Electronic Supplementary Material (ESI) for ChemComm.

Supporting Information

Access to 5-Fluoroalkylated Trisubstituted Oxazoles *via* Copper-Catalyzed Cyclization of *α*-Fluoroalkyl-*α*-diazoketones with Amides

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General Experimental Section

Analytic methods. Unless otherwise noted, all reactions were carried out in flame-dried glassware with dry solvents under argon atmosphere using standard Schlenk technique. ^{1}H NMR (400 MHz), ^{19}F (376 MHz) and $^{13}C\{^{1}H\}$ NMR (100 MHz) were recorded on a Bruker AV400 NMR spectrometer. Chemical shifts of ^{1}H, ^{19}F, and $^{13}C\{^{1}H\}$ NMR spectra are reported in parts per million (ppm), and the residual solvent peak was used as an internal reference: proton ($CDCl_3$: δ = 7.26 ppm, DMSO-d_6: δ = 2.50 ppm), carbon ($CDCl_3$: δ = 77.00 ppm, DMSO-d_6: δ = 39.52 ppm). All coupling constants (*J* values) were reported in Hertz (Hz). Multiplicities are reported as follows: singlet (s), doublet (d), doublet of doublets (dd), doublet of doublet of doublets (ddd), doublet of triplets (dt), triplet (t), triplet of doublets (td), quartet (q), broad (s), and multiplet (m). Analytical thin-layer chromatography (TLC) was performed on pre-coated, glass-backed silica gel plates and visualized by UV radiation (254 nm). Column chromatography was performed on silica gel 200-300 mesh. Preparative thin-layer chromatography (TLC) was performed on pre-coated, glass-backed (200 mm*200 mm) silica gel plates with 1mm silica gel 200-300 mesh. HRMS were done on Agilent 6520 Q-TOF LC/MS, Varian 7.0T FTMS or Bruker Solarix scimax MRMS.

General preparation for chemicals. All commercial catalysts, reagents, and solvents were used without additional purification unless otherwise noted.

Important Safety Note

The treatment fluoroalkylated diazo compounds should be carried out in a well-ventilated fume hood. During this study, no accidents occurred when handling these reagents, but readers should be aware of the potentially explosive nature of the fluoroalkylated diazo compounds described in this article. When using fluoroalkylated diazo compounds, general safety precautions should be followed. None of the reactions described in this manuscript should be carried out without a rigorous risk assessment.

X-ray Crystallographic Analysis. All intensity data were collected with a Bruker SMART CCD diffractometer equipped with graphite mono-chromated Mo-Kα radiation (λ = 0.71073 Å). The structures were solved by direct methods and refined by full-matrix least squares on F^2.[1] All non-hydrogen atoms were refined anisotropically. Hydrogen atoms were considered in calculated positions. Single crystals of complexes **3d** and **3x'** suitable for X-ray diffraction were obtained from hexane/CH_2Cl_2 solution. The crystal data and summary of X-ray data collection are presented in Tables S1.

Single crystal X-ray structure of complex 3d and 3x'

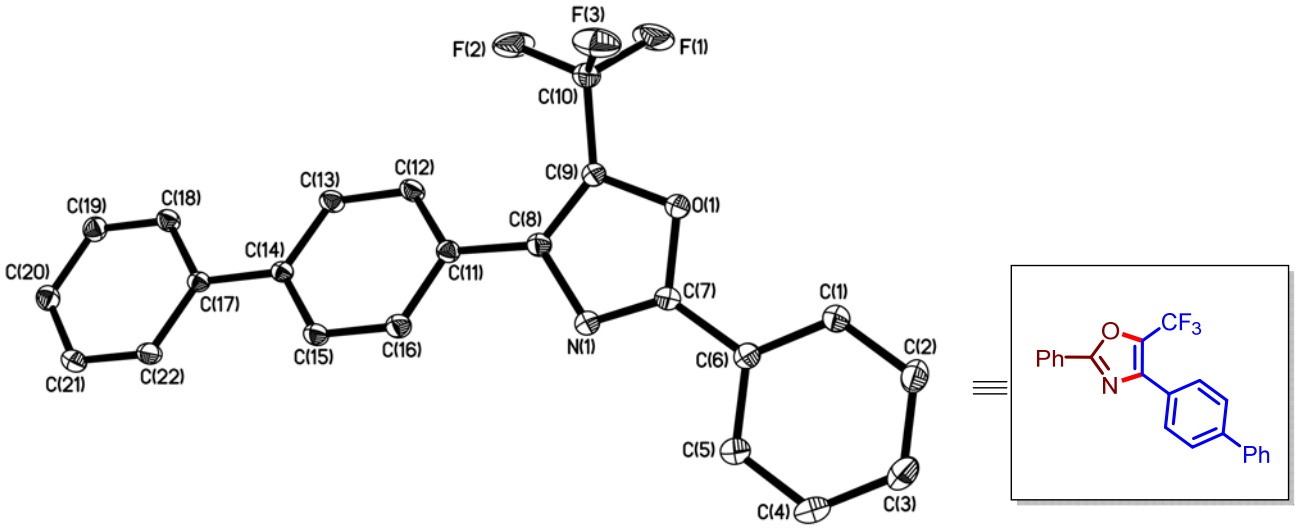


Figure S1. ORTEP diagram of complex **3d**. Thermal ellipsoids are shown at the 30% level. All hydrogen atoms have been omitted for clarity.

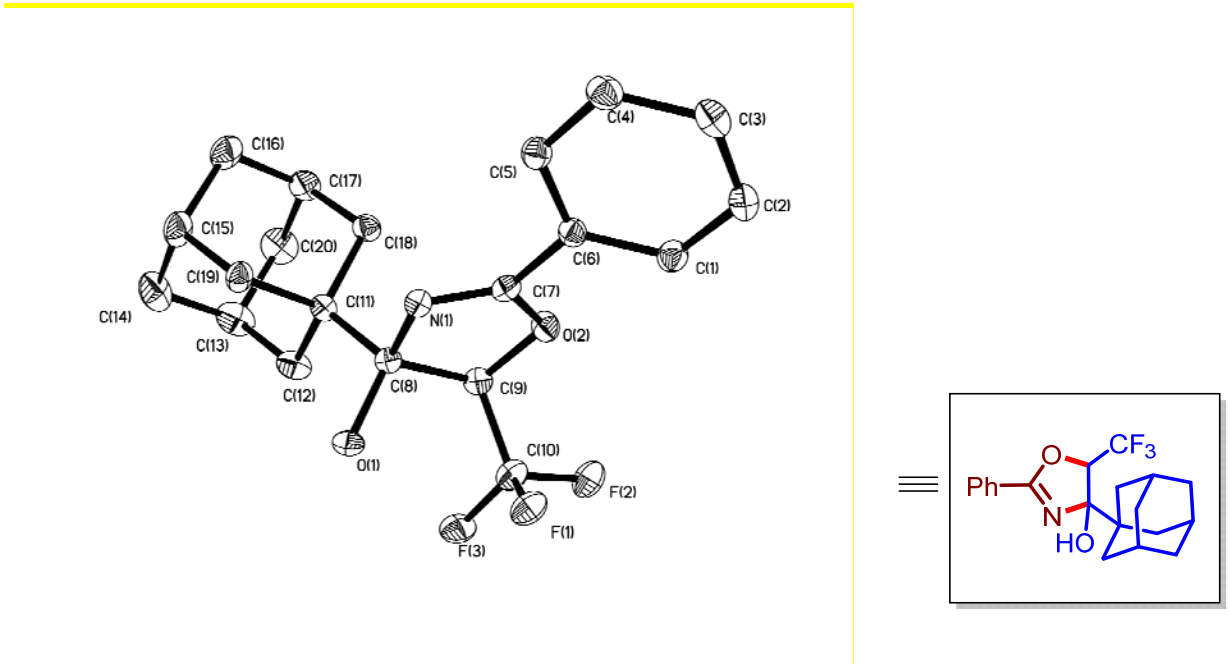


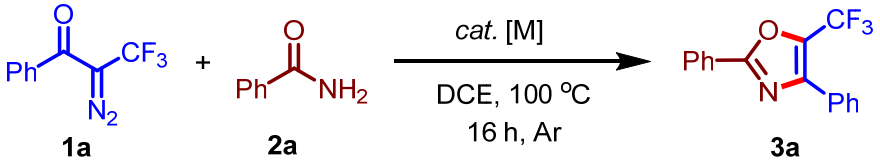
Figure S2. ORTEP diagram of complex **3x'**. Thermal ellipsoids are shown at the 30% level. All hydrogen atoms have been omitted for clarity.

Table S1. Crystal Data and Summary of X-ray Data Collection for 3d and 3x'

Identification code	**3d**	**3x'**
Empirical formula	$C_{22}H_{14}F_3NO$	$C_{20}H_{22}F_3NO_2$
Formula weight	365.34	365.38
Temperature/K	113.15	113.15
Crystal system	triclinic	monoclinic
Space group	P-1	C2/c
a/Å	9.3924(4)	19.3769(11)
b/Å	9.7630(4)	12.2278(6)
c/Å	19.6787(7)	17.2662(10)
α/°	92.407(3)	90
β/°	98.520(3)	99.188(6)
γ/°	108.808(4)	90
Volume/Å^3	1681.51(12)	4038.5(4)
Z	4	8
ρ_{calc}g/cm^3	1.443	1.202
μ/mm^{-1}	0.111	0.096
F(000)	752.0	1536.0
Crystal size/mm	0.22 × 0.2 × 0.15	0.23 × 0.2 × 0.17
max. 2ϑ(°)	65.838	52.738
no. of reflns collected	25482	17252
no. of indep reflns/R_{int}	11257 / 0.0458	4120 / 0.0746
no. of params	516	236
Goodness-of-fit on F^2	1.059	1.099
R_1, wR_2 [$I > 2\sigma(I)$]	0.0613, 0.1473	0.0628, 0.1850
R_1, wR_2 (all data)	0.1059, 0.1810	0.0829, 0.2033

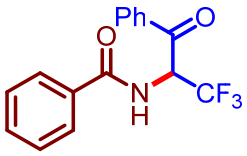
Optimization of the Reaction Conditions

Table S2. Screen of the Transition Metal Catalysts for oxazole synthesis



Entry	[M] (x mol %)	Yield (%)[b]	Entry	[M] (x mol %)	Yield (%)[b]
1	$Rh_2(OAc)_4$ (5)	17[c]	12	$FeCl_2$ (20)	Trace
2	$AgSbF_6$ (20)	92	13	CuCl (20)	33
3	AgOTf (20)	21	14	CuBr (20)	68
4	$AgPF_6$ (20)	77	15	CuI (20)	92
5	$AgNTf_2$ (20)	81	16	CuTc (20)	61
6	AgOMs (20)	11	17	CuOTf·1⁄2Toluene (20)	56
7	$AgBF_4$ (20)	44	18	CuOTf·1⁄2Benzene (20)	43
8	AgOAc (20)	6	19	$CuBr{\cdot}SMe_2$ (20)	74
9	Ag_2CO_3 (20)	32	20	$Cu(MeCN)_4PF_6$ (20)	98
10	$Ni(OTf)_2$ (20)	10	21	$CuBr_2$ (20)	25
11	$FeCl_3$ (20)	Trace	***22***	***$Cu(MeCN)_4PF_6$ (5)***	***98***

[a]Reaction conditions: **1a** (0.2 mmol), **2a** (0.1 mmol, 1.0 equiv), catalyst (x mol %), DCE (1.0 mL), 100 °C, Ar atmosphere, 16 h. [b]The yield was determined by ^{19}F NMR spectroscopy by using $PhCF_3$ as internal standard. [c]The N-H insertion product **4** was formed in 62% NMR yield.

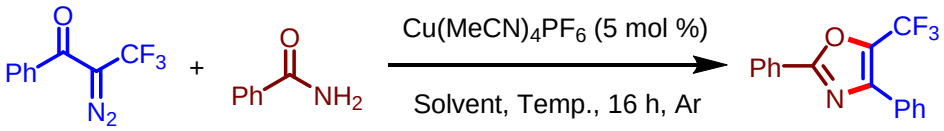


4

***N*-(1,1,1-trifluoro-3-oxo-3-phenylpropan-2-yl)benzamide (4)**

The title compound was obtained as a white solid in 57% yield (17.5 mg); M.p.: 91-94 °C; **^{1}H NMR (DMSO-*d*$_6$, 400 MHz):** δ 9.75 (d, *J* = 8.9 Hz, 1H), 7.98-7.93 (m, 2H), 7.90-7.84 (m, 2H), 7.67 (t, *J* = 7.4 Hz, 1H), 7.61-7.47 (m, 5H), 6.67-6.55 (m, 1H); **^{13}C{^{1}H} NMR (DMSO-*d*$_6$, 100 MHz):** δ 191.65, 167.46, 135.27, 134.89, 133.49, 133.16, 129.64, 129.43, 129.21, 128.61, 124.9 (q, *J* = 282.5 Hz), 55.5 (q, *J* = 28.5 Hz); **^{19}F NMR (DMSO-*d*$_6$, 376 MHz):** δ -65.1 (d, *J* = 8.2 Hz); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{16}H_{12}F_3NNaO_2$ 330.0712, Found: 330.0714.

Table S3. Screen of the Reaction Conditions for oxazole synthesis



1a **2a** **3a**

Entry	Solvent	Temp. (°C)	Yield (%)[b]
1	***DCE***	***100***	***98 (98)[c]***
2	THF	100	0
3	TFE	100	11
4	EtOAc	100	59
5	Toluene	100	86
6	H_2O	100	0
7	DCE	80	87
8[d]	***DCE***	***100***	***(97)[c]***

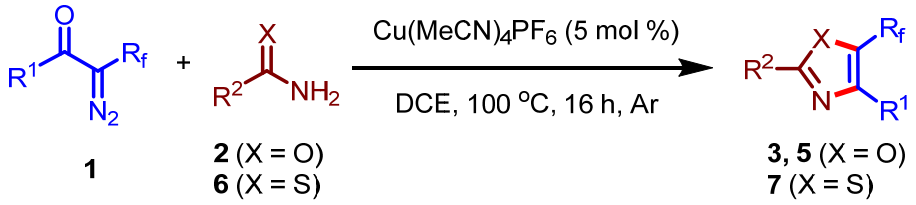
[a]Reaction conditions: **1a** (0.2 mmol, 2.0 equiv), **2a** (0.1 mmol, 1.0 equiv), $Cu(MeCN)_4PF_6$ (5 mol %), solvent (1.0 mL), Temp., Ar atmosphere, 16 h. [b]The yield was determined by ^{19}F NMR spectroscopy by using $PhCF_3$ as internal standard. [c]Value in parentheses indicates isolated yield. [d]2.0 mmol scale.

Results and Discussion of the Optimization of Reaction Conditions

We commenced the optimization experiments by treatment of fluoroalkylated diazo **1a** with benzamide **2a** in 1,2-dichloroethane (DCE) at 100 ^{o}C under various metal complexes catalysis. As anticipated, the utilization of $Rh(OAc)_2$ as catalyst produced the N-H insertion complex **4a** as the predominant product along with small amount of the desired 2,4-diphenyl-5-(trifluoromethyl)oxazole **3a** (Table S2, entry 1). In contrast, $AgSbF_6$ successfully promoted the reaction to deliver **3a** as the sole product in 92% NMR yield (Table S2, entry 2). Further exploration of other metal catalysts revealed that copper salts also effectively enhance this transformation (Table S2, entries 3-21). An evaluation of the copper sources identified $Cu(MeCN)_4PF_6$ as the optimal catalyst, thus allowing a lower catalyst loading (5 mol %) while maintaining high catalytic activity (Table S2, entry 22). The choice of DCE as solvent was superior to THF, TFE, EtOAc, toluene, and H_2O (Table S3, entries 2-6). The reaction efficiency was also sensitive to the reaction temperatures (Table S3, entry 7). Importantly, the optimal conditions were applicable to a scale up to 2 mmol of **2a**, furnishing **3a** in 97% isolated yield (Table S3, entry 8).

General Procedure:

Synthesis of 5-Fluoroalkylated Trisubstituted Oxazoles and Thiazoles



1

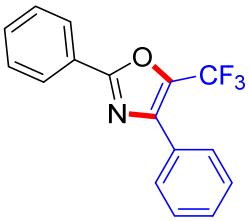
2 (X = O)
6 (X = S)

3, 5 (X = O)
7 (X = S)

A mixture of diazo compounds **1** (0.2 mmol), amides **2** or thioamide **6** (0.1 mmol), $Cu(MeCN)_4PF_6$ (1.9 mg, 0.005 mmol, 5.0 mol %), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (1 mL) was added and the resulting mixture was stirred at 100 °C for 16 h using heating modular of parallel reactor under Ar atmosphere. The reaction was then cooled to room temperature. The suspension was filtered through a short column filled with celite and the solvent was removed in vacuo, and the residue was purified by preparative thin-layer chromatography (TLC) with petroleum ether: ethyl acetate = 50:1 (v/v) to give the final products.

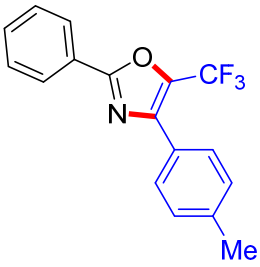
Characterization of Products 3, 5, and 7

2,4-diphenyl-5-(trifluoromethyl)oxazole (3a)



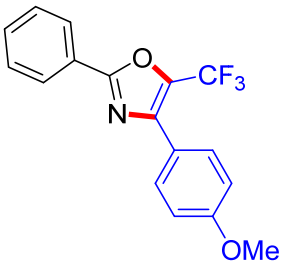
The title compound was obtained as a white solid in 98% yield (28.3 mg) by following the general procedure; M.p.: 48-50 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.16 (dd, *J* = 7.6, 1.7 Hz, 2H), 7.80-7.79 (m, 2H), 7.57-7.44 (m, 6H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 161.7, 142.5 (q, *J* = 2.6 Hz), 133.5 (q, *J* = 42.6 Hz), 131.6, 129.6, 129.3, 128.9, 128.6, 128.5 (br s), 127.1, 126.0, 119.8 (q, *J* = 267.9 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1 (s). This product has been previously reported and spectral data are in agreement with those reported in the literature.[2]

2-phenyl-4-(p-tolyl)-5-(trifluoromethyl)oxazole (3b)



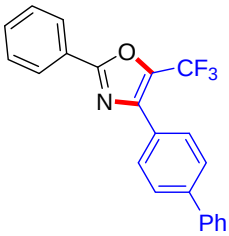
The title compound was obtained as a white solid in 89% yield (26.8 mg) by following the general procedure; M.p.: 61-63 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.18-8.15 (m, 2H), 7.69 (d, *J* = 8.1 Hz, 2H), 7.54-7.49 (m, 3H), 7.30 (d, *J* = 7.9 Hz, 2H), 2.43 (s, 3H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 161.5, 142.5 (q, *J* = 2.6 Hz), 139.7, 133.1 (q, *J* = 42.7 Hz), 131.5, 129.3, 128.9, 128.3 (q, *J* = 1.7 Hz), 127.1, 126.4, 126.1, 119.9 (q, *J* = 267.8 Hz), 21.4; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1; **HRMS (ESI)** m/z: $[M+H]^+$ $C_{17}H_{13}F_3NO$ 304.0944, Found: 304.0952.

4-(4-methoxyphenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3c)



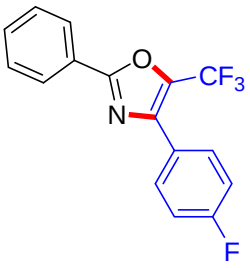
The title compound was obtained as a white solid in 98% yield (31.2 mg) by following the general procedure; M.p.: 70-72°C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.15 (dd, *J* = 7.8, 1.8 Hz, 2H), 7.74 (d, *J* = 8.8 Hz, 2H), 7.56-7.48 (m, 3H), 7.02-6.99 (m, 2H), 3.87 (s, 3H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 161.5, 160.6, 142.3 (q, *J* = 2.6 Hz), 132.7 (q, *J* = 42.6 Hz), 131.5, 129.9 (q, *J* = 1.8 Hz), 128.9, 127.1, 126.1, 121.8, 120.0 (q, *J* = 267.8 Hz), 114.1, 55.3; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1. This product has been previously reported and spectral data are in agreement with those reported in the literature.[2]

4-([1,1'-biphenyl]-4-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3d)



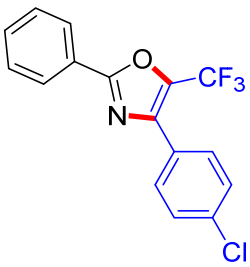
The title compound was obtained as a white solid in 91% yield (33.3 mg) by following the general procedure; M.p.: 124-127 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.21-8.18 (m, 2H), 7.89 (d, J = 8.3 Hz, 2H), 7.75-7.72 (m, 2H), 7.68-7.66 (m, 2H), 7.56-7.47 (m, 5H), 7.43-7.38 (m, 1H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.7, 142.3, 142.1 (q, *J* = 2.3 Hz), 140.3, 133.5 (q, *J* = 43.4 Hz), 131.6, 128.93, 128.86, 128.2, 127.7, 127.3, 127.1, 126.0, 119.9 (q, *J* = 267.7 Hz) (two signals missing due to overlap); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.0 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{22}H_{15}F_3NO$ 366.1100, Found: 366.1101.

4-(4-fluorophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3e)



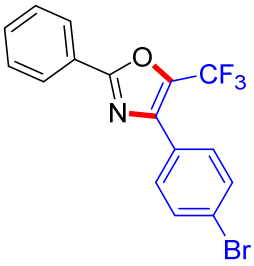
The title compound was obtained as a white solid in 82% yield (25.2 mg) by following the general procedure; M.p.: 67-69 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.14 (dd, *J* = 7.6, 1.8 Hz, 2H), 7.78 (dd, *J* = 8.6, 5.4 Hz, 2H), 7.57-7.49 (m, 3H), 7.18 (t, *J* = 8.7 Hz, 2H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 163.5 (d, *J* = 250.0 Hz), 161.7, 141.5 (q, *J* = 2.7 Hz), 133.3 (q, *J* = 43.6 Hz), 131.7, 130.4 (d, *J* = 8.4 Hz), 129.0, 127.1, 125.9, 125.5 (d, *J* = 2.8 Hz), 119.8 (q, *J* = 267.7 Hz), 115.7 (d, *J* = 21.9 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2 (s, CF_3), -111.1 (s, F); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}F_4NO$ 308.0693, Found: 308.0692.

4-(4-chlorophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3f)



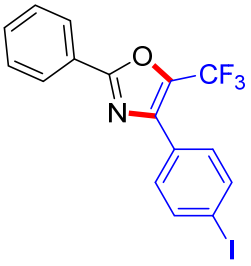
The title compound was obtained as a white solid in 84% yield (27.0 mg) by following the general procedure; M.p.: 73-75 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.16-8.13 (m, 2H), 7.73 (d, *J* = 8.5 Hz, 2H), 7.57-7.49 (m, 3H), 7.48-7.44 (m, 2H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.8, 141.3 (q, *J* = 2.5 Hz), 135.7, 133.6 (q, *J* = 42.4 Hz), 131.8, 129.7 (q, *J* = 1.8 Hz), 129.0, 128.9, 127.8, 127.1, 125.8, 119.7 (q, *J* = 267.9 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2; **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}ClF_3NO$ 324.0398, Found: 324.0399.

4-(4-bromophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3g)



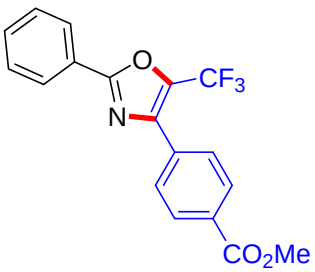
The title compound was obtained as a white solid in 91% yield (33.6 mg) by following the general procedure; M.p.: 70-72 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.16-8.11 (m, 2H), 7.67-7.60 (m, 4H), 7.57-7.50 (m, 3H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ161.8, 141.4 (q, *J* = 2.4 Hz), 133.7 (q, *J* = 42.7 Hz), 131.84, 131.76, 130.0 (q, *J* = 1.6 Hz), 129.0, 128.2, 127.1, 125.8, 124.0, 119.7 (q, *J* = 268.1 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2; This product has been previously reported and spectral data are in agreement with those reported in the literature.[2]

4-(4-iodophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3h)



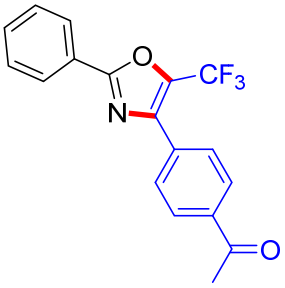
The title compound was obtained as a white solid in 94% yield (38.9 mg) by following the general procedure; M.p.: 80-82 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.15-8.12 (m, 2H), 7.84-7.81 (m, 2H), 7.57-7.49 (m, 5H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 161.8, 141.5 (q, *J* = 2.4 Hz), 137.8, 133.7 (q, *J* = 43.4 Hz), 131.8, 130.0 (q, *J* = 1.9 Hz), 129.0, 128.8, 127.1, 125.8, 119.7 (q, *J* = 268.6 Hz), 95.9; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}F_3INO$ 415.9754, Found: 415.9758.

methyl 4-(2-phenyl-5-(trifluoromethyl)oxazol-4-yl)benzoate (3i)



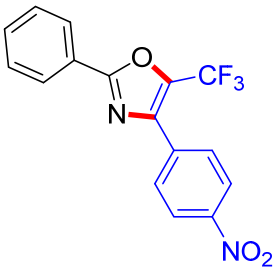
The title compound was obtained as a white solid in 97% yield (33.5 mg) by following the general procedure; M.p.: 110-102 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.16-8.12 (m, 4H), 7.86 (d, *J* = 8.3 Hz, 2H), 7.58-7.50 (m, 3H), 3.96 (s, 3H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 166.5, 161.9, 141.4 (q, *J* = 2.2 Hz), 134.3 (q, *J* = 42.9 Hz), 133.5, 131.8, 131.0, 129.8, 129.0, 128.4 (q, *J* = 1.8 Hz), 127.1, 125.8, 119.6 (q, *J* = 268.3 Hz), 52.3; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{18}H_{13}F_3NO_3$ 348.0842, Found: 348.0845.

1-(4-(2-phenyl-5-(trifluoromethyl)oxazol-4-yl)phenyl)ethan-1-one (3j)



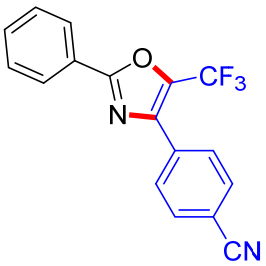
The title compound was obtained as a white solid in 81% yield (26.8 mg) by following the general procedure; M.p.: 73-75 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.17-8.14 (m, 2H), 8.08-8.05 (m, 2H), 7.89 (d, *J* = 8.4 Hz, 2H), 7.56-7.50 (m, 3H), 2.65 (s, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 197.5, 161.9, 141.3 (q, *J* = 2.5 Hz), 137.6, 134.3 (q, *J* = 42.6 Hz), 133.7, 131.9, 129.0, 128.7 (q, *J* = 1.9 Hz), 128.5, 127.2, 125.7, 119.6 (q, *J* = 268.4 Hz), 26.7; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{18}H_{13}F_3NO_2$ 332.0893, Found: 332.0895.

