

Supporting Information

Enantioselective Synthesis of Trifluoromethylated Dihydroquinoxalinone *via* Palladium-catalyzed Hydrogenation

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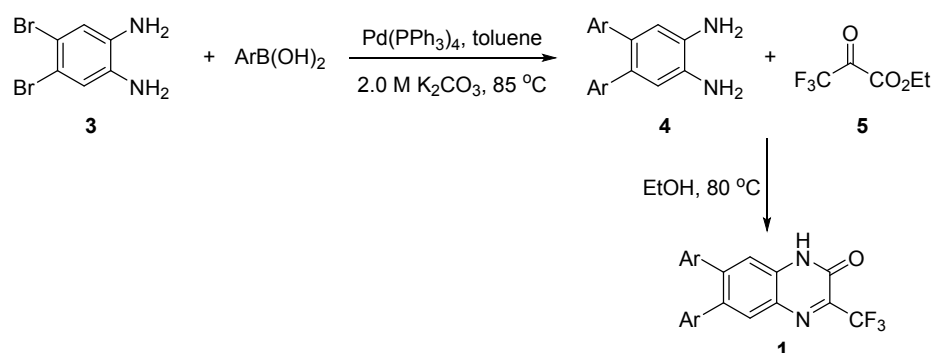
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1. General

All reactions were carried out under an atmosphere of nitrogen using the standard Schlenk techniques, unless otherwise noted. ^1H NMR, ^{13}C NMR and ^{19}F NMR spectra were recorded at room temperature in CDCl_3 , CD_3OD or DMSO on 400 MHz instrument with tetramethylsilane (TMS) as internal standard. Enantiomeric excess was determined by HPLC analysis, using chiral column described below in detail. Optical rotations were measured by polarimeter. Flash column chromatography was performed on silica gel (200-300 mesh). All reactions were monitored by TLC analysis.

2. General procedure for synthesis of 3-(trifluoromethyl)quinoxalinone

The 3-(trifluoromethyl)quinoxalinones were prepared from the accessible starting materials benzene-1,2-diamine and ethyl 3,3,3-trifluoro-2-oxopropanoate according to the literature methods.^[1] The compounds **1a-1g**, **1i** and **1n** were the known compounds.^[1b-f]



General procedure: 4,5-dibromobenzene-1,2-diamine **3** (536 mg, 2.02 mmol), aryl boronic acid (5.12 mmol) and $\text{Pd(PPh}_3)_4$ (64.1 mg, 0.0555 mmol) were dissolved in toluene (50 mL). Next, 2.0 M K_2CO_3 aqueous solution (15 mL) was added to the toluene solution under nitrogen atmosphere. The mixture was stirred at $85\text{ }^\circ\text{C}$ for 24 hours. The reaction was quenched by the addition of 30 mL of H_2O and the aqueous layer was extracted with 3 x 20 mL of CH_2Cl_2 . The combined organic layers were washed with 40 mL of brine, dried over anhydrous Na_2SO_4 . Evaporation of solvent and purification of the residue by column chromatography (Hexanes/EtOAc) gave **4**^[1a].

A suspension of diamine **4** (1.0 equiv) in EtOH (8.0 mL) was stirred at room temperature and treated by dropwise addition of ethyl 3,3,3-trifluoro-2-oxopropanoate **5** (1.0 equiv). The mixture was reflux overnight. Evaporation of EtOH and purification of the residue by column chromatography (petroleum ether/EtOAc) gave **1**^[1b].

6,7-Dibromo-3-(trifluoromethyl)quinoxalinone (1g): 1.029 g, 92% yield, pale solid $291\text{--}293\text{ }^\circ\text{C}$, $R_f = 0.55$ (hexanes/ethyl acetate = 2/1); ^1H NMR (400 MHz, CD_3OD) δ 8.24 (s, 1H), 7.72 (s, 1H); ^{13}C NMR (100 MHz, CD_3OD) δ 151.7, 146.0 (d, $J = 33.0\text{ Hz}$), 133.8, 133.3, 130.3, 129.3, 119.9, 119.7 (q, $J = 273.0\text{ Hz}$), 118.7; ^{19}F NMR (376 MHz, CD_3OD) δ - 71.6; HRMS (ESI) m/z Calculated for $\text{C}_9\text{H}_3\text{Br}_2\text{F}_3\text{N}_2\text{ONa}$ $[\text{M}+\text{Na}]^+$ 392.8456, found 392.8444.

8-Methyl-3-(trifluoromethyl)quinoxalinone (1h)^{1f}: 0.254 g, 22% yield, pale solid 307-309 °C, R_f = 0.16 (hexanes/ethyl acetate = 5/1); ¹H NMR (400 MHz, DMSO) δ 12.41 (s, 1H), 7.75 (d, J = 8.0 Hz, 1H), 7.56 (d, J = 7.2 Hz, 1H), 7.32 (t, J = 7.7 Hz, 1H), 2.46 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 152.7, 134.9, 132.8, 130.5, 128.3 (2C), 125.3, 124.3, 120.6 (q, J = 274.0 Hz), 17.3; ¹⁹F NMR (376 MHz, DMSO) δ - 68.5.

3-(Trifluoromethyl)benzoquinoxalinone (1j): 0.619 g, 78% yield, pale solid 341-343 °C, R_f = 0.41 (hexanes/ethyl acetate = 2/1); [CAS: 339348-44-6]; ¹H NMR (400 MHz, DMSO) δ 12.90 (s, 1H), 8.59 (s, 1H), 8.10 (d, J = 8.3 Hz, 1H), 7.99 (d, J = 8.4 Hz, 1H), 7.66 (dd, J = 22.1, 14.8 Hz, 2H), 7.52 (t, J = 7.4 Hz, 1H); ¹³C NMR (100 MHz, DMSO) δ 152.0, 145.3 (q, J = 32.0 Hz), 135.2, 131.1, 130.7, 130.0, 129.5, 129.4, 127.3, 125.7, 124.5, 117.6 (q, J = 276.0 Hz), 111.6; ¹⁹F NMR (376 MHz, DMSO) δ - 68.3.

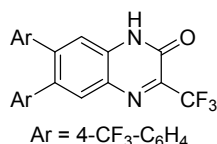
6,7-Diphenyl-3-(trifluoromethyl)quinoxalinone (1k): 0.592 g, 87% yield, yellow solid 283-285 °C, R_f = 0.17 (hexanes/ethyl acetate = 3/1); ¹H NMR (400 MHz, CDCl₃) δ 12.54 (brs, 1H), 8.05 (s, 1H), 7.51 (s, 1H), 7.32 – 7.27 (m, 3H), 7.26 – 7.23 (m, 3H), 7.21 – 7.17 (m, 2H), 7.17 – 7.12 (m, 2H); ¹³C NMR (100 MHz, CDCl₃) 153.6, 147.0, 139.3, 138.8, 131.9, 131.5, 130.4, 129.8, 129.7, 128.3, 128.2, 127.9, 127.9, 127.3, 121.3, 118.5, 117.5; ¹⁹F NMR (376 MHz, CDCl₃) δ - 69.3; HRMS (ESI) m/z Calculated for C₂₁H₁₄F₃N₂O [M+H]⁺ 367.1053, found 367.1052.

6,7-Bis(4-methoxyphenyl)-3-(trifluoromethyl)quinoxalinone (1l): 0.639 g, 80% yield, yellow solid 308-310 °C, R_f = 0.37 (hexanes/ethyl acetate = 3/1); ¹H NMR (400 MHz, CDCl₃) δ 12.05 (brs, 1H), 7.99 (s, 1H), 7.39 (s, 1H), 7.12 (d, J = 8.7 Hz, 2H), 7.07 (d, J = 8.7 Hz, 2H), 6.82 (dd, J = 12.1, 8.7 Hz, 4H), 3.82 (s, 3H), 3.81 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 159.4, 158.8, 153.6, 146.7, 138.4, 131.9, 131.7(d), 131.4, 130.9, 130.8, 130.3, 120.0 (q, J = 273.0 Hz), 117.1, 115.9, 113.8, 137.7, 55.3, 55.2; ¹⁹F NMR (376 MHz, CDCl₃) δ - 69.3; HRMS (ESI) m/z Calculated for C₂₃H₁₈F₃N₂O₃ [M+H]⁺ 427.1264, found 427.1258.

7-(3-Methoxyphenyl)-6-(4-methoxyphenyl)-3-(trifluoromethyl)quinoxalinone (1m): 0.363 g, 85% yield, pale solid 181-183 °C, R_f = 0.47 (hexanes/ethyl acetate = 5/1); ¹H NMR (400 MHz, CDCl₃) δ 12.46 (brs, 1H), 8.07 (s, 1H), 7.51 (s, 1H), 7.20 (dt, J = 17.2, 7.9 Hz, 2H), 6.90 – 6.74 (m, 4H), 6.73 – 6.66 (m, 2H), 3.66 (s, 3H), 3.65 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 159.3, 153.6, 146.8, 140.6, 140.5, 138.6, 131.8, 131.5, 130.4, 129.4, 129.3, 122.2, 122.0, 119.9 (q, J = 275.0 Hz), 117.3, 115.0, 114.9, 114.2, 113.4, 55.2, 55.1; ¹⁹F NMR (376 MHz, CDCl₃) δ - 69.3; HRMS (ESI) m/z Calculated for C₂₃H₁₈F₃N₂O₃ [M+H]⁺ 427.1264, found 427.1270.

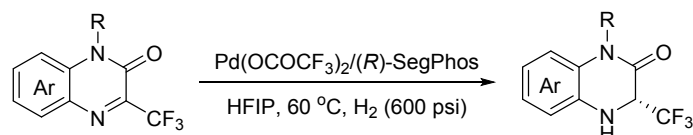
6,7-Bis(2-methoxyphenyl)-3-(trifluoromethyl)quinoxalinone (1n): 0.511 g, 94% yield, pale solid 211-213 °C, R_f = 0.28 (hexanes/ethyl acetate = 2/1); ¹H NMR (400 MHz, CD₃OD) δ 7.84 (s, 1H), 7.34 (s, 1H), 7.20 (q, J = 7.7 Hz, 2H), 7.06 (d, J = 7.2 Hz, 2H), 6.90 – 6.72 (m, 4H), 3.49 (d, 6H); ¹³C NMR (100 MHz, CD₃OD) δ 156.2, 156.1, 152.4, 145.4, 144.0, 143.7, 136.3, 131.0, 130.9, 130.5, 129.7, 129.0, 128.8, 128.6, 120.2 (q, J = 274.0 Hz), 119.6, 119.5, 116.9, 110.2, 110.1, 54.1, 54.0; ¹⁹F NMR (376 MHz, CD₃OD) δ - 71.0; HRMS (ESI) m/z Calculated for C₂₃H₁₈F₃N₂O₃ [M+H]⁺ 427.1264, found 427.1260.

3-(Trifluoromethyl)-6,7-bis(4-(trifluoromethyl)phenyl)quinoxalinone (1o): 0.342 g, 45%



yield, pale solid 302-304 °C, R_f = 0.32 (hexanes/ethyl acetate = 5/1); ^1H NMR (400 MHz, CDCl_3) δ 12.56 (s, 1H), 8.10 (s, 1H), 7.60 (d, J = 8.1 Hz, 2H), 7.58 – 7.51 (m, 3H), 7.32 (d, J = 8.0 Hz, 2H), 7.27 (d, J = 6.9 Hz, 2H); ^{13}C NMR (100 MHz, CDCl_3) δ 153.5, 145.2, 142.3, 137.1, 135.9, 133.9, 132.3, 132.0, 130.7, 130.3, 130.1, 130.0, 129.7, 125.5 (dq, J = 3.0 Hz, 2C), 123.9 (q, J = 271.0 Hz), 123.3 (q, J = 271.0 Hz), 119.7 (q, J = 274.0 Hz), 118.0; ^{19}F NMR (376 MHz, CDCl_3) δ - 62.60, - 62.67, - 69.46; HRMS (ESI) m/z Calculated for $\text{C}_{23}\text{H}_{12}\text{F}_9\text{N}_2\text{O}$ $[\text{M}+\text{H}]^+$ 503.0800, found 503.0789.

3. Typical procedure for palladium-catalyzed asymmetric hydrogenation of 3-(trifluoromethyl)quinoxalinone



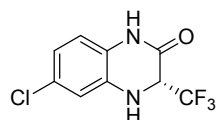
Typical procedure: (*R*)-SegPhos (5.4 mg, 0.009 mmol) and $\text{Pd}(\text{OCOCF}_3)_2$ (2.6 mg, 0.0075 mmol) were placed in a dried Schlenk tube under nitrogen atmosphere, and degassed anhydrous acetone was added. The mixture was stirred at room temperature for 1 h. The solvent was removed under vacuum to give the catalyst. This catalyst was taken into a glovebox filled with nitrogen and dissolved in dry HFIP (3 mL). To a mixture of 3-(trifluoromethyl)quinoxalinone (0.25 mmol), the catalyst solution was added, and then the mixture was transferred to an autoclave, which was charged with H_2 (600 psi). The autoclave was stirred under directed conditions for 48 h, then the hydrogen was carefully released, the autoclave was opened, and the reaction mixture was evaporated. The enantiomeric excesses were determined by chiral HPLC after the purification by column chromatography on silica gel (ethyl acetate/petroleum).

Racemates of **2** were prepared by the reduction of the corresponding 3-(trifluoromethyl)quinoxalinone using ($\pm$)-BINAP and $\text{Pd}(\text{OCOCF}_3)_2$ as catalyst.

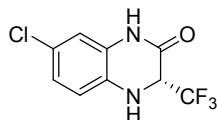
(*R*)-(+)-3-(Trifluoromethyl)-3,4-dihydroquinoxalinone (2a): 52 mg, 97% yield, pale solid 120-122 °C, R_f = 0.45 (hexanes/ethyl acetate = 3/1), 96% ee, $[\alpha]_D^{20}$ = + 10.19 (c 0.52, CHCl_3); ^1H NMR (400 MHz, CDCl_3) δ 9.13 (brs, 1H), 6.96 (ddd, J = 8.6, 6.2, 2.7 Hz, 1H), 6.85 – 6.79 (m, 2H), 6.76 (d, J = 7.8 Hz, 1H), 4.54 (q, J = 7.7 Hz, 1H), 4.38 (s, 1H); ^{13}C NMR (100 MHz, CDCl_3) δ 159.8, 130.2, 124.7, 123.7, 123.5 (q, J = 286.0 Hz), 120.3, 115.9, 113.9, 58.3 (q, J = 30.0 Hz); ^{19}F NMR (376 MHz, CDCl_3) δ - 74.3; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 °C, t_1 = 12.6 min (maj), t_2 = 14.5 min; HRMS (ESI) m/z Calculated for $\text{C}_9\text{H}_8\text{F}_3\text{N}_2\text{O}$ $[\text{M}+\text{H}]^+$ 217.0583, found 217.0584.

(*R*)-6-Methoxy-3-(trifluoromethyl)-3,4-dihydroquinoxalinone (2b): 59 mg, 96% yield, pale yellow solid 180-182 °C, R_f = 0.32 (hexanes/ethyl acetate = 2/1), 97% ee, $[\alpha]_D^{20}$ = + 1.36 (c 0.59, EtOAc); ^1H NMR (400 MHz, DMSO) δ 10.71 (s, 1H), 6.91 (d, J = 2.1 Hz, 1H), 6.68 (d, J = 8.5 Hz, 1H), 6.43 (d, J = 2.5 Hz, 1H), 6.24 (dd, J = 8.5, 2.6 Hz, 1H), 4.75 (qd, J = 8.4, 2.7 Hz, 1H), 3.65 (s, 3H); ^{13}C NMR (100 MHz, DMSO) δ 158.6, 156.3, 130.0, 124.7 (q, J = 287.0 Hz), 118.6, 116.0, 103.8, 99.9, 57.2 (q, J = 28.0 Hz), 55.5; ^{19}F NMR (376 MHz, DMSO) δ - 72.8; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 °C, t_1 = 13.6 min (maj), t_2 = 21.1 min; HRMS (ESI) m/z Calculated for $\text{C}_{10}\text{H}_{10}\text{F}_3\text{N}_2\text{O}_2$ $[\text{M}+\text{H}]^+$ 247.0689, found 247.0664.

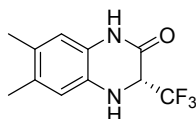
(R)-(+)-6-Chloro-3-(trifluoromethyl)-3,4-dihydroquinoxalinone (2c) : 55 mg, 96% yield, pale solid 168-170 °C, R_f = 0.54 (hexanes/ethyl acetate = 3/1), 90% ee, $[\alpha]^{20}_D$ = + 13.27 (c 0.55, EtOAc); ^1H NMR (400 MHz, DMSO) δ 11.04 (s, 1H), 7.16 (d, J = 2.1 Hz, 1H), 6.91-6.82 (m, 3H), 4.91 (qd, J = 8.3, 2.6 Hz, 1H); ^{13}C NMR (100 MHz, DMSO) δ 159.2, 131.0, 126.1, 124.6 (q, J = 286.0 Hz), 123.3, 121.9, 115.0, 114.9, 57.1 (q, J = 28.0 Hz); ^{19}F NMR (376 MHz, DMSO) δ - 72.8; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 °C, t_1 = 12.2 min (maj), t_2 = 16.2 min; HRMS (ESI) m/z Calculated for $\text{C}_9\text{H}_7\text{ClF}_3\text{N}_2\text{O}$ $[\text{M}+\text{H}]^+$ 251.0194, found 251.0193.



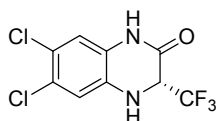
(R)-(+)-7-Chloro-3-(trifluoromethyl)-3,4-dihydroquinoxalinone (2d) : 61 mg, 98% yield, pale solid 159-161 °C, R_f = 0.41 (hexanes/ethyl acetate = 3/1), 88% ee, $[\alpha]^{20}_D$ = + 0.33 (c 0.61, EtOAc); ^1H NMR (400 MHz, DMSO) δ 11.00 (s, 1H), 7.20 (s, 1H), 6.85 (d, J = 2.1 Hz, 1H), 6.76 (d, J = 8.3 Hz, 1H), 6.69 (d, J = 2.1 Hz, 1H), 4.89 (qd, J = 8.3, 2.5 Hz, 1H); ^{13}C NMR (100 MHz, DMSO) δ 158.9, 133.4, 127.5, 124.6 (q, J = 286.0 Hz), 123.9, 118.2, 116.6, 113.2, 56.8 (q, J = 28.0 Hz); ^{19}F NMR (376 MHz, DMSO) δ - 72.9; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 °C, t_1 = 9.9 min (maj), t_2 = 11.0 min; HRMS (ESI) m/z Calculated for $\text{C}_9\text{H}_7\text{ClF}_3\text{N}_2\text{O}$ $[\text{M}+\text{H}]^+$ 251.0194, found 251.0191.



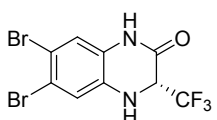
(R)-(+)-6,7-Dimethyl-3-(trifluoromethyl)-3,4-dihydroquinoxalinone (2e) : 58 mg, 95% yield, pale yellow solid 182-184 °C, R_f = 0.26 (hexanes/ethyl acetate = 3/1), 89% ee, $[\alpha]^{20}_D$ = + 0.86 (c 0.58, EtOAc); ^1H NMR (400 MHz, DMSO) δ 10.70 (s, 1H), 6.63 (d, J = 1.7 Hz, 1H), 6.60 (s, 1H), 6.54 (s, 1H), 4.67 (qd, J = 8.5, 2.7 Hz, 1H), 2.07 (s, 3H), 2.05 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 159.2, 131.2, 129.5, 126.1, 124.8 (q, J = 286.0 Hz), 122.7, 116.6, 115.2, 57.6 (q, J = 28.0 Hz), 19.4, 19.0; ^{19}F NMR (376 MHz, DMSO) δ - 72.7; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 °C, t_1 = 12.2 min (maj), t_2 = 19.7 min; HRMS (ESI) m/z Calculated for $\text{C}_{11}\text{H}_{12}\text{F}_3\text{N}_2\text{O}$ $[\text{M}+\text{H}]^+$ 245.0896, found 245.0893.



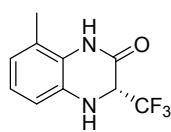
(R)-(+)-6,7-Dichloro-3-(trifluoromethyl)-3,4-dihydroquinoxalinone (2f) : 69 mg, 97% yield, pale solid 230-232 °C, R_f = 0.39 (hexanes/ethyl acetate = 3/1), 95% ee, $[\alpha]^{20}_D$ = + 8.70 (c 0.69, EtOAc); ^1H NMR (400 MHz, DMSO) δ 11.11 (s, 1H), 7.34 (d, J = 1.8 Hz, 1H), 7.01 (s, 1H), 6.93 (s, 1H), 4.96 (qd, J = 8.3, 2.6 Hz, 1H); ^{13}C NMR (100 MHz, DMSO) δ 158.9, 132.3, 125.2, 125.1, 124.4 (q, J = 286.0 Hz), 119.6, 116.3, 114.5, 56.7 (d, J = 28.0 Hz); ^{19}F NMR (376 MHz, DMSO) δ - 72.9; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 °C, t_1 = 9.5 min (maj), t_2 = 10.9 min; HRMS (ESI) m/z Calculated for $\text{C}_9\text{H}_6\text{Cl}_2\text{F}_3\text{N}_2\text{O}$ $[\text{M}+\text{H}]^+$ 284.9804, found 284.9799.



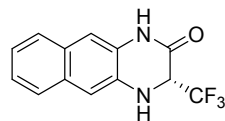
(R)-(-)-6,7-Dibromo-3-(trifluoromethyl)-3,4-dihydroquinoxalinone (2g) : 78 mg, 84% yield, pale solid 221-223 °C, R_f = 0.41 (hexanes/ethyl acetate = 3/1), 90% ee, $[\alpha]^{20}_D$ = - 20.13 (c 0.78, EtOAc); ^1H NMR (400 MHz, DMSO) δ 11.10 (s, 1H), 7.34 (d, J = 2.4 Hz, 1H), 7.15 (s, 1H), 7.04 (s, 1H), 4.96 (qd, J = 8.3, 2.7 Hz, 1H); ^{13}C NMR (100 MHz, DMSO) δ 158.9, 132.9, 125.9, 124.4 (q, J = 277.0 Hz), 119.2, 117.6, 117.1, 110.1, 56.7 (q, J = 28.0 Hz); ^{19}F NMR (376 MHz, DMSO) δ - 72.9; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 °C, t_1 = 11.5 min (maj), t_2 = 13.6 min; HRMS (ESI) m/z Calculated for $\text{C}_9\text{H}_6\text{Br}_2\text{F}_3\text{N}_2\text{O}$ $[\text{M}+\text{H}]^+$ 372.8793, found 372.8816.



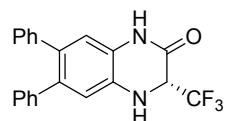
(R)-(+)-8-Methyl-3-(trifluoromethyl)-3,4-dihydroquinoxalinone (2h) : 55 mg, 96% yield, pale oil, R_f = 0.45 (hexanes/ethyl acetate = 3/1), 88% ee, $[\alpha]_D^{20}$ = + 16.91 (c 0.55, CHCl_3); ^1H NMR (400 MHz, CDCl_3) δ 8.09 (brs, 1H), 6.86 (t, J = 7.7 Hz, 1H), 6.68 (d, J = 7.6 Hz, 1H), 6.63 (d, J = 7.8 Hz, 1H), 4.51 (q, J = 7.6 Hz, 1H), 4.34 (s, 1H), 2.25 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 159.8, 130.3, 124.0 (2C), 123.6 (q, J = 286.0 Hz), 122.2, 122.1, 112.0, 58.2 (q, J = 30.0 Hz), 16.4; ^{19}F NMR (376 MHz, CDCl_3) δ - 74.3; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 °C, t_1 = 11.3 min (maj), t_2 = 16.6 min; HRMS (ESI) m/z Calculated for $\text{C}_{10}\text{H}_{10}\text{F}_3\text{N}_2\text{O}$ $[\text{M}+\text{H}]^+$ 231.0740, found 231.0738.



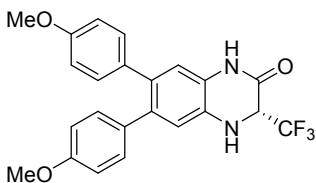
(R)-(+)-3-(trifluoromethyl)-3,4-dihydrobenzo[g]quinoxalinone (2j) : 66 mg, 99% yield, pale yellow solid 198-200 °C, R_f = 0.33 (hexanes/ethyl acetate = 3/1), 91% ee, $[\alpha]_D^{20}$ = + 50.45 (c 0.66, EtOAc); ^1H NMR (400 MHz, DMSO) δ 11.26 (s, 1H), 7.60 (dd, J = 18.1, 8.0 Hz, 2H), 7.40 – 7.06 (m, 5H), 4.91 (q, J = 16.6 Hz, 1H); ^{13}C NMR (100 MHz, DMSO) δ 160.1, 132.3, 131.3, 127.9, 127.1, 127.0, 125.9, 125.2, 124.7 (q, J = 286.0 Hz), 123.4, 111.4, 108.0, 57.3 (q, J = 28.0 Hz); ^{19}F NMR (376 MHz, DMSO) δ - 72.6; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 °C, t_1 = 20.0 min (maj), t_2 = 29.7 min; HRMS (ESI) m/z Calculated for $\text{C}_{13}\text{H}_{10}\text{F}_3\text{N}_2\text{O}$ $[\text{M}+\text{H}]^+$ 267.0740, found 267.0743.



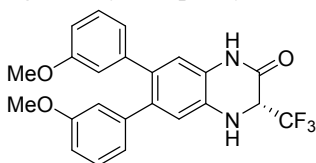
(R)-(-)-6,7-Diphenyl-3-(trifluoromethyl)-3,4-dihydroquinoxalinone (2k): 91 mg, 99% yield, pale yellow solid 89-91 °C, R_f = 0.58 (hexanes/ethyl acetate = 3/1), 99% ee, $[\alpha]_D^{20}$ = - 7.8 (c 0.91, CHCl_3); ^1H NMR (400 MHz, CDCl_3) δ 9.13 (brs, 1H), 7.25 – 7.15 (m, 6H), 7.10 (dd, J = 10.2, 5.7 Hz, 4H), 6.87 (d, J = 4.6 Hz, 1H), 6.82 (s, 1H), 4.59 (q, J = 7.5 Hz, 1H), 4.48 (s, 1H); ^{13}C NMR (100 MHz, CDCl_3) δ 159.6, 140.7, 140.5, 137.2, 133.0, 129.8, 129.7, 129.4, 127.9, 126.6, 126.4, 123.5 (q, J = 286.0 Hz), 123.0, 117.8, 117.6, 115.9, 58.3 (q, J = 29.0 Hz); ^{19}F NMR (376 MHz, CDCl_3) δ - 74.2; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 °C, t_1 = 18.7 min (maj), t_2 = 29.9 min; HRMS (ESI) m/z Calculated for $\text{C}_{21}\text{H}_{16}\text{F}_3\text{N}_2\text{O}$ $[\text{M}+\text{H}]^+$ 369.1209, found 369.1213.



(R)-(+)-6,7-Bis(4-methoxyphenyl)-3-(trifluoromethyl)-3,4-dihydroquinoxalinone (2l) : 102 mg, 95% yield, pale yellow oil, R_f = 0.27 (hexanes/ethyl acetate = 2/1), >99% ee, $[\alpha]_D^{20}$ = + 0.49 (c 1.02, EtOAc); ^1H NMR (400 MHz, DMSO) δ 10.99 (brs, 1H), 7.12 – 6.84 (m, 5H), 6.88 – 6.67 (m, 6H), 4.89 (q, J = 14.6 Hz, 1H), 3.71 (d, 6H); ^{13}C NMR (100 MHz, CDCl_3) δ 159.2, 158.2, 158.0, 135.2, 133.9, 133.8, 131.0, 130.9 (2C), 130.2, 124.7 (q, J = 286.0 Hz), 124.0, 117.2, 115.5, 113.9 (2C), 57.4 (q, J = 28.0 Hz), 55.4 (d, 2C); ^{19}F NMR (376 MHz, DMSO) δ - 72.6; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 85/15, detector: 230 nm, flow rate: 1.0 mL/min), 30 °C, t_1 = 23.1 min (maj), t_2 = 51.8 min; HRMS (ESI) m/z Calculated for $\text{C}_{23}\text{H}_{20}\text{F}_3\text{N}_2\text{O}_3$ $[\text{M}+\text{H}]^+$ 429.1421, found 429.1423.



(R)-(+)-6,7-Bis(3-methoxyphenyl)-3-(trifluoromethyl)-3,4-dihydroquinoxalinone (2m) : 106 mg, 99% yield, pale yellow solid 84-86 °C, R_f = 0.20 (hexanes/ethyl acetate = 3/1), 98% ee, $[\alpha]_D^{20}$ = + 2.83 (c 1.06, EtOAc); ^1H NMR (400 MHz, CDCl_3) δ 9.26 (brs, 1H), 7.12 (td, J = 7.9, 2.6 Hz, 2H), 6.87 (s, 1H), 6.82 (s, 1H), 6.78 – 6.68 (m, 4H), 6.62 (d, J = 7.0 Hz, 2H), 4.59 (q, J = 18.7 Hz, 1H),



4.52 (brs, 1H), 3.61 (s, 6H); ^{13}C NMR (100 MHz, CDCl_3) δ 159.6, 159.1 (2C), 142.1, 141.9, 137.0, 132.8, 129.5, 129.0 (2C), 123.5 (q, J = 286.0 Hz) 123.0, 122.2, 122.1, 117.6, 115.7, 115.1, 115.0, 112.8, 112.6, 58.6 (q, J = 30.0 Hz), 55.1 (d, 2C); ^{19}F NMR (376 MHz, CDCl_3) δ - 74.2; HPLC (OD-3, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 0.8 mL/min), 30 °C, t_1 = 36.1 min (maj), t_2 = 64.5 min; HRMS (ESI) m/z Calculated for $\text{C}_{23}\text{H}_{20}\text{F}_3\text{N}_2\text{O}_3$ $[\text{M}+\text{H}]^+$ 429.1421, found 429.1388.

(R)-(+)-6,7-Bis(2-methoxyphenyl)-3-(trifluoromethyl)-3,4-dihydroquinoxalinone (2n) : 106 mg, 99% yield, pale yellow solid 144-146 °C, R_f = 0.14 (hexanes/ethyl acetate = 3/1), >99% ee,

$[\alpha]_D^{20}$ = + 2.26 (*c* 1.06, EtOAc); ^1H NMR (400 MHz, CDCl_3) δ 10.89 (brs, 1H), 7.17 – 7.04 (m, 3H), 6.91 (d, J = 10.4 Hz, 2H), 6.82 (t, J = 7.5 Hz, 2H), 6.73 (t, J = 7.4 Hz, 1H), 6.68 (s, 1H), 6.63 (d, J = 8.1 Hz, 1H), 4.62 (s, 1H), 4.34 (q, J = 18.1 Hz, 1H), 3.68 (s, 3H), 3.44 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 159.5, 156.2, 156.1, 134.3, 131.7, 131.6, 130.1, 129.7, 129.3, 129.1, 128.0, 125.2, 123.8 (q, J = 285.0 Hz), 122.8, 120.1, 120.0, 117.7, 116.0, 110.2, 110.1, 57.6 (q, J = 29.0 Hz), 54.9, 54.6; ^{19}F NMR (376 MHz, CDCl_3) δ - 74.7; HPLC (OD-3, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 0.8 mL/min), 30 °C, t_1 = 46.8 min (maj), t_2 = 89.1 min; HRMS (ESI) m/z Calculated for $\text{C}_{23}\text{H}_{23}\text{F}_3\text{N}_3\text{O}_3$ $[\text{M}+\text{NH}_4]^+$ 446.1685, found 446.1686.

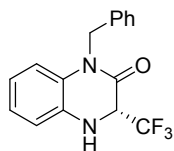
(R)-(+)-3-(Trifluoromethyl)-6,7-bis(4-(trifluoromethyl)phenyl)-3,4-dihydroquinoxalinone (2o) : 111 mg, 88% yield, pale yellow oil, R_f = 0.48 (hexanes/ethyl acetate = 3/1), 79% ee, $[\alpha]_D^{20}$

= + 0.54 (*c* 1.11, EtOAc); ^1H NMR (400 MHz, CDCl_3) δ 9.23 (brs, 1H), 7.48 (dd, J = 8.2, 3.3 Hz, 4H), 7.19 (dd, J = 10.7, 8.4 Hz, 4H), 6.85 (d, J = 18.5 Hz, 2H), 4.62 (q, J = 7.5 Hz, 1H), 4.59 (brs, 1H); ^{13}C NMR (100 MHz, CDCl_3) δ 159.8, 143.9, 143.7, 135.8, 131.4, 130.2, 130.1, 130.0, 129.2 (q, J = 32.0 Hz), 128.9 (q, J = 32.0 Hz), 125.1 (dq, J = 3.0 Hz, 2C), 124.1 (q, J = 271.0 Hz), 124.0 (q, J = 271.0 Hz), 123.7, 123.4 (q, J = 285.0 Hz), 117.9, 115.9, 58.2 (q, J = 30.0 Hz); ^{19}F NMR (376 MHz, CDCl_3) δ - 62.4, - 62.5, - 74.2; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 °C, t_1 = 10.5 min (maj), t_2 = 13.8 min; HRMS (ESI) m/z Calculated for $\text{C}_{23}\text{H}_{14}\text{F}_9\text{N}_2\text{O}$ $[\text{M}+\text{H}]^+$ 505.0957, found 505.0946.

(R)-(-)-1-Methyl-3-(trifluoromethyl)-3,4-dihydroquinoxalinone (2p): 57 mg, 99% yield, pale solid 132-134 °C, R_f = 0.37 (hexanes/ethyl acetate = 5/1), 96% ee, $[\alpha]_D^{20}$ = - 5.79 (*c* 0.57,

CHCl_3); ^1H NMR (400 MHz, CDCl_3) δ 7.02 – 6.93 (m, 2H), 6.93 – 6.86 (m, 1H), 6.78 (d, J = 7.8 Hz, 1H), 4.53 (q, J = 7.8 Hz, 1H), 4.47 (s, 1H), 3.44 (s, 3H); ^{13}C NMR (100 MHz, CDCl_3) δ 158.7, 131.8, 127.3, 124.2, 123.7 (q, J = 286.0 Hz), 120.3, 114.9, 114.1, 58.5 (q, J = 29.0 Hz), 29.4; ^{19}F NMR (376 MHz, CDCl_3) δ - 74.1; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 °C, t_1 = 8.6 min, t_2 = 16.7 min (maj); HRMS (ESI) m/z Calculated for $\text{C}_{10}\text{H}_{10}\text{F}_3\text{N}_2\text{O}$ $[\text{M}+\text{H}]^+$ 231.0740, found 231.0745.

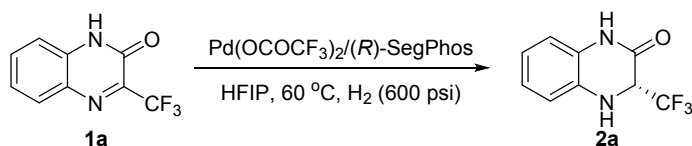
(R)-1-Benzyl-3-(trifluoromethyl)-3,4-dihydroquinoxalin-2-one (2q): 76 mg, 99% yield, pale solid 125-127 °C, R_f = 0.26 (hexanes/ethyl acetate = 5/1), 92% ee, $[\alpha]_D^{20}$ = + 25.26 (*c* 0.76, CHCl_3); ^1H NMR (400 MHz, CDCl_3) δ 7.25 (t, J = 7.3 Hz, 2H), 7.19 – 7.14 (m, 3H), 6.90 – 6.81 (m, 1H), 6.79 – 6.72 (m, 1H), 6.70 – 6.65 (m, 2H), 5.44 (d, J = 16.2 Hz, 1H), 4.87 (d, J = 16.2 Hz, 1H), 4.55 (q, J = 7.8 Hz, 1H), 4.39 (brs, 1H); ^{13}C NMR (100 MHz, CDCl_3) δ 158.9, 135.8, 131.8,



128.9, 127.4, 126.6, 126.2, 124.4, 123.8 (q, $J = 286.0$ Hz), 120.4, 115.8, 114.2, 58.7 (q, $J = 29.0$ Hz), 46.3; ^{19}F NMR (376 MHz, CDCl_3) $\delta -73.8$; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 $^\circ\text{C}$, $t_1 = 9.6$ min, $t_2 = 13.4$ min (maj); HRMS (ESI) m/z Calculated for $\text{C}_{16}\text{H}_{14}\text{F}_3\text{N}_2\text{O}$ $[\text{M}+\text{H}]^+$ 307.1053, found 307.1054.

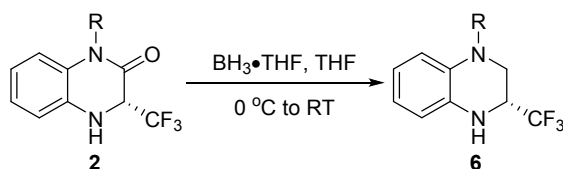
(R)-(+)-3-(Trifluoromethyl)-3,4-dihydro-2H-benzo[b][1,4]oxazinone (2r) : 30 mg, 55% yield, pale yellow solid 85-87 $^\circ\text{C}$, $R_f = 0.16$ (hexanes/ethyl acetate = 5/1), 57% ee, $[\alpha]_D^{20} = +13.67$ (c 0.3, CH_3Cl); ^1H NMR (400 MHz, CDCl_3) δ 7.05 (d, $J = 7.3$ Hz, 2H), 6.88 (dd, $J = 27.4$, 7.3 Hz, 2H), 4.64 (q, $J = 6.7$ Hz, 1H), 4.39 (brs, 1H); ^{13}C NMR (100 MHz, CDCl_3) δ 157.7, 140.1, 128.8, 125.8, 122.7 (q, $J = 284.0$ Hz), 121.2, 117.0, 114.9, 57.0 (q, $J = 31.0$ Hz); ^{19}F NMR (376 MHz, CDCl_3) $\delta -73.5$; HPLC (OD-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 1.0 mL/min), 30 $^\circ\text{C}$, $t_1 = 7.9$ min, $t_2 = 14.7$ min (maj); HRMS (ESI) m/z Calculated for $\text{C}_9\text{H}_6\text{F}_3\text{NO}_2\text{Na}$ $[\text{M}+\text{Na}]^+$ 240.0243, found 240.0244.

4. The scale-up experiment



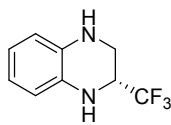
(*R*)-SegPhos (110 mg, 0.18 mmol) and $\text{Pd}(\text{OCOCF}_3)_2$ (50 mg, 0.15 mmol) were placed in a dried Schlenk tube under nitrogen atmosphere, and degassed anhydrous acetone was added. The mixture was stirred at room temperature for 1 h. The solvent was removed under vacuum to give the catalyst. This catalyst was taken into a glovebox filled with nitrogen and dissolved in dry HFIP (15 mL). To a mixture of 3-(trifluoromethyl)quinoxalinone (1.071 g, 5.0 mmol), the catalyst solution was added, and then the mixture was transferred to an autoclave, which was charged with H_2 (600 psi). The autoclave was stirred under directed conditions for 48 h, then the hydrogen was carefully released, the autoclave was opened, and the reaction mixture was evaporated. The organic layer was concentrated in vacuo. Purification was performed on silica gel using ethyl acetate/hexanes (3:1) as the eluent to give chiral product **2a** (1.078 g, 99% yield, 95% ee).

5. Typical procedure for reduction of (*R*)-3-(trifluoromethyl)-3,4-dihydroquinoxalinone

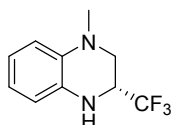


Typical procedure: To a stirred solution of **2** (1.0 equiv.) in the THF at 0 $^\circ\text{C}$ was added $\text{BH}_3\cdot\text{THF}$ (10.0 equiv, 1.0 M in THF), and the mixture was left to stir for overnight at 0 $^\circ\text{C}$ to room temperature. The reaction was quenched by the addition of MeOH, and the resulting mixture was concentrated in vacuo. The residue obtained was purified by column chromatography (petroleum ether/EtOAc) to give **6**^[2].

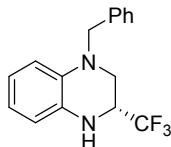
(R)-(-)-2-(Trifluoromethyl)-1,2,3,4-tetrahydroquinoxaline (6a) : 32 mg, 89% yield, pale yellow solid 128-130 °C, R_f = 0.30 (hexanes/ethyl acetate = 20/1), 96% ee, $[\alpha]^{20}_D$ = - 4.69 (c 0.32, CH₃Cl); ¹H NMR (400 MHz, CDCl₃) δ 6.87 – 6.79 (m, 2H), 6.75 – 6.68 (m, 1H), 6.65 (dd, J = 8.1, 1.3 Hz, 1H), 4.13 (qd, J = 6.8, 3.1 Hz, 1H), 3.61 (dd, J = 11.6, 3.5 Hz, 1H), 3.50 (dd, J = 11.7, 6.7 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 131.7, 131.4, 124.9 (q, J = 280.0 Hz), 120.2, 119.6, 115.6, 114.9, 52.3 (q, J = 30.0 Hz), 39.5 (q, J = 2.0 Hz); ¹⁹F NMR (376 MHz, CDCl₃) δ - 76.5; HPLC (OJ-H, elute: Hexanes/*i*-PrOH = 90/10, detector: 230 nm, flow rate: 0.9 mL/min), 30 °C, t_1 = 55.7 min, t_2 = 64.2 min (maj).



(R)-(+)-1-methyl-3-(trifluoromethyl)-1,2,3,4-tetrahydroquinoxaline (6p) : 47 mg, 94% yield, pale yellow oil, R_f = 0.78 (hexanes/ethyl acetate = 5/1), 95% ee, $[\alpha]^{20}_D$ = + 2.34 (c 0.47, CH₃Cl); ¹H NMR (400 MHz, CDCl₃) δ 6.79 (td, J = 7.6, 1.5 Hz, 1H), 6.72 (td, J = 7.5, 1.4 Hz, 1H), 6.66 (dd, J = 7.9, 1.3 Hz, 1H), 6.60 (dd, J = 7.6, 1.5 Hz, 1H), 4.18 – 3.94 (m, 2H), 3.33 (qd, J = 11.5, 4.6 Hz, 2H), 2.91 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 135.2, 131.9, 124.9 (q, J = 280.0 Hz), 119.6, 119.2, 113.9, 112.3, 52.8 (q, J = 30.0 Hz), 47.5 (q, J = 20.0 Hz), 39.0; ¹⁹F NMR (376 MHz, CDCl₃) δ - 76.9; HPLC (OJ-H, elute: Hexanes/*i*-PrOH = 95/5, detector: 230 nm, flow rate: 0.8 mL/min), 30 °C, t_1 = 29.4 min, t_2 = 36.7 min (maj); HRMS (ESI) m/z Calculated for C₁₀H₁₂F₃N₂ [M+H]⁺ 217.0947, found 217.0944.



(R)-(+)-1-benzyl-3-(trifluoromethyl)-1,2,3,4-tetrahydroquinoxaline (6q) : 57 mg, 75% yield, pale yellow oil, R_f = 0.67 (hexanes/ethyl acetate = 5/1), 92% ee, $[\alpha]^{20}_D$ = + 12.63 (c 0.57, CH₃Cl); ¹H NMR (400 MHz, CDCl₃) δ 7.30 – 7.14 (m, 5H), 6.66 – 6.47 (m, 4H), 4.35 (q, J = 15.8 Hz, 2H), 3.94 – 3.89 (m, 1H), 3.40 – 3.24 (m, 2H); ¹³C NMR (100 MHz, CDCl₃) δ 137.6, 134.0, 131.7, 128.7, 127.4, 124.9 (q, J = 280.0 Hz), 119.7, 119.3, 114.3, 113.1, 55.7, 52.3 (q, J = 30.0 Hz), 45.4; ¹⁹F NMR (376 MHz, CDCl₃) δ - 73.4; HPLC (OJ-H, elute: Hexanes/*i*-PrOH = 95/5, detector: 230 nm, flow rate: 0.9 mL/min), 30 °C, t_1 = 30.0 min, t_2 = 60.0 min (maj); HRMS (ESI) m/z Calculated for C₁₆H₁₆F₃N₂ [M+H]⁺ 293.1260, found 293.1262.



6. The determination of the absolute configuration of 6a

The absolute configuration of the product 2-(trifluoromethyl)-1,2,3,4-tetrahydroquinoxaline **6a** [96% ee, $[\alpha]^{20}_D$ = - 4.69 (c 0.32, CHCl₃)] was determined by X-ray diffraction analysis by recrystallization from mixture solvent of dichloromethane/*n*-hexane to upgrade ee to >99%. The configurations of the other chiral products are assigned by analogy. CCDC 1879859 contains the structure and supplementary crystallographic data for the structure of (R)-2-(trifluoromethyl)-1,2,3,4-tetrahydroquinoxaline **6a**. These data can be obtained free of charge via www.ccdc.com.ac.uk/data_request/cif from the Cambridge Crystallographic Data Centre.

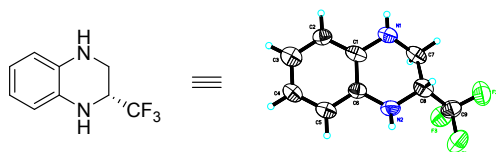
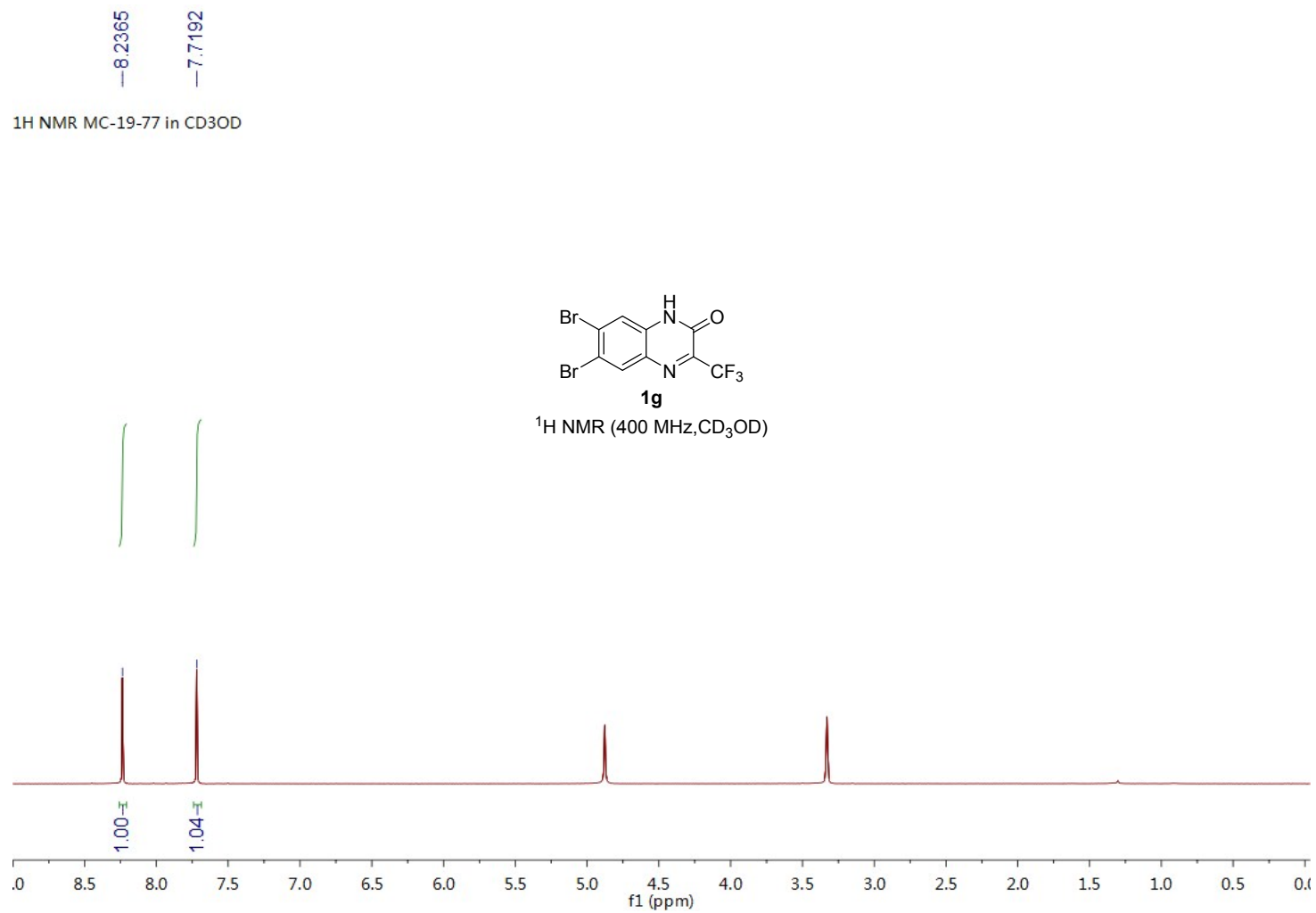


Figure 1. The X-ray structure of (R)-2-(trifluoromethyl)-1,2,3,4-tetrahydroquinoxaline **6a**.

