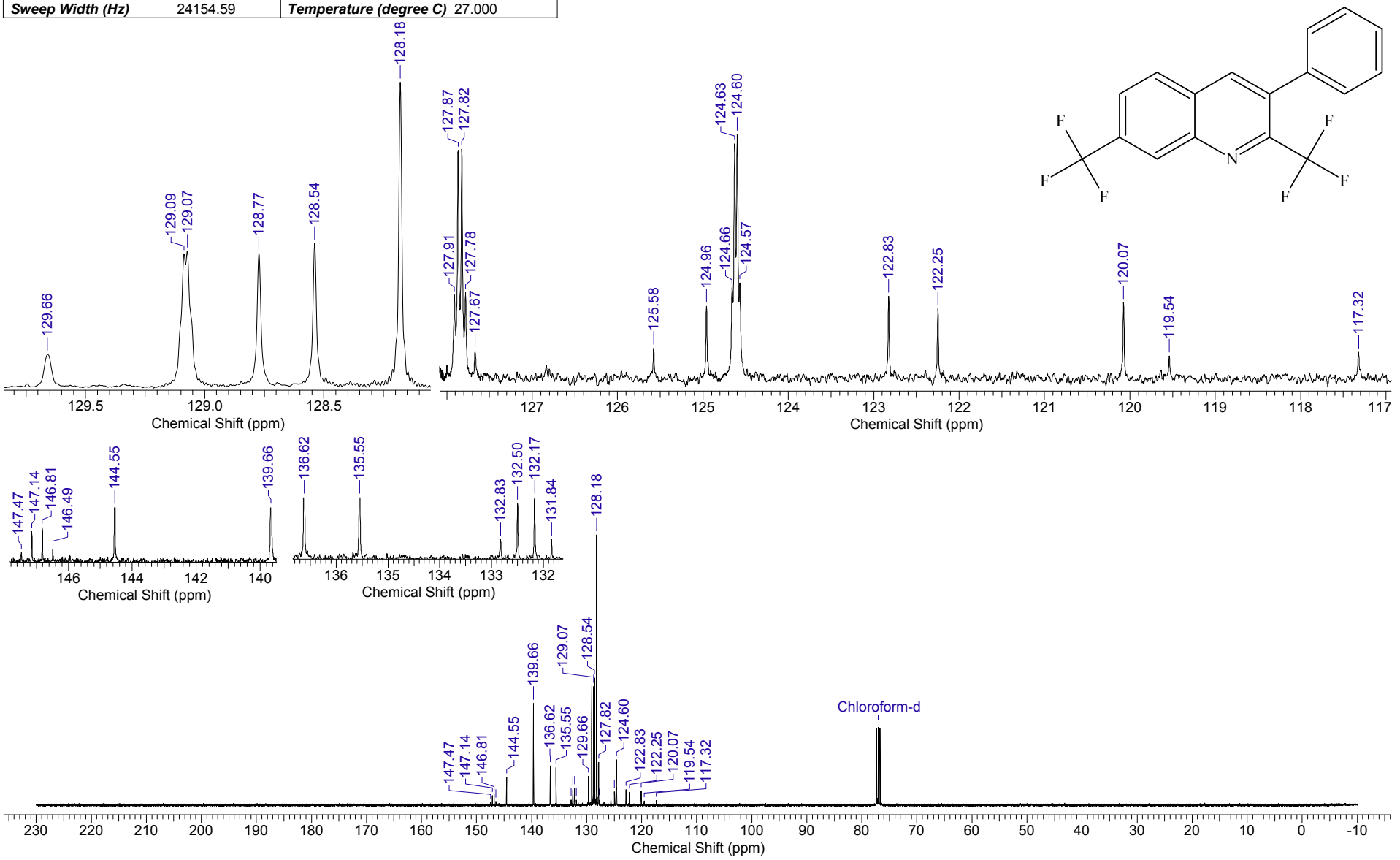






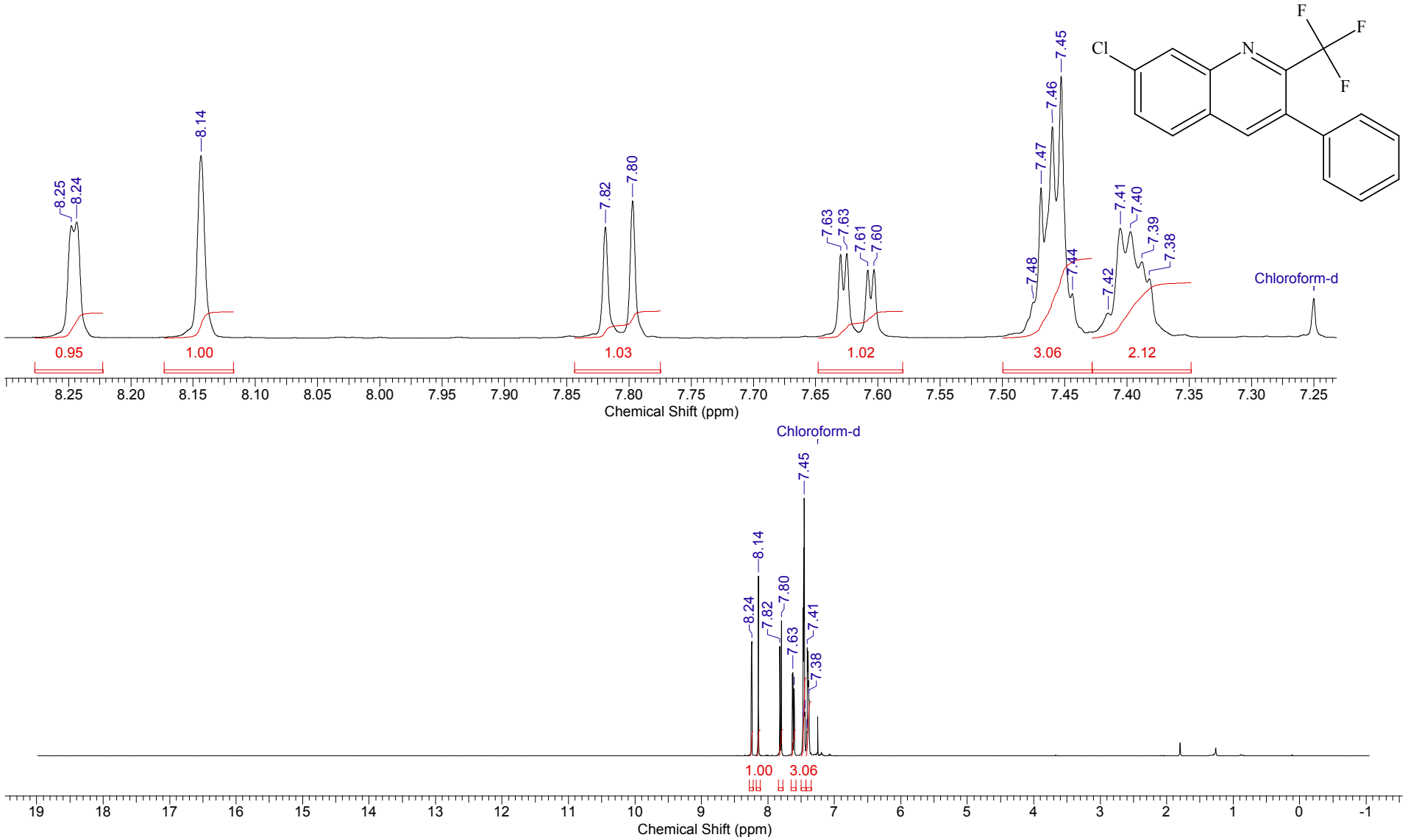
^{19}F NMR spectrum of **5d** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	03 Aug 2019 21:31:06
File Name	C:\DOCS\BM\190803\BM-1693-2_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C ***Number of Transients*** 256
Original Points Count	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30	***Solvent***	CHLOROFORM-D
Sweep Width (Hz)	24154.59	***Temperature (degree C)***	27.000				



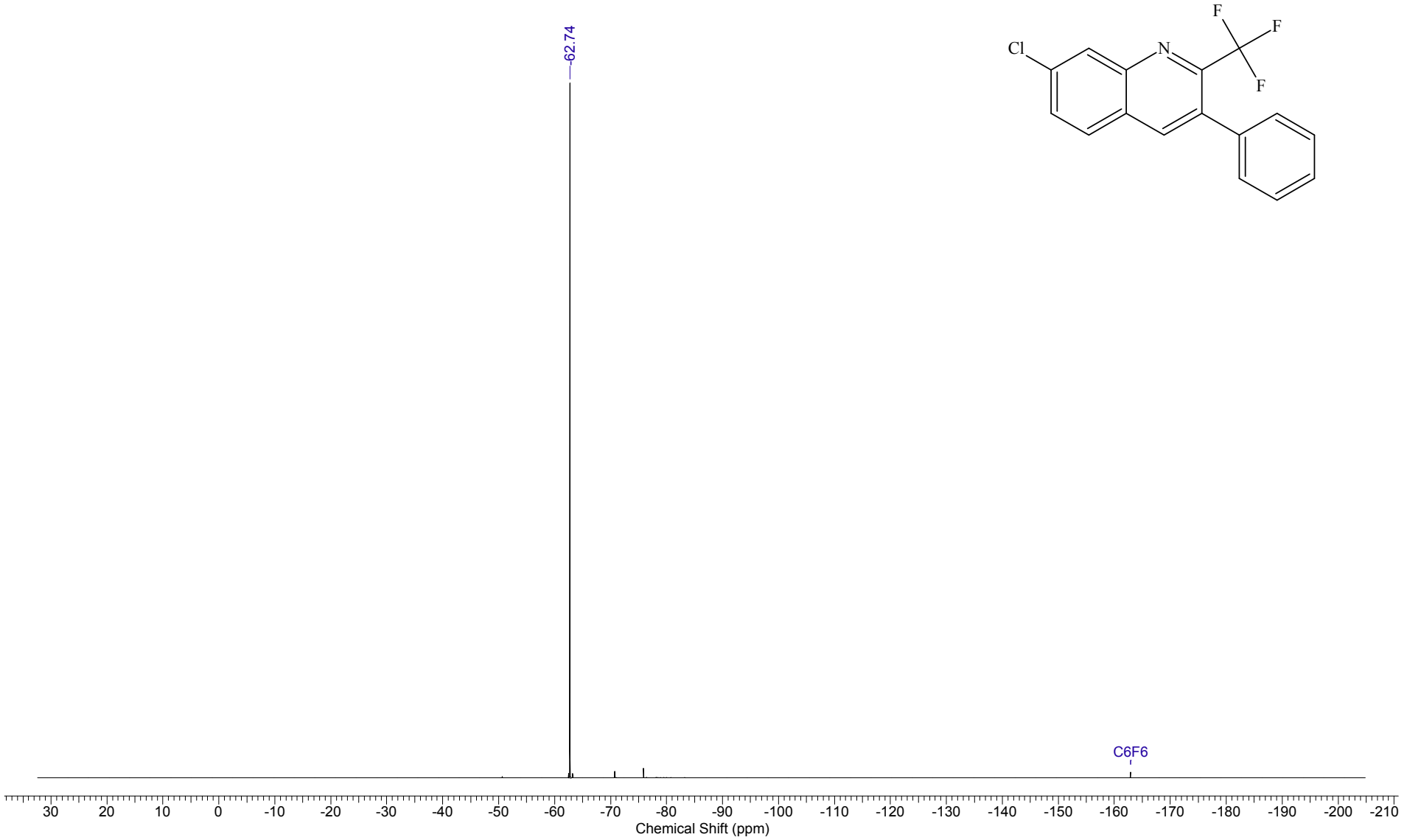
^{13}C NMR spectrum of **5d** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	25 May 2019 12:43:04		
File Name	C:\DOCS\BM\BM-1582\BM-1582_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H	***Number of Transients***	8
Original Points Count	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000								



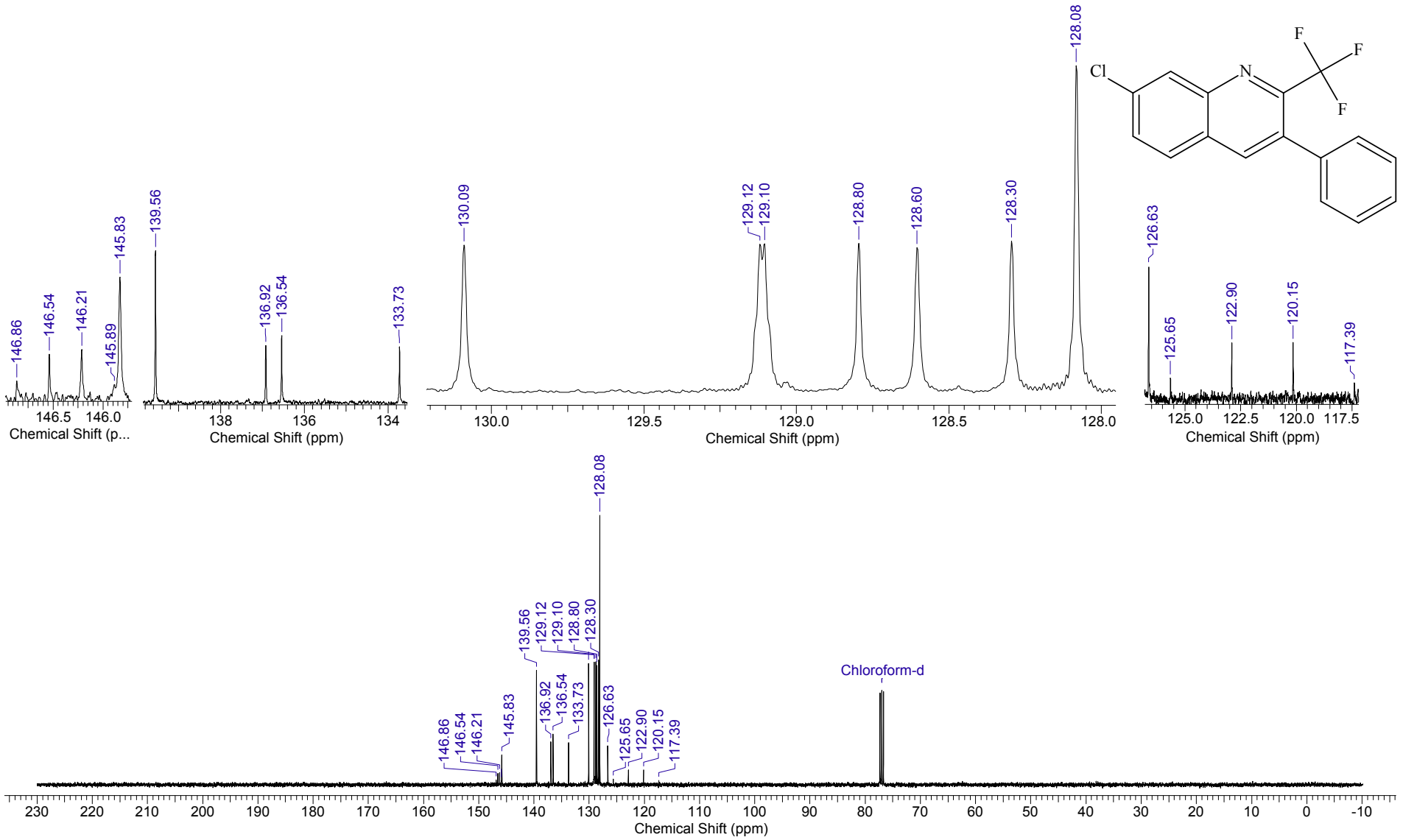
^{1}H NMR spectrum of **5e** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.0000	***Date***	May 27 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.05.27\BM-1582_20190527_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	16	***Original Points Count***	89286
Points Count	131072	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	22.000				



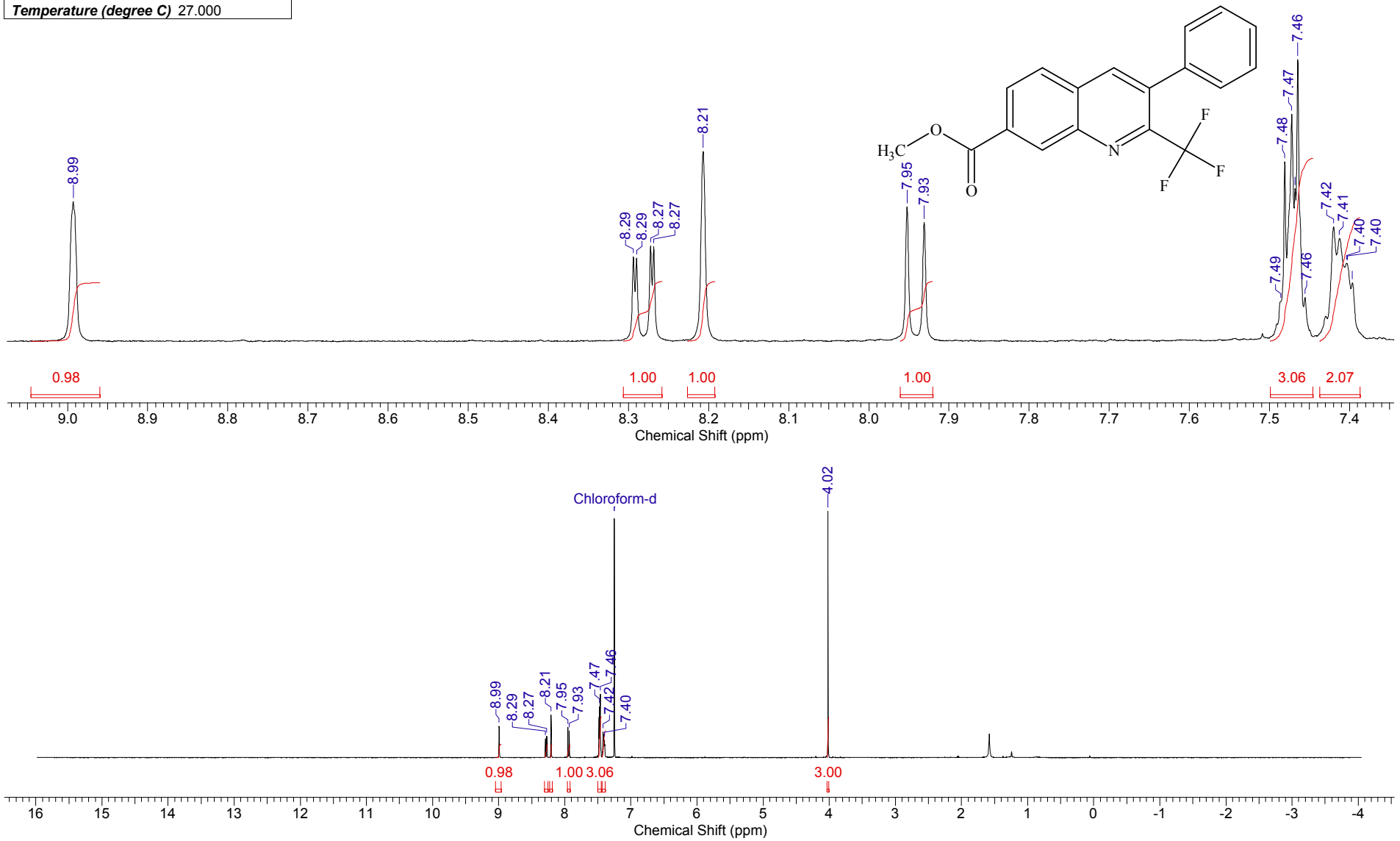
^{19}F NMR spectrum of **5e** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	25 May 2019 12:48:12
File Name	C:\DOCS\BM\BM-1582\BM-1582_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	80	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000		



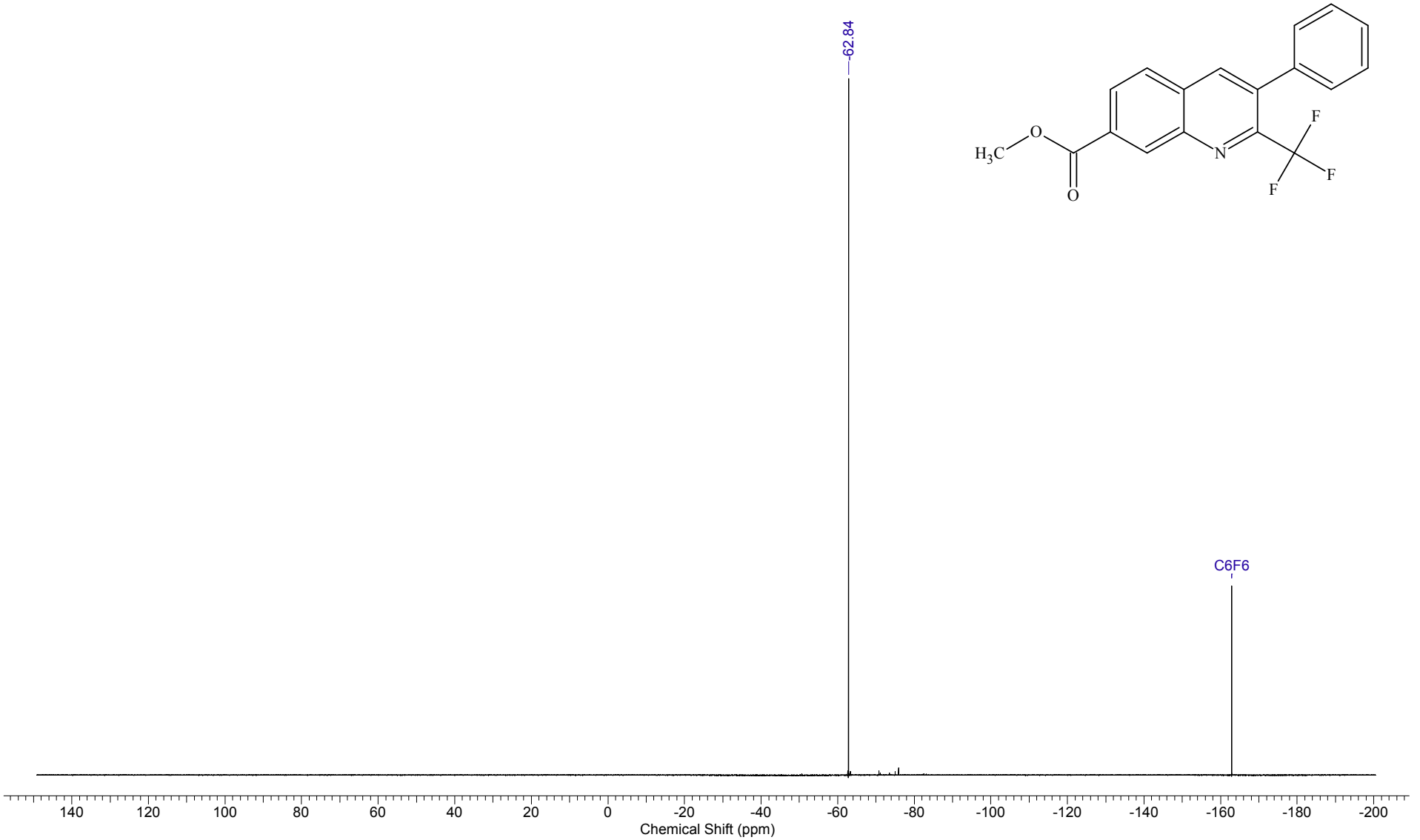
^{13}C NMR spectrum of **5e** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	16 Sep 2019 15:12:30
File Name	C:\DOCS\OUTPUT_301\2019\09.ñâí òÿáðü\BM-1584-x.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



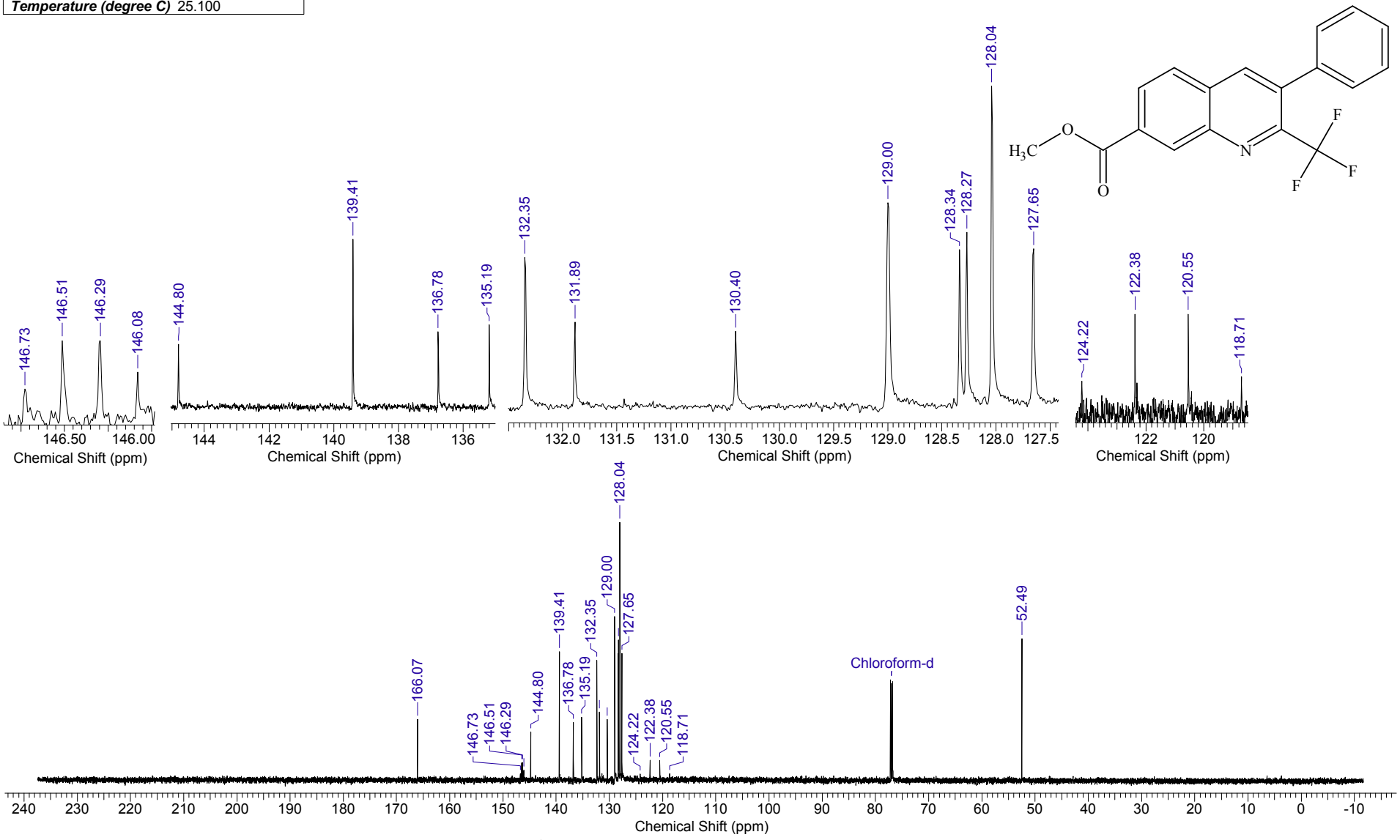
^{1}H NMR spectrum of **5f** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.9923	***Date***	Sep 5 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.05\BM-1584-X-F_20190905_01\FLUORINE_01		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	262144
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	131578.95	***Temperature (degree C)***	22.000				



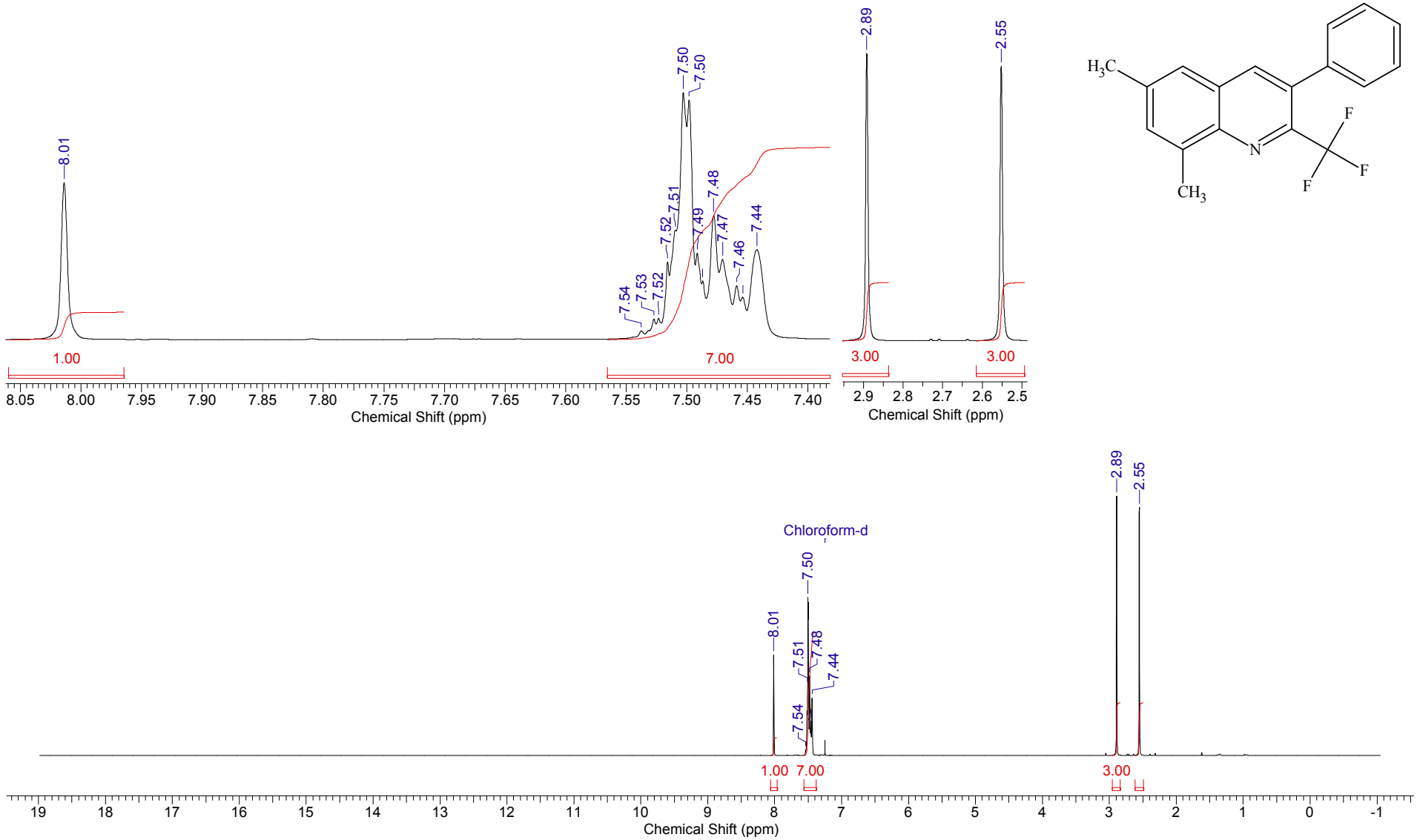
^{19}F NMR spectrum of **5f** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.8716	***Date***	26 Jul 2019 09:04:00				
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\BM-1584-x (1)_13C_PATXI_13C_PATXI_013000fid					***Frequency (MHz)***	150.92
Nucleus	13C	***Number of Transients***	29	***Original Points Count***	32768	***Points Count***	32768
Pulse Sequence	zgpg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	37593.98
Temperature (degree C)	25.100						