4-(4-nitrophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3k)



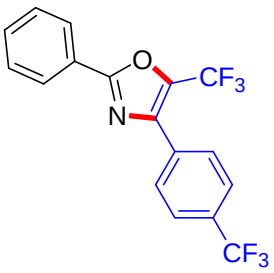
The title compound was obtained as a white solid in 95% yield (31.7 mg) by following the general procedure; M.p.: 125-127 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.35-8.31 (m, 2H), 8.16-8.13 (m, 2H), 7.97 (d, *J* = 8.8 Hz, 2H), 7.58-7.51 (m, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 162.2, 148.3, 140.2 (q, *J* = 2.7 Hz), 135.4, 134.9 (q, *J* = 43.4 Hz), 132.1, 129.3 (q, *J* = 1.4 Hz), 129.1, 127.2, 125.5, 123.8, 119.4 (q, *J* = 268.4 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}F_3N_2O_3$ 335.0638, Found: 335.0636.

4-(2-phenyl-5-(trifluoromethyl)oxazol-4-yl)benzonitrile (3l)



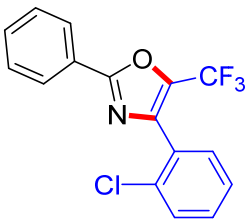
The title compound was obtained as a white solid in 72% yield (22.6 mg) by following the general procedure; M.p.: 119-125 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.16-8.13 (m, 2H), 7.91 (d, *J* = 8.4 Hz, 2H), 7.80-7.76 (m, 2H), 7.59-7.51 (m, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 162.1, 140.5 (q, *J* = 2.4 Hz), 134.6 (q, *J* = 37.8 Hz), 133.6, 132.4, 132.0, 129.1, 127.2, 125.5, 119.4 (q, *J* = 268.5 Hz), 118.3, 113.2 (one signal missing due to overlap); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{10}F_3N_2O$ 315.0740, Found: 315.0742.

2-phenyl-5-(trifluoromethyl)-4-(4-(trifluoromethyl)phenyl)oxazole (3m)



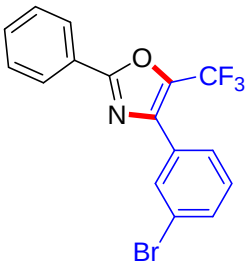
The title compound was obtained as a white solid in 71% yield (25.4 mg) by following the general procedure; M.p.: 47-49 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.17-8.14 (m, 2H), 7.91 (d, *J* = 8.2 Hz, 2H), 7.75 (d, *J* = 8.2 Hz, 2H), 7.57-7.50 (m, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 162.0, 141.0 (d, *J* = 2.0 Hz), 134.3 (d, *J* = 43.2 Hz), 132.8, 131.9, 131.5 (d, *J* = 33.1 Hz), 129.0, 128.8, 127.2, 125.7, 125.6 (d, *J* = 3.7 Hz), 123.9 (q, *J* = 272.0 Hz), 119.6 (q, *J* = 268.7 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2 (s), -62.8 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{10}F_6NO$ 358.0661, Found: 358.0662.

4-(2-chlorophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3n)



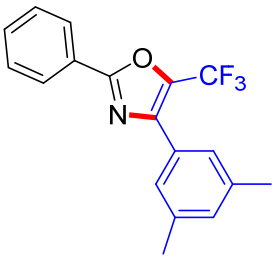
The title compound was obtained as a colorless oil in 98% yield (31.6 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.15 (d, *J* = 7.7 Hz, 2H), 7.58-7.49 (m, 4H), 7.48-7.35 (m, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 162.2, 139.8 (q, *J* = 2.4 Hz), 135.5 (q, *J* = 42.4 Hz), 133.9, 131.8, 131.5, 130.9, 129.9, 129.0, 128.8, 127.2, 126.7, 125.9, 119.1 (q, *J* = 268.4 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -62.1 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}ClF_3NO$ 324.0398, Found: 324.0397.

4-(3-bromophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3o)



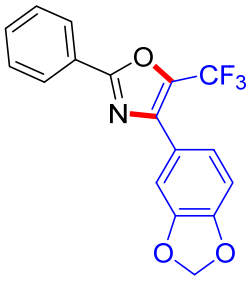
The title compound was obtained as a white solid in 84% yield (30.8 mg) by following the general procedure; M.p.: 62-64 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.14 (dd, *J* = 7.4, 1.6 Hz, 2H), 7.98 (s, 1H), 7.69 (d, *J* = 7.8 Hz, 1H), 7.60-7.49 (m, 4H), 7.35 (t, *J* = 7.9 Hz, 1H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.8, 140.9 (q, *J* = 2.8 Hz), 133.9 (q, *J* = 42.9 Hz), 132.6, 131.8, 131.4, 131.3, 130.1, 129.0, 127.1, 127.0 (q, *J* = 1.8 Hz), 125.8, 122.7, 119.6 (q, *J* = 268.1 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}BrF_3NO$ 367.9892, Found: 367.9894.

4-(3,5-dimethylphenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3p)



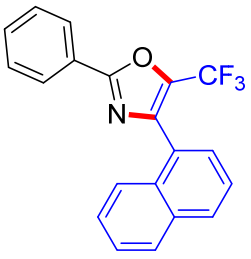
The title compound was obtained as a white solid in 88% yield (27.9 mg) by following the general procedure; M.p.:71-73 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.22-8.11 (m, 2H), 7.58-7.47 (m, 3H), 7.40 (s, 2H), 7.10 (s, 1H), 2.41 (s, 3H), 2.40 (s, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.5, 142.7 (q, *J* = 2.5 Hz), 138.2, 133.3 (q, *J* = 42.5 Hz), 131.5, 131.3, 129.1, 128.9, 127.1, 126.2 (q, *J* = 1.5 Hz), 126.1, 119.8 (q, *J* = 268.0 Hz), 21.3; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.0 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{18}H_{15}F_3NO$ 318.1100, Found: 318.1098.

4-(benzo[d][1,3]dioxol-5-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3q)



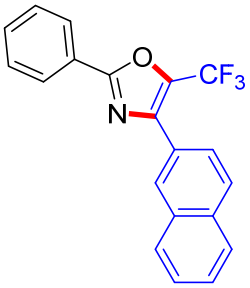
The title compound was obtained as a white solid in 90% yield (29.9 mg) by following the general procedure; M.p.: 80-82 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.13 (dd, *J* = 7.8, 1.7 Hz, 2H), 7.55-7.47 (m, 3H), 7.30 (dd, *J* = 8.1, 1.6 Hz, 1H), 7.27-7.25 (m, 1H), 6.90 (d, *J* = 8.1 Hz, 1H), 6.02 (s, 2H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.4, 148.8, 147.9, 142.1 (q, *J* = 2.3 Hz), 132.8 (q, *J* = 42.7 Hz), 131.6, 128.9, 127.1, 126.0, 123.1, 122.8 (q, *J* = 1.6 Hz), 119.9 (q, *J* = 267.8 Hz), 108.8, 108.5, 101.4; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.0 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{11}F_3NO_3$ 334.0686, Found: 334.0685.

4-(naphthalen-1-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3r)



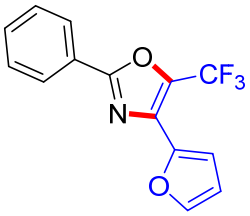
The title compound was obtained as a white solid in 97% yield (32.9 mg) by following the general procedure; M.p.: 67-69 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.21 (dd, *J* = 7.7, 1.8 Hz, 2H), 7.99 (d, *J* = 7.4 Hz, 2H), 7.95-7.92 (m, 1H), 7.60 (d, *J* = 6.5 Hz, 1H), 7.57-7.51 (m, 6H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 162.1, 141.8 (q, *J* = 2.3 Hz), 135.7 (q, *J* = 42.2 Hz), 133.7, 131.8, 131.6, 130.2, 129.0, 128.5, 128.4, 127.2, 126.8, 126.6, 126.3, 126.0, 125.3, 124.9, 119.5 (q, *J* = 268.3 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.9 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{20}H_{13}F_3NO$ 340.0944, Found: 340.0943.

4-(naphthalen-2-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3s)



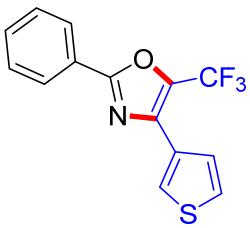
The title compound was obtained as a white solid in 82% yield (27.7 mg) by following the general procedure; M.p.: 107-109 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.32 (s, 1H), 8.20 (dd, *J* = 7.3, 2.0 Hz, 2H), 7.96 (d, *J* = 8.7 Hz, 2H), 7.91-7.87 (m, 2H), 7.58-7.51 (m, 5H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.7, 142.5 (q, *J* = 2.8 Hz), 133.72 (q, *J* = 42.6 Hz), 133.65, 133.0, 131.7, 129.0, 128.6, 128.4, 128.3, 127.7, 127.2, 127.0, 126.7, 126.6, 126.0, 125.5, 119.9 (q, *J* = 267.9 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -59.9 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{20}H_{13}F_3NO$ 340.0944, Found: 340.0947.

4-(furan-2-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3t)



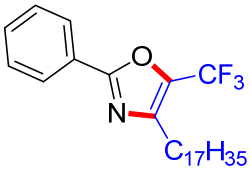
The title compound was obtained as a white solid in 98% yield (27.4 mg) by following the general procedure; M.p.: 83-85 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.14 (dd, *J* = 7.7, 1.7 Hz, 2H), 7.60 (d, *J* = 1.0 Hz, 1H), 7.56-7.48 (m, 3H), 6.98 (d, *J* = 3.4 Hz, 1H), 6.55 (dd, *J* = 3.4, 1.8 Hz, 1H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.9, 144.2, 144.0, 133.5 (q, *J* = 4.8 Hz), 132.3 (q, *J* = 43.8 Hz), 131.8, 128.9, 127.2, 125.7, 119.5 (q, *J* = 267.9 Hz), 111.9 (q, *J* = 2.2 Hz), 111.7; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.7 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{14}H_9F_3NO_2$ 280.0580, Found: 280.0582.

2-phenyl-4-(thiophen-3-yl)-5-(trifluoromethyl)oxazole (3u)



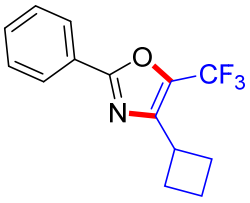
The title compound was obtained as a white solid in 80% yield (23.6 mg) by following the general procedure; M.p.: 101-103 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.16-8.13 (m, 2H), 7.87 (dd, *J* = 3.0, 1.2 Hz, 1H), 7.56-7.49 (m, 4H), 7.42 (dd, *J* = 5.1, 3.0 Hz, 1H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.5, 137.9 (q, *J* = 2.8 Hz), 132.5 (q, *J* = 43.0 Hz), 131.6, 130.1, 128.9, 127.14 (q, *J* = 2.4 Hz), 127.10, 126.3, 126.1 (q, *J* = 2.4 Hz), 125.9, 119.8 (q, *J* = 267.8 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{14}H_9F_3NOS$ 296.0351, Found: 296.0354.

4-heptadecyl-2-phenyl-5-(trifluoromethyl)oxazole (3v)



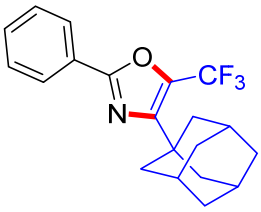
The title compound was obtained as a white solid in 62% yield (27.9 mg) by following the general procedure; M.p.: 116-118 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.07 (dd, *J* = 7.8, 1.7 Hz, 2H), 7.53-7.45 (m, 3H), 2.71-2.67 (m, 2H), 1.78-1.64 (m, 3H), 1.33-1.25 (br s, 27H), 0.88 (t, *J* = 6.8 Hz, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.9, 144.0 (q, *J* = 2.1 Hz), 134.0 (q, *J* = 41.8 Hz), 131.4, 128.9, 127.0, 126.3, 120.0 (q, *J* = 267.1 Hz), 31.9, 29.69, 29.65, 29.61, 29.5, 29.36, 29.28, 29.1, 28.7, 26.1, 22.7, 14.1 (five signals missing due to overlap); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -61.3 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{27}H_{41}F_3NO$ 452.3135, Found: 452.3136.

4-cyclobutyl-2-phenyl-5-(trifluoromethyl)oxazole (3w)



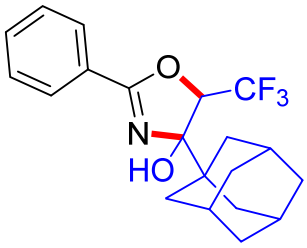
The title compound was obtained as a colorless oil in 64% yield (17.1 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.12-8.08 (m, 2H), 7.53-7.46 (m, 3H), 3.75-3.67 (m, 1H), 2.54-2.44 (m, 2H), 2.33-2.25 (m, 2H), 2.13-1.95 (m, 2H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):**δ 161.8, 146.3 (q, *J* = 2.2 Hz), 132.5 (q, *J* = 42.3 Hz), 131.3, 128.8, 127.0, 126.4, 119.9 (q, *J* = 266.6 Hz), 30.9, 27.8, 18.7; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -61.1 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{14}H_{13}F_3NO$ 268.0944, Found: 268.0947.

4-(adamantan-1-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3x)



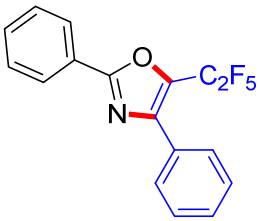
The title compound was obtained as a white solid in 37% yield (13.0 mg) by following the general procedure; M.p.: 71-75 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.9-8.03 (m, 2H), 7.51-7.44 (m, 3H), 2.09 (br s, 3H), 2.07 (br s, 6H), 1.79 (br s, 6H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 159.9, 151.7 (q, *J* = 2.4 Hz), 133.5 (q, *J* = 42.7 Hz), 131.1, 128.8, 126.9, 126.5, 120.1 (q, *J* = 267.7 Hz), 40.9, 36.6, 34.5, 28.4; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -56.0 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{20}H_{21}F_3NO$ 348.1570, Found: 348.1569.

4-(adamantan-1-yl)-2-phenyl-5-(trifluoromethyl)-4,5-dihydrooxazol-4-ol (3x')



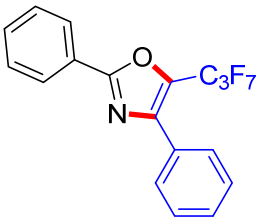
The title compound was obtained as a white solid in 29% yield (10.6 mg) by following the general procedure; M.p.: 140-142 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.01 (d, *J* = 7.3 Hz, 2H), 7.55 (t, *J* = 7.5 Hz, 1H), 7.45 (t, *J* = 7.6 Hz, 2H), 4.81 (q, *J* = 7.0 Hz, 1H), 3.33 (br s, 1H), 2.02 (br s, 3H), 1.72 (t, *J* = 11.4 Hz, 6H), 1.63-1.60 (m, 6H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 163.0, 132.5, 128.9, 128.5, 125.8, 123.1 (q, *J* = 281.2 Hz), 104.0, 76.7 (q, *J* = 30.2 Hz), 40.3, 36.8, 35.2, 27.9; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -72.2 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{20}H_{23}F_3NO_2$ 366.1675, Found: 366.1674.

5-(perfluoroethyl)-2,4-diphenyloxazole (3y)



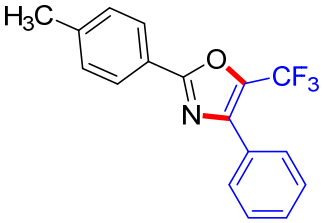
The title compound was obtained as a colorless oil in 84% yield (28.5 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.15 (dd, *J* = 9.2, 1.7 Hz, 2H), 7.77-7.75 (m, 2H), 7.57-7.47 (m, 6H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 162.6, 145.1, 132.2 (t, *J* = 34.5 Hz), 131.7, 129.6, 129.5, 129.0, 128.8 (t, *J* = 2.6 Hz), 128.5, 127.1, 126.0, 118.7 (qt, *J* = 286.8, 37.9 Hz), 109.8 (tq, *J* = 252.9, 40.5 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -83.6 (d, *J* = 7.2 Hz, CF_3), -111.5 (br s, CF_2). This product has been previously reported and spectral data are in agreement with those reported in the literature.[3]

5-(perfluoropropyl)-2,4-diphenyloxazole (3z)



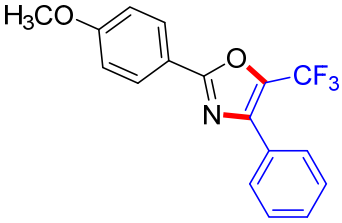
The title compound was obtained as a white solid in 79% yield (30.7 mg) by following the general procedure; M.p.: 45-49 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.16 (dd, *J* = 7.8, 1.6 Hz, 2H), 7.77-7.75 (m, 2H), 7.59-7.44 (m, 6H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 162.8, 145.4, 132.2 (t, *J* = 34.4 Hz), 131.7, 129.6, 129.0, 128.9 (br s), 128.4, 127.1, 125.9, 119.6-105.6 (m, 3C) (one signal mssing due to ovlap); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -80.3 (t, *J* = 9.4 Hz, CF_3), -109.2 (q, *J* = 9.3 Hz, CF_2), -126.1 (br s, CF_2). This product has been previously reported and spectral data are in agreement with those reported in the literature.[3]

4-phenyl-2-(p-tolyl)-5-(trifluoromethyl)oxazole (5a)



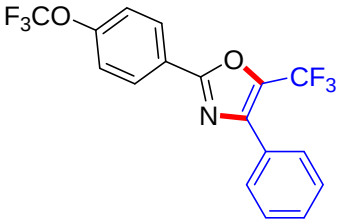
The title compound was obtained as a white solid in 98% yield (29.7 mg) by following the general procedure; M.p.: 72-74 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.04 (d, *J* = 8.2 Hz, 2H), 7.79-7.75 (m, 2H), 7.51-7.43 (m, 3H), 7.32 (d, *J* = 8.0 Hz, 2H), 2.44 (s, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.9, 142.3 (q, *J* = 2.5 Hz), 142.2, 133.1 (q, *J* = 42.5 Hz), 129.6, 129.5, 129.4, 128.6, 128.5 (q, *J* = 1.7 Hz), 127.1, 123.3, 119.8 (q, *J* = 267.9 Hz), 21.6 (s); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1 (s); **HRMS (ESI)** m/z: $[M+H]^+$ $C_{17}H_{13}F_3NO$ 304.0944, Found: 304.0953.

2-(4-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5b)



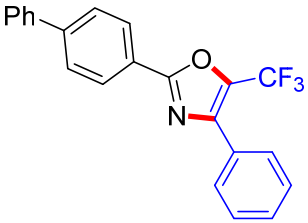
The title compound was obtained as a white solid in 89% yield (28.5 mg) by following the general procedure; M.p.: 75-77 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.11-8.07 (m, 2H), 7.79-7.76 (m, 2H), 7.50-7.43 (m, 3H), 7.03-6.99 (m, 2H), 3.88 (s, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 162.3, 161.8, 142.3 (q, *J* = 2.1 Hz), 132.9 (q, *J* = 42.5 Hz), 129.5, 128.9, 128.5, 128.5 (br s), 119.9 (q, *J* = 268.0 Hz), 118.7, 114.3, 55.4 (one signal missing due to overlap); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.0 (s). This product has been previously reported and spectral data are in agreement with those reported in the literature.[2]

4-phenyl-2-(4-(trifluoromethoxy)phenyl)-5-(trifluoromethyl)oxazole (5c)



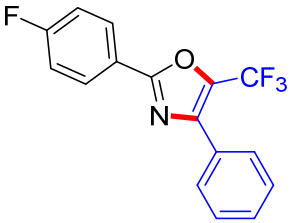
The title compound was obtained as a colorless oil in 81% yield (30.2 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.21-8.18 (m, 2H), 7.77 (dd, *J* = 7.6, 1.8 Hz, 2H), 7.52-7.44 (m, 3H), 7.37-7.34 (m, 2H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 160.4, 151.5 (q, *J* = 1.8 Hz), 142.6 (q, *J* = 2.6 Hz), 133.8 (q, *J* = 42.9 Hz), 129.7, 129.0, 128.9, 128.6, 128.4 (q, *J* = 1.8 Hz), 124.5, 121.1 (q, *J* = 0.8 Hz), 120.3 (q, *J* = 258.7 Hz), 119.7 (q, *J* = 268.1 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -57.7 (s), -60.2 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{10}F_6NO_2$ 374.0610, Found: 374.0608.

2-([1,1'-biphenyl]-4-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5d)



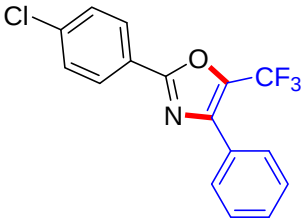
The title compound was obtained as a white solid in 83% yield (30.1 mg) by following the general procedure; M.p.: 87-90 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.23 (d, *J* = 8.4 Hz, 2H), 7.81 (d, *J* = 7.0 Hz, 2H), 7.75 (d, *J* = 8.4 Hz, 2H), 7.67 (d, *J* = 7.3 Hz, 2H), 7.53-7.48 (m, 5H), 7.45-7.40 (m, 1H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.6, 144.3, 142.6 (q, *J* = 2.0 Hz), 139.8, 133.5 (q, *J* = 43.0 Hz), 129.6, 129.3, 129.0, 128.6, 128.5 (br s), 128.1, 127.6, 127.1, 124.8, 119.8 (q, *J* = 267.9 Hz) (one signal missing due to overlap); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.0 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{22}H_{15}F_3NO$ 366.1100, Found: 366.1102.

2-(4-fluorophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5e)



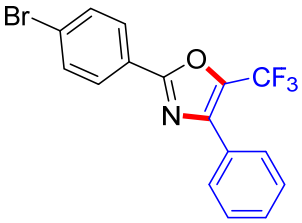
The title compound was obtained as a white solid in 91% yield (28.0 mg) by following the general procedure; M.p.: 58-60 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.17-8.14 (m, 2H), 7.78 (d, *J* = 6.6 Hz, 2H), 7.52-7.44 (m, 3H), 7.20 (t, *J* = 8.6 Hz, 2H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 164.8 (d, *J* = 253.0 Hz), 160.8, 142.5 (q, *J* = 2.6 Hz), 133.5 (q, *J* = 42.8 Hz), 129.6, 129.3 (d, *J* = 8.9 Hz), 129.1, 128.6, 128.4 (q, *J* = 1.8 Hz), 122.3 (d, *J* = 3.2 Hz), 119.7 (q, *J* = 267.9 Hz), 116.2 (d, *J* = 22.3 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1 (s, CF_3), -107.1 (s, F); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}F_4NO$ 308.0693, Found: 308.0695.

2-(4-chlorophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5f)



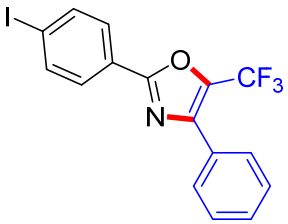
The title compound was obtained as a colorless oil in 85% yield (27.6 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.08 (d, *J* = 7.8 Hz, 2H), 7.77 (d, *J* = 7.7 Hz, 2H), 7.51-7.46 (m, 5H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 160.7, 142.5 (q, *J* = 2.7 Hz), 137.9, 133.6 (q, *J* = 42.9 Hz), 129.7, 129.3, 129.1, 128.6, 128.4 (q, *J* = 1.8 Hz), 128.3, 124.4, 119.7 (q, *J* = 268.1 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}ClF_3NO$ 324.0398, Found: 324.0397.

2-(4-bromophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5g)



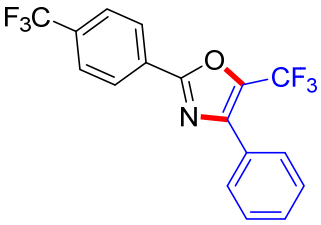
The title compound was obtained as a white solid in 83% yield (30.5 mg) by following the general procedure; M.p.: 63-65 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.03-8.00 (m, 2H), 7.77 (dd, *J* = 7.6, 1.8 Hz, 2H), 7.67-7.64 (m, 2H), 7.51-7.46 (m, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 160.8, 142.6 (q, *J* = 2.8 Hz), 133.7 (q, *J* = 42.8 Hz), 132.3, 129.7, 129.0, 128.6, 128.5, 128.4 (q, *J* = 1.8 Hz), 126.4, 124.9, 119.7 (q, *J* = 268.1 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1 (s). This product has been previously reported and spectral data are in agreement with those reported in the literature.[2]

2-(4-iodophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5h)



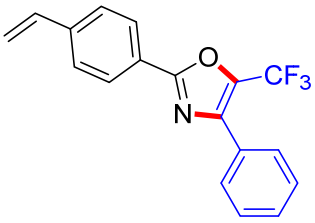
The title compound was obtained as a white solid in 81% yield (33.7 mg) by following the general procedure; M.p.: 56-58 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.87 (br s, 4H), 7.78-7.75 (m, 2H), 7.51-7.45 (m, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 160.9, 142.6 (q, *J* = 2.3 Hz), 138.2, 133.7 (q, *J* = 42.8 Hz), 129.7, 129.1, 128.6, 128.4, 125.4, 119.7 (q, *J* = 268.2 Hz), 98.6 (one signal missing due to overlap); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}F_3INO$ 415.9754, Found: 415.9758.

4-phenyl-5-(trifluoromethyl)-2-(4-(trifluoromethyl)phenyl)oxazole (5i)



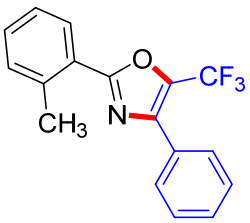
The title compound was obtained as a white solid in 92% yield (32.7 mg) by following the general procedure; M.p.: 45-47 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.27 (d, *J* = 8.2 Hz, 2H), 7.81-7.77 (m, 4H), 7.52-7.46 (m, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 160.1, 142.7 (q, *J* = 2.6 Hz), 134.2 (q, *J* = 43.0 Hz), 133.1 (q, *J* = 32.8 Hz), 129.8, 129.1, 128.9, 128.7, 128.4 (q, *J* = 1.7 Hz), 127.4, 126.0 (q, *J* = 3.8 Hz), 123.6 (q, *J* = 272.5 Hz), 119.6 (q, *J* = 268.2 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2 (s), -63.1 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{10}F_6NO$ 358.0661, Found: 358.0667.