7. References

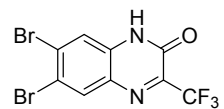
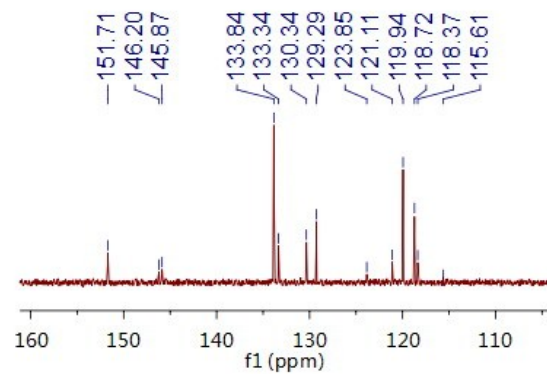
- [1] a) Sakai, H.; Shinto, S.; Araki, Y.; Wada, T.; Sakanoue, T.; Takenobu, T.; Hasobe, T. *Chem. Eur. J.* **2014**, *20*, 10099; b) Didenko, A. V.; Vorobiev, M. V.; Sevenard, D. V.; Sosnovskikh, V. Y. *Chem. Heterocycl. Com.* **2015**, *51*, 259; c) Katagiri, N.; Kasai, K.; Kaneko, C. *Chem. Pharm. Bull.* **1986**, *34*, 4429; d) Shekhar, A. C.; Kumar, A. R.; Sathaiah, G.; Raju, K.; Srinivas, P. V. S. S, Rao. P. S.; Narsaiah, B. *J. Heterocyclic Chem.* **2015**, *51*, 1504; e) Cudhman, M.; Patel. H. H.; Scheuring, J.; Bacher, A. J. *Org. Chem.* 1992, *57*, 5630; f) Landge, S.; Török, B. *Catal Lett.* **2008**, *122*, 338.
- [2] Nemoto, T.; Hayashi, M.; Xu, D.; Hamajima, A.; Hamada, Y. *Tetrahedron: Asymmetry* **2014**, *25*, 1133.

5. Copy of NMR and HPLC for the Compounds



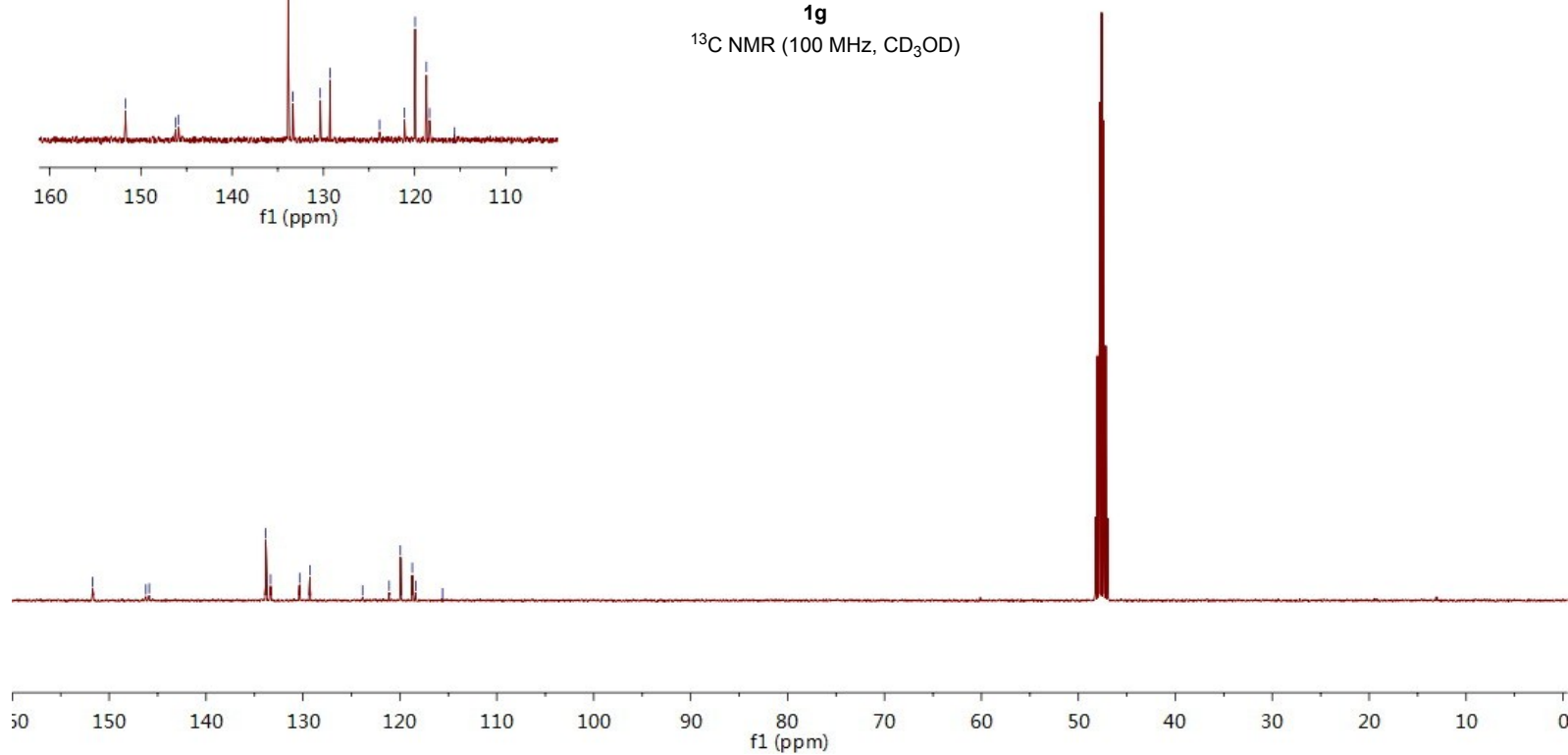
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 115.61

¹³C NMR MC-19-77 in CD₃OD



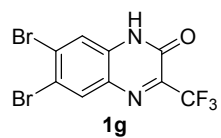
1g

¹³C NMR (100 MHz, CD₃OD)

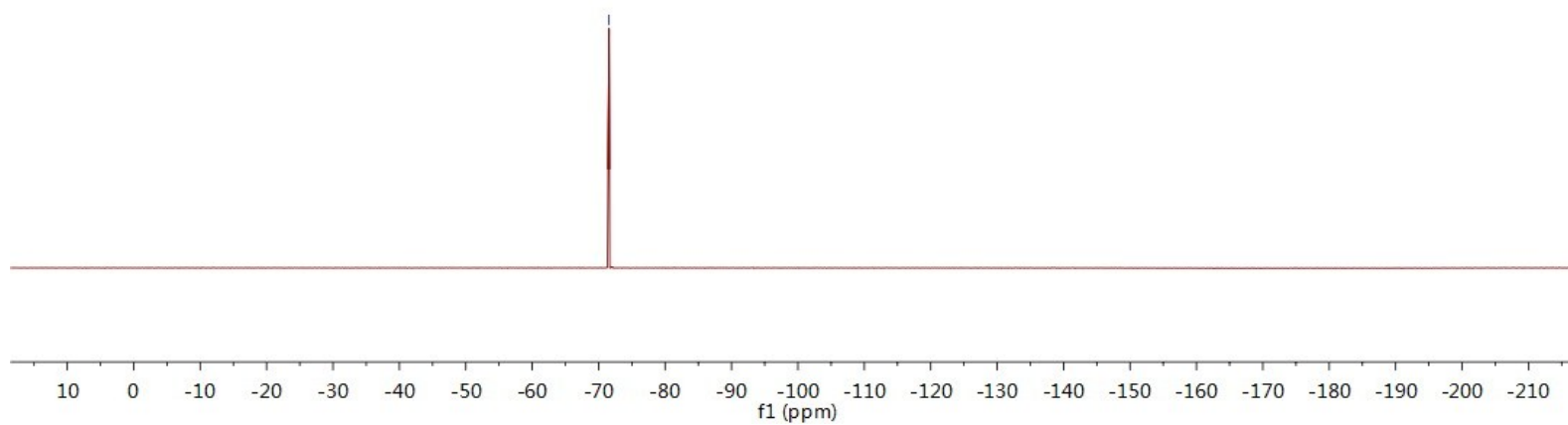


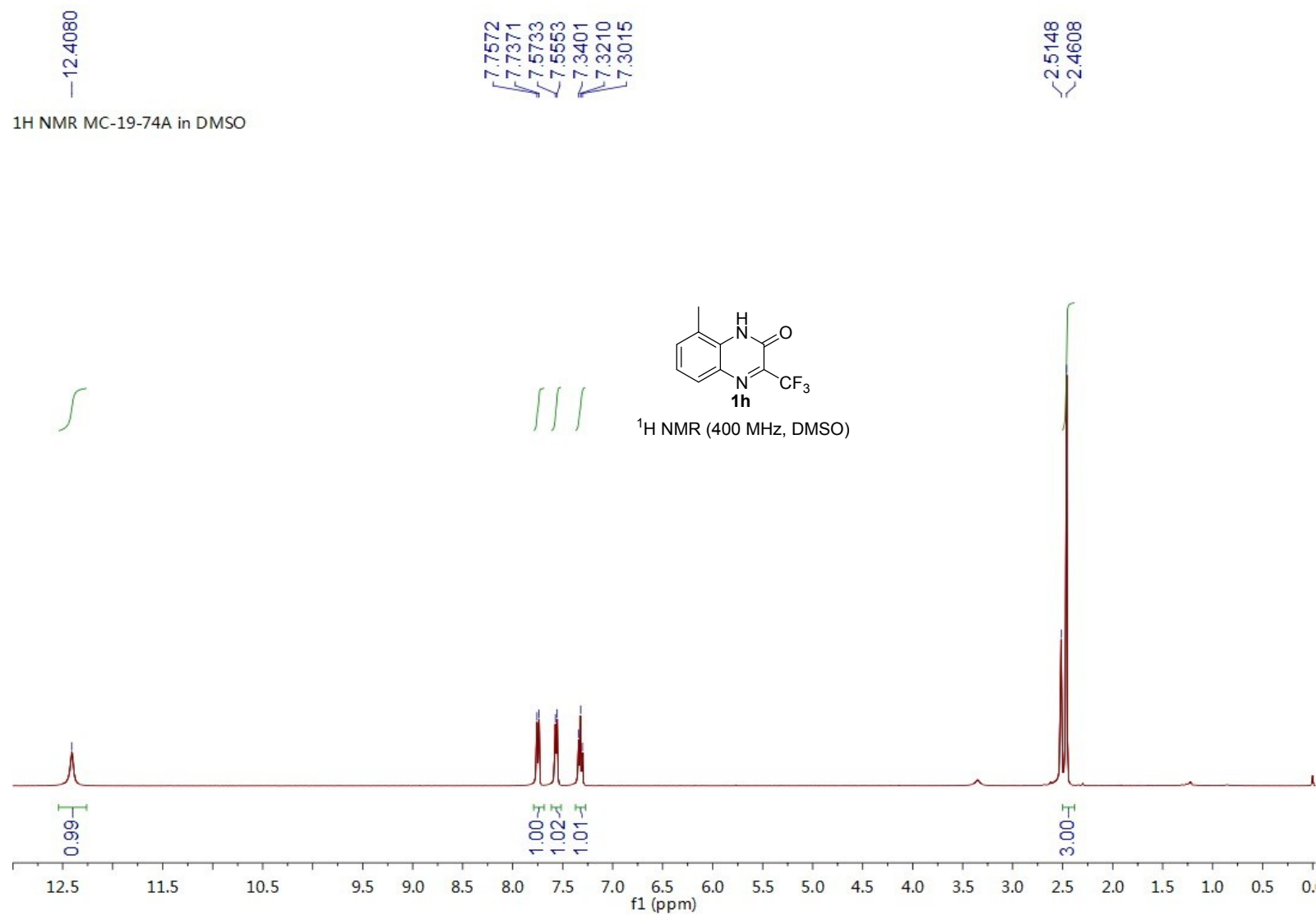
¹⁹F NMR MC-19-77 in CD₃OD

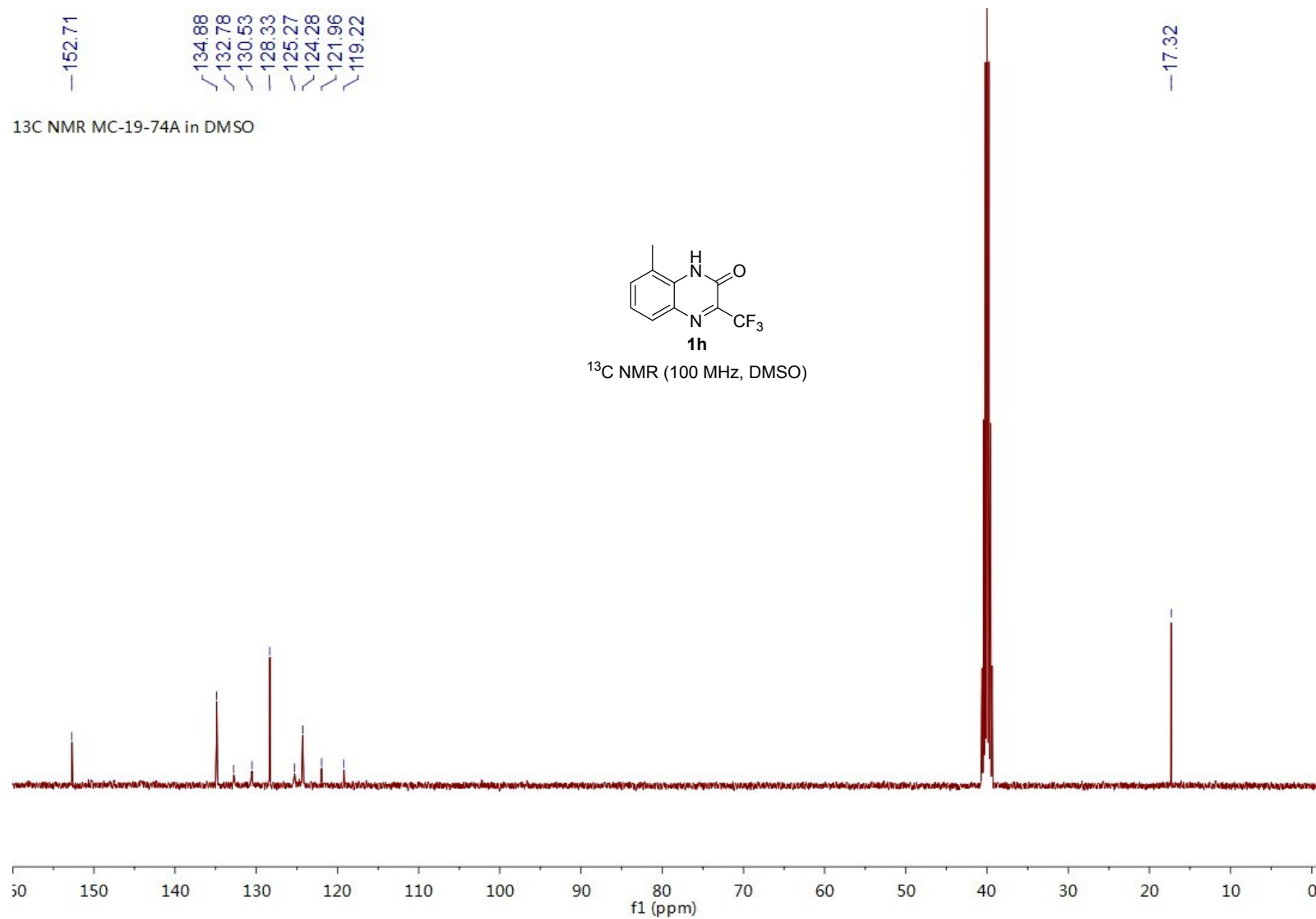
—71.5721



¹⁹F NMR (376 MHz, CD₃OD)

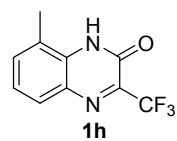




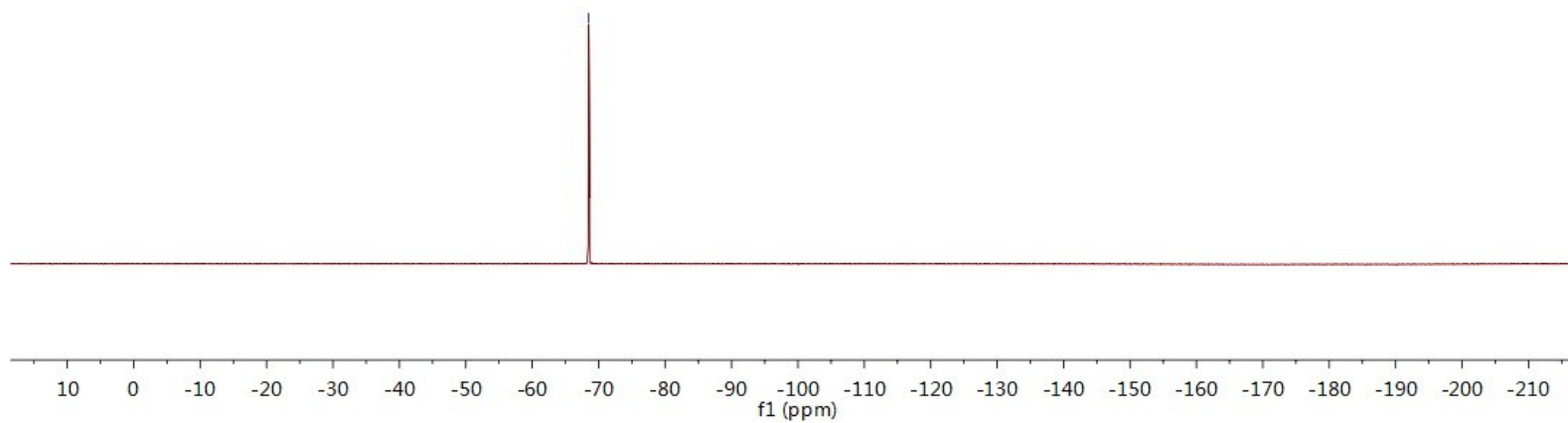


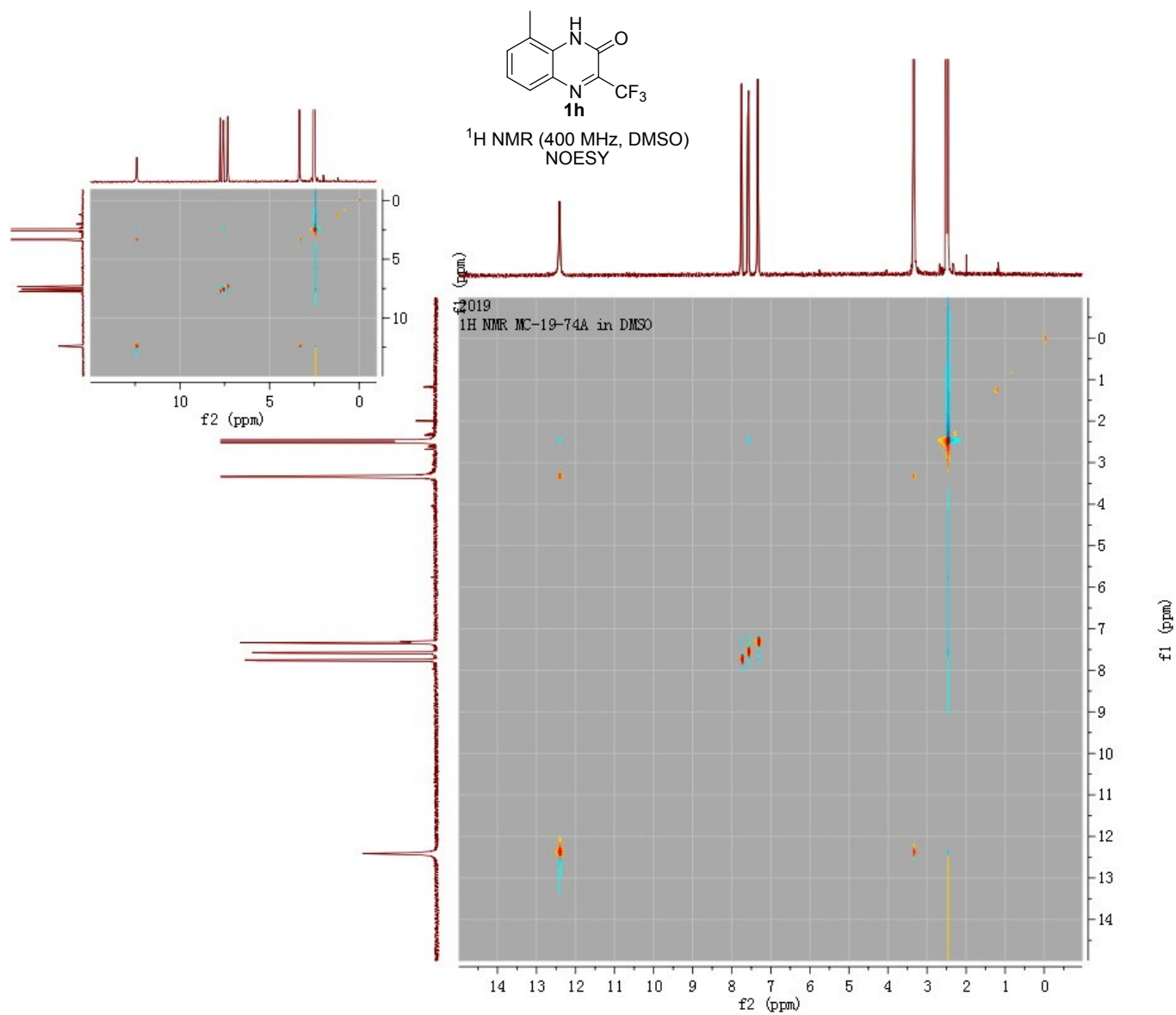
¹⁹F NMR MC-19-74A in DMSO

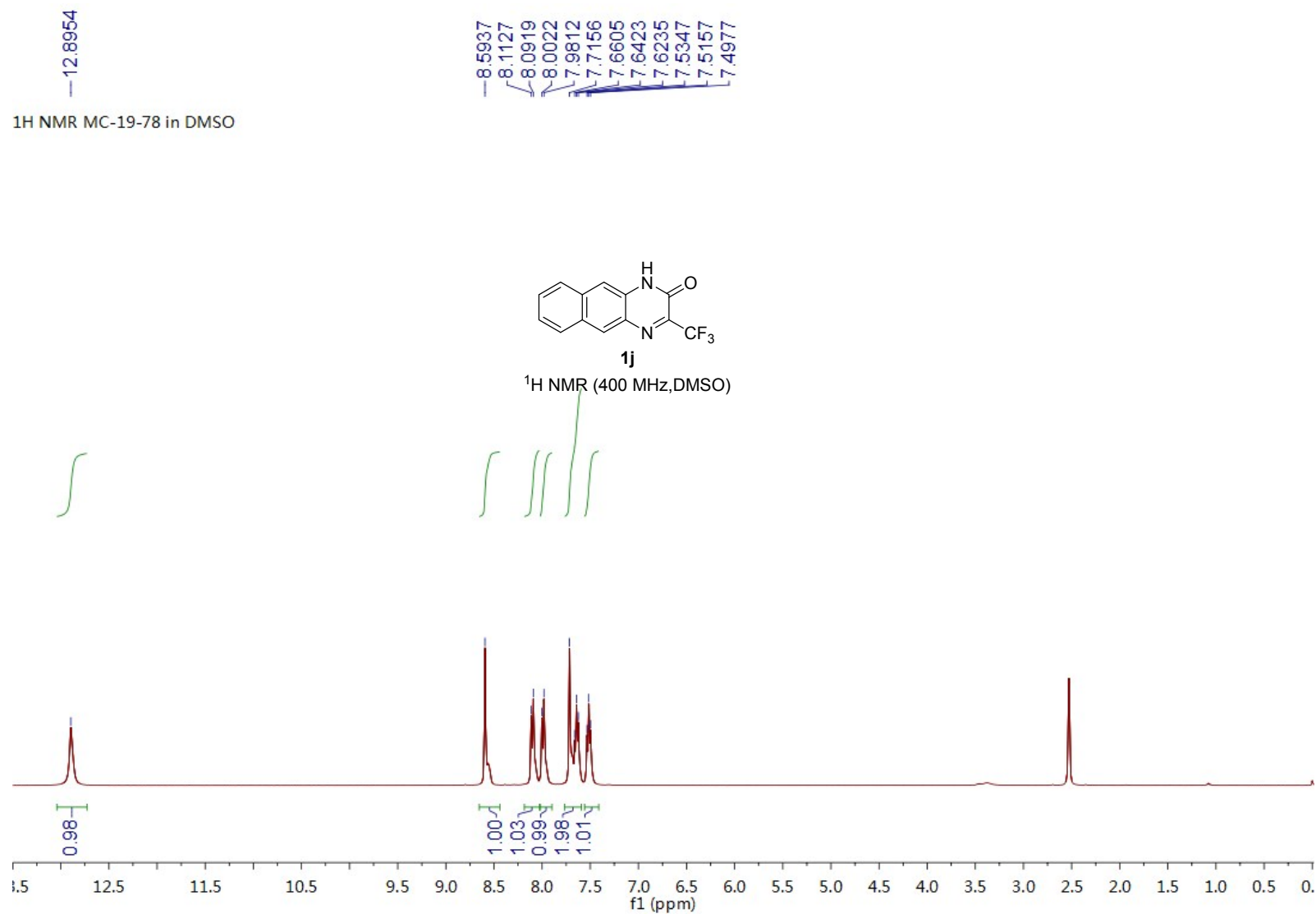
—68.5069

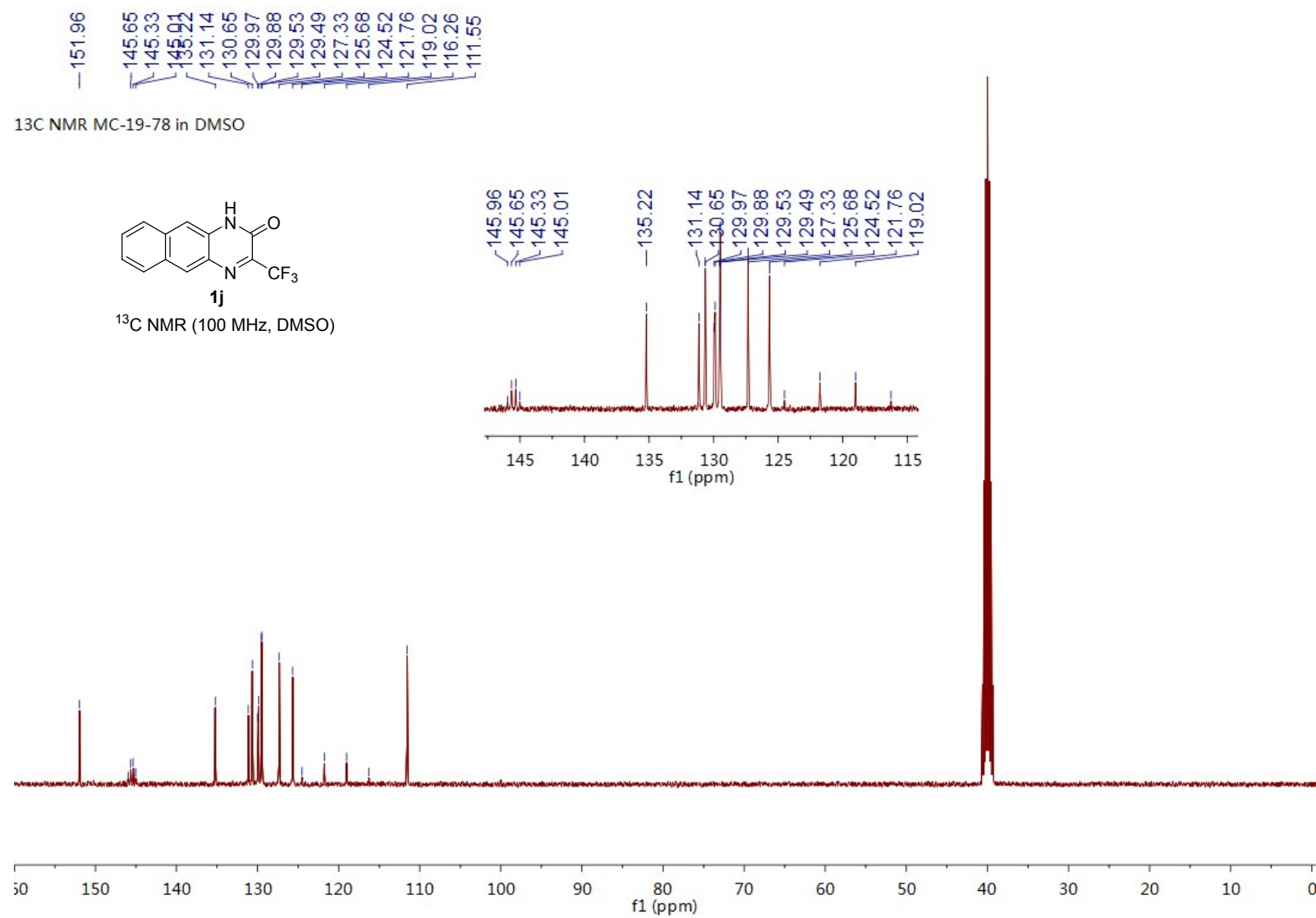


¹⁹F NMR (376 MHz, DMSO)



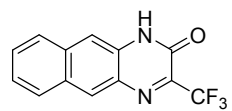






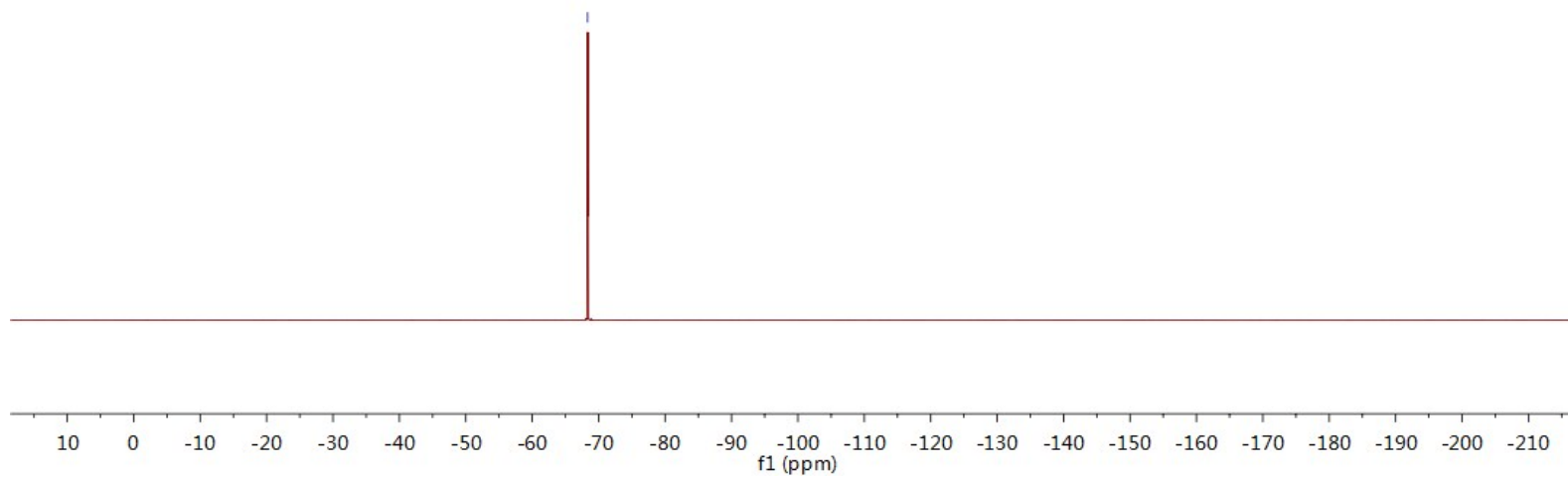
¹⁹F NMR MC-19-78 in DMSO

68.3413



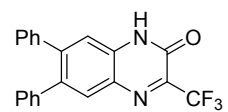
1j

¹⁹F NMR (376 MHz, DMSO)



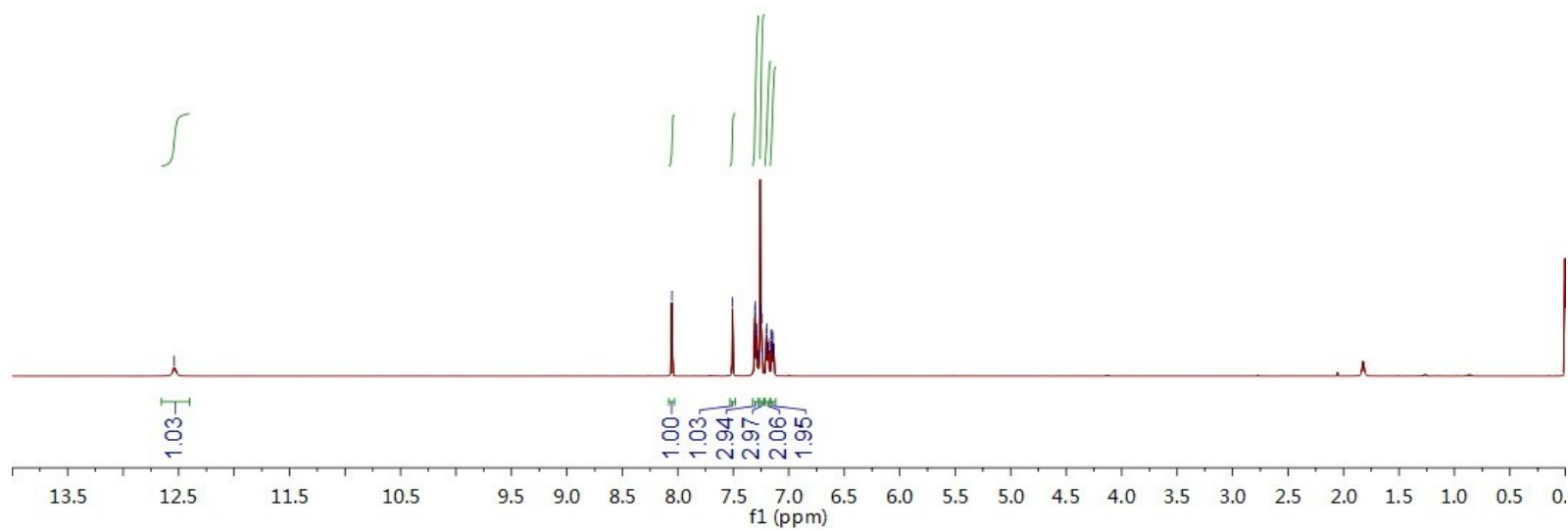
12.5390
1H NMR MC-20-43 in CDCl₃

8.0539
7.5076
7.3057
7.3011
7.2935
7.2880
7.2767
7.2524
7.2429
7.2360
7.2031
7.1987
7.1904
7.1860
7.1791
7.1575
7.1516
7.1456
7.1426
7.1365
7.1335



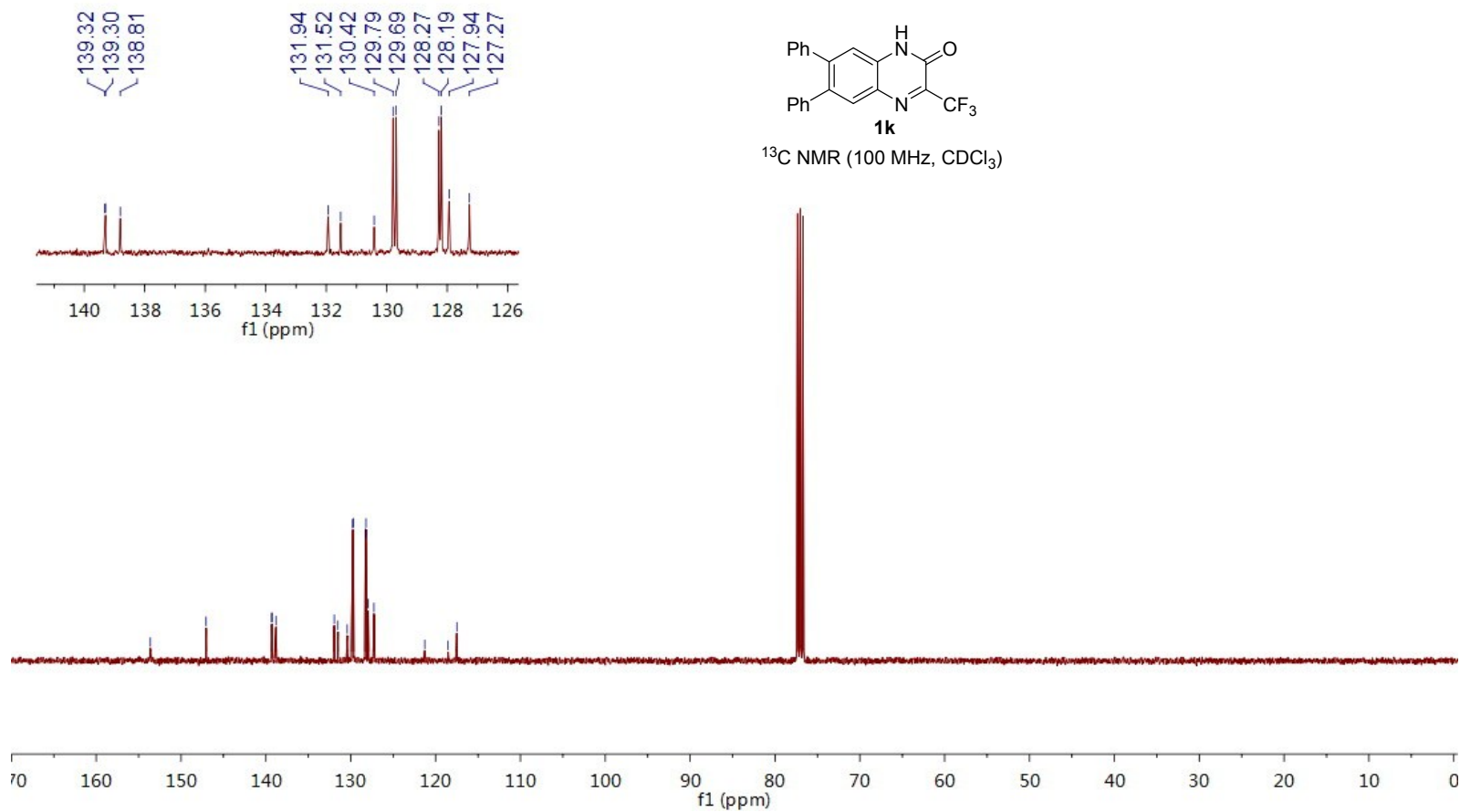
1k

¹H NMR (400 MHz, CDCl₃)



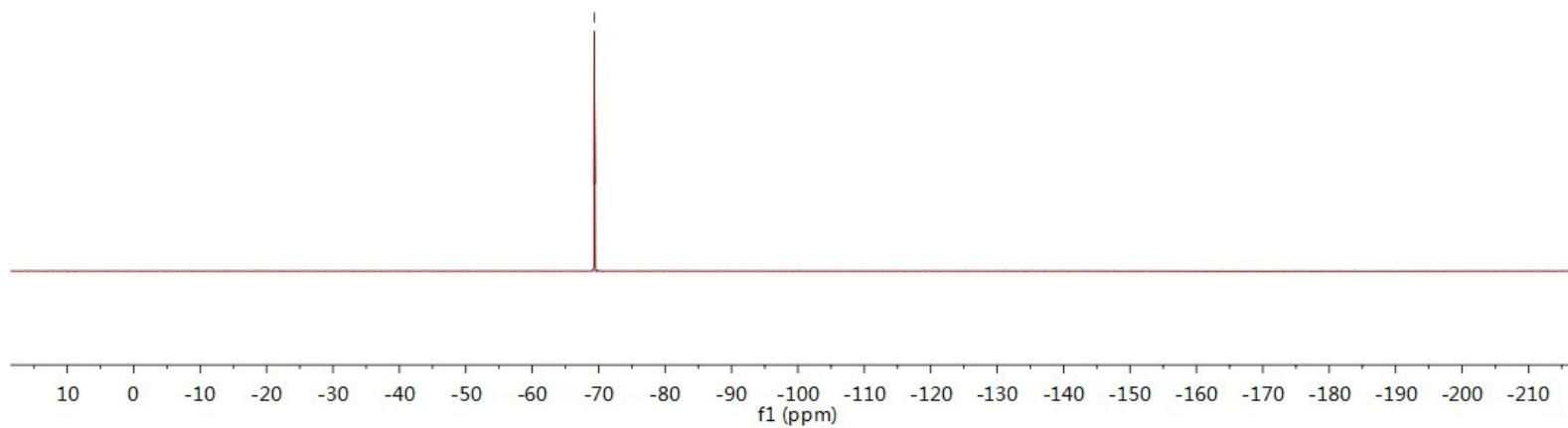
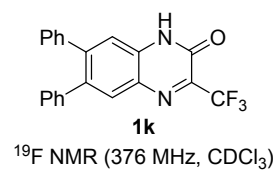
— 153.62
 — 147.04
 139.32
 139.30
 138.81
 129.79
 129.69
 128.27
 128.19
 128.17
 118.53
 117.49

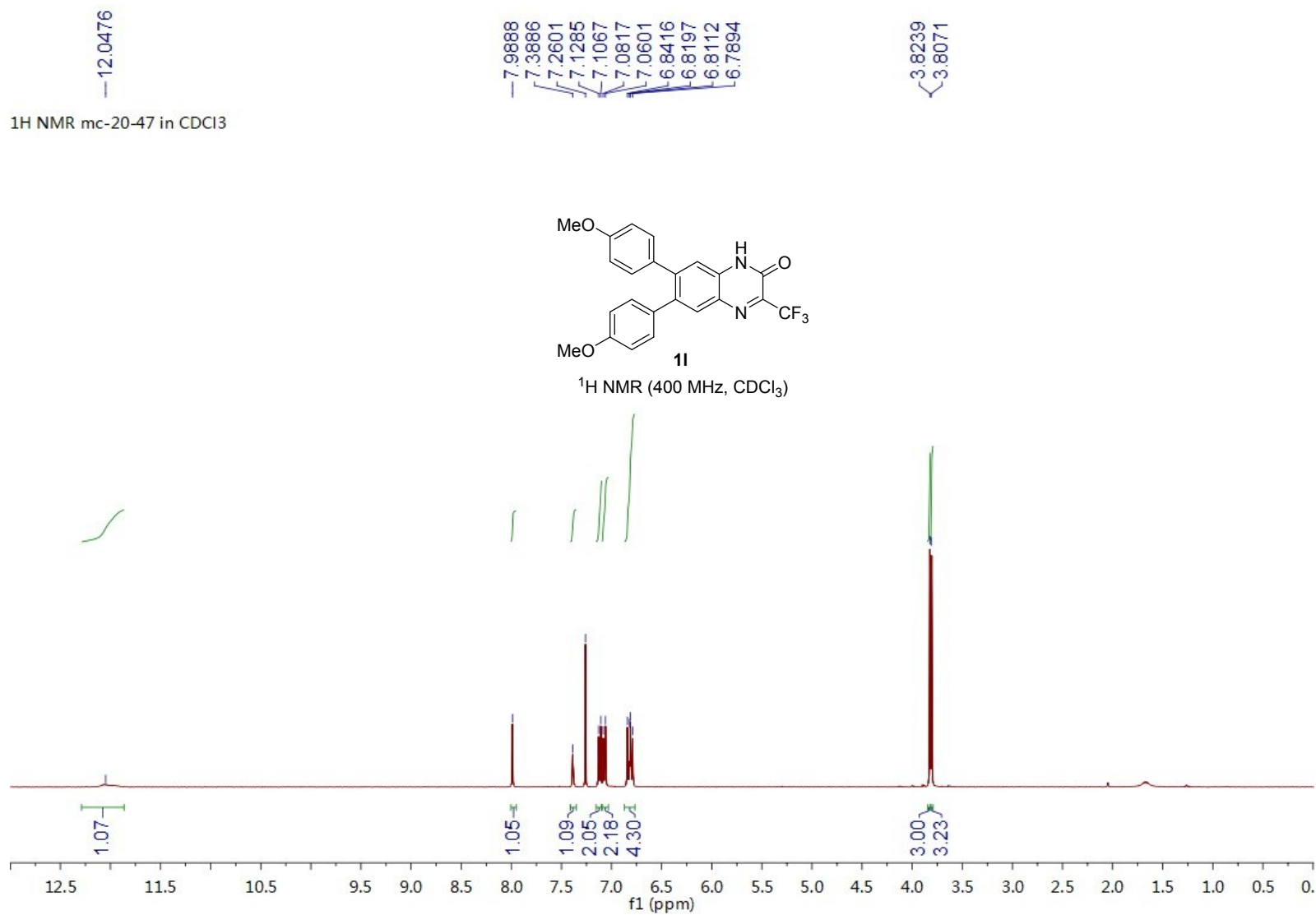
¹³C MC-20-43 in CDCl₃

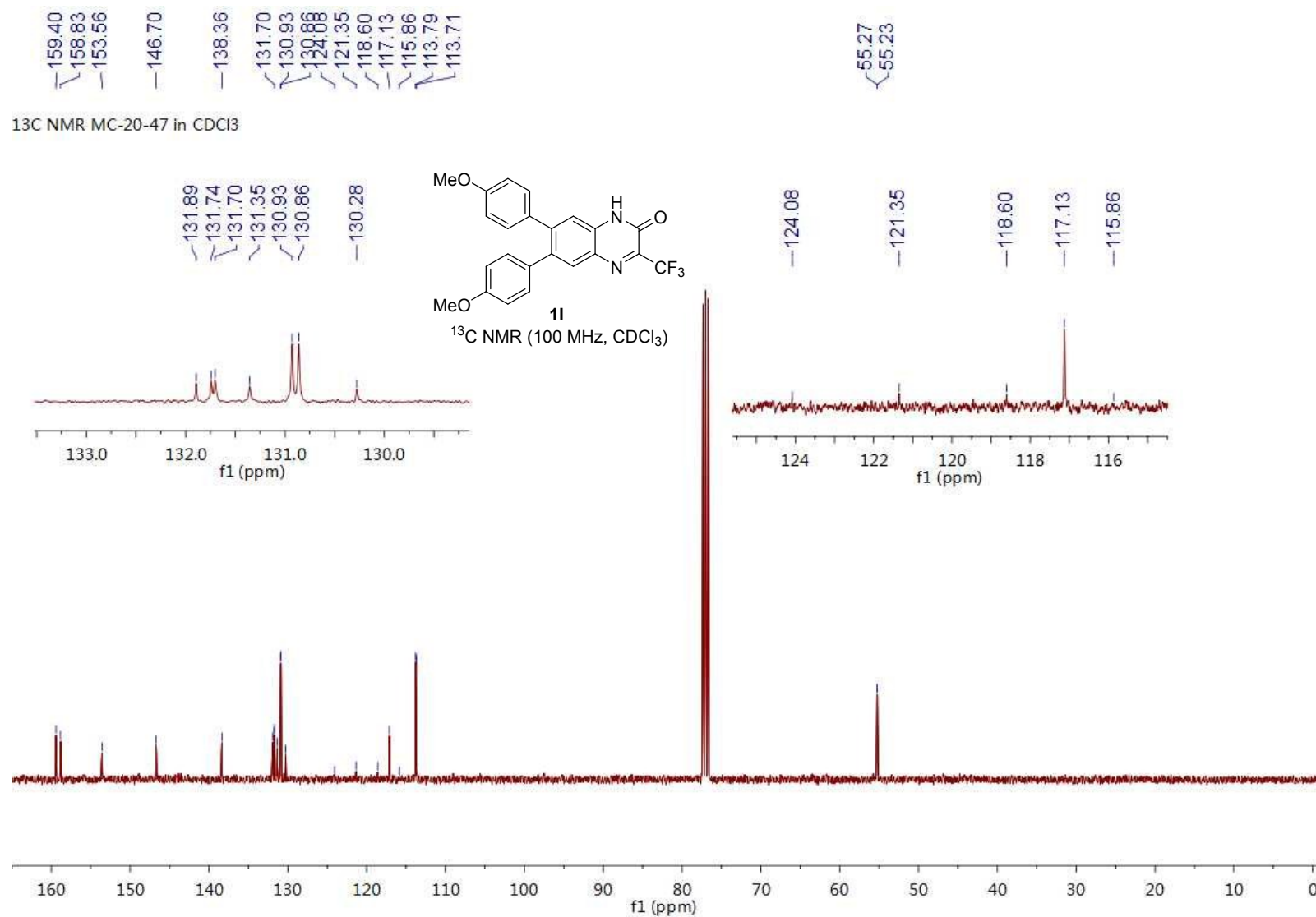


¹⁹F NMR MC-20-43 in CDCl₃

—69.3397

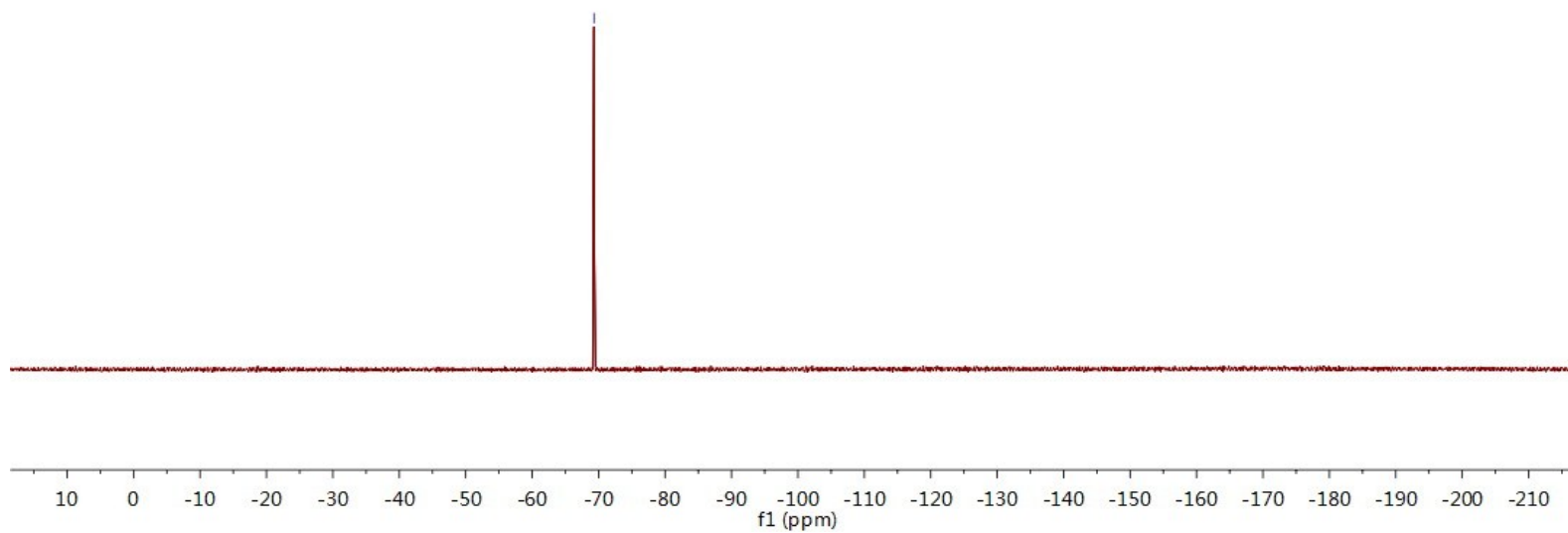
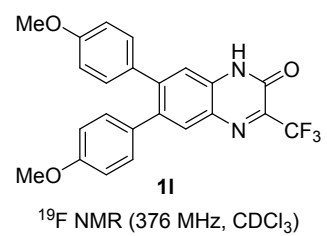