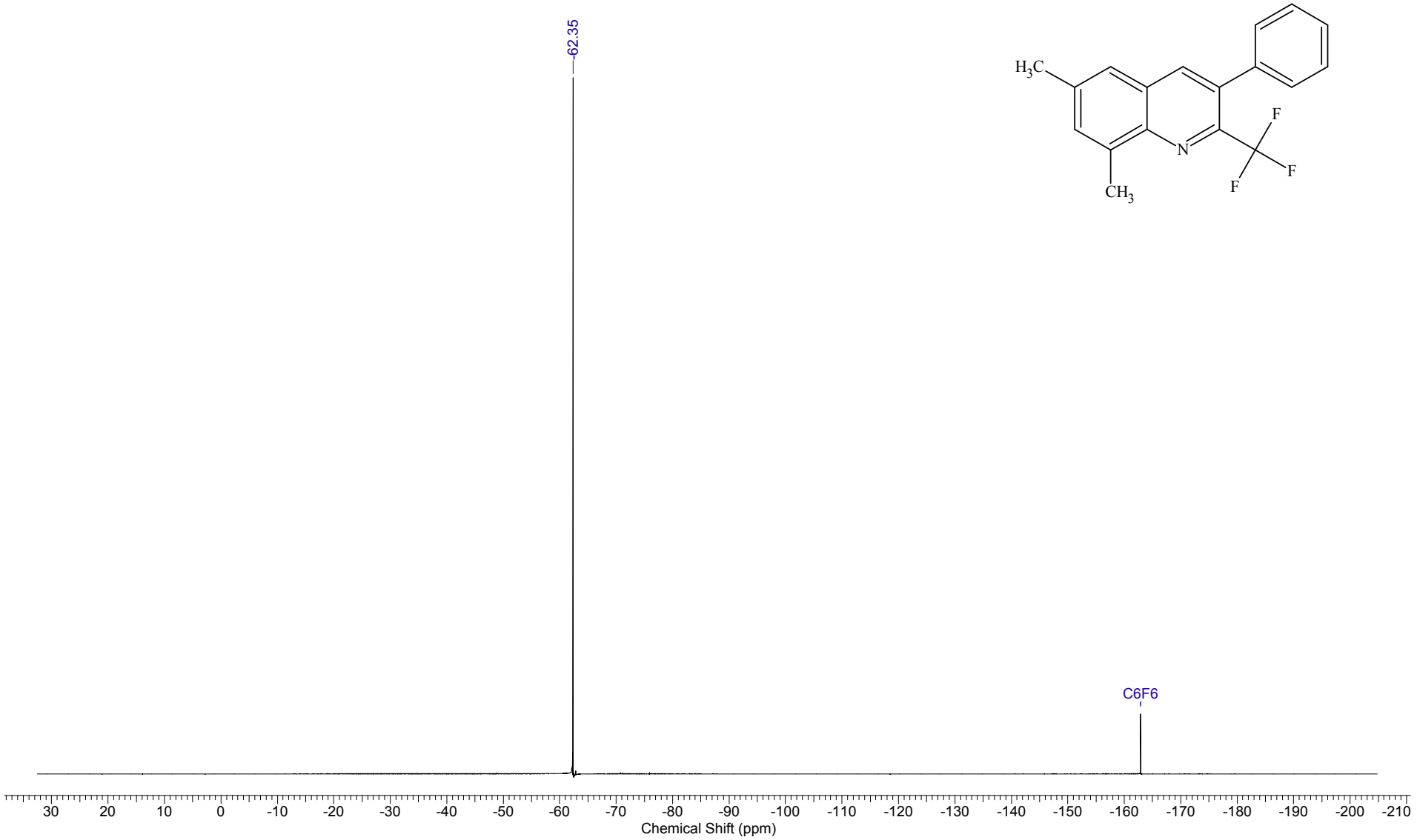
^{13}C NMR spectrum of **5f** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	02 Aug 2019 21:39:16
File Name	C:\DOCS\BM\190802\BM-1682-2_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H	***Number of Transients***	8
Original Points Count	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	8012.82	***Temperature (degree C)***	27.000						



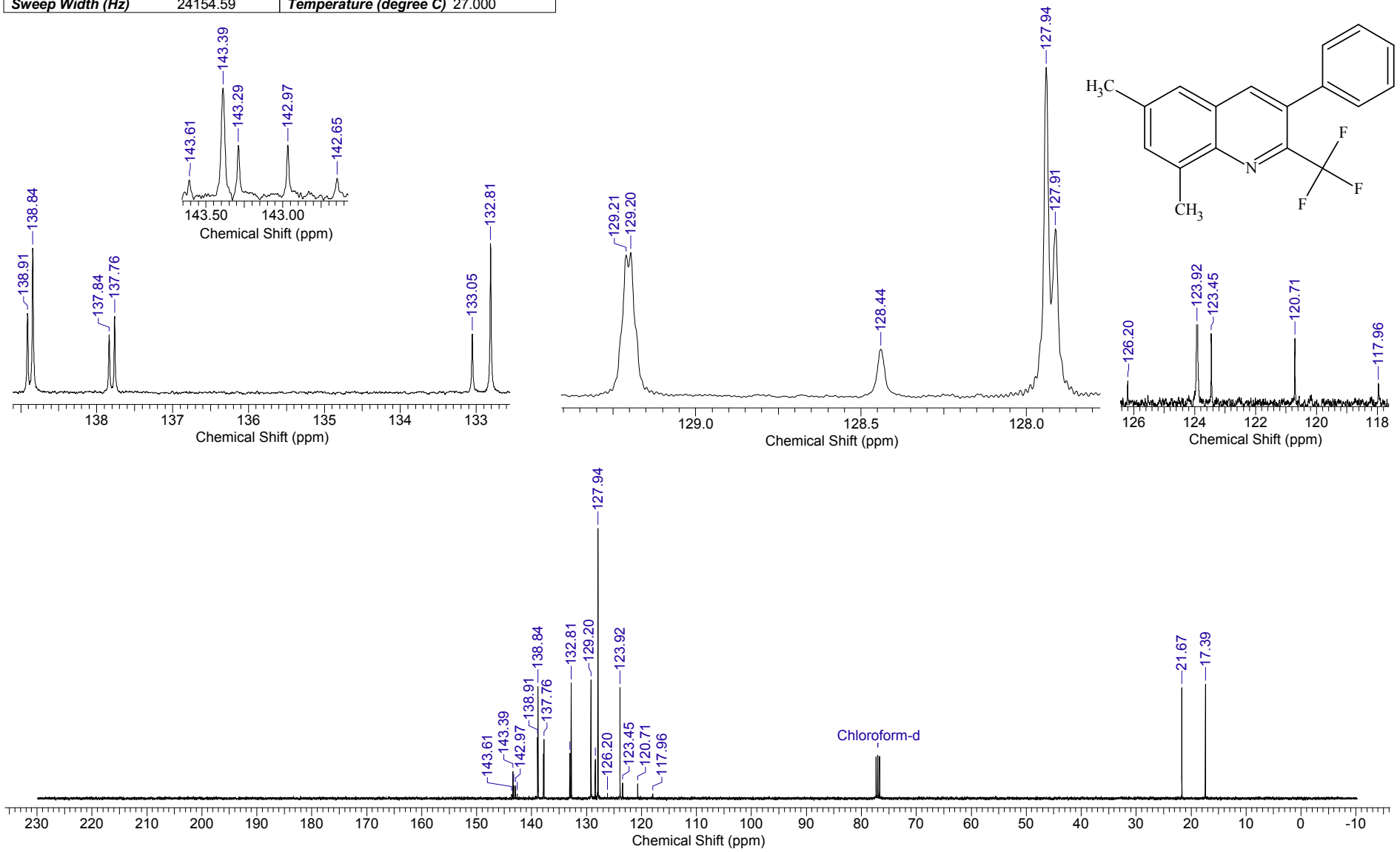
^{1}H NMR spectrum of **5g** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.0000	***Date***	Sep 6 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.06\BM-1682-2_20190906_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	4	***Original Points Count***	89286
Points Count	131072	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	22.000				



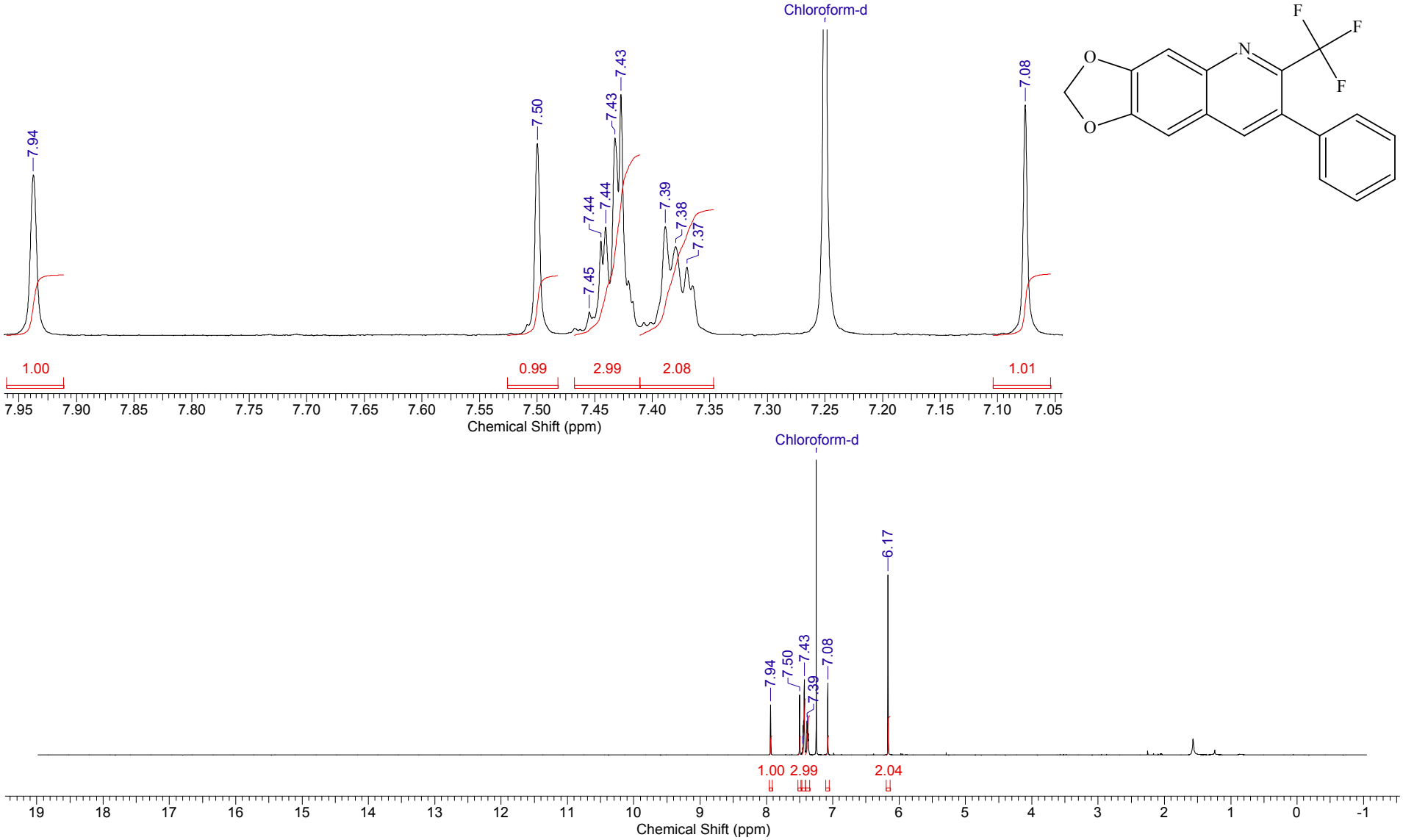
^{19}F NMR spectrum of **5g** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	02 Aug 2019 21:41:46
File Name	C:\DOCS\BM\190802\BM-1682-2_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C ***Number of Transients*** 64
Original Points Count	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30	***Solvent***	CHLOROFORM-D
Sweep Width (Hz)	24154.59	***Temperature (degree C)***	27.000				



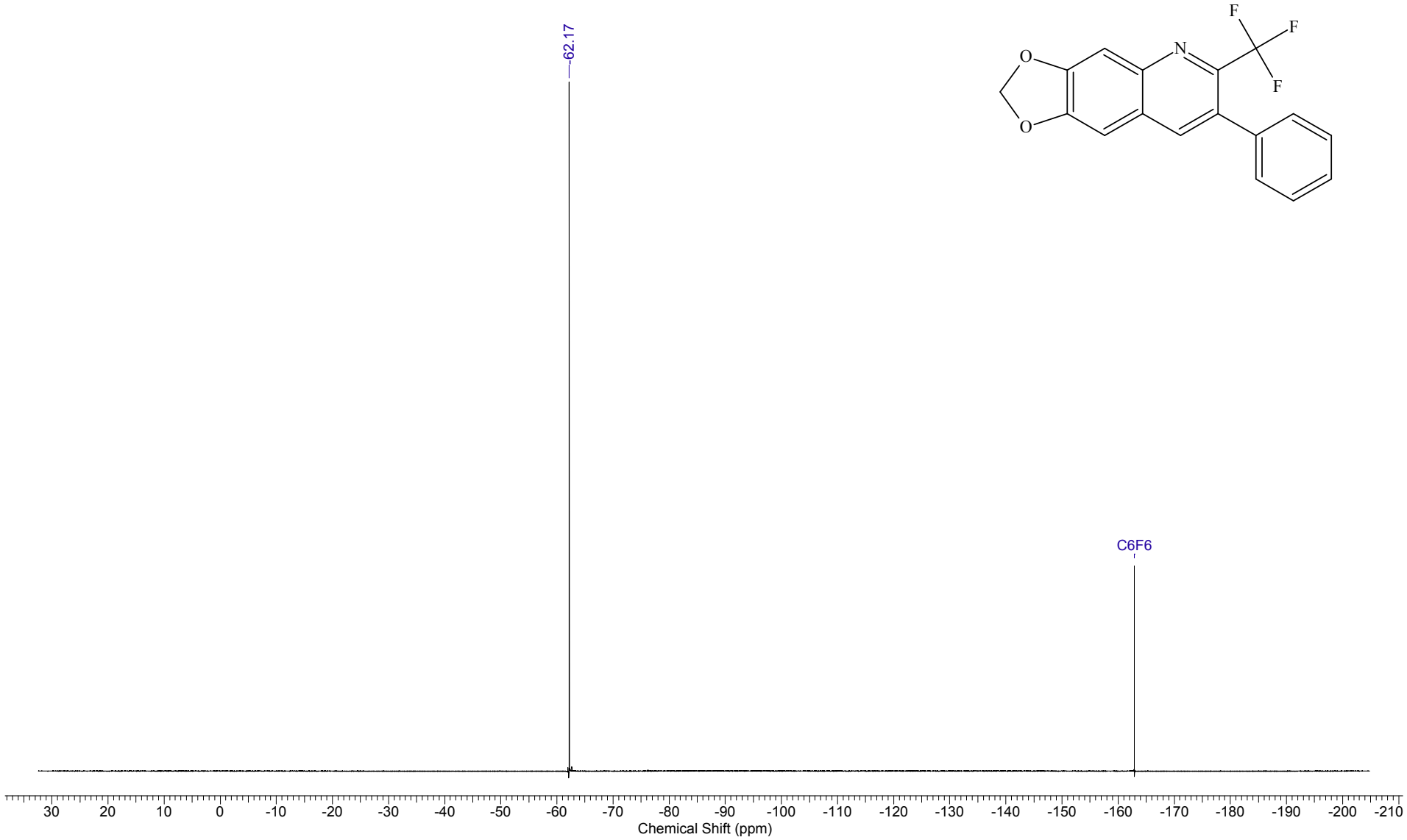
^{13}C NMR spectrum of **5g** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	21 May 2019 21:47:32
File Name	C:\Users\BM-1\Downloads\bm190521\BM-1574_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	8	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



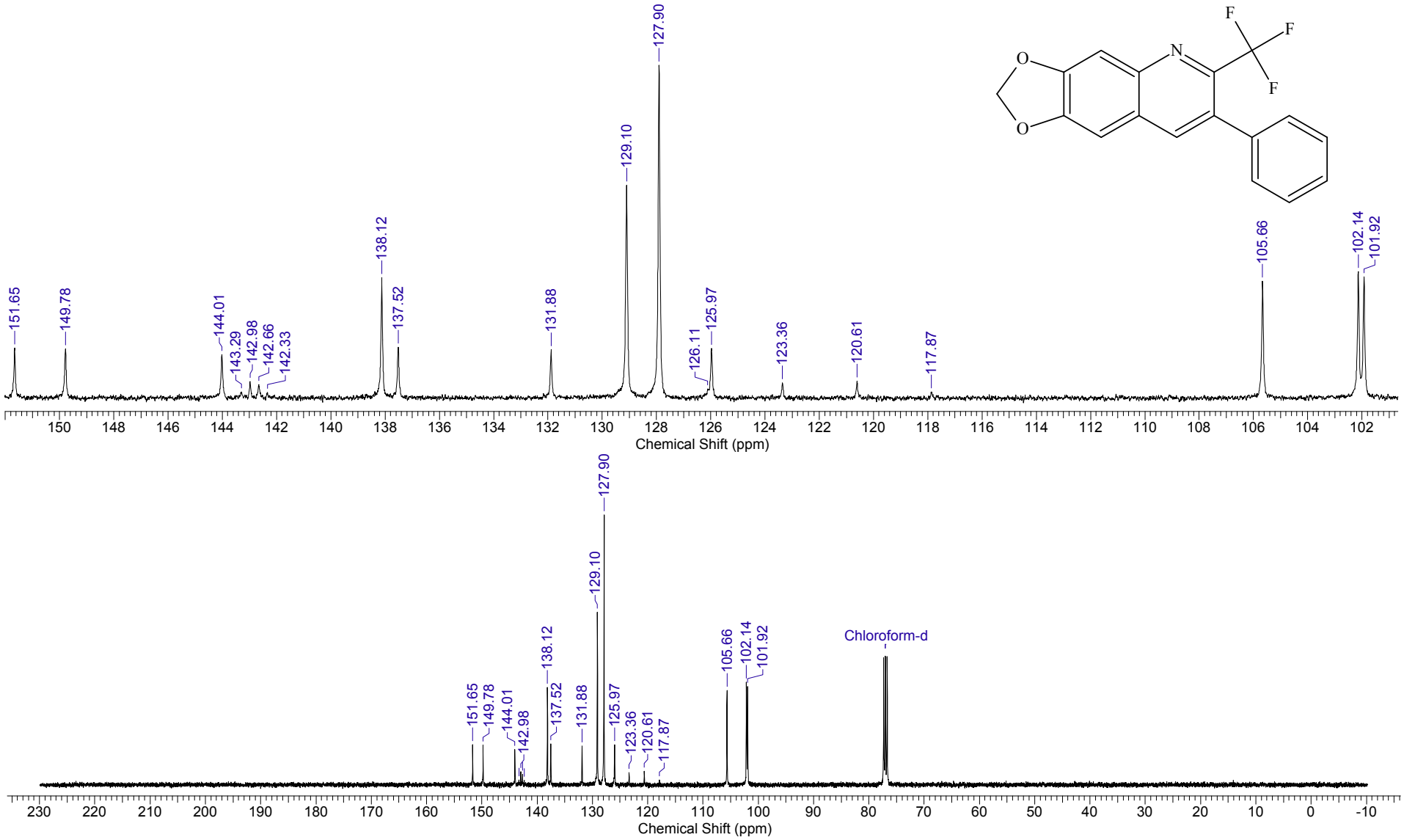
^{1}H NMR spectrum of **5h** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	0.7340	***Date***	May 21 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.05.21\bm1574-f_20190521_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	100	***Original Points Count***	65536
Points Count	65536	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	30.000				



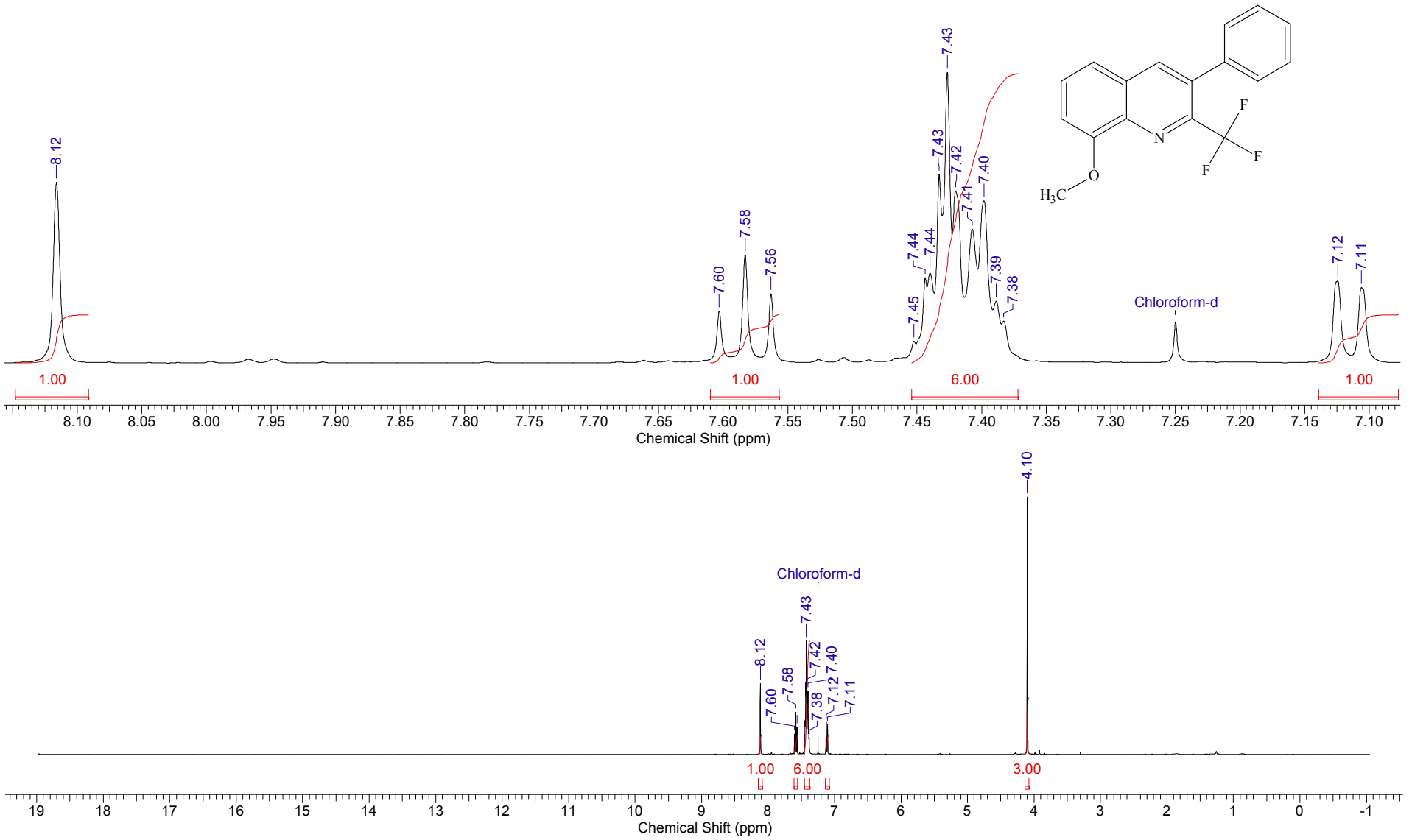
^{19}F NMR spectrum of **5h** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	20 May 2019 16:02:40
File Name	C:\DOCS\OUTPUT_301\2019\05.l àé\BM-1574.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	314	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



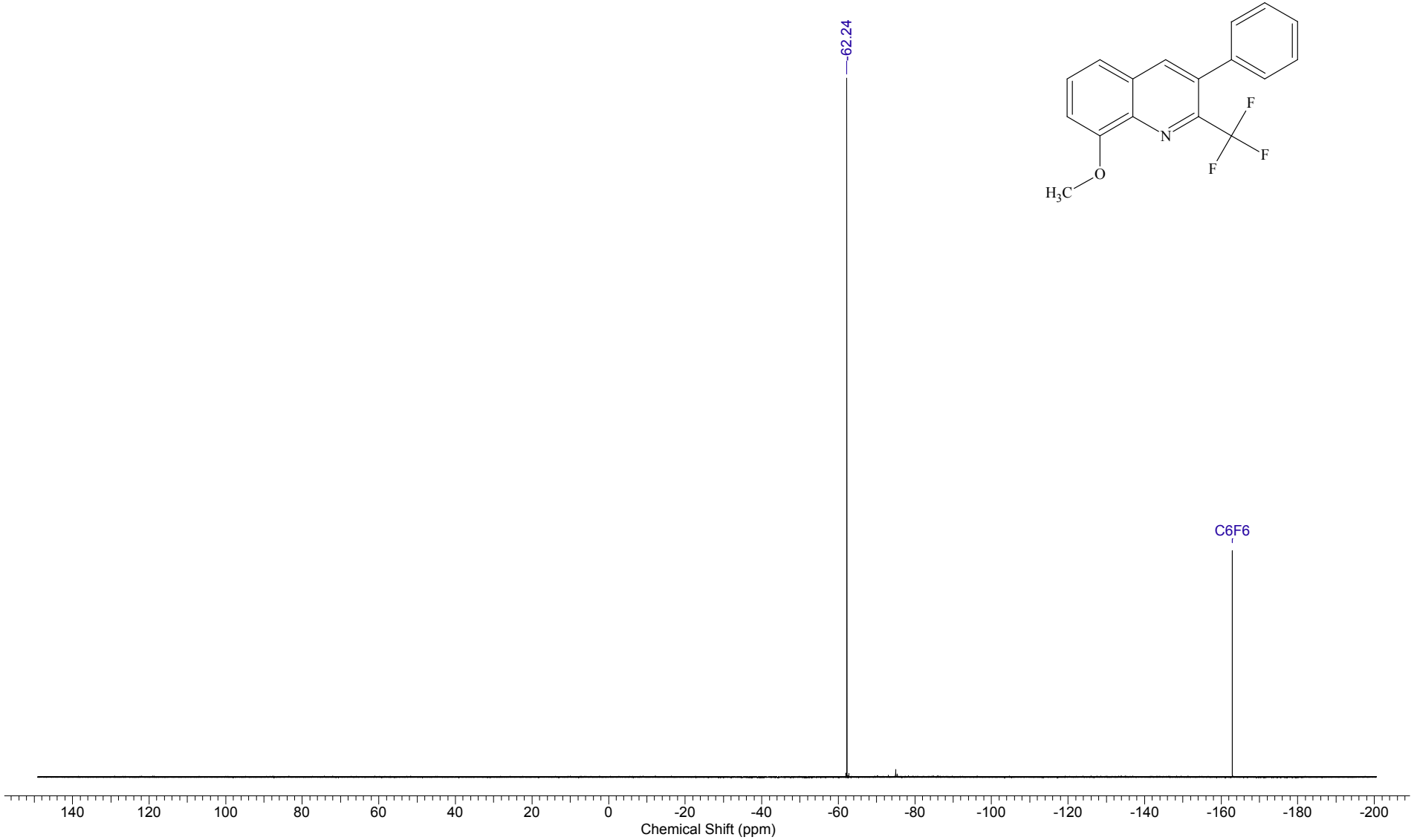
^{13}C NMR spectrum of **5h** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	29 Jul 2019 21:27:54
File Name	C:\Users\BM-1\Downloads\190729\BM-1672-2_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	8	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