4-phenyl-5-(trifluoromethyl)-2-(4-vinylphenyl)oxazole (5j)



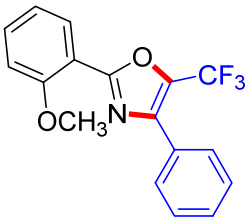
The title compound was obtained as a colorless oil in 88% yield (27.7 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.11 (d, *J* = 8.4 Hz, 2H), 7.80-7.77 (m, 2H), 7.55-7.43 (m, 5H), 6.77 (dd, *J* = 17.6, 10.9 Hz, 1H), 5.89 (d, *J* = 17.6 Hz, 1H), 5.40 (d, *J* = 10.9 Hz, 1H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.5, 142.5 (q, *J* = 2.2 Hz), 140.7, 135.9, 133.4 (q, *J* = 43.0 Hz), 129.6, 129.3, 128.6, 128.5 (q, *J* = 1.9 Hz), 127.3, 126.7, 125.1, 119.8 (q, *J* = 268.3 Hz), 116.2; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{18}H_{13}F_3NO$ 316.0944, Found: 316.0947.

4-phenyl-2-(o-tolyl)-5-(trifluoromethyl)oxazole (5k)



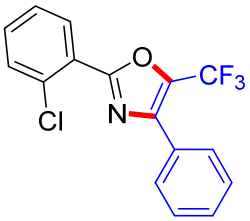
The title compound was obtained as a colorless oil in 88% yield (26.7 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):**δ 8.11-8.09 (m, 1H), 7.83-7.81 (m, 2H), 7.52-7.40 (m, 4H), 7.36-7.32 (m, 2H), 2.77 (s, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 162.0, 141.9 (q, *J* = 2.5 Hz), 138.4, 133.0 (q, *J* = 42.7 Hz), 131.8, 131.1, 129.5, 129.4, 129.3, 128.6, 128.4 (q, *J* = 1.8 Hz), 126.1, 124.9, 119.9 (q, *J* = 268.0 Hz), 22.1; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1; **HRMS (ESI)** m/z: $[M+H]^+$ $C_{17}H_{13}F_3NO$ 304.0944, Found: 304.0948.

2-(2-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5l)



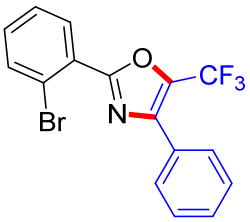
The title compound was obtained as a white solid in 93% yield (29.7 mg) by following the general procedure; M.p.: 56-58 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.05 (dd, *J* = 7.7, 1.7 Hz, 1H), 7.81-7.79 (m, 2H), 7.52-7.44 (m, 4H), 7.10-7.05 (m, 2H), 3.97 (s, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 160.6, 158.1, 141.9 (q, *J* = 2.2 Hz), 133.3 (q, *J* = 42.3 Hz), 132.9, 131.0, 129.5, 129.4, 128.52 (q, *J* = 1.9 Hz), 128.48, 120.7, 119.9 (q, *J* = 267.6 Hz), 115.2, 112.1, 56.0; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1; **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{13}F_3NO_2$ 320.0893, Found: 320.0891.

2-(2-chlorophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5m)



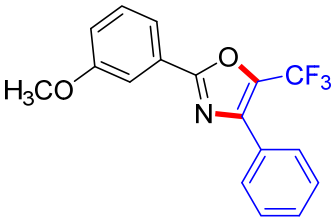
The title compound was obtained as a a colorless oil in 78% yield (25.2 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.10 (dd, *J* = 7.7, 1.7 Hz, 1H), 7.81-7.79 (m, 2H), 7.56 (d, *J* = 8.0 Hz, 1H), 7.51-7.39 (m, 5H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 159.7, 142.1 (q, *J* = 2.3 Hz), 134.0 (q, *J* = 43.1 Hz), 133.3, 132.2, 131.42, 131.40, 129.6, 129.1, 128.6, 128.5 (q, *J* = 1.3 Hz), 127.0, 125.0, 119.7 (q, *J* = 268.2 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2; **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}ClF_3NO$ 324.0398, Found: 324.0398.

2-(2-bromophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5n)



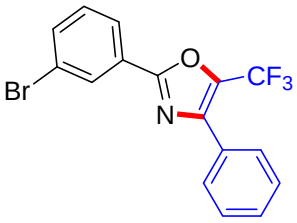
The title compound was obtained as a colorless oil in 85% yield (31.4 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.04 (dd, *J* = 7.8, 1.7 Hz, 1H), 7.82-7.80 (m, 2H), 7.77 (dd, *J* = 8.0, 0.9 Hz, 1H), 7.52-7.44 (m, 4H), 7.37 (td, *J* = 7.8, 1.6 Hz, 1H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 160.2, 142.1 (q, *J* = 2.8 Hz), 134.7, 133.9 (q, *J* = 42.9 Hz), 132.2, 131.7, 129.7, 129.1, 128.6, 128.5 (br s), 127.5, 127.1, 121.6, 119.7 (q, *J* = 268.3 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2; **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}BrF_3NO$ 367.9892, Found: 367.9893.

2-(3-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5o)



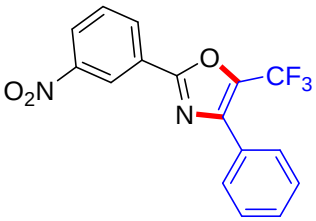
The title compound was obtained as a colorless oil in 93% yield (29.6 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.79 (d, *J* = 6.5 Hz, 2H), 7.75 (d, *J* = 7.7 Hz, 1H), 7.67 (s, 1H), 7.51-7.46 (m, 3H), 7.42 (t, *J* = 8.0 Hz, 1H), 7.09 (dd, *J* = 8.3, 2.1 Hz, 1H), 3.90 (s, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.6, 160.0, 142.5 (q, *J* = 2.3 Hz), 133.5 (q, *J* = 42.4 Hz), 130.1, 129.6, 129.3, 128.6, 128.5 (br s), 127.2, 119.8 (q, *J* = 268.0 Hz), 119.6, 118.2, 111.7, 55.5; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1; **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{13}F_3NO_2$ 320.0893, Found: 320.0898.

2-(3-bromophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5p)



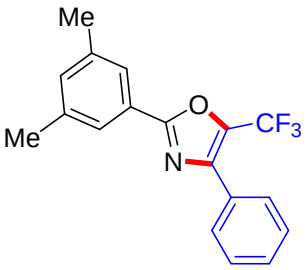
The title compound was obtained as a white solid in 73% yield (26.8 mg) by following the general procedure; M.p.: 82-84 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.31 (t, *J* = 1.7 Hz, 1H), 8.08 (d, *J* = 7.9 Hz, 1H), 7.79-7.77 (m, 2H), 7.66 (dd, *J* = 8.0, 0.7 Hz, 1H), 7.52-7.46 (m, 3H), 7.38 (t, *J* = 7.9 Hz, 1H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 160.1, 142.6 (q, *J* = 2.3 Hz), 134.6, 133.9 (q, *J* = 42.7 Hz), 130.5, 130.0, 129.7, 129.0, 128.6, 128.4 (br s), 127.8, 125.6, 123.1, 119.6 (q, *J* = 268.1 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2; **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}BrF_3NO$ 367.9892, Found: 367.9892.

2-(3-nitrophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5q)



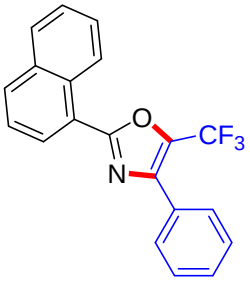
The title compound was obtained as a white solid in 88% yield (29.4 mg) by following the general procedure; M.p.: 75-77 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.98 (t, *J* = 1.8 Hz, 1H), 8.47 (d, *J* = 7.8 Hz, 1H), 8.40-8.38 (m, 1H), 7.80-7.77 (m, 2H), 7.73 (t, *J* = 8.0 Hz, 1H), 7.53-7.47 (m, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 159.2, 148.7, 142.8 (q, *J* = 2.2 Hz), 134.4 (q, *J* = 42.9 Hz), 132.5, 130.2, 129.9, 128.7, 128.4, 127.6, 126.0, 122.0, 119.5 (q, *J* = 268.2 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}F_3N_2O_3$ 335.0638, Found: 335.0644.

2-(3,5-dimethylphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5r)



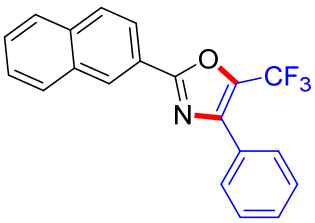
The title compound was obtained as a white solid in 99% yield (31.6 mg) by following the general procedure; M.p.: 79-81 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.80-7.77 (m, 4H), 7.51-7.45 (m, 3H), 7.17 (br s, 1H), 2.41 (br s, 6H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 162.1, 142.3 (q, *J* = 2.7 Hz), 138.7, 133.4, 133.3 (q, *J* = 42.7 Hz), 129.5, 129.4, 128.6, 128.5 (q, *J* = 1.8 Hz), 125.7, 124.8, 119.8 (q, *J* = 267.8 Hz), 21.2 (one signal missing due to overlap); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{18}H_{15}F_3NO$ 318.1100, Found: 318.1107.

2-(naphthalen-1-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5s)



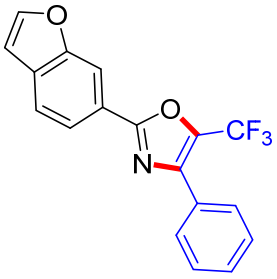
The title compound was obtained as a white solid in 98% yield (33.1 mg) by following the general procedure; M.p.: 88-90 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 9.36 (d, *J* = 8.7 Hz, 1H), 8.34 (dd, *J* = 7.3, 1.1 Hz, 1H), 8.05 (d, *J* = 8.2 Hz, 1H), 7.94 (d, *J* = 8.1 Hz, 1H), 7.90-7.86 (m, 2H), 7.72-7.68 (m, 1H), 7.62-7.58 (m, 2H), 7.56-7.47 (m, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.5, 142.2 (q, *J* = 2.4 Hz), 133.9, 133.2 (q, *J* = 42.9 Hz), 132.6, 130.2, 129.6, 129.4, 128.8, 128.7, 128.62, 128.58 (br s), 128.1, 126.6, 125.9, 124.9, 122.3, 120.0 (q, *J* = 267.4 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.0 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{20}H_{13}F_3NO$ 340.0944, Found: 340.0948.

2-(naphthalen-2-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5t)



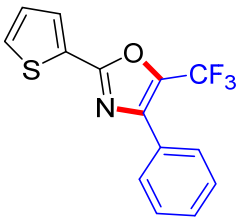
The title compound was obtained as a white solid in 82% yield (27.8 mg) by following the general procedure; M.p.: 83-85 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.65 (s, 1H), 8.20 (d, *J* = 8.6 Hz, 1H), 7.98-7.94 (m, 2H), 7.90-7.88 (m, 1H), 7.84 (d, *J* = 7.4 Hz, 2H), 7.60-7.47 (m, 5H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.8, 142.6 (q, *J* = 2.7 Hz), 134.7, 133.6 (q, *J* = 42.6 Hz), 132.8, 129.6, 129.3, 128.9, 128.8, 128.6, 128.5 (br s), 127.9, 127.6, 127.0, 123.3, 123.2, 119.8 (q, *J* = 267.8 Hz) (one signal missing due to overlap); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.0 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{20}H_{13}F_3NO$ 340.0944, Found: 340.0948.

2-(benzofuran-6-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5u)



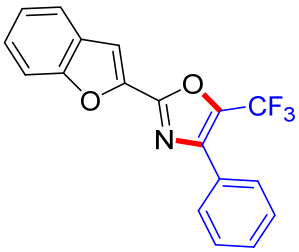
The title compound was obtained as a white solid in 94% yield (30.9 mg) by following the general procedure; M.p.: 86-88 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.30 (s, 1H), 8.07 (d, *J* = 8.1 Hz, 1H), 7.81 (d, *J* = 6.8 Hz, 2H), 7.76 (d, *J* = 2.1 Hz, 1H), 7.71 (d, *J* = 8.2 Hz, 1H), 7.52-7.46 (m, 3H), 6.84 (d, *J* = 1.2 Hz, 1H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 162.0, 154.7, 147.5, 142.5 (q, *J* = 2.2 Hz), 133.4 (q, *J* = 42.6 Hz), 130.6, 129.6, 129.4, 128.6, 128.5 (br s), 122.2, 121.9, 121.7, 119.8 (q, *J* = 267.9 Hz), 110.5, 106.9; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.0 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{18}H_{11}F_3NO_2$ 330.0736, Found: 330.0736.

4-phenyl-2-(thiophen-2-yl)-5-(trifluoromethyl)oxazole (5v)



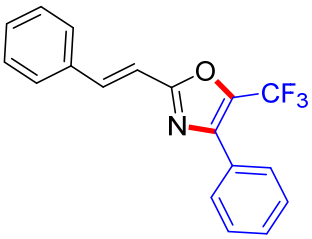
The title compound was obtained as a colorless oil in 87% yield (25.7 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.84 (dd, *J* = 3.7, 1.2 Hz, 1H), 7.75 (dd, *J* = 7.6, 1.8 Hz, 2H), 7.55 (dd, *J* = 5.0, 1.2 Hz, 1H), 7.50-7.44 (m, 3H), 7.17 (dd, *J* = 5.0, 3.7 Hz, 1H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 157.9, 142.5 (q, *J* = 2.7 Hz), 132.8 (q, *J* = 42.9 Hz), 130.2, 129.8, 129.6, 129.0, 128.6, 128.5 (q, *J* = 1.8 Hz), 128.21, 128.19, 119.7 (q, *J* = 268.1 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{14}H_9F_3NOS$ 296.0351, Found: 296.0354.

2-(benzofuran-2-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5w)



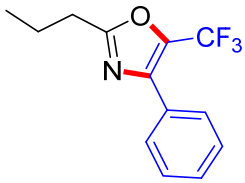
The title compound was obtained as a white solid in 83% yield (27.3 mg) by following the general procedure; M.p.: 84-86 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.81-7.79 (m, 2H), 7.71 (d, *J* = 7.4 Hz, 1H), 7.65 (dd, *J* = 8.4, 0.8 Hz, 1H), 7.58 (d, *J* = 0.8 Hz, 1H), 7.52-7.43 (m, 4H), 7.36-7.32 (m, 1H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 155.7, 154.3, 142.8 (q, *J* = 2.6 Hz), 142.4, 133.7 (q, *J* = 43.2 Hz), 129.9, 128.63, 128.61, 128.56 (q, *J* = 1.8 Hz), 127.3, 127.1, 124.0, 122.3, 119.5 (q, *J* = 268.2 Hz), 112.1, 110.2; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{18}H_{11}F_3NO_2$ 330.0736, Found: 330.0734.

(E)-4-phenyl-2-styryl-5-(trifluoromethyl)oxazole (5x)



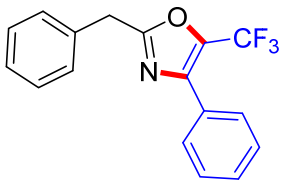
The title compound was obtained a colorless oil in 98% yield (30.9 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.76-7.69 (m, 3H), 7.60-7.57 (m, 2H), 7.51-7.39 (m, 6H), 6.99 (d, *J* = 16.4 Hz, 1H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 161.4, 142.5 (q, *J* = 2.4 Hz), 139.4, 134.8, 133.0 (q, *J* = 42.7 Hz), 129.9, 129.6, 129.2, 129.0, 128.6, 128.4 (br s), 127.5, 119.7 (q, *J* = 267.6 Hz), 112.4; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{18}H_{13}F_3NO$ 316.0944, Found: 316.0942.

4-phenyl-2-propyl-5-(trifluoromethyl)oxazole (5y)



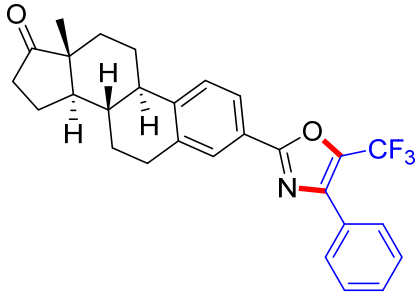
The title compound was obtained as a colorless oil in 63% yield (16.1 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.69-7.64 (m, 2H), 7.47-7.39 (m, 3H), 2.83 (t, *J* = 7.5 Hz, 2H), 1.92-1.83 (m, *J* = 7.4 Hz, 2H), 1.05 (t, *J* = 7.4 Hz, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 165.5, 141.1 (q, *J* = 3.0 Hz), 133.3 (q, *J* = 42.4 Hz), 129.4, 128.5, 128.4 (br s), 119.7 (q, *J* = 267.6 Hz), 29.9, 20.3, 13.6; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.3 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{13}H_{13}F_3NO$ 256.0944, Found: 259.0946.

2-benzyl-4-phenyl-5-(trifluoromethyl)oxazole (5z)



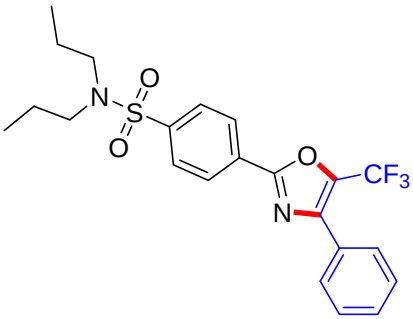
The title compound was obtained as a white solid in 56% yield (16.5 mg) by following the general procedure; M.p.: 86-88 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.69-7.67 (m, 2H), 7.47-7.41 (m, 3H), 7.39-7.34 (m, 4H), 7.32-7.29 (m, 1H), 4.20 (s, 2H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 163.5, 141.5, 134.2, 133.9 (q, *J* = 42.5 Hz), 129.5, 129.2, 128.9, 128.5, 128.4 (q, *J* = 1.6 Hz) 127.4, 119.6 (q, *J* = 268.0 Hz), 34.5; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.3 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{13}F_3NO$ 304.0944, Found: 304.0947.

(8S,9R,13R,14R)-13-methyl-3-(4-phenyl-5-(trifluoromethyl)oxazol-2-yl)-6,7,8,9,11,12,13,14,15,16-decahydro-17H-cyclopenta[a]phenanthren-17-one (5aa)



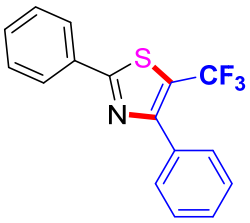
The title compound was obtained as a white solid in 94% yield (43.7 mg) by following the general procedure; M.p.: 123-128 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.91-7.88 (m, 2H), 7.79-7.76 (m, 2H), 7.50-7.41 (m, 4H), 3.04-2.96 (m, 2H), 2.56-2.44 (m, 2H), 2.39-2.33 (m, 1H), 2.21-1.98 (m, 4H), 1.69-1.46 (m, 6H), 0.94 (s, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 220.6, 161.9, 143.9, 142.4 (q, *J* = 2.3 Hz), 137.4, 133.2 (q, *J* = 42.6 Hz), 129.5, 129.4, 128.6, 128.5 (br s), 127.6, 126.0, 124.4, 123.4, 119.8 (q, *J* = 267.9 Hz), 50.5, 47.9, 44.6, 37.8, 35.8, 31.5, 29.2, 26.2, 25.6, 21.6, 13.8; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.1 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{28}H_{27}F_3NO_2$ 466.1988, Found: 466.1982.

4-(4-phenyl-5-(trifluoromethyl)oxazol-2-yl)-N,N-dipropylbenzenesulfonamide (5ab)



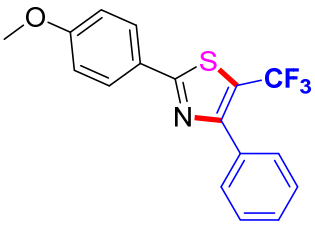
The title compound was obtained as a white solid in 94% yield (42.5 mg) by following the general procedure; M.p.: 86-88 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.28 (d, *J* = 8.4 Hz, 2H), 7.95 (d, *J* = 8.4 Hz, 2H), 7.78-7.76 (m, 2H), 7.52-7.48 (m, 3H), 3.14 (t, *J* = 7.6 Hz, 4H), 1.61-1.52 (m, 4H), 0.88 (t, *J* = 7.4 Hz, 6H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 160.0, 143.0, 142.8 (q, *J* = 2.6 Hz), 134.3 (q, *J* = 43.2 Hz), 129.8, 129.2, 128.8, 128.7, 128.4 (br s), 127.6, 119.5 (q, *J* = 268.5 Hz), 49.8, 21.8, 11.1 (one signal missing due to overlap); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -60.2 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{22}H_{24}F_3N_2O_3S$ 453.1454, Found: 453.1452.

2,4-diphenyl-5-(trifluoromethyl)thiazole (7a)



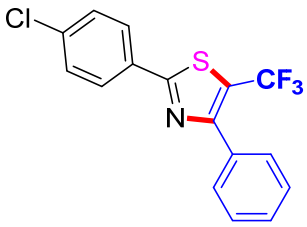
The title compound was obtained as a white solid in 97% yield (29.6 mg) by following the general procedure; M.p.: 61-63 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.03-8.00 (m, 2H), 7.80-7.76 (m, 2H), 7.52-7.46 (m, 6H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):**δ 168.2, 156.8 (q, *J* = 2.5 Hz), 133.2, 132.4, 131.2, 129.4, 129.1, 129.0 (q, *J* = 1.7 Hz), 128.4, 126.8, 122.4 (q, *J* = 270.2 Hz), 120.0 (q, *J* = 37.3 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -50.1 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ $C_{16}H_{11}F_3NS$ 306.0559, Found: 306.0559.

2-(4-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)thiazole (7b)



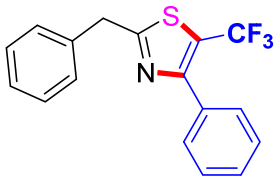
The title compound was obtained as a white solid in 98% yield (32.7 mg) by following the general procedure; M.p.: 71-74 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.96-7.93 (m, 2H), 7.78-7.76 (m, 2H), 7.51-7.45 (m, 3H), 6.99-6.96 (m, 2H), 3.87 (s, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):**δ 168.1, 162.0, 156.6 (q, *J* = 1.9 Hz), 133.4, 129.3, 129.0, 128.4, 128.3, 125.3, 122.4 (q, *J* = 269.7 Hz), 119.0 (q, *J* = 36.9 Hz), 114.4, 55.4; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -50.0 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ $C_{17}H_{13}F_3NOS$ 336.0665, Found: 336.0659.

2-(4-chlorophenyl)-4-phenyl-5-(trifluoromethyl)thiazole (7c)



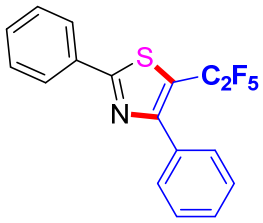
The title compound was obtained as a colorless oil in 98% yield (33.2 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.97-7.92 (m, 2H), 7.78-7.75 (m, 2H), 7.51-7.44 (m, 5H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 166.8, 157.0 (q, *J* = 2.5 Hz), 137.3, 133.0, 130.9, 129.5, 129.4, 129.0 (br s), 128.4, 128.0, 122.2 (q, *J* = 270.0 Hz), 120.3 (q, *J* = 37.6 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -50.2 (s); **HRMS (MALDI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{10}ClF_3NS$ 340.0169, Found: 340.0167.

2-benzyl-4-phenyl-5-(trifluoromethyl)thiazole (7d)



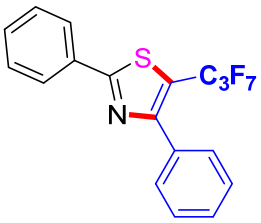
The title compound was obtained as a colorless oil in 78% yield (25.0 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.72-7.70 (m, 2H), 7.49-7.44 (m, 3H), 7.43-7.33 (m, 5H), 4.37 (s, 2H). **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 171.9, 155.9 (q, *J* = 2.6 Hz), 136.7, 133.2, 129.3, 129.14, 129.05, 129.0 (br s), 128.3, 127.7, 122.3 (q, *J* = 269.7 Hz), 120.6 (q, *J* = 37.2 Hz), 39.8; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -50.2 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{13}F_3NS$ 320.0715, Found: 320.0713.

5-(perfluoroethyl)-2,4-diphenylthiazole (7e)



The title compound was obtained as a colorless oil in 87% yield (30.9 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.04-8.01 (m, 2H), 7.65-7.62 (m, 2H), 7.53–7.46 (m, 6H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):**δ 169.6, 158.8, 133.9, 132.3, 131.3, 129.4, 129.2, 129.1, 128.0, 126.9, 119.2 (qt, *J* = 287.6, 39.9 Hz), 118.2 (t, *J* = 27.8 Hz) 112.4 (tq, *J* = 255.7, 40.2 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -83.8 (s, CF_3), -99.5 (s, CF_2); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{11}F_5NS$ 356.0527, Found: 356.0532.

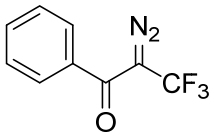
5-(perfluoroethyl)-2,4-diphenylthiazole (7f)



The title compound was obtained as a colorless oil in 88% yield (35.5 mg) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.03-8.00 (m, 2H), 7.61-7.59 (m, 2H), 7.51-7.45 (m, 6H); **$^{13}C\{^1H\}$ NMR ($CDCl_3$, 100 MHz):** δ 169.8, 159.0 (t, *J* = 2.0 Hz) 134.0, 132.3, 131.3, 129.4, 129.1, 128.0, 126.9, 118.3 (t, *J* = 28.4 Hz), 114.4 (t, *J* = 32.2 Hz), 119.2-108.4 (m, 3C); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -79.9 (t, *J* = 8.9 Hz, CF_3), -96.2 (q, *J* = 10.0 Hz, CF_2), -124.4 (s, CF_2); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{18}H_{11}F_7NS$ 406.0495, Found: 406.0493.

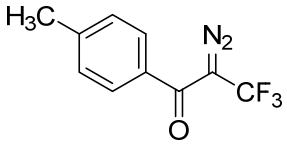
Characterization of dizao compounds 1

2-diazo-3,3,3-trifluoro-1-phenylpropan-1-one (1a)



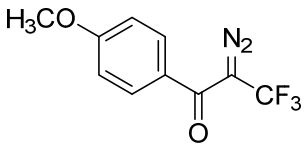
The title compound was obtained as a yellow solid in 89% yield (1.91 g) by following the general procedure; M.p.: 56-57 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.63 (d, *J* = 8.2 Hz, 2H), 7.59-7.55 (m, 1H), 7.51-7.43 (t, *J* = 7.6 Hz, 2H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 184.3, 136.0, 132.8, 128.8, 127.2, 122.9 (q, *J* = 271.3 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -56.4 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_9H_6F_3N_2O$ 215.0427, Found: 215.0423.

2-diazo-3,3,3-trifluoro-1-(*p*-tolyl)propan-1-one (1b)



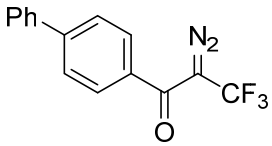
The title compound was obtained as a yellow solid in 77 % yield (1.76 g) by following the general procedure; M.p.: 73-75 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.55 (d, *J* = 8.1 Hz, 2H), 7.27 (d, *J* = 7.8 Hz, 2H), 2.41 (s, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 184.0, 143.7, 133.3, 129.4, 127.3, 123.0 (q, *J* = 271.1 Hz), 21.6; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -56.4 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{10}H_7F_3N_2NaO$ 251.0403, Found: 251.0403.