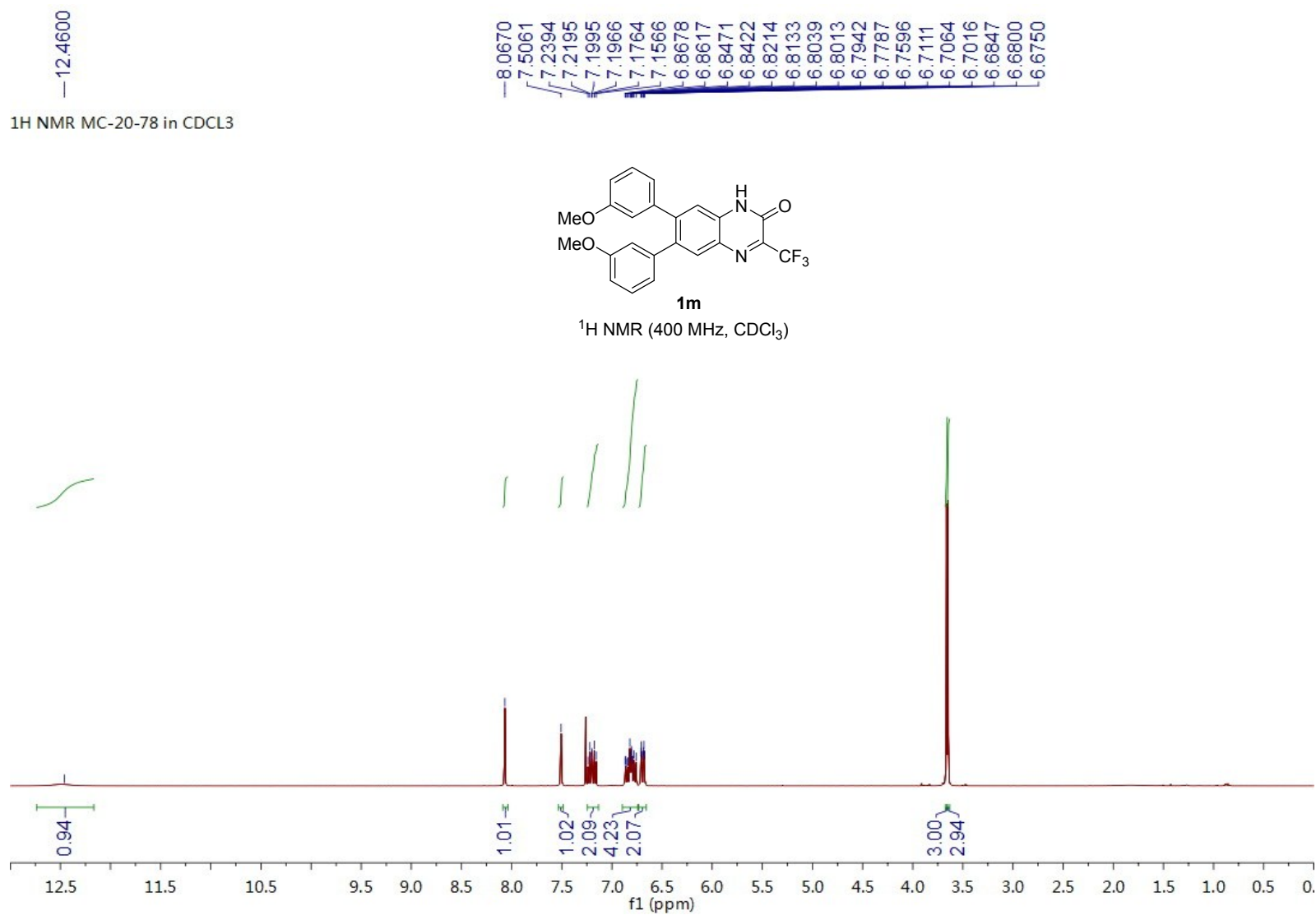


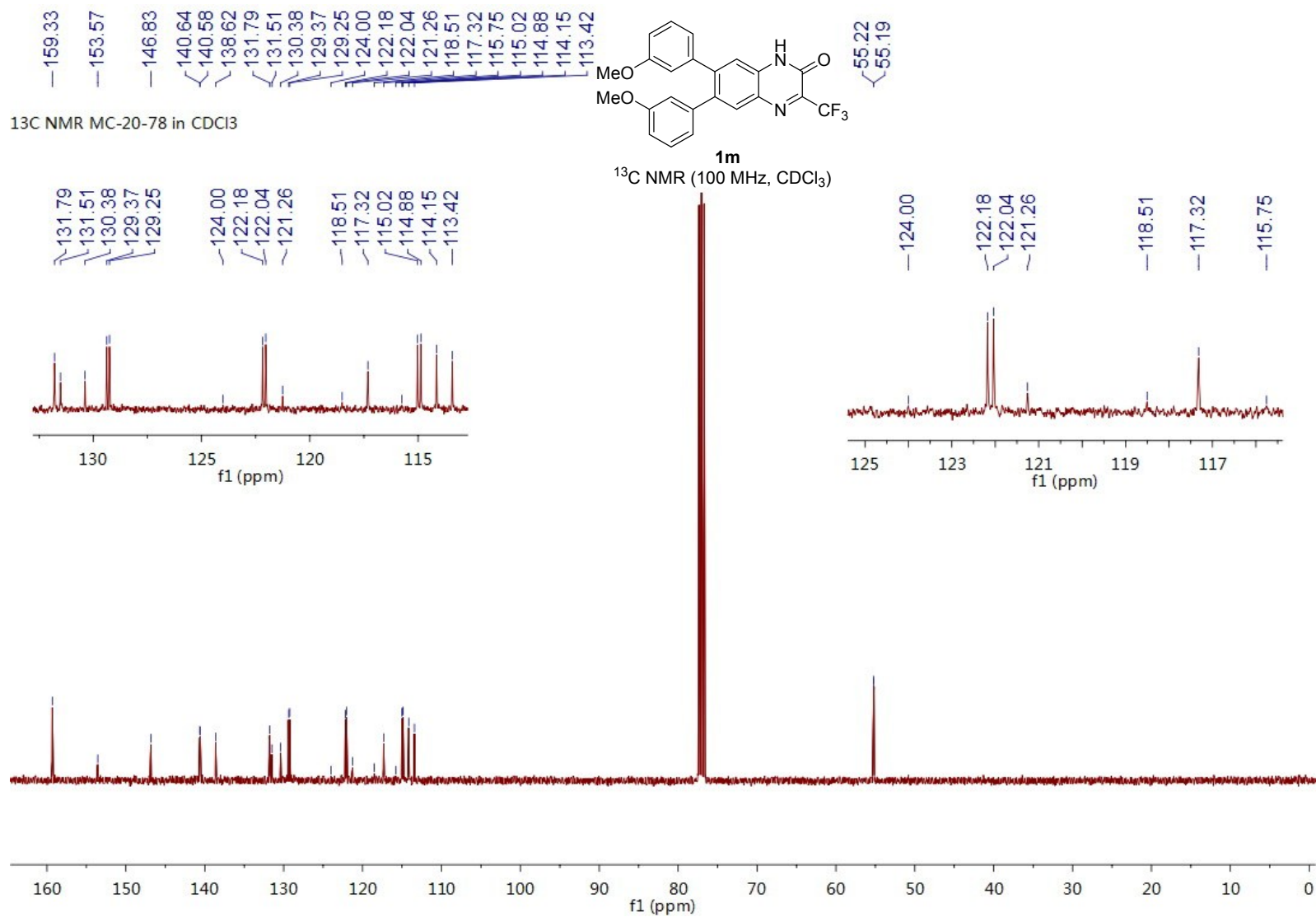


¹⁹F NMR mc-20-47 in CDCl₃

-69.3127

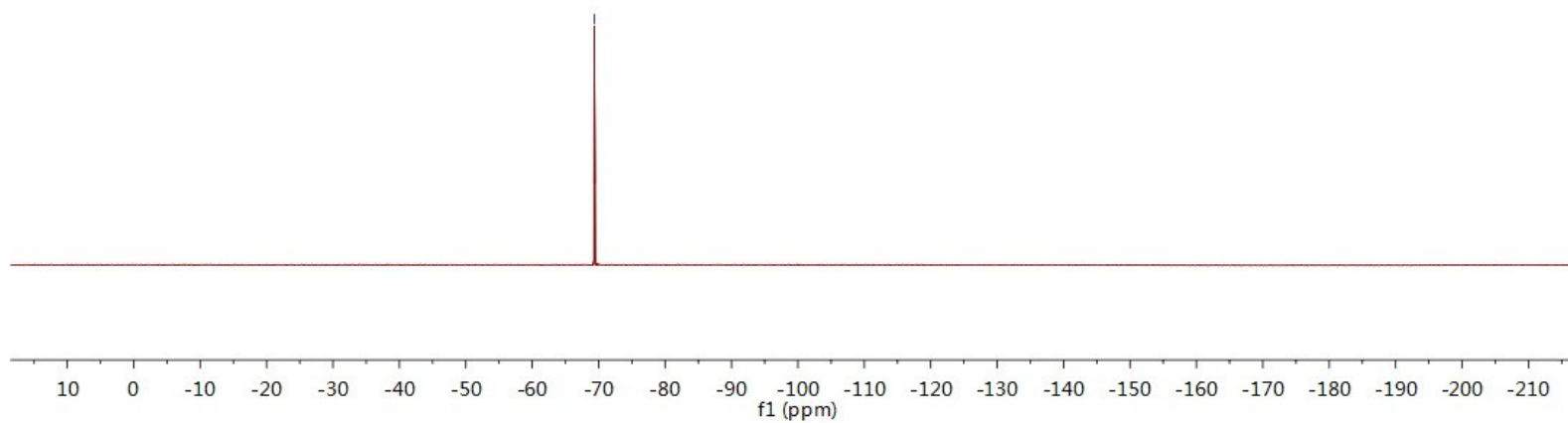
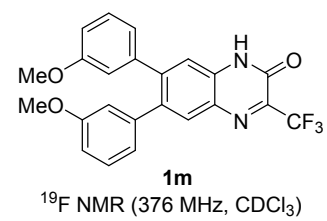






¹⁹F NMR MC-20-78 in CDCl₃

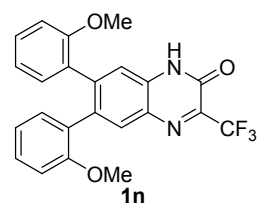
—69.3447



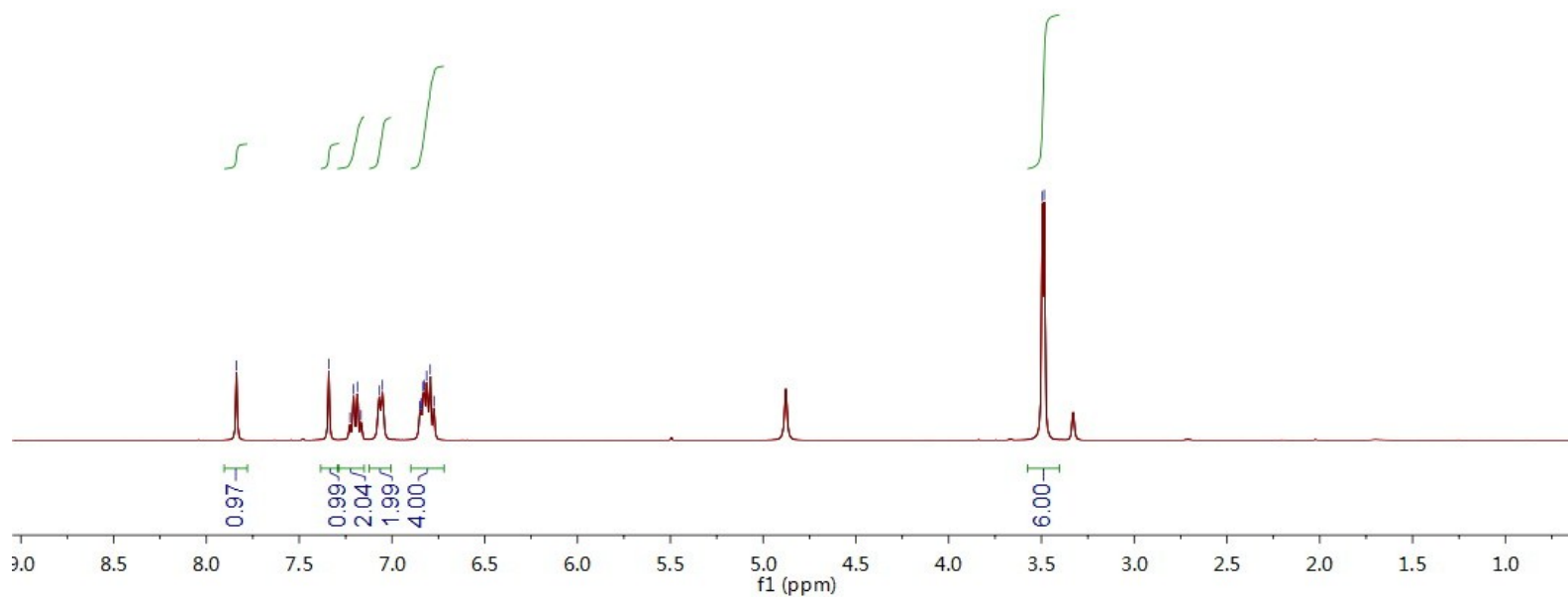
7.8376
7.3404
7.2264
7.2070
7.1864
7.1670
7.0694
7.0513
6.8505
6.8439
6.8322
6.8257
6.8137
6.7940
6.7742

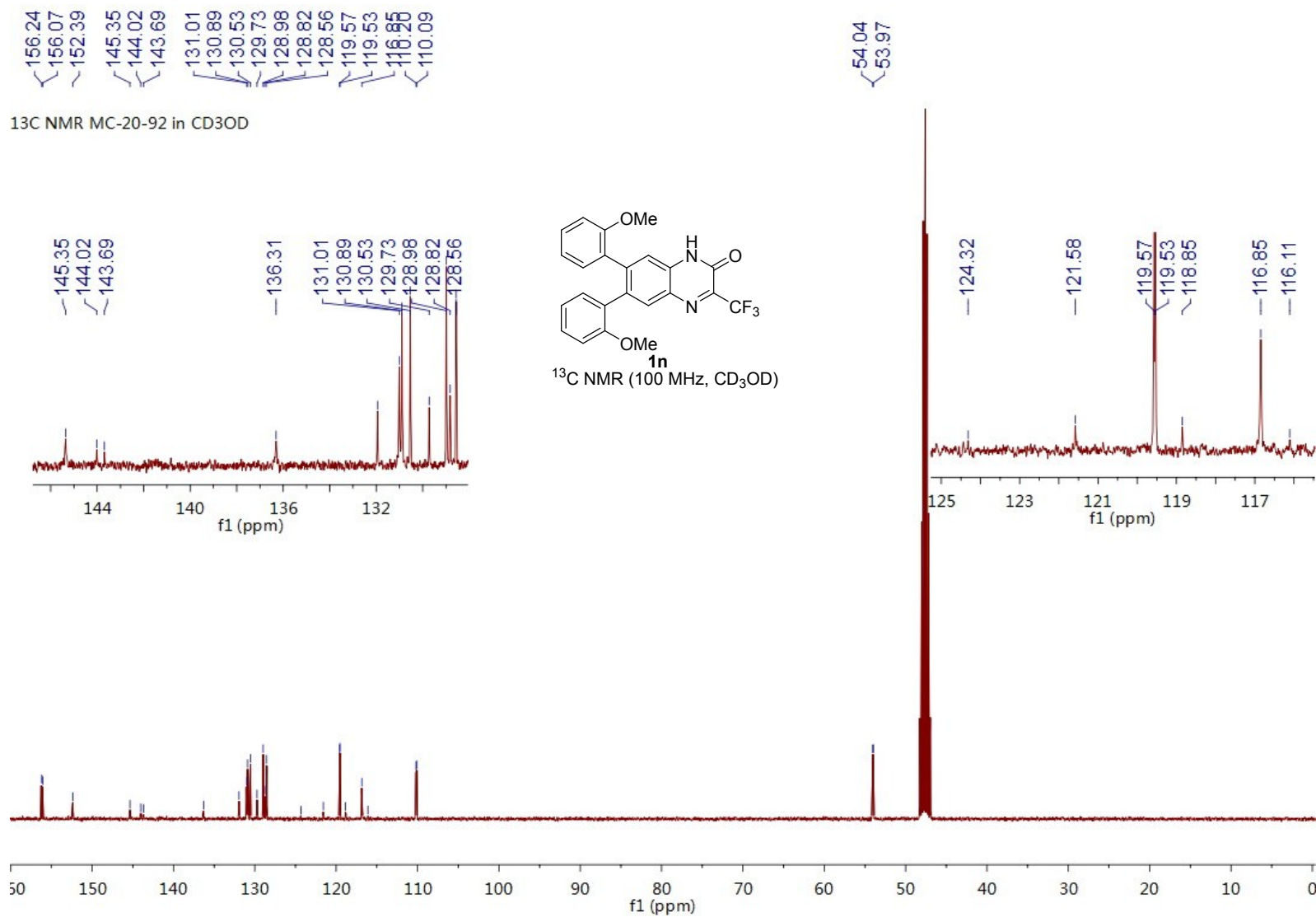
3.4947
3.4844

¹H NMR MC-20-92 in CD₃OD



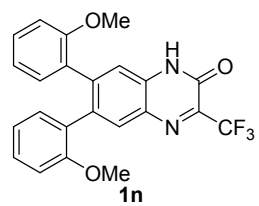
¹H NMR (400 MHz, CD₃OD)



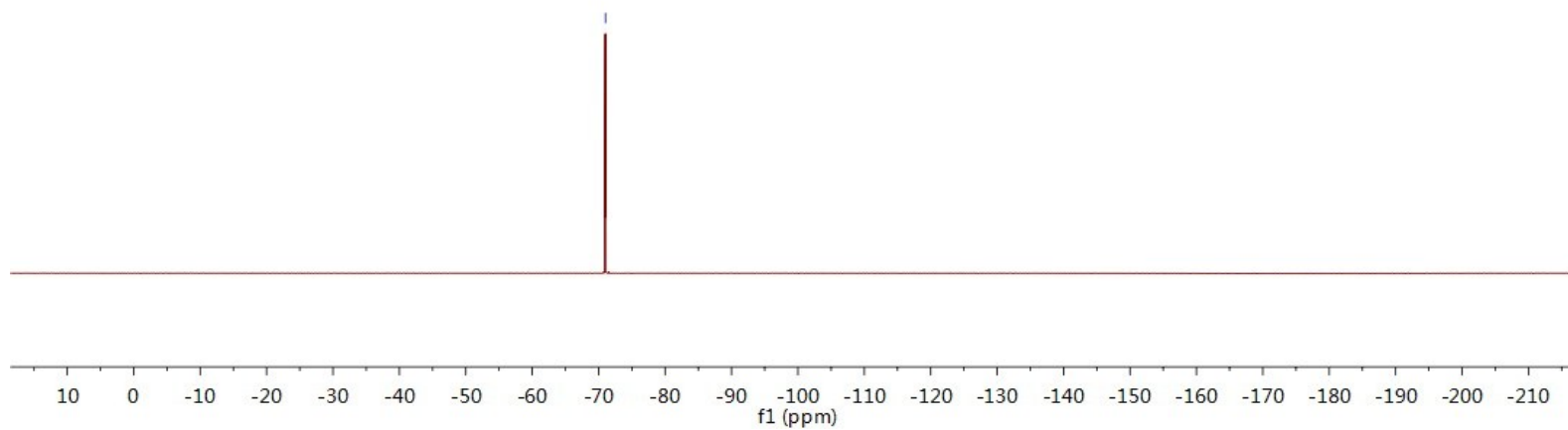


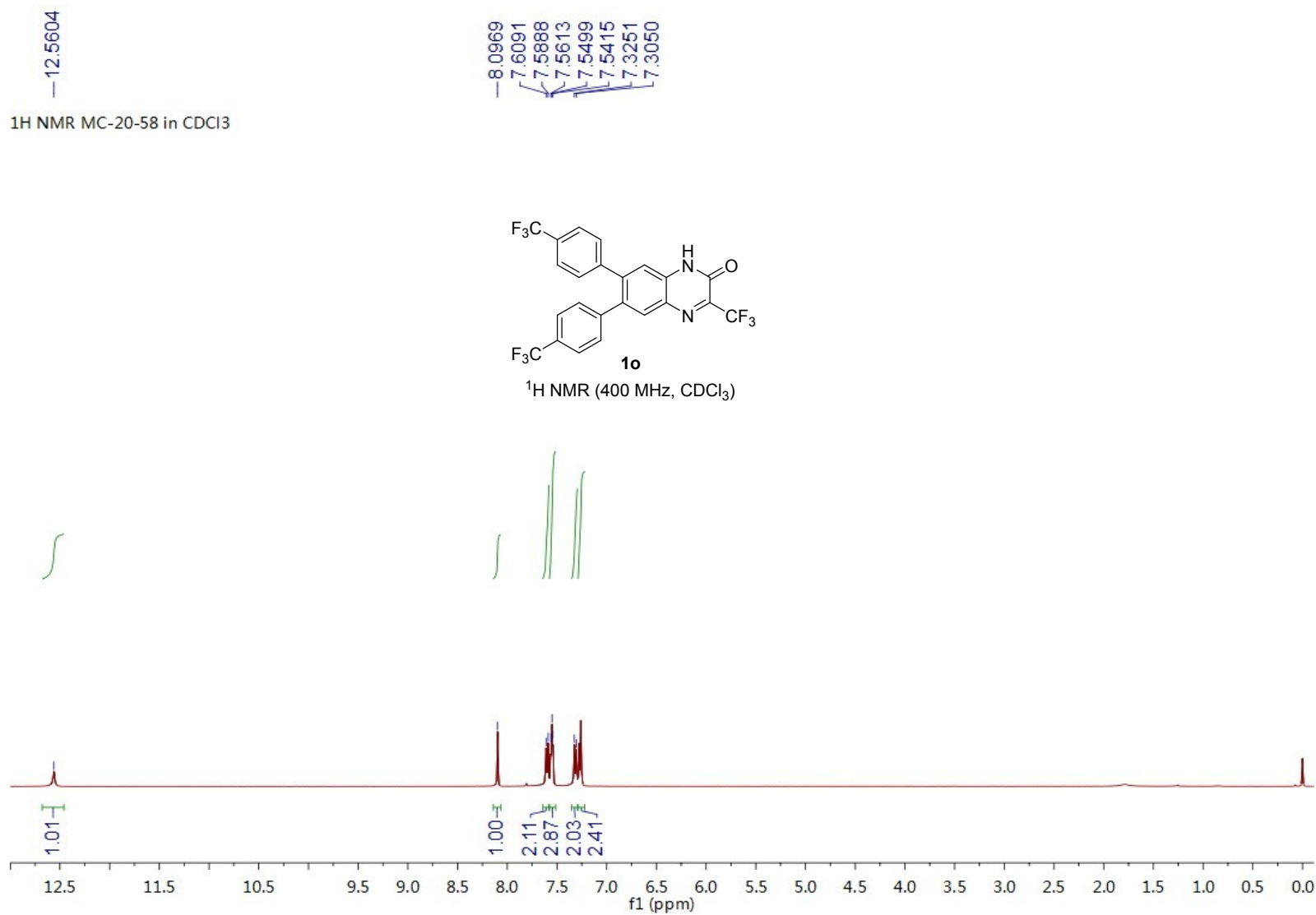
¹⁹F NMR MC-20-92 in CD₃OD

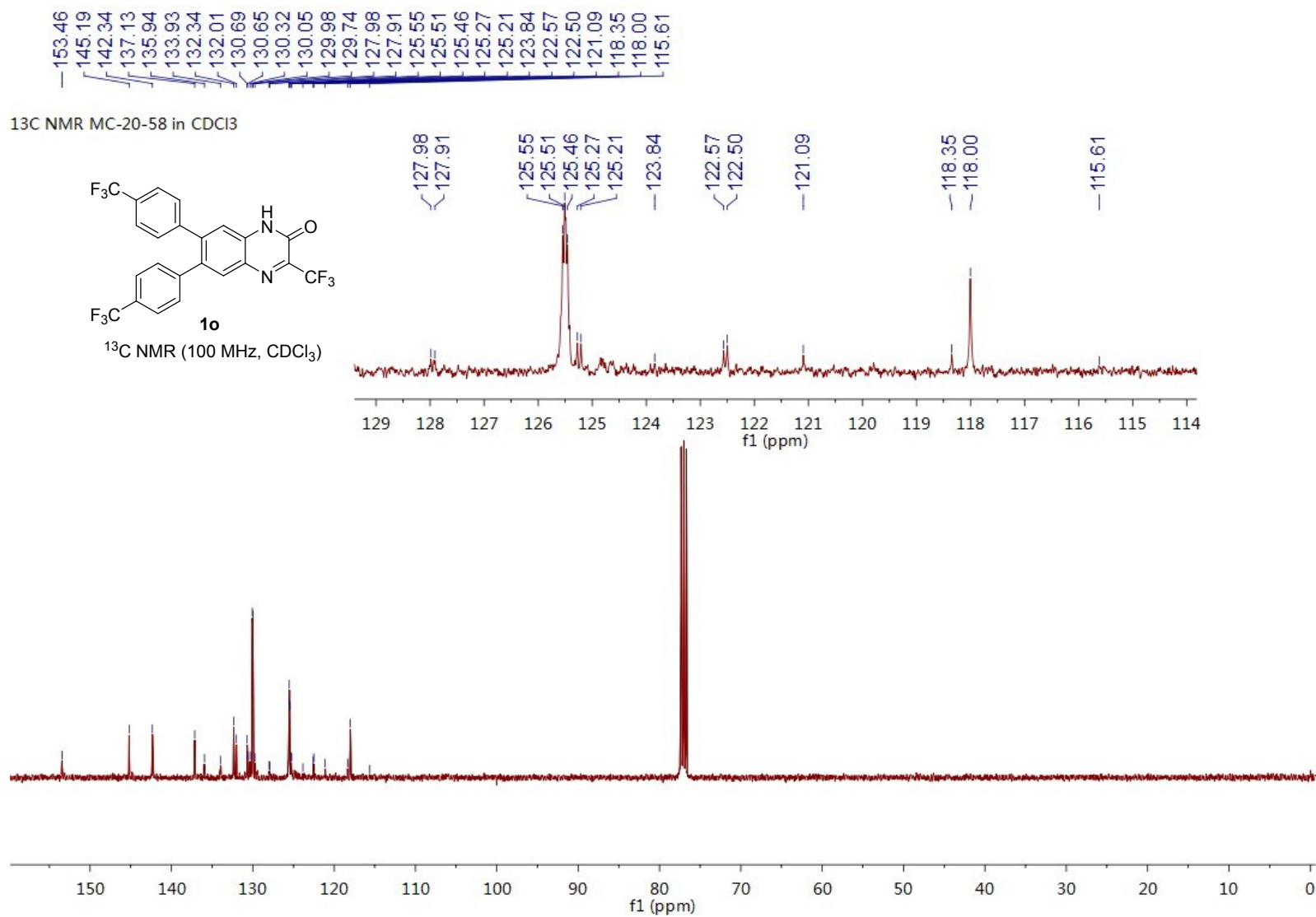
-71.0337



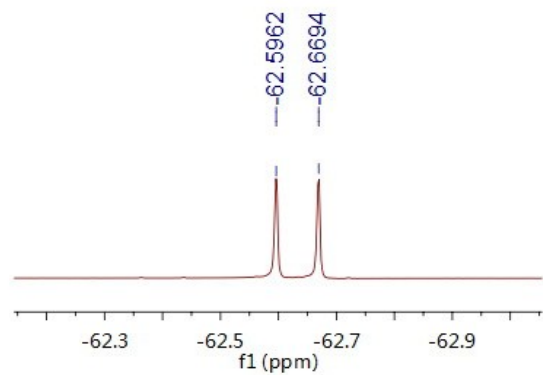
1n
¹⁹F NMR (376 MHz, CD₃OD)



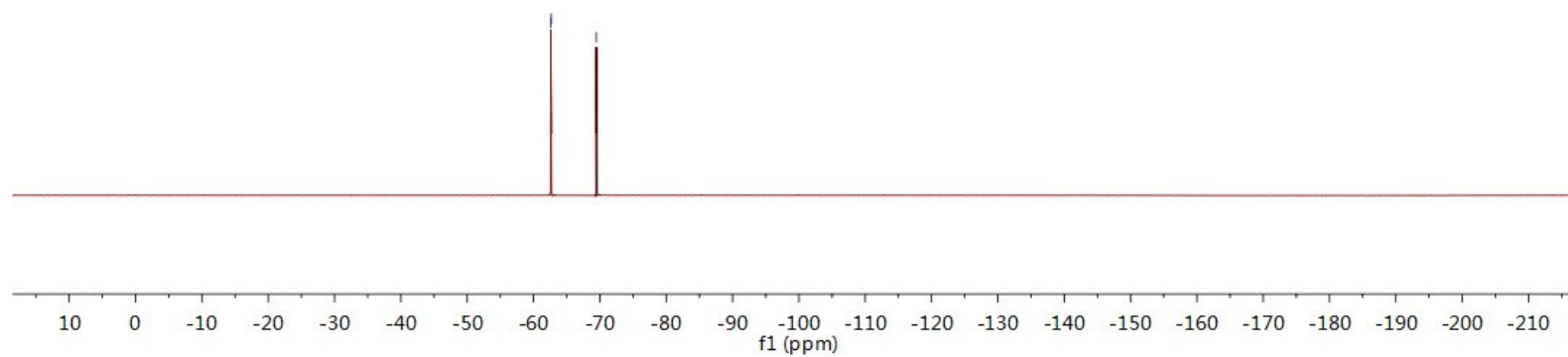
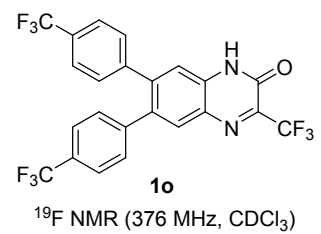


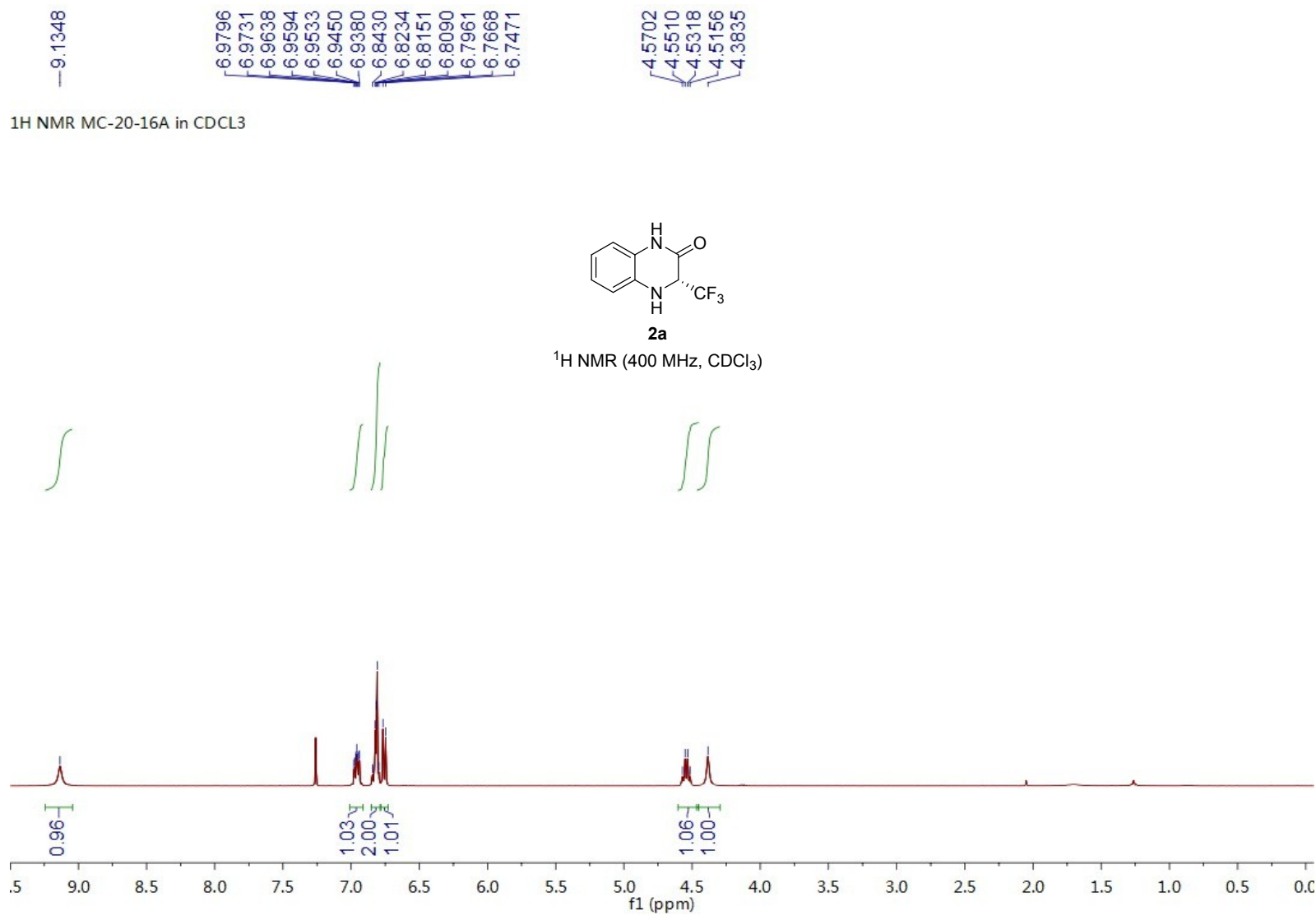


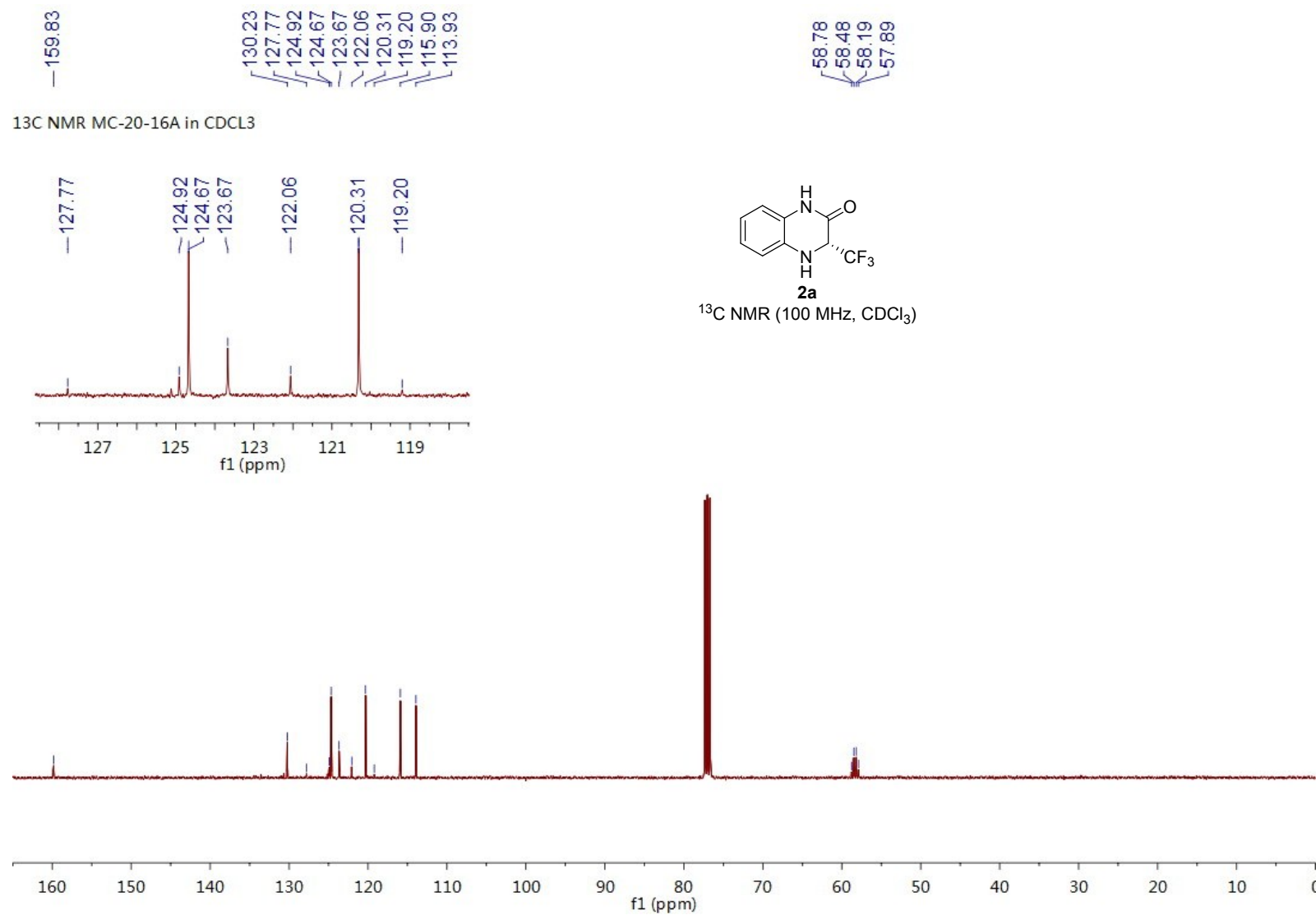
¹H NMR MC-20-58 in CDCl₃



62.5962
62.6694
69.4609

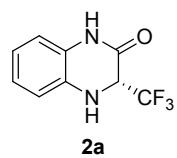




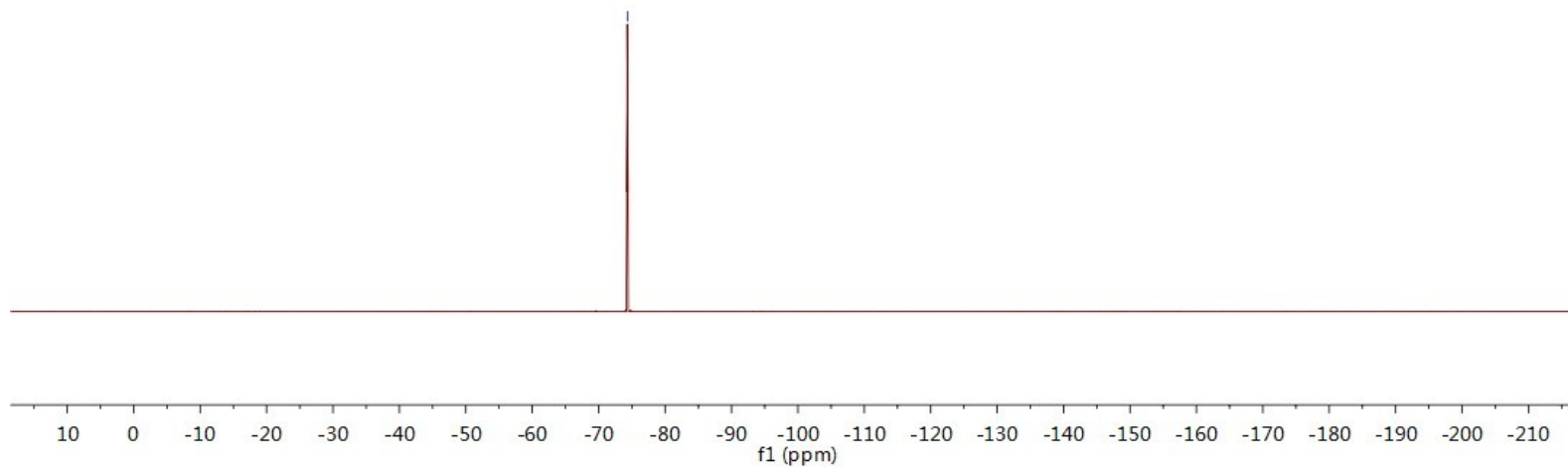


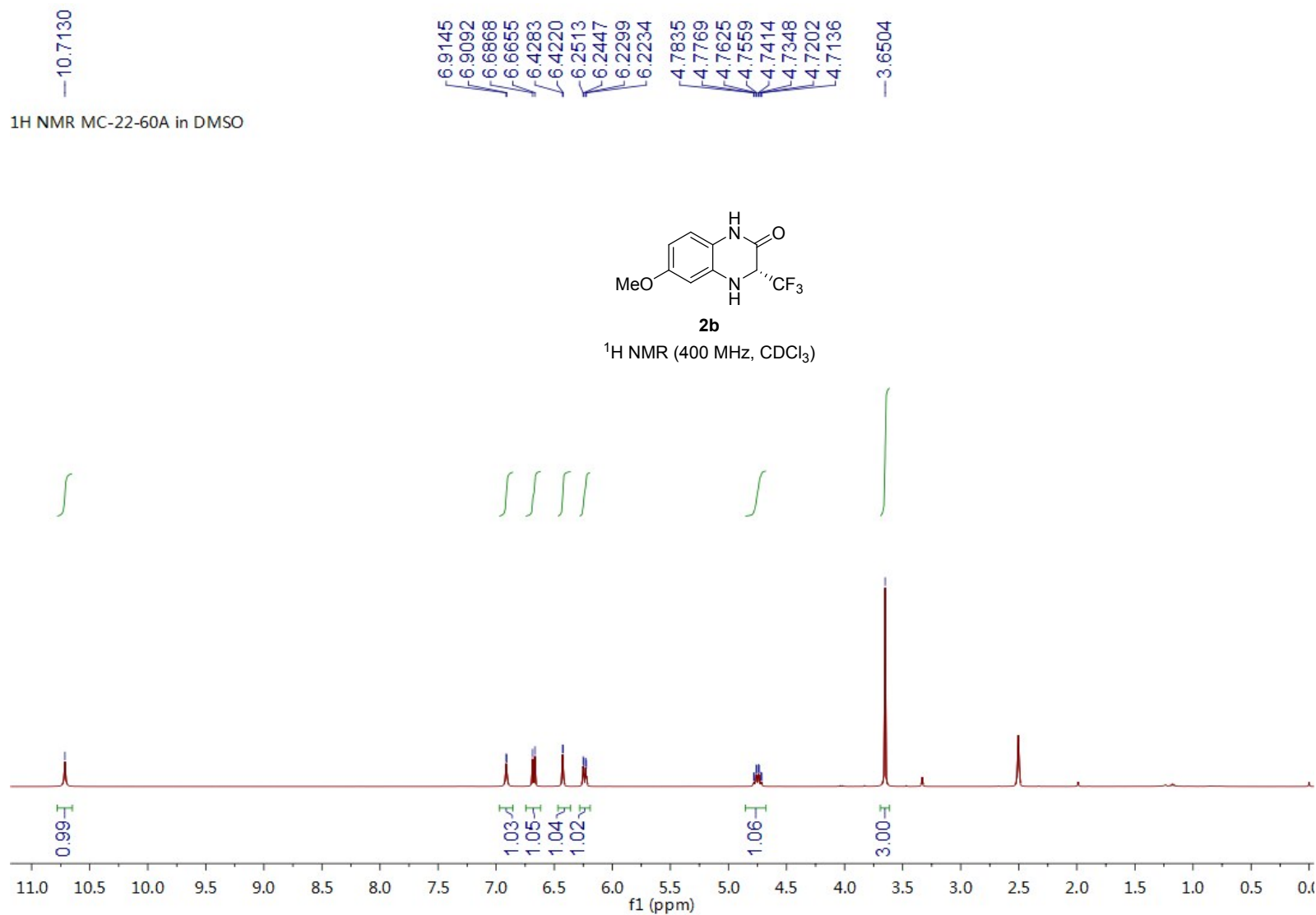
¹⁹F NMR MC-20-16A in CDCl₃

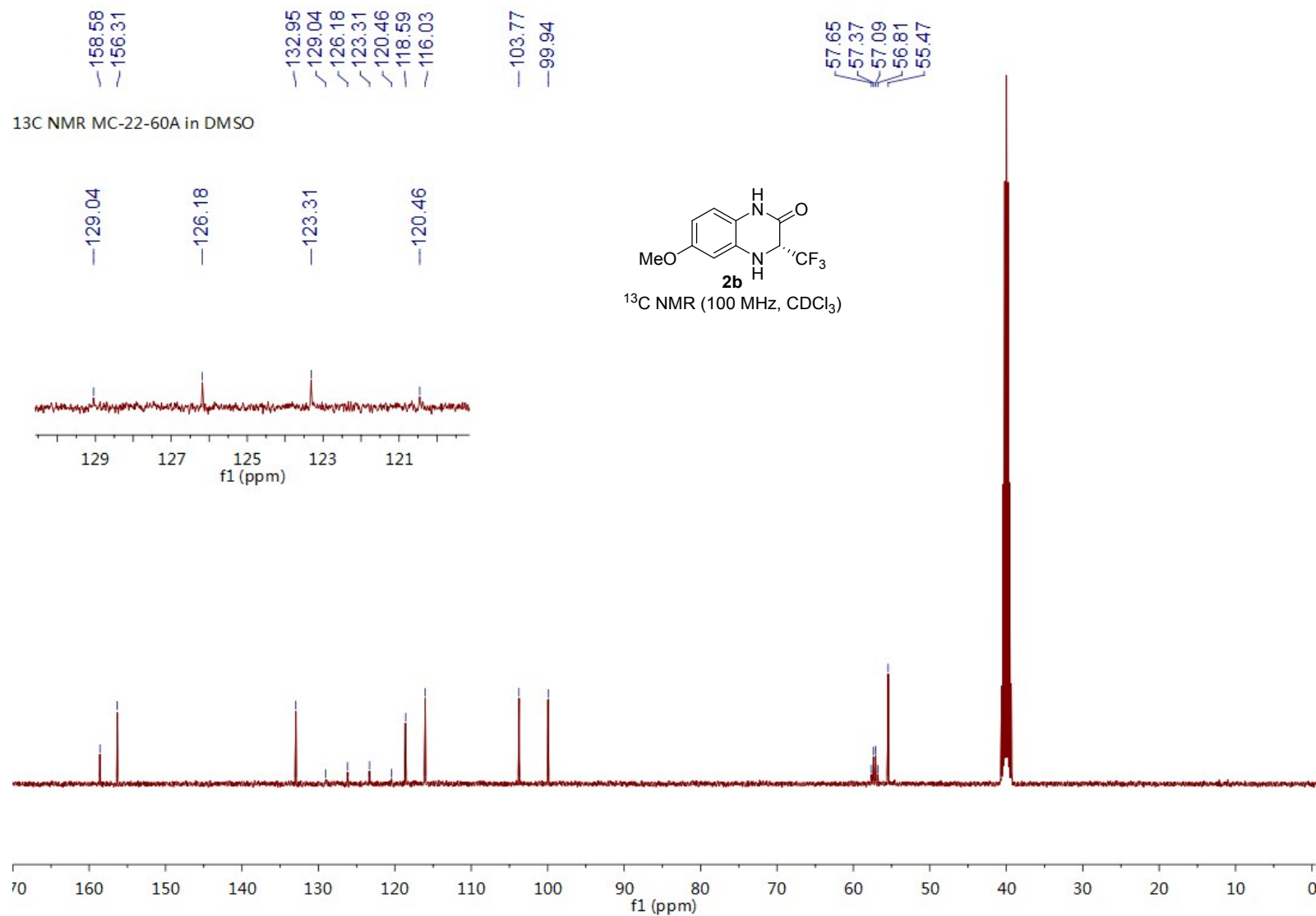
—74.3344



¹⁹F NMR (376 MHz, CDCl₃)