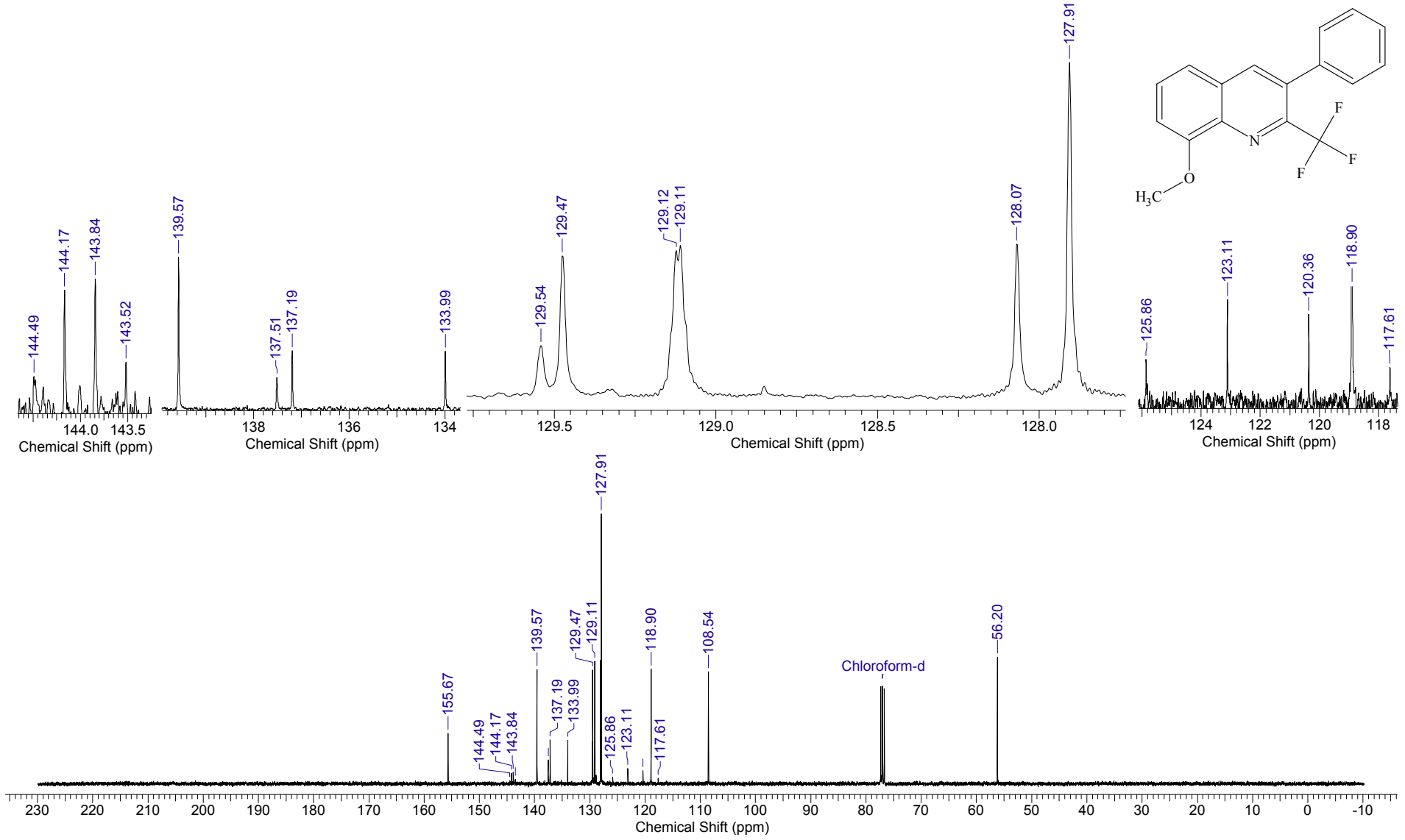
^{1}H NMR spectrum of **5i** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.9923	***Date***	Sep 5 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.05\BM-1672-2-F_20190905_01\FLUORINE_01		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	262144
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	131578.95	***Temperature (degree C)***	22.000				



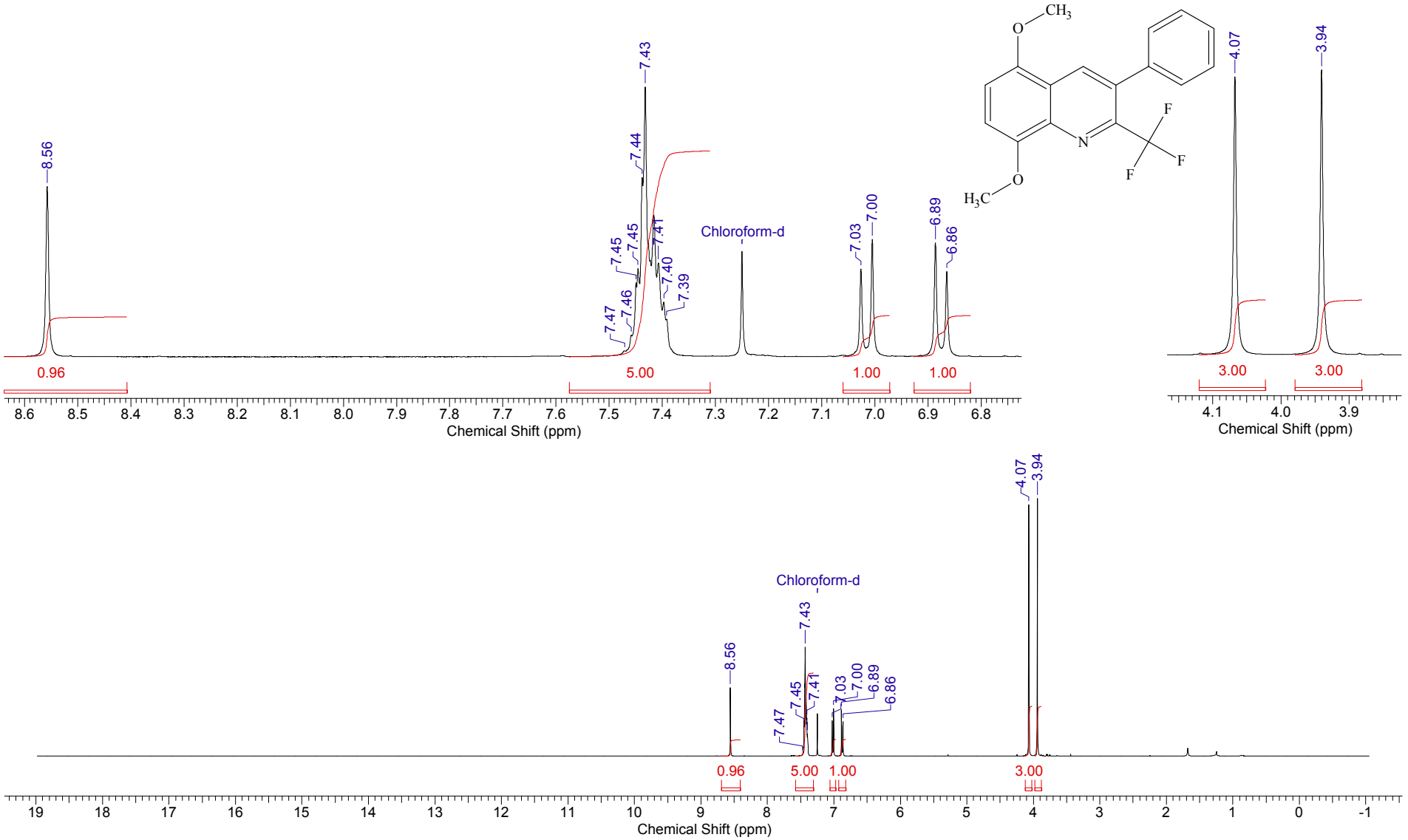
^{19}F NMR spectrum of **5i** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	29 Jul 2019 21:33:54
File Name	C:\Users\BM-1\Downloads\190729\BM-1672-2_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	128	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



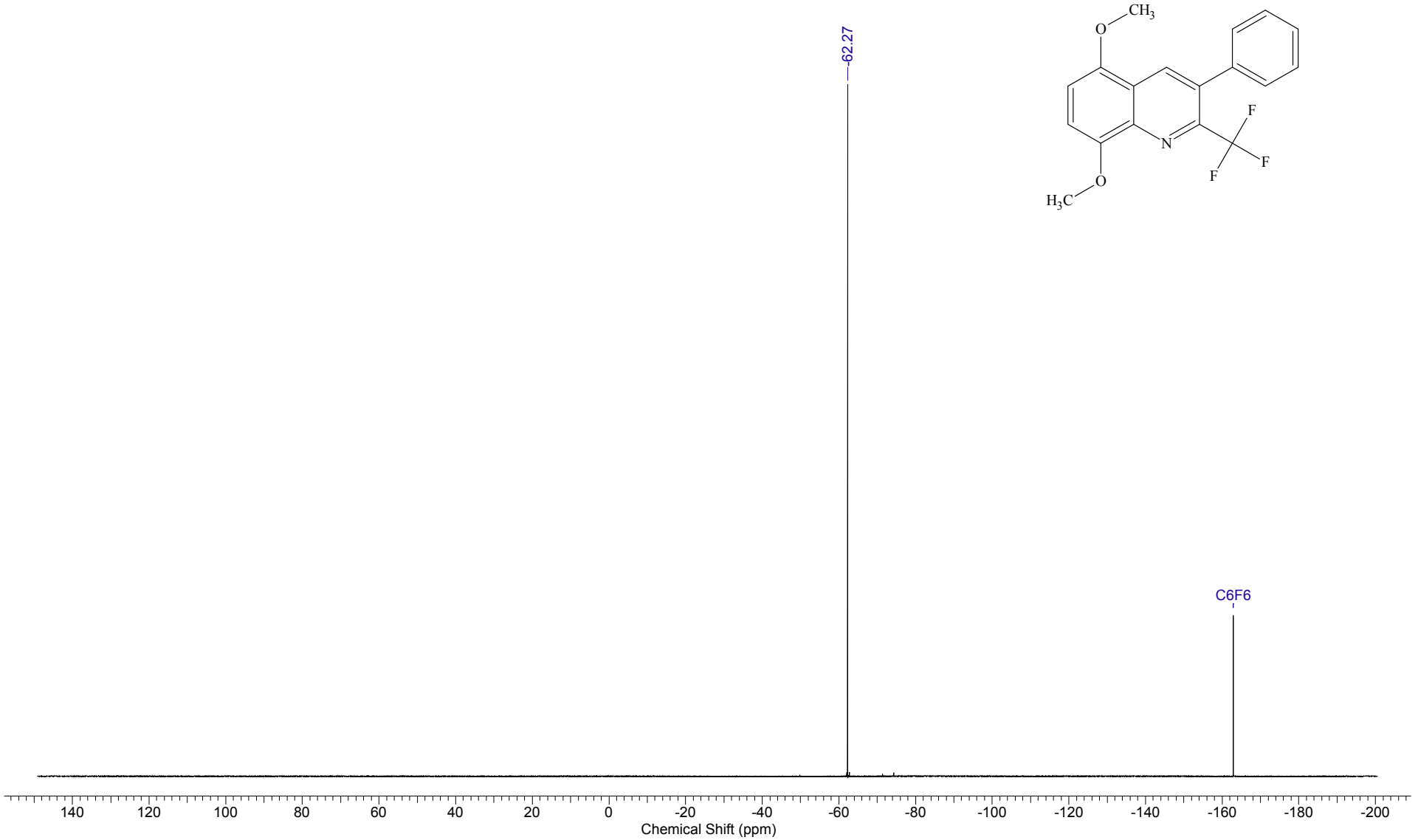
^{13}C NMR spectrum of **5i** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	31 Jul 2019 22:22:02
File Name	C:\Users\BM-1\Downloads\bm190731\BM-1676-2_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	8	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



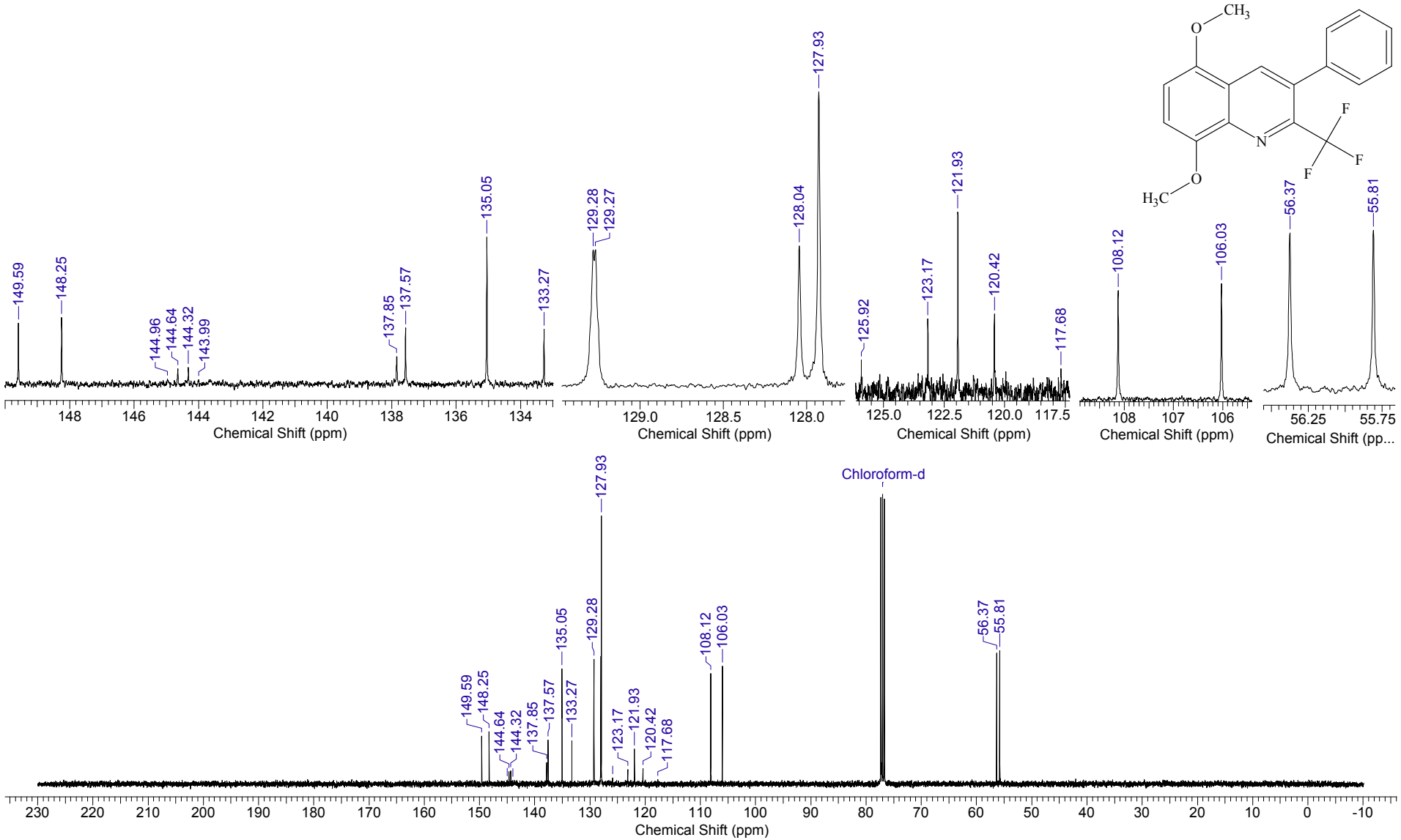
^{1}H NMR spectrum of **5j** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.9923	***Date***	Sep 5 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.05\BM-1676-2-F_20190905_01\FLUORINE_01		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	262144
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	131578.95	***Temperature (degree C)***	22.000				



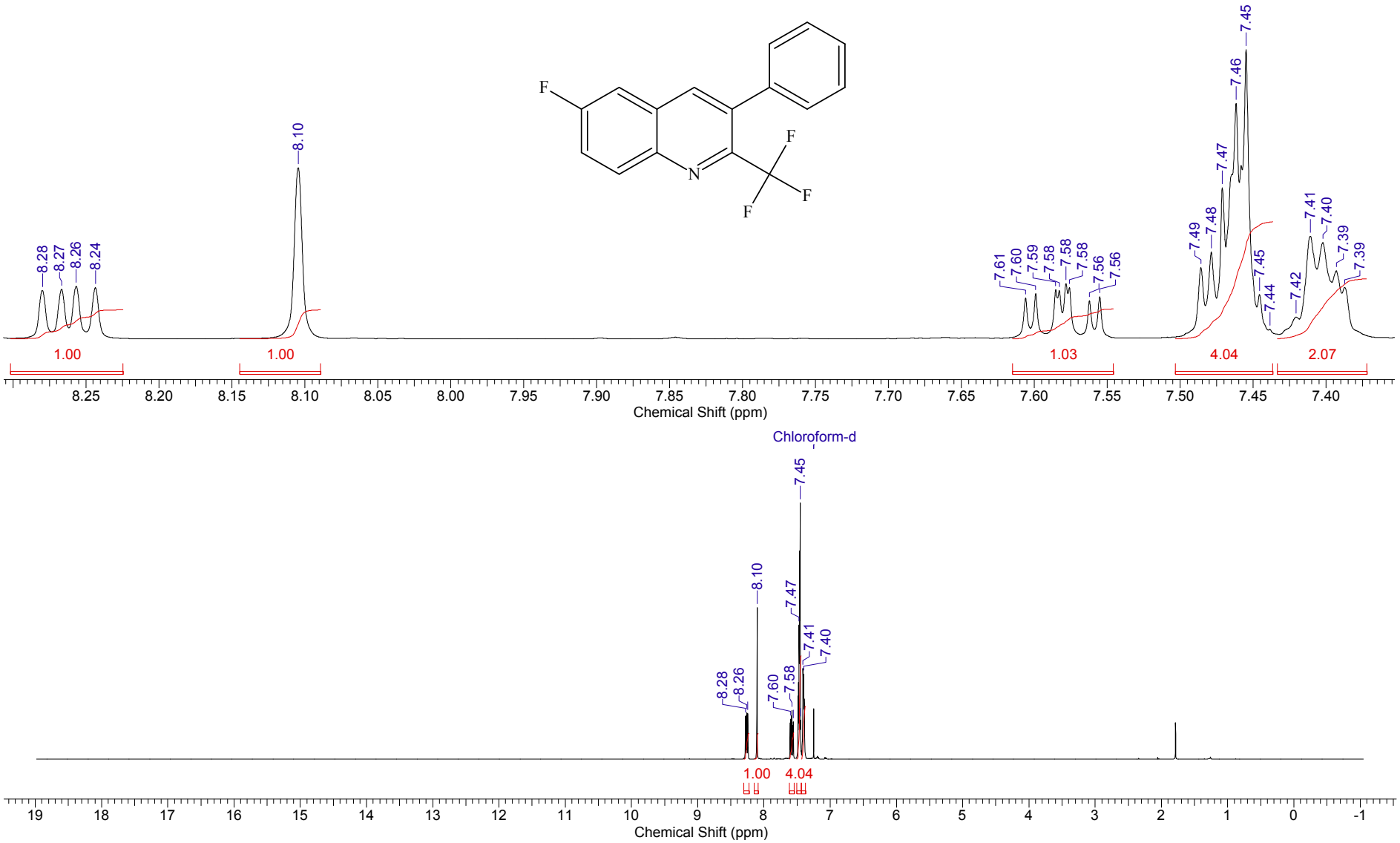
^{19}F NMR spectrum of **5j** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	31 Jul 2019 22:37:34
File Name	C:\Users\BM-1\Downloads\bm190731\BM-1676-2_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	512	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



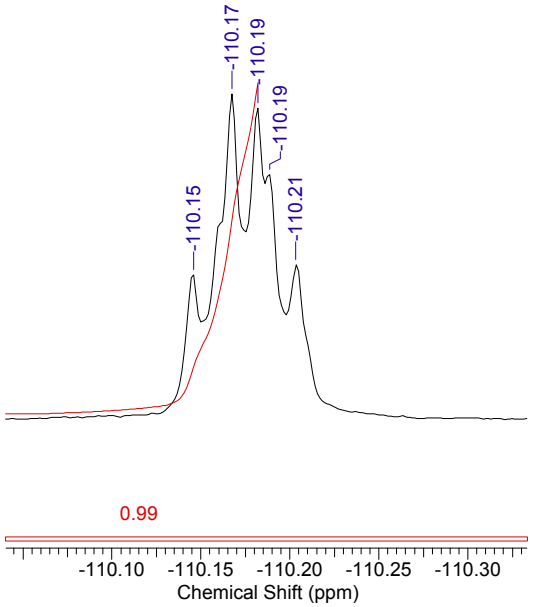
^{13}C NMR spectrum of **5j** (100.6 MHz, $CDCl_3$)

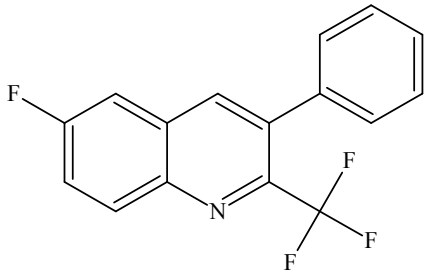
Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	26 Jul 2019 21:51:14
File Name	C:\Users\BM-1\Downloads\bm190726\BM-1671-2_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	8	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000

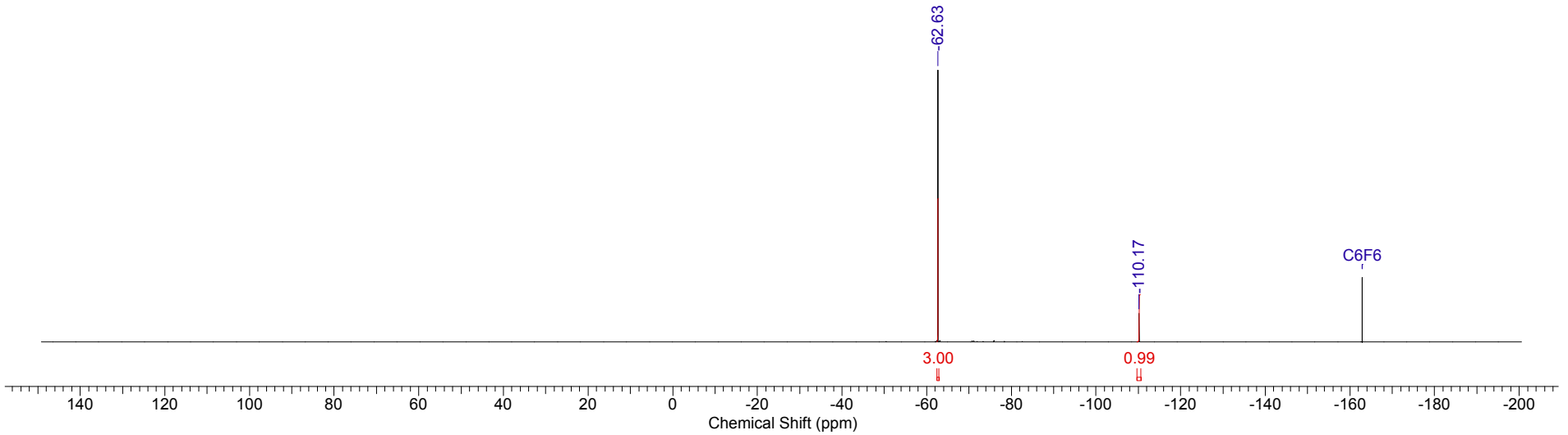


^{1}H NMR spectrum of **5k** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.9923	***Date***	Sep 5 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.05\BM-1671-2-F_20190905_01\FLUORINE_01		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	262144
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	131578.95	***Temperature (degree C)***	22.000				

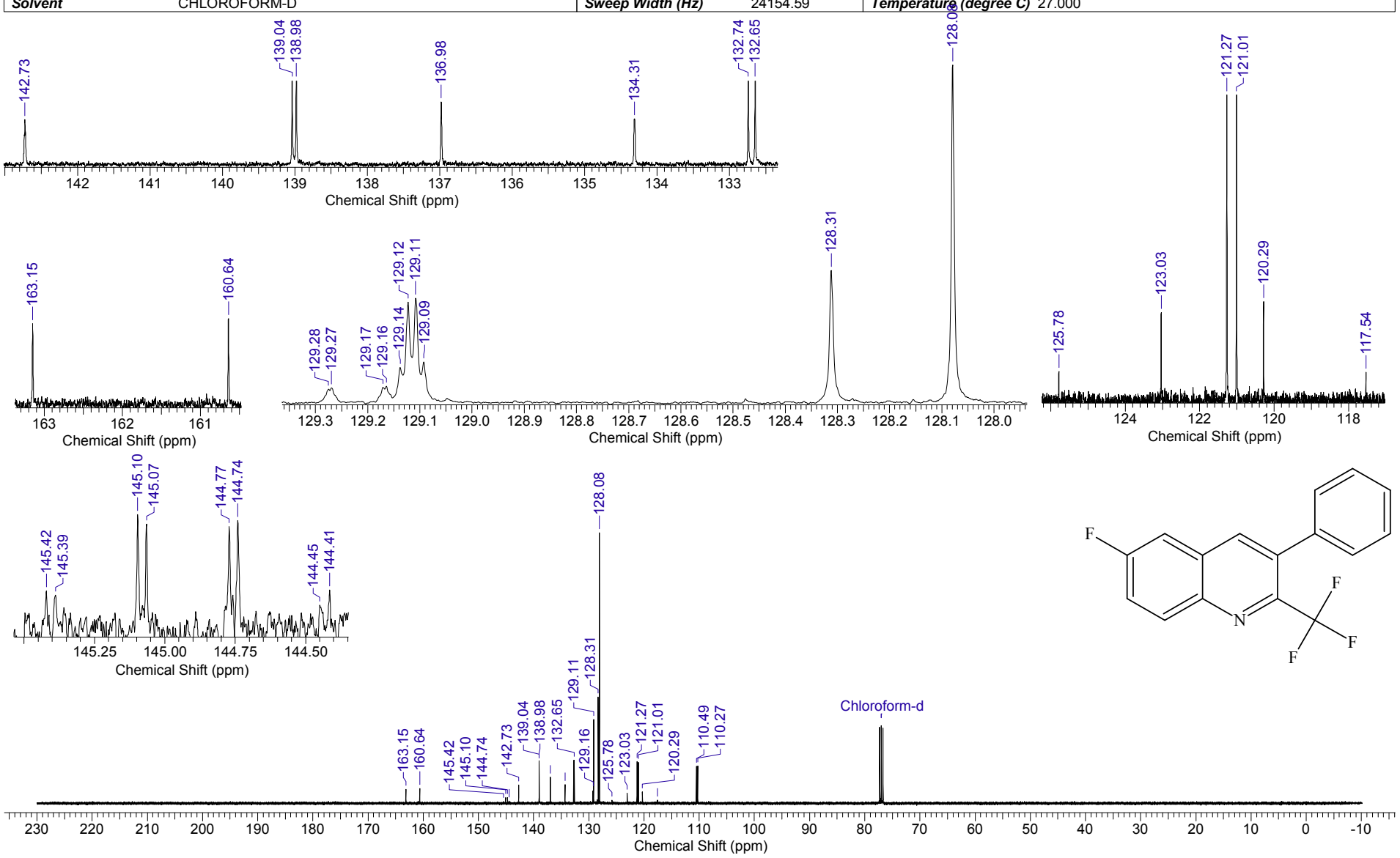






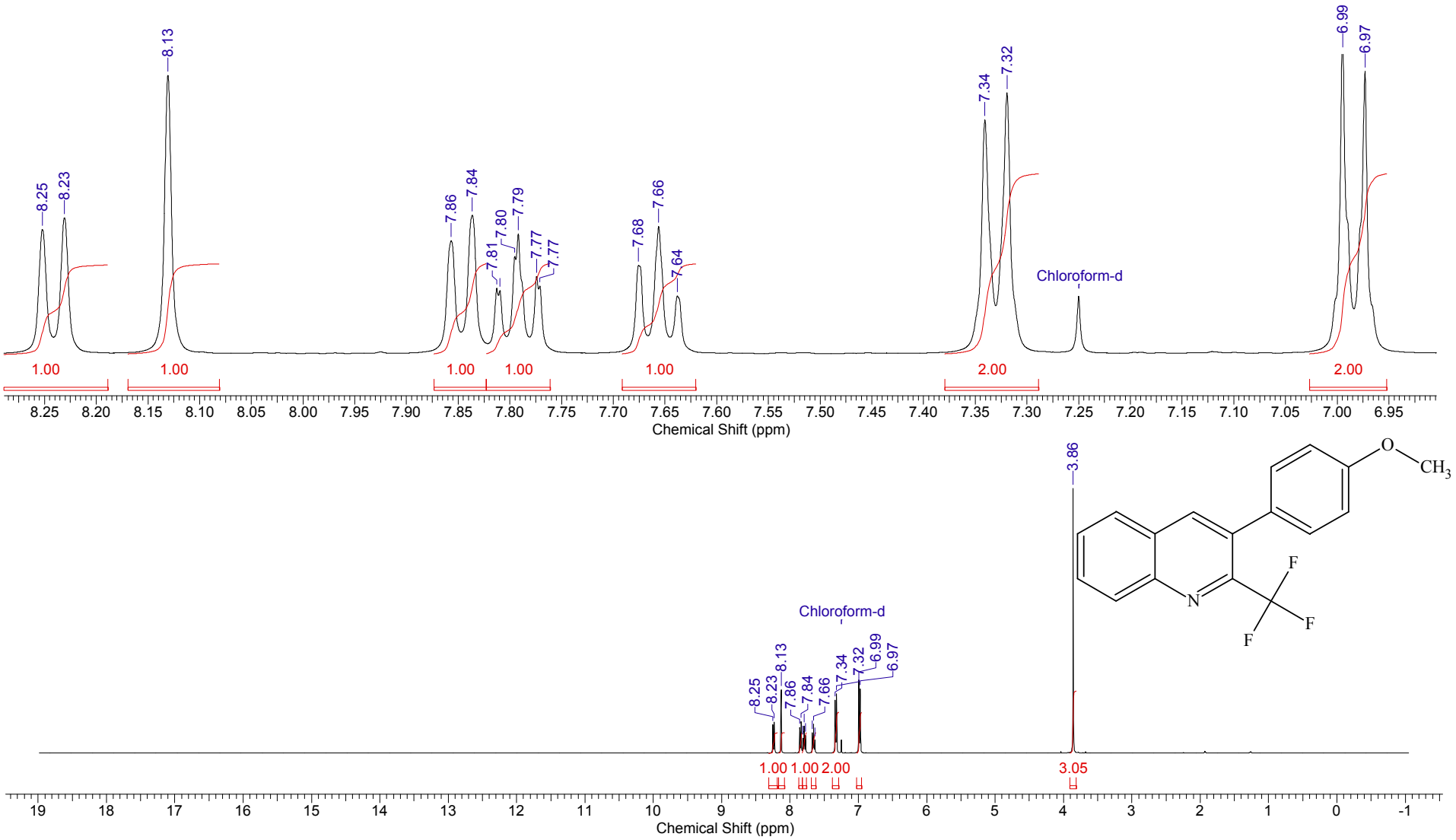
^{19}F NMR spectrum of **5k** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	2.7132	***Comment***	Imported from UXNMR.			***Date***	26 Jul 2019 22:17:54
File Name	C:\Users\BM-1\Downloads\bm190726\BM-1671-2_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	256	***Original Points Count***	65536	***Points Count***	262144	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