2-diazo-3,3,3-trifluoro-1-(4-methoxyphenyl)propan-1-one (1c)



The title compound was obtained as a yellow solid in 59% yield (1.44 g) by following the general procedure; M.p.: 44-46 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.66-7.63 (m, 2H), 6.97-6.93 (m, 2H), 3.86 (s, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 182.9, 163.3, 129.6, 128.6, 123.2 (q, *J* = 271.2 Hz), 114.0, 55.5; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -56.3 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{10}H_7F_3N_2NaO_2$ 267.0352, Found: 267.0352.

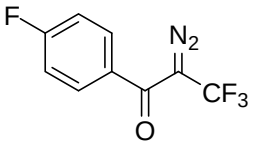
1-([1,1'-biphenyl]-4-yl)-2-diazo-3,3,3-trifluoropropan-1-one (1d)



The title compound was obtained as a yellow solid in 63% yield (1.83 g) by following the general procedure; M.p.: 127-129 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.75-7.69 (m, 4H), 7.63-7.58 (m, 2H), 7.50-7.46 (m, 2H), 7.43-7.40

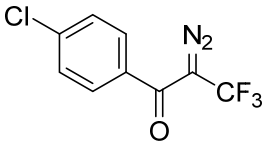
(m, 1H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 183.8, 145.7, 139.5, 134.7, 129.0, 128.4, 127.9, 127.4, 127.3, 123.0 (q, *J* = 271.6 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -56.1 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{15}H_{10}F_3N_2O$ 291.0740, Found: 291.0740.

2-diazo-3,3,3-trifluoro-1-(4-fluorophenyl)propan-1-one (1e)



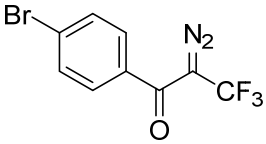
The title compound was obtained as a yellow solid in 65% yield (1.51 g) by following the general procedure; M.p.44-46: °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.70-7.66 (m, 2H), 7.19-7.15 (m, 2H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 183.0, 165.3 (d, *J* = 254.9 Hz), 132.3 (d, *J* = 3.1 Hz), 129.9 (d, *J* = 9.2 Hz), 122.9 (q, *J* = 271.2 Hz), 116.1 (d, *J* = 22.1 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -55.8 (s, CF_3), -104.8 (s, F); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_9H_4F_4N_2NaO$ 255.0152, Found: 255.0151.

1-(4-chlorophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1f)



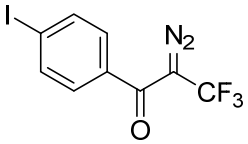
The title compound was obtained as a yellow solid in 62% yield (1.52 g) by following the general procedure; M.p.: 41-43°C; **^{1}H NMR ($CDCl_3$, 400 MHz):**δ 7.59 (d, *J* = 8.4 Hz, 2H), 7.46 (d, *J* = 8.4 Hz, 2H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 183.1, 139.2, 134.4, 129.2, 128.7, 122.8 (q, *J* = 271.3 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -55.7 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_9H_4ClF_3N_2NaO$ 270.9856, Found: 270.9858.

1-(4-bromophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1g)



The title compound was obtained as a white solid in 67% yield (1.96 g) by following the general procedure; M.p. 67-69: °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.63 (d, *J* = 8.5 Hz, 2H), 7.51 (d, *J* = 8.4 Hz, 2H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 183.3, 134.8, 132.1, 128.8, 127.8, 122.8 (q, *J* = 271.3 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -55.7 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_9H_4BrF_3N_2NaO$ 314.9351, Found: 314.9352.

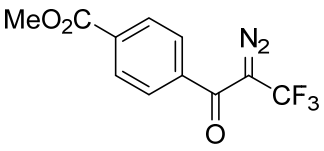
2-diazo-3,3,3-trifluoro-1-(4-iodophenyl)propan-1-one (1h)



The title compound was obtained as a white solid in 52% yield (1.76 g) by following the general procedure; M.p.: 58-60 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.84 (d, *J* = 8.5 Hz, 2H), 7.36 (d, *J* = 8.4 Hz, 2H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100**

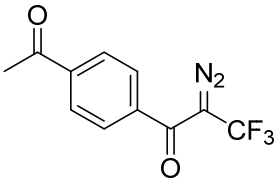
MHz): δ 183.4, 138.1, 135.4, 128.6, 122.8 (q, *J* = 271.2 Hz), 100.2; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -55.8 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_9H_4F_3IN_2NaO$ 362.9213, Found: 362.9209.

4-(2-diazo-3,3,3-trifluoropropanoyl)phenyl acetate (1i)



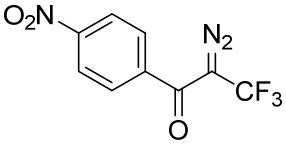
The title compound was obtained as a yellow solid in 70% yield (1.91 g) by following the general procedure; M.p.: 79-81 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.14 (d, *J* = 8.2 Hz, 2H), 7.69 (d, *J* = 8.2 Hz, 2H), 3.95 (s, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 183.7, 165.8, 139.6, 133.7, 130.0, 127.2, 122.7 (q, *J* = 271.4 Hz), 52.5; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -55.8 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{11}H_7F_3N_2NaO_3$ 295.0301, Found: 295.0298.

1-(4-acetylphenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1j)



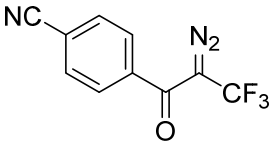
The title compound was obtained as a yellow solid in 83 % yield (2.12 g) by following the general procedure; M.p.: 35-37 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.06-8.03 (m, 2H), 7.73-7.70 (m, 2H), 2.65 (s, 3H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 197.1, 183.7, 139.9, 139.6, 128.6, 127.5, 122.7 (q, *J* = 271.4 Hz), 26.8; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -55.7 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{11}H_7F_3N_2NaO_2$ 279.0352, Found: 279.0350.

2-diazo-3,3,3-trifluoro-1-(4-nitrophenyl)propan-1-one (1k)



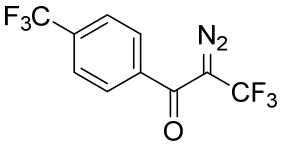
The title compound was obtained as a yellow solid in 47% yield (1.22 g) by following the general procedure; M.p.: 40-42 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.33 (d, *J* = 8.5 Hz, 2H), 7.80 (d, *J* = 8.5 Hz, 2H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 182.6, 150.0, 141.3, 128.3, 124.0, 122.5 (q, *J* = 271.3 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -55.0 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_9H_4F_3N_3NaO_3$ 282.0097, Found: 282.0099.

4-(2-diazo-3,3,3-trifluoropropanoyl)benzonitrile (1l)



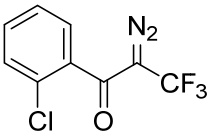
The title compound was obtained as a yellow solid in 36 % yield (0.86 g) by following the general procedure; M.p.: 84-86 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.78 (d, *J* = 8.3 Hz, 2H), 7.72 (d, *J* = 8.2 Hz, 2H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 182.7, 139.6, 132.6, 127.7, 122.5 (q, *J* = 271.3 Hz), 117.5, 116.2; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -55.3 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{10}H_4F_3N_3NaO$ 262.0199, Found: 262.0201.

2-diazo-3,3,3-trifluoro-1-(4-(trifluoromethyl)phenyl)propan-1-one (1m)



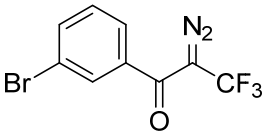
The title compound was obtained as a yellow oil in 30% yield (0.85 g) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.75 (br s, 4H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 183.3, 139.2, 134.2 (q, *J* = 33.0 Hz), 130.4, 127.6, 125.9 (q, *J* = 3.6 Hz), 123.3 (q, *J* = 272.8 Hz), 122.7 (q, *J* = 271.1 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -55.4, -63.2; **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{10}H_4F_6N_2NaO$ 305.0120, Found: 305.0125.

1-(2-chlorophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1n)



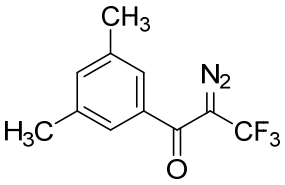
The title compound was obtained as a yellow oil in 59% yield (1.46 g) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.46-7.42 (m, 2H), 7.40-7.33 (m, 2H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 183.1, 135.7, 132.2, 130.4, 130.1, 128.2, 127.2, 122.3 (q, *J* = 271.9 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -57.4 (br s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_9H_4ClF_3N_2NaO$ 270.9856, Found: 270.9859.

1-(3-bromophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1o)



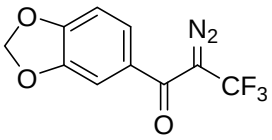
The title compound was obtained as a yellow solid in 85% yield (2.47 g) by following the general procedure; M.p.: 68-70 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.78 (t, *J* = 1.7 Hz, 1H), 7.70 (ddd, *J* = 8.0, 1.9, 1.0 Hz, 1H), 7.55 (dt, *J* = 7.8, 1.2 Hz, 1H), 7.36 (t, *J* = 7.9 Hz, 1H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 182.8, 137.8, 135.7, 130.35, 130.30, 125.6, 123.0, 122.7 (q, *J* = 271.4 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -55.8 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_9H_4BrF_3N_2NaO$ 314.9351, Found: 314.9354.

2-diazo-1-(3,5-dimethylphenyl)-3,3,3-trifluoropropan-1-one (1p)



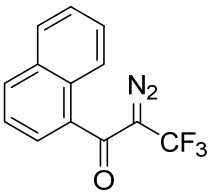
The title compound was obtained as a yellow oil in 89 % yield (2.15 g) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.23 (s, 2H), 7.19 (s, 1H), 2.35 (s, 6H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 184.6, 138.6, 136.0, 134.3, 124.8, 123.0 (q, *J* = 271.3 Hz), 21.0; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -56.7 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{11}H_9F_3N_2NaO$ 265.0559, Found: 265.0564.

1-(benzo[*d*][*1,3*]dioxol-5-yl)-2-diazo-3,3,3-trifluoropropan-1-one(1q)



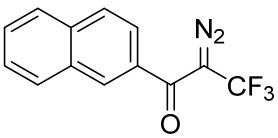
The title compound was obtained as a yellow solid in 50% yield (1.29 g) by following the general procedure; M.p.: 64-66 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.21 (dd, *J* = 8.1, 1.5 Hz, 1H), 7.11 (d, *J* = 1.4 Hz, 1H), 6.84 (d, *J* = 8.1 Hz, 1H), 6.04 (s, 2H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 182.5, 151.6, 148.2, 130.1, 123.1 (q, *J* = 271.3 Hz), 122.9, 108.1, 107.7, 102.0; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -56.4 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{10}H_6F_3N_2O_3$ 259.0325, Found: 259.0323.

2-diazo-3,3,3-trifluoro-1-(naphthalen-1-yl)propan-1-one (1r)



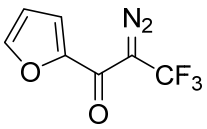
The title compound was obtained as a yellow oil in 58% yield (1.53 g) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.10 (d, *J* = 8.2 Hz, 1H), 7.99 (d, *J* = 8.2 Hz, 1H), 7.92-7.89 (m, 1H), 7.62-7.54 (m, 3H), 7.51-7.47 (m, 1H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 185.6, 133.7, 133.5, 132.0, 129.4, 128.6, 127.9, 126.9, 125.2, 124.34, 124.31 122.7 (q, *J* = 271.4 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -56.5 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{13}H_7F_3N_2NaO$ 287.0403, Found: 287.0405.

2-diazo-3,3,3-trifluoro-1-(naphthalen-2-yl)propan-1-one (1s)



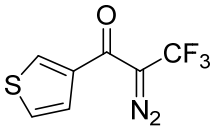
The title compound was obtained as a yellow solid in 83% yield (2.20 g) by following the general procedure; M.p.: 94-96 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 8.17 (br s, 1H), 7.93 (d, *J* = 8.5 Hz, 2H), 7.89 (d, *J* = 7.9 Hz, 1H), 7.71 (dd, *J* = 8.5, 1.6 Hz, 1H), 7.64-7.56 (m, 2H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 184.2, 135.2, 133.3, 132.2, 129.1, 128.9, 128.6, 128.3, 127.9, 127.2, 123.3, 123.0 (q, *J* = 271.4 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -56.2 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{13}H_7F_3N_2NaO$ 287.0403, Found: 287.0402.

2-diazo-3,3,3-trifluoro-1-(furan-2-yl)propan-1-one (1t)



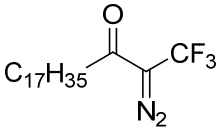
The title compound was obtained as a yellow solid in 71% yield (1.45 g) by following the general procedure; M.p.38-40 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ^{1}H NMR (400 MHz,) δ 7.55 (s, 1H), 7.30 (d, *J* = 3.3 Hz, 1H), 6.63-6.59 (m, 1H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 169.5, 151.0, 145.5, 123.0 (q, *J* = 271.5 Hz), 117.8, 112.7; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -57.4 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_7H_4F_3N_2O_2$ 205.0219, Found: 205.0218.

2-diazo-3,3,3-trifluoro-1-(thiophen-3-yl)propan-1-one (1u)



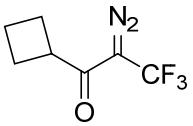
The title compound was obtained as a yellow solid in 86% yield (1.89 g) by following the general procedure; M.p.45-47 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.93-7.92 (m, 1H), 7.43 (d, *J* = 5.0, 1.0 Hz, 1H), 7.38 (dd, *J* = 5.1, 2.9 Hz, 1H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 177.2, 138.5, 130.7, 126.8, 123.0 (q, *J* = 270.7 Hz); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -55.7 (s); **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_7H_3F_3N_2NaOS$ 242.9810, Found: 242.9809.

2-diazo-1,1,1-trifluoroicosan-3-one (1v)



The title compound was obtained as a yellow solid in 64 % yield (2.41 g) by following the general procedure; M.p. 36-38 °C **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 2.51 (t, *J* = 7.4 Hz, 2H), 1.69-1.62 (m, 2H), 1.25 (br s, 28H), 0.87 (t, *J* = 7.1 Hz, 3H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 189.7, 123.1 (q, *J* = 269.5 Hz), 39.0, 31.9, 29.69, 29.65, 29.63, 29.56, 29.41, 29.36, 29.3, 29.0, 24.0, 22.7, 14.0; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -55.0; **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{20}H_{35}F_3N_2NaO$ 399.2594, Found: 399.2599.

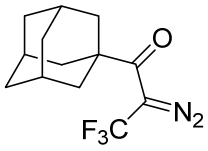
1-cyclobutyl-2-diazo-3,3,3-trifluoropropan-1-one (1w)



The title compound was obtained as a a yellow oil in 69% yield (1.34 g) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 3.49-3.41 (m, 1H), 2.44-2.35 (m, 2H), 2.21-2.13 (m, 2H), 2.06-1.97 (m, 1H), 1.94-1.85 (m, 1H); **$^{13}C\{^{1}H\}$ NMR ($CDCl_3$, 100 MHz):** δ 190.8, 123.0 (q, *J* = 269.7 Hz), 42.4, 24.5, 17.7; **^{19}F NMR ($CDCl_3$, 376**

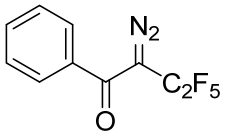
MHz): δ -55.0 (br s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_7H_8F_3N_2O$ 193.0583, Found: 193.0579.

1-(adamantan-1-yl)-2-diazo-3,3,3-trifluoropropan-1-one (1x)



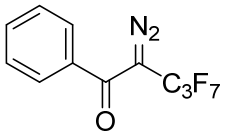
The title compound was obtained as a yellowe solid in 69% yield (1.88 g) by following the general procedure; M.p.: 91-93 °C; **^{1}H NMR ($CDCl_3$, 400 MHz):**δ 2.09 (br s, 3H), 1.91 (d, *J* = 2.6 Hz, 6H), 178-1.67 (m, 6H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 193.7, 123.5 (q, *J* = 272.3 Hz), 47.7, 37.5, 36.3, 28.0; **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -58.3 (s); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{13}H_{16}F_3N_2O$ 273.1209, Found: 273.1215.

2-diazo-3,3,4,4,4-pentafluoro-1-phenylbutan-1-one(1y)



The title compound was obtained as a yellow oil in 78% yield (2.06 g) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):**δ 7.63-7.61 (m, 2H), 7.59-7.54 (m, 1H), 7.47 (t, *J* = 7.5 Hz, 2H). **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 184.2, 136.1, 132.8, 128.8, 127.2, 118.7 (qt, *J* = 287.2, 40.4 Hz), 111.6 (tq, *J* = 260.9, 41.7 Hz); **^{9}F NMR ($CDCl_3$, 376 MHz):** δ -84.0 (s, CF_3), -111.6 (s, CF_2); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{10}H_6F_5N_2O$ 265.0395, Found: 265.0395.

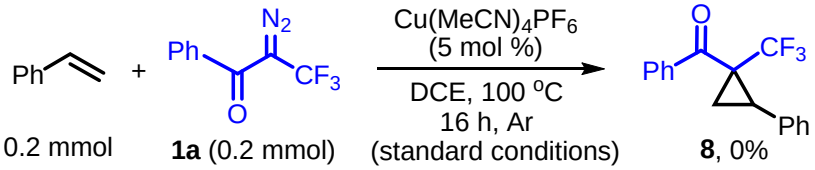
2-diazo-3,3,4,4,5,5,5-heptafluoro-1-phenylpentan-1-one(1z)



The title compound was obtained as a yellow oil in 84% yield (2.64 g) by following the general procedure; **^{1}H NMR ($CDCl_3$, 400 MHz):** δ 7.62-7.59 (m, 2H), 7.58-7.54 (m, 1H), 7.48-7.44 (m, 2H); **^{13}C{^{1}H} NMR ($CDCl_3$, 100 MHz):** δ 184.1, 136.2, 132.7, 128.8, 127.2, 119.1-108.6 (m, 3C); **^{19}F NMR ($CDCl_3$, 376 MHz):** δ -80.6 (t, *J* = 9.2 Hz, CF_3), -108.0 (q, *J* = 8.8 Hz, CF_2), -126.2 (br s, CF_2); **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{11}H_6F_7N_2O$ 315.0363, Found: 315.0365.

Experimental Mechanism Studies

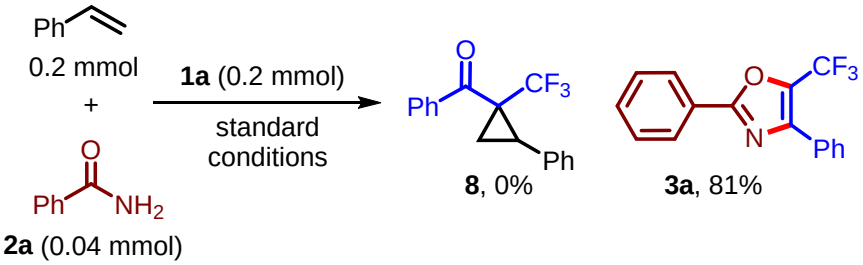
(a) Reaction of styrene with 1a to trap the possible Cu carbene intermediate



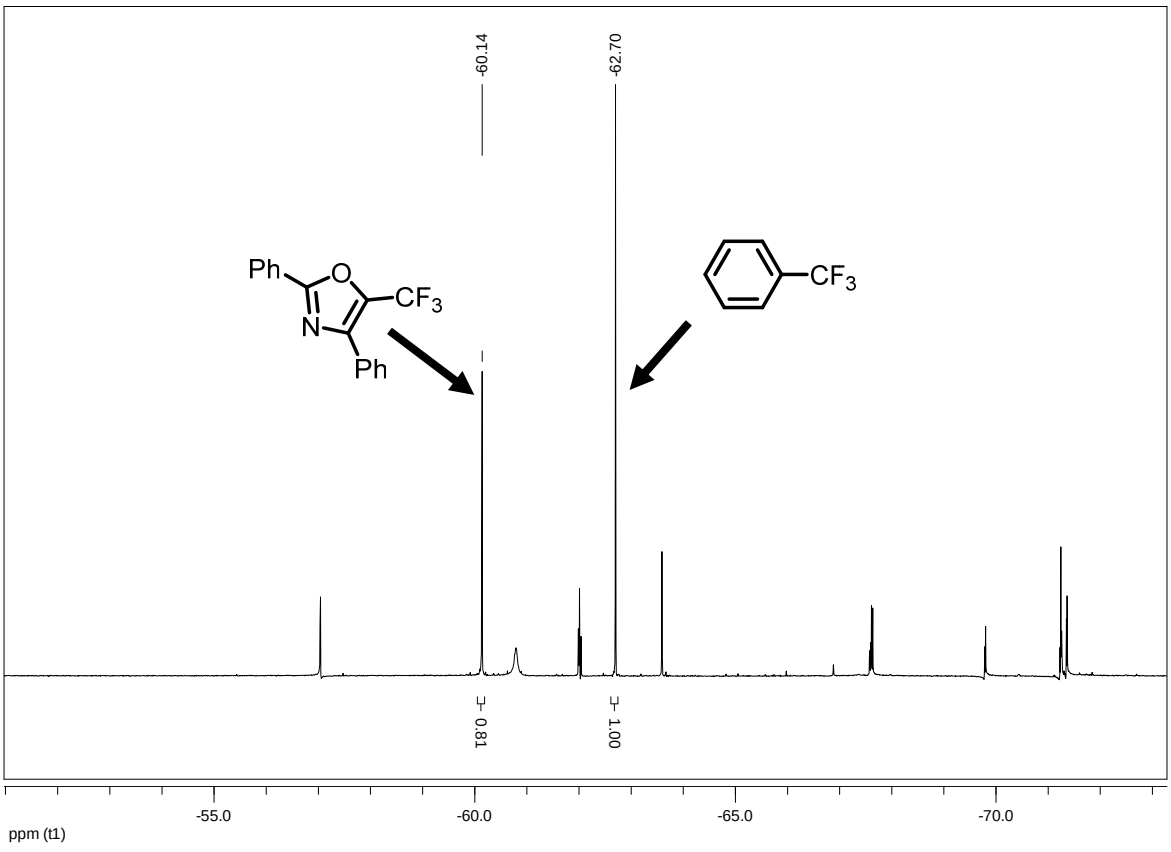
0.2 mmol **1a** (0.2 mmol) **8**, 0%

A mixture of **1a** (42.8 mg, 0.2 mmol, 1.0 equiv), $Cu(MeCN)_4PF_6$ (3.7 mg, 0.01 mmol, 5.0 mol %), styrene (20.8 mg, 0.2 mmol, 1.0 equiv), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (2.0 mL) was added and the resulting mixture was stirred at 100 °C for using heating modular of parallel reactor 16 h under Ar atmosphere. The reaction was cooled to room temperature and transferred to a 100 mL round-bottomed flask using CH_2Cl_2. Silica was added to the flask and volatiles were evaporated under reduced pressure. The residue was purified by column chromatography on silica gel with petroleum ether/EtOAc (50:1) shown that no cyclopropanation product was formed.

(b) Reaction of styrene with 1a in the presence of catalytic amount of 2a



A mixture of **1a** (42.8 mg, 0.2 mmol, 1.0 equiv), **2a** (0.5 mg, 0.04 mmol, 0.2 equiv), $Cu(MeCN)_4PF_6$ (3.7 mg, 0.01 mmol, 5.0 mol %), styrene (20.8 mg, 0.2 mmol, 1.0 equiv), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (2.0 mL) was added and the resulting mixture was stirred at 100 °C using heating modular of parallel reactor for 16 h under Ar atmosphere. The reaction was cooled to room temperature and the suspension was filtered through a short column filled with celite and the solvent was removed in vacuo. The solvent was removed to leave a crude product, which was analysed by ^{19}F NMR using $PhCF_3$ (0.04 mmol) as the internal standard. Based on ^{19}F NMR spectra, the **5a** was formed in 81% NMR yield. The residue was then purified by column chromatography on silica gel with petroleum ether/EtOAc (50:1) shown that no cyclopropanation product was formed.



(c) Stoichiometric reaction of amide 2a with $Cu(MeCN)_4PF_6$

Detailed process:

both **2a** and $Cu(MeCN)_4PF_6$ are **insoluble** in DCE at r.t.

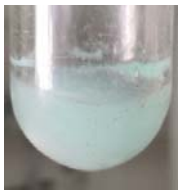
r.t.

100 °C

the mixture becomes **clear** (colorless) when heated to 100 °C

100 °C, 1 h

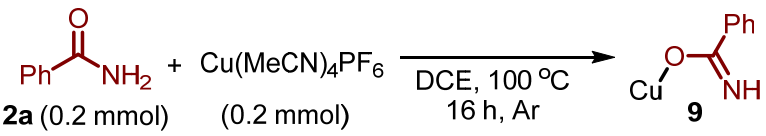
The colorless solution turns into **light-green** after heated at 100 °C for 1 h



100 °C, 16 h

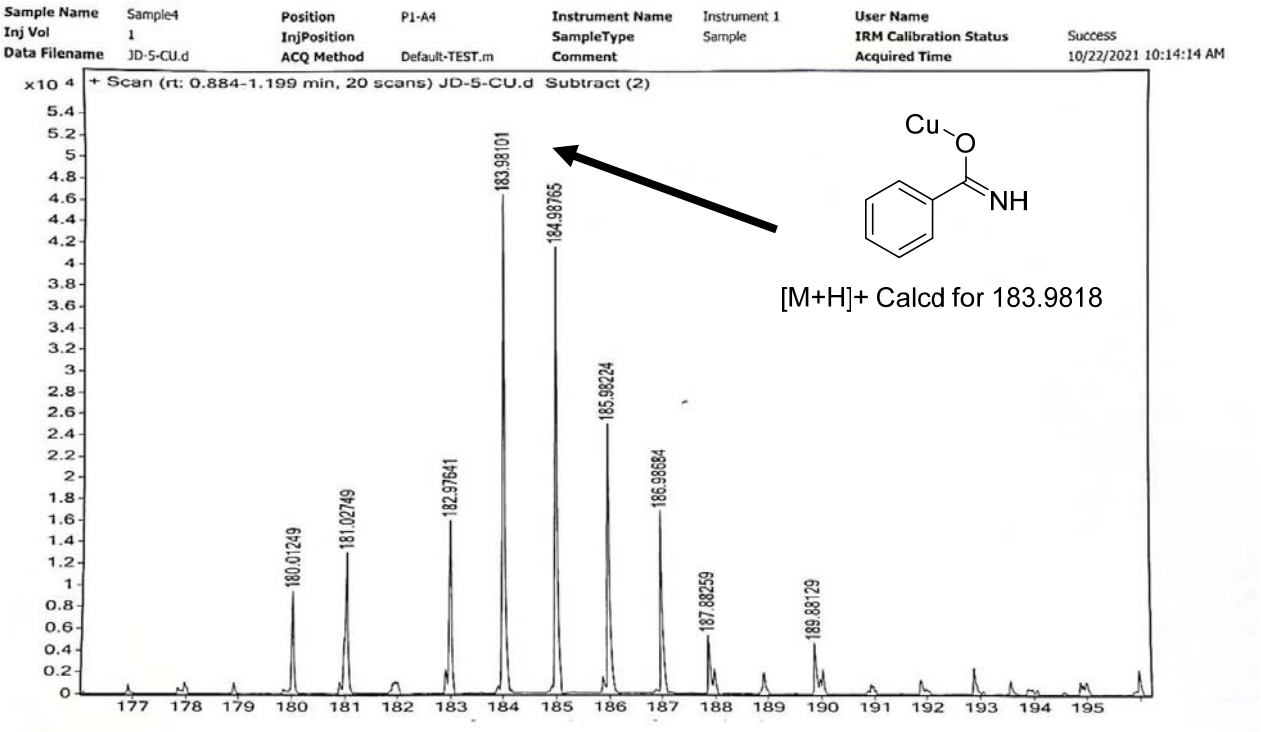
large amount of light-green **precipitation** emerges after heated at 100 °C for 16 h

filtration

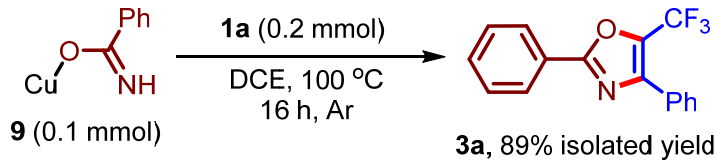


A mixture of **2a** (24.2 mg, 0.2 mmol, 1.0 equiv), $Cu(MeCN)_4PF_6$ (74.4 mg, 0.2 mmol, 1.0 equiv), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (2.0 mL) was then added. and the resulting mixture was stirred at 100 °C using heating modular of parallel reactor for 16 h under Ar atmosphere. Then the reaction mixture was filtered while still hot. The obtained light green precipitation **9** was analyzed by HRMS. The HRMS analysis of **9** showed a peak at m/z = 183.9810, which match the structure of proposed Cu-imidate complex (calcd mass: 183.9818).