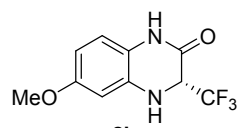




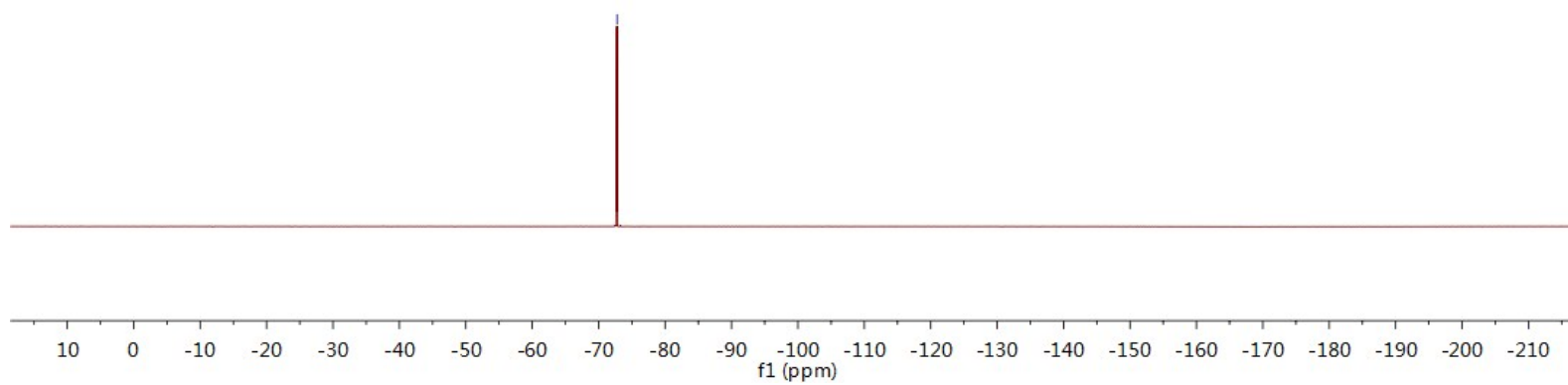


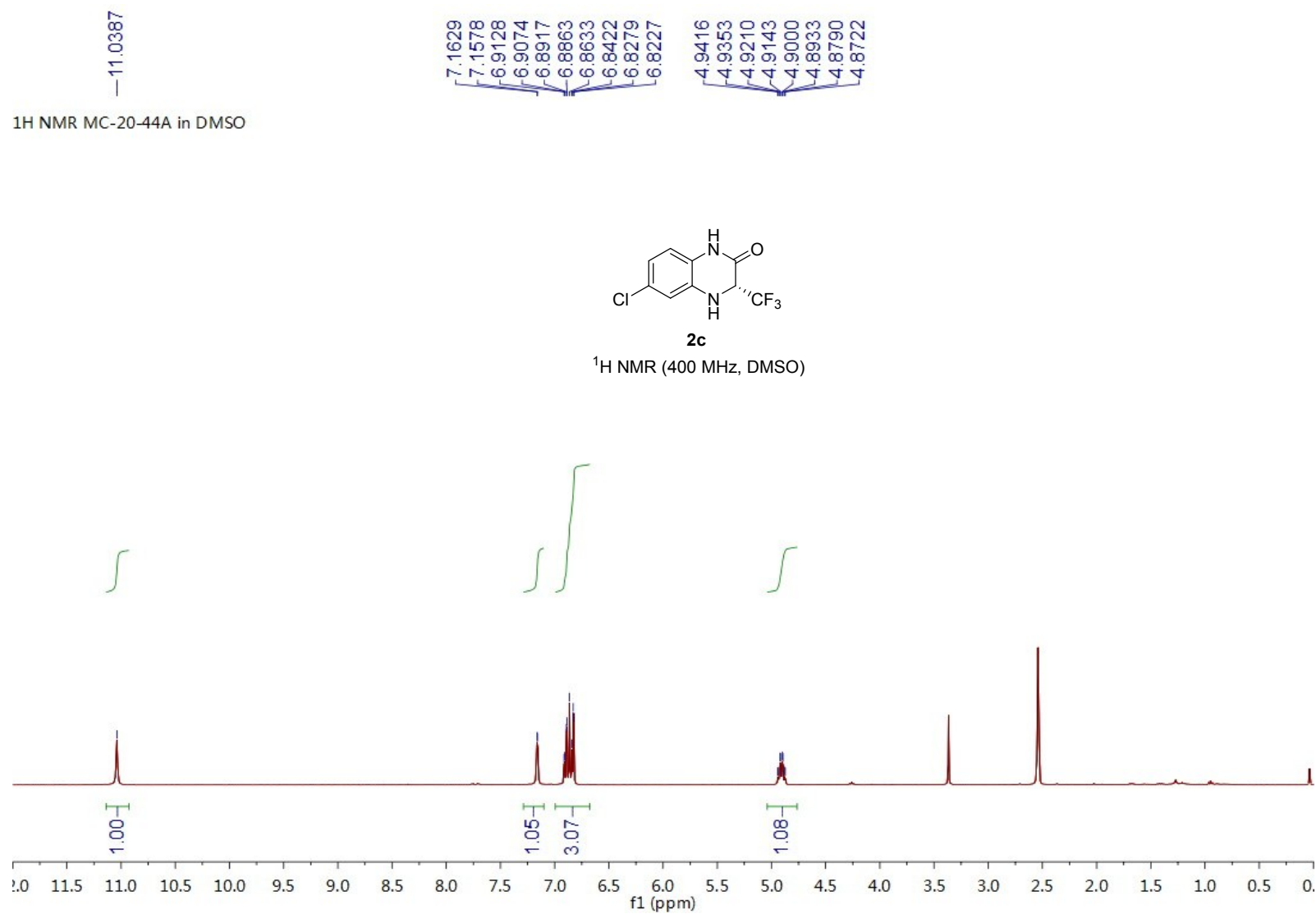
¹F NMR MC-22-60A in DMSO

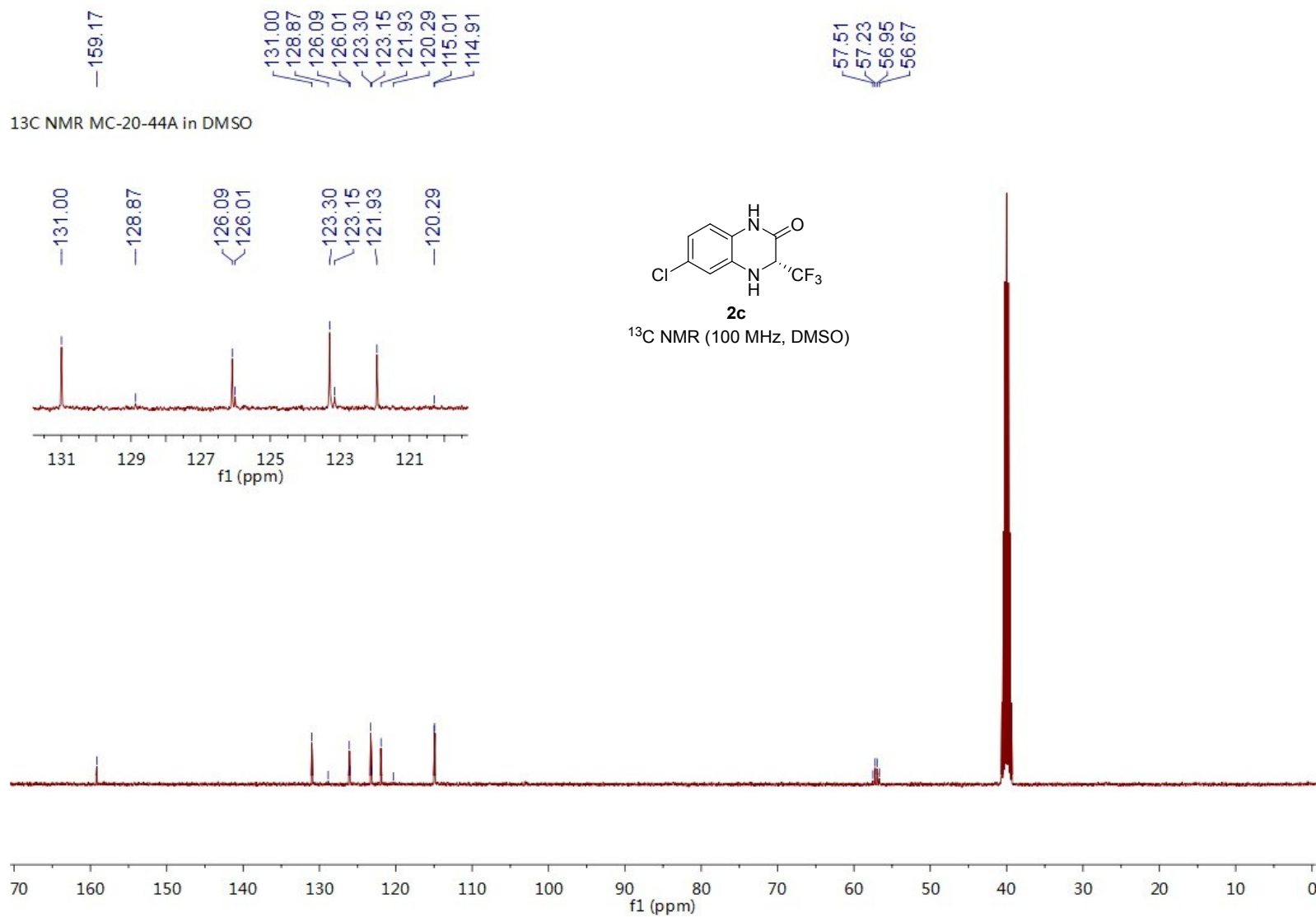
--72.7713



¹⁹F NMR (376 MHz, CDCl₃)

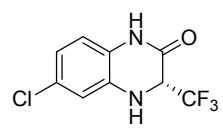






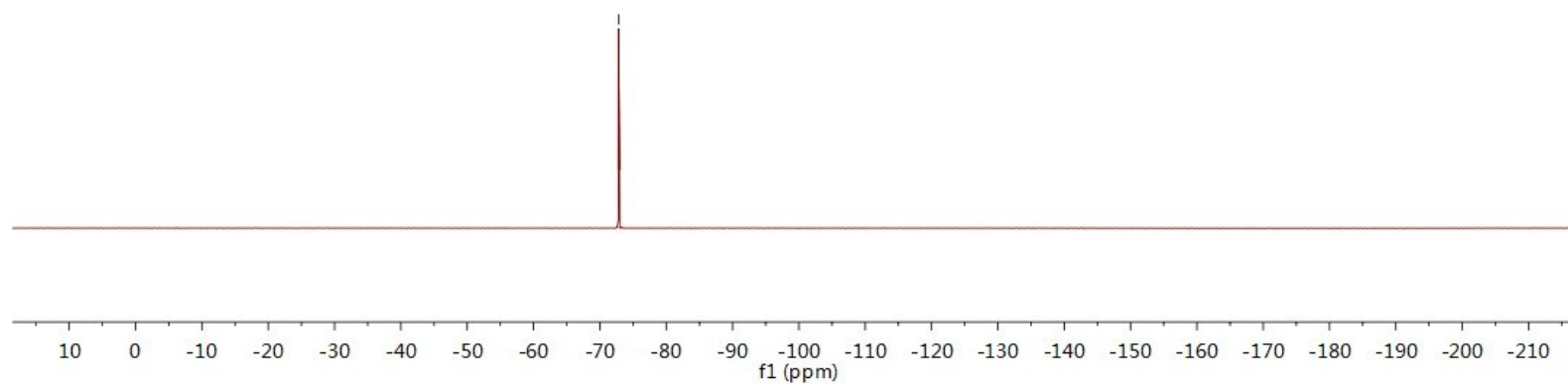
¹⁹F NMR MC-20-44A in DMSO

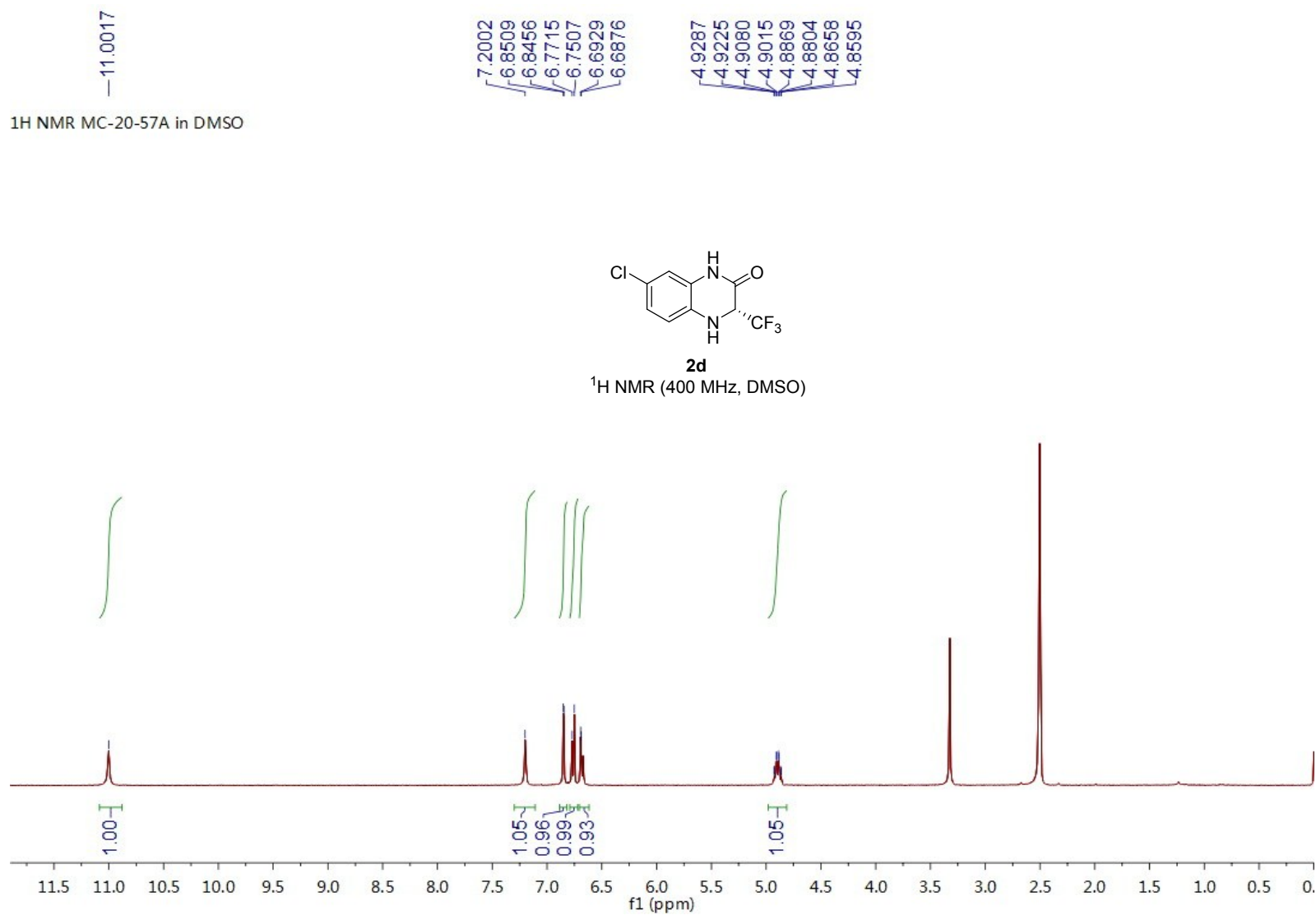
—72.8188

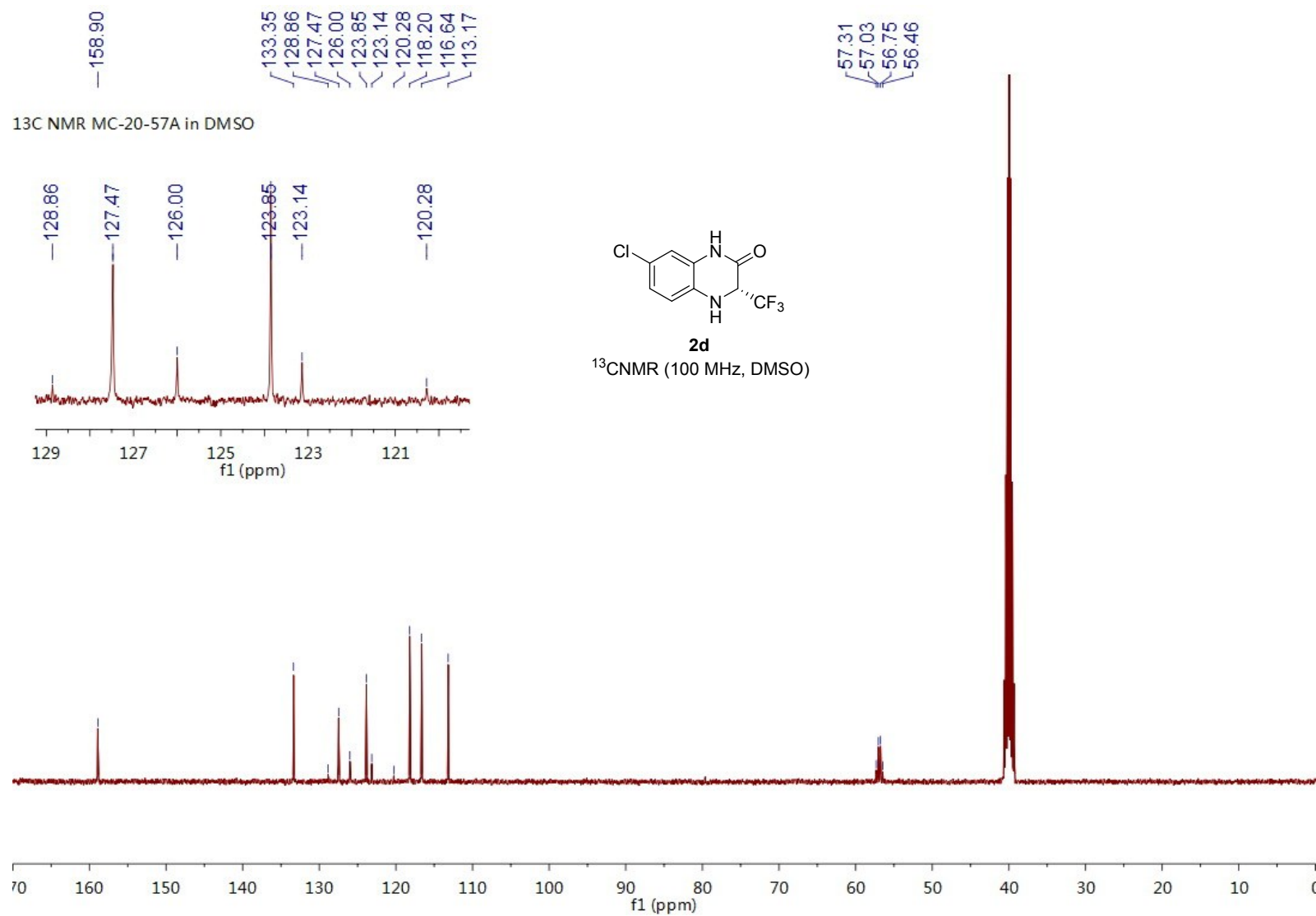


2c

¹⁹F NMR (376 MHz, DMSO)

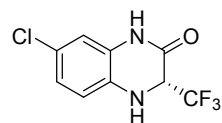






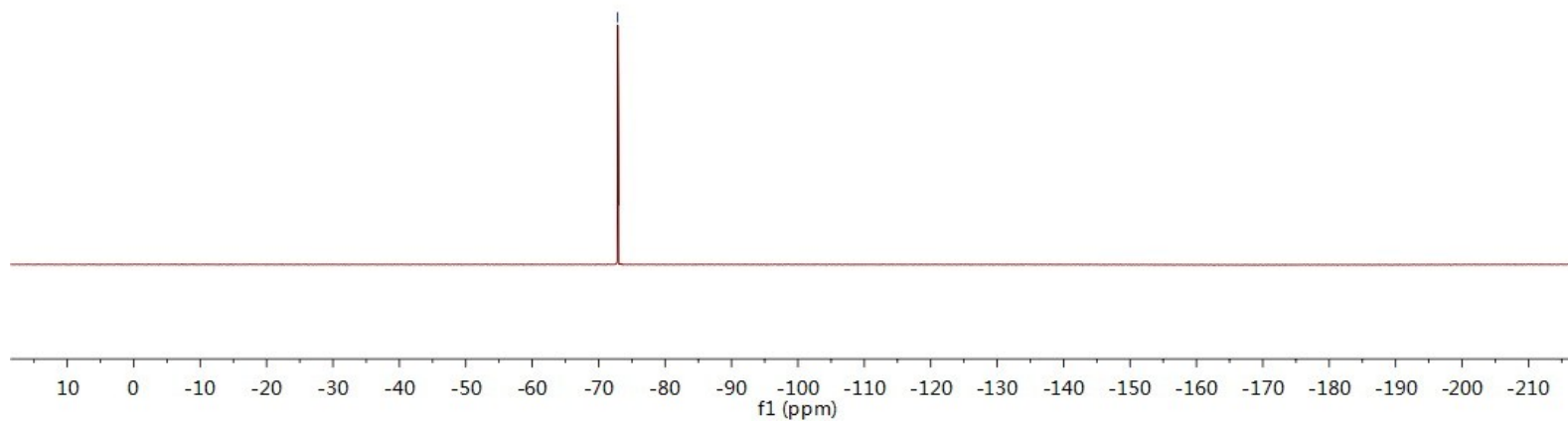
¹⁹F NMR MC-20-57A in DMSO

—72.8804



2d

¹⁹F NMR (376 MHz, DMSO)

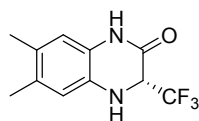


—10.6965
¹H NMR MC-20-31A in DMSO

6.6309
 6.6267
 6.5994
 6.5415

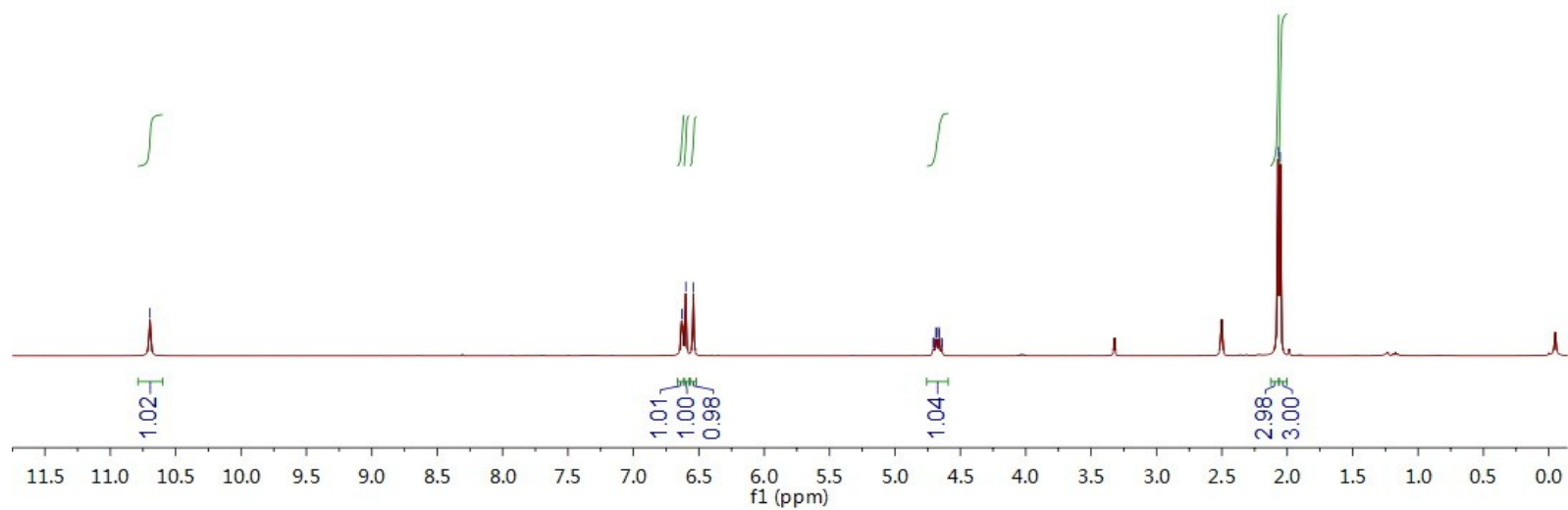
4.7080
 4.7014
 4.6871
 4.6806
 4.6659
 4.6594
 4.6447
 4.6380

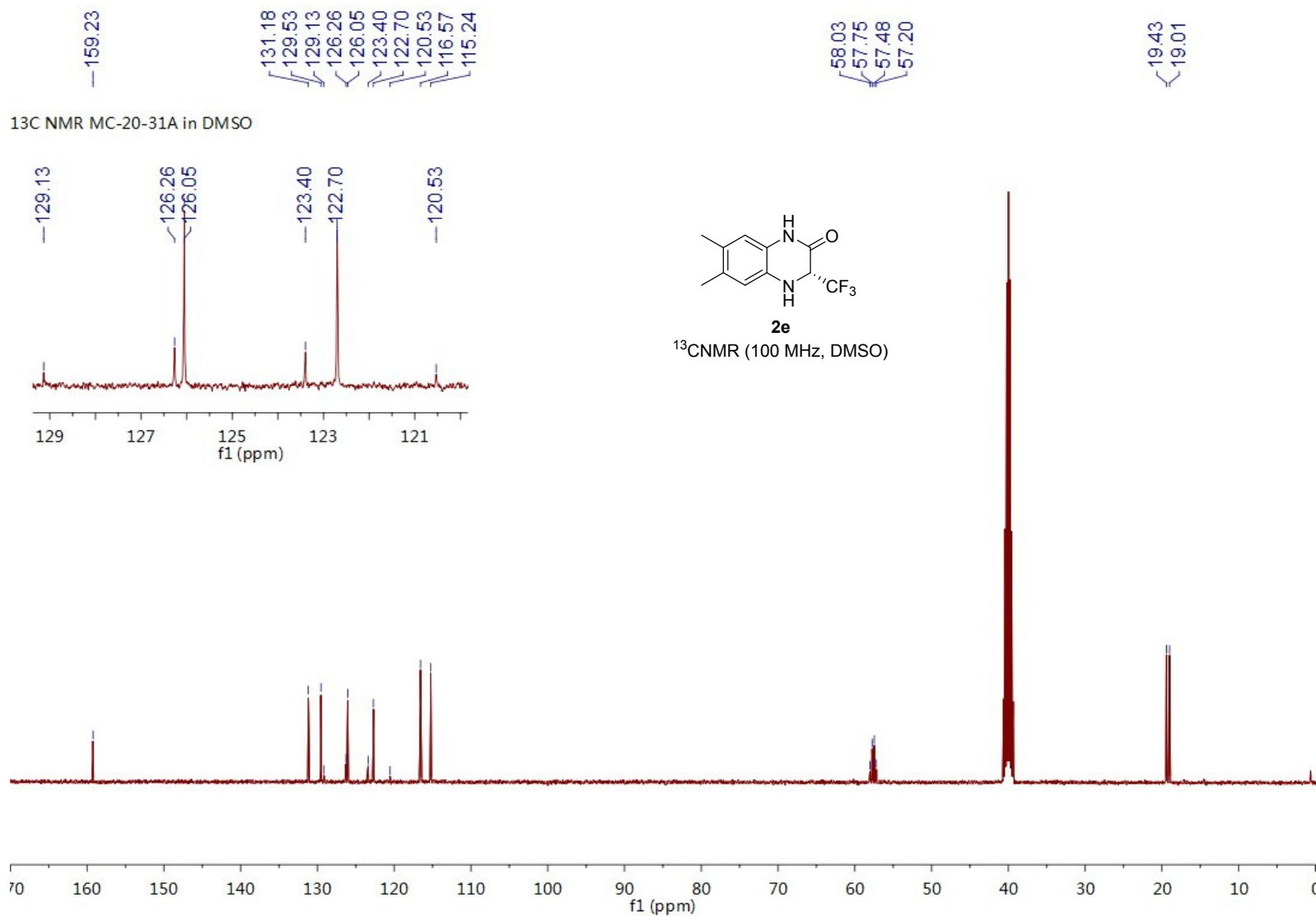
2.0706
 2.0531



2e

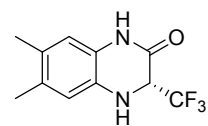
¹H NMR (400 MHz, DMSO)





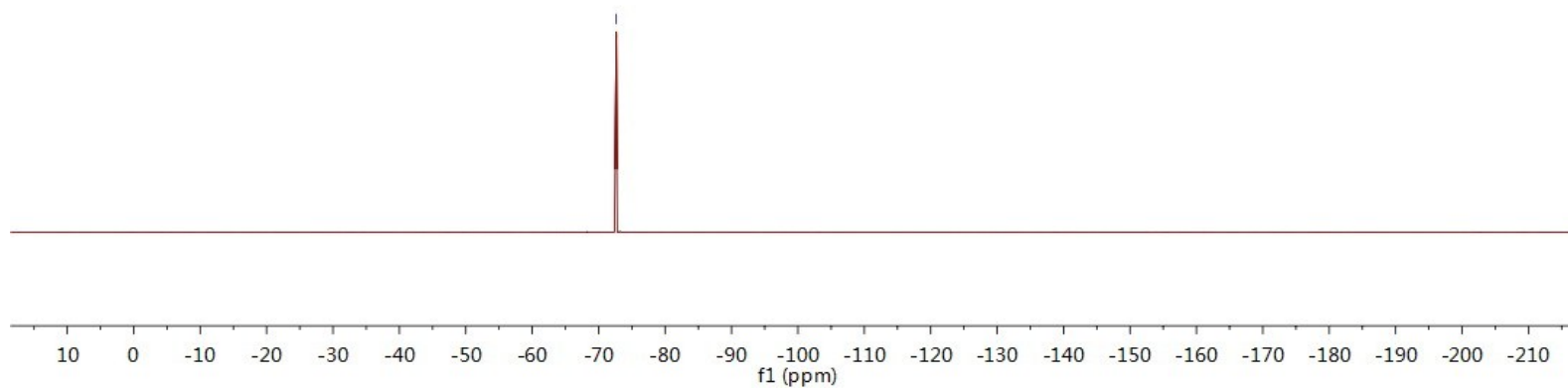
¹⁹F NMR MC-20-31A in DMSO

—72.6618



2e

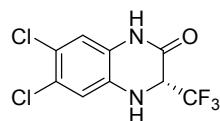
¹⁹F NMR (376 MHz, DMSO)



11.1069
1H NMR MC-20-34A in DMSO

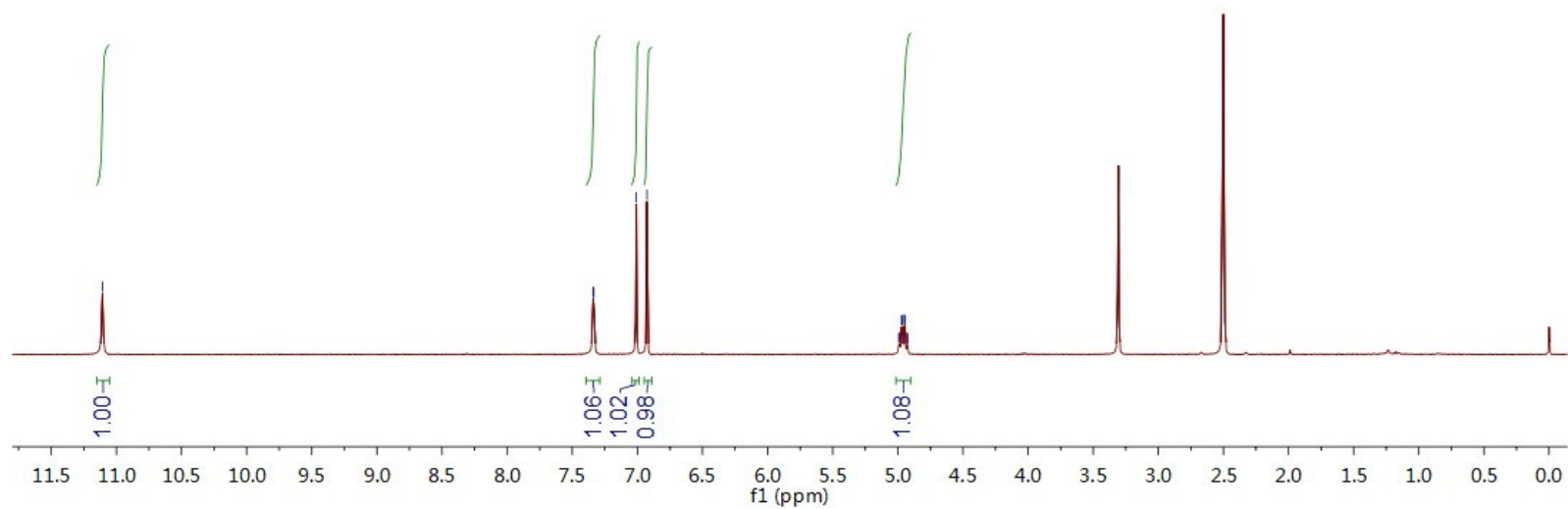
7.3395
7.3350
7.0083
6.9263

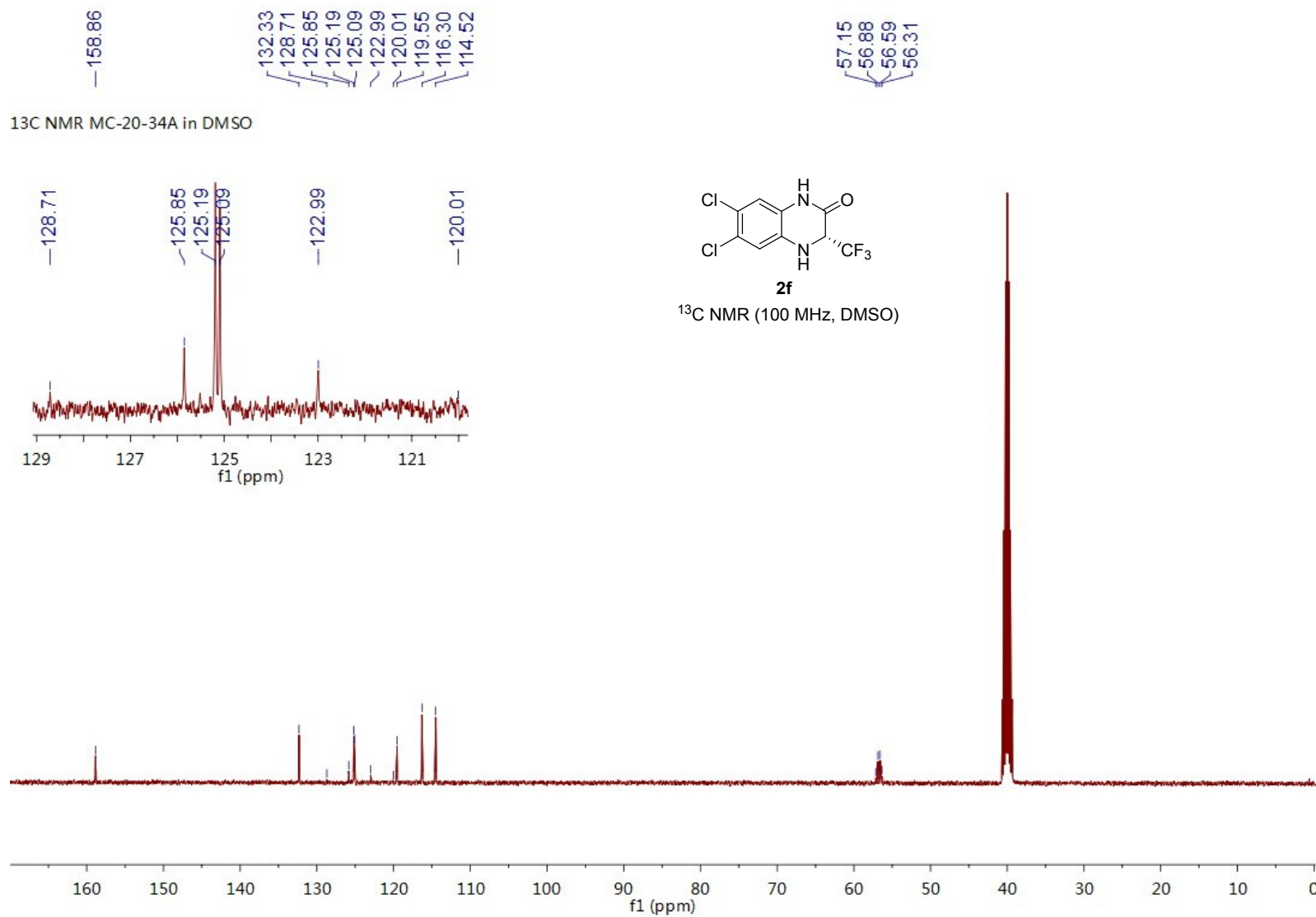
4.9932
4.9861
4.9721
4.9660
4.9515
4.9451
4.9308
4.9248



2f

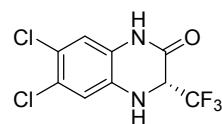
¹H NMR (400 MHz, DMSO)





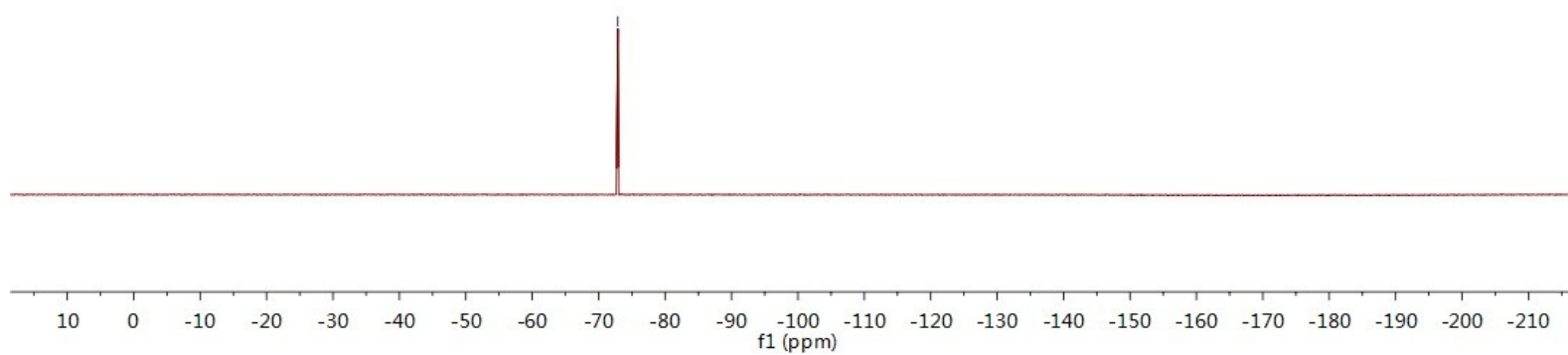
¹⁹F NMR MC-20-34A in DMSO

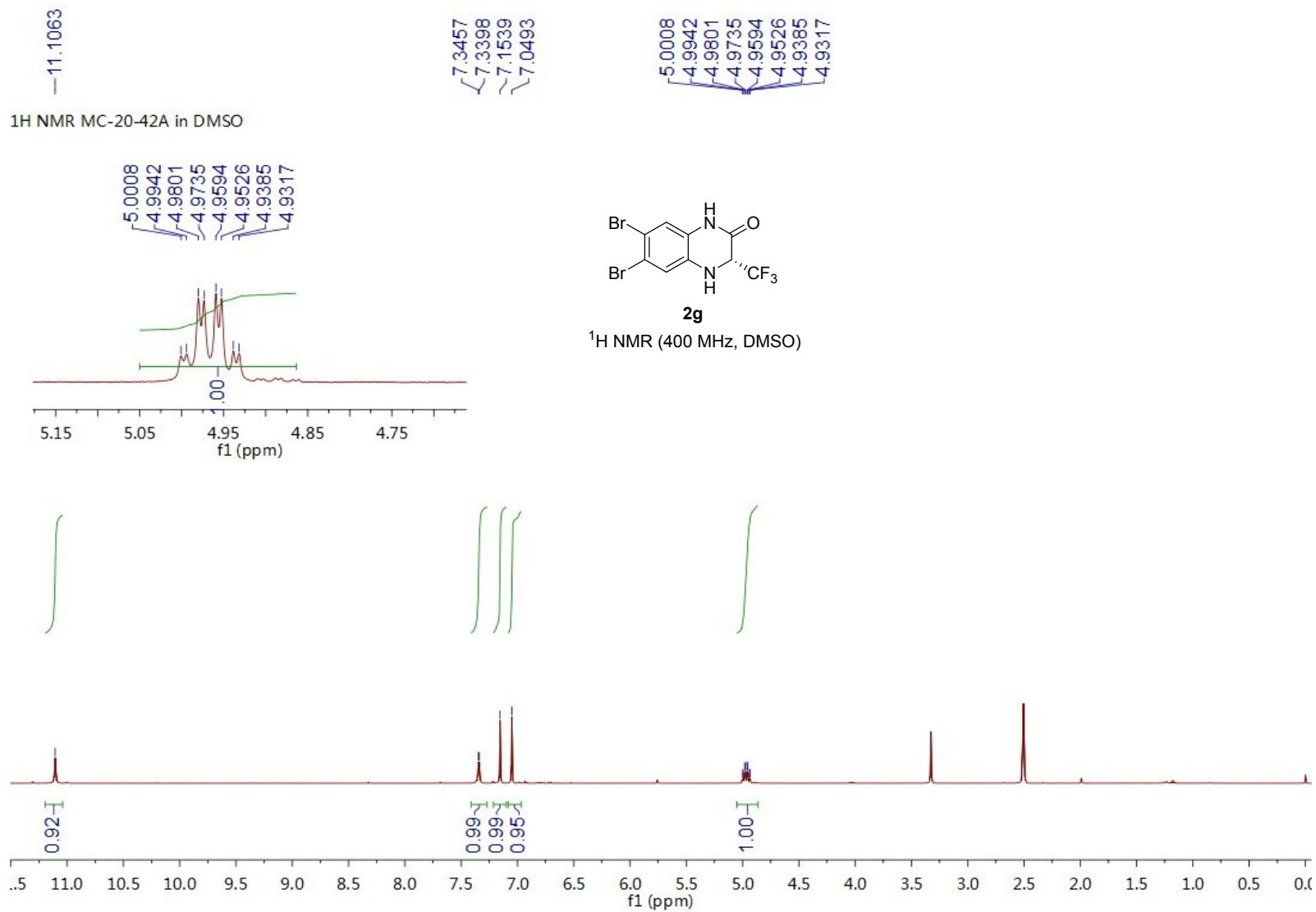
-72.8957

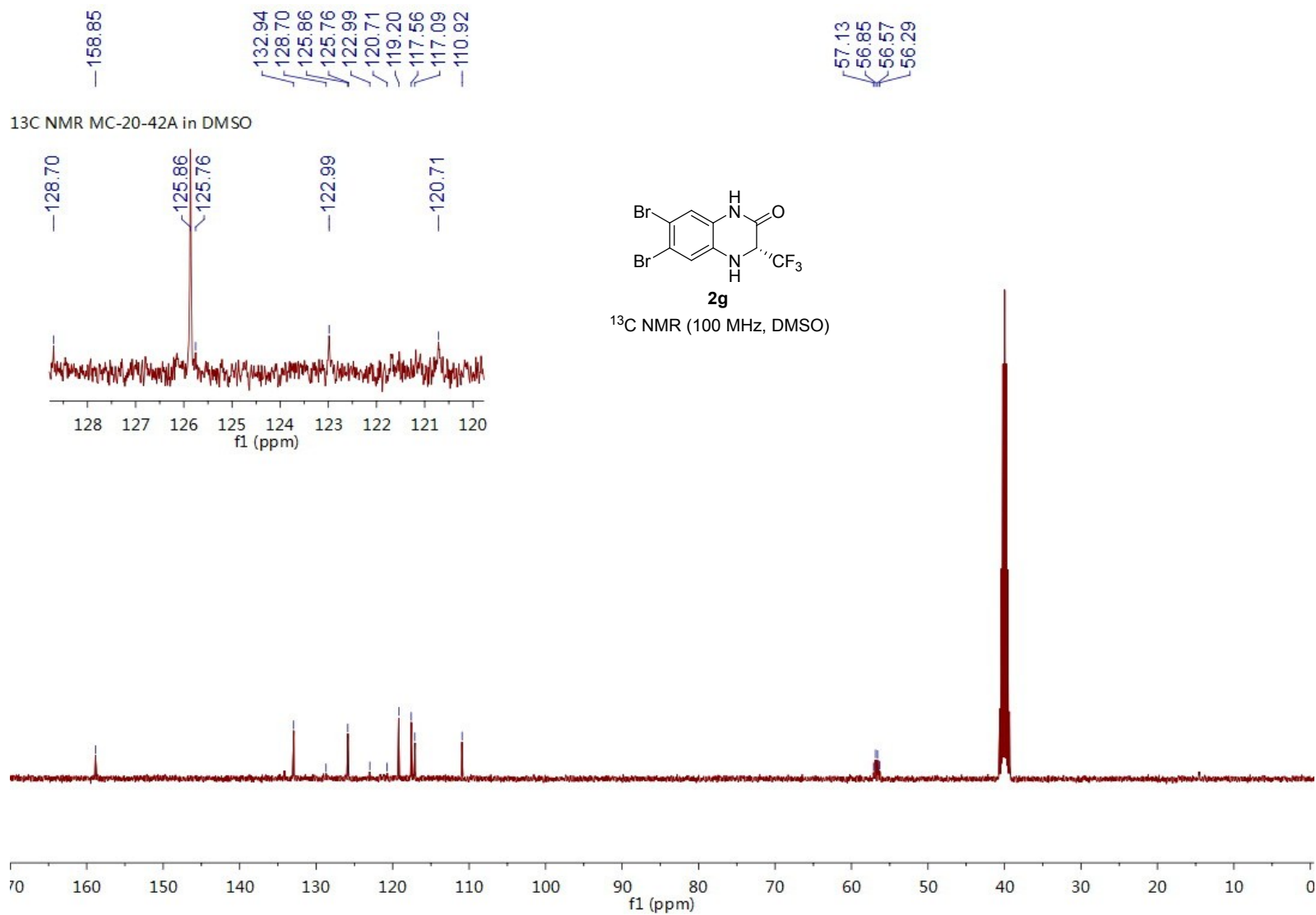


2f

¹⁹F NMR (376 MHz, DMSO)