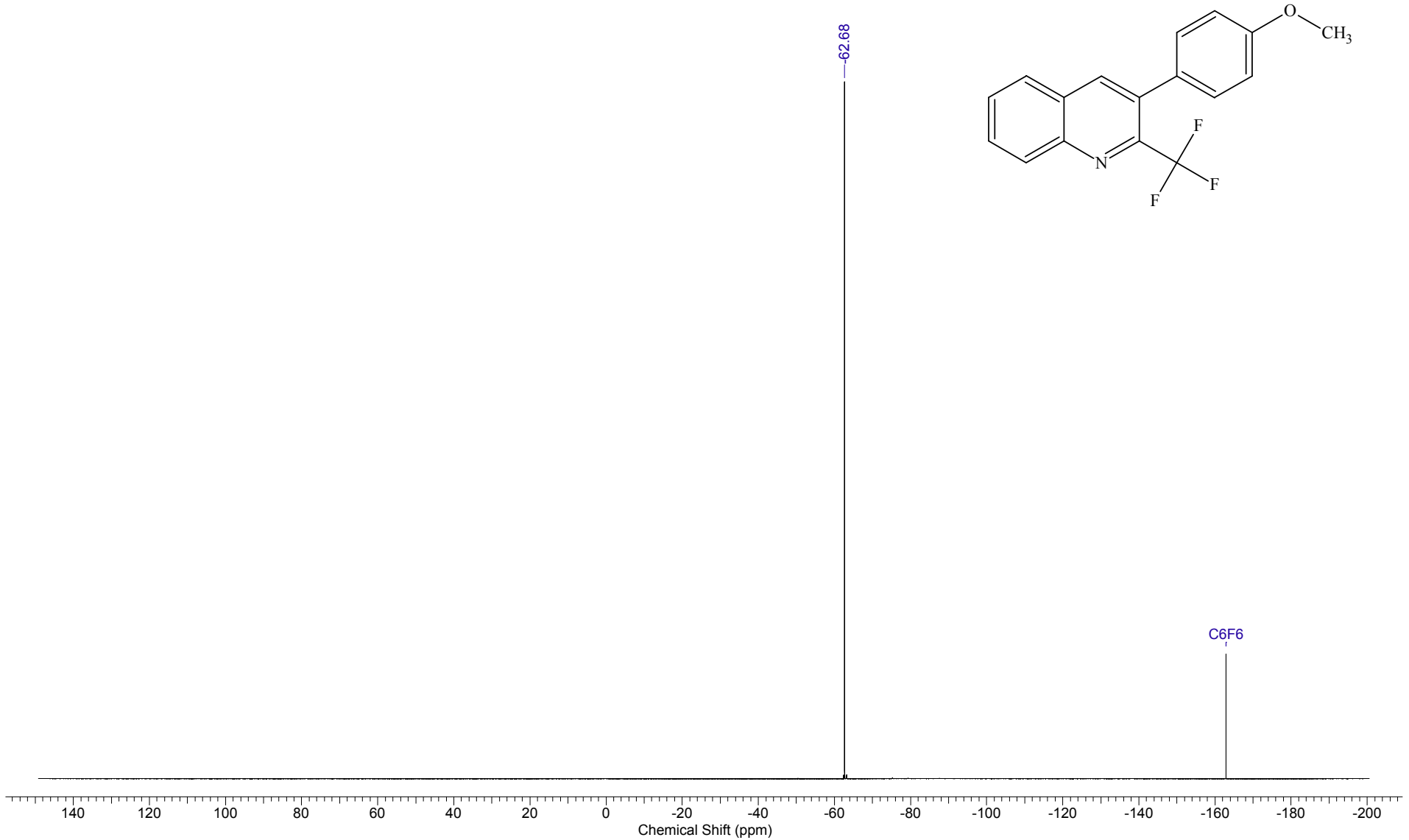
^{13}C NMR spectrum of **5k** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	01 Aug 2019 20:16:40
File Name	C:\DOCS\BM\bm190801\BM-1694_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H	***Number of Transients***	8
Original Points Count	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	8012.82	***Temperature (degree C)***	27.000						



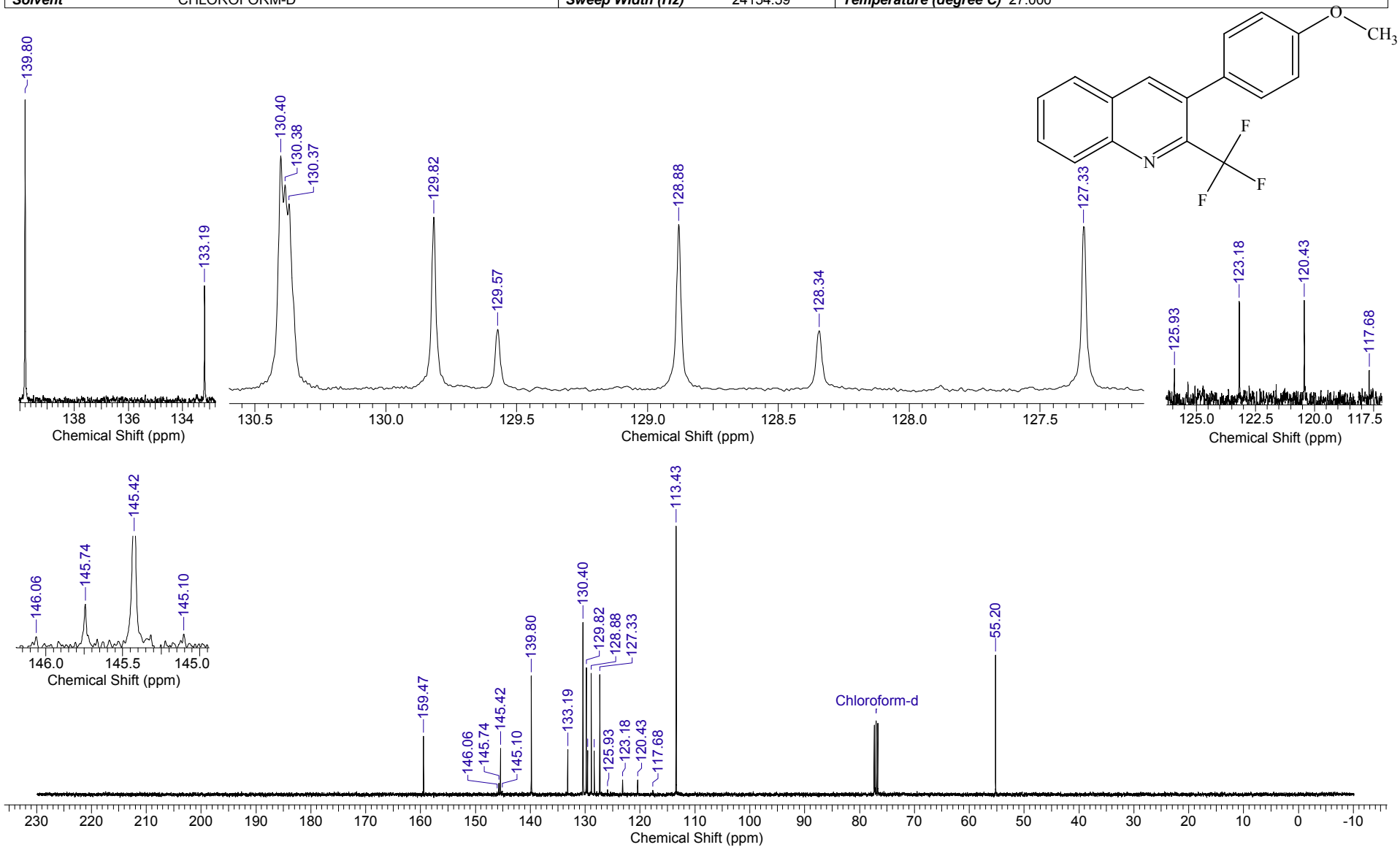
^{1}H NMR spectrum of **5l** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.9923	***Date***	Sep 5 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.05\BM-1694-F_20190905_01\FLUORINE_02		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	262144
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	131578.95	***Temperature (degree C)***	22.000				



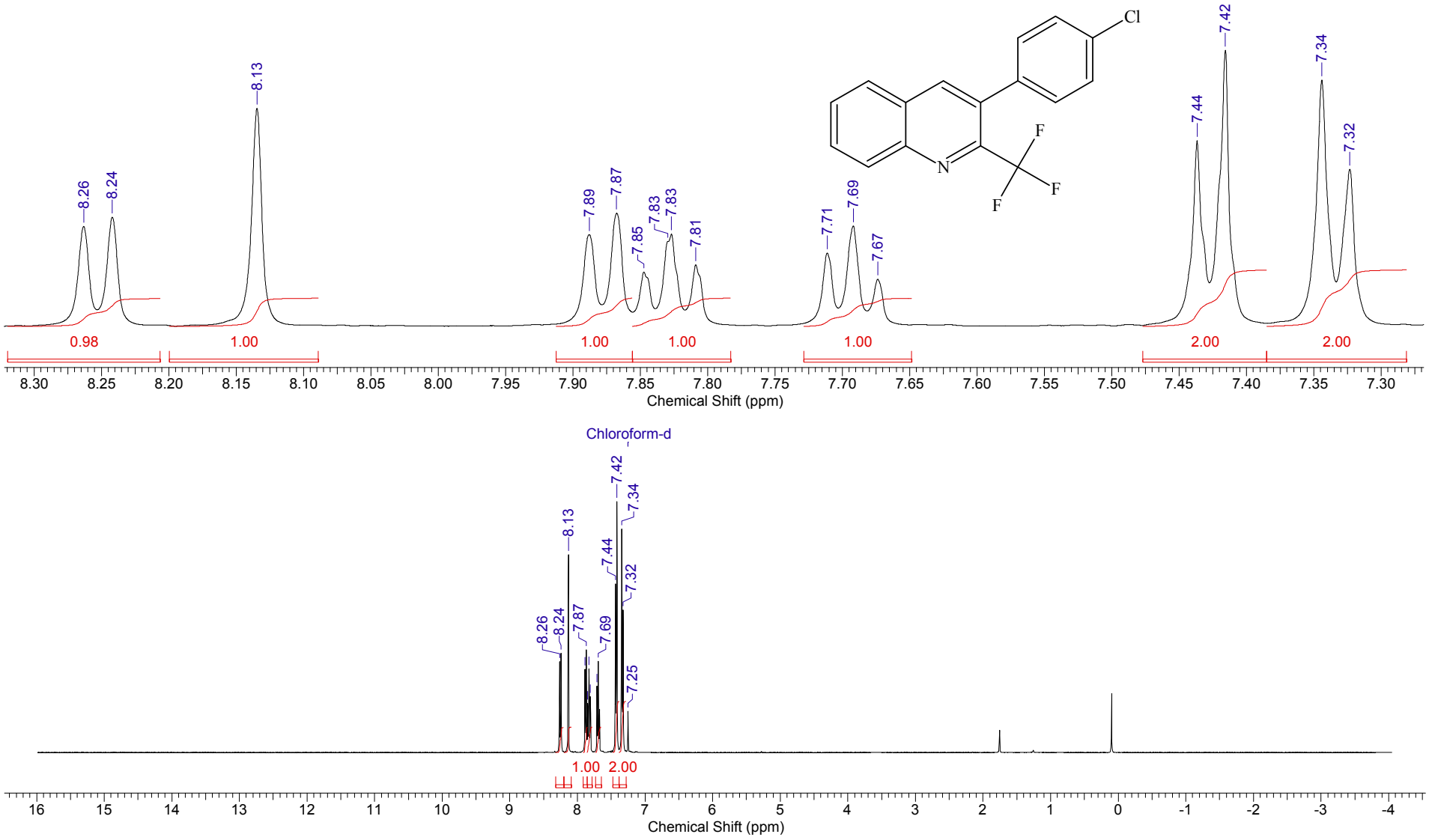
^{19}F NMR spectrum of **5l** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	01 Aug 2019 20:20:26
File Name	C:\DOCS\BM\bm190801\BM-1694_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	128	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



^{13}C NMR spectrum of **5l** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	01 Oct 2019 15:30:18
File Name	C:\DOCS\OUTPUT_301\2019\10.î êòÿáðü\BM-1516-16.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						

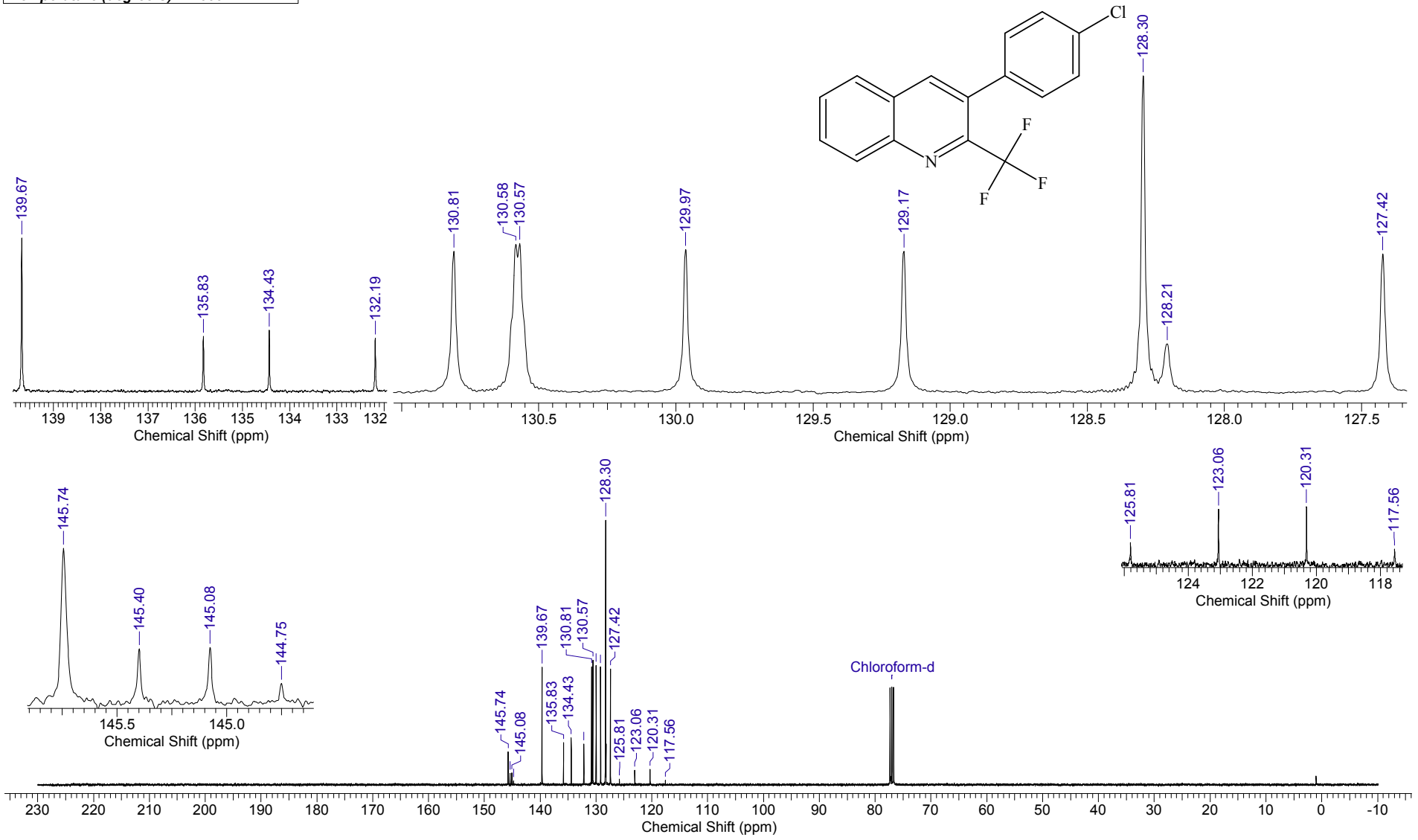


^{1}H NMR spectrum of **5m** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.5729	***Date***	Oct 3 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.10.03\BM-1516-16-F_20191003_01\FLUORINE_01		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	206956
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	131578.95	***Temperature (degree C)***	20.000				

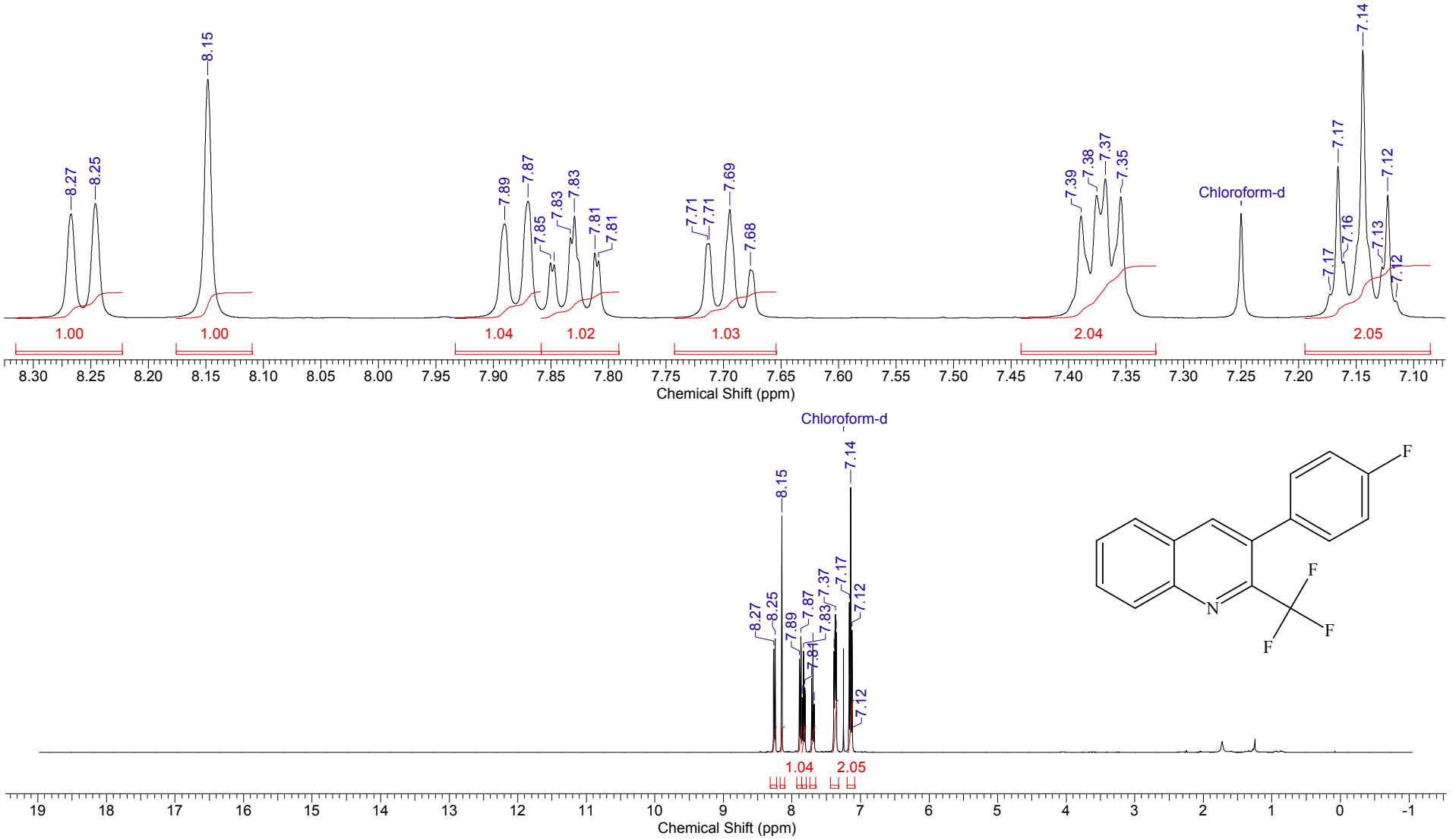
^{19}F NMR spectrum of **5m** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	01 Oct 2019 15:54:58
File Name	C:\DOCS\OUTPUT_301\2019\10.î êòÿáðü\BM-1516-16.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	636	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59
Temperature (degree C)	27.000						



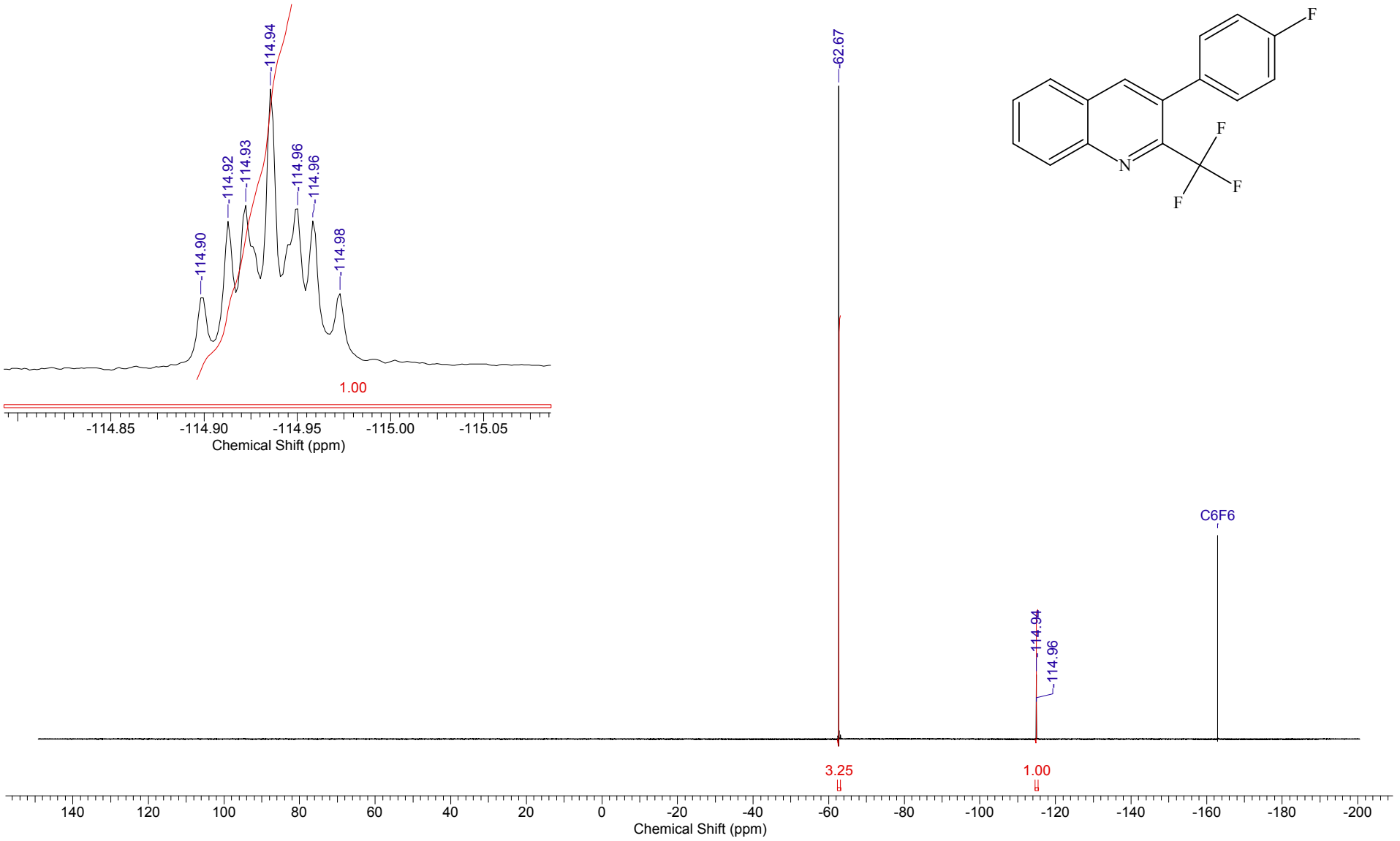
^{13}C NMR spectrum of **5m** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	13 Jul 2019 15:03:00
File Name	C:\DOCS\BM\bm190713\BM-1628-X1a_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Original Points Count	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	CHLOROFORM-D
Sweep Width (Hz)	8012.82	***Temperature (degree C)***	27.000				



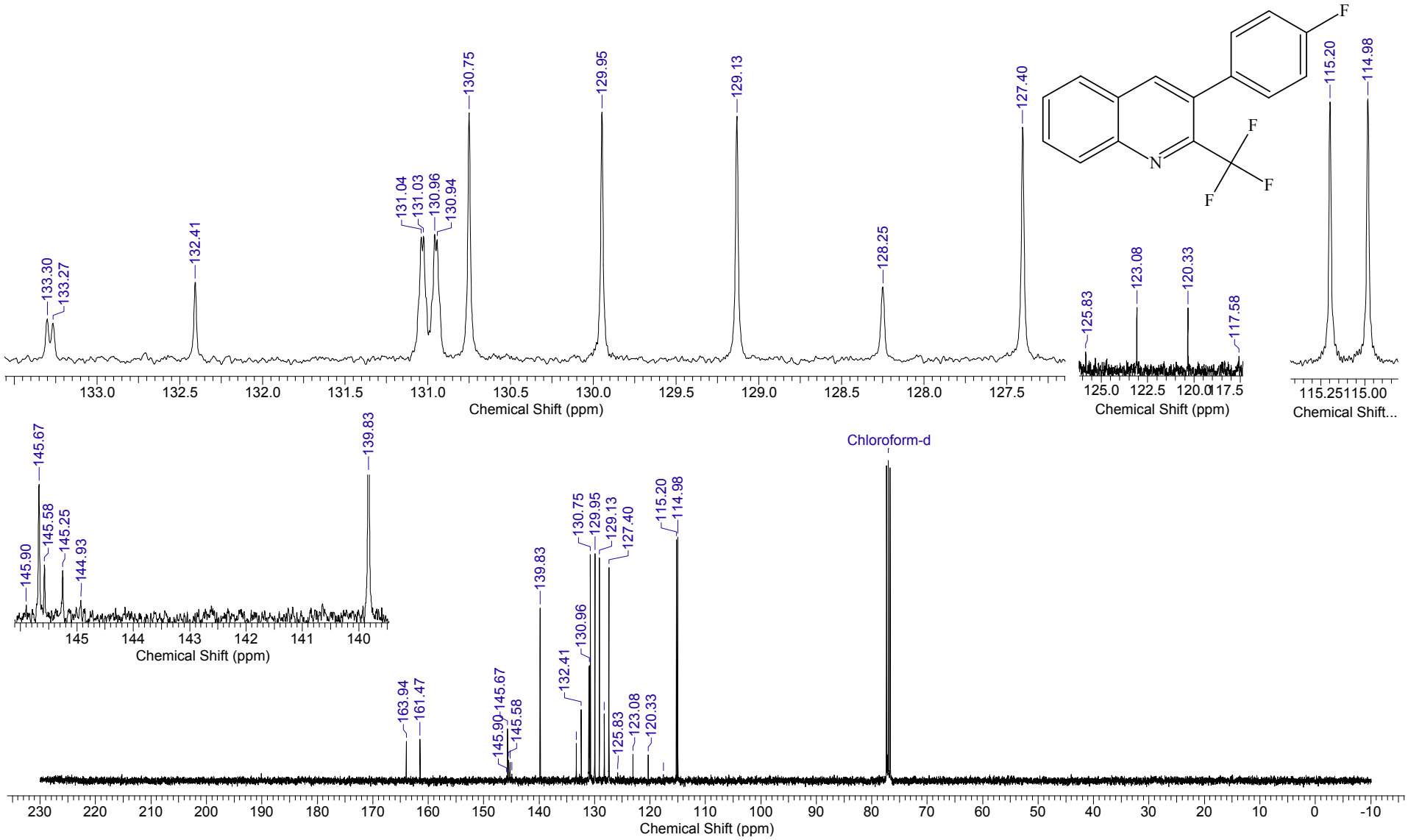
^{1}H NMR spectrum of **5n** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.9923	***Date***	Sep 5 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.05\BM-1628-81a-F_20190905_01\FLUORINE_01		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	262144
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	131578.95	***Temperature (degree C)***	22.000				



^{19}F NMR spectrum of **5n** (376.5 MHz, $CDCl_3$)