Cu-complex **9**: **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for C_7H_7CuNO 183.9818, Found: 183.9810.



(d) The reaction of stoichiometric amounts of complex 9 with diazo 1a

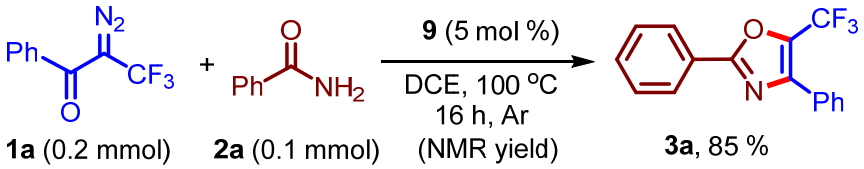


9 (0.1 mmol)

3a, 89% isolated yield

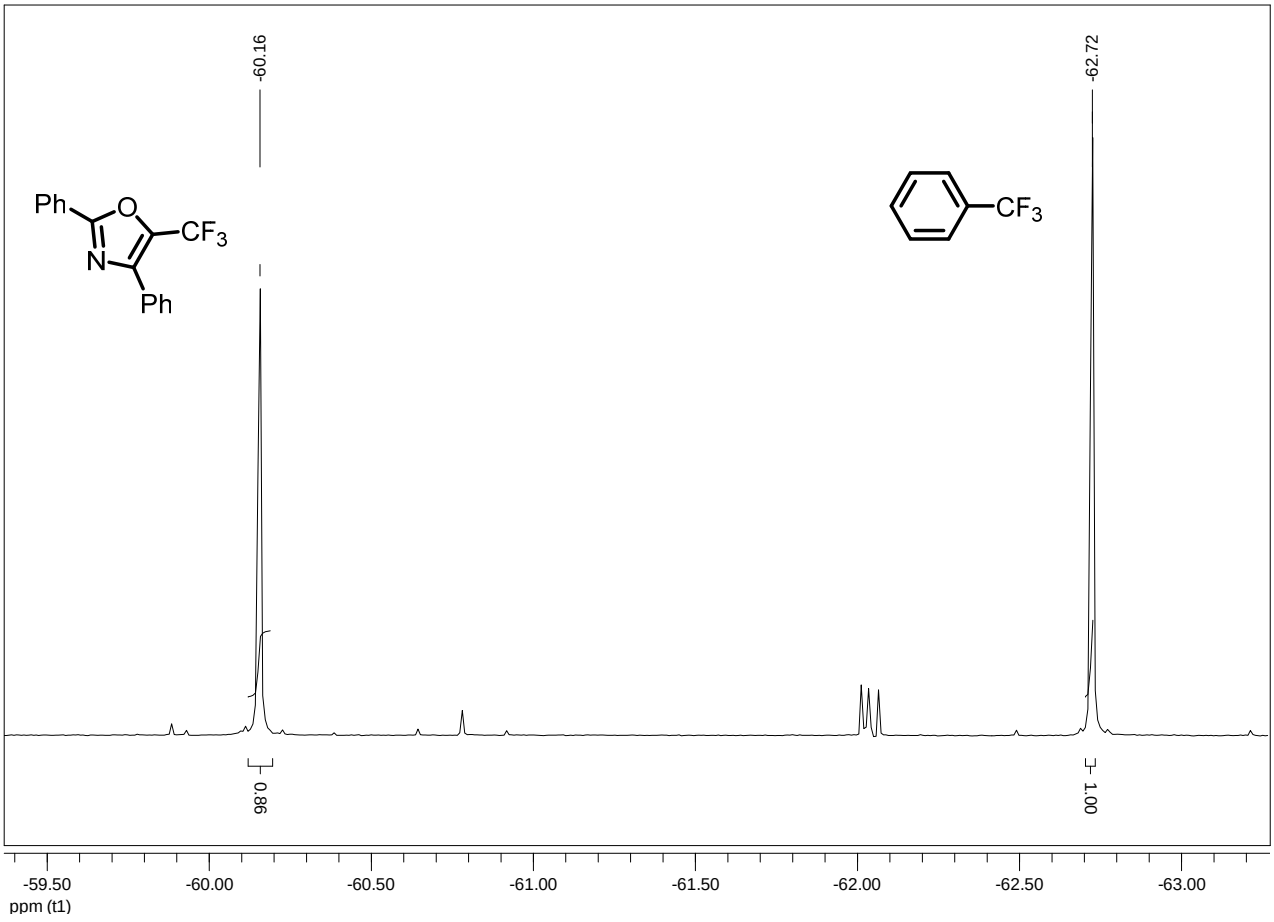
A mixture of **1a** (42.8 mg, 0.2 mmol, 2.0 equiv), Cu complex **6** (18.4 mg, 0.1 mmol, 1.0 equiv), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (2.0 mL) was added and the resulting mixture was stirred at 100 °C using heating modular of parallel reactor for 16 h under Ar atmosphere. The reaction was cooled to room temperature and the suspension was filtered through a short column filled with celite and the solvent was removed in vacuo. The solvent was removed to leave a crude product, which was purified by column chromatography on silica gel with petroleum ether/EtOAc (50:1). The desired product **3a** was obtained in 89% yield (25.7 mg).

(e) Complex 9-catalyzed cyclization of diazo 1a with amide 2a

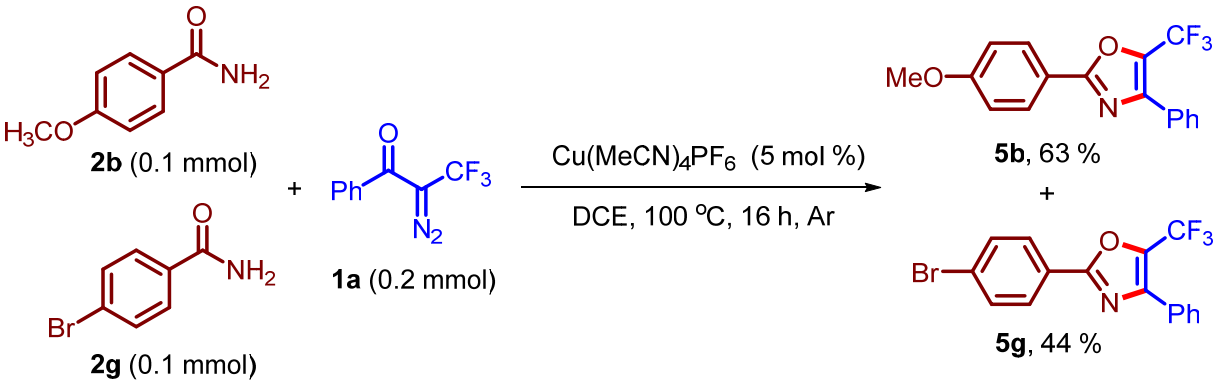


1a (0.2 mmol) **2a** (0.1 mmol) **3a**, 85 %

A mixture of **1a** (42.8 mg, 0.2 mmol, 2.0 equiv), **2a** (12.1 mg, 0.1 mmol, 1.0 equiv), Cu complex **9** (0.9 mg, 0.005 mmol, 5.0 mol %), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (1.0 mL) was added and the resulting mixture was stirred at 100 °C using heating modular of parallel reactor for 16 h under Ar atmosphere. The reaction was cooled to room temperature and the suspension was filtered through a short column filled with celite and the solvent was removed in vacuo. The solvent was removed to leave a crude product, which was analysed by ^{19}F NMR using $PhCF_3$ (0.1 mmol) as the internal standard. Based on ^{19}F NMR spectra, the **5a** was formed in 86% NMR yield.

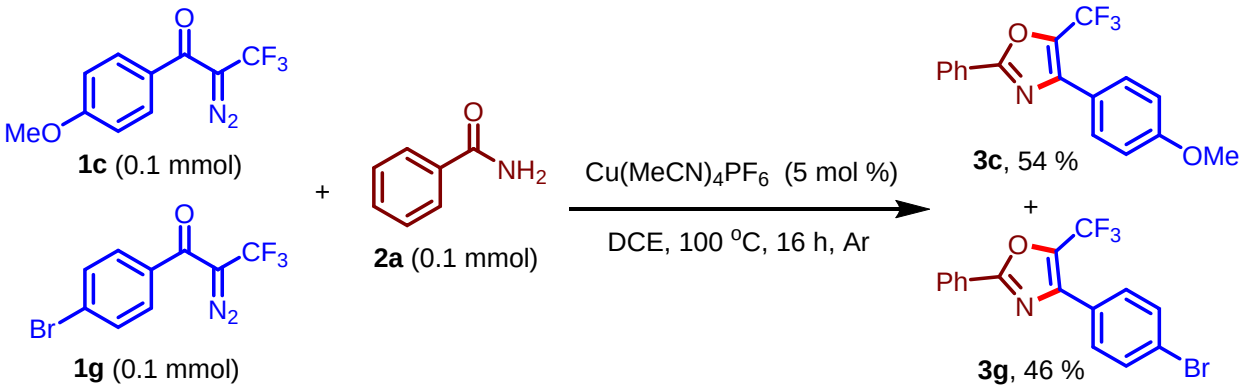


(f) Intermolecular competation reaction between electronically differentiated amides 2b and 2g



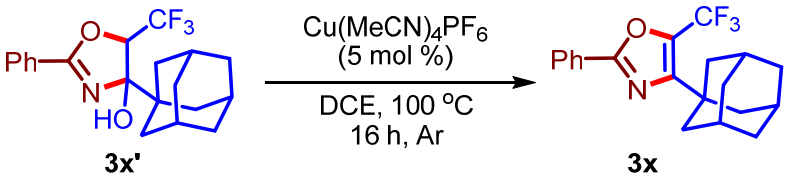
A mixture of **1a** (42.8 mg, 0.2 mmol, 2.0 equiv), **2b** (15.1 mg, 0.1 mmol, 1.0 equiv), **2g** (19.9 mg, 0.1 mmol, 1.0 equiv), $Cu(MeCN)_4PF_6$ (1.9 mg, 0.005 mmol, 5.0 mol %), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (1.0 mL) was added and the resulting mixture was stirred at 100 °C for 16 h using heating modular of parallel reactor under Ar atmosphere. The reaction was cooled to room temperature and transferred to a 100 mL round-bottomed flask using CH_2Cl_2. Silica was added to the flask and volatiles were evaporated under reduced pressure. The residue was purified by preparative thin-layer chromatography (TLC) with petroleum ether/EtOAc (50:1, v/v). The desired products **5b** and **5g** were obtained in 63% yield (20.1 mg) and 44% yield (16.2 mg), respectively.

(g) Intermolecular competation reaction between electronically differentiated diazoes 1c and 1g



A mixture of **1c** (24.4 mg, 0.1 mmol, 1.0 equiv), **1g** (29.3 mg, 0.1 mmol, 1.0 equiv), **2a** (12.1 mg, 0.1 mmol, 1.0 equiv), $Cu(MeCN)_4PF_6$ (1.9 mg, 0.005 mmol, 5.0 mol %), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (1.0 mL) was added and the resulting mixture was stirred at 100 °C for 16 h using heating modular of parallel reactor under Ar atmosphere. The reaction was cooled to room temperature and transferred to a 100 mL round-bottomed flask using CH_2Cl_2. Silica was added to the flask and volatiles were evaporated under reduced pressure. The residue was purified by preparative thin-layer chromatography (TLC) with petroleum ether/EtOAc (50:1, v/v). The desired products **3c** and **3g** were obtained in 54% yield (17.3 mg) and 46% yield (16.8 mg), respectively.

(h) Conversion of oxazoline 3x' to oxazole 3x



3x' **3x**

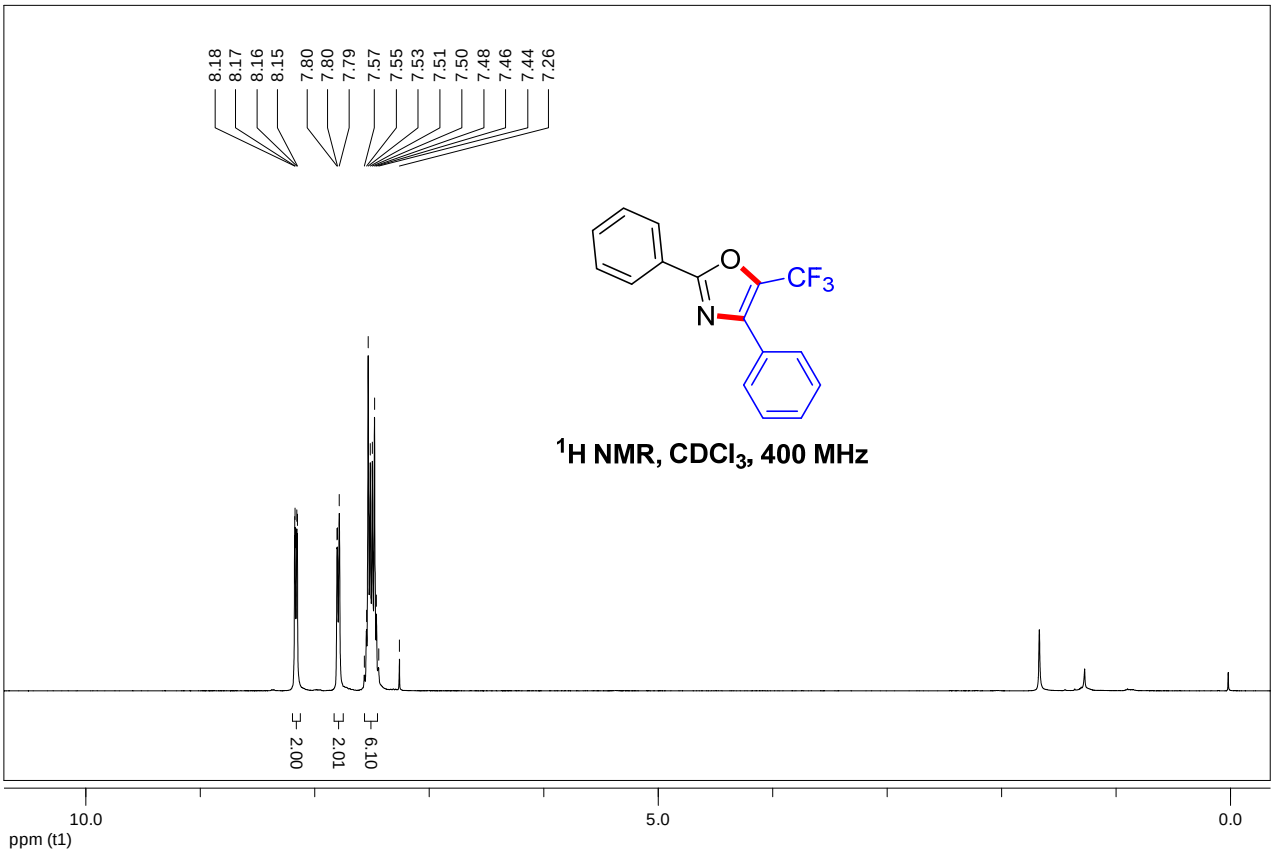
standard conditions: **3x** (43%) + **3x'** (55% recovery)
without $Cu(MeCN)_4PF_6$: **3x** (0%) + **3x'** (97% recovery)

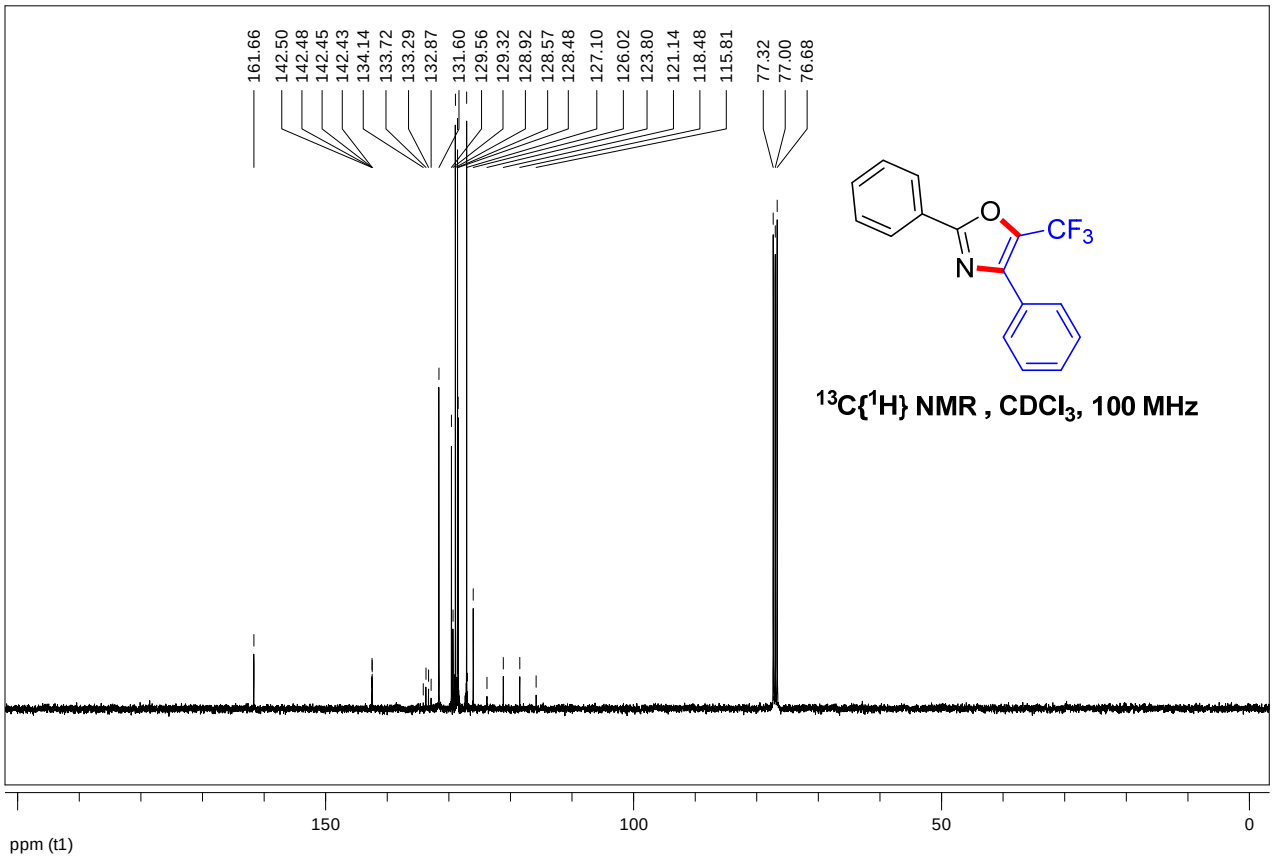
A mixture of **3x'** (36.5 mg, 0.1 mmol, 1.0 equiv), $Cu(MeCN)_4PF_6$ (1.9 mg, 0.005 mmol, 5.0 mol %), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (1.0 mL) was added and the resulting mixture was stirred at 100 °C for 16 h using heating modular of parallel reactor under Ar atmosphere. The reaction was cooled to room temperature and transferred to a 100 mL round-bottomed flask using CH_2Cl_2. Silica was added to the flask and volatiles were evaporated under reduced pressure. The residue was purified by column chromatography on silica gel with with petroleum ether: ethyl acetate = 50:1 (v/v). The desired product **3x** was obtained in 43% yield (15.0 mg) and unreacted **3x'** was recovered in 55% yield (20.2 mg).

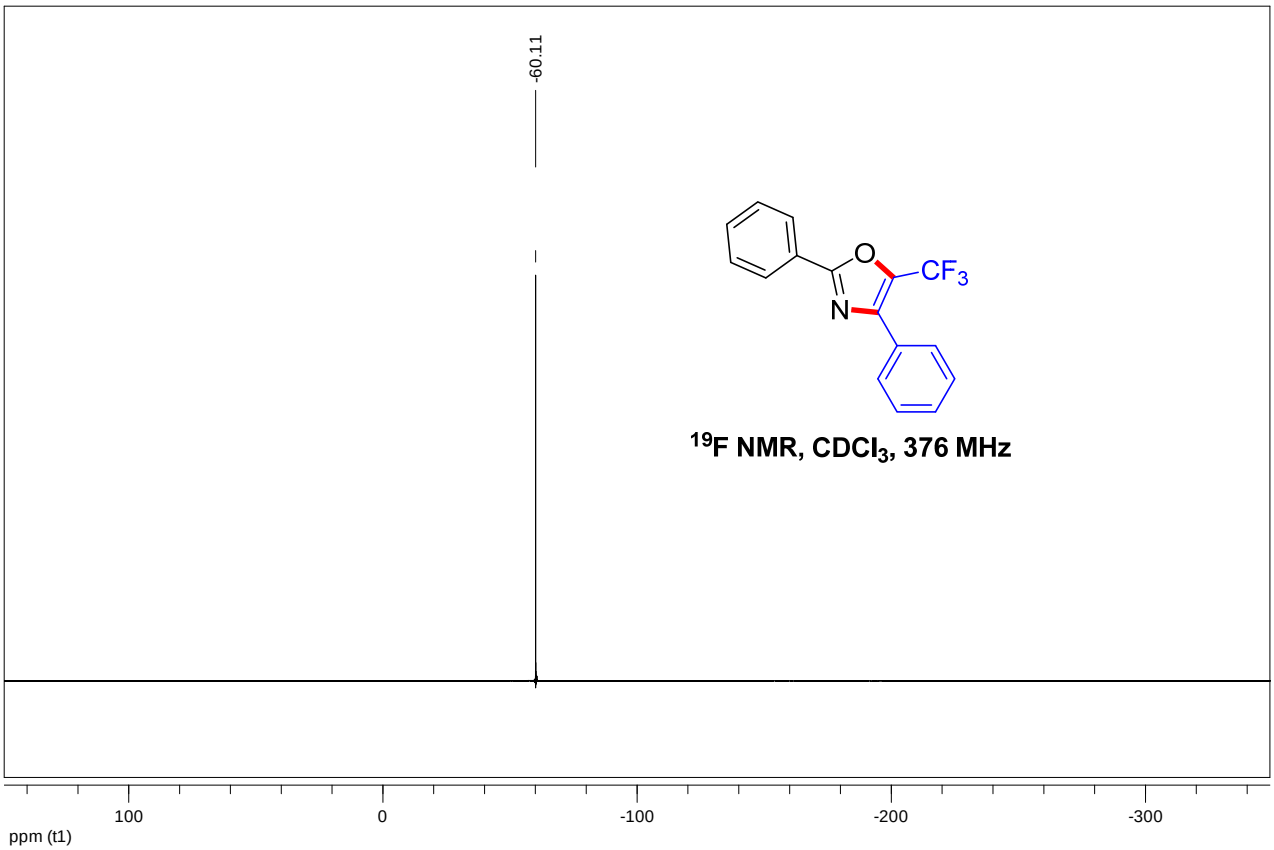
When the above reaction was carried out in the absence of $Cu(MeCN)_4PF_6$, TLC indicadeted that no reaction occurred and most of **3x'** (35.2 mg, 97%) was recovered.