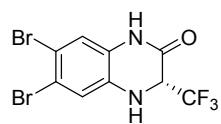






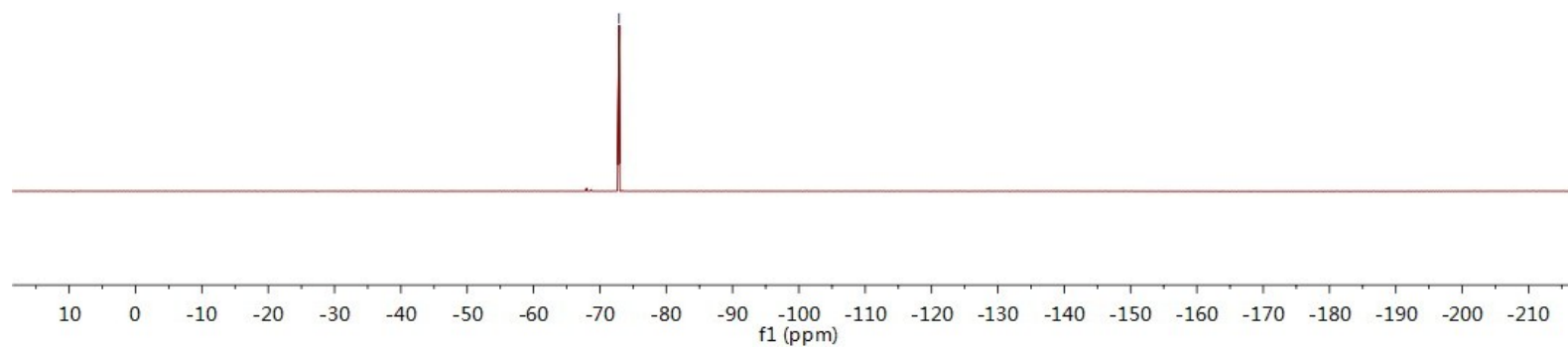
¹⁹F NMR MC-20-42A in DMSO

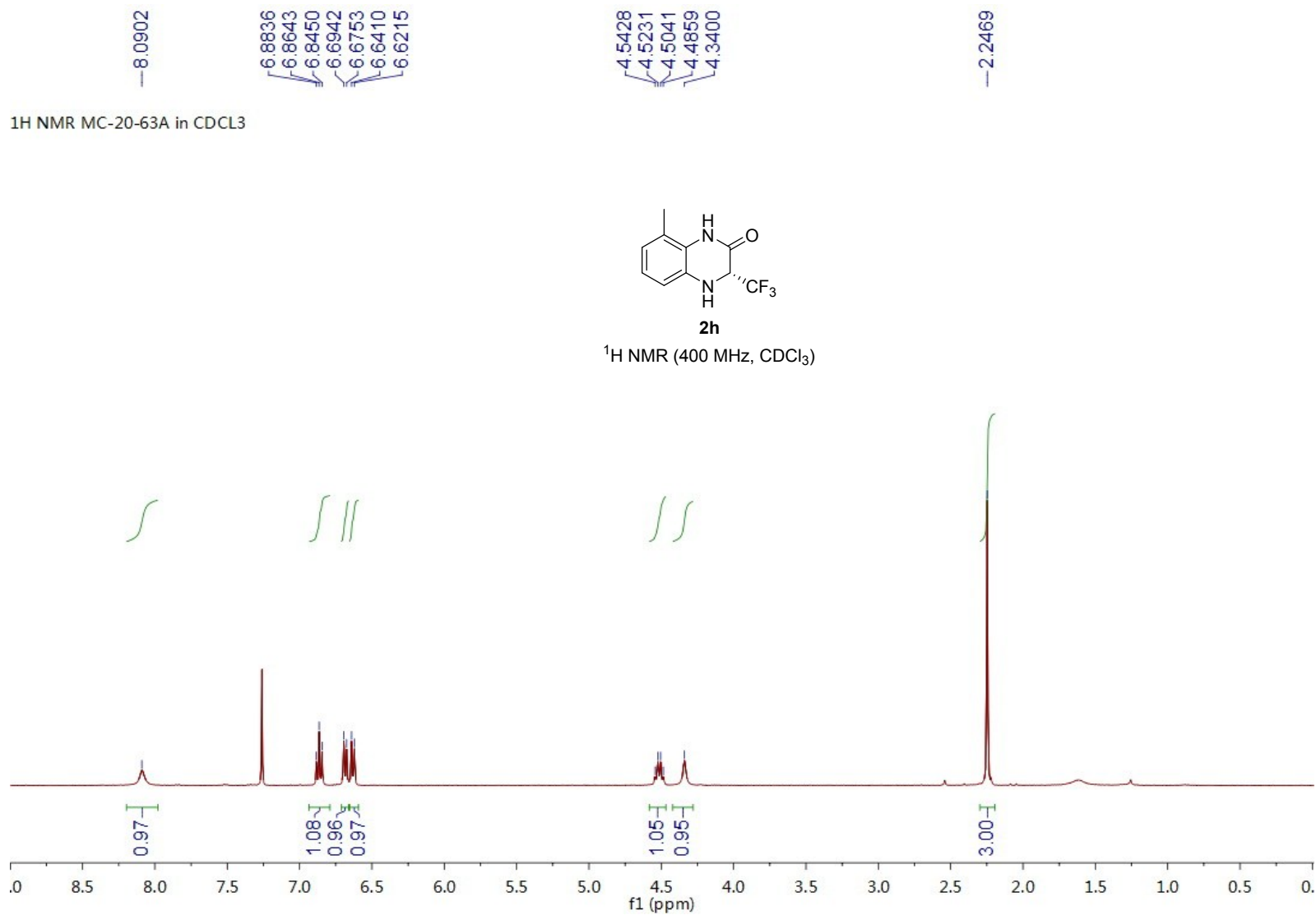
-72.9035

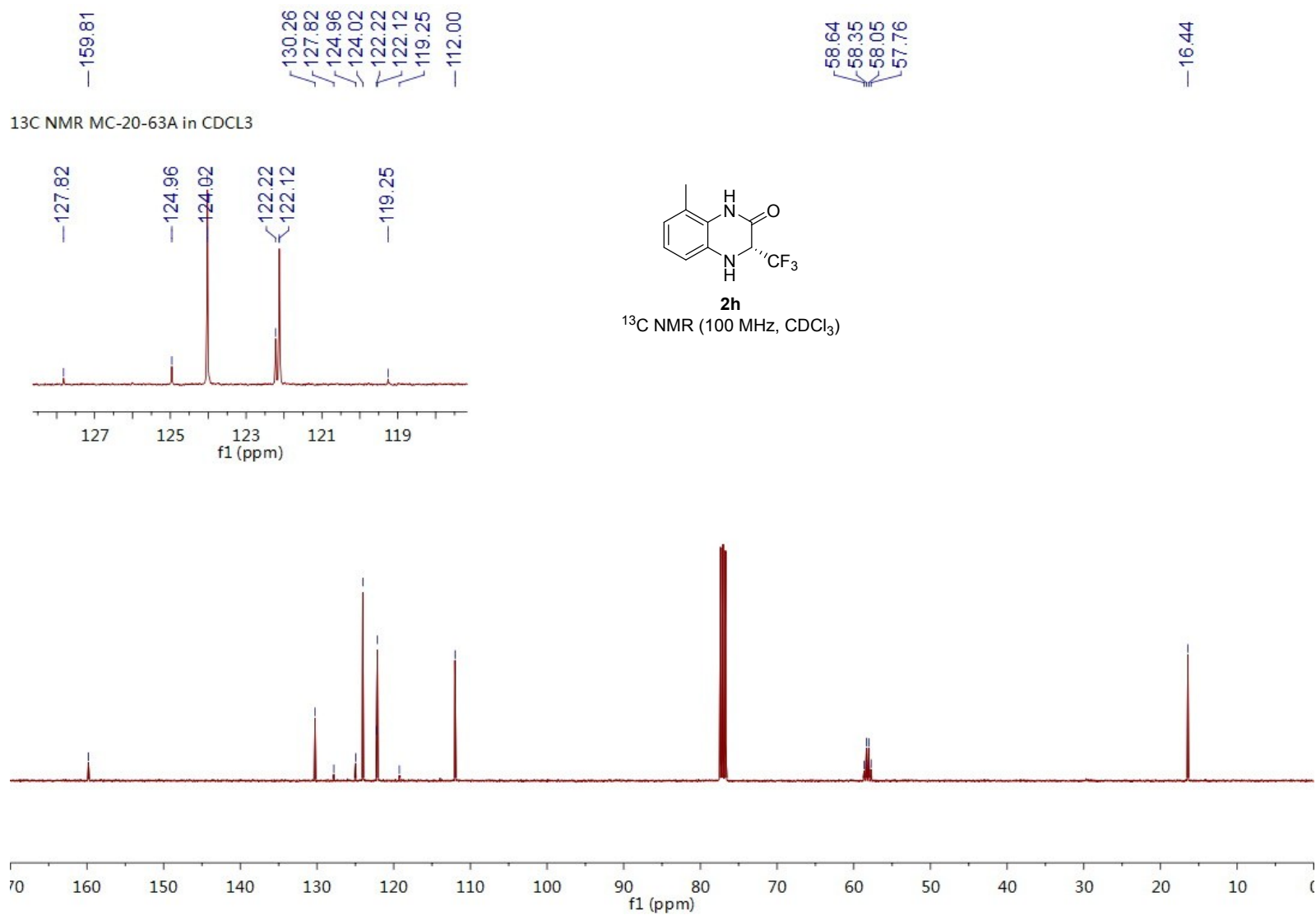


2g

¹⁹F NMR (376 MHz, DMSO)

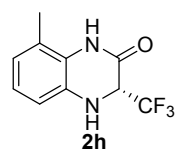




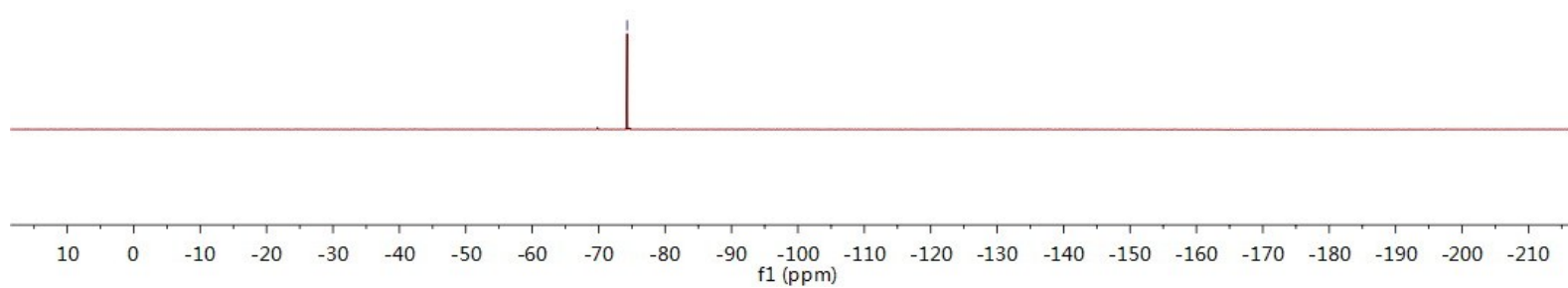


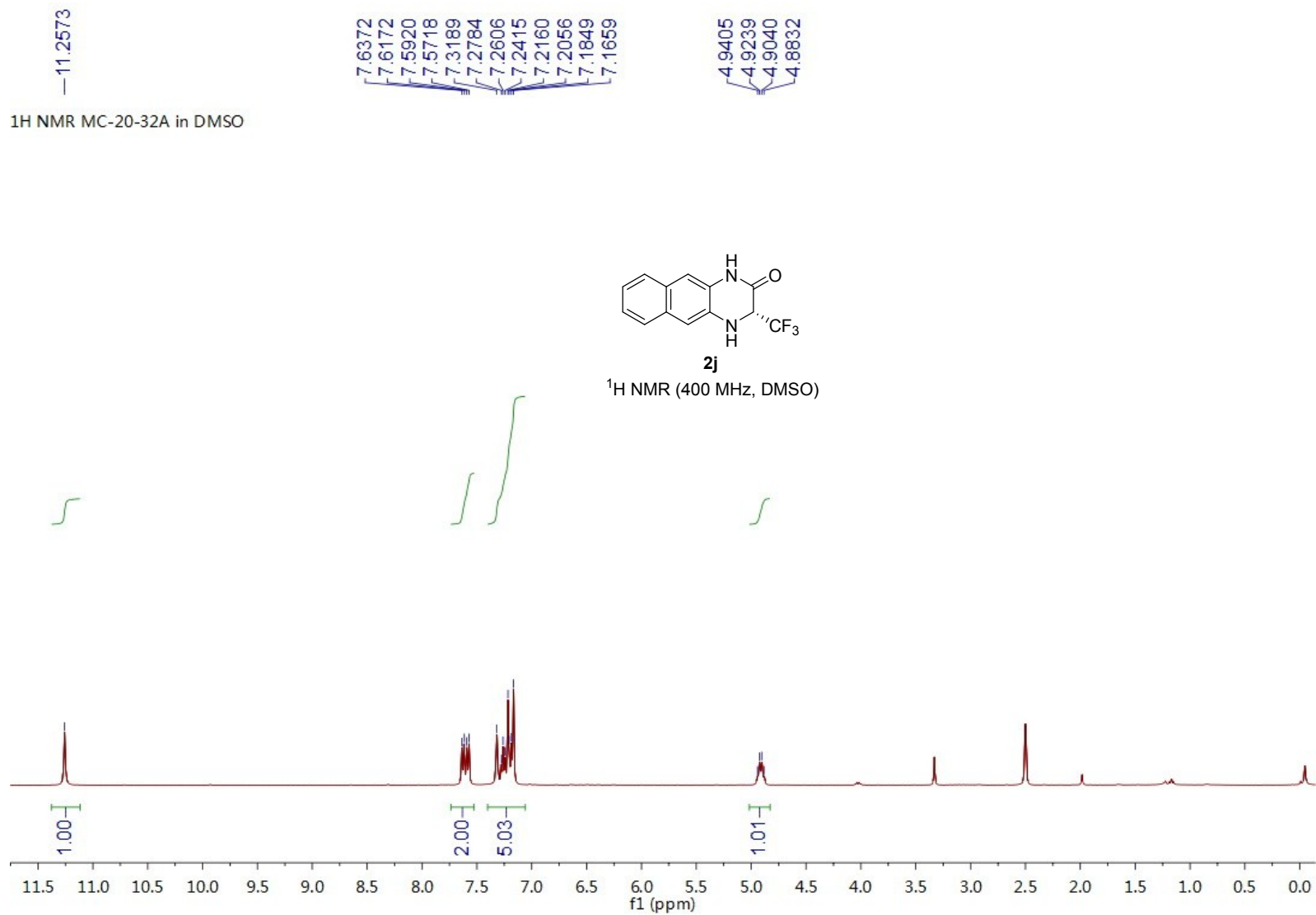
¹⁹F NMR MC-20-63A in CDCl₃

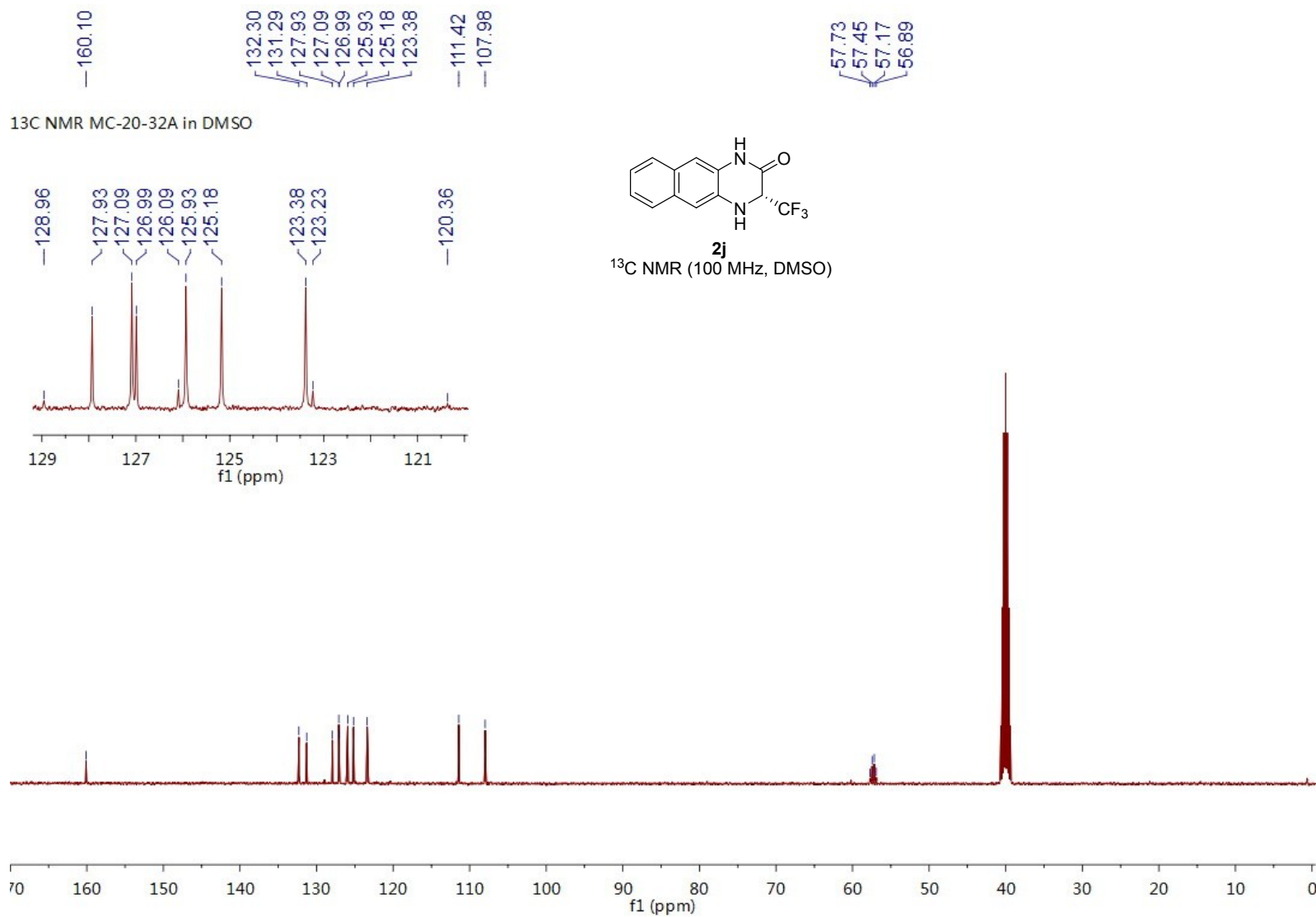
74.2836



¹⁹F NMR (376 MHz, CDCl₃)

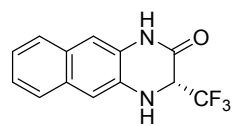




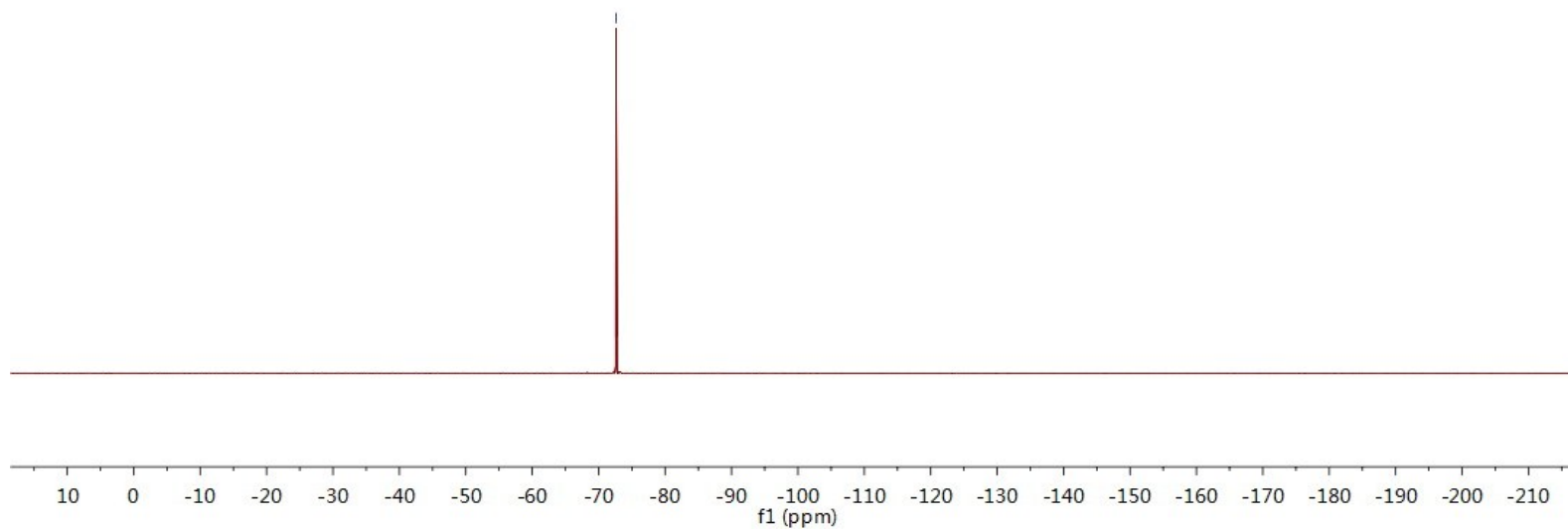


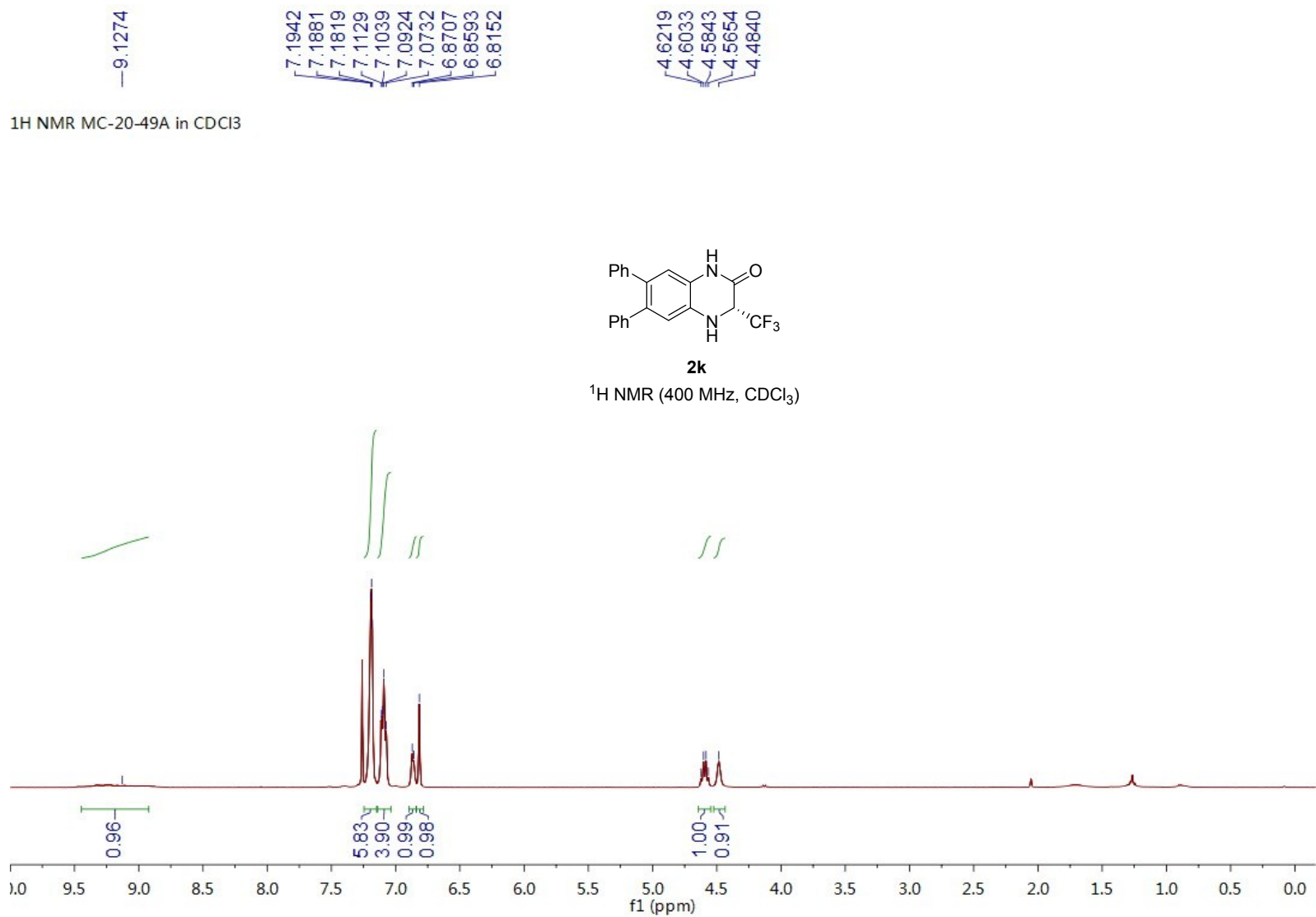
¹⁹F NMR MC-20-32A in DMSO

—72.6171



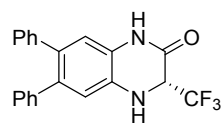
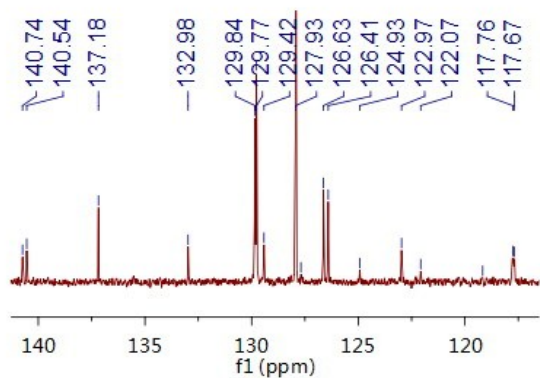
2j
¹⁹F NMR (376 MHz, DMSO)



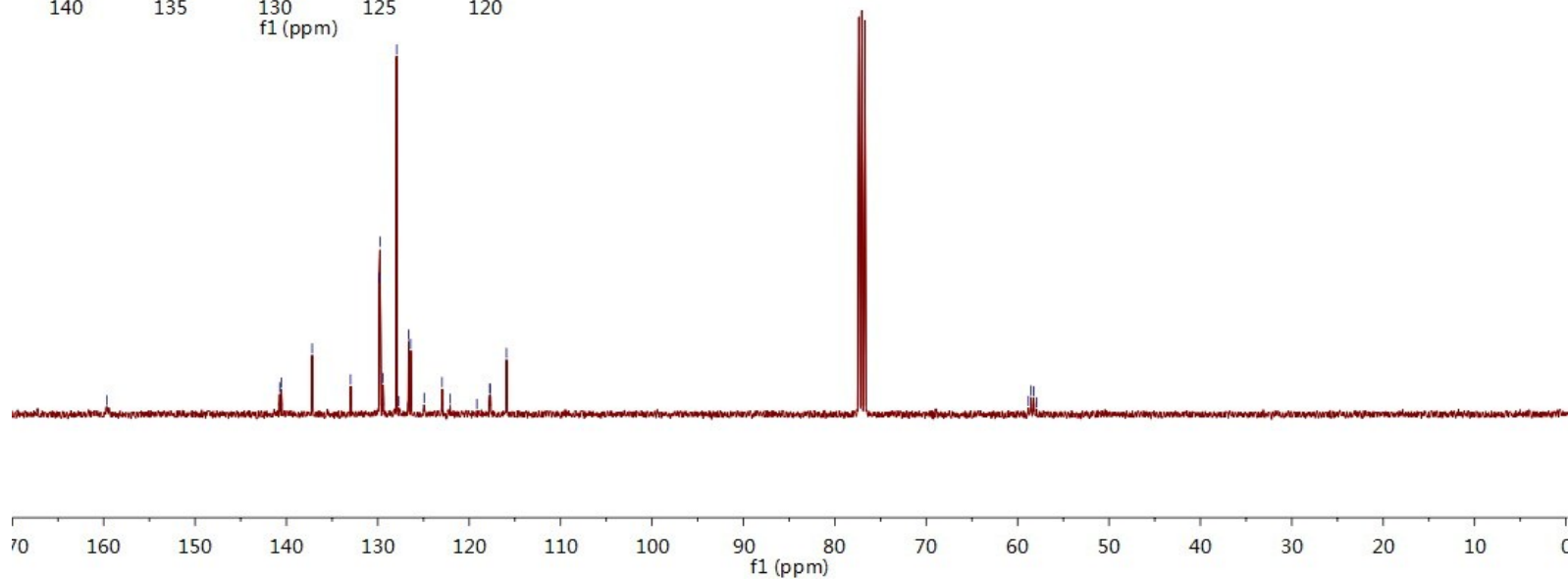




13C NMR MC-20-49A in CDCl₃

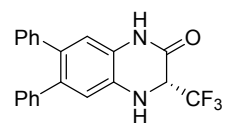


2k
¹³C NMR (100 MHz, CDCl₃)



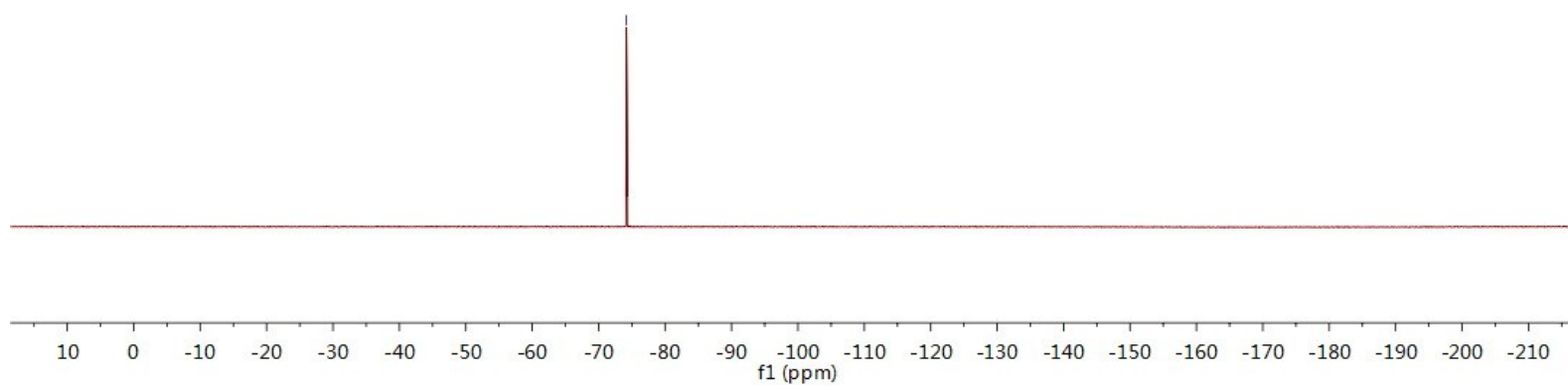
¹⁹F NMR MC-20-49A in CDCl₃

—74.1805



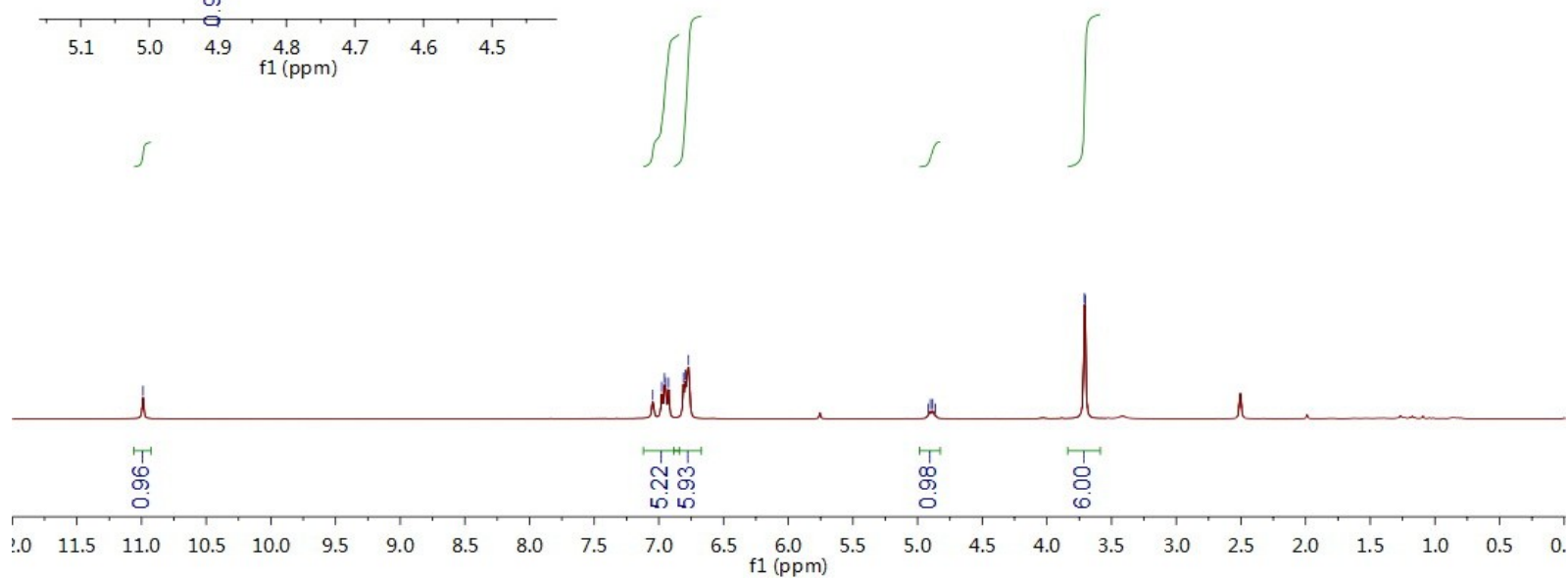
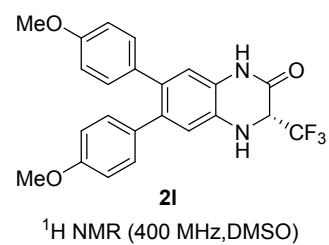
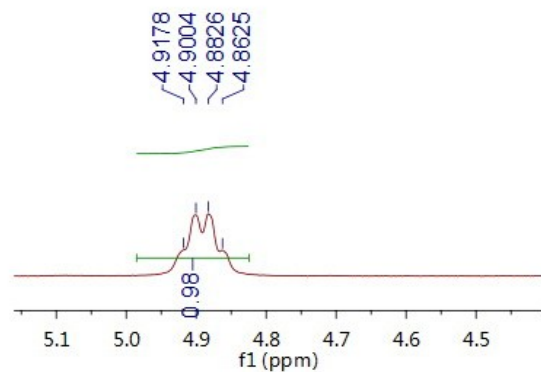
2k

¹⁹F NMR (376 MHz, CDCl₃)



10.9883
1H NMR MC-20-65A in DMSO

7.0475
6.9777
6.9565
6.9462
6.9246
6.8103
6.7974
6.7711
4.9178
4.9004
4.8826
4.8625
3.7102
3.7047

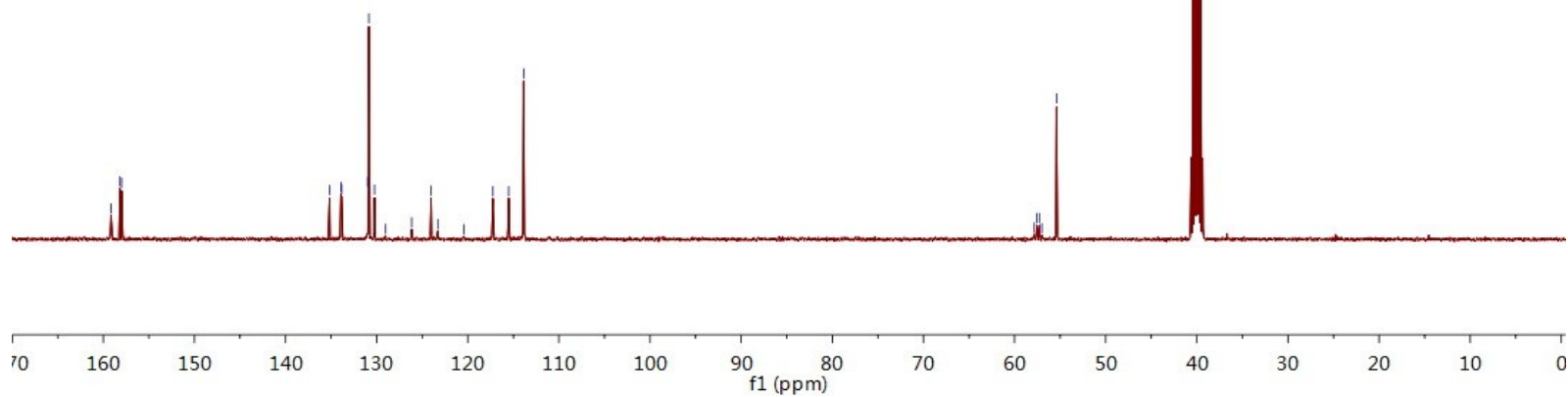
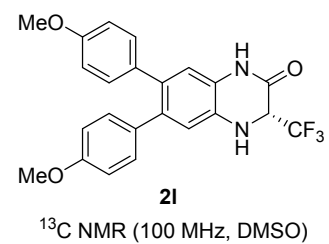
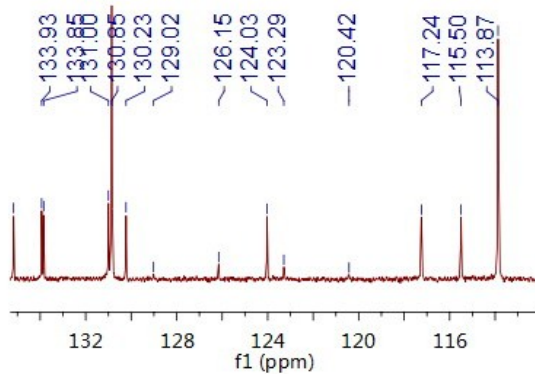


159.16
158.18
157.98

135.17
133.93
133.85
131.00
130.85
130.23
129.02
126.15
124.03
123.29
120.42
117.24
115.50
113.87

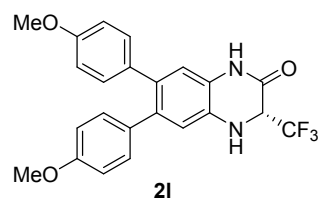
57.84
57.56
57.28
57.00
55.39

¹³C NMR MC-20-65A in DMSO

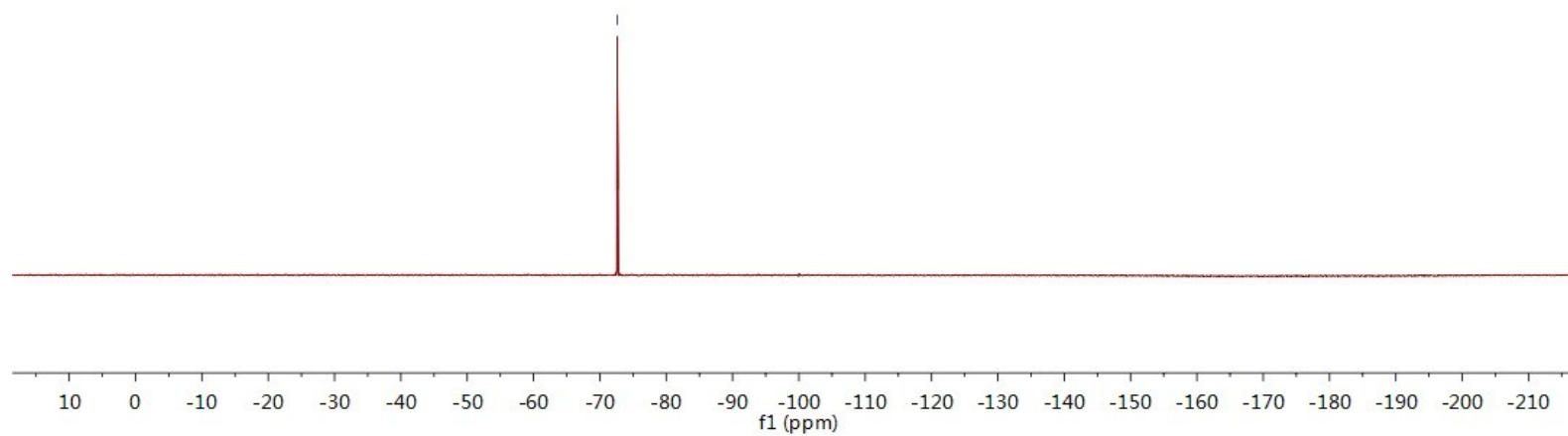


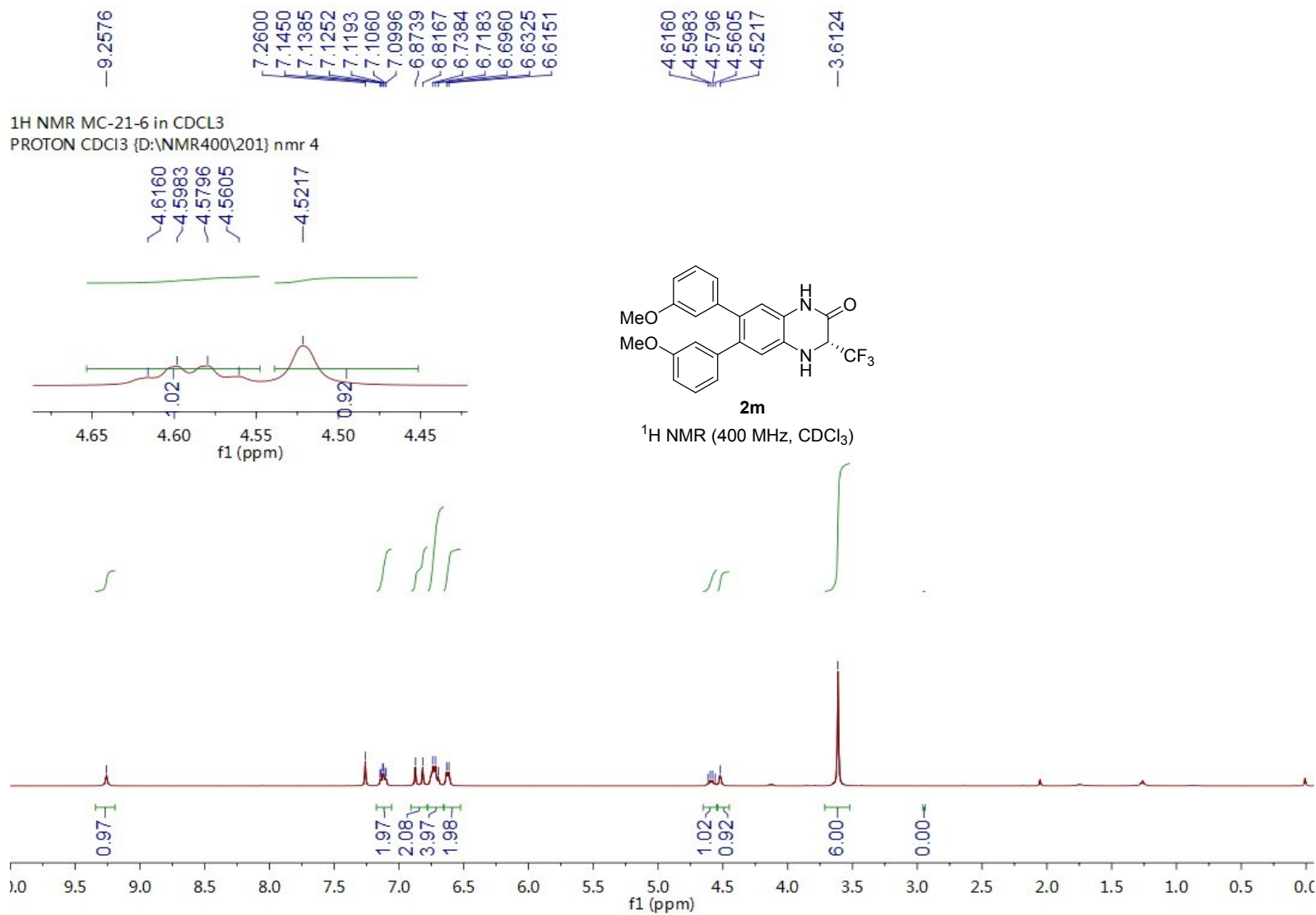
¹⁹F NMR MC-20-65A in DMSO

—72.6165



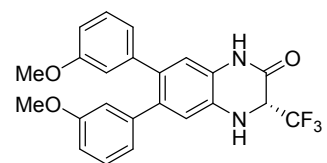
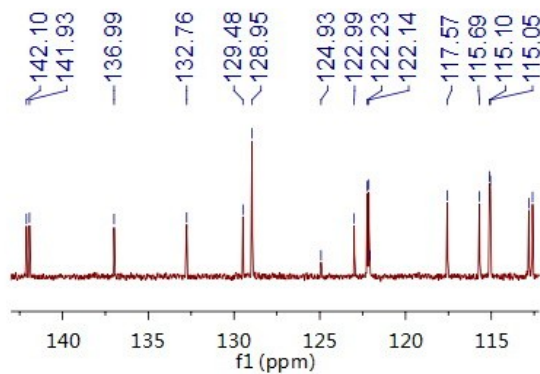
¹⁹F NMR (376 MHz, DMSO)