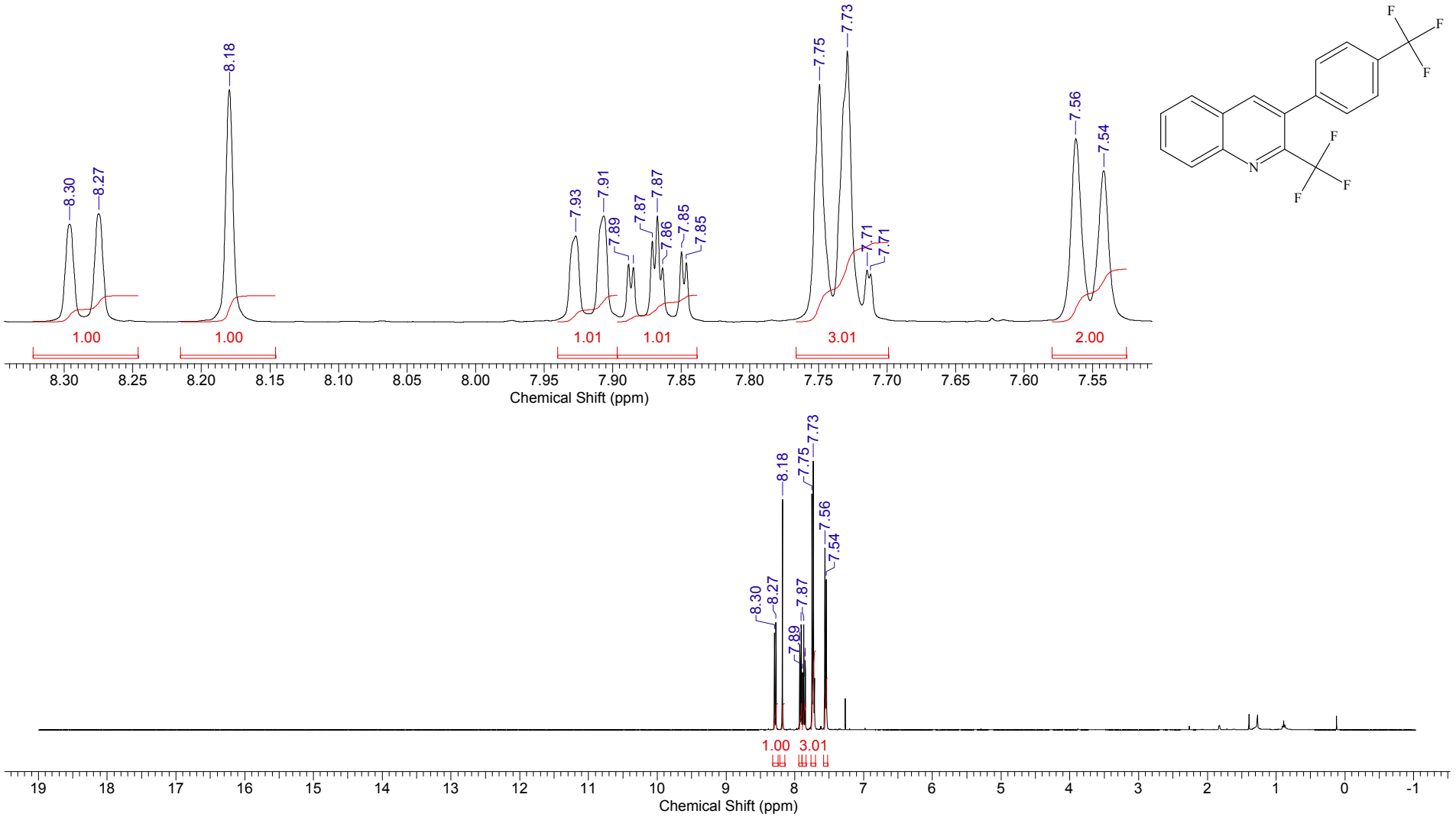
Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	15 Jul 2019 15:58:56
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\BM-1628-x1a.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	305	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



^{13}C NMR spectrum of **5n** (100.6 MHz, $CDCl_3$)

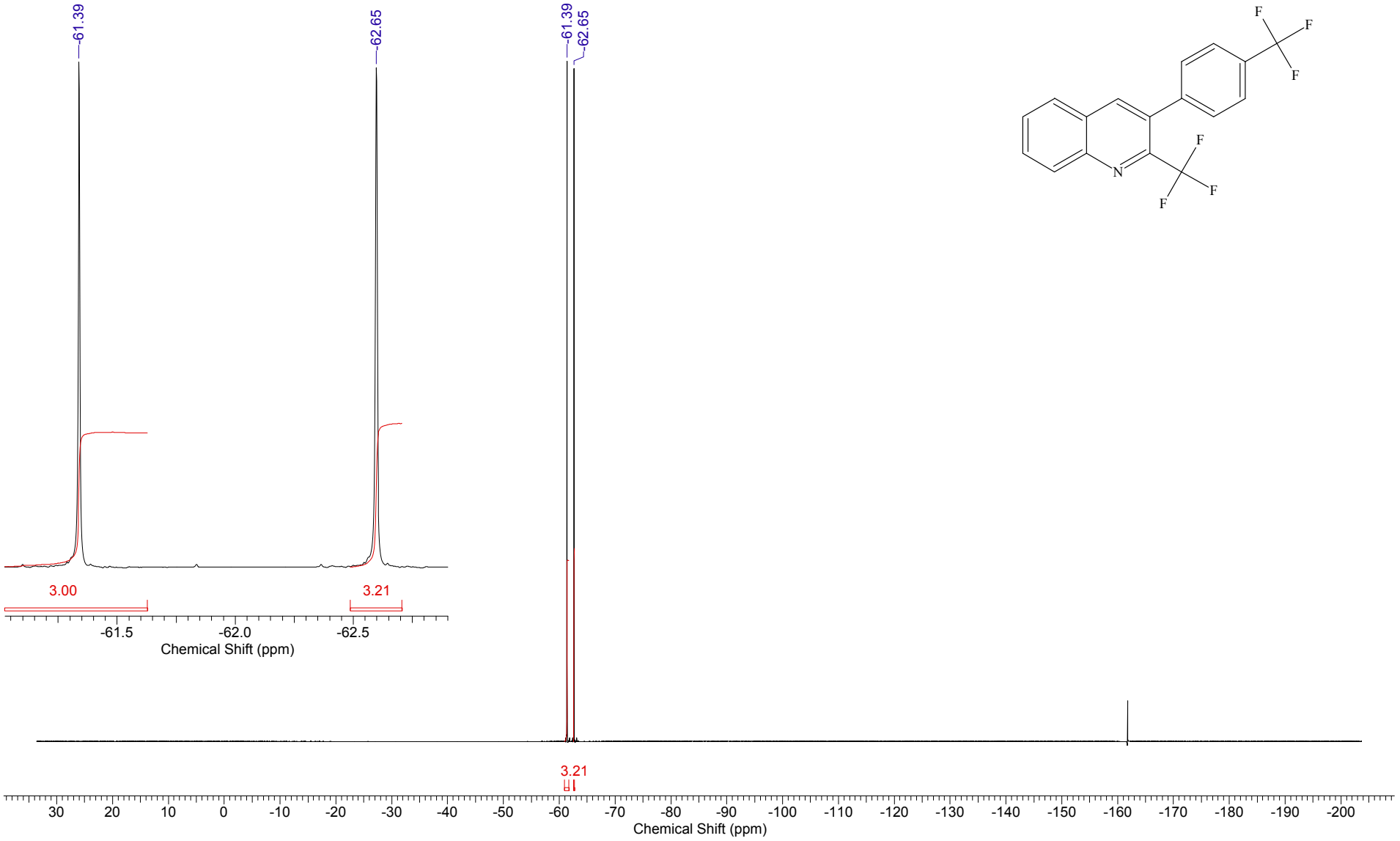
FW	341.2505	Formula	$C_{17}H_9F_6N$

Acquisition Time (sec)	4.0894	**Comment**	Imported from UXNMR.			**Date**	12 Oct 2020 15:12:36
File Name	C:\Users\BM-1\Downloads\SZA-BM 12.10\SZA-BM 12.10\SZA-BM-1881-2.H_001001r					**Frequency (MHz)**	400.13
Nucleus	1H	**Number of Transients**	4	**Original Points Count**	32768	**Points Count**	131072
Pulse Sequence	zg30	**Solvent**	CHLOROFORM-D			**Sweep Width (Hz)**	8012.82
Temperature (degree C)	27.000						



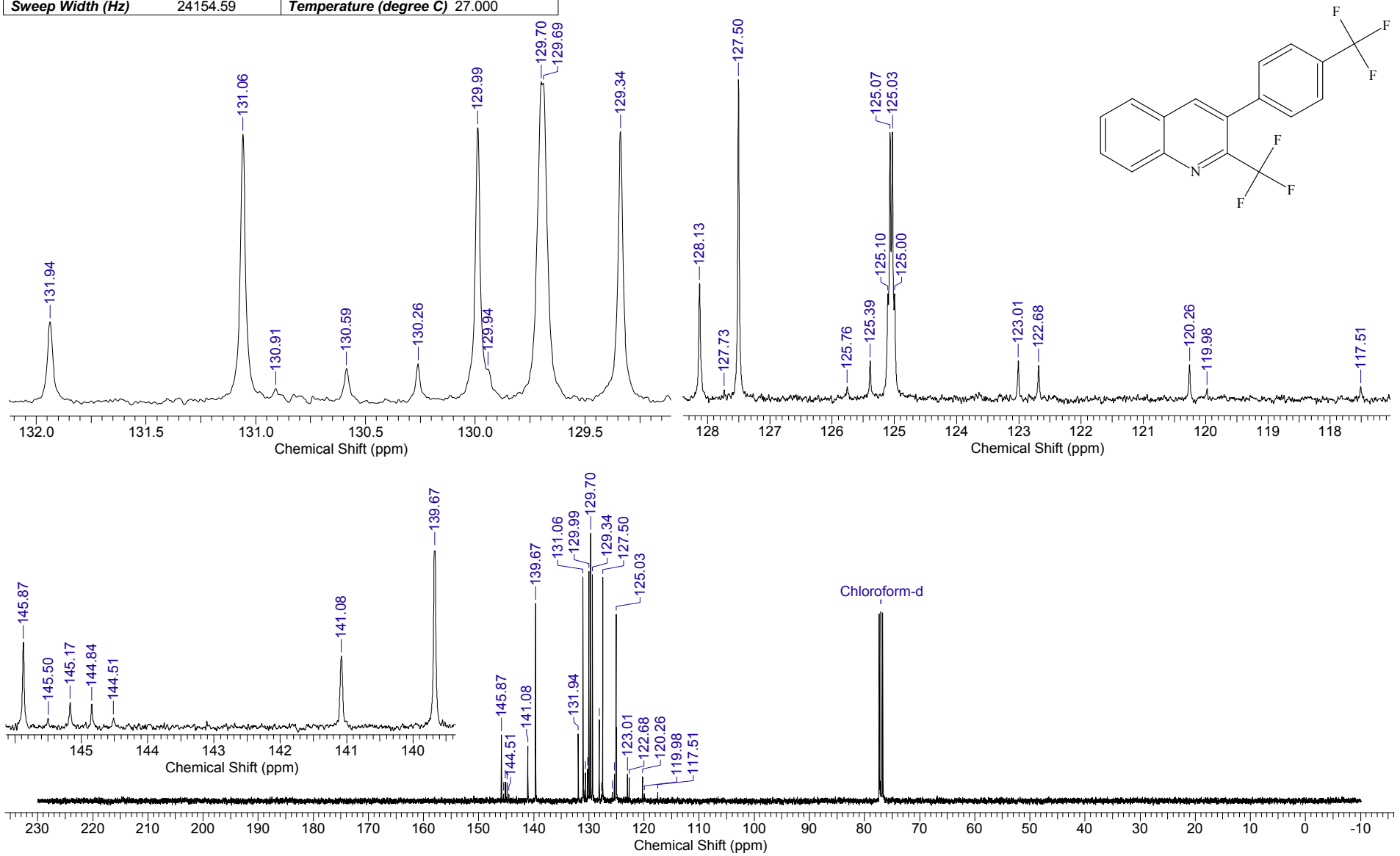
^{1}H NMR spectrum of **5o** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.0000	***Date***	Sep 6 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.06\BM-1675-2_20190906_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	4	***Original Points Count***	89286
Points Count	131072	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	22.000				



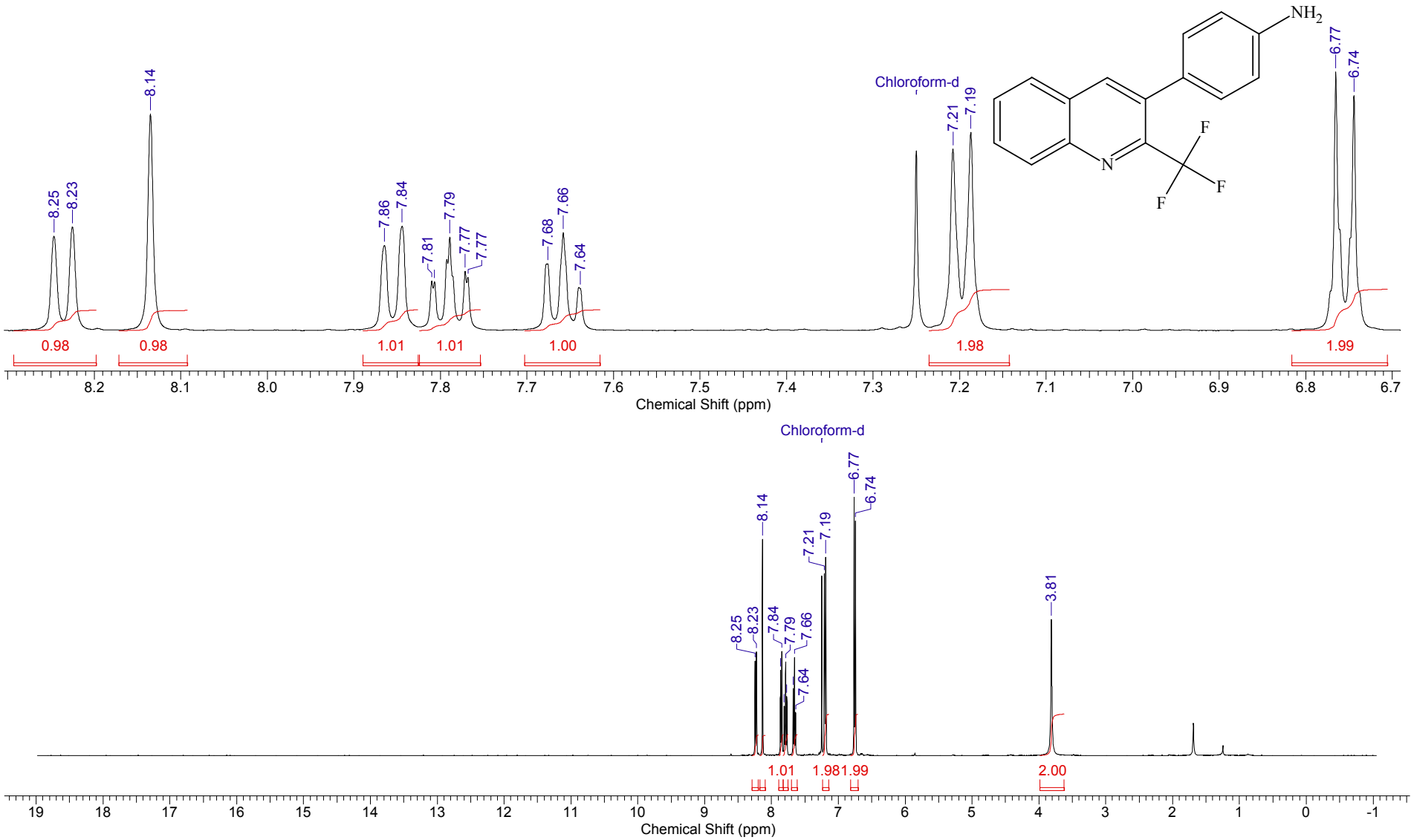
^{19}F NMR spectrum of **5o** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	02 Aug 2019 22:00:18
File Name	C:\DOCS\BM\190802\BM-1675-2_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Original Points Count	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30	***Solvent***	CHLOROFORM-D
Sweep Width (Hz)	24154.59	***Temperature (degree C)***	27.000				



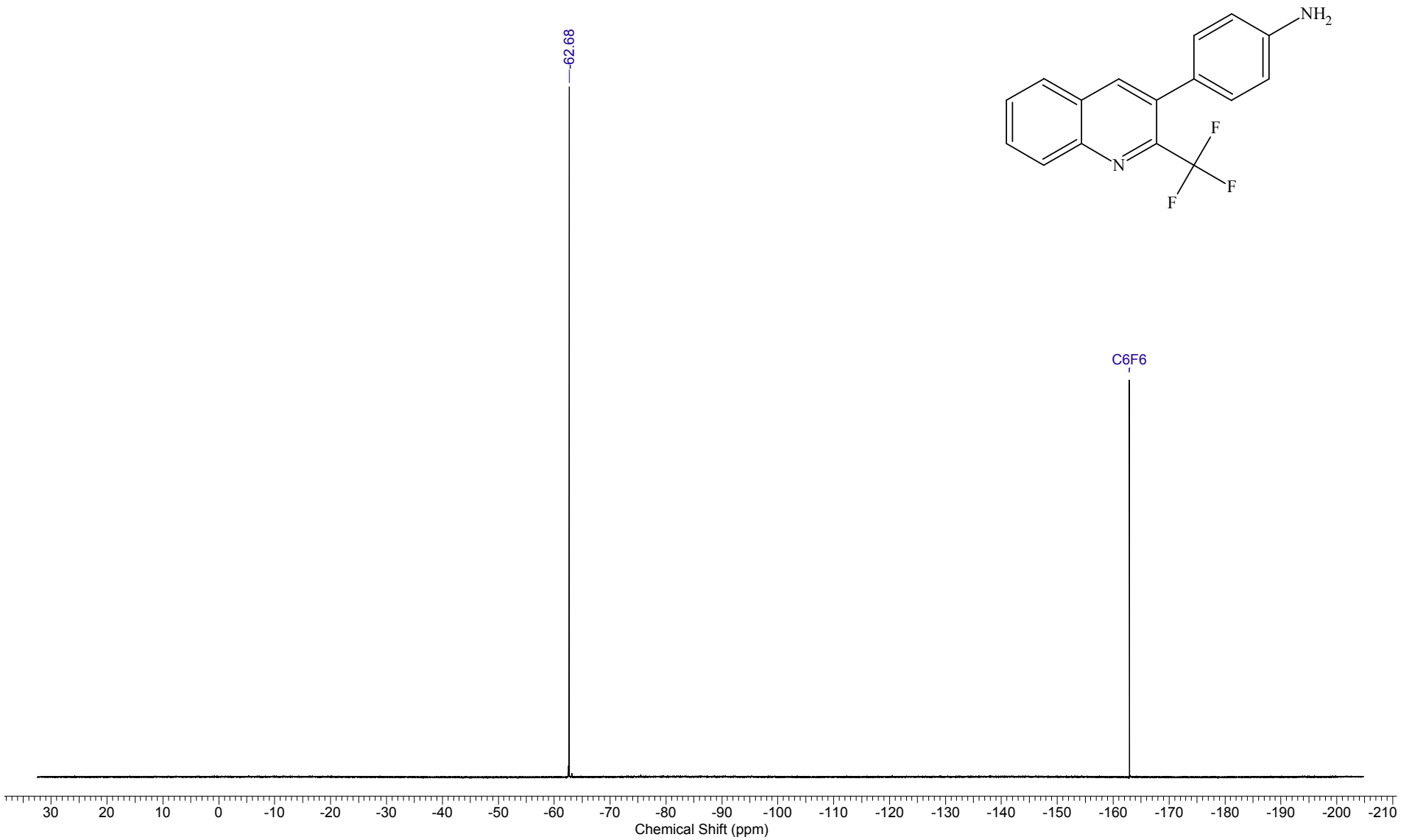
^{13}C NMR spectrum of **5o** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	06 Aug 2019 21:58:40
File Name	C:\Users\BM-1\Downloads\bm190806\BM-1678-a_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	8	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



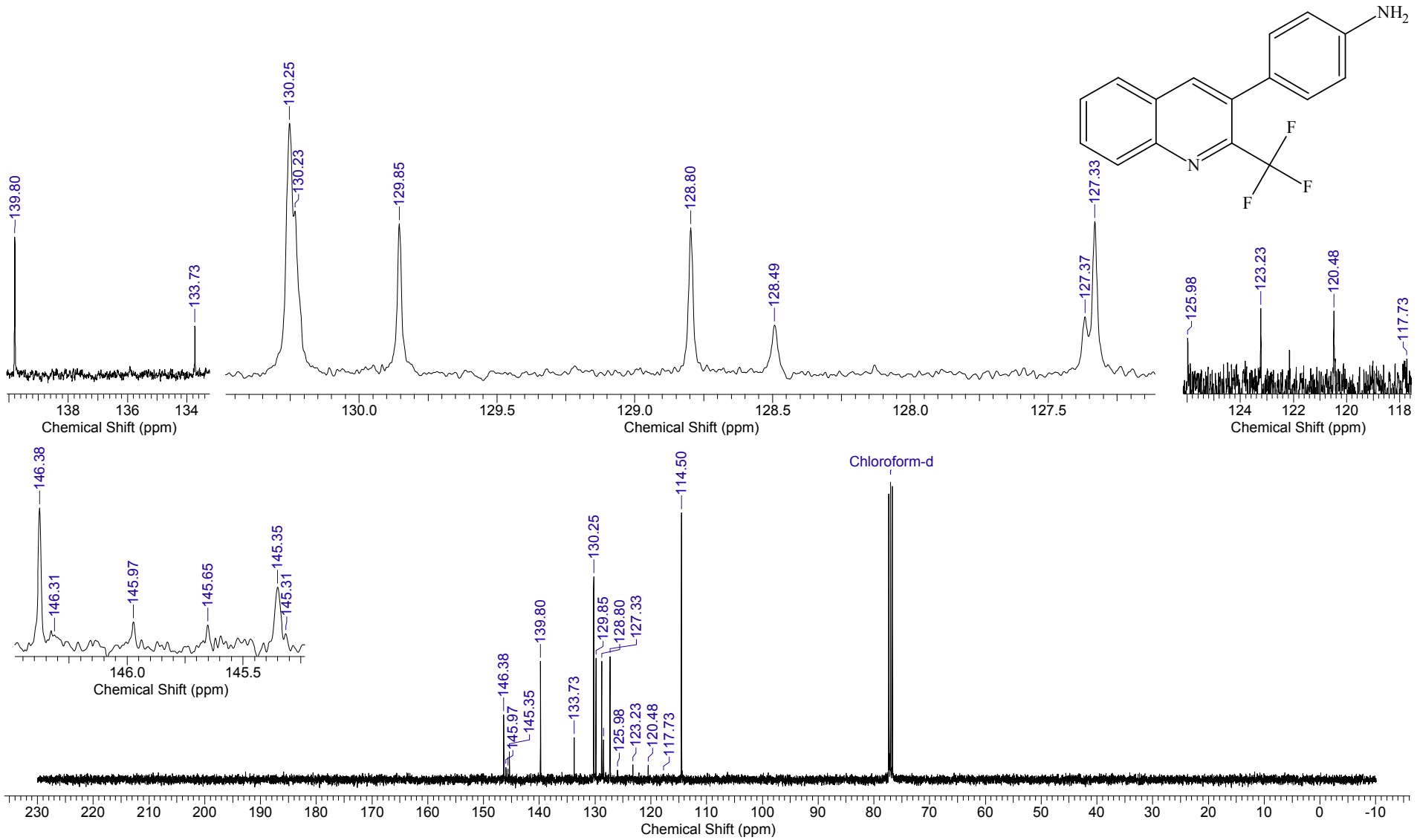
^{1}H NMR spectrum of **5p** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.0000	***Date***	Sep 6 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.06\BM-1678-a_20190906_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	4	***Original Points Count***	89286
Points Count	131072	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	22.000				



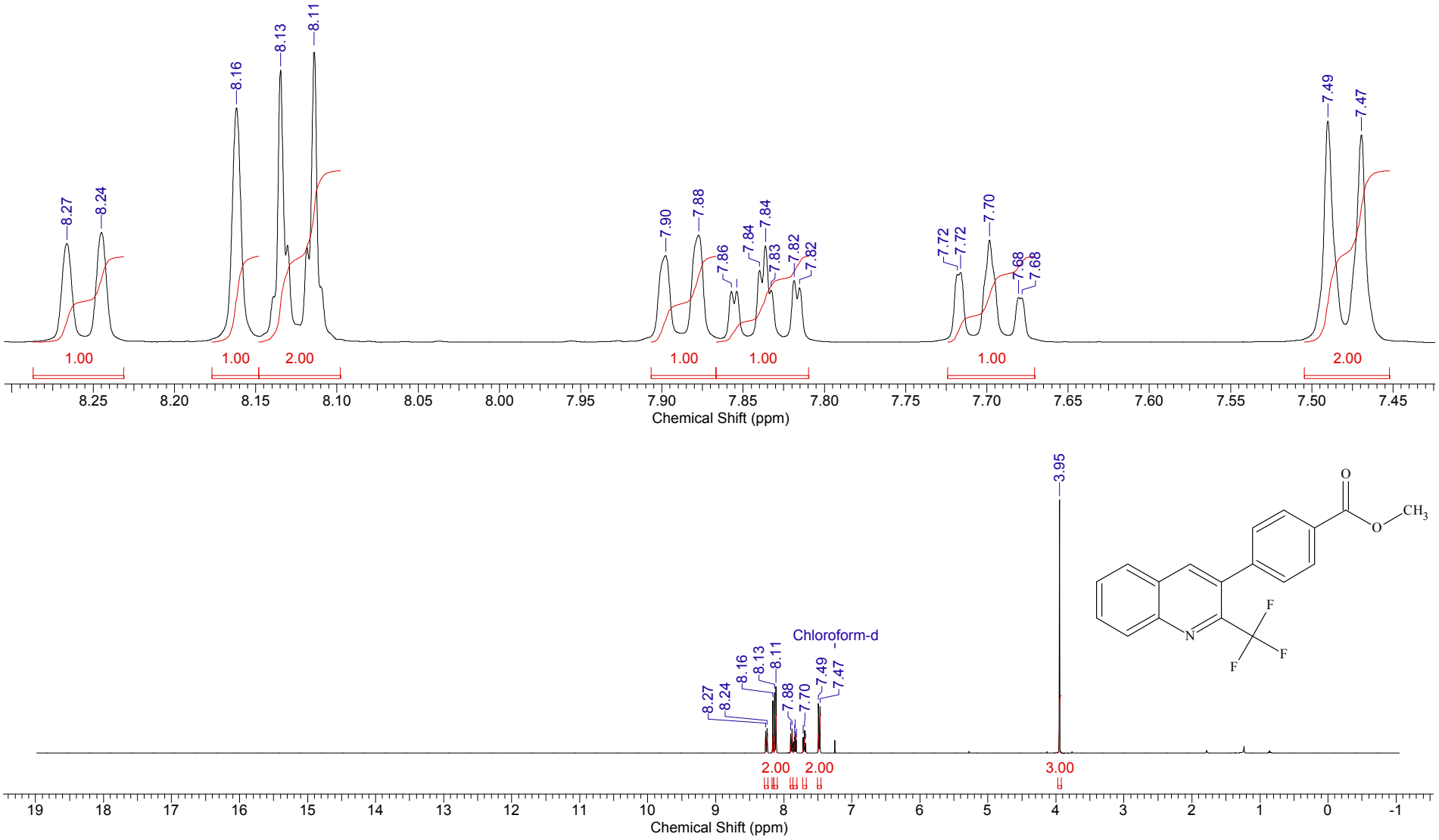
^{19}F NMR spectrum of **5p** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	06 Aug 2019 22:06:48
File Name	C:\Users\BM-1\Downloads\bm190806\BM-1678-a_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	256	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