Spectral Copies of ^{1}H, ^{19}F and $^{13}C\{^{1}H\}$ NMR of Compounds Obtained in this Study

2,4-diphenyl-5-(trifluoromethyl)oxazole (3a)

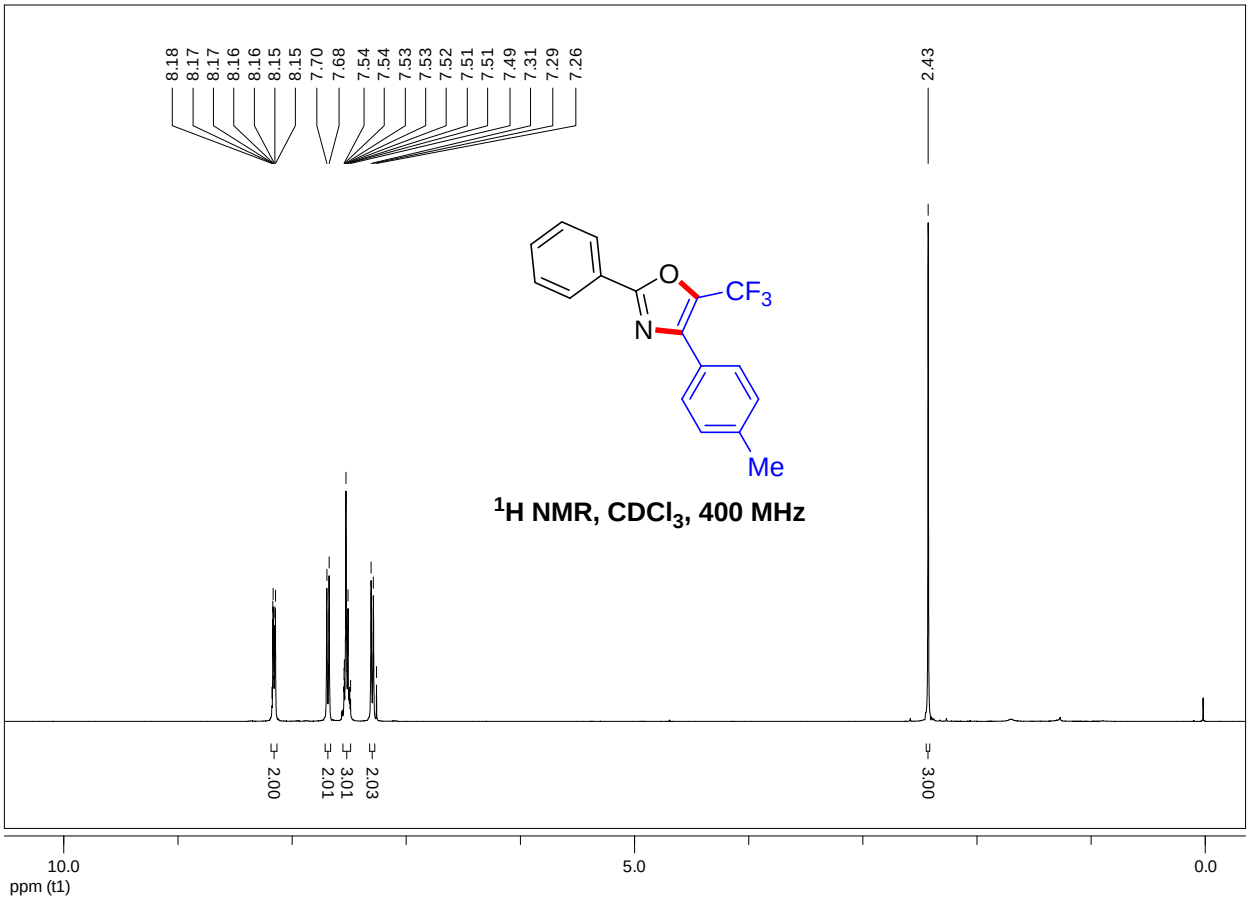


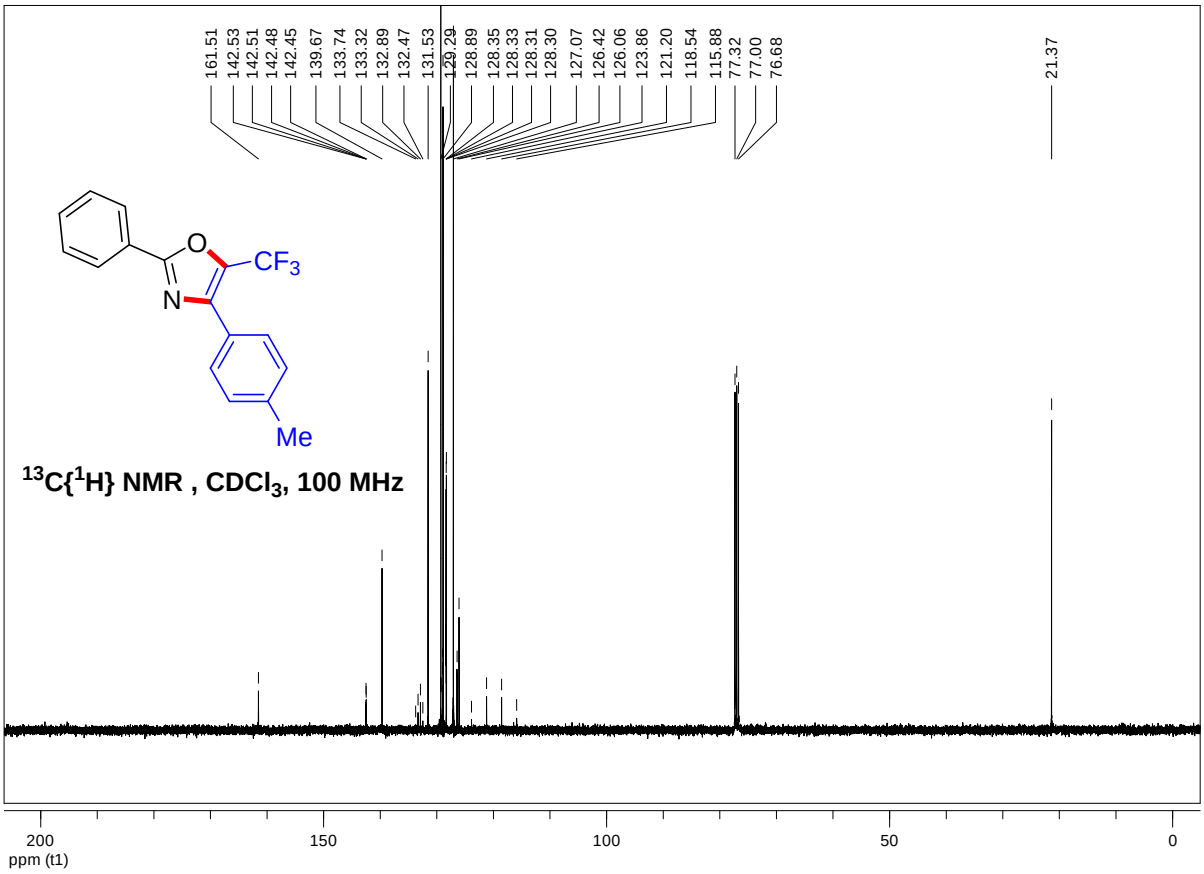


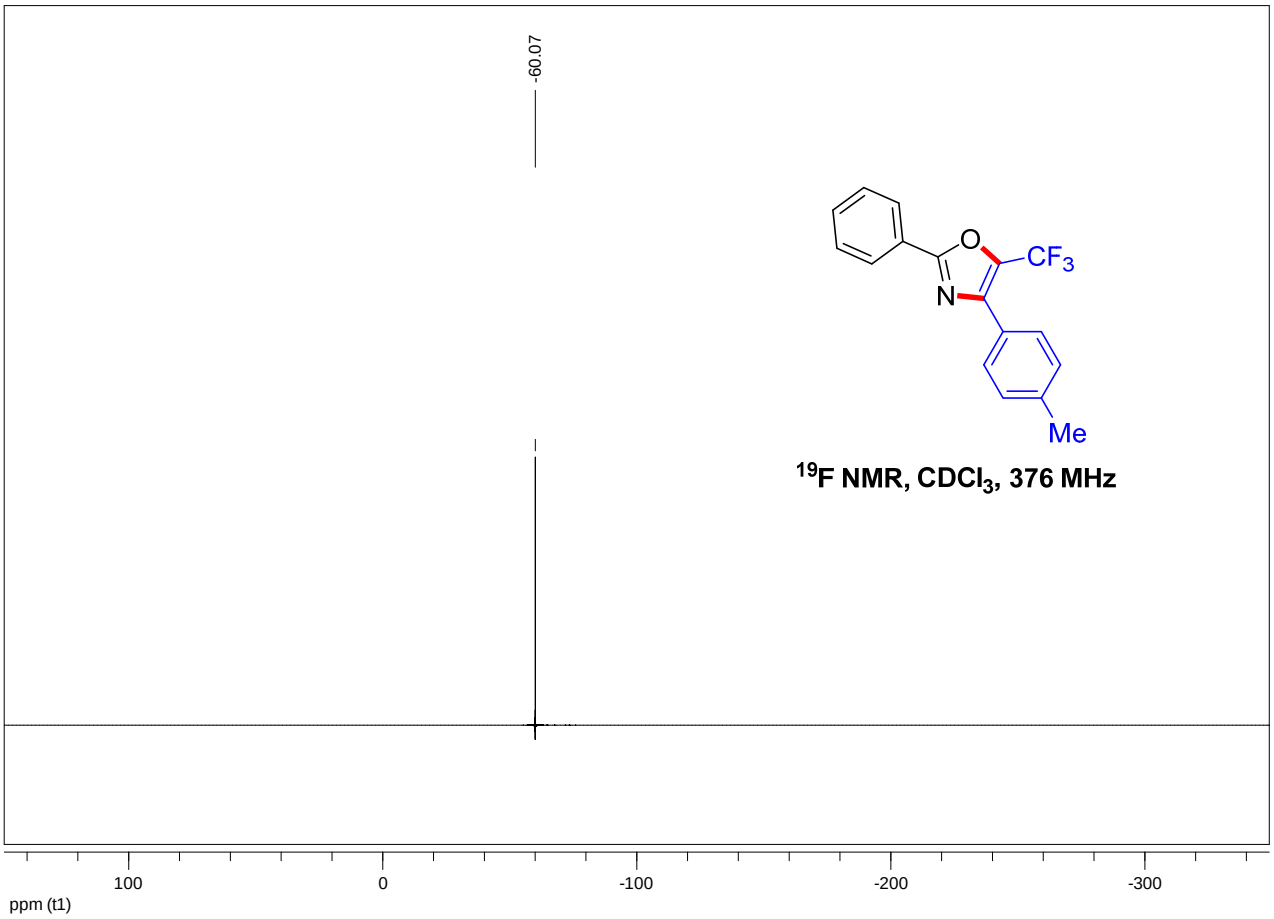


^{19}F NMR, $CDCl_3$, 376 MHz

2-phenyl-4-(p-tolyl)-5-(trifluoromethyl)oxazole (3b)

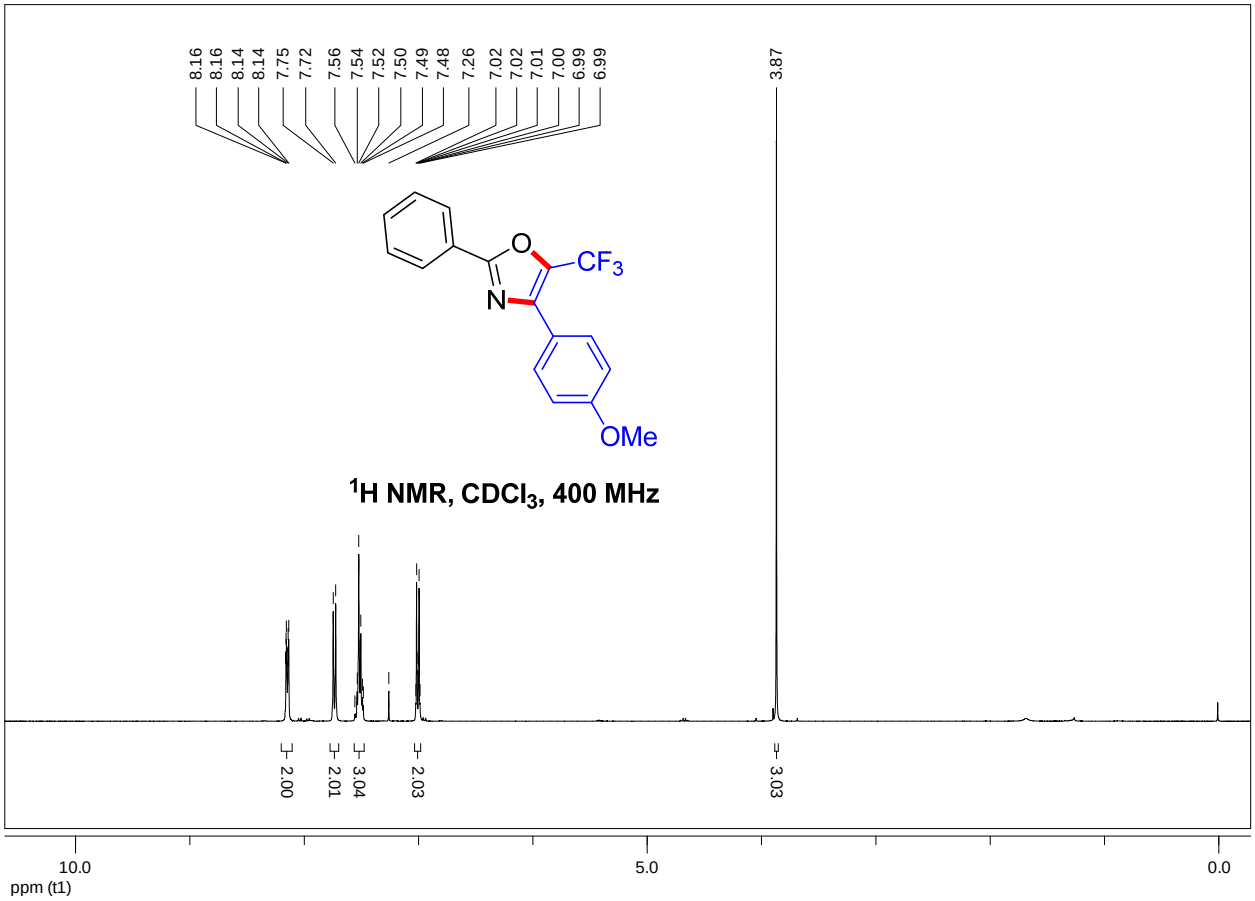


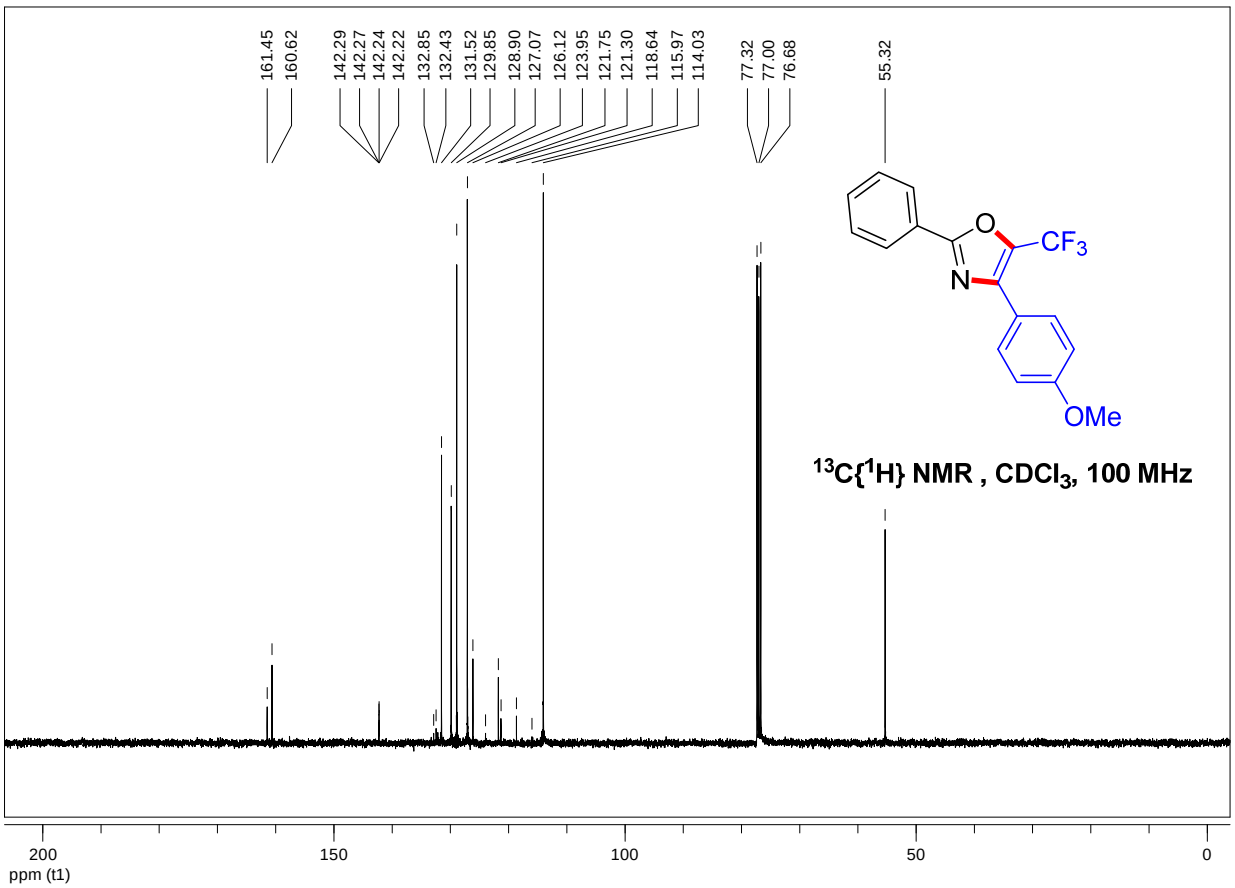


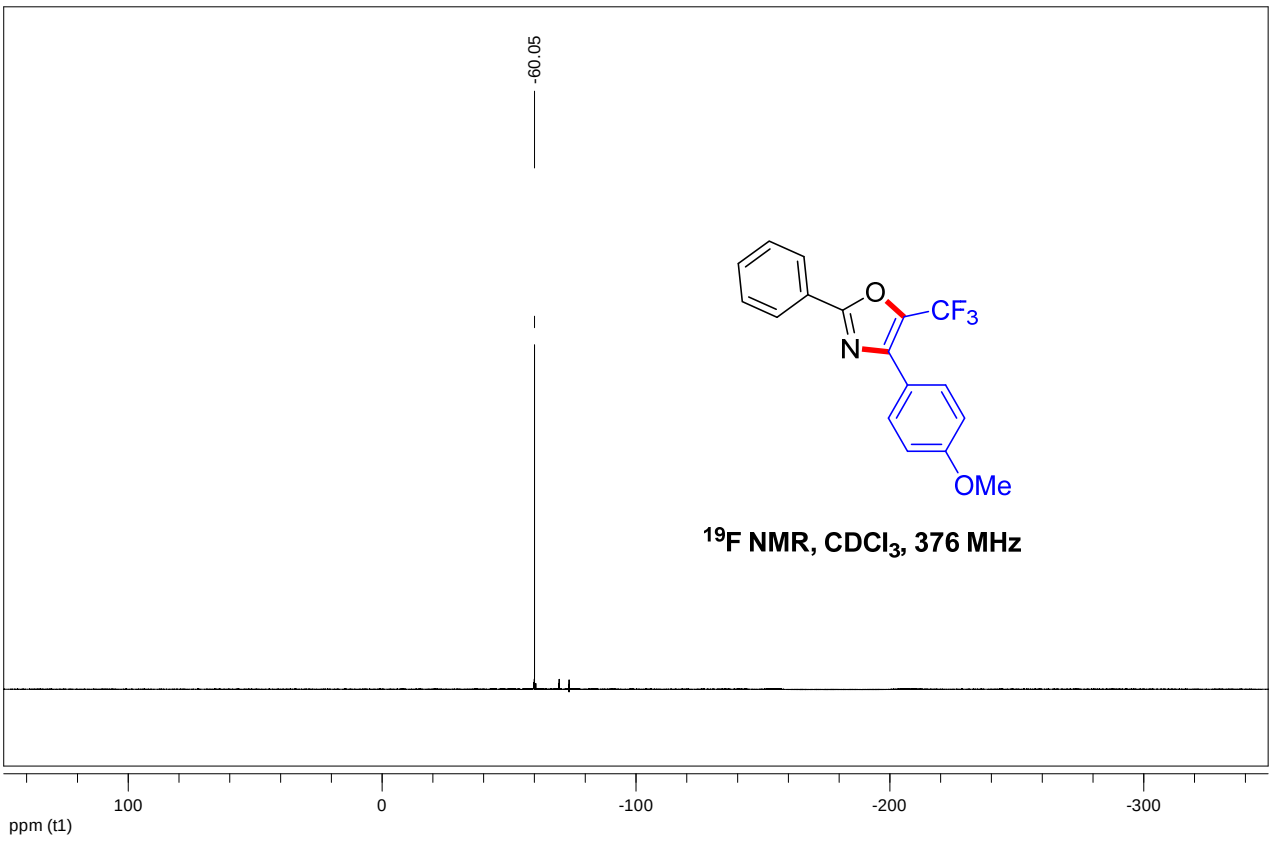


^{19}F NMR, $CDCl_3$, 376 MHz

4-(4-methoxyphenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3c)

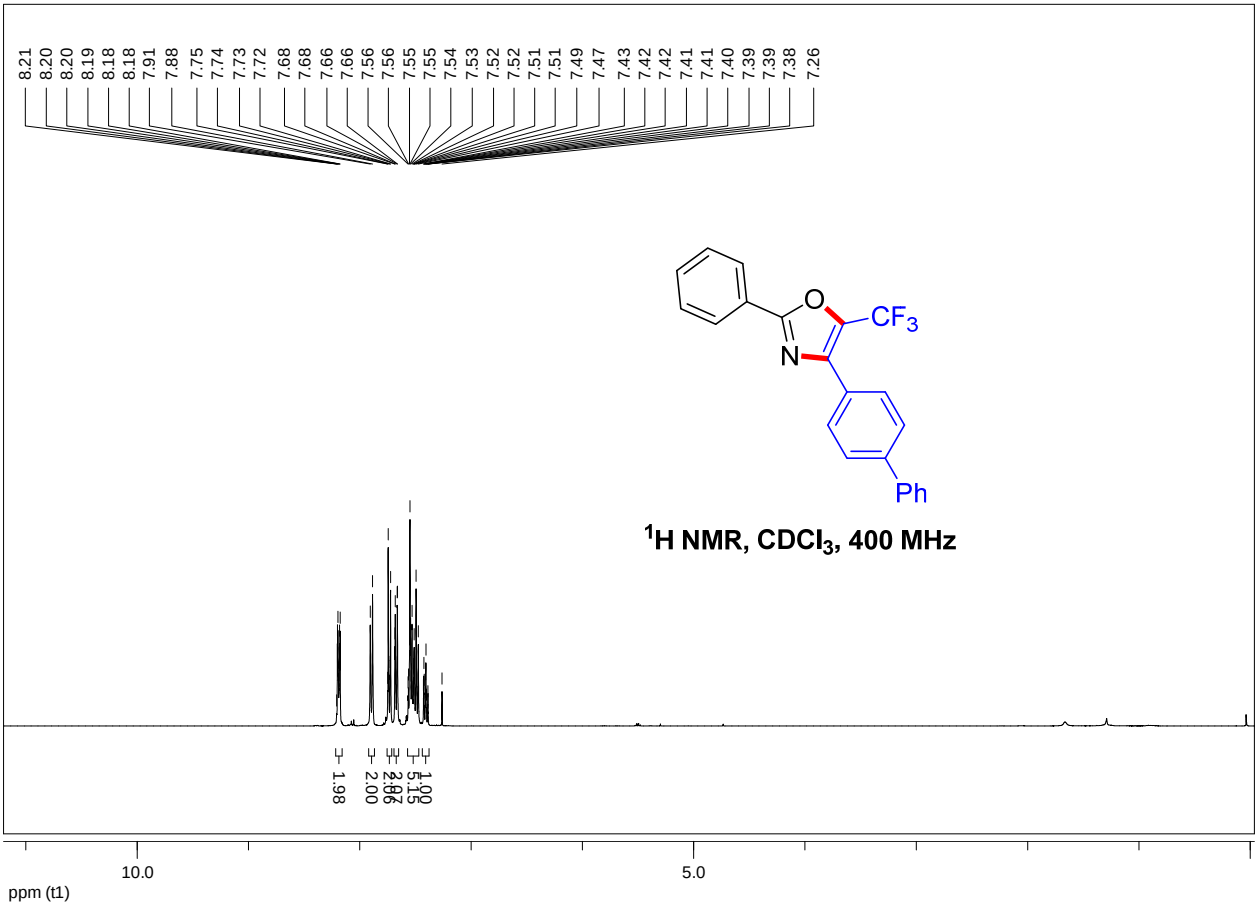


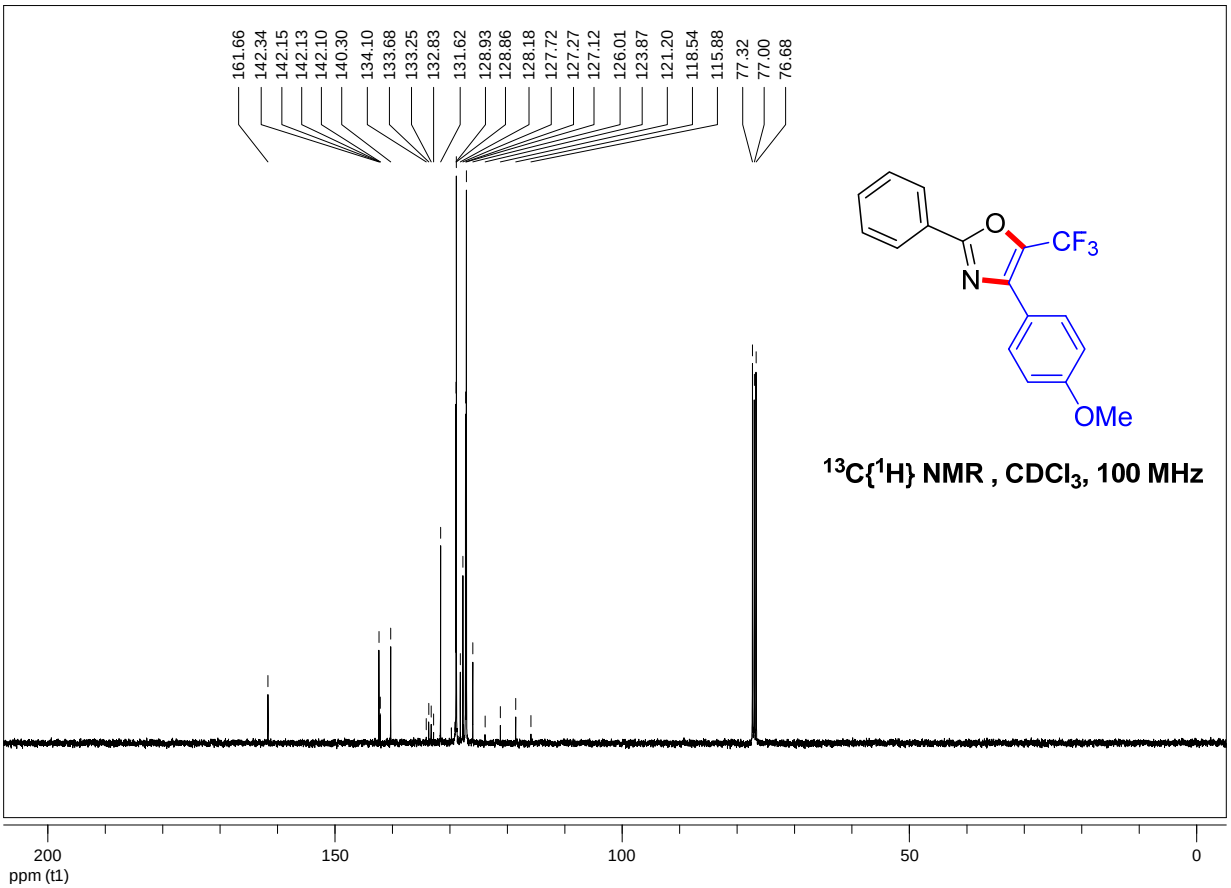


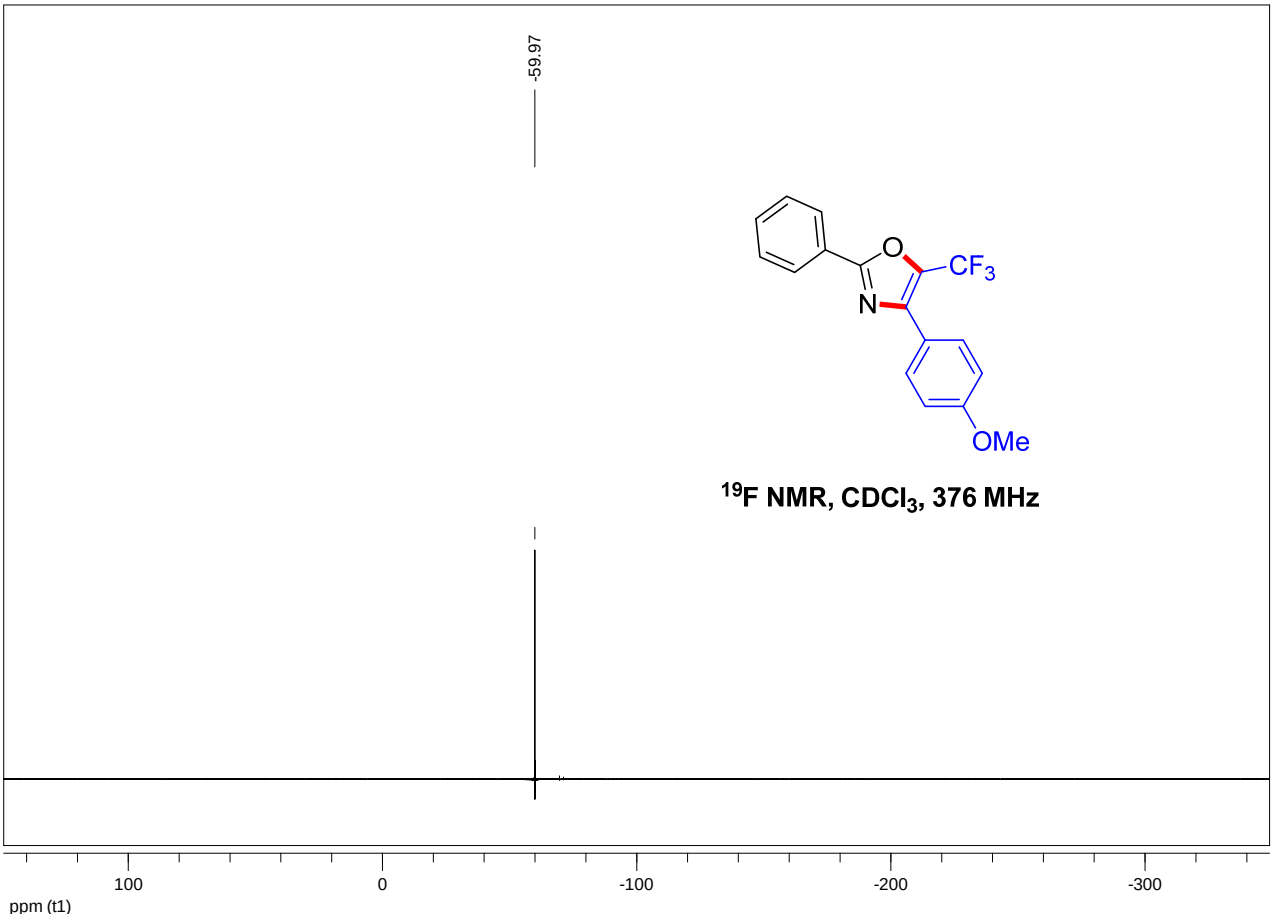


^{19}F NMR, $CDCl_3$, 376 MHz

4-([1,1'-biphenyl]-4-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3d)