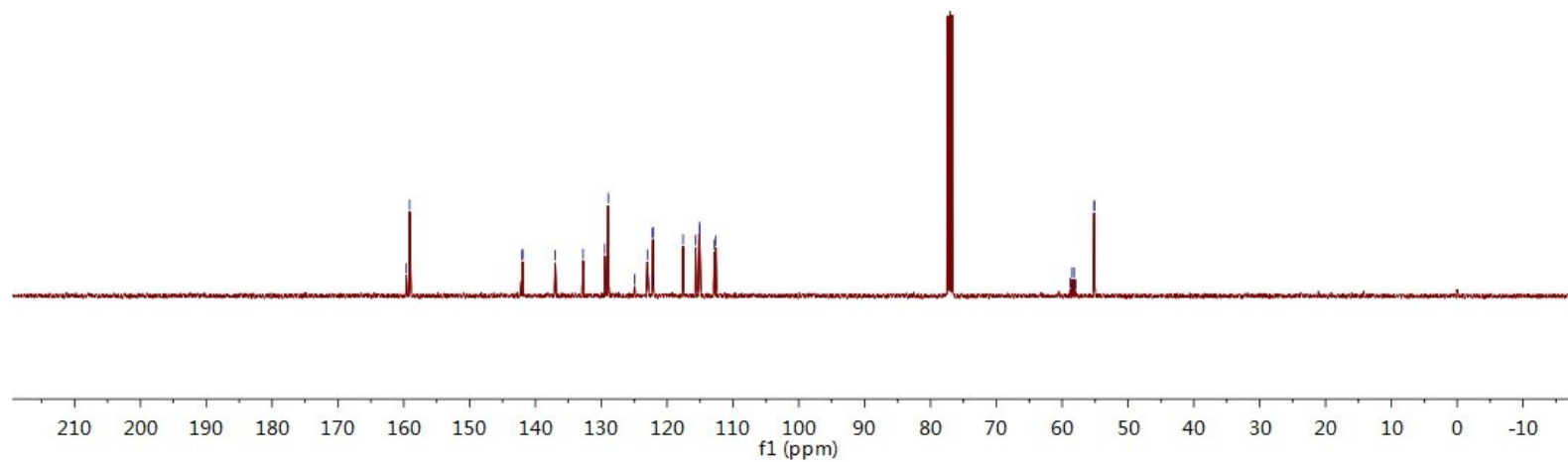




MC-21-6A in CDCl₃

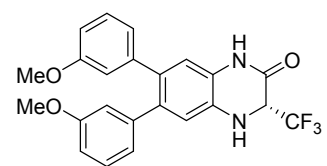


2m
¹³C NMR (100 MHz, CDCl₃)

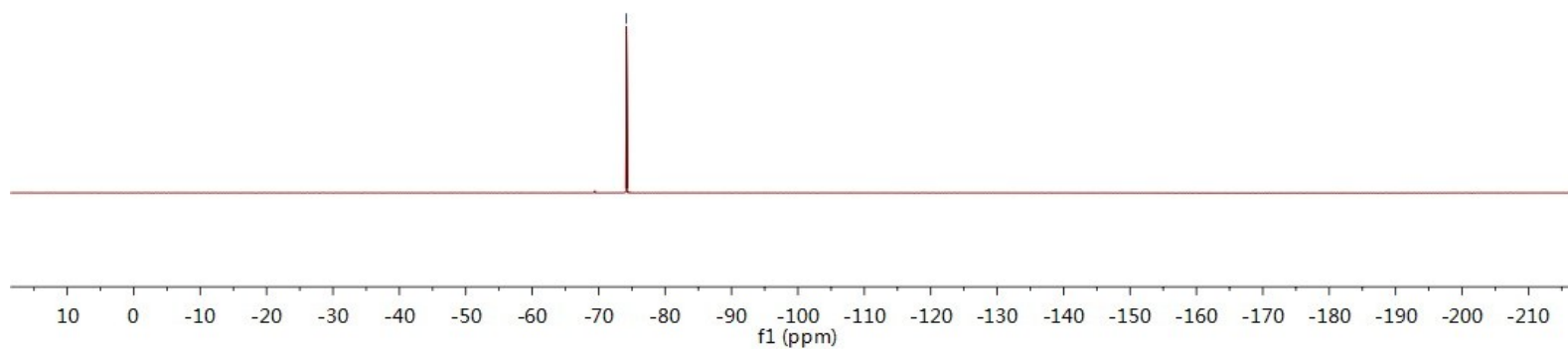


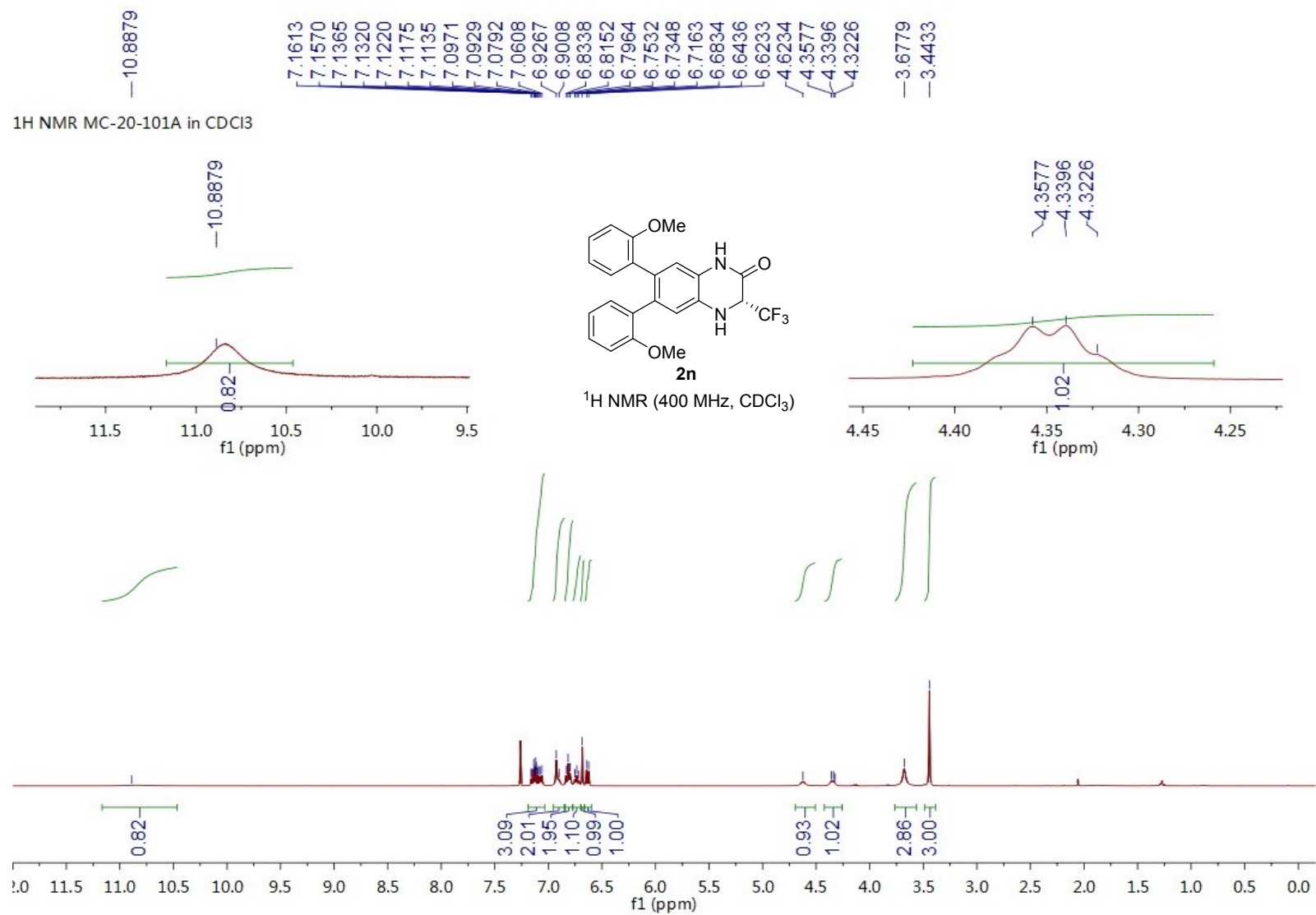
¹⁹F NMR MC-21-6A in CDCl₃

—74.1804



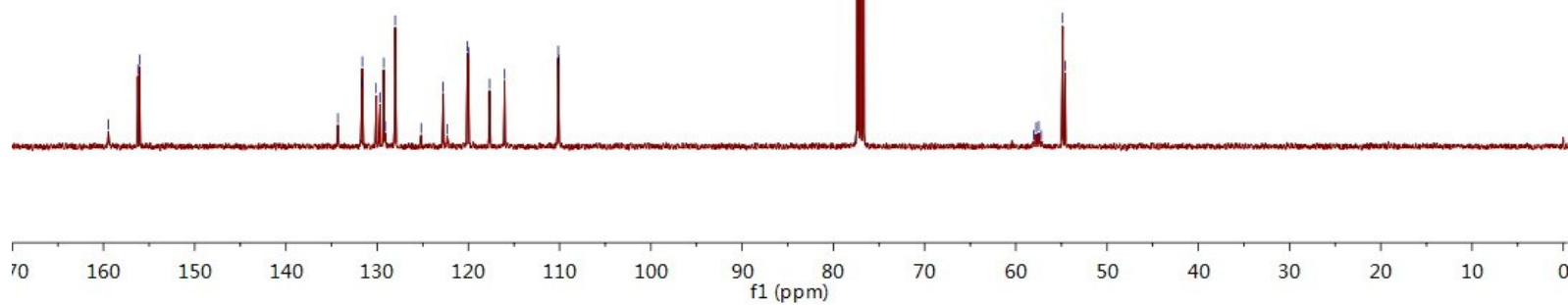
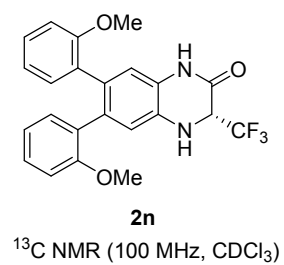
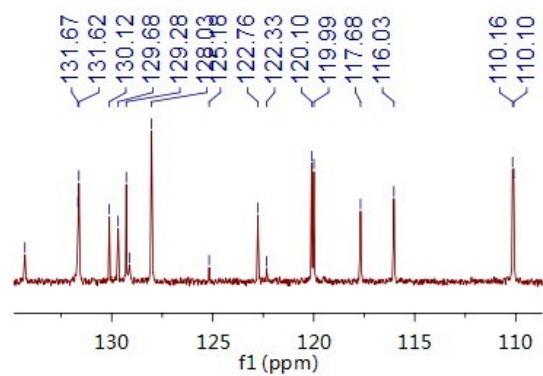
2m
¹⁹F NMR (376 MHz, CDCl₃)





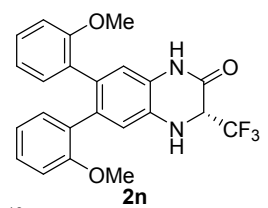


¹³C NMR MC-20-101A in CDCl₃

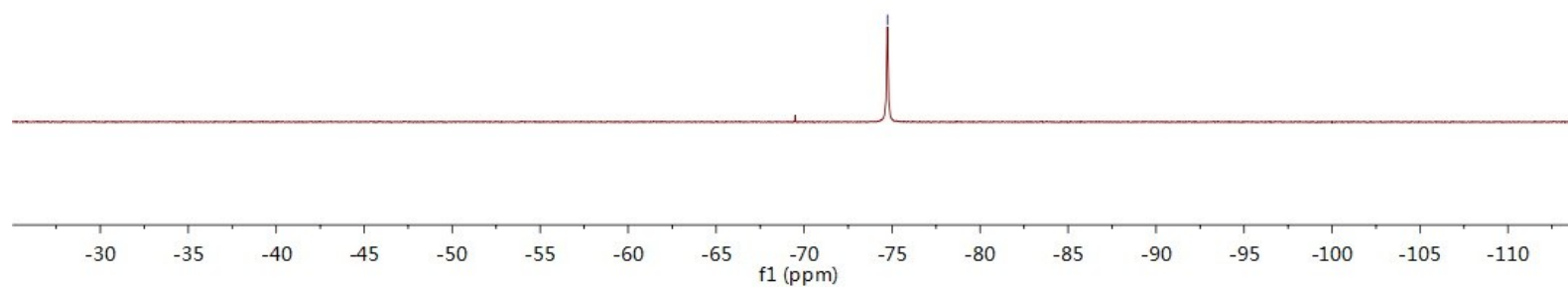


¹⁹F NMR MC-20-101A in CDCl₃

---74.7362

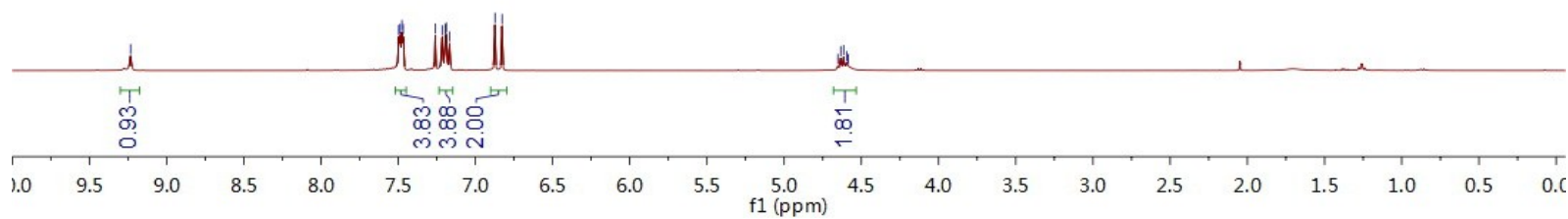
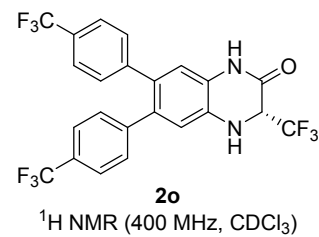
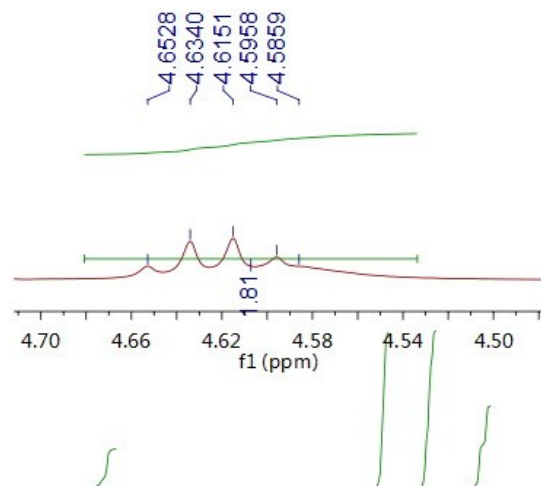


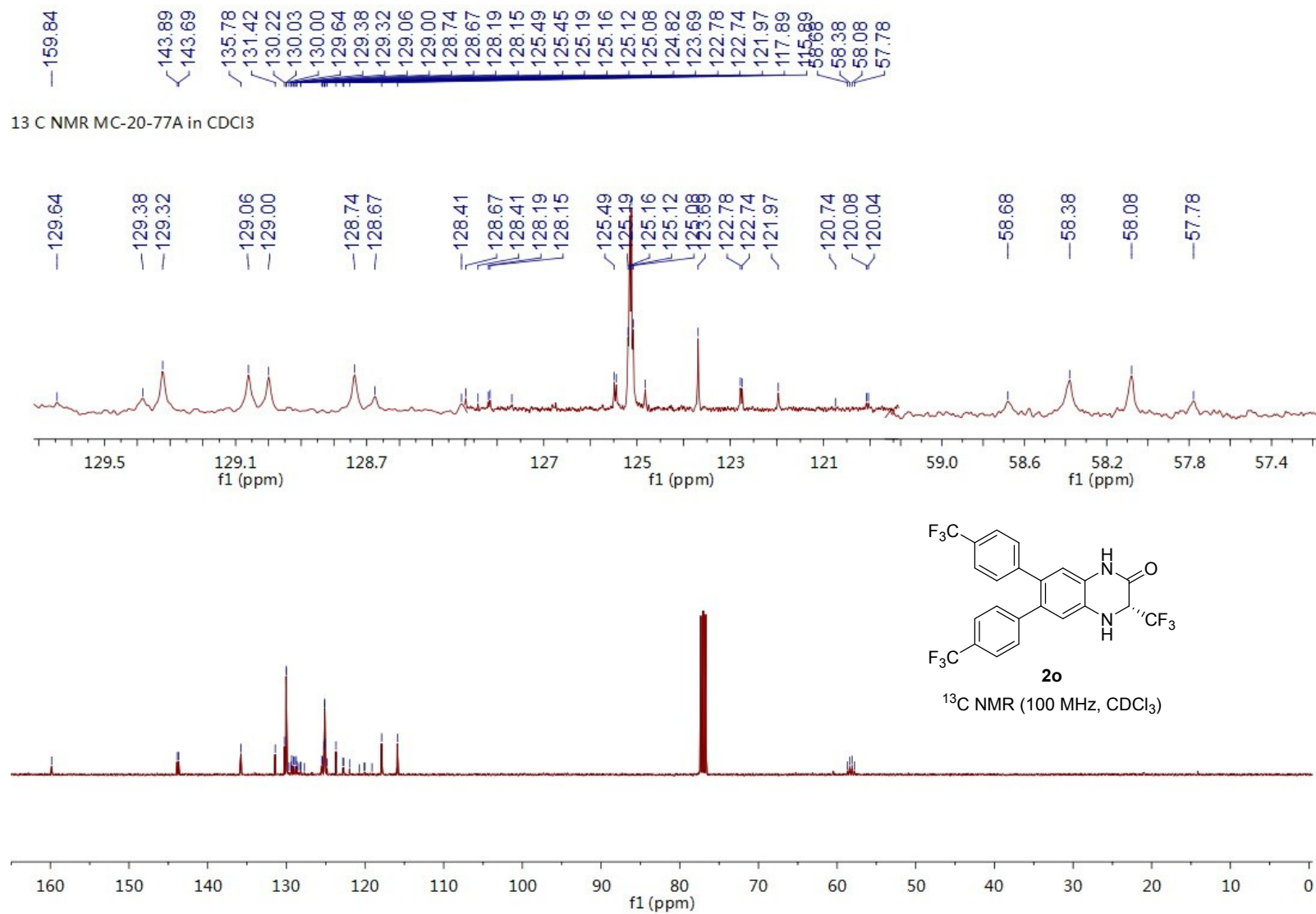
¹⁹F NMR (376 MHz, CDCl₃)



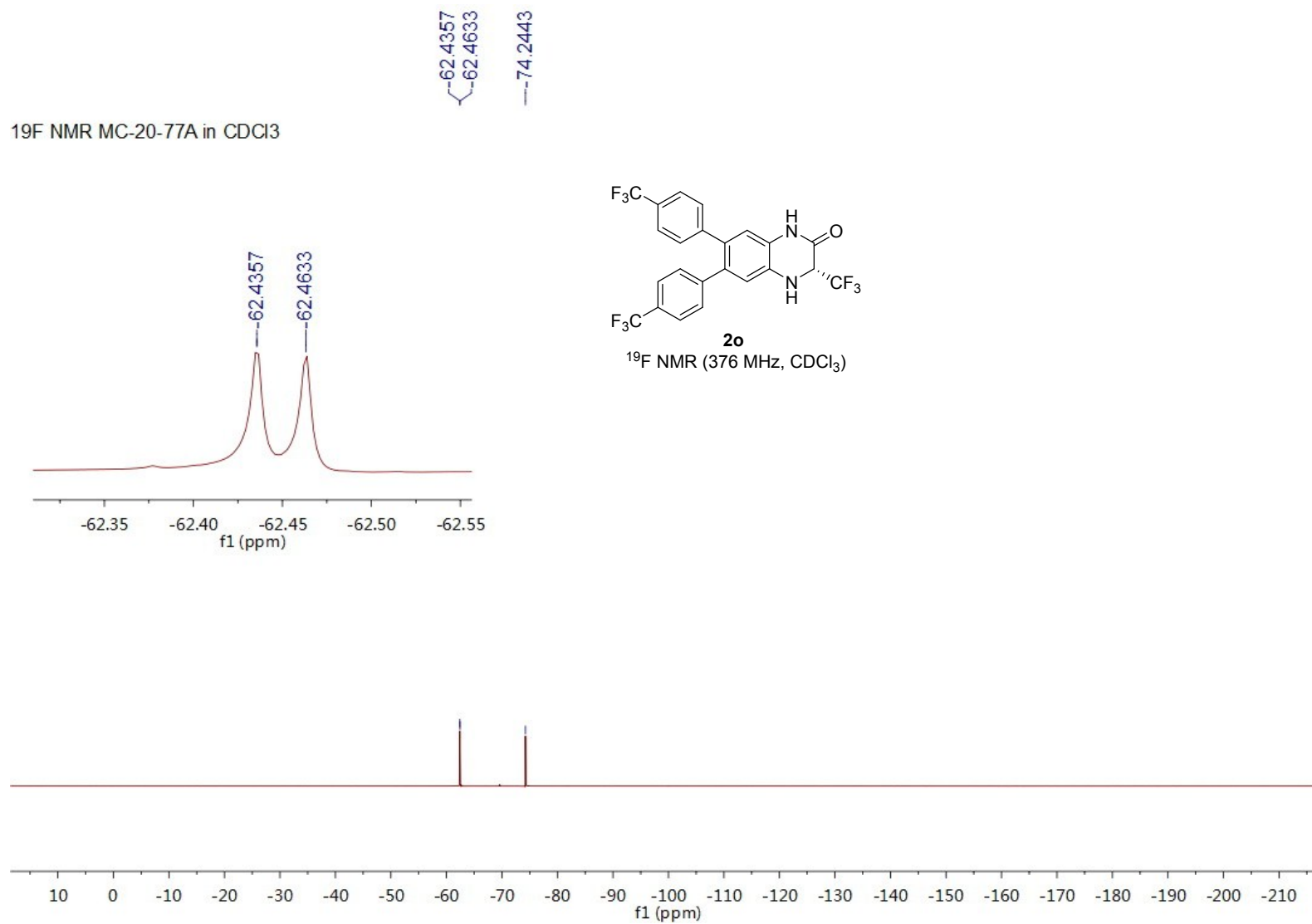
¹H NMR MC-20-77A in CDCl₃
 9.2329
 7.4963
 7.4881
 7.4758
 7.4676
 7.2600
 7.2151
 7.1941
 7.1883
 7.1674
 6.8733
 6.8271

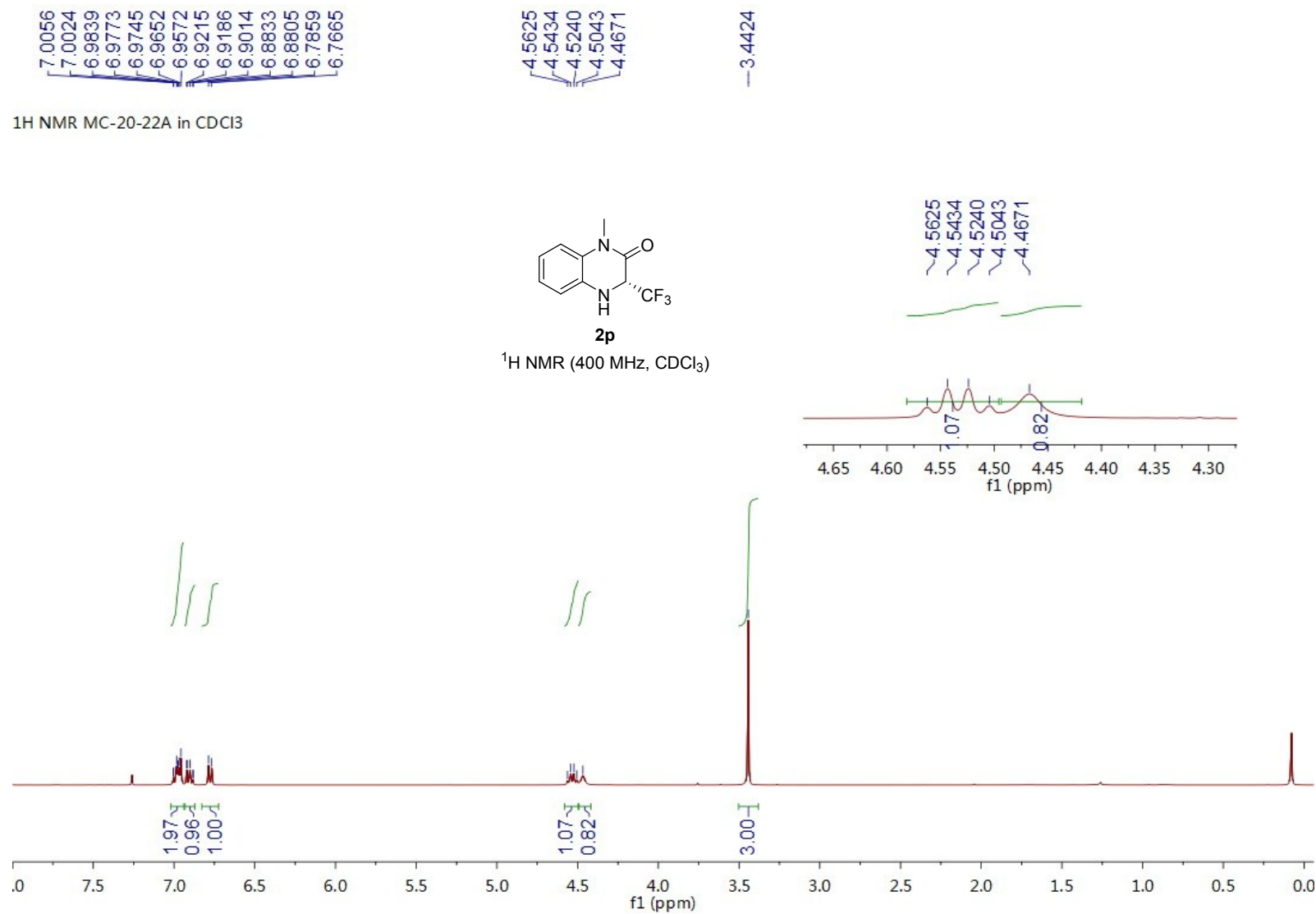
4.6528
 4.6340
 4.6151
 4.5958
 4.5859

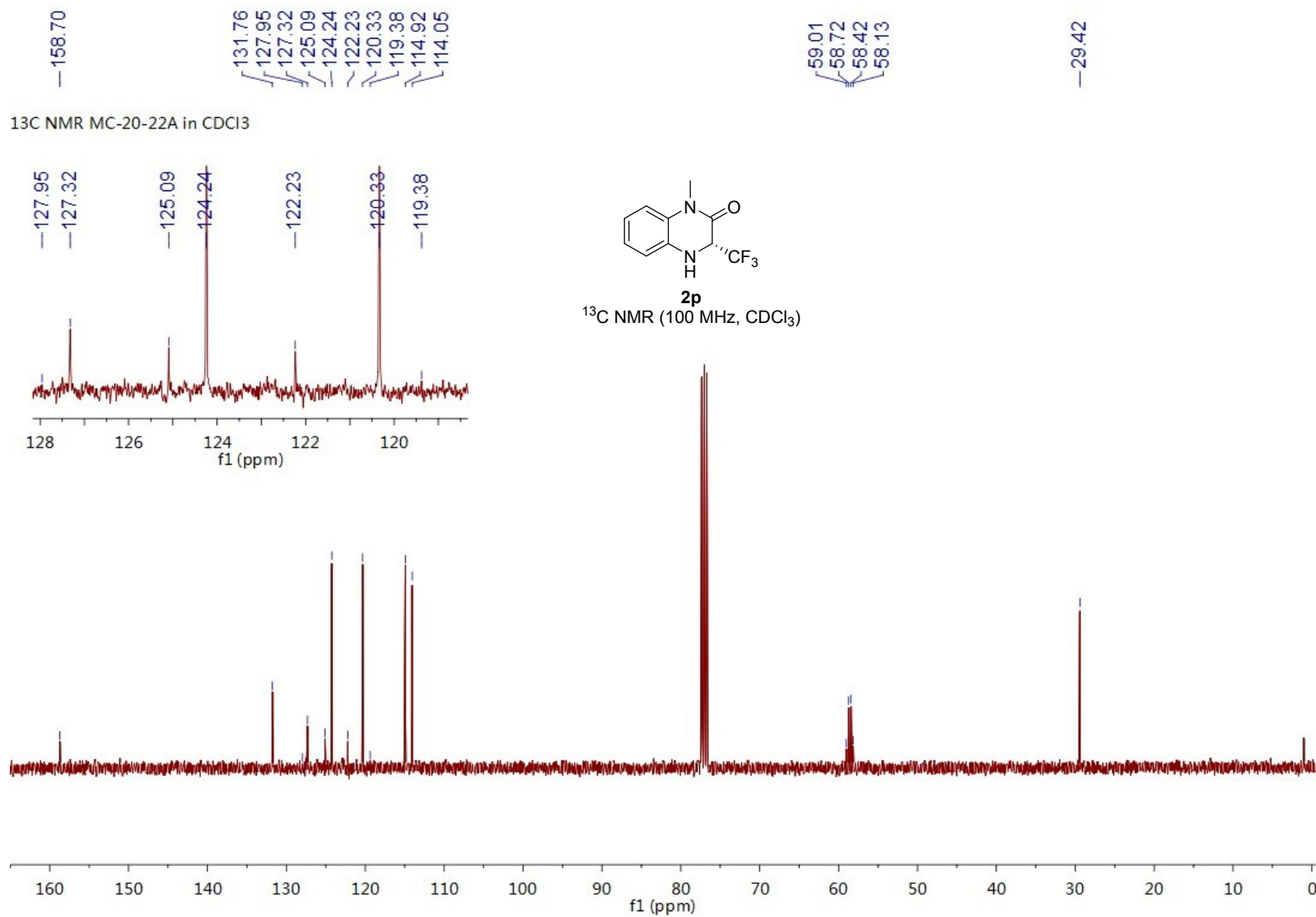




¹⁹F NMR MC-20-77A in CDCl₃

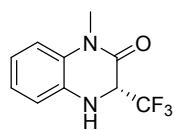






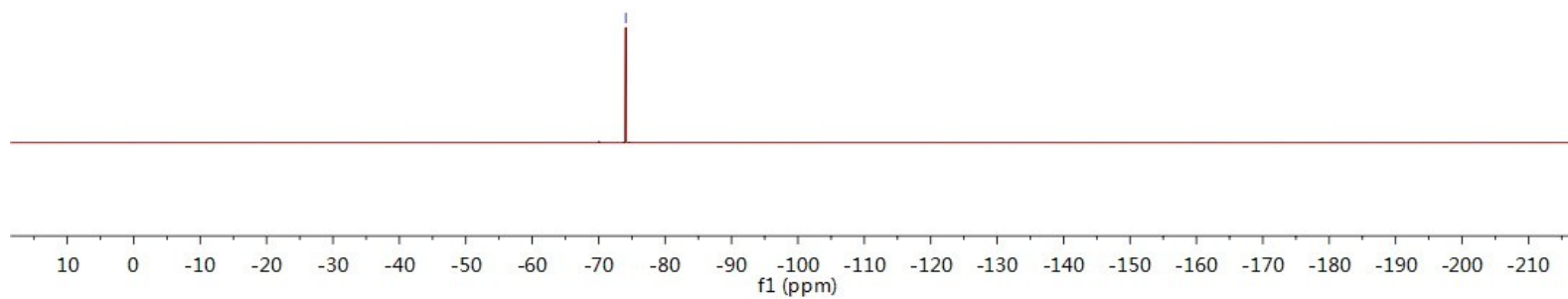
¹⁹F NMR MC-20-22A in CDCl₃

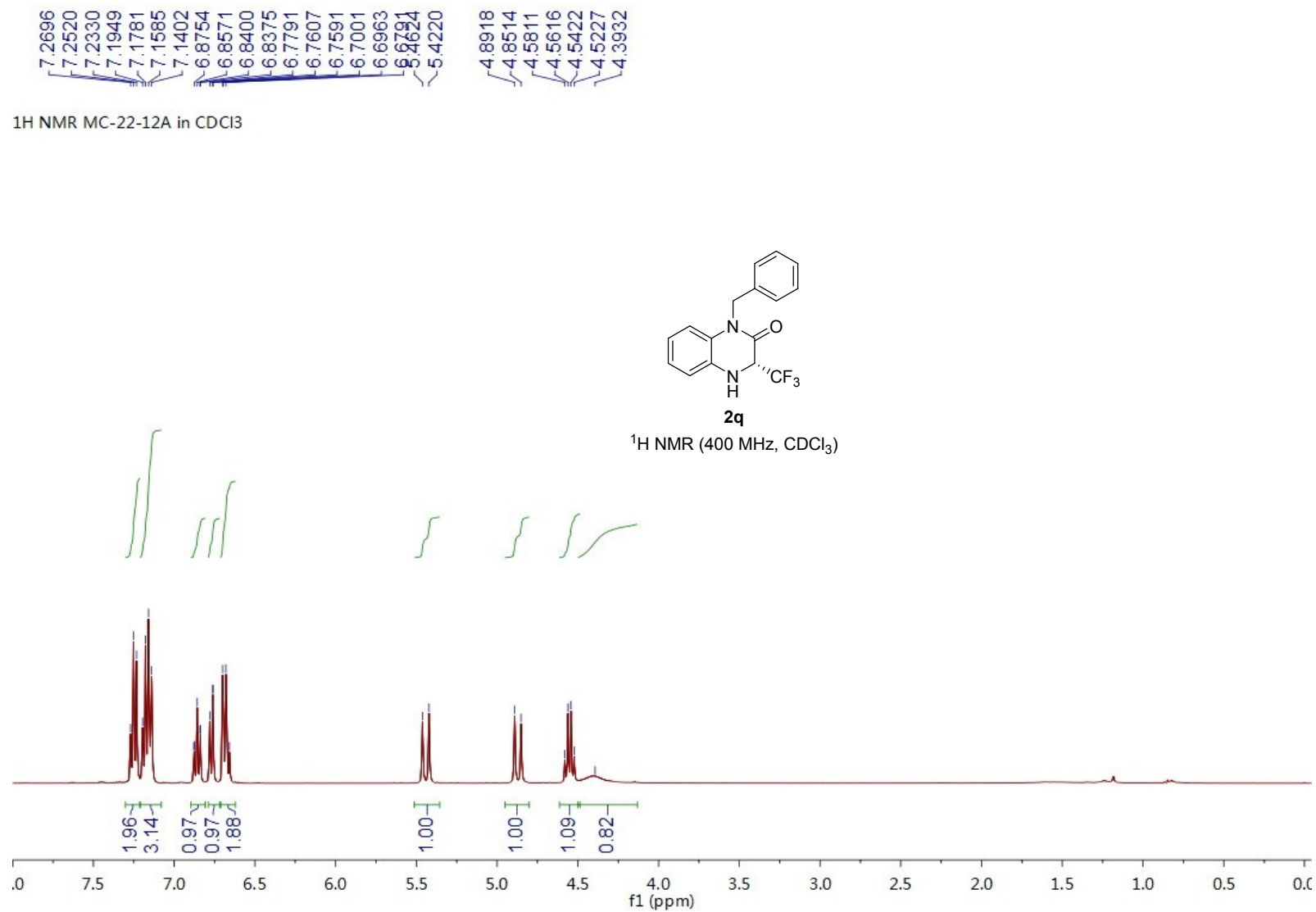
-74.0809



2p

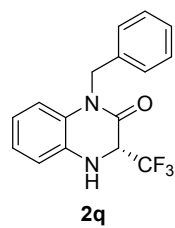
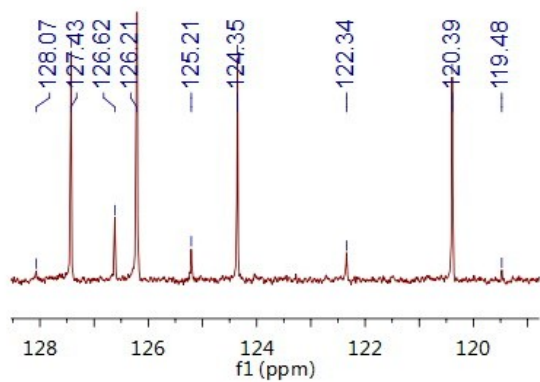
¹⁹F NMR (376 MHz, CDCl₃)



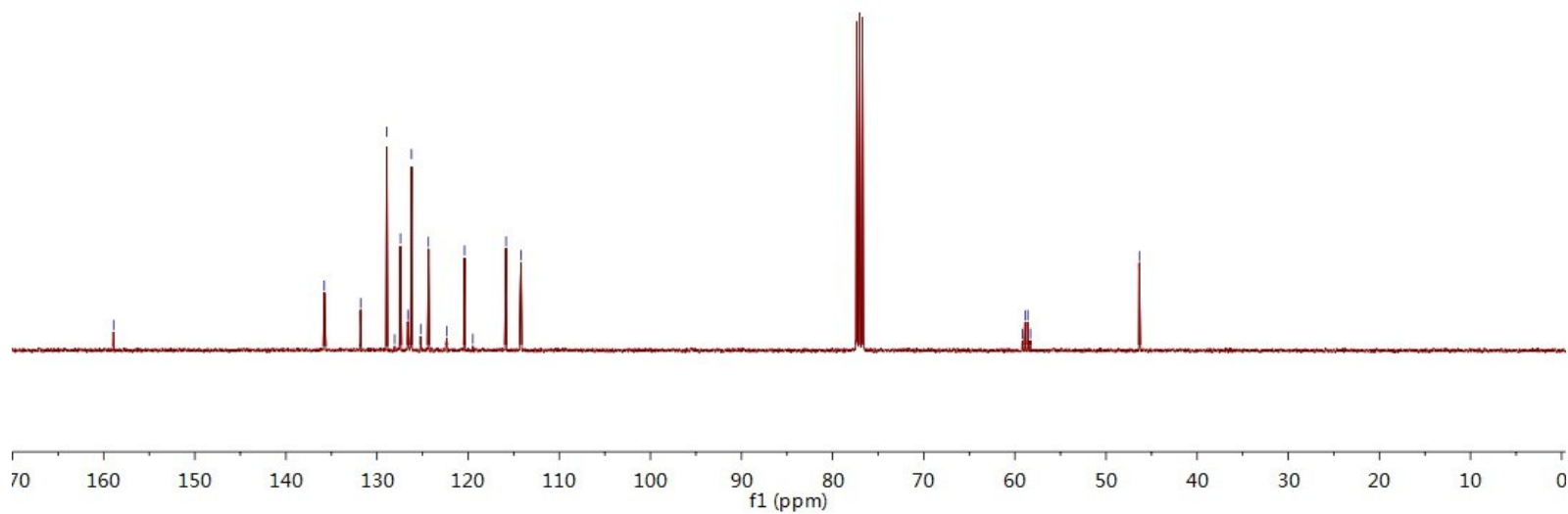




¹³C NMR MC-22-12A in CDCl₃

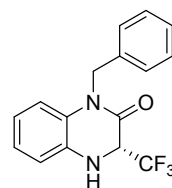


¹³C NMR (100 MHz, CDCl₃)



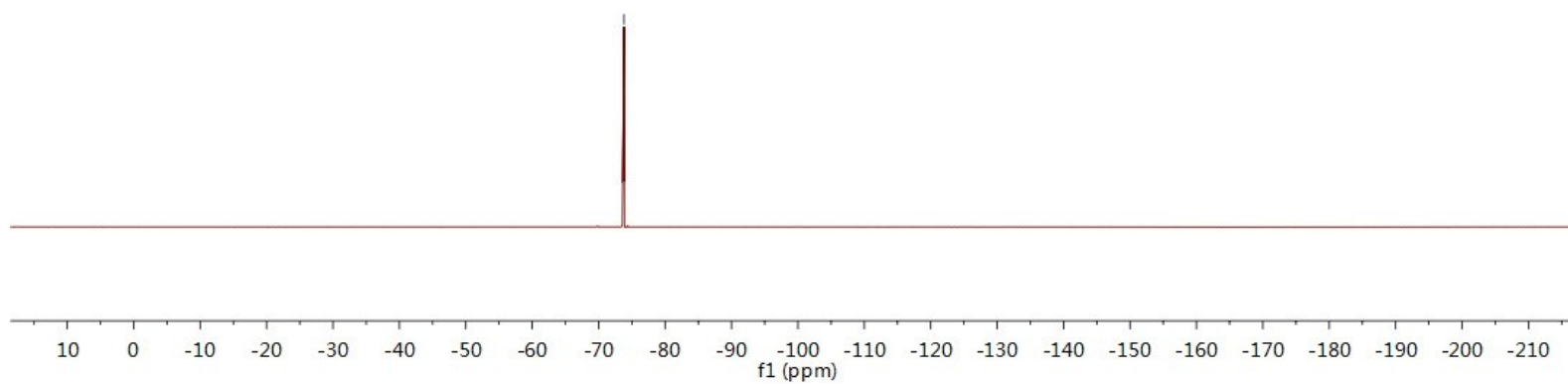
19 NMR MC-22-12A in CDCl₃

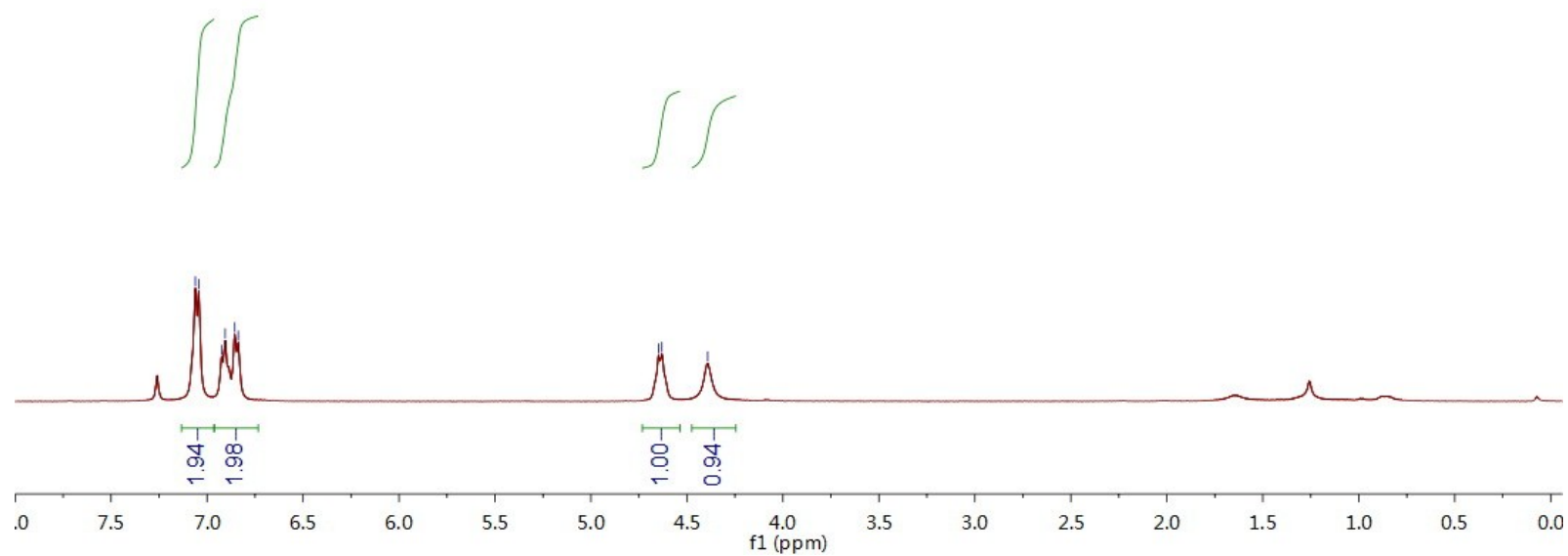
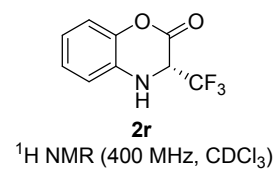
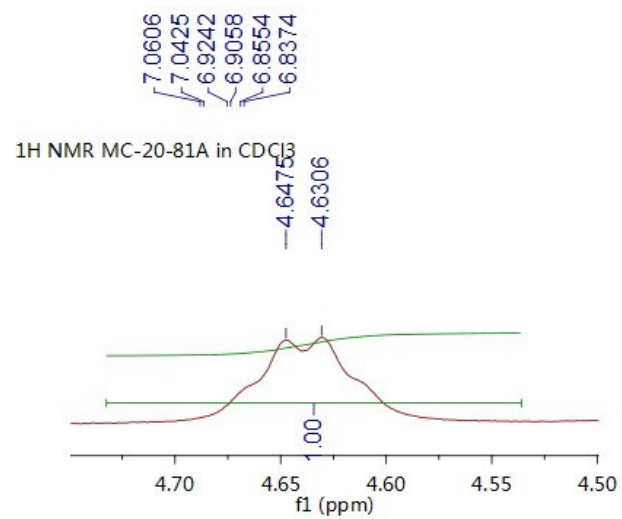
73.8210

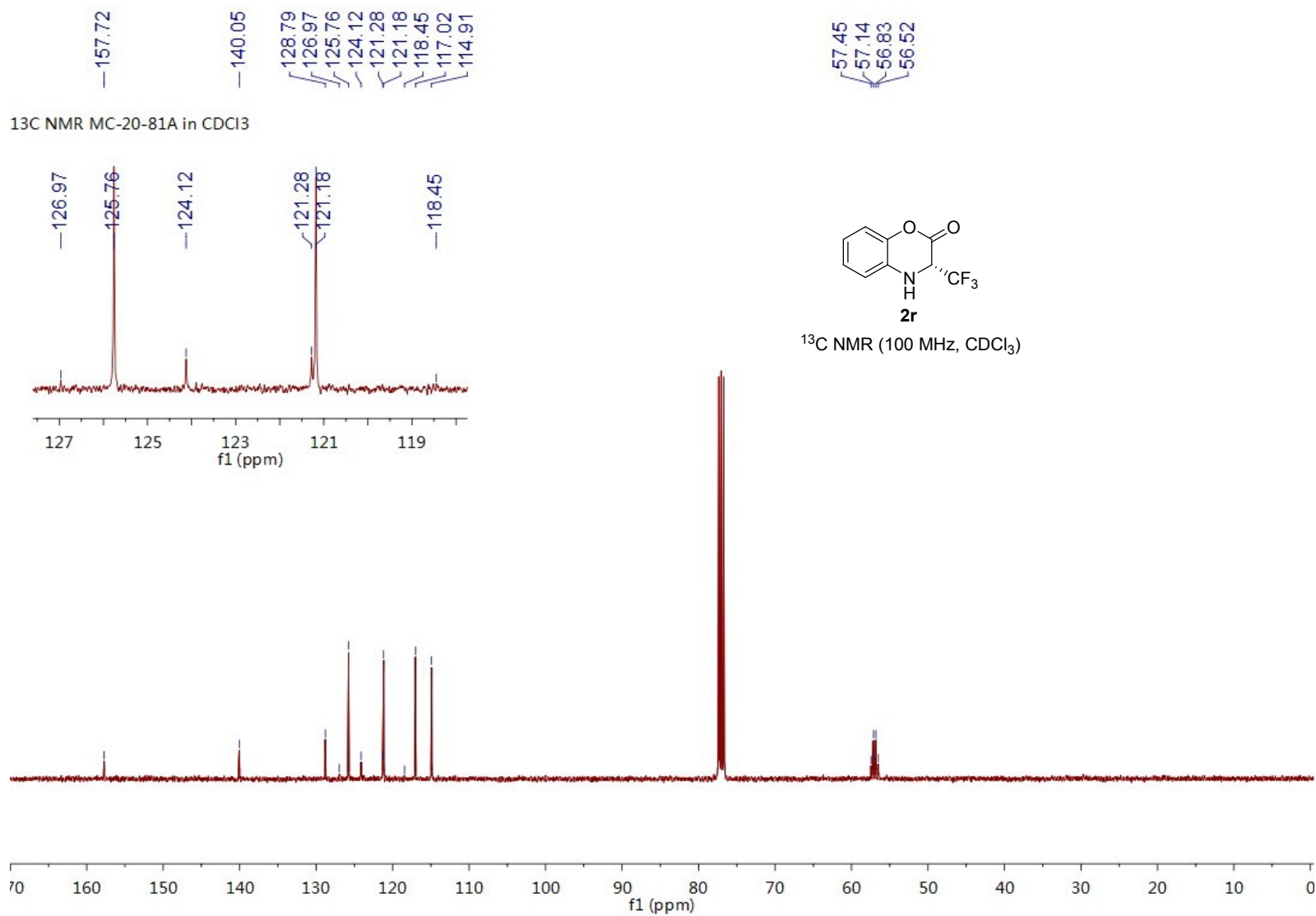


2q

¹⁹F NMR (376 MHz, CDCl₃)