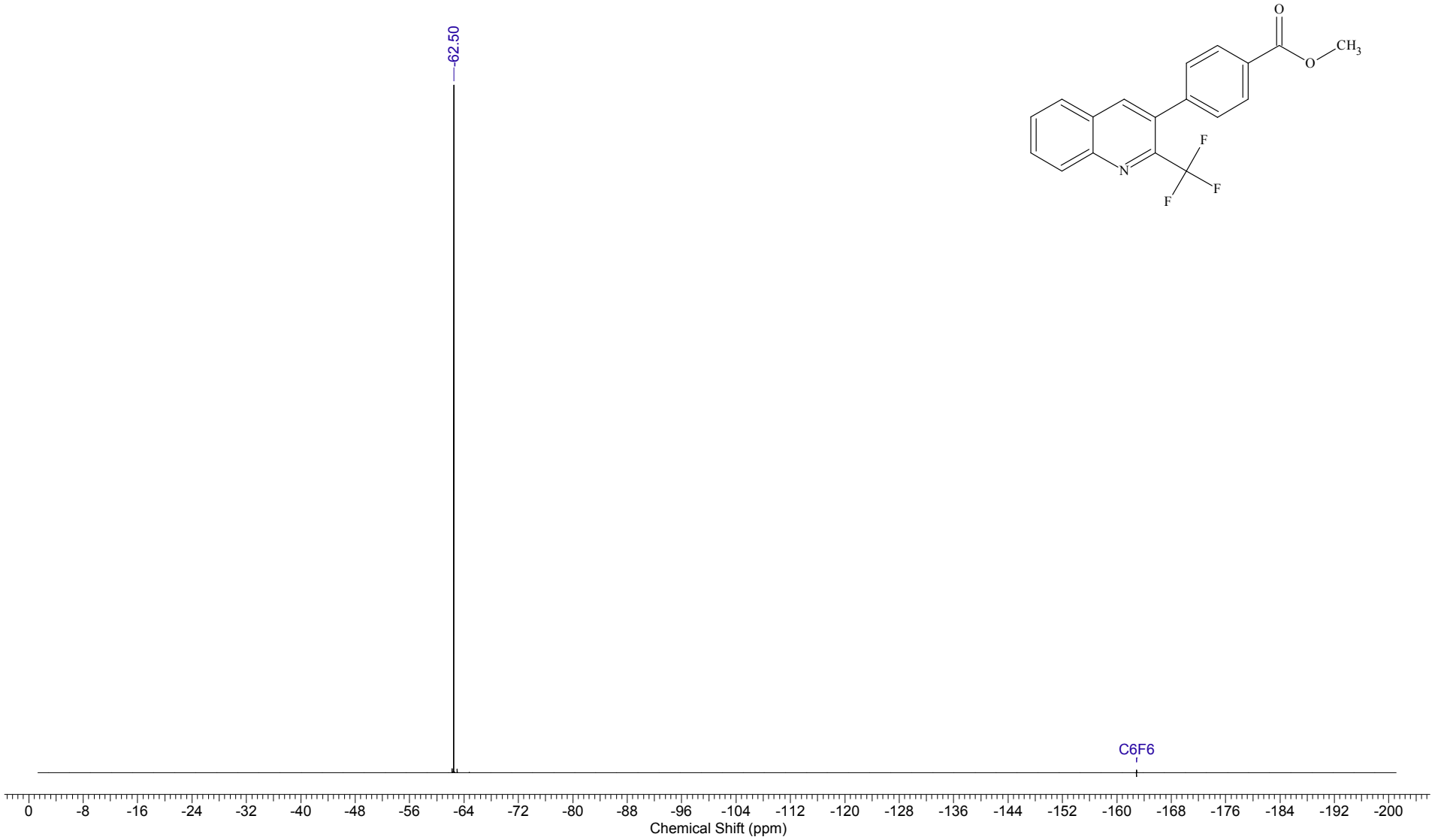
^{13}C NMR spectrum of **5p** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	05 Oct 2020 15:56:36
File Name	C:\BM_DATA\DOCS\05.10.20\05.10.20\SZA-BM-1880-9.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



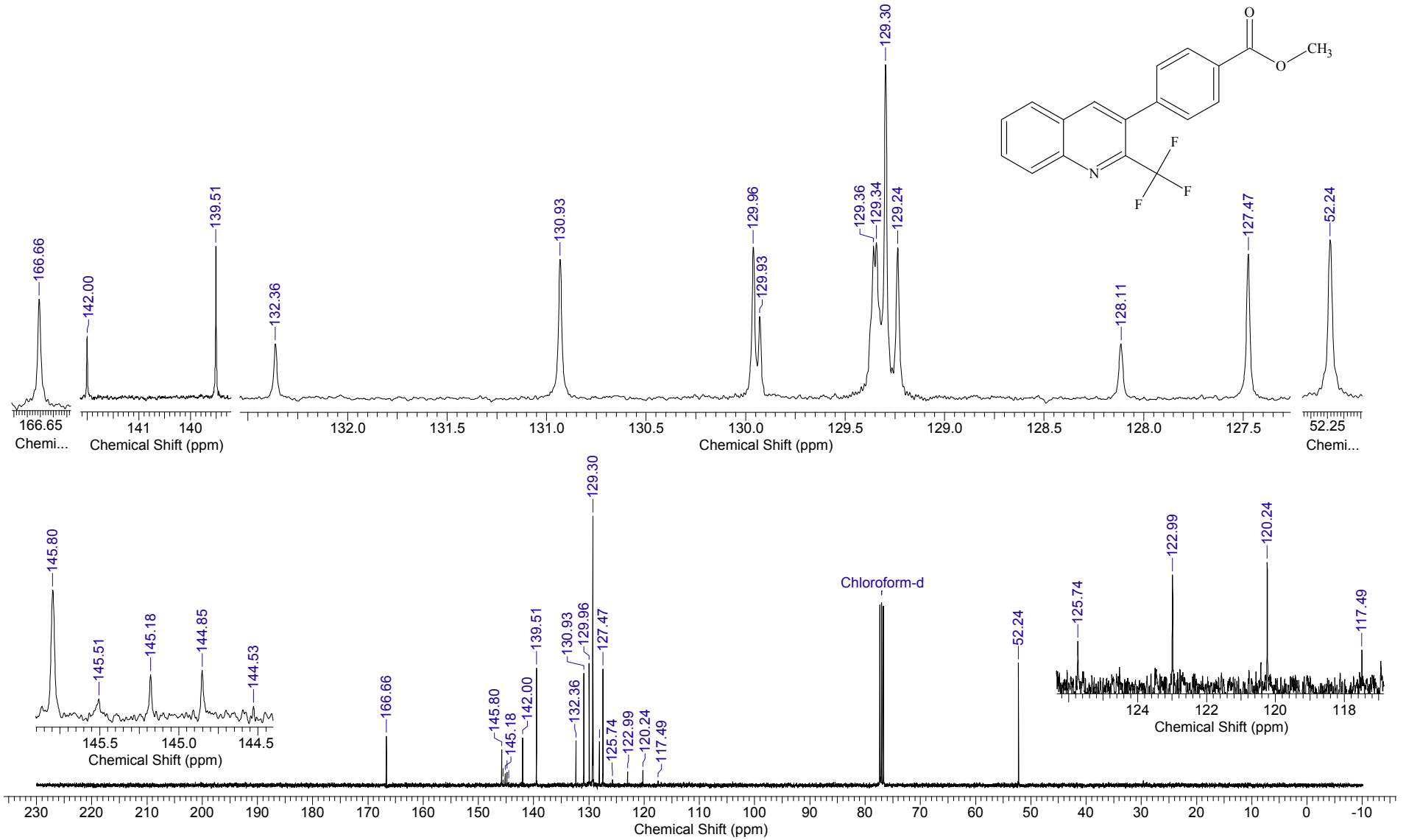
^{1}H NMR spectrum of **5q** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.7433	***Comment***	Imported from UXNMR.			***Date***	06 Oct 2020 15:22:46
File Name	C:\BM_DATA\DOCS\06.10.20\06.10.20\SZA-BM-1880-9.F_005001r					***Frequency (MHz)***	376.50
Nucleus	19F	***Number of Transients***	16	***Original Points Count***	131072	***Points Count***	262144
Pulse Sequence	zgflqn	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	75187.97
Temperature (degree C)	27.000						



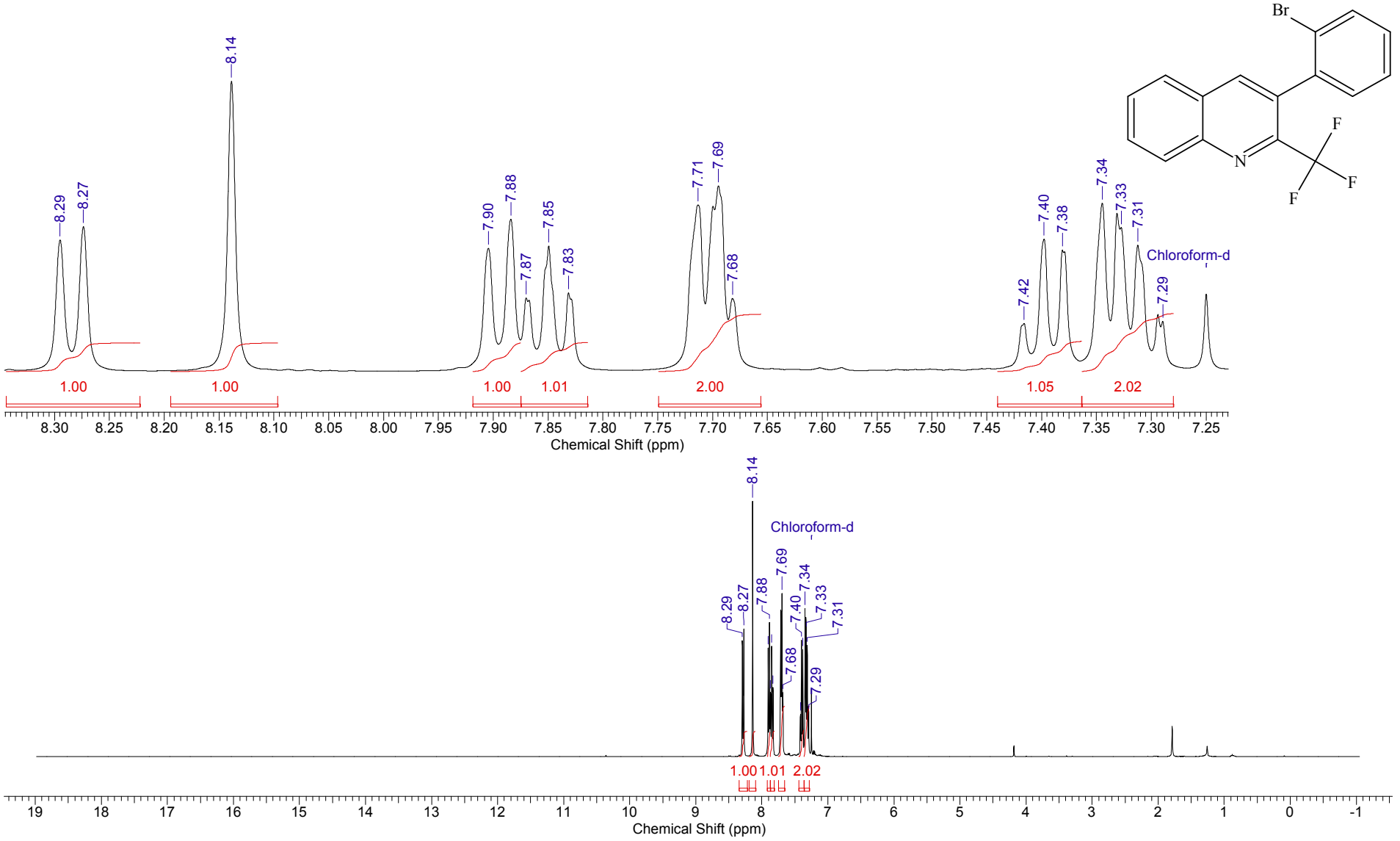
^{19}F NMR spectrum of **5q** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	06 Oct 2020 14:51:46
File Name	C:\BM_DATA\DOCS\06.10.20\06.10.20\SZA-BM-1880-9.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	258	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	BENZENE-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



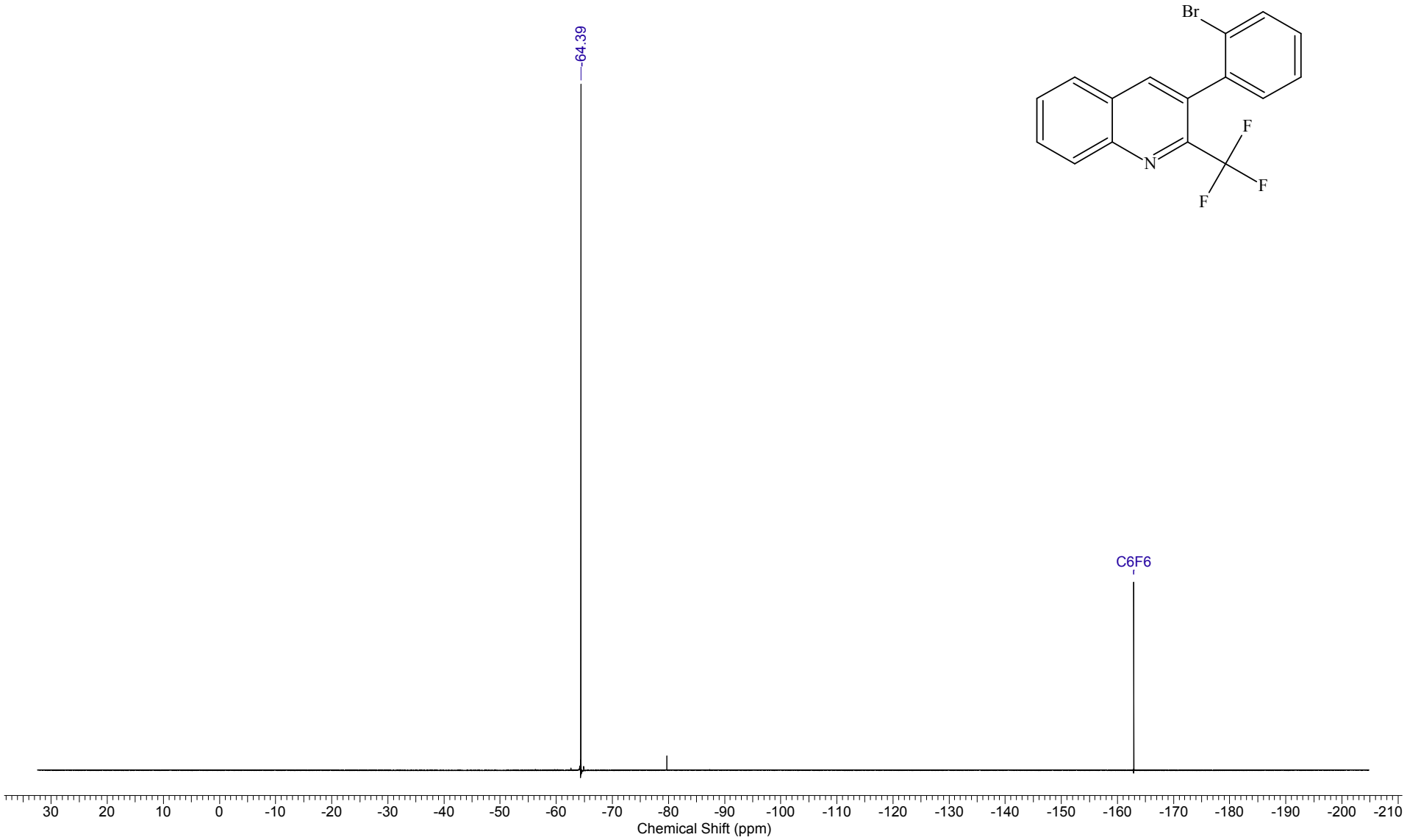
^{13}C NMR spectrum of **5q** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	07 Aug 2019 21:37:42
File Name	C:\Users\BM-1\Downloads\bm190807\BM-1677-a2_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	8	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



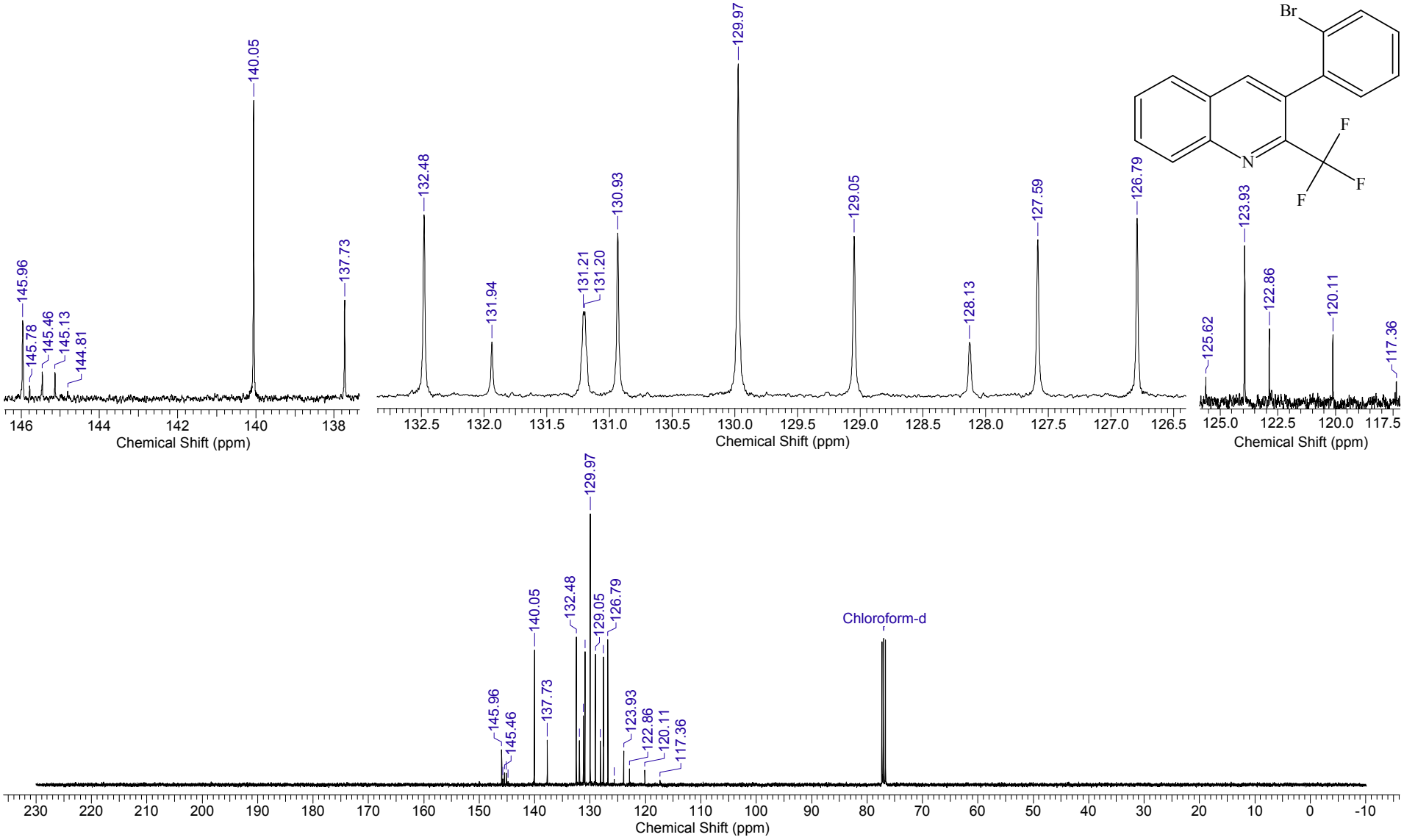
^{1}H NMR spectrum of **5r** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.0000	***Date***	Sep 6 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.06\BM-1677-a2_20190906_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	4	***Original Points Count***	89286
Points Count	131072	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	22.000				



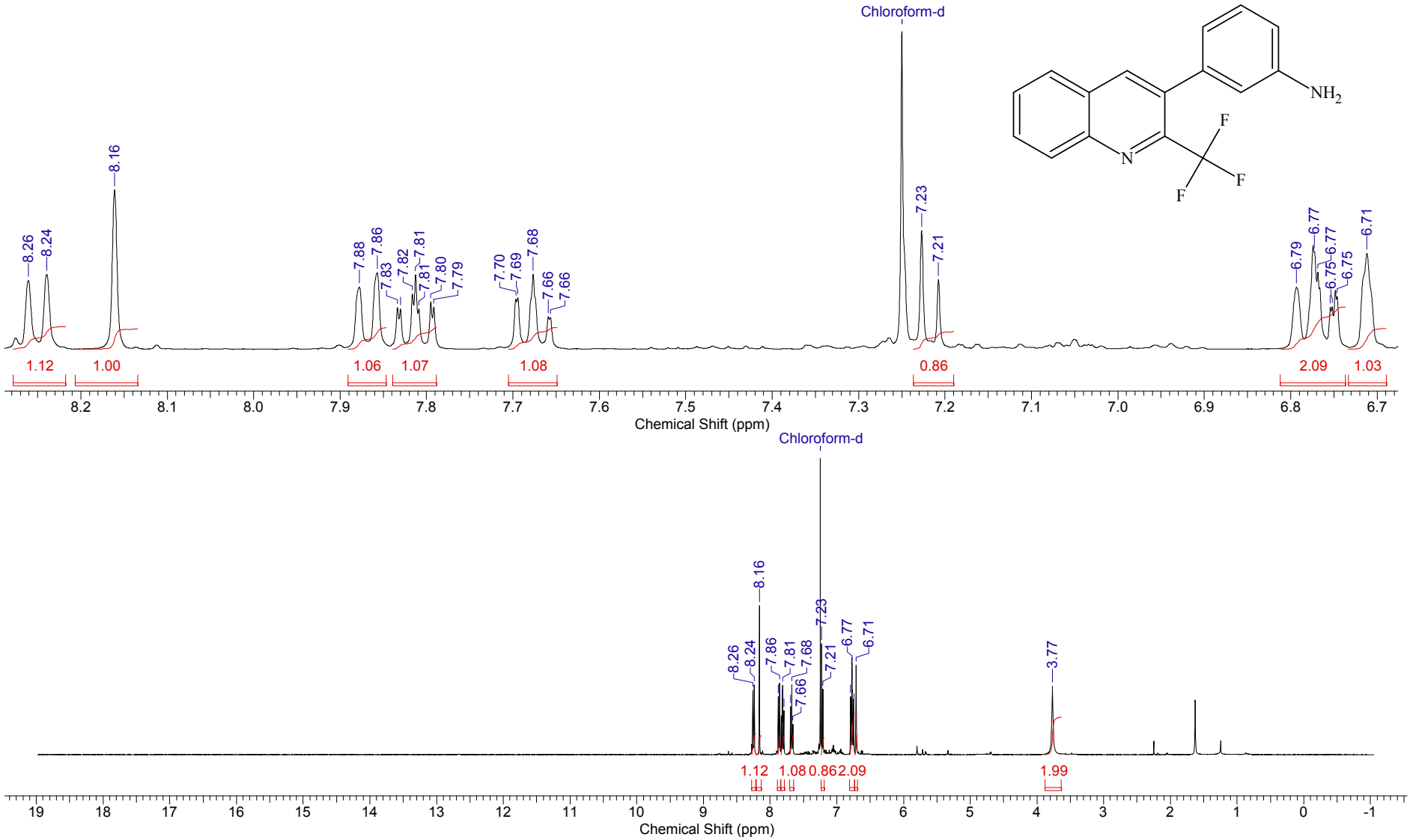
^{19}F NMR spectrum of **5r** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	07 Aug 2019 21:51:18
File Name	C:\Users\BM-1\Downloads\bm190807\BM-1677-a2_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	296	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



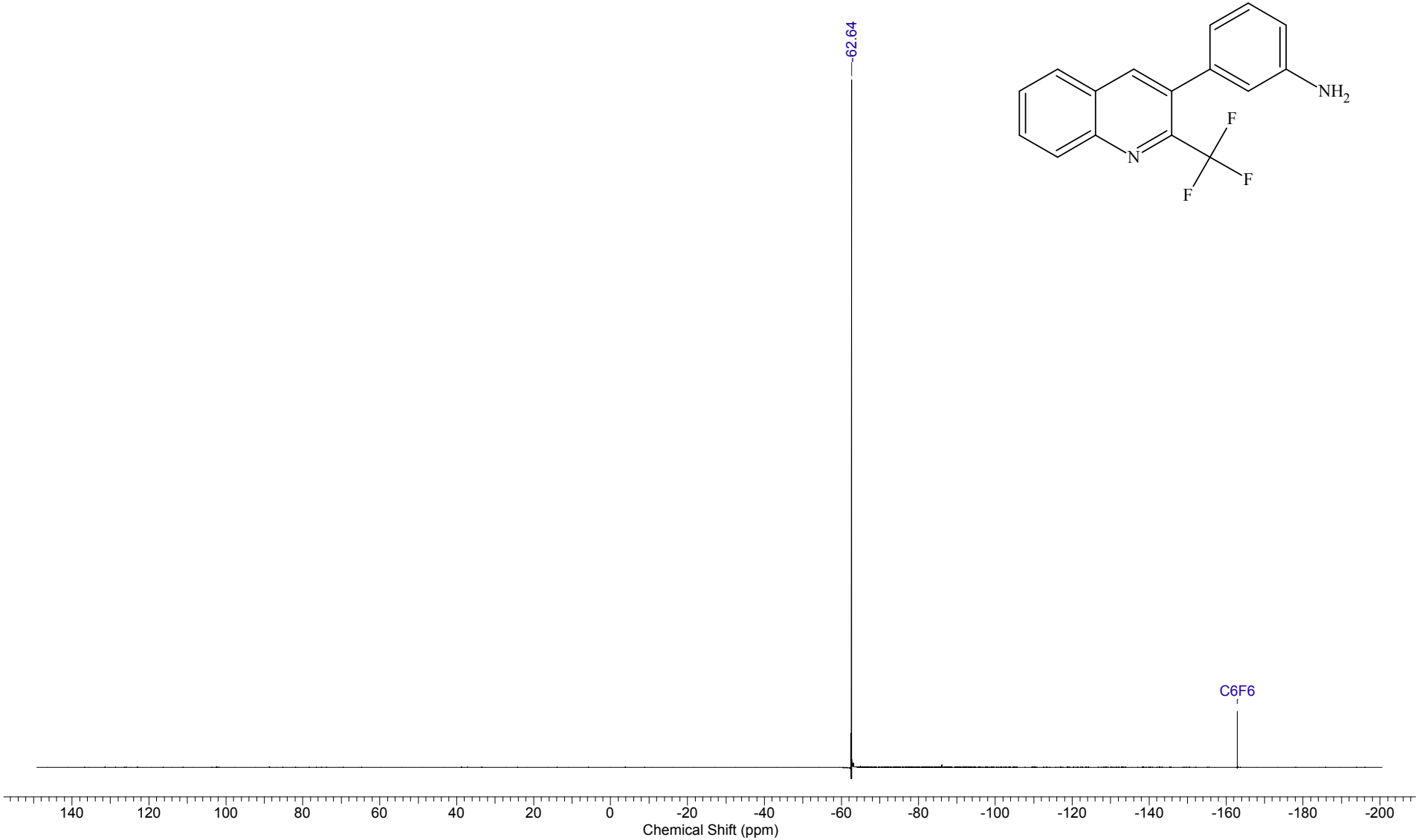
^{13}C NMR spectrum of **5r** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	06 Aug 2019 21:23:50
File Name	C:\Users\BM-1\Downloads\bm190806\BM-1681-a1_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H
Number of Transients	8	***Original Points Count***	32768	***Points Count***	131072	***Pulse Sequence***	zg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



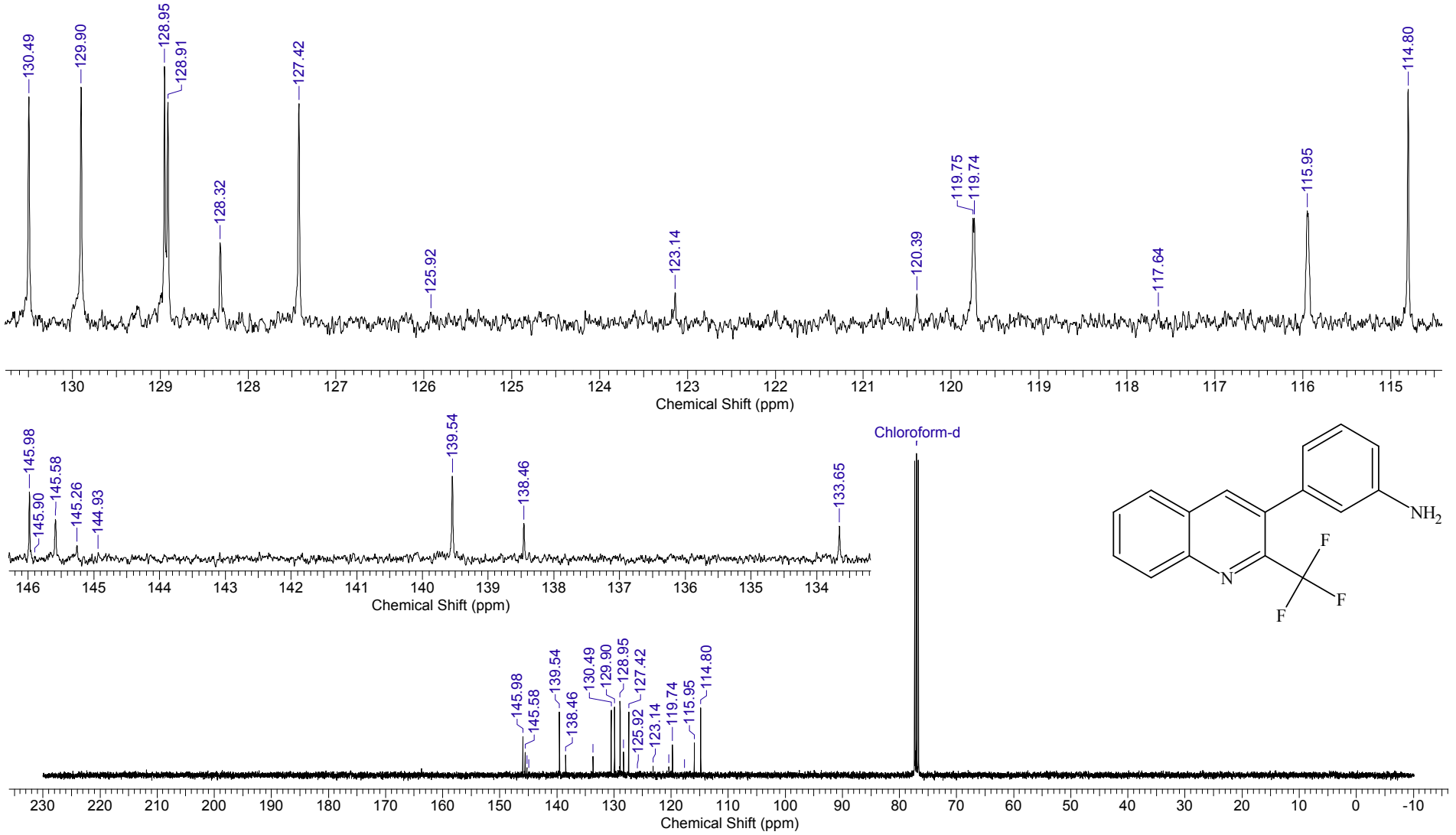
^{1}H NMR spectrum of **5s** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.9923	***Date***	Sep 5 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.05\BM-168a1-F_20190905_01\FLUORINE_01		
Frequency (MHz)	376.33	***Nucleus***	19F	***Number of Transients***	8	***Original Points Count***	262144
Points Count	262144	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	131578.95	***Temperature (degree C)***	22.000				