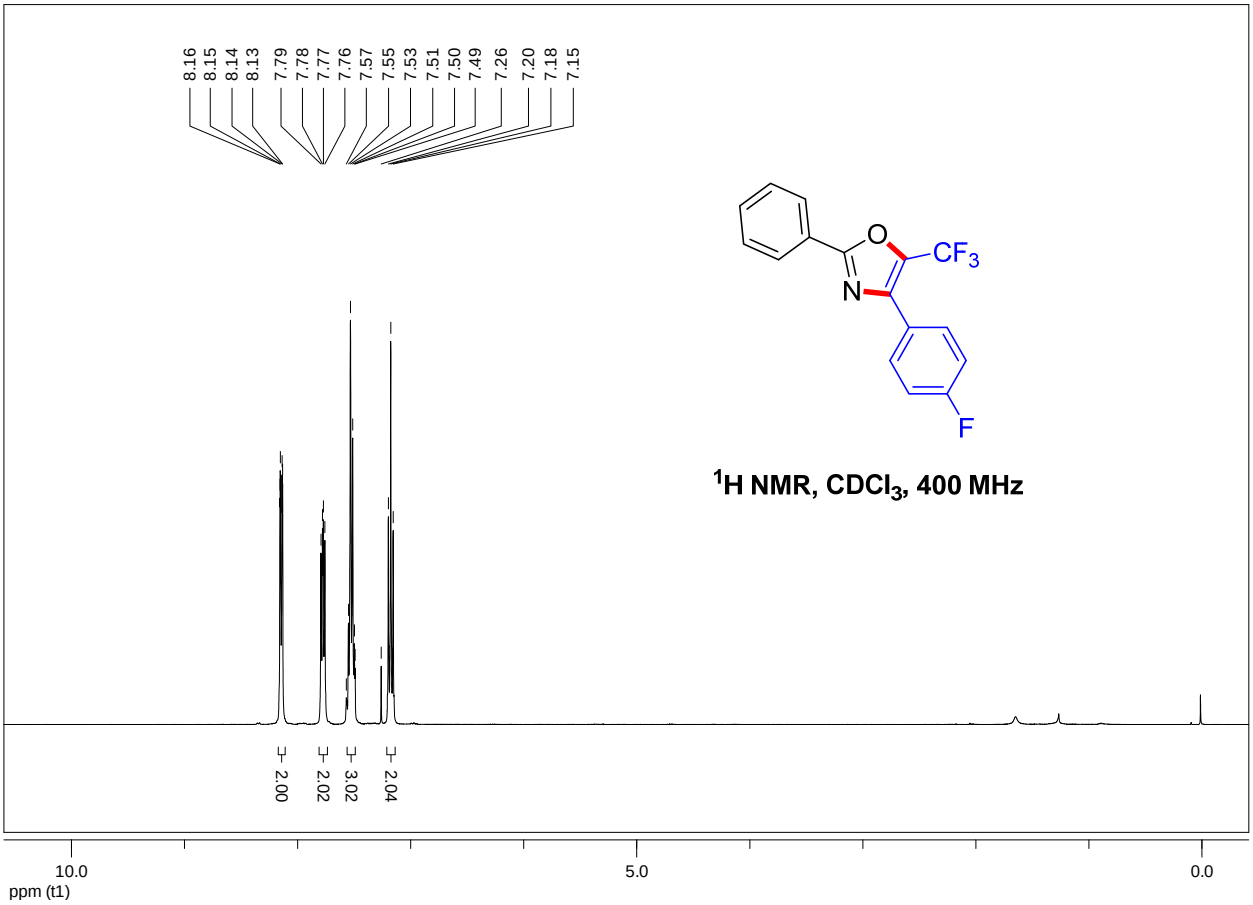


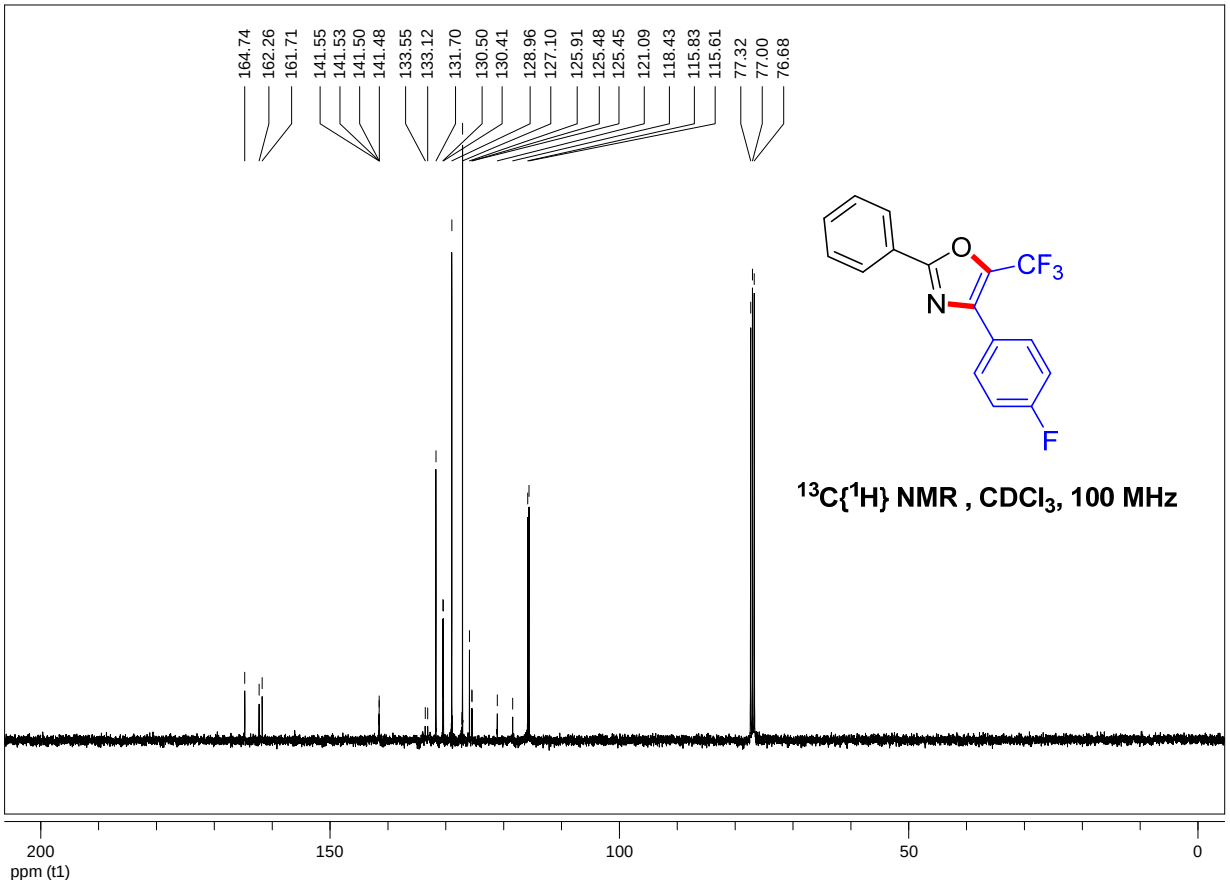


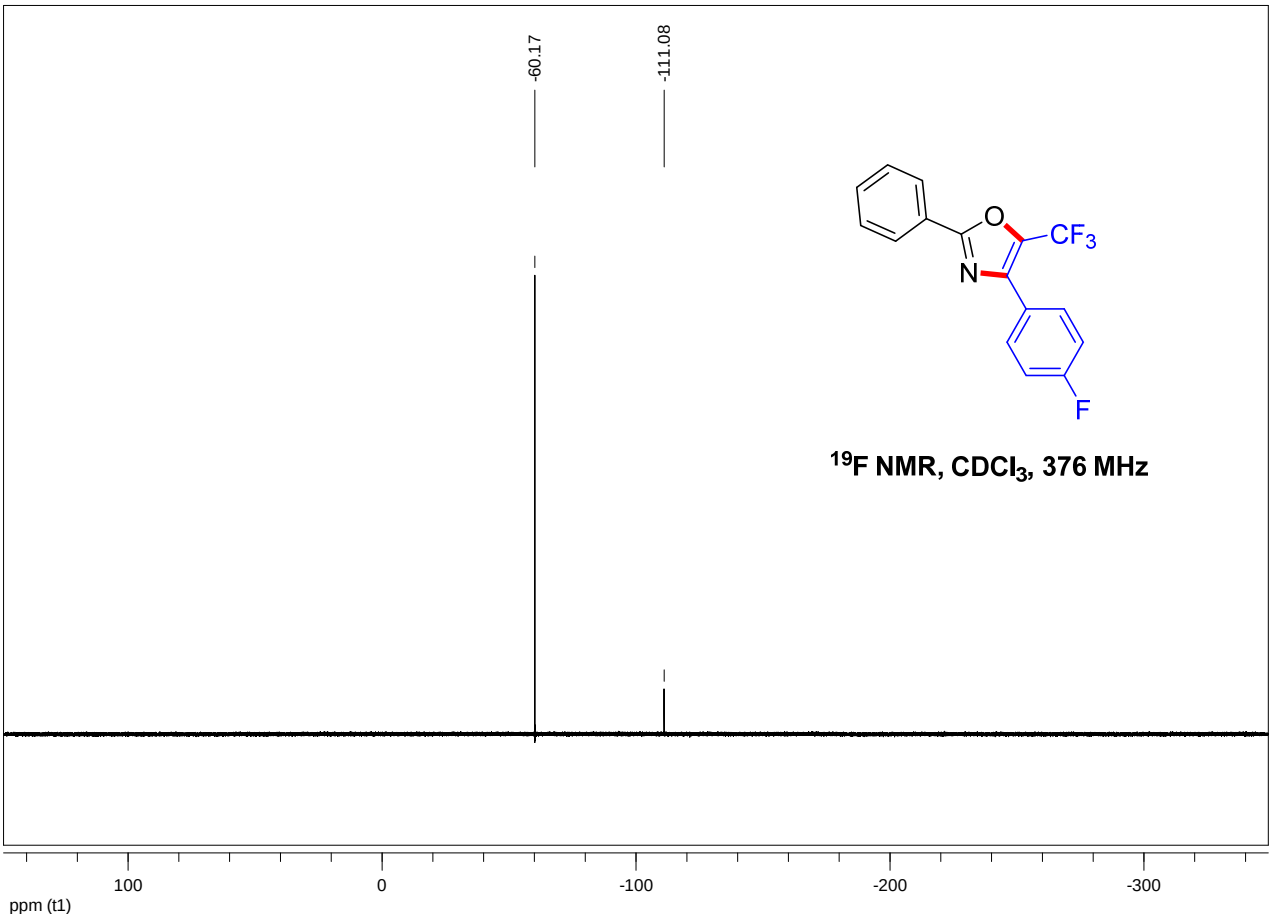


^{19}F NMR, $CDCl_3$, 376 MHz

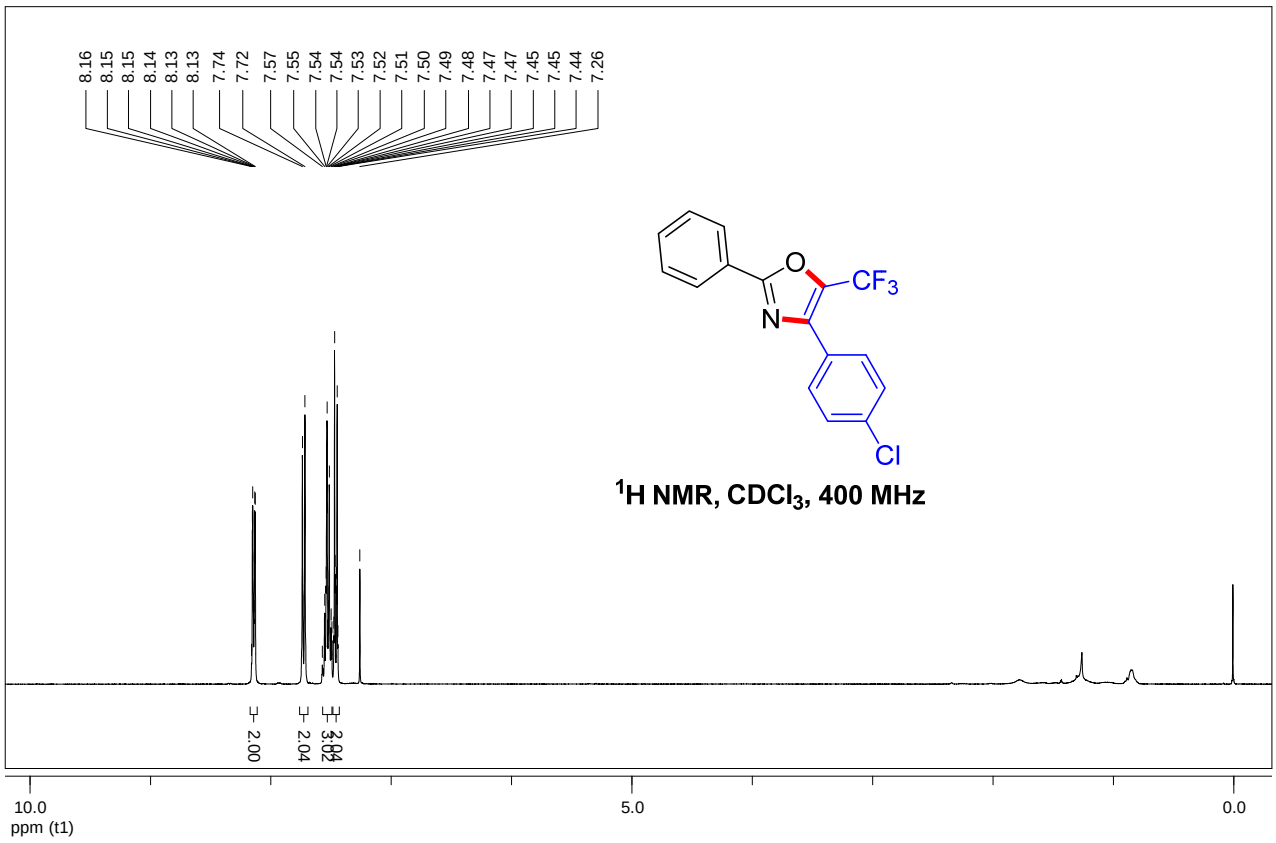
4-(4-fluorophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3e)

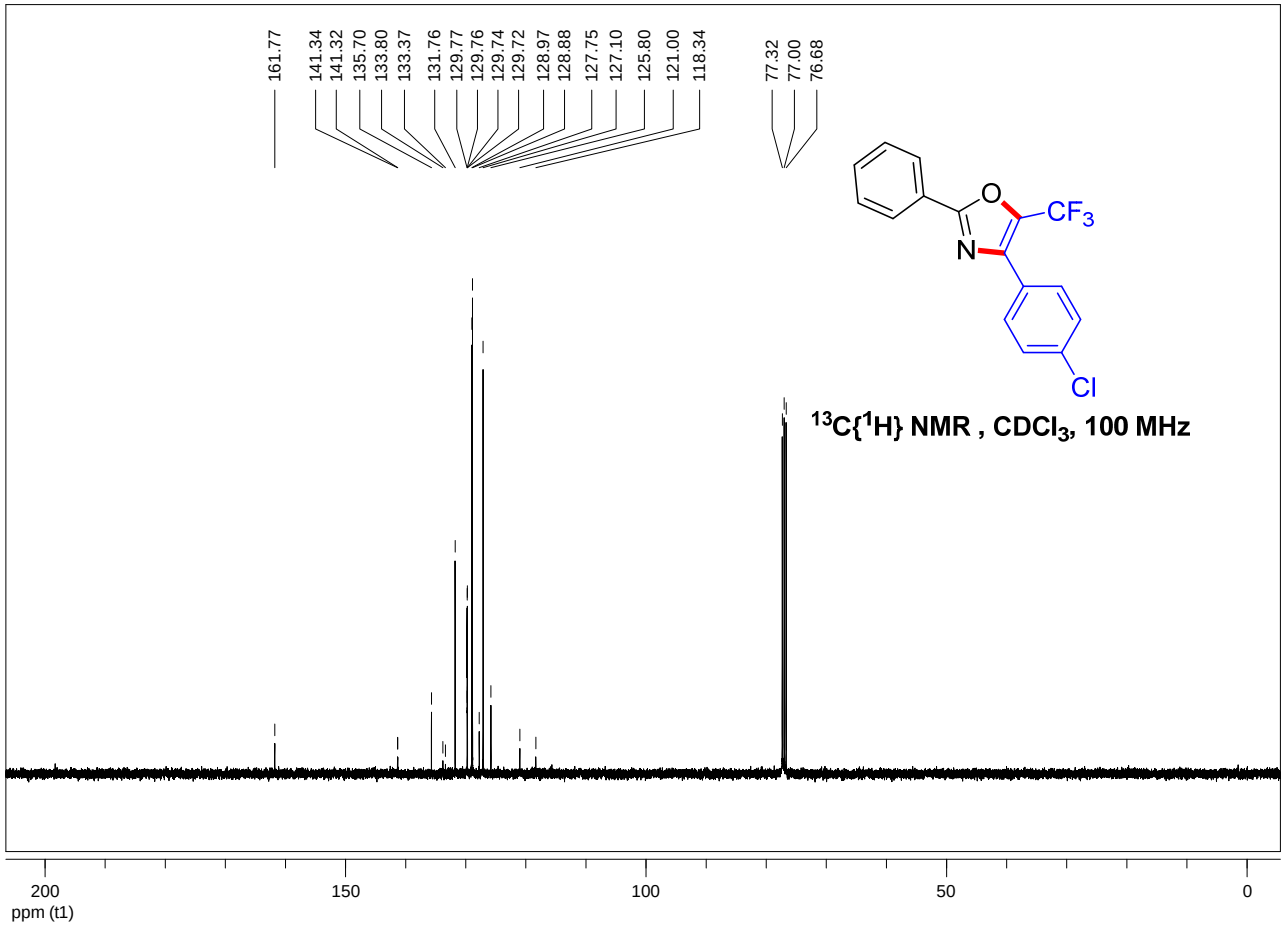


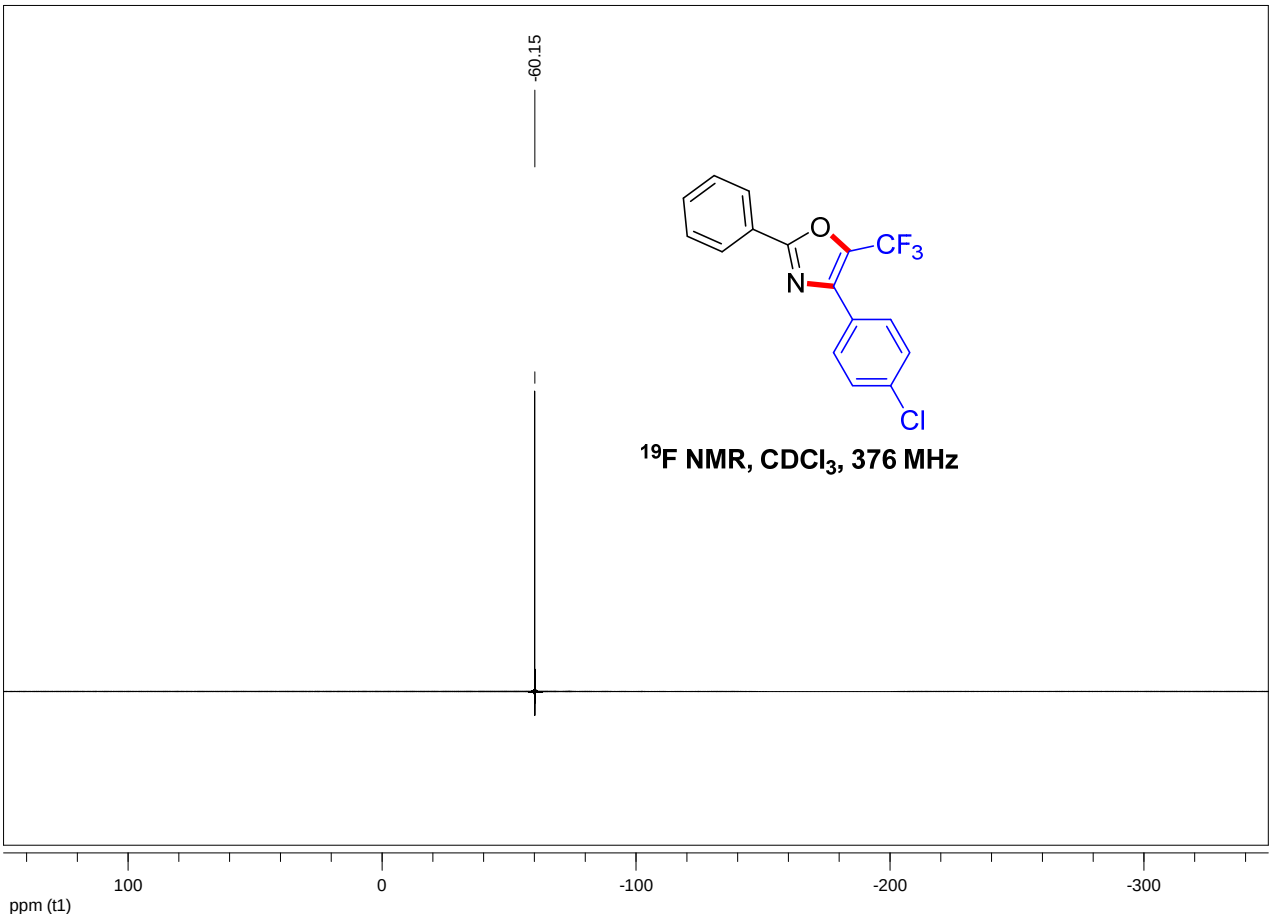



-60.17
-111.08
O
N
CF3
F
19F NMR, CDCl3, 376 MHz
100
0
-100
-200
-300
ppm (t1)

4-(4-chlorophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3f)