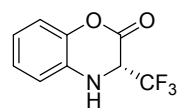






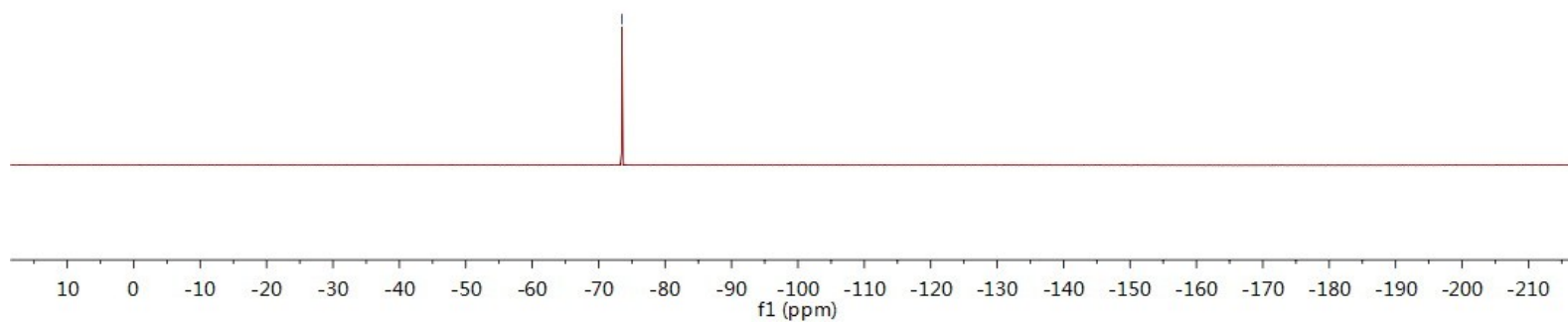
¹⁹F NMR MC-20-81A in CDCl₃

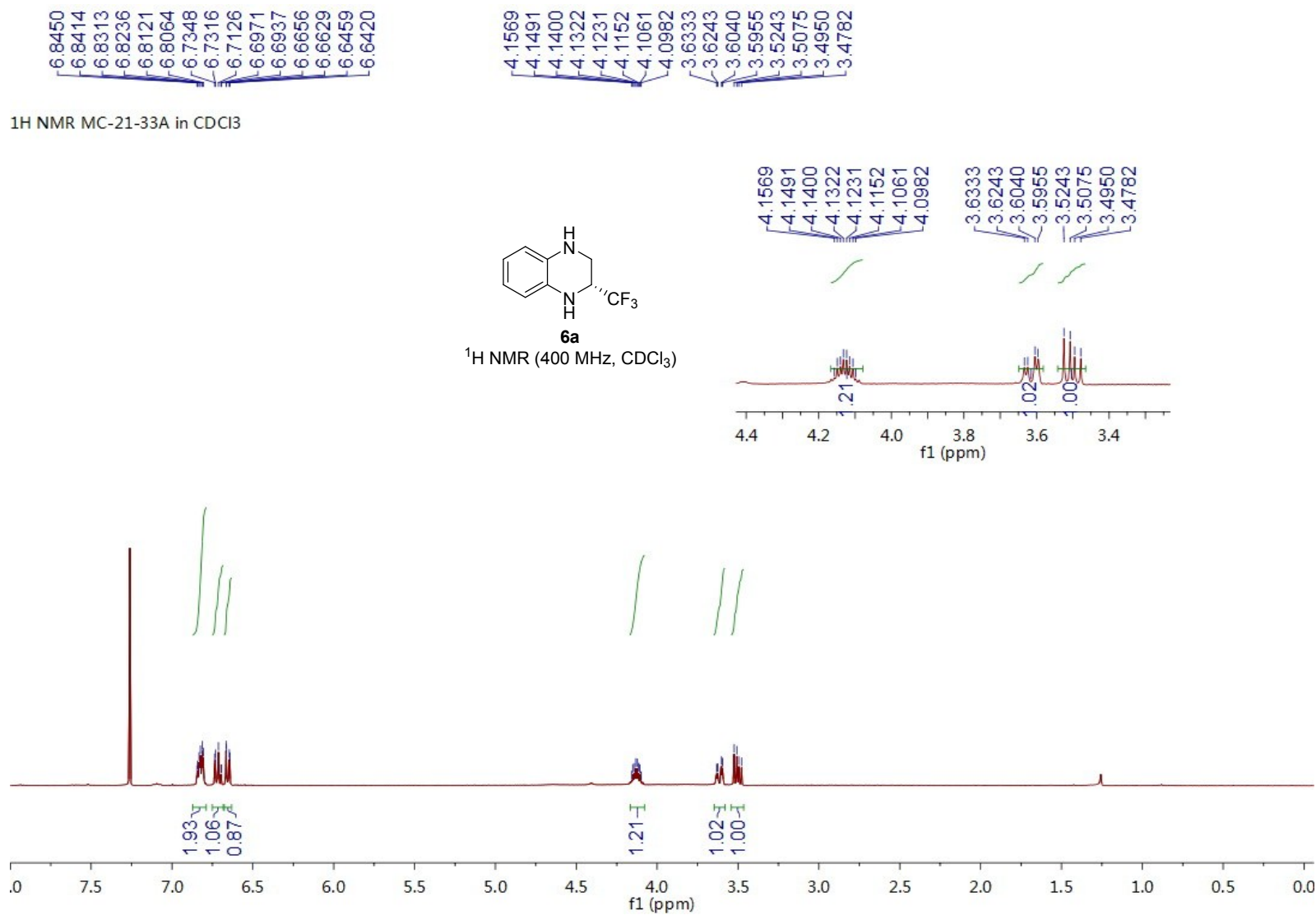
—73.4928

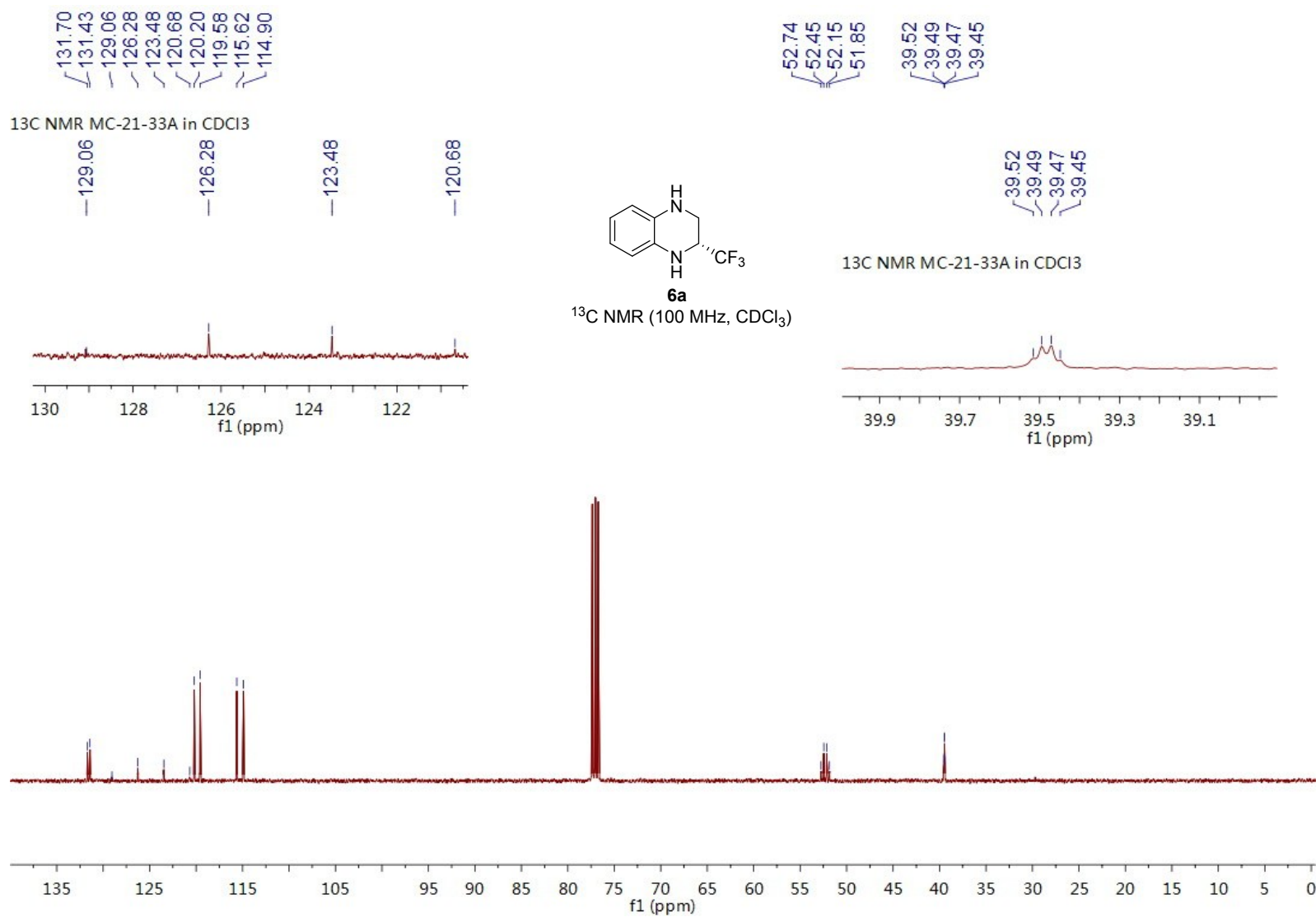


2r

¹⁹F NMR (376 MHz, CDCl₃)

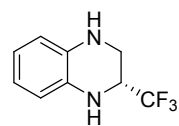






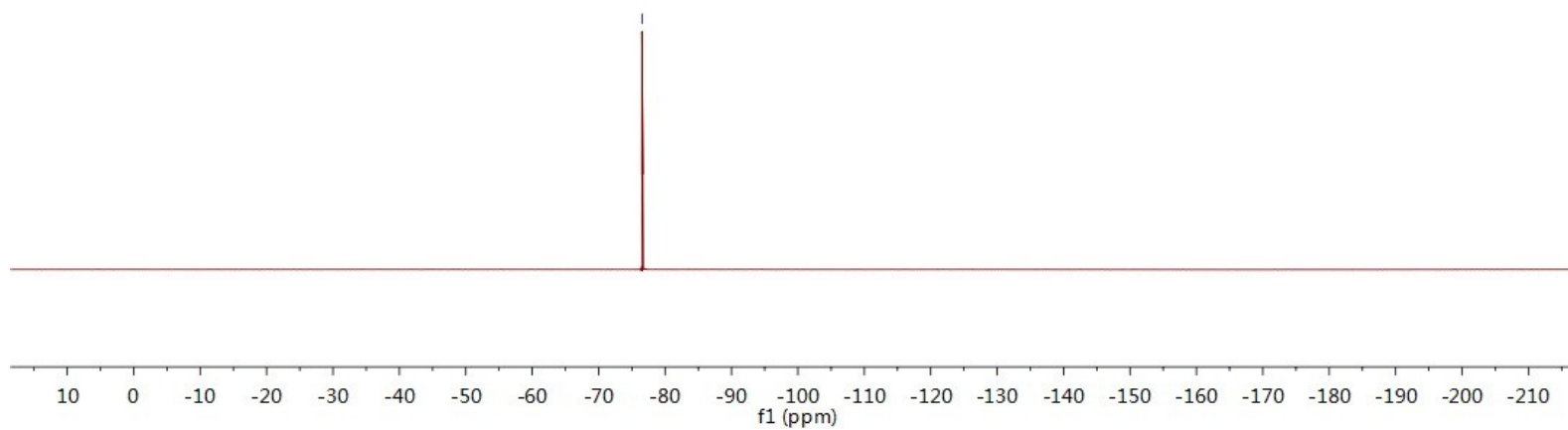
¹⁹F MC-21-33A in CDCl₃

—76.5242



6a

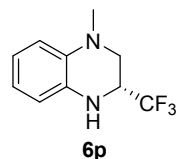
¹⁹F NMR (376 MHz, CDCl₃)



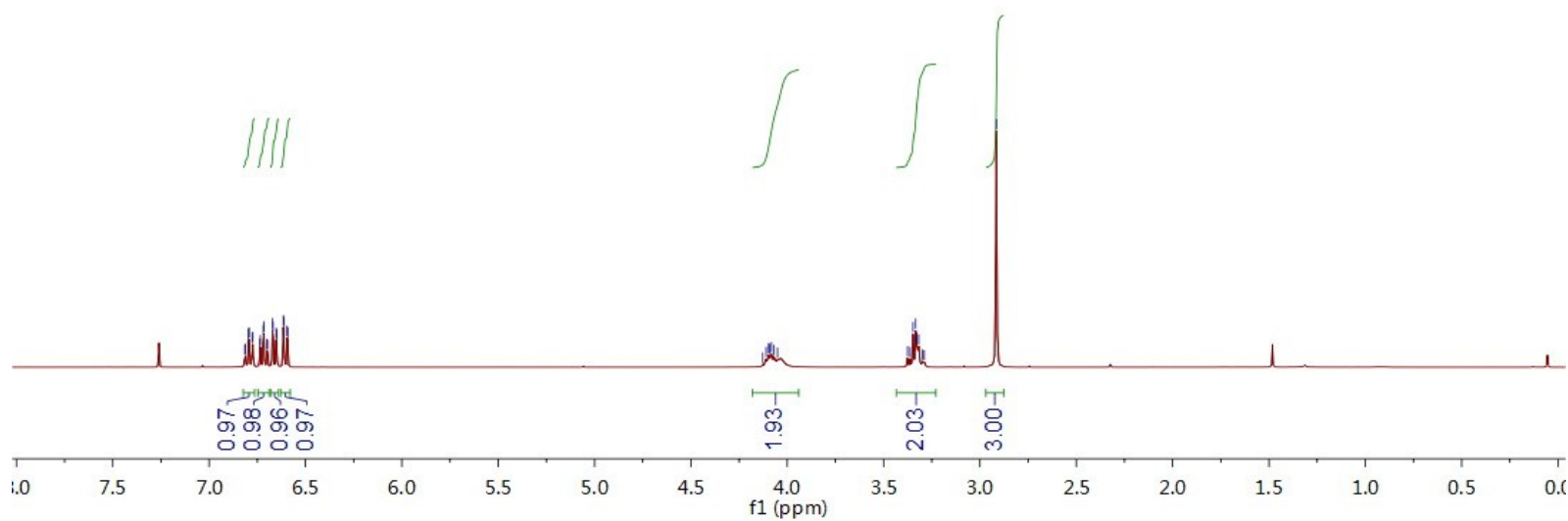
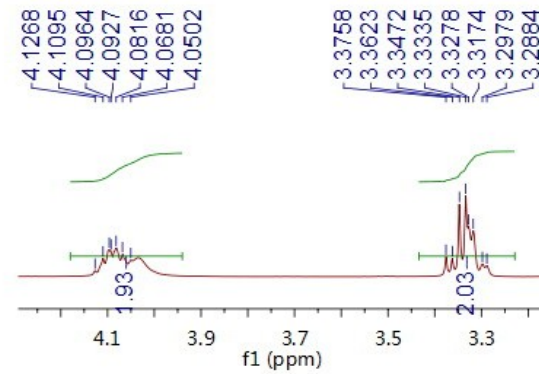
6.8149
6.8113
6.7960
6.7924
6.7769
6.7732
6.7379
6.7343
6.7190
6.7155
6.7003
6.6969
6.6716
6.6684
6.6520
6.6487
6.6146
6.6109
6.5955
6.5918

4.1268
4.1095
4.0964
4.0927
4.0816
4.0681
4.0502
3.3758
3.3472
3.3335
3.3278
3.3174
3.2884

¹H NMR MC-20-73 in CDCl₃



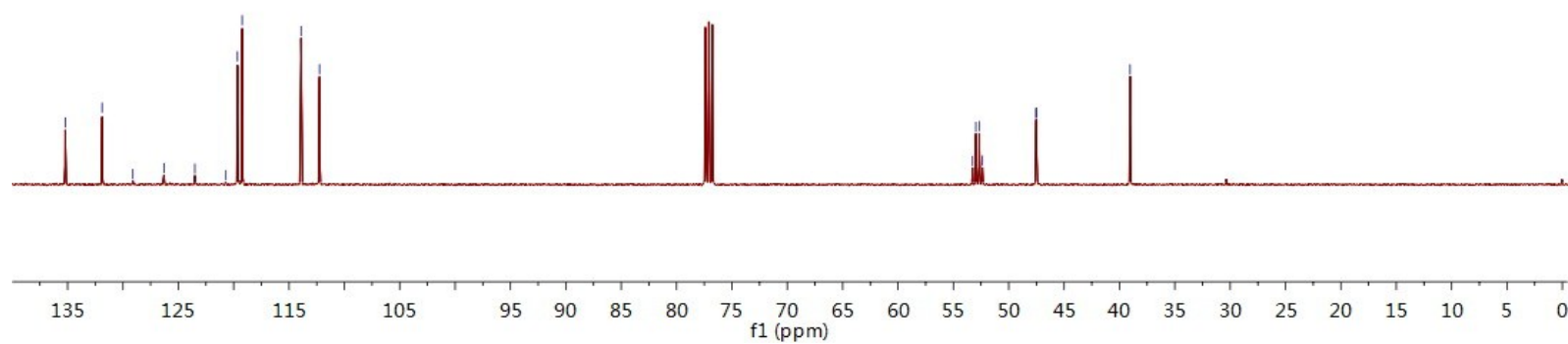
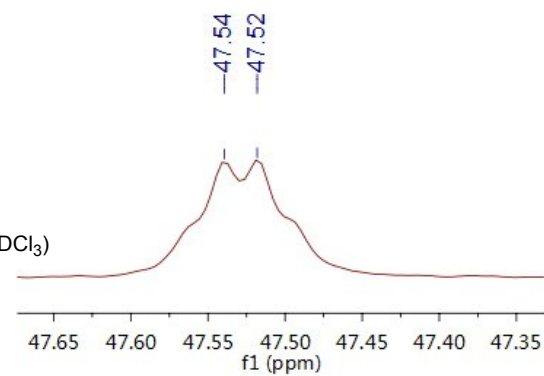
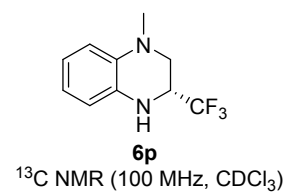
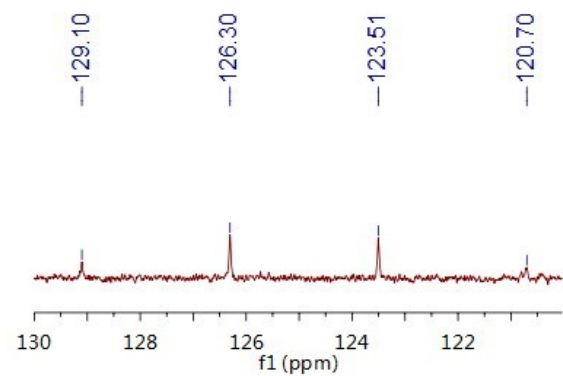
¹H NMR (400 MHz, CDCl₃)



135.21
131.88
129.10
126.30
123.51
120.70
119.65
119.24
113.91
112.25

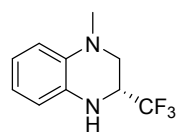
53.26
52.97
52.67
52.37
47.54
47.52
39.04

¹³C NMR MC-20-73 in CDCl₃



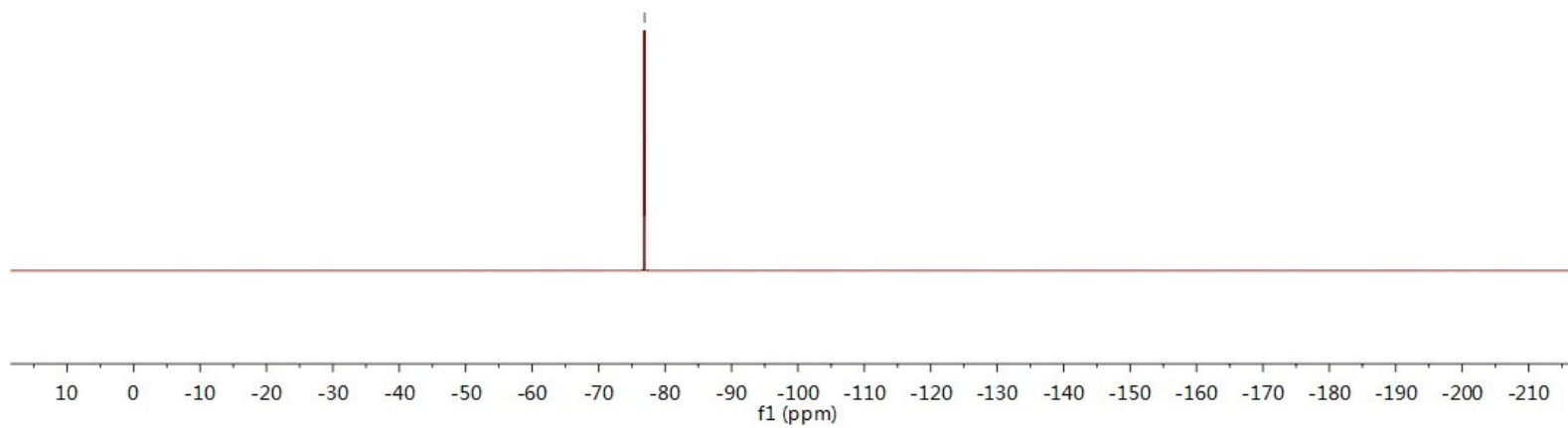
¹⁹F NMR mc-20-73 in CDCl₃

76.9145



6p

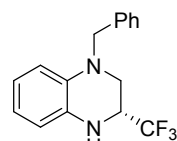
¹⁹F NMR (376 MHz, CDCl₃)



7.2577
7.2556
7.2410
7.2364
7.2203
7.2089
7.1874
7.1521
6.6138
6.6013
6.5922
6.5801
6.5705
6.5564
6.5493
6.5429
6.5367
6.5263

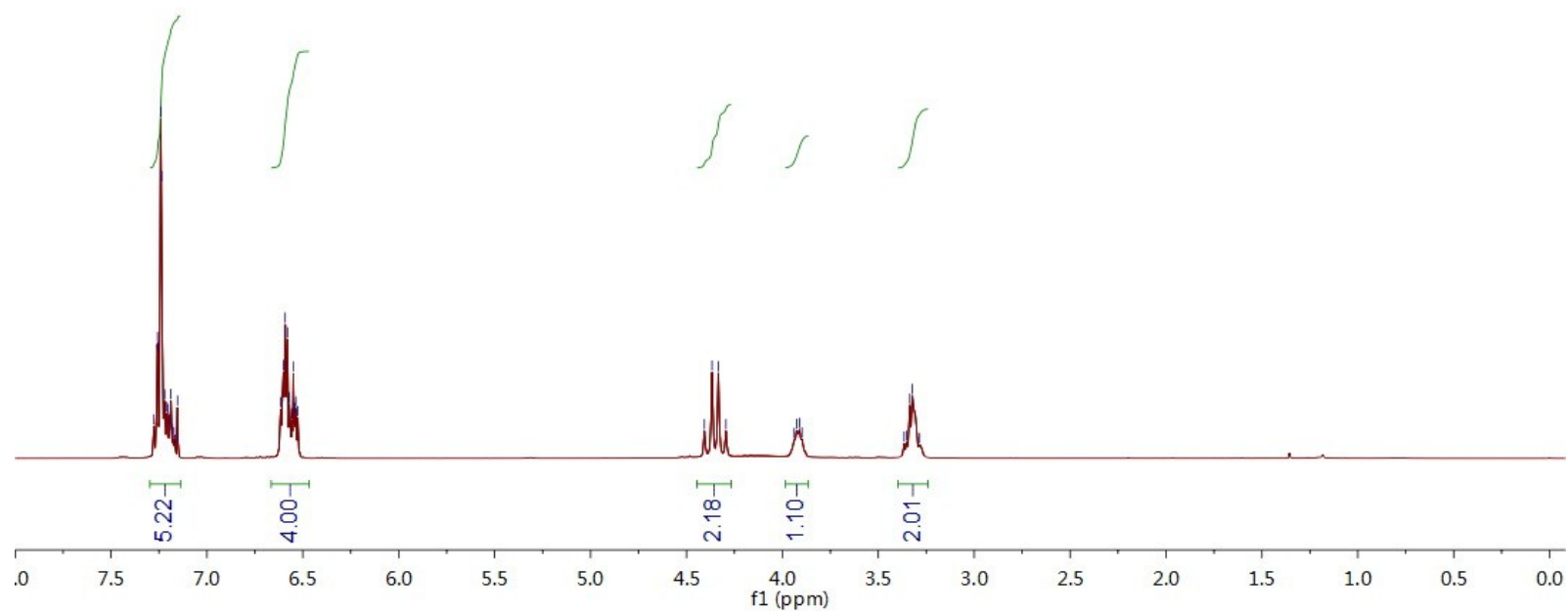
4.4063
4.3669
4.3336
4.2942
3.9256
3.9106
3.8979
3.8653
3.3521
3.3356
3.3221
3.2843

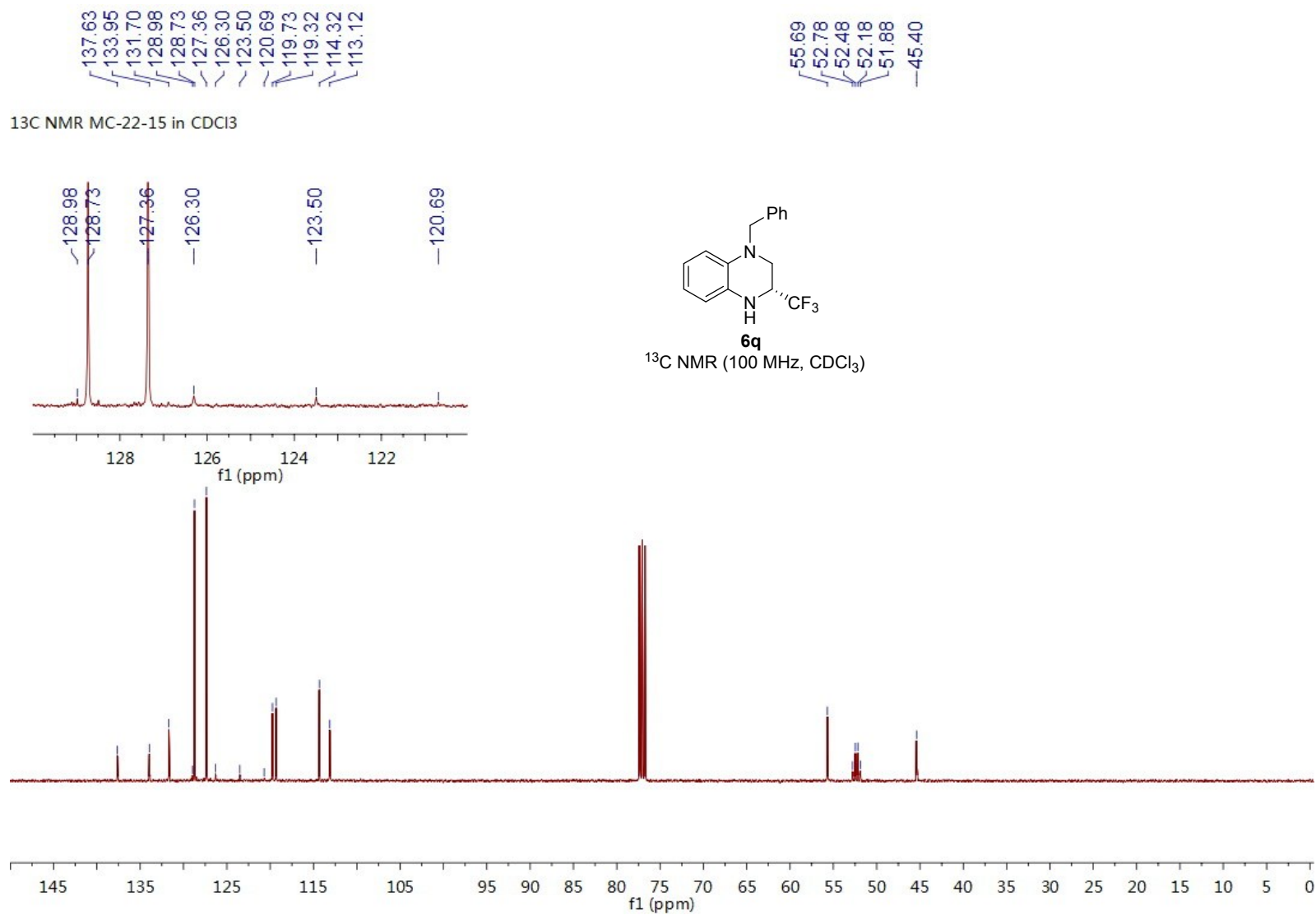
¹H NMR MC-22-15 in CDCl₃



6q

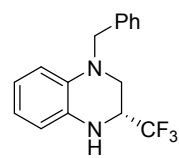
¹H NMR (400 MHz, CDCl₃)





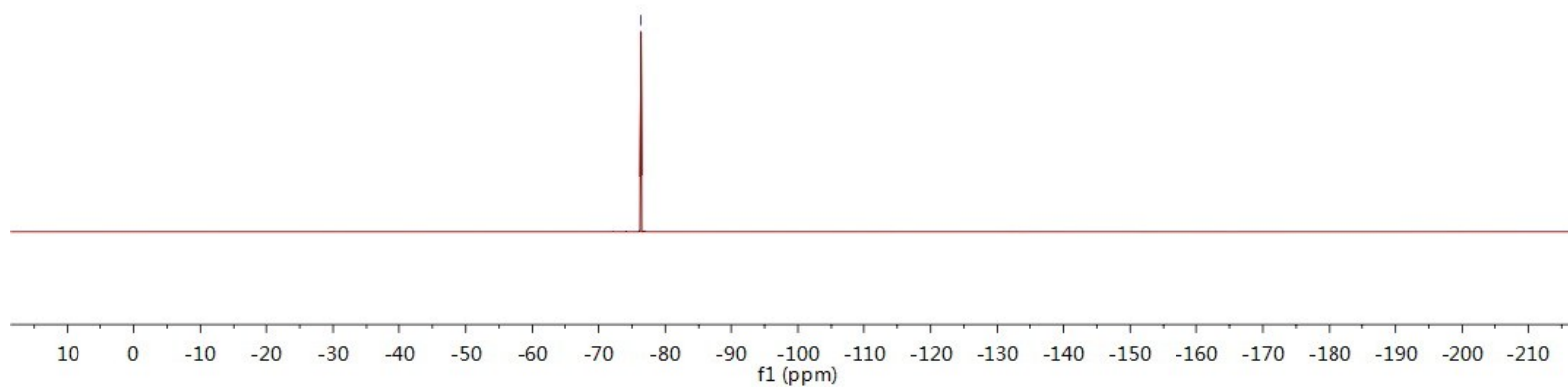
¹⁹F NMR MC-22-15 in CDCl₃

—76.3660



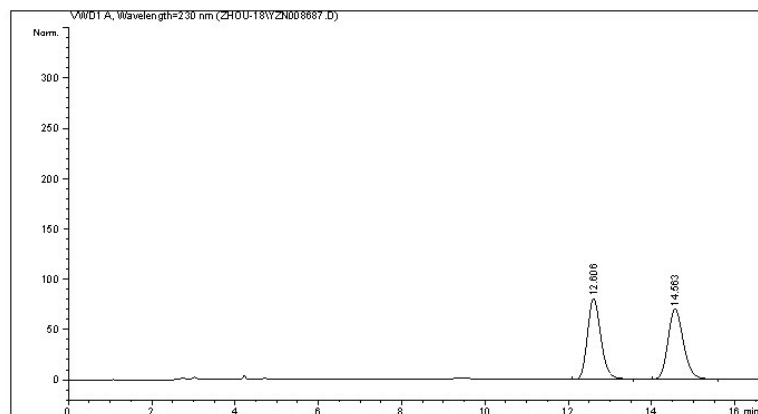
6q

¹⁹F NMR (376 MHz, CDCl₃)



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN008687.D
Sample Name: MC-20-16B

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Acq. Instrument : Instrument 1          Location : Vial 1
Injection Date  : 5/29/2018 2:42:10 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed    : 5/29/2018 2:31:48 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 11/12/2018 3:23:13 PM
                  (modified after loading)
Sample Info     : OD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230nm
=====
```



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Area Percent Report
=====

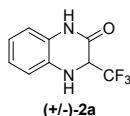
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Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	12.606	BB	0.3449	1805.42505	80.41638	50.1329	
2	14.563	BB	0.3981	1795.85144	69.70950	49.8671	

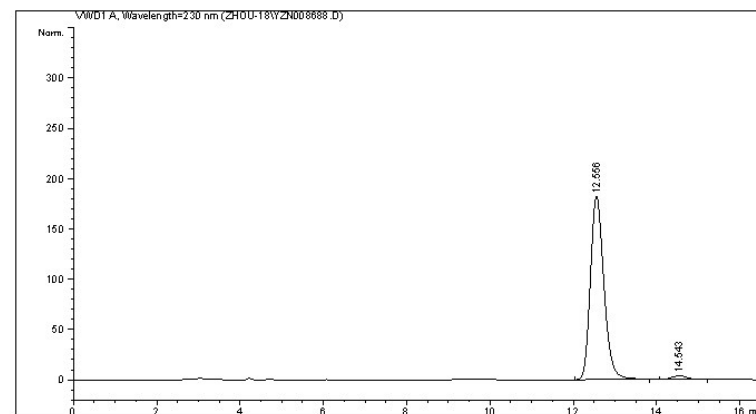
Totals : 3601.27649 150.12588

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*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN008688.D
Sample Name: MC-20-16A

```
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Acq. Operator   :
Acq. Instrument : Instrument 1          Location : Vial 1
Injection Date  : 5/29/2018 2:59:54 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed    : 5/29/2018 2:59:13 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 11/12/2018 3:23:13 PM
                  (modified after loading)
Sample Info     : OD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230nm
=====
```



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Area Percent Report
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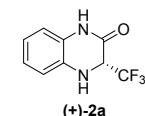
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Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
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Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	12.556	BB	0.3482	4118.27100	182.19572	97.7988	
2	14.543	BB	0.3874	92.69196	3.71187	2.2012	

Totals : 4210.96296 185.90759

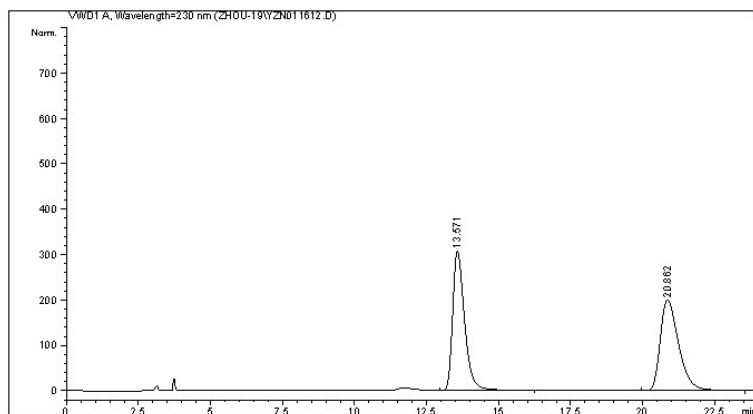
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*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN011612.D
Sample Name: MC-22-60B+-

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Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 1/16/2019 6:22:41 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 1/16/2019 5:43:58 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 1/17/2019 6:05:46 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm



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Area Percent Report

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Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

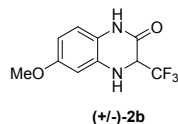
Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU*s	Height [mAU]	Area %
1	13.571	VB	0.4417	8902.35938	307.00684	50.1022
2	20.862	VB	0.6799	8866.04492	199.03458	49.8978

Totals : 1.77684e4 506.04141

=====

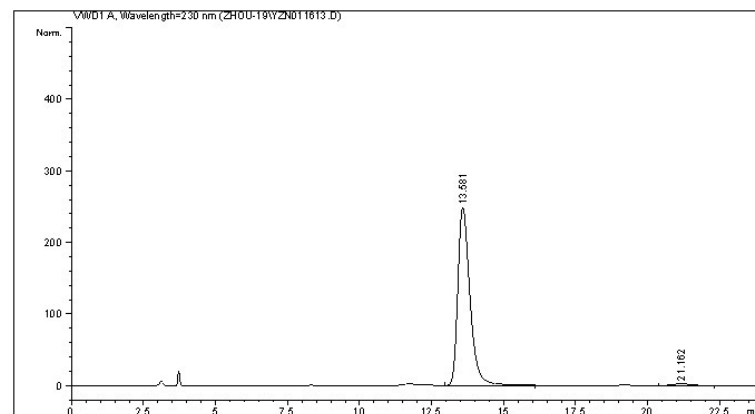
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Data File C:\CHEM32\1\DATA\ZHOU-19\YZN011613.D
Sample Name: MC-22-60A

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Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 1/16/2019 6:53:06 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 1/16/2019 6:50:52 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 1/17/2019 6:06:36 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm



=====

Area Percent Report

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Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

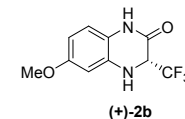
Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU*s	Height [mAU]	Area %
1	13.581	VB	0.4467	7280.50537	248.43874	98.5763
2	21.162	BB	0.6390	105.14967	2.42875	1.4237

Totals : 7385.65504 250.86749

=====

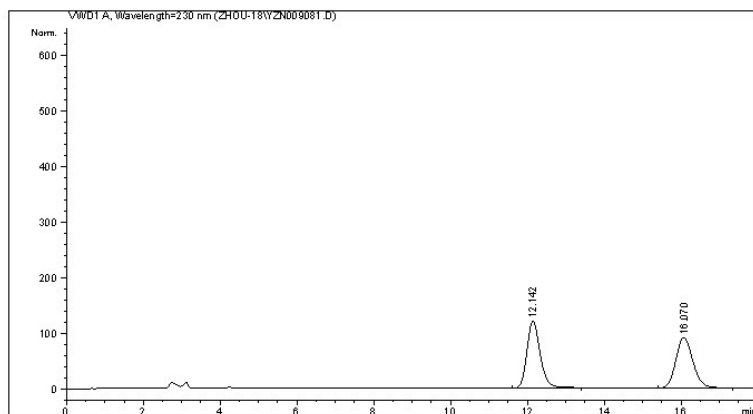
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009081.D
Sample Name: MC-20-44B+-

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 6/24/2018 4:28:13 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 6/24/2018 4:13:08 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 3:34:38 PM
(modified after loading)
Sample Info : 0D-H, Hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 230 nm



=====

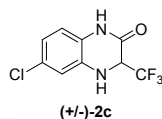
Area Percent Report

=====

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	%
1	12.142	BB	0.3659	2869.74878	120.20657	50.5785	
2	16.070	BB	0.4769	2804.10669	91.14387	49.4215	
Totals :				5673.85547	211.35043		



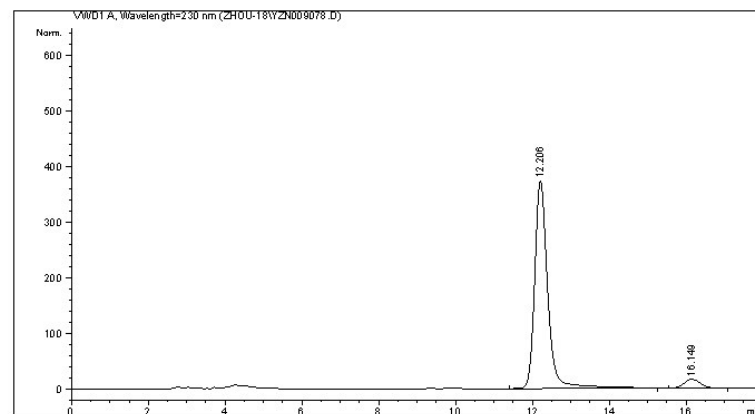
=====

*** End of Report ***

Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009078.D
Sample Name: MC-20-44A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 6/24/2018 3:07:24 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 6/24/2018 3:04:51 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 3:34:38 PM
(modified after loading)
Sample Info : 0D-H, Hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 230 nm



=====

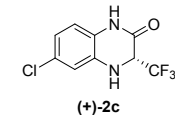
Area Percent Report

=====

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	%
1	12.206	BB	0.3571	8837.92871	374.15646	94.7792	
2	16.149	BB	0.4692	486.83115	16.10035	5.2208	
Totals :				9324.75986	390.25682		

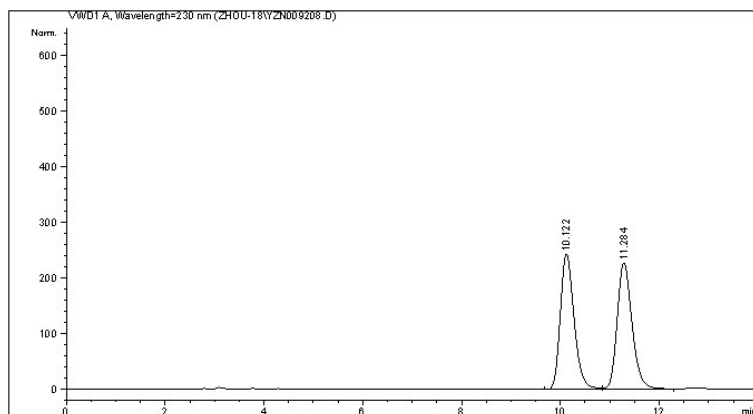


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*** End of Report ***

Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009208.D
Sample Name: MC-20-57B+-

```
=====
Acq. Operator   :
Acq. Instrument : Instrument 1          Location : Vial 1
Injection Date  : 7/7/2018 1:09:59 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed    : 7/7/2018 12:49:42 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 11/12/2018 3:37:09 PM
                  (modified after loading)
Sample Info     : 0D-H, Hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 230 nm
=====
```



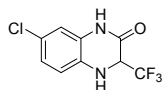
```
=====
Area Percent Report
=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU*s	Height [mAU]	Area %
1	10.122	BV	0.2999	4746.76562	243.86140	49.6712
2	11.284	VB	0.3251	4809.61475	227.70230	50.3288

Totals : 9556.38037 471.56371

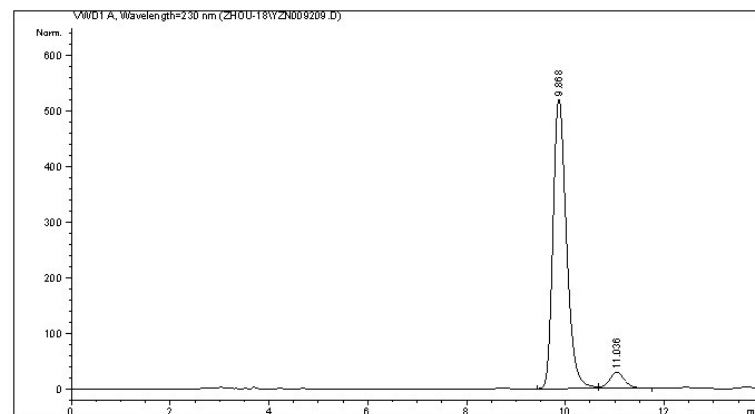
```
=====
*** End of Report ***
```



(+/-)-2d

Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009209.D
Sample Name: MC-20-57A

```
=====
Acq. Operator   :
Acq. Instrument : Instrument 1          Location : Vial 1
Injection Date   : 7/7/2018 1:28:11 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed    : 7/7/2018 1:26:51 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 11/12/2018 3:37:09 PM
                  (modified after loading)
Sample Info     : 0D-H, Hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 230 nm
=====
```



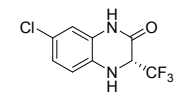
```
=====
Area Percent Report
=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU*s	Height [mAU]	Area %
1	9.868	BV	0.2913	9893.15918	521.20184	94.0313
2	11.036	VB	0.3284	627.97430	29.15906	5.9687

Totals : 1.05211e4 550.36090