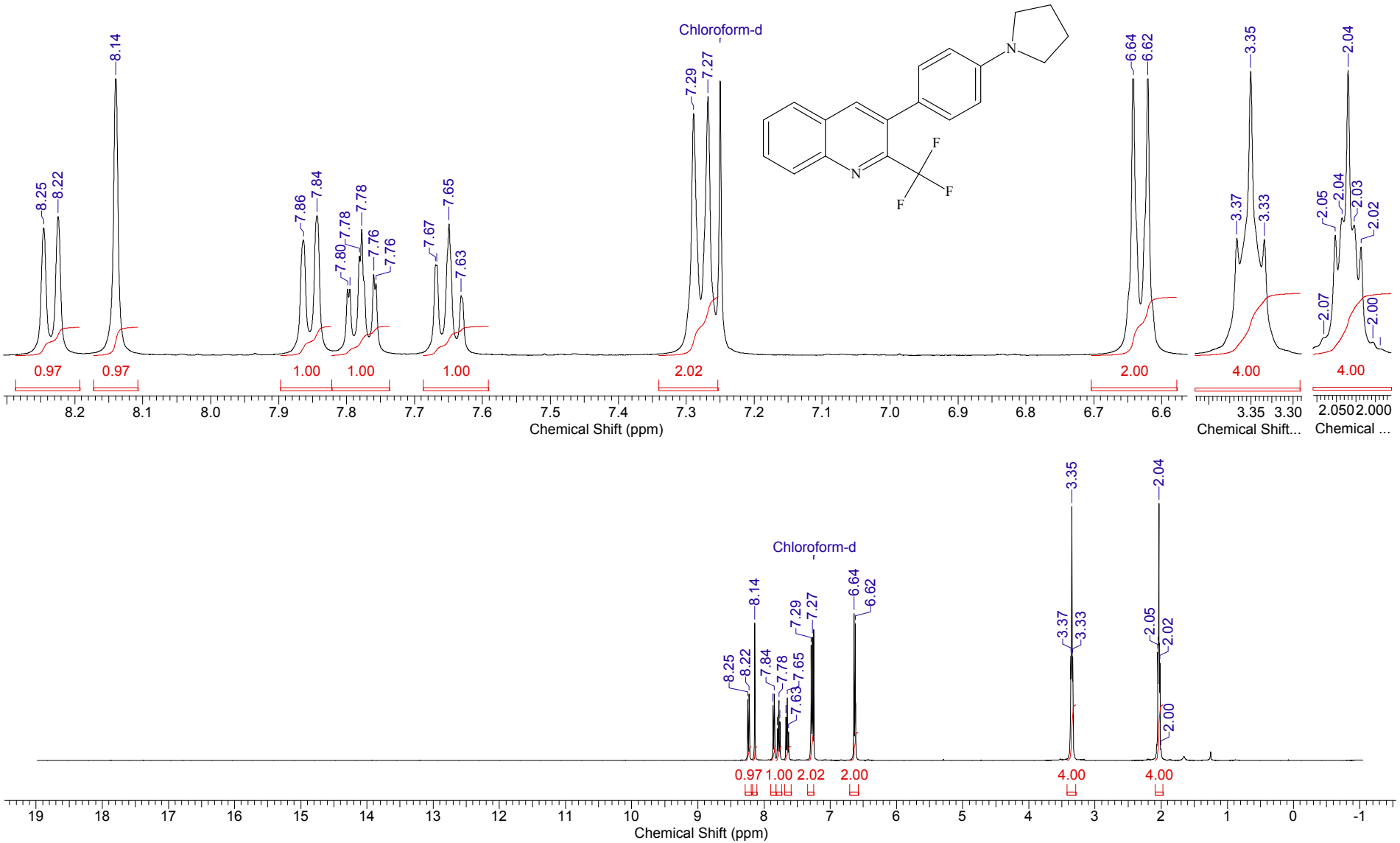
^{19}F NMR spectrum of **5s** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	09 Aug 2019 15:28:24
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\BM-1681-a1.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	424	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59
Temperature (degree C)	27.000						



^{13}C NMR spectrum of **5s** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	29 Feb 2020 22:18:42
File Name	C:\DOCS\BM\200229\BM-1866-1p_001001r			***Frequency (MHz)***	400.13	***Nucleus***	1H	***Number of Transients***	8
Original Points Count	32768	***Points Count***	131072	***Pulse Sequence***	zg30	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	8012.82	***Temperature (degree C)***	27.000						

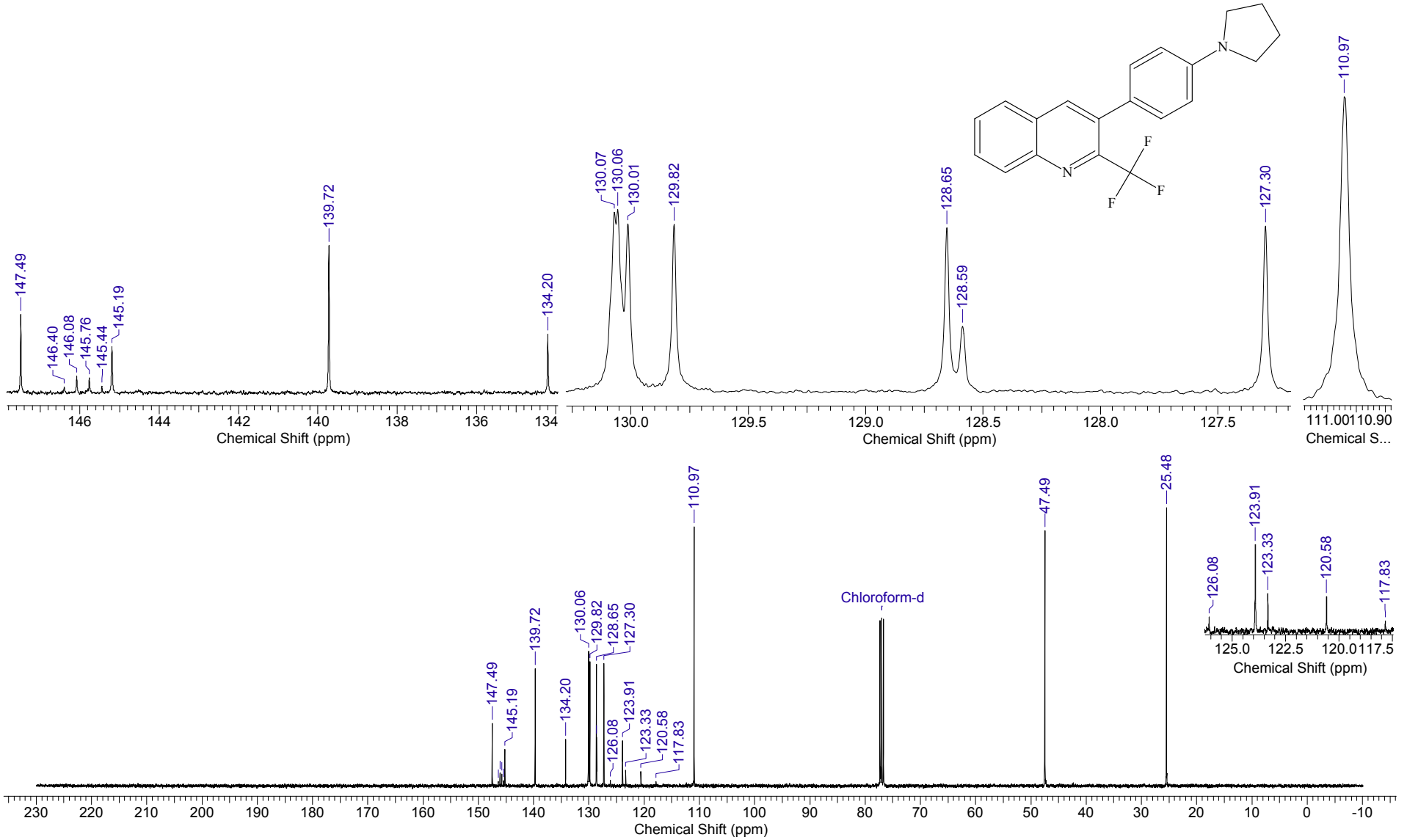


^{1}H NMR spectrum of **5t** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.5000	***Comment***	STANDARD FLUORINE PARAMETERS			***Date***	Mar 2 2020
File Name	C:\DOCS\OUTPUT_301\F19\2020.03.02\bm-1866-1p_20200302_01\FLUORINE_01					***Frequency (MHz)***	376.31
Nucleus	19F	***Number of Transients***	16	***Original Points Count***	133929	***Points Count***	262144
Pulse Sequence	s2pul	***Solvent***	CHLOROFORM-D	***Sweep Width (Hz)***	89285.71	***Temperature (degree C)***	30.000

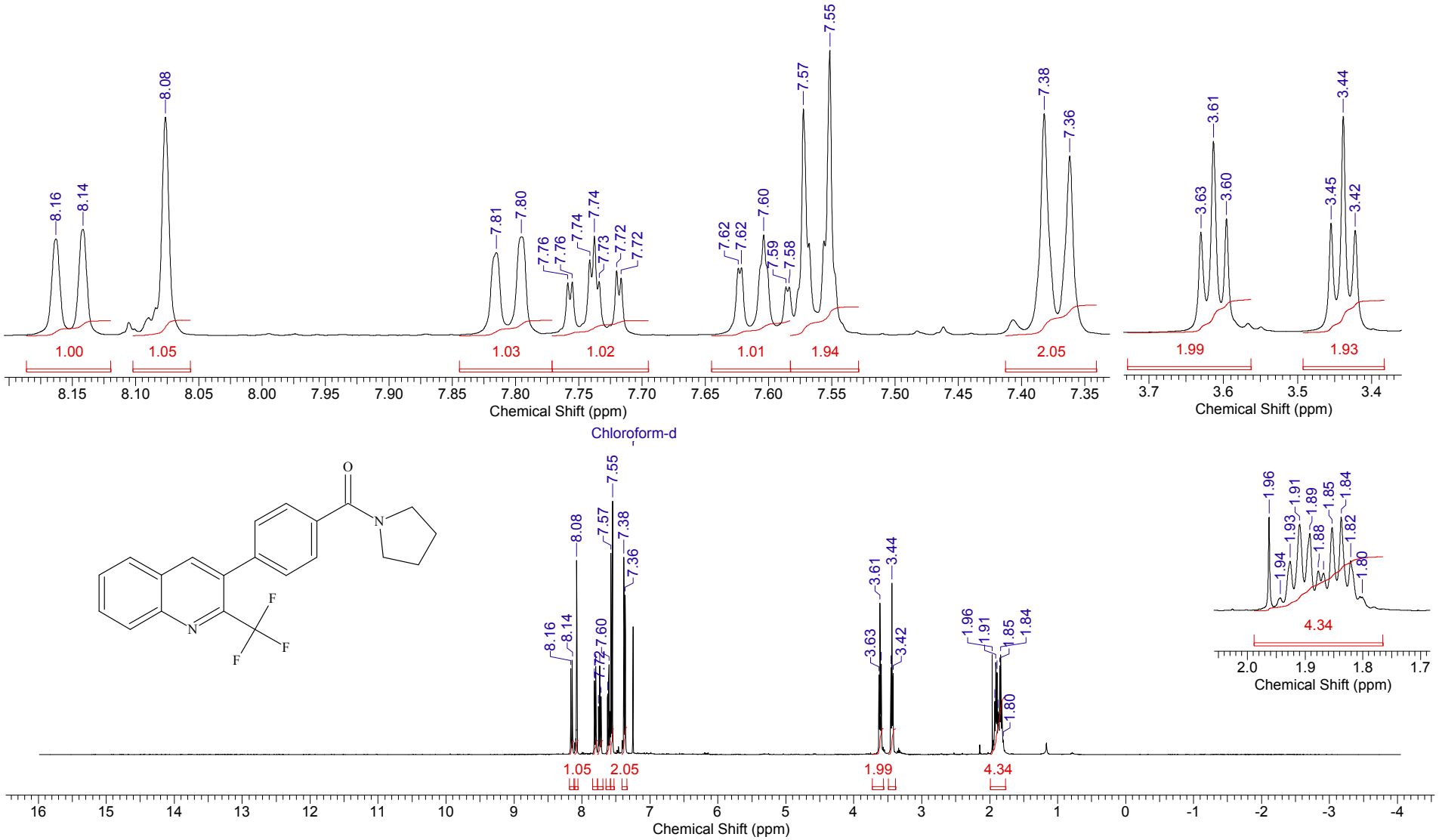
^{19}F NMR spectrum of **5t** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	29 Feb 2020 11:05:48
File Name	C:\DOCS\BM\BM-1866-1\BM-1866-1_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	616	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	CHLOROFORM-D			***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



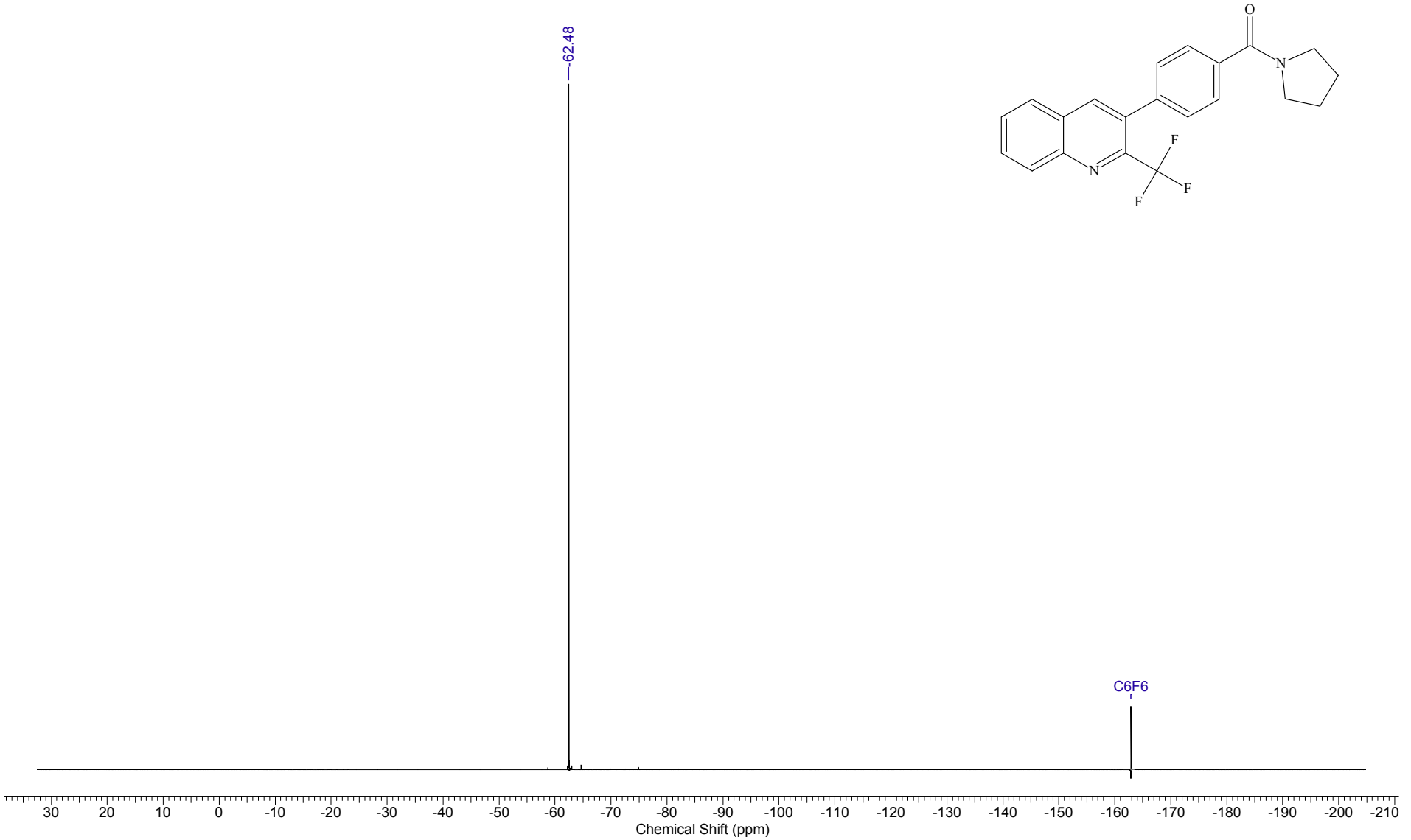
^{13}C NMR spectrum of **5t** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	15 Jul 2019 15:40:02
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\BM-1643-1.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



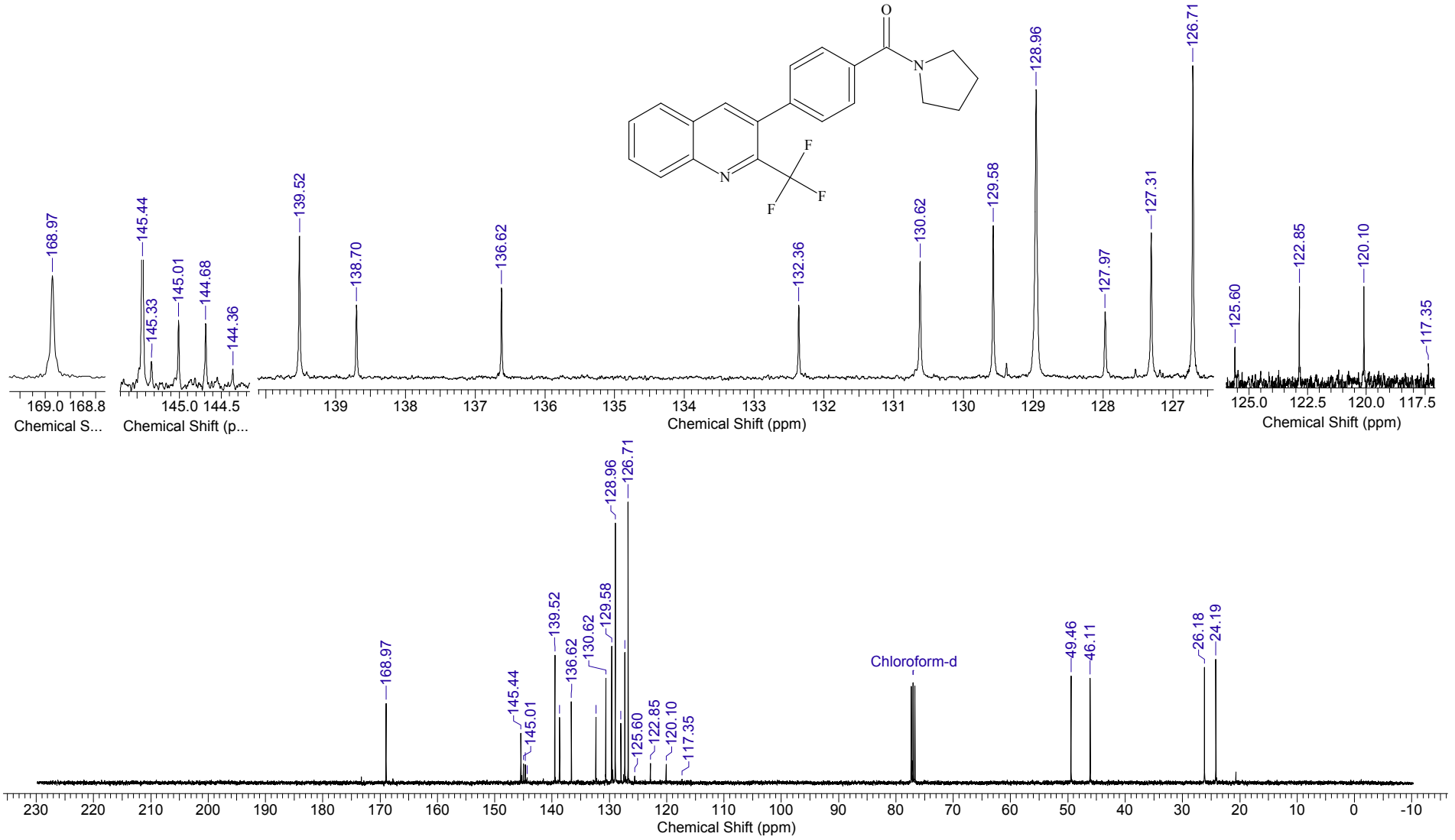
^{1}H NMR spectrum of **5u** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.0000	***Date***	Sep 6 2019	***File Name***	C:\DOCS\OUTPUT_301\F19\2019.09.06\BM-1643-1_20190906_01\FLUORINE_01		
Frequency (MHz)	376.31	***Nucleus***	19F	***Number of Transients***	4	***Original Points Count***	89286
Points Count	131072	***Pulse Sequence***	s2pul	***Solvent***	CHLOROFORM-D		
Sweep Width (Hz)	89285.71	***Temperature (degree C)***	22.000				



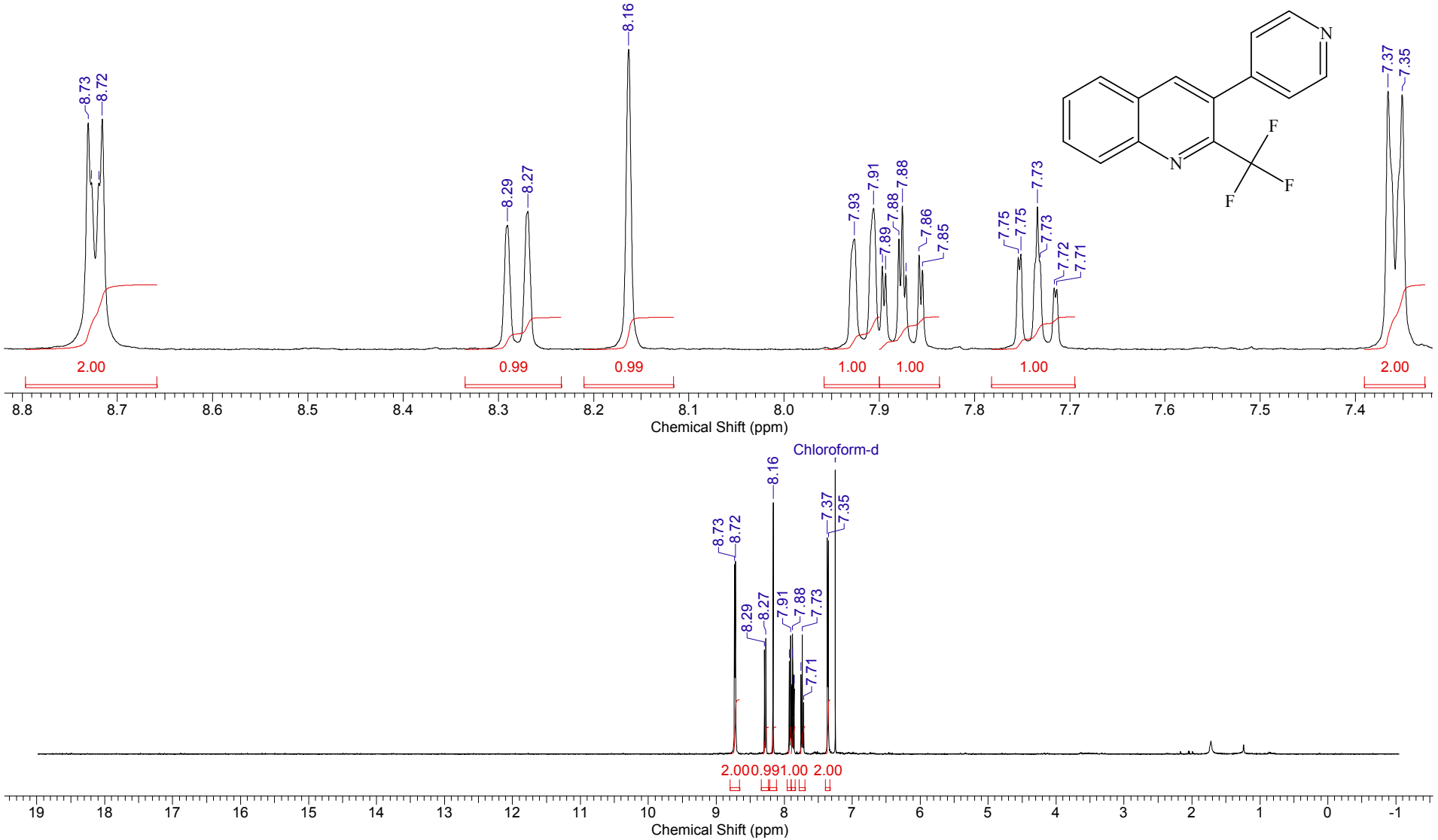
^{19}F NMR spectrum of **5u** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	15 Jul 2019 15:45:04
File Name	C:\DOCS\OUTPUT_301\2019\07.èþ ëü\BM-1643-1.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	112	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



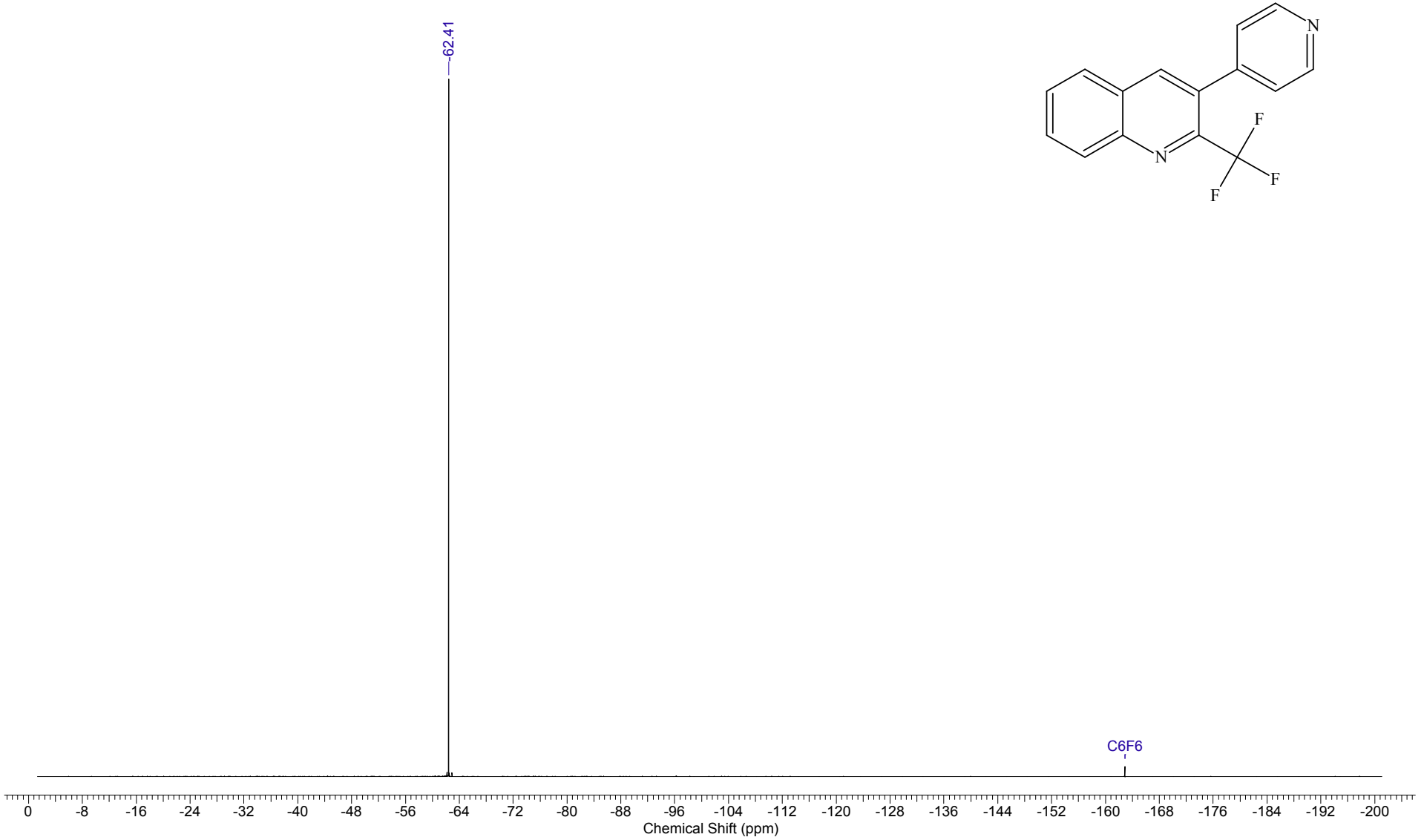
^{13}C NMR spectrum of **5u** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	26 Feb 2021 15:14:14
File Name	C:\DOCS\OUTPUT_301\2021\02.ô åâðàëü\BM-2090-3p.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