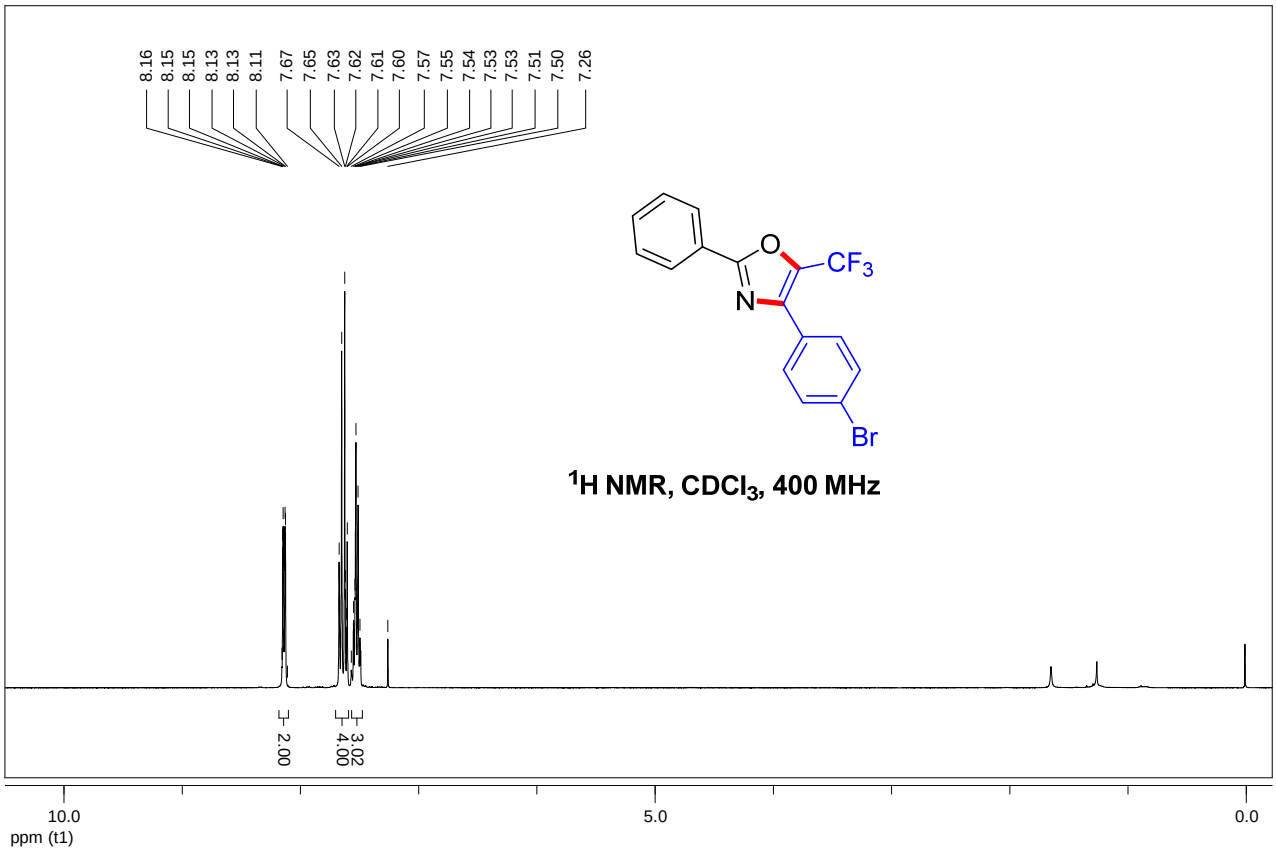


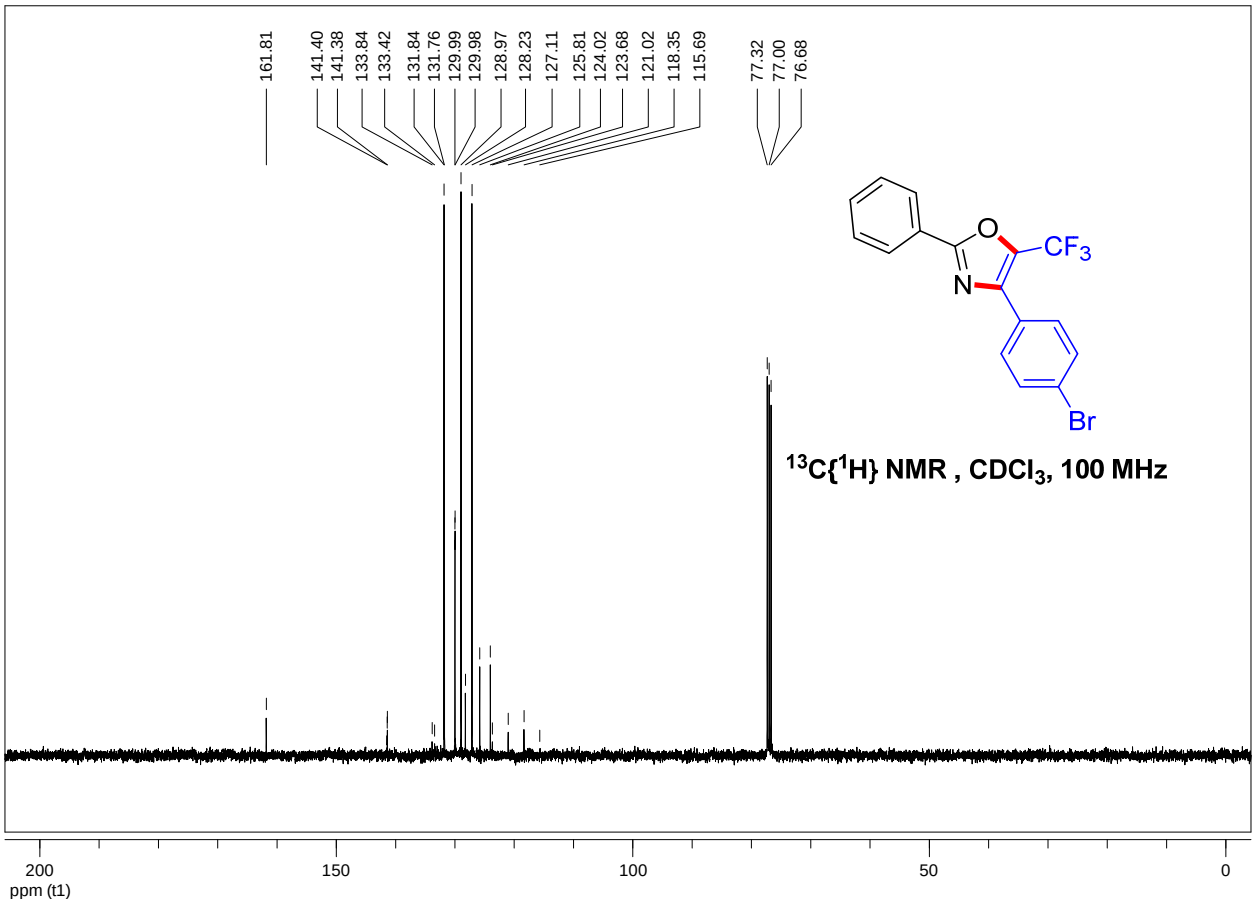


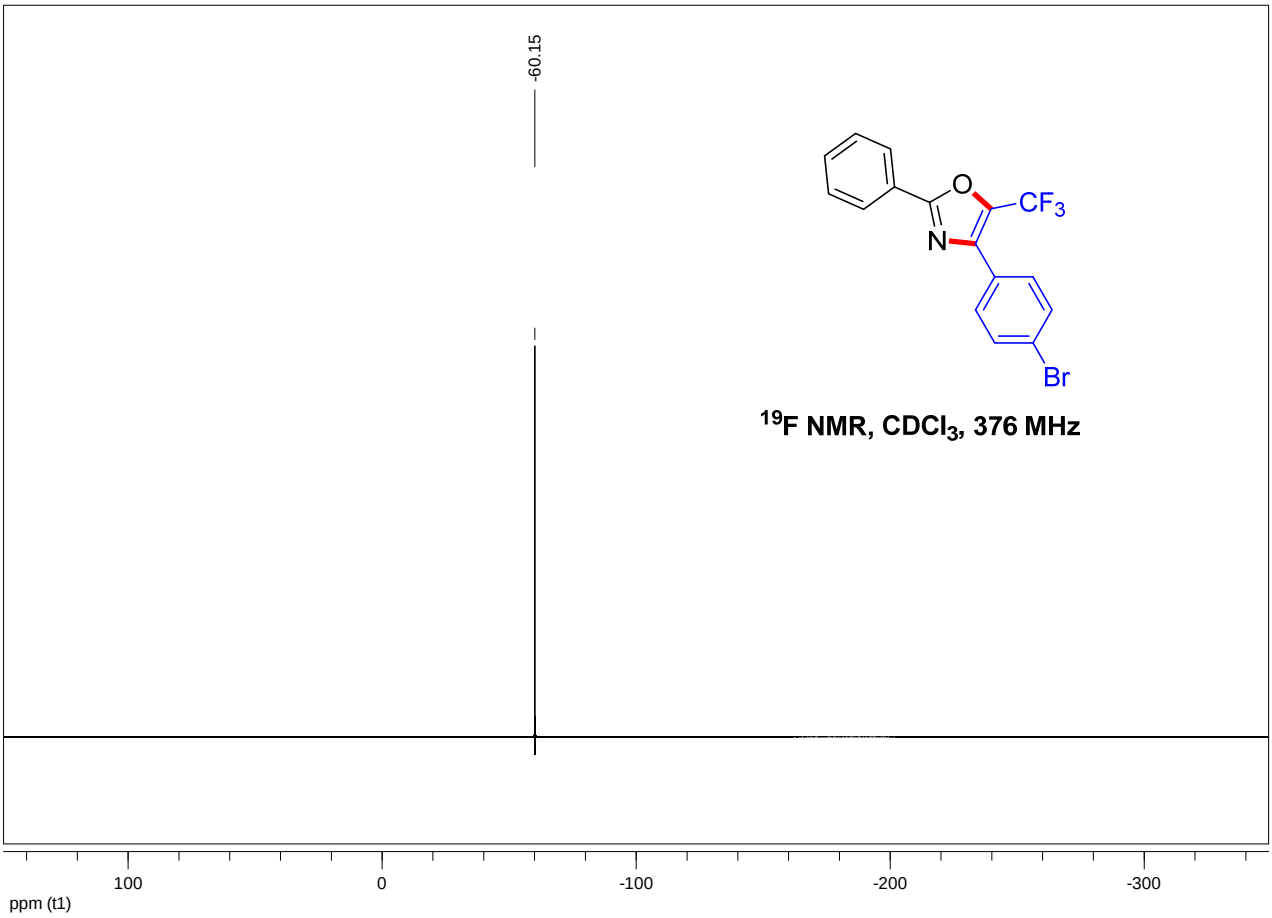


^{19}F NMR, $CDCl_3$, 376 MHz

4-(4-bromophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3g)

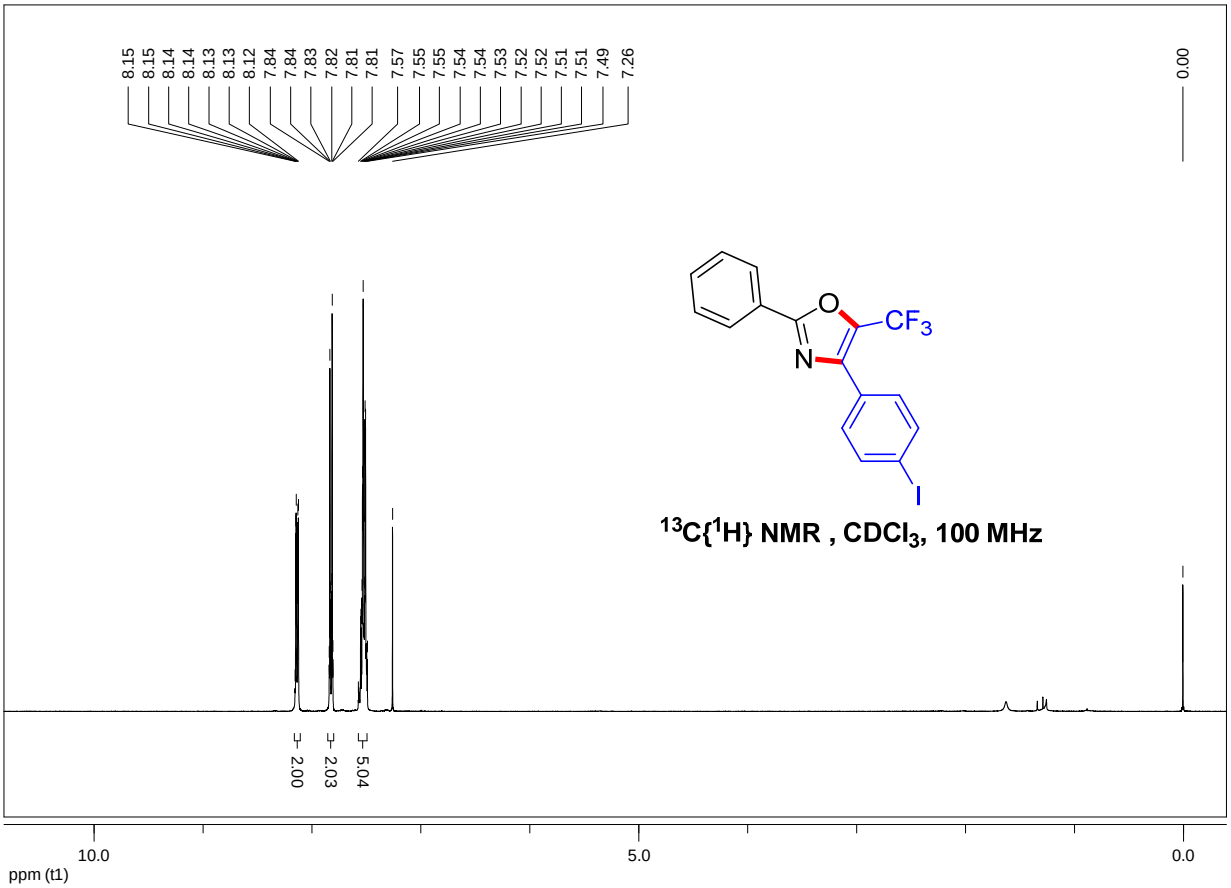


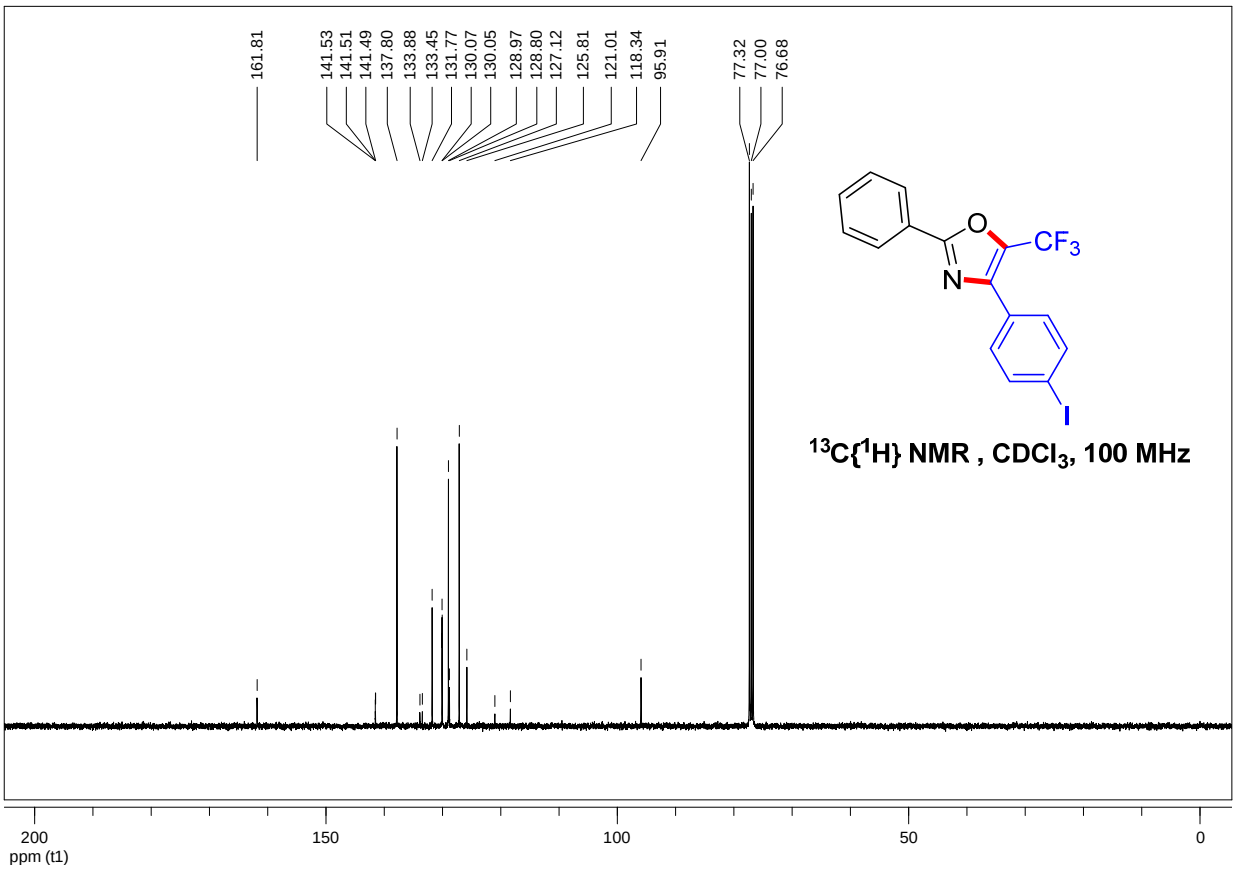


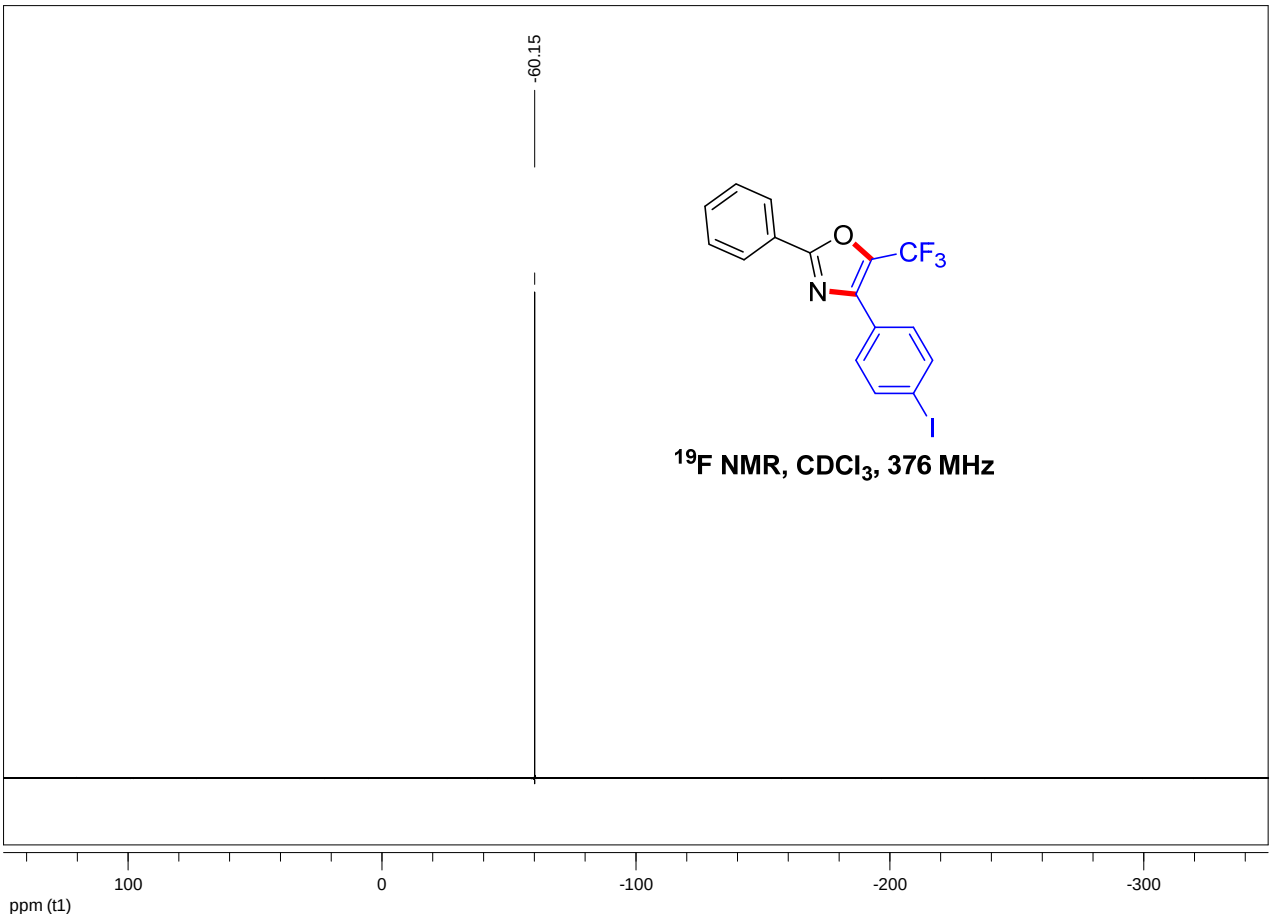


^{19}F NMR, $CDCl_3$, 376 MHz

4-(4-iodophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3h)

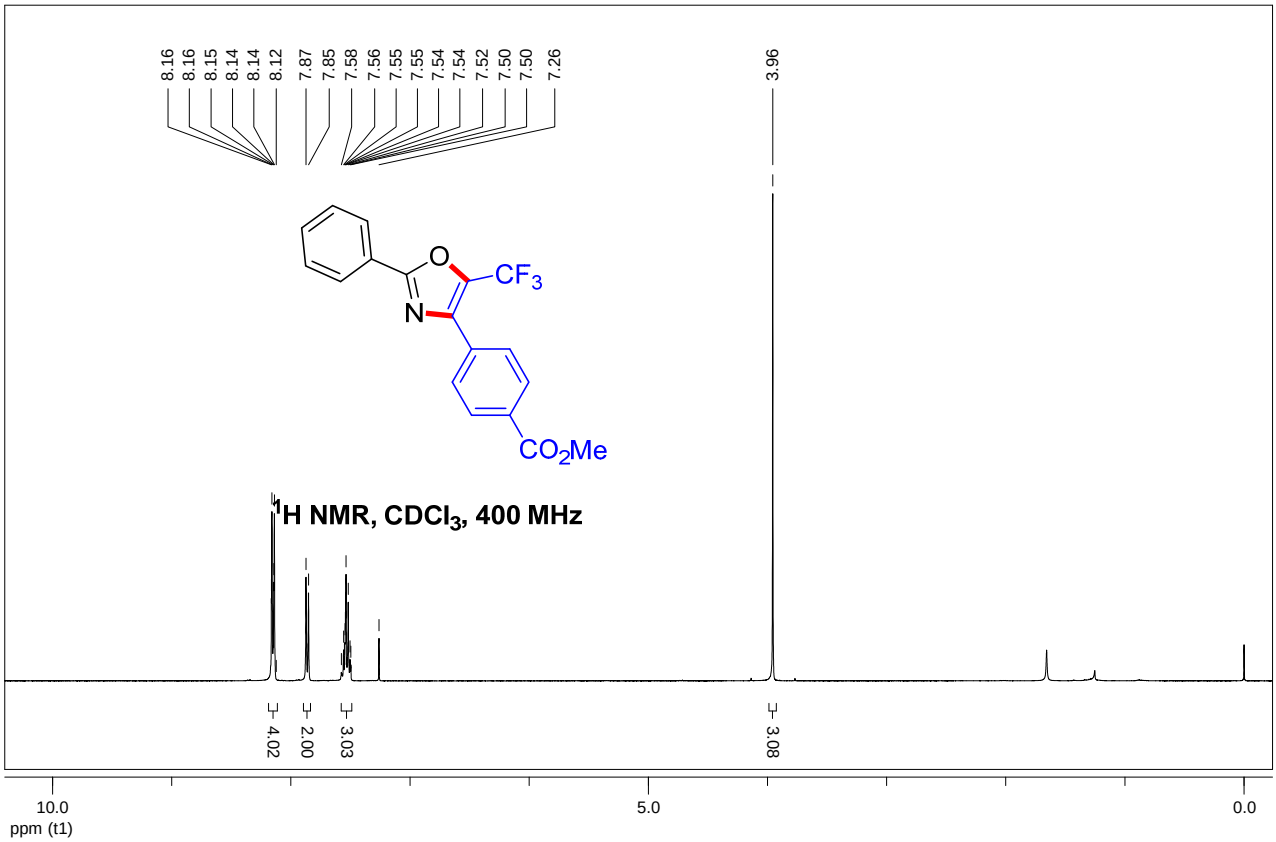


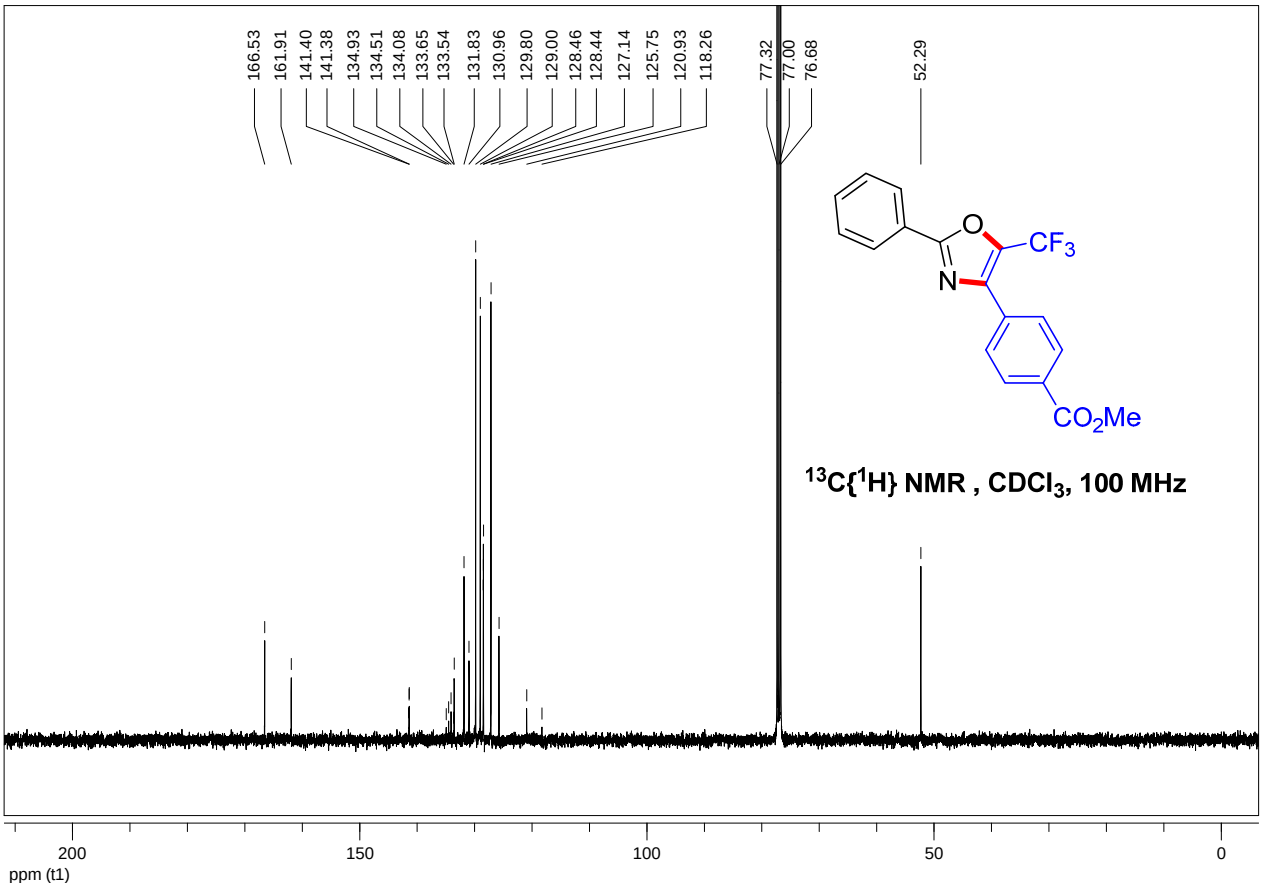