```
=====
*** End of Report ***
```

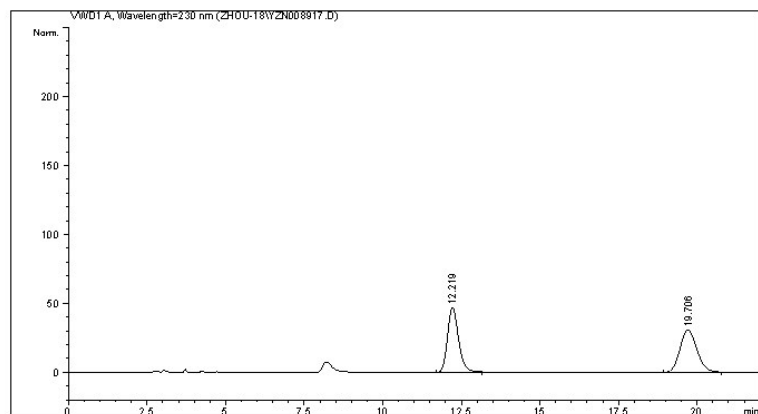


(+)-2d

Data File C:\CHEM32\1\DATA\ZHOU-18\YZN008917.D
Sample Name: MC-20-31B+-

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 6/11/2018 4:49:51 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 6/11/2018 4:47:56 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/13/2018 7:22:44 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm



=====

Area Percent Report

=====

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

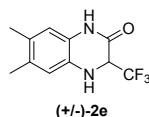
Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	12.219	BB	0.3734	1139.32166	46.94137	49.7698	
2	19.706	BB	0.5845	1149.86157	30.86938	50.2302	

Totals : 2289.18323 77.81075

=====

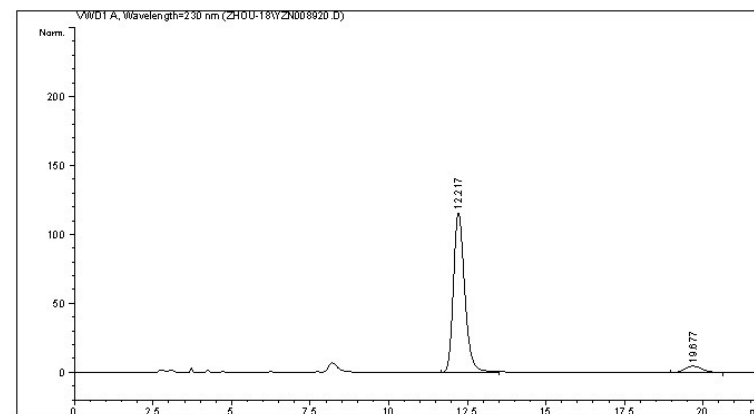
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN008920.D
Sample Name: MC-20-31A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 6/11/2018 5:51:54 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 6/11/2018 5:47:55 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/13/2018 7:22:44 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm



=====

Area Percent Report

=====

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

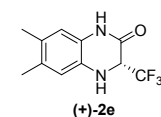
Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	12.217	BB	0.3822	2884.69482	115.84557	94.4116	
2	19.677	BB	0.5701	170.74945	4.58313	5.5884	

Totals : 3055.44427 120.42870

=====

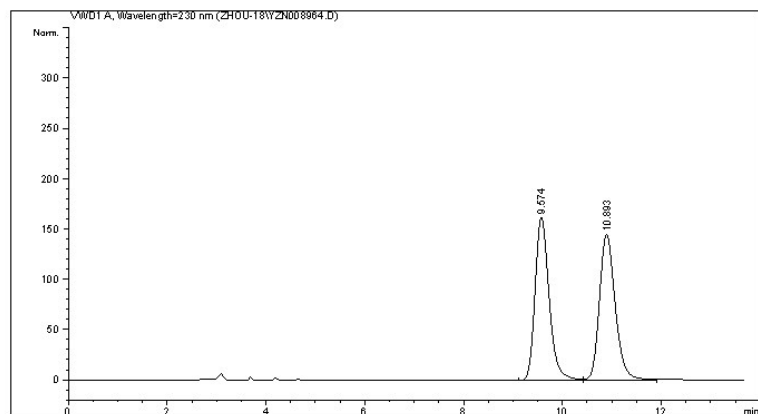
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN008964.D
Sample Name: MC-20-34B+-

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 6/15/2018 1:23:40 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 6/15/2018 12:59:32 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 3:50:31 PM
(modified after loading)
Sample Info : 0D, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm



Area Percent Report

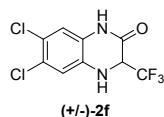
Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height s	Area [mAU]	Area %
1	9.574	BV	0.3036	3203.31250	161.89218	49.8997	
2	10.893	VB	0.3405	3216.18506	144.89038	50.1003	

Totals : 6419.49756 306.78256

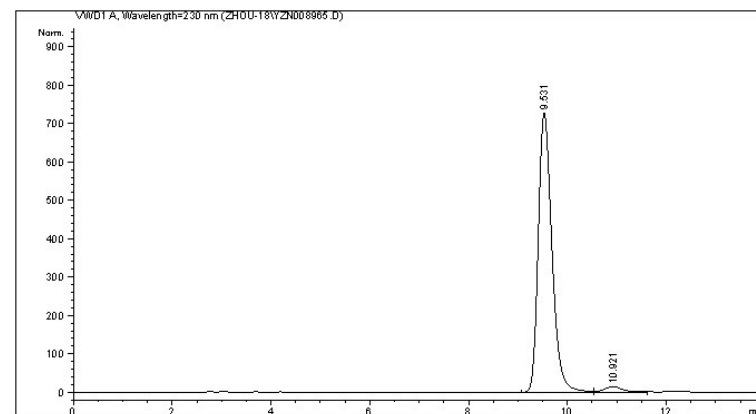
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN008965.D
Sample Name: MC-20-34A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 6/15/2018 1:37:58 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 6/15/2018 1:37:31 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 3:51:10 PM
(modified after loading)
Sample Info : 0D, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm



Area Percent Report

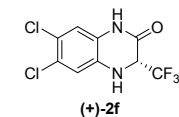
Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height s	Area [mAU]	Area %
1	9.531	BV	0.2952	1.39635e4	727.75531	97.5953	
2	10.921	VB	0.3647	344.05646	14.32294	2.4047	

Totals : 1.43075e4 742.07825

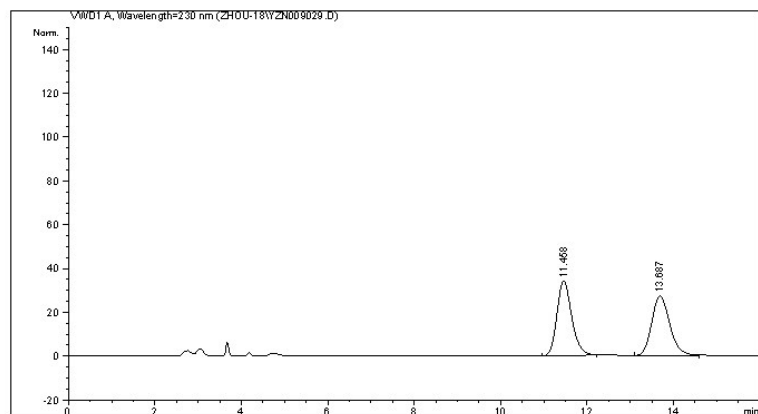
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009029.D
Sample Name: MC-20-42B+-

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 6/21/2018 2:00:41 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 6/21/2018 1:24:52 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/13/2018 7:25:49 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 230 nm



=====

Area Percent Report

=====

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

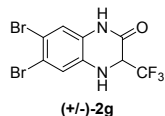
Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	11.458	BB	0.3672	811.52869	34.00456	50.9474	
2	13.687	BB	0.4440	781.34827	27.22516	49.0526	

Totals : 1592.87695 61.22972

=====

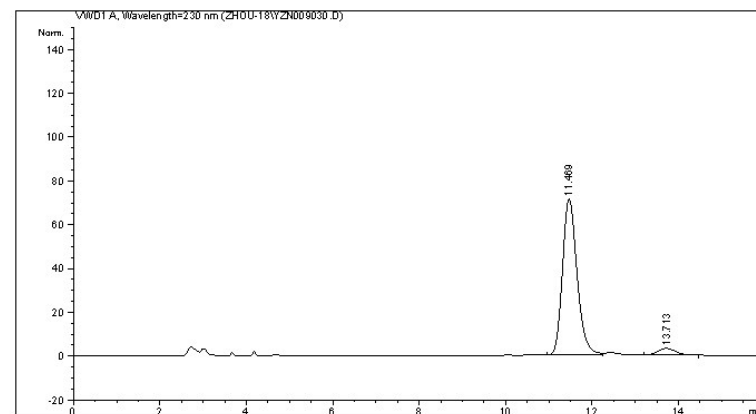
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009030.D
Sample Name: MC-20-42A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 6/21/2018 2:18:02 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 6/21/2018 2:16:57 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/13/2018 7:25:49 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 230 nm



=====

Area Percent Report

=====

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

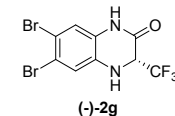
Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	11.469	BB	0.3615	1674.11719	71.24928	95.0873	
2	13.713	BB	0.4367	86.49313	3.06746	4.9127	

Totals : 1760.61031 74.31674

=====

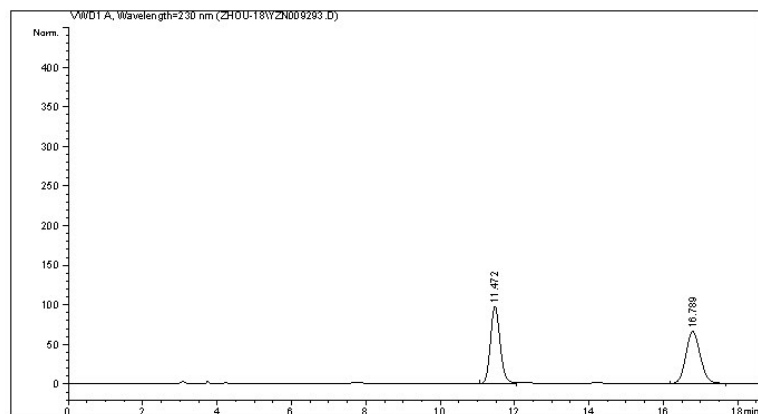
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009293.D
Sample Name: MC-20-63B+-

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 7/12/2018 2:07:19 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 7/12/2018 2:06:39 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 3:30:17 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 230 nm



=====

Area Percent Report

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Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

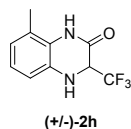
Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	11.472	EV	0.2772	1757.79346	97.56631	50.0348	
2	16.789	BB	0.4146	1755.34814	65.80070	49.9652	

Totals : 3513.14160 163.36702

=====

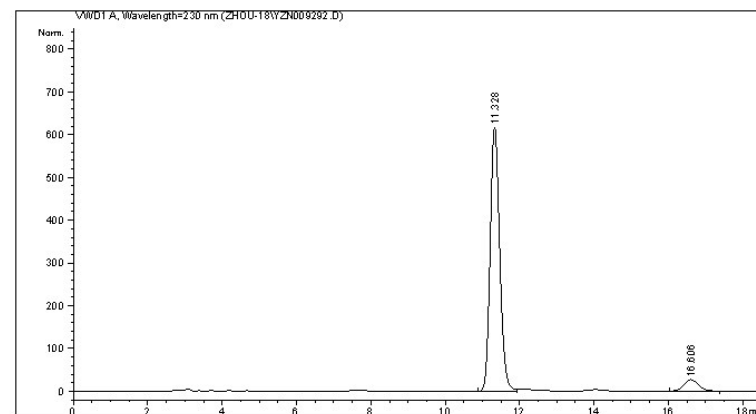
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009292.D
Sample Name: MC-20-63A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 7/12/2018 1:47:30 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 7/12/2018 1:45:45 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 3:29:33 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 230 nm



=====

Area Percent Report

=====

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

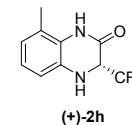
Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	11.328	EV	0.2761	1.09830e4	616.89709	93.9657	
2	16.606	BB	0.4101	705.30536	26.69634	6.0343	

Totals : 1.16883e4 643.59344

=====

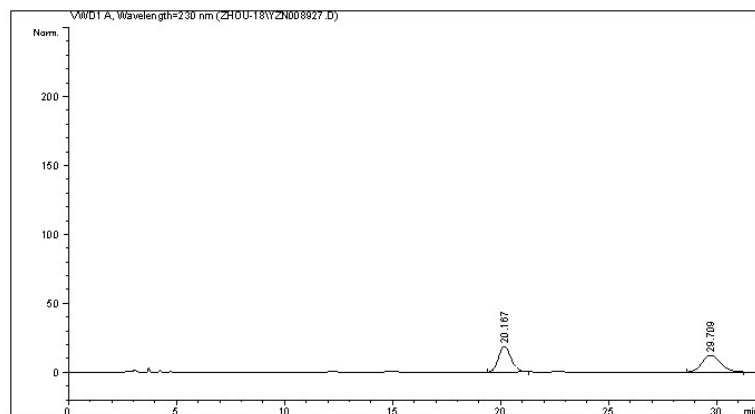
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN008927.D
Sample Name: MC-20-32B+-

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 6/12/2018 12:52:04 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 6/12/2018 12:14:49 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 3:57:03 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm



=====

Area Percent Report

=====

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

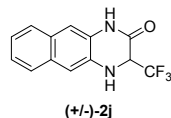
Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height [mAU]	Area %
1	20.167	BB	0.6222	752.92139	18.65873	51.2157
2	29.709	BB	0.8572	717.17780	12.10550	48.7843

Totals : 1470.09918 30.76423

=====

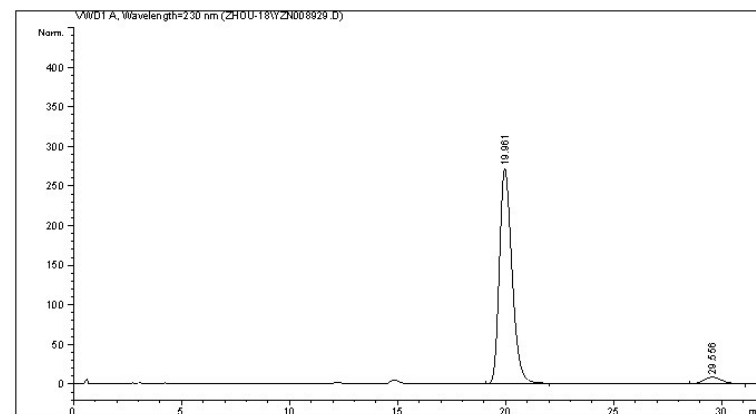
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN008929.D
Sample Name: MC-20-32A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 6/12/2018 1:29:33 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 6/12/2018 1:29:13 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 3:56:41 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm



=====

Area Percent Report

=====

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

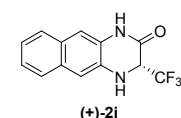
Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height [mAU]	Area %
1	19.961	BB	0.6217	1.09759e4	271.43182	95.6638
2	29.556	BB	0.8833	497.50555	8.39874	4.3362

Totals : 1.14734e4 279.83056

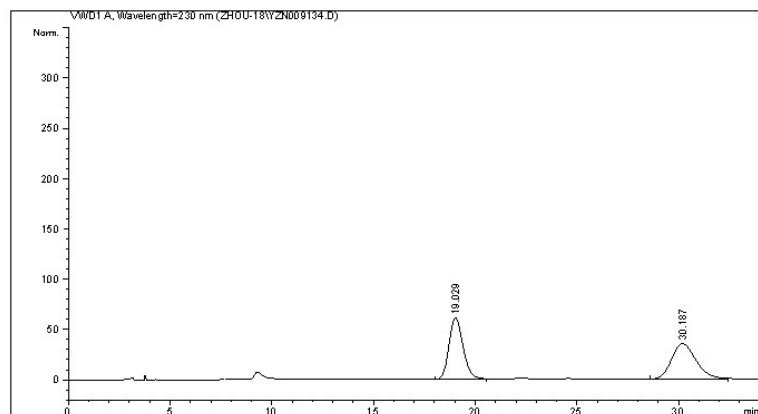
=====

*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009134.D
Sample Name: MC-20-49B+-

```
=====
Acq. Operator   :
Acq. Instrument : Instrument 1          Location : Vial 1
Injection Date  : 7/1/2018 1:22:13 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed    : 7/1/2018 1:06:50 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 11/12/2018 3:59:52 PM
                  (modified after loading)
Sample Info     : OD-H, Hexane/i-PrOH =90/10, 1. 0 mL/min, 30 oC, 230nm
=====
```



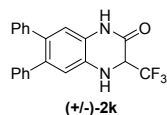
```
=====
Area Percent Report
=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	19.029	BB	0.7428	2916.08276	60.98511	50.0841	
2	30.187	BB	1.2683	2906.29150	35.17297	49.9159	

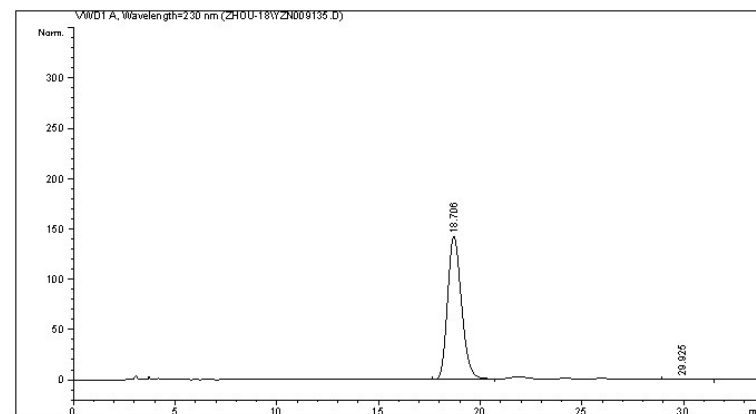
Totals : 5822.37427 96.15808

```
=====
*** End of Report ***
```



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009135.D
Sample Name: MC-20-49A

```
=====
Acq. Operator   :
Acq. Instrument : Instrument 1          Location : Vial 1
Injection Date  : 7/1/2018 1:57:18 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed    : 7/1/2018 1:56:47 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 11/12/2018 4:00:20 PM
                  (modified after loading)
Sample Info     : OD-H, Hexane/i-PrOH =90/10, 1. 0 mL/min, 30 oC, 230nm
=====
```



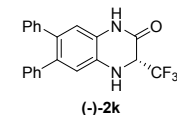
```
=====
Area Percent Report
=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	18.706	BB	0.7313	6824.13672	142.29384	99.4047	
2	29.925	BB	0.9046	40.86567	5.40995e-1	0.5953	

Totals : 6865.00239 142.83483

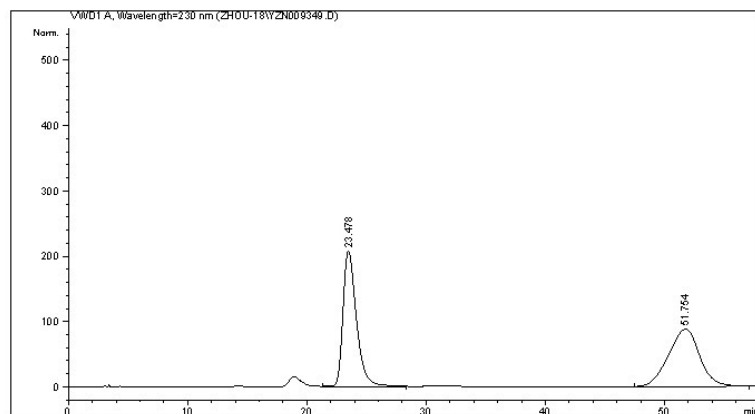
```
=====
*** End of Report ***
```



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009349.D
Sample Name: MC-20-65B+-

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 7/16/2018 8:39:50 AM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 7/16/2018 8:09:37 AM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 4:04:39 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH =85/15, 1.0 mL/min, 30 oC, 230 nm



Area Percent Report

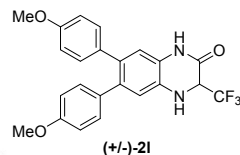
Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	23.478	BB	1.2057	1.63003e4	207.29549	50.4498	
2	51.754	BB	2.5760	1.60097e4	88.15229	49.5502	

Totals : 3.23100e4 295.44778

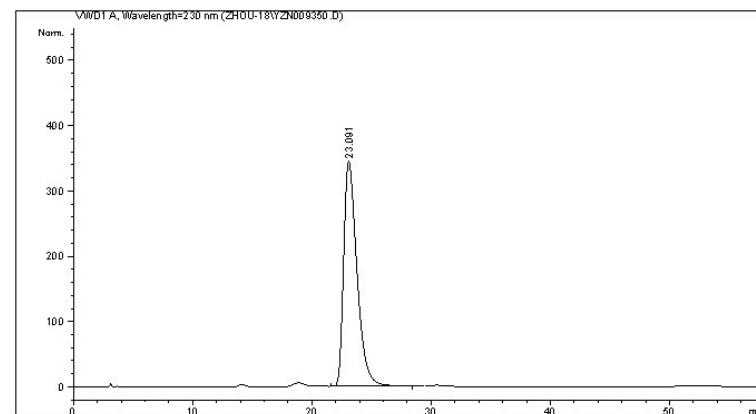
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009350.D
Sample Name: MC-20-65A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 7/16/2018 9:55:52 AM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 7/16/2018 9:53:42 AM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 4:07:11 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH =85/15, 1.0 mL/min, 30 oC, 230 nm



Area Percent Report

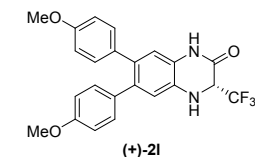
Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	23.091	BB	1.1739	2.67005e4	344.93823	100.0000	

Totals : 2.67005e4 344.93823

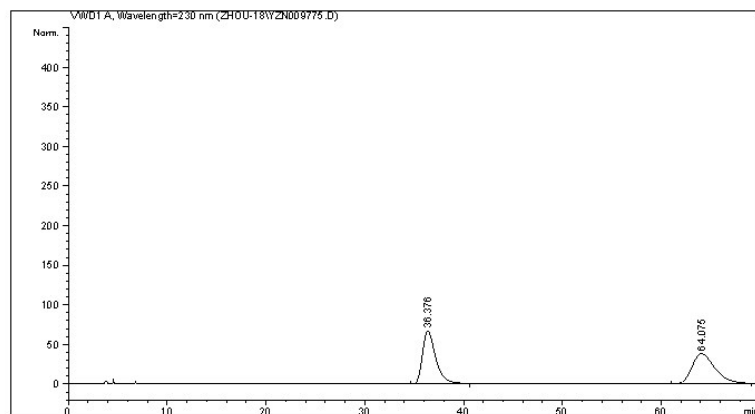
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009775.D
Sample Name: MC-21-6B(+/-)

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 8/18/2018 1:44:20 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 8/18/2018 1:04:09 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 4:18:17 PM
(modified after loading)
Sample Info : OD-3, Hexane/i-PrOH =90/10, 0.8 mL/min, 30 oC, 230 nm



Area Percent Report

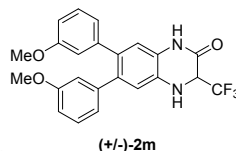
Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	36.376	BB	1.3806	6206.34668	66.64536	50.4333
2	64.075	BB	2.2516	6099.70312	37.81731	49.5667

Totals : 1.23060e4 104.46266

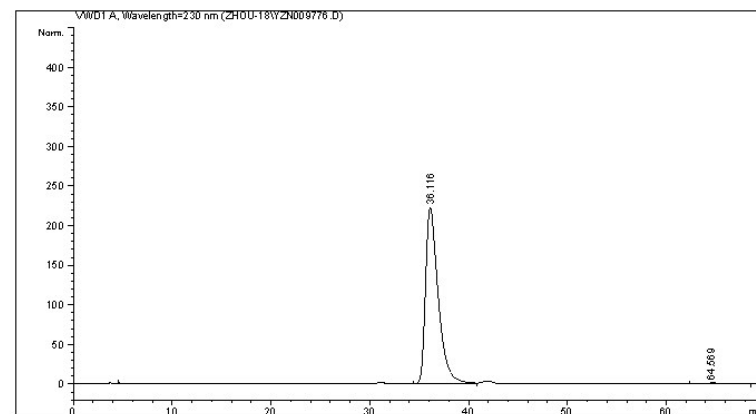
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009776.D
Sample Name: MC-21-6A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 8/18/2018 3:02:08 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 8/18/2018 3:00:43 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 4:18:17 PM
(modified after loading)
Sample Info : OD-3, Hexane/i-PrOH =90/10, 0.8 mL/min, 30 oC, 230 nm



Area Percent Report

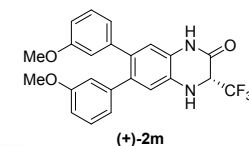
Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	36.116	BB	1.3149	1.99430e4	222.83774	99.1763
2	64.569	BB	1.9350	165.62535	1.00463	0.8237

Totals : 2.01087e4 223.84237

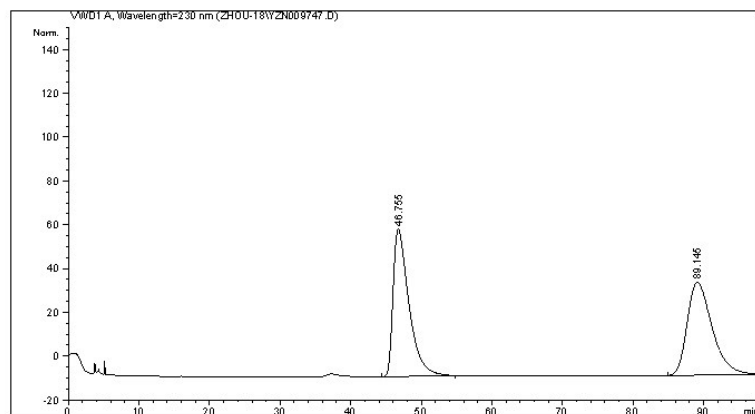
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009747.D
Sample Name: MC-20-101B+-

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 8/16/2018 8:24:52 AM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 8/16/2018 8:02:23 AM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/13/2018 7:31:41 PM
(modified after loading)
Sample Info : OD-3, Hexane/i-PrOH =90/10, 0.8 mL/min, 30 oC, 230 nm



Area Percent Report

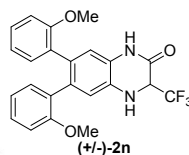
Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	46.755	BB	2.2221	1.05044e4	67.32678	50.3017
2	89.145	BB	3.1938	1.03784e4	42.39584	49.6983

Totals : 2.08828e4 109.72262

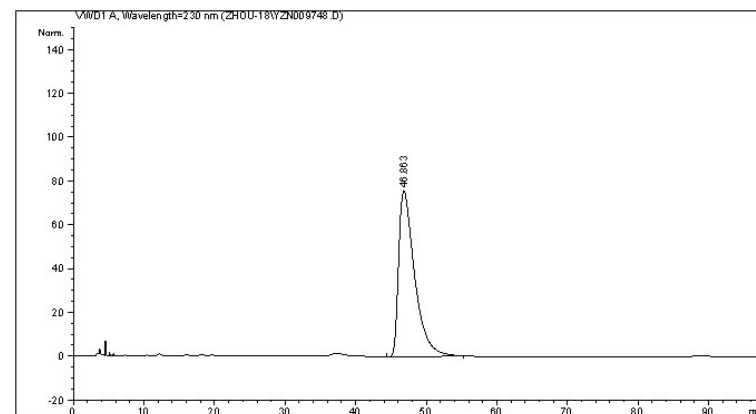
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009748.D
Sample Name: MC-20-101A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 8/16/2018 10:24:06 AM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 8/16/2018 10:02:56 AM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/13/2018 7:31:41 PM
(modified after loading)
Sample Info : OD-3, Hexane/i-PrOH =90/10, 0.8 mL/min, 30 oC, 230 nm



Area Percent Report

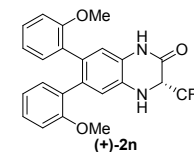
Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	46.863	BB	2.2589	1.19181e4	75.82401	100.0000

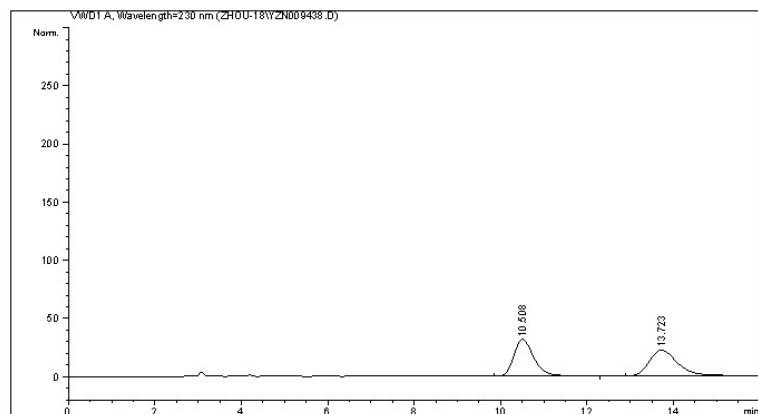
Totals : 1.19181e4 75.82401

*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009438.D
Sample Name: MC-20-77B+-

```
=====
Acq. Operator   :
Acq. Instrument : Instrument 1          Location : -
Injection Date  : 7/23/2018 2:38:42 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed    : 7/23/2018 2:37:16 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 11/12/2018 4:29:23 PM
                  (modified after loading)
Sample Info     : OD-H, Hexane/iPrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm
=====
```



=====
Area Percent Report
=====

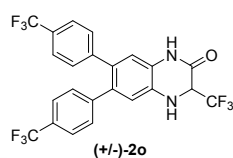
```
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	10.508	BB	0.4956	1015.14679	31.47969	47.7832	
2	13.723	BB	0.7273	1072.69287	22.29696	50.4919	
3	20.054	BB	0.6293	36.64447	7.44897e-1	1.7249	

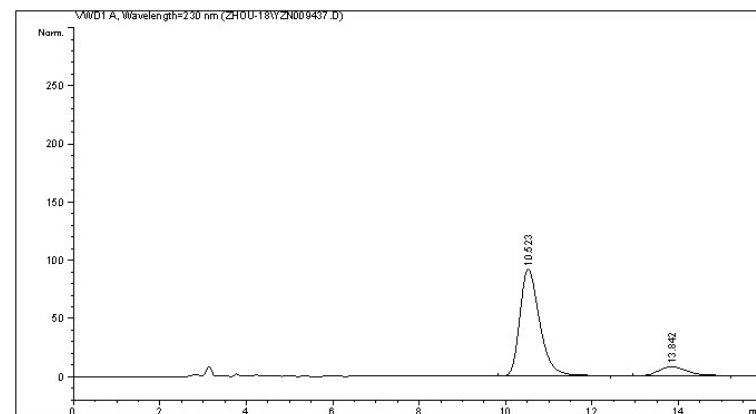
Totals : 2124.48413 54.52155

=====
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009437.D
Sample Name: MC-20-77A

```
=====
Acq. Operator   :
Acq. Instrument : Instrument 1          Location : -
Injection Date   : 7/23/2018 2:08:09 PM
Acq. Method      : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed     : 7/23/2018 2:06:10 PM
                  (modified after loading)
Analysis Method  : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed     : 11/12/2018 4:30:01 PM
                  (modified after loading)
Sample Info      : OD-H, Hexane/iPrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm
=====
```



=====
Area Percent Report
=====

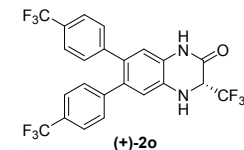
```
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	10.523	BB	0.4885	2924.61206	91.71946	89.3921	
2	13.842	BB	0.7045	347.05426	7.68461	10.6079	

Totals : 3271.66632 99.40407

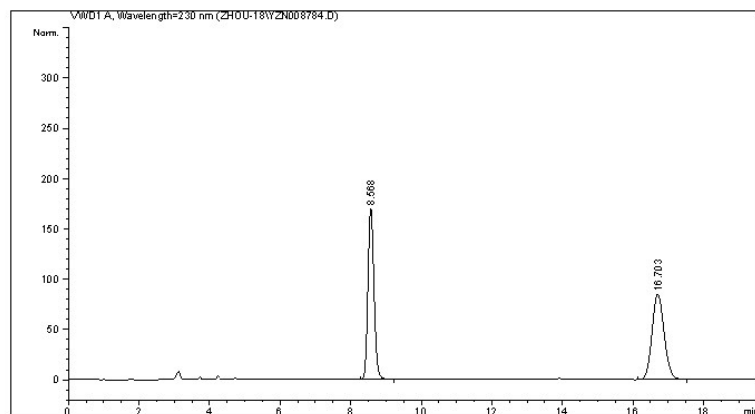
=====
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN008784.D
Sample Name: MC-20-22B+-

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 6/4/2018 2:40:40 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 6/4/2018 2:39:00 PM by
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 3:26:09 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 230 nm



=====

Area Percent Report

=====

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

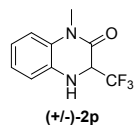
Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	8.568	BB	0.1842	2025.32959	169.93089	49.8896	
2	16.703	BB	0.3723	2034.29395	85.03346	50.1104	

Totals : 4059.62354 254.96436

=====

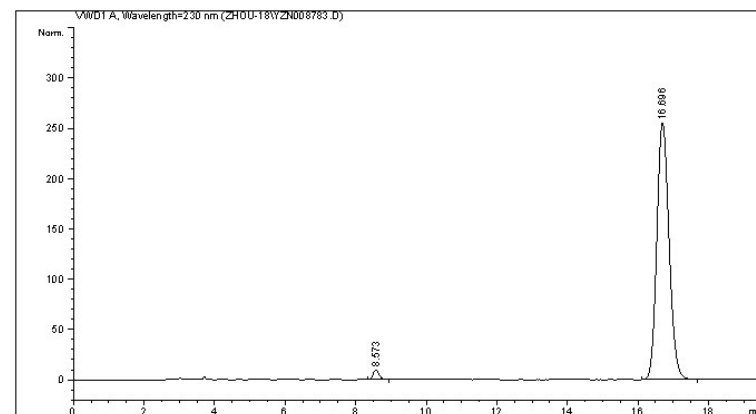
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN008783.D
Sample Name: MC-20-22A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : Vial 1
Injection Date : 6/4/2018 2:19:26 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 6/4/2018 2:17:47 PM by
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/12/2018 3:26:09 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 230 nm



=====

Area Percent Report

=====

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

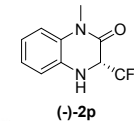
Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	8.573	BB	0.1822	116.32828	9.89644	1.8597	
2	16.696	BB	0.3737	6139.02344	255.35190	98.1403	

Totals : 6255.35172 265.25034

=====

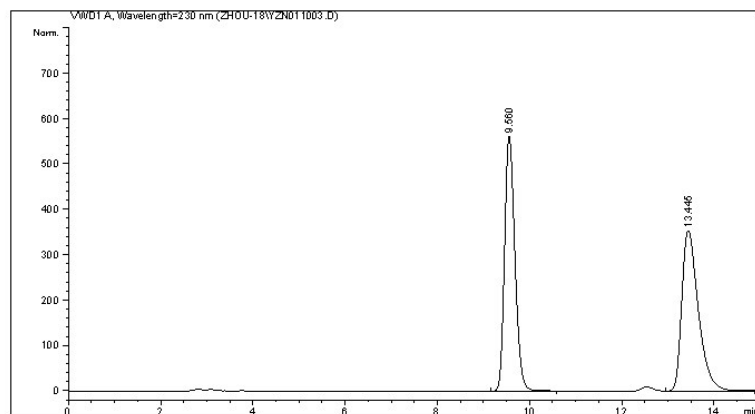
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN011003.D
Sample Name: MC-22-12B+-

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 12/8/2018 4:13:05 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 12/8/2018 3:52:42 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 12/12/2018 6:11:11 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm



Area Percent Report

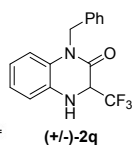
Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	9.560	EB	0.2413	8744.78516	561.85980	49.9368	
2	13.445	VB	0.3780	8766.92773	353.67664	50.0632	

Totals : 1.75117e4 915.53644

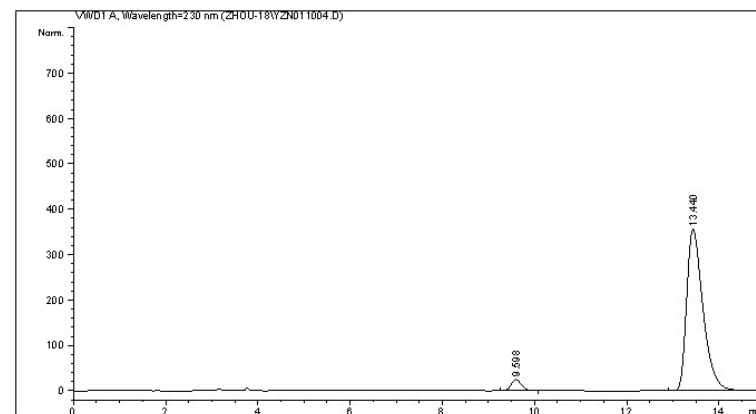
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN011004.D
Sample Name: MC-22-12A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 12/8/2018 4:34:05 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 12/8/2018 4:32:26 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 12/12/2018 6:11:11 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm



Area Percent Report

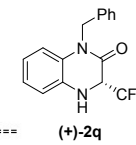
Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height *s	Area [mAU]	Area %
1	9.598	EB	0.2357	380.67886	25.03120	4.1654	
2	13.440	VB	0.3761	8758.33008	355.68436	95.8346	

Totals : 9139.00894 380.71556

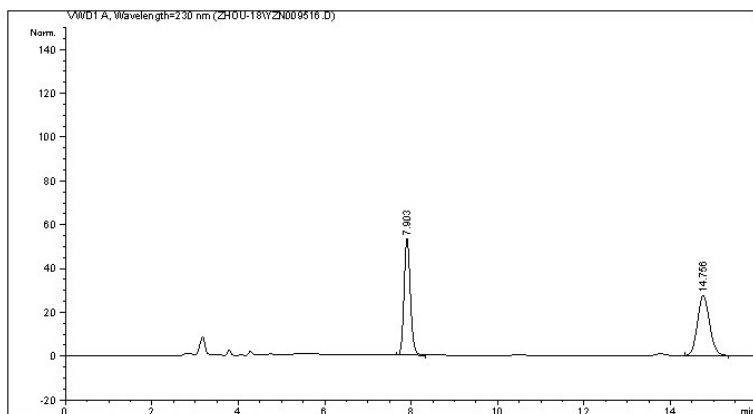
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009516.D
Sample Name: MC-20-81B+-

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 7/28/2018 1:17:52 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 7/28/2018 12:50:54 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/13/2018 7:25:49 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm



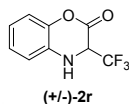
Area Percent Report

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.903	BB	0.1557	536.84174	53.16722	50.2097
2	14.756	BB	0.3013	532.35773	27.35320	49.7903

Totals : 1069.19946 80.52041

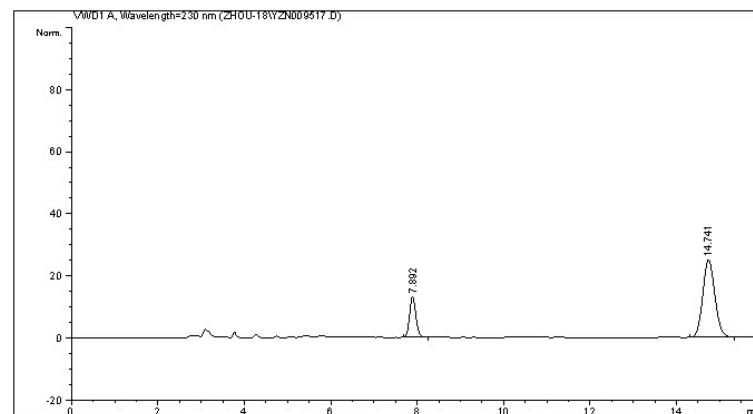


*** End of Report ***

Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009517.D
Sample Name: MC-20-81A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 7/28/2018 1:44:58 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed : 7/28/2018 1:35:37 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/13/2018 7:28:23 PM
(modified after loading)
Sample Info : OD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 230 nm



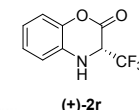
Area Percent Report

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.892	BB	0.1576	133.67540	13.18592	21.5822
2	14.741	BB	0.3012	485.70389	24.96558	78.4178

Totals : 619.37929 38.15150

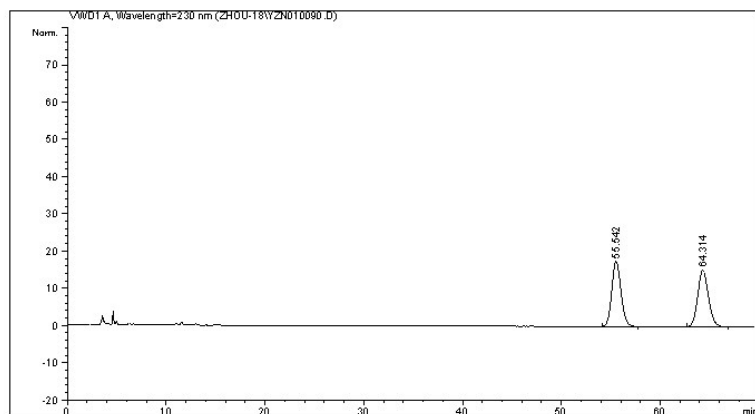


*** End of Report ***

Data File C:\CHEM32\1\DATA\ZHOU-18\YZN010090.D
Sample Name: MC-21-33B+-

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 9/8/2018 4:06:04 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 9/8/2018 4:03:34 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/13/2018 7:35:00 PM
(modified after loading)
Sample Info : 0J-H, Hexane/i-PrOH = 90/10, 0.9 mL/min, 30 oC, 230 nm



Area Percent Report

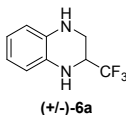
Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	55.542	BB	1.0109	1141.49072	17.51209	49.7695
2	64.314	BB	1.1623	1152.06262	15.22610	50.2305

Totals : 2293.55334 32.73819

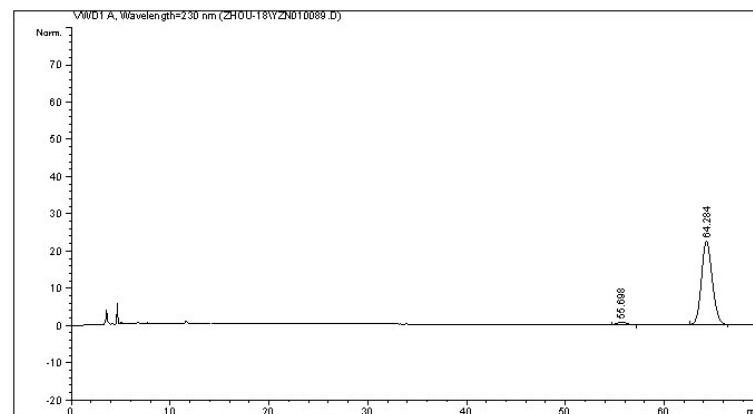
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN010089.D
Sample Name: MC-21-33A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 9/8/2018 2:53:11 PM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 9/8/2018 2:36:28 PM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 11/13/2018 7:50:37 PM
(modified after loading)
Sample Info : 0J-H, Hexane/i-PrOH = 90/10, 0.9 mL/min, 30 oC, 230 nm



Area Percent Report

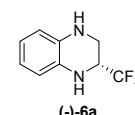
Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	55.698	BB	0.7530	38.89859	6.29460e-1	2.2252
2	64.284	BB	1.1485	1709.18872	22.49501	97.7748

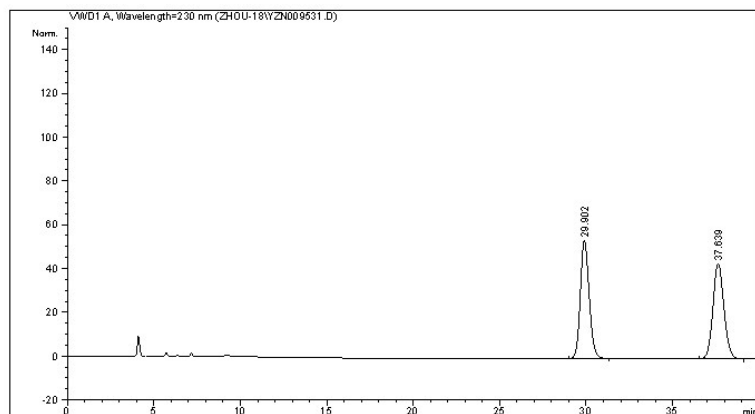
Totals : 1748.08731 23.12447

*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009531.D
Sample Name: MC-20-83

```
=====
Acq. Operator   :
Acq. Instrument : Instrument 1      Location :  -
Injection Date  : 7/29/2018 8:20:47 AM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed    : 7/29/2018 8:02:28 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 11/12/2018 4:36:06 PM
                  (modified after loading)
Sample Info     : 0J-H, Hexane/i-PrOH = 95/5, 30, 0.8 mL/min, 30 oC, 230
                  nm
=====
```



Area Percent Report

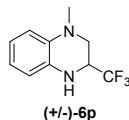
```
=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Area %	Height [mAU]
1	29.902	BB	0.5422	1911.28931	49.9786	53.85464
2	37.639	BB	0.6801	1912.92969	50.0214	43.40989

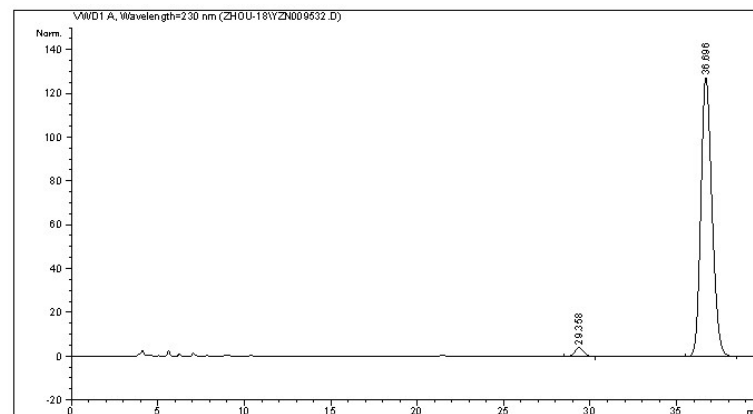
Totals : 3824.21899 97.26453

*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN009532.D
Sample Name: MC-20-73

```
=====
Acq. Operator   :
Acq. Instrument : Instrument 1      Location :  -
Injection Date  : 7/29/2018 9:15:05 AM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC.M
Last changed    : 7/29/2018 9:02:23 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 11/12/2018 4:36:06 PM
                  (modified after loading)
Sample Info     : 0J-H, Hexane/i-PrOH = 95/5, 30, 0.8 mL/min, 30 oC, 230
                  nm
=====
```



Area Percent Report

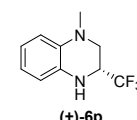
```
=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
=====
```

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Area %	Height [mAU]
1	29.358	VB	0.5559	144.97533	2.4773	4.06493
2	36.696	BB	0.6885	5707.23486	97.5227	127.42167

Totals : 5852.21019 131.48660

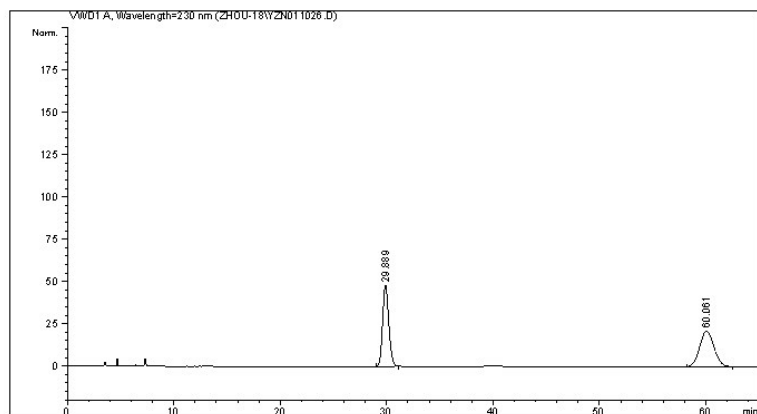
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-18\YZN011026.D
Sample Name: MC-22-15B+-

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 12/10/2018 10:02:18 AM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 12/10/2018 10:02:00 AM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 12/12/2018 6:13:49 PM
(modified after loading)
Sample Info : 0J-H, Hexane/i-PrOH = 90/10, 0.9 mL/min, 30 oC, 230 nm

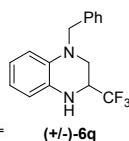


=====
Area Percent Report
=====

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	29.889	BB	0.6307	1950.49744	48.06812	49.9038
2	60.061	BB	1.4025	1958.01819	21.10945	50.0962
Totals :				3908.51562	69.17757	

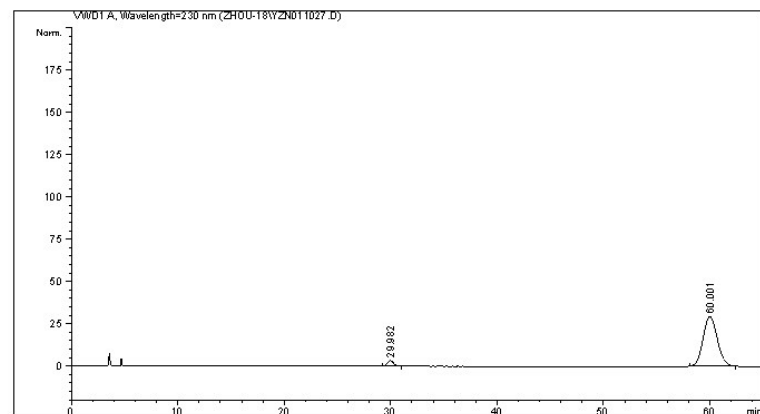


*** End of Report ***

Data File C:\CHEM32\1\DATA\ZHOU-18\YZN011027.D
Sample Name: MC-22-15A

=====

Acq. Operator :
Acq. Instrument : Instrument 1 Location : -
Injection Date : 12/10/2018 11:25:43 AM
Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 12/10/2018 11:19:39 AM
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed : 12/12/2018 6:14:23 PM
(modified after loading)
Sample Info : 0J-H, Hexane/i-PrOH = 90/10, 0.9 mL/min, 30 oC, 230 nm

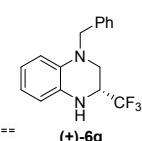


=====
Area Percent Report
=====

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=230 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	29.982	BB	0.5910	136.19583	3.35860	4.7395
2	60.001	BB	1.3946	2737.44604	29.44832	95.2605
Totals :				2873.64188	32.80692	



*** End of Report ***