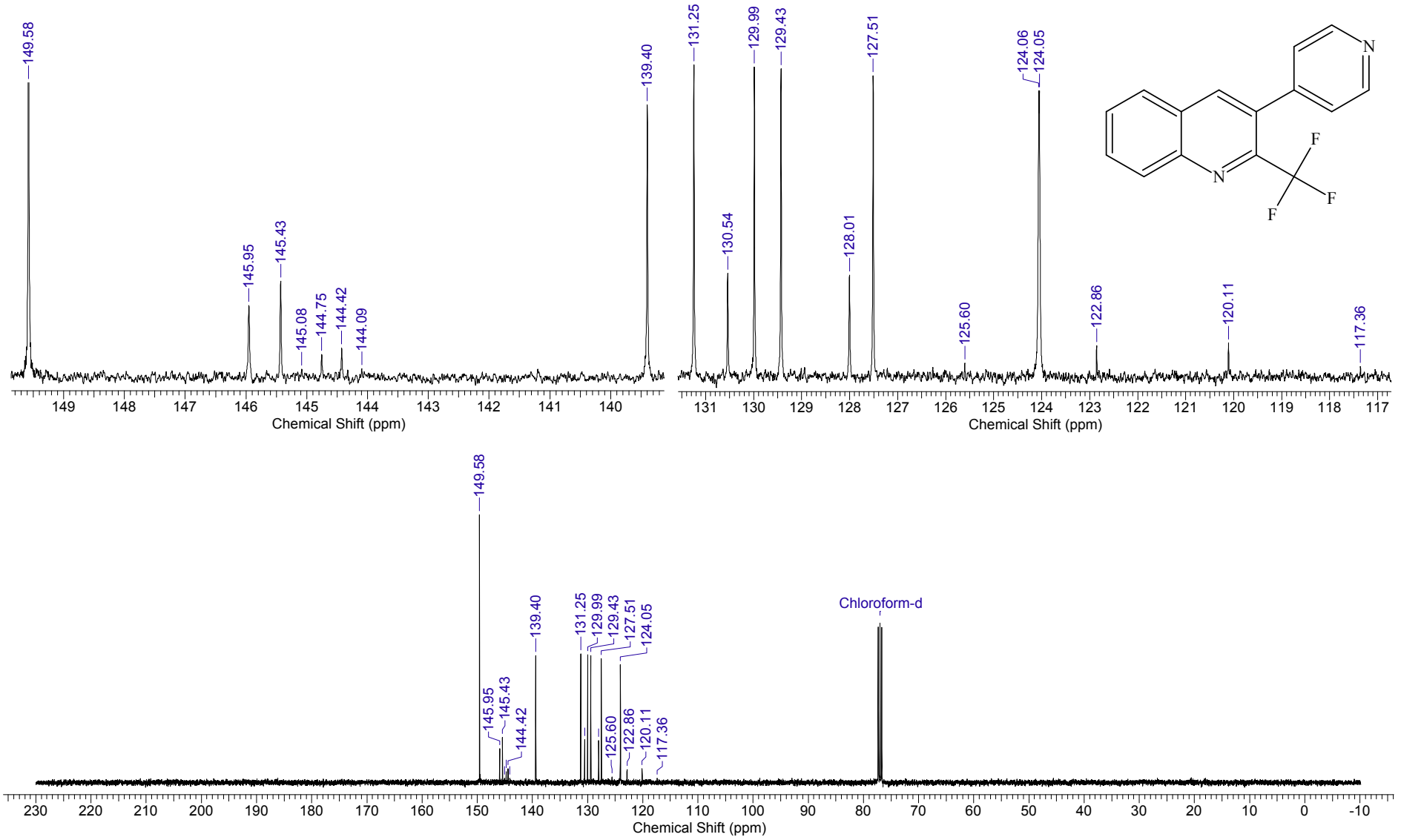
^{1}H NMR spectrum of **5v** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.7433	***Comment***	Imported from UXNMR.			***Date***	26 Feb 2021 15:56:58
File Name	C:\DOCS\OUTPUT_301\2021\02.ô åâðàëü\BM-2090-2p.F_005001r					***Frequency (MHz)***	376.50
Nucleus	19F	***Number of Transients***	8	***Original Points Count***	131072	***Points Count***	262144
Pulse Sequence	zgflqn	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	75187.97	***Temperature (degree C)***	27.000



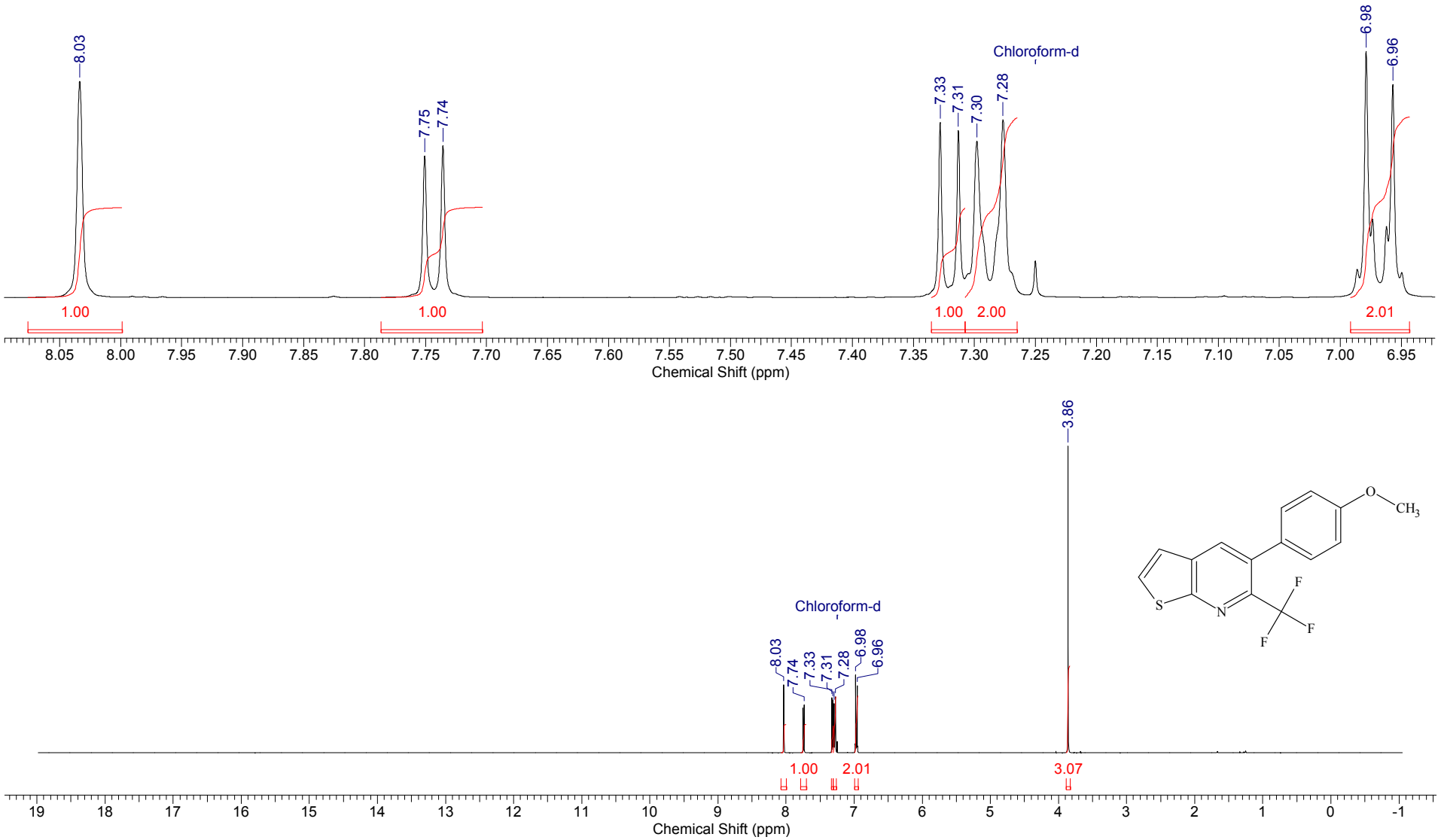
^{19}F NMR spectrum of **5v** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	26 Feb 2021 16:04:32
File Name	I:\SPEC_H,C_2021\02.ô åâðàëü\BM-2090-2p.C_002001r			***Frequency (MHz)***	100.61	***Nucleus***	13C
Number of Transients	137	***Original Points Count***	16384	***Points Count***	131072	***Pulse Sequence***	zgpg30
Solvent	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000		



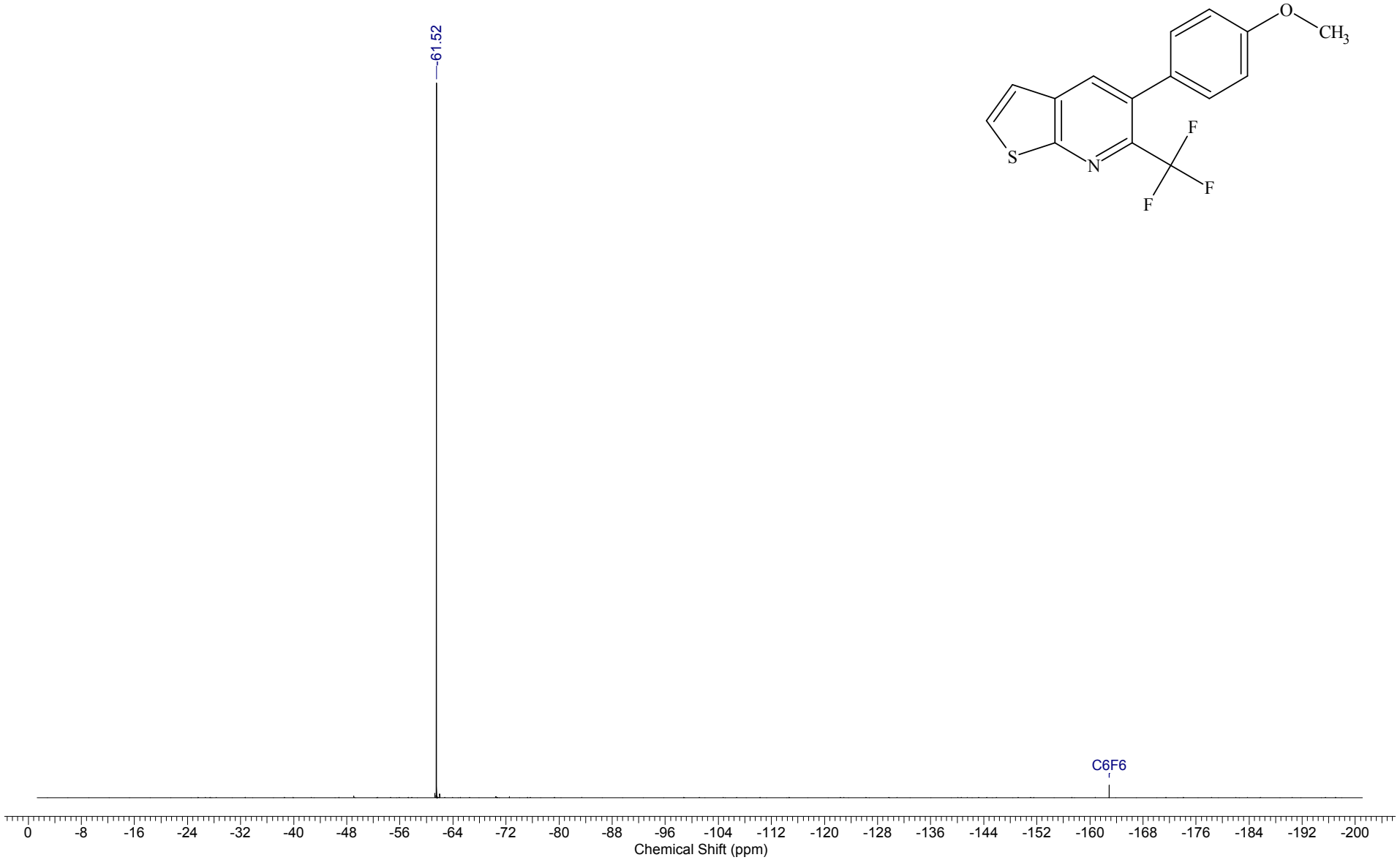
^{13}C NMR spectrum of **5v** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	10 Mar 2021 22:01:18
File Name	C:\DOCS\BM\ßÌ Ð_ÑÎ ÑÅÄÈ\BM-2103-1\BM-2103-1_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	8	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	CHLOROFORM-D			***Sweep Width (Hz)***	8012.82
Temperature (degree C)	27.000						



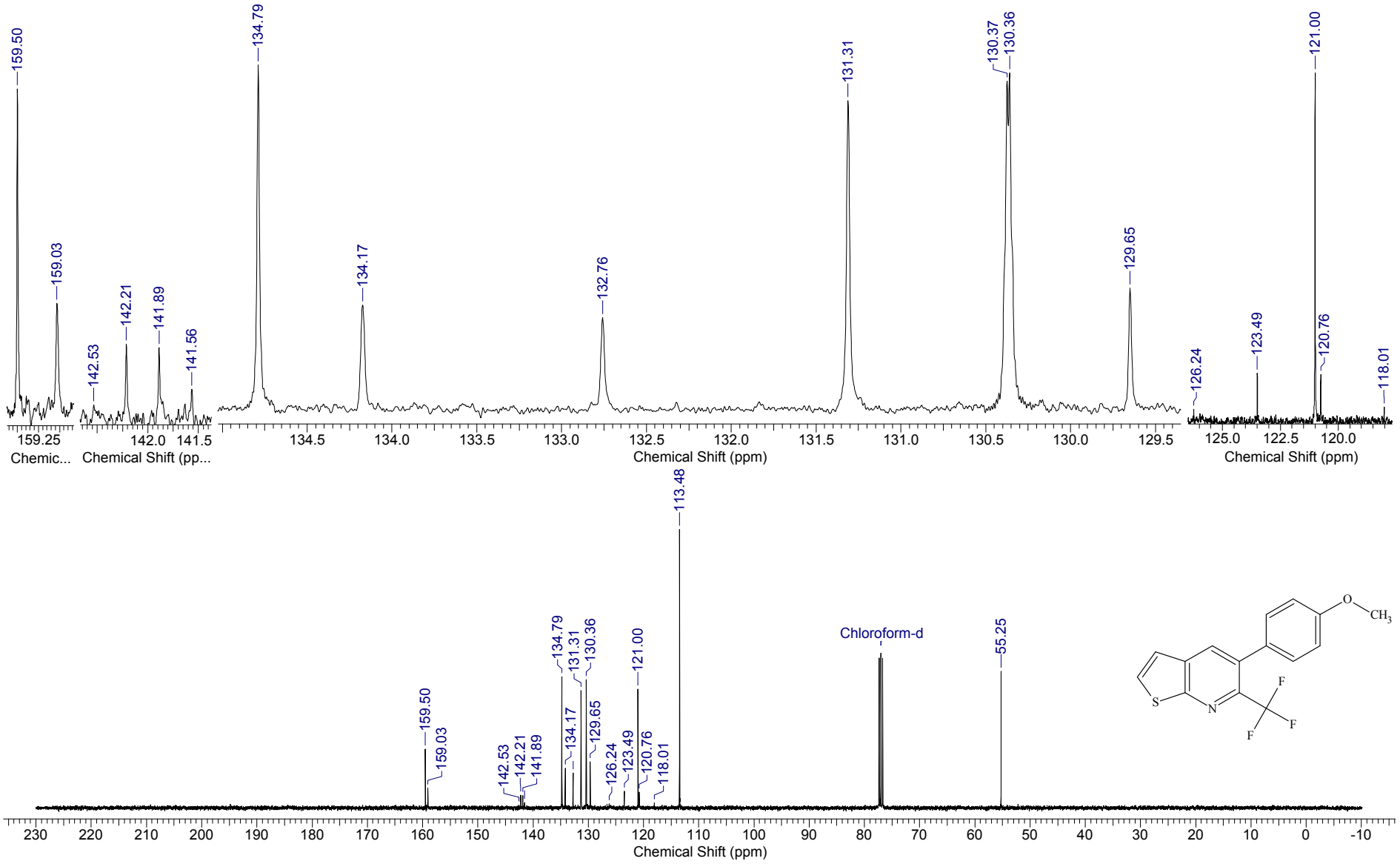
^{1}H NMR spectrum of **5w** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.7433	***Comment***	Imported from UXNMR.			***Date***	11 Mar 2021 13:12:28
File Name	C:\DOCS\OUTPUT_301\2021\03.ì àðò\BM-2103-1.F_005001r					***Frequency (MHz)***	376.50
Nucleus	19F	***Number of Transients***	16	***Original Points Count***	131072	***Points Count***	262144
Pulse Sequence	zgflqn	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	75187.97	***Temperature (degree C)***	27.000



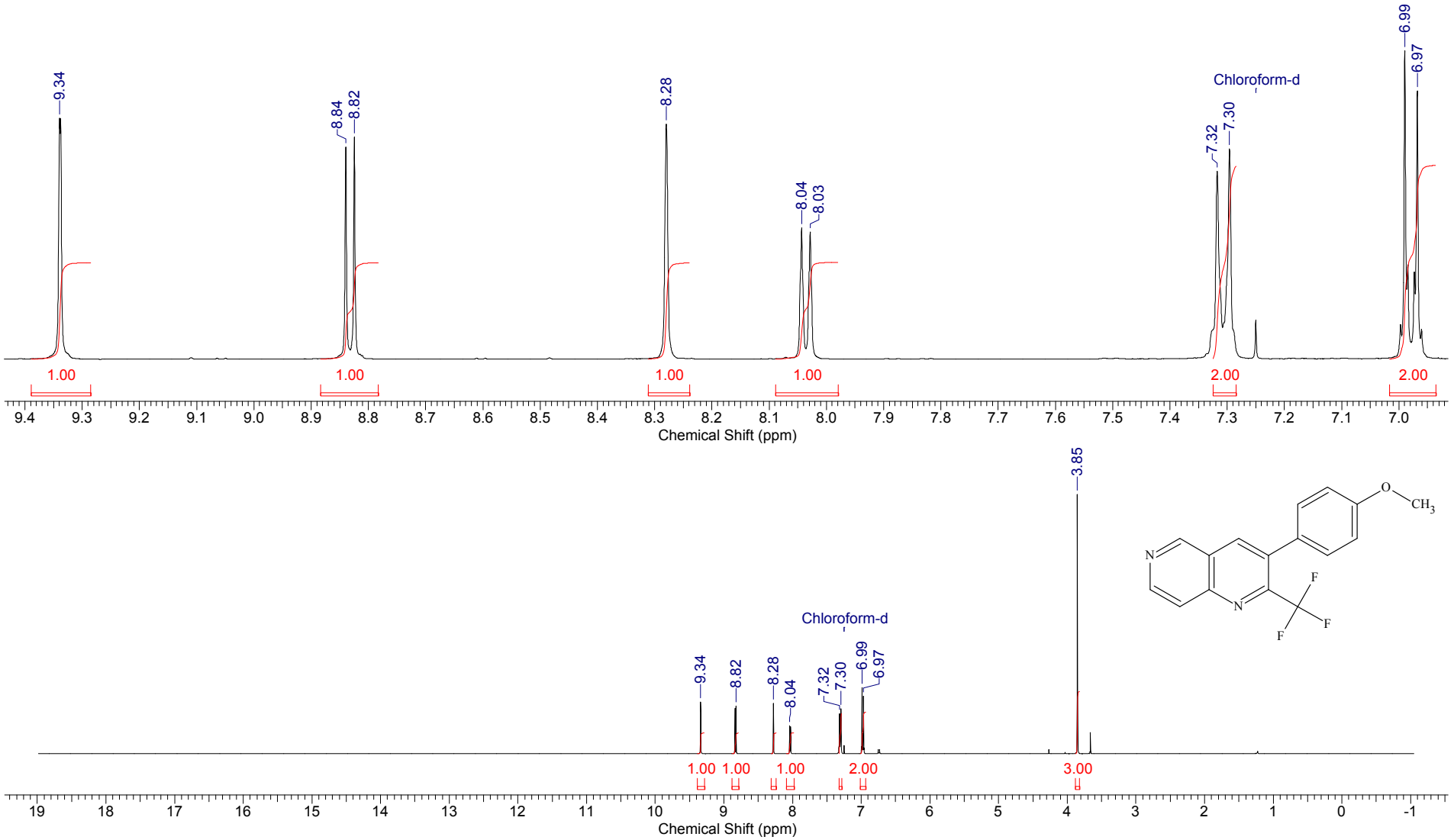
^{19}F NMR spectrum of **5w** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	11 Mar 2021 12:31:06
File Name	C:\DOCS\OUTPUT_301\2021\03.ì àðò\BM-2103-1.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	325	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



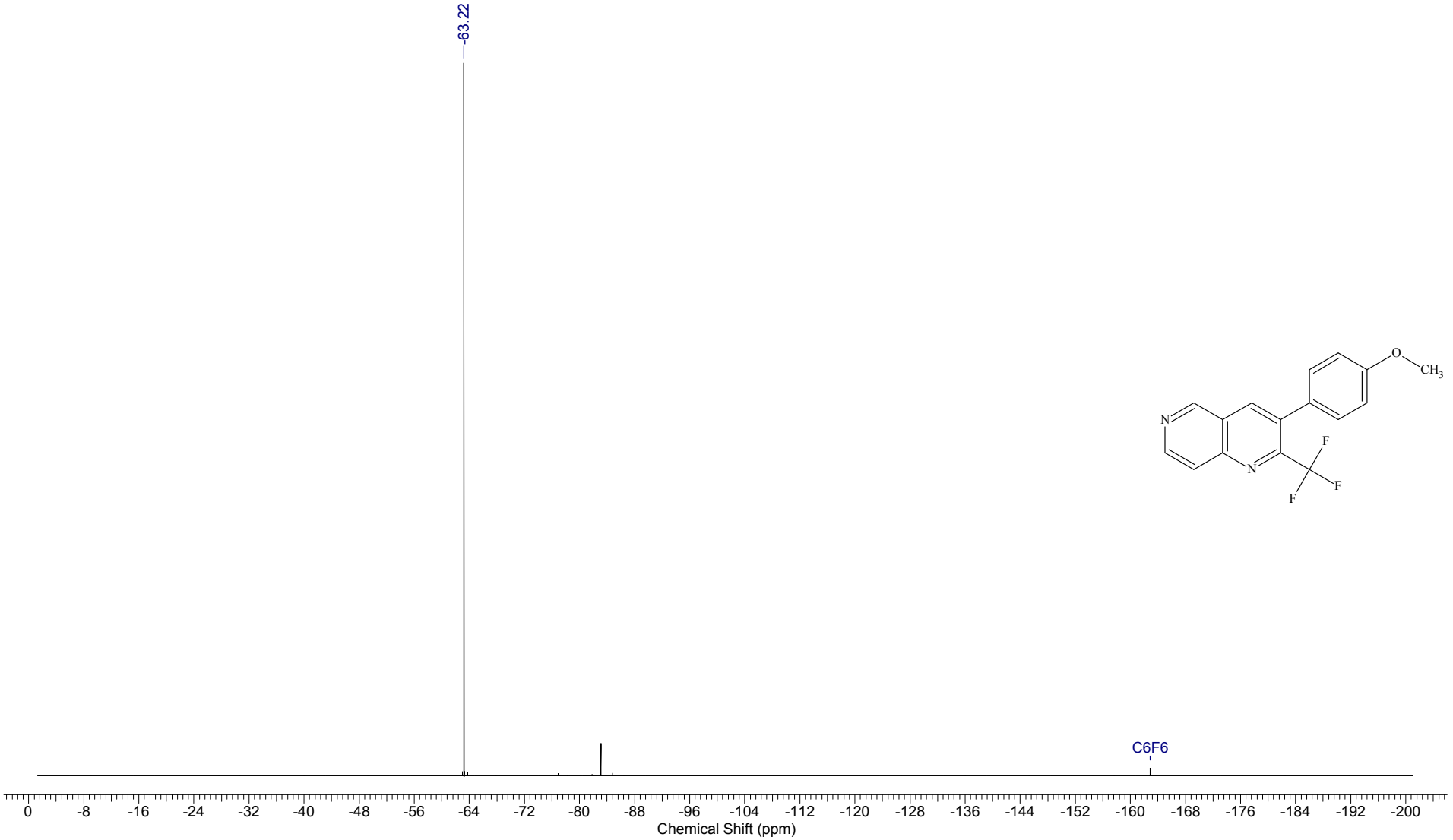
^{13}C NMR spectrum of **5w** (100.6 MHz, $CDCl_3$)

Acquisition Time (sec)	4.0894	***Comment***	Imported from UXNMR.			***Date***	10 Mar 2021 17:30:58
File Name	C:\DOCS\OUTPUT_301\2021\03.ì àðò\BM-2098-2p.H_001001r					***Frequency (MHz)***	400.13
Nucleus	1H	***Number of Transients***	4	***Original Points Count***	32768	***Points Count***	131072
Pulse Sequence	zg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	8012.82	***Temperature (degree C)***	27.000



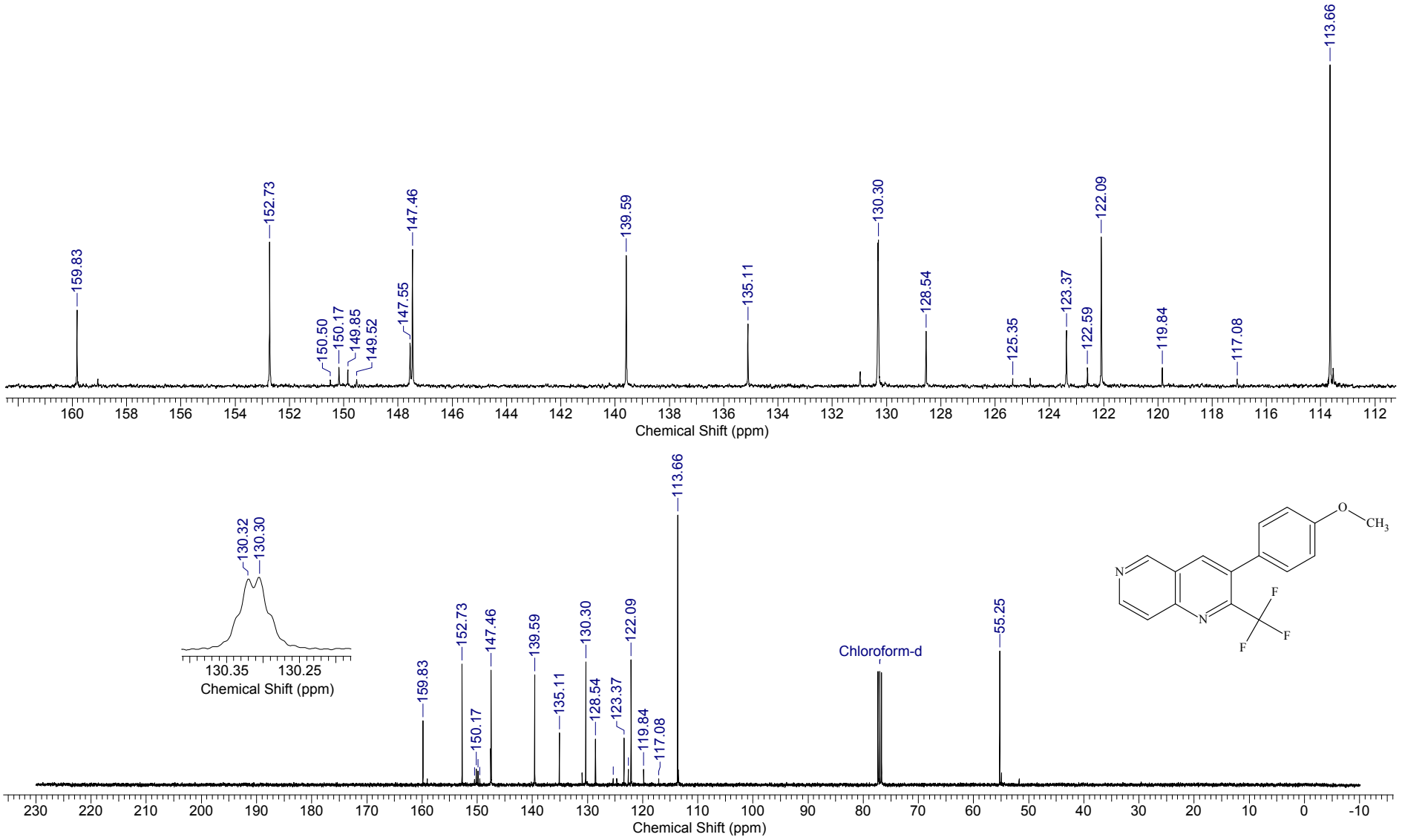
^{1}H NMR spectrum of **5x** (400.1 MHz, $CDCl_3$)

Acquisition Time (sec)	1.7433	***Comment***	Imported from UXNMR.			***Date***	11 Mar 2021 13:09:24
File Name	C:\DOCS\OUTPUT_301\2021\03.l àðò\BM-2098-2p.F_005001r					***Frequency (MHz)***	376.50
Nucleus	19F	***Number of Transients***	16	***Original Points Count***	131072	***Points Count***	262144
Pulse Sequence	zgflqn	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	75187.97	***Temperature (degree C)***	27.000



^{19}F NMR spectrum of **5x** (376.5 MHz, $CDCl_3$)

Acquisition Time (sec)	0.6783	***Comment***	Imported from UXNMR.			***Date***	10 Mar 2021 17:40:52
File Name	C:\DOCS\OUTPUT_301\2021\03.ì àðò\BM-2098-2p.C_002001r					***Frequency (MHz)***	100.61
Nucleus	13C	***Number of Transients***	241	***Original Points Count***	16384	***Points Count***	131072
Pulse Sequence	zgpg30	***Solvent***	DMSO-D6	***Sweep Width (Hz)***	24154.59	***Temperature (degree C)***	27.000



^{13}C NMR spectrum of **5x** (100.6 MHz, $CDCl_3$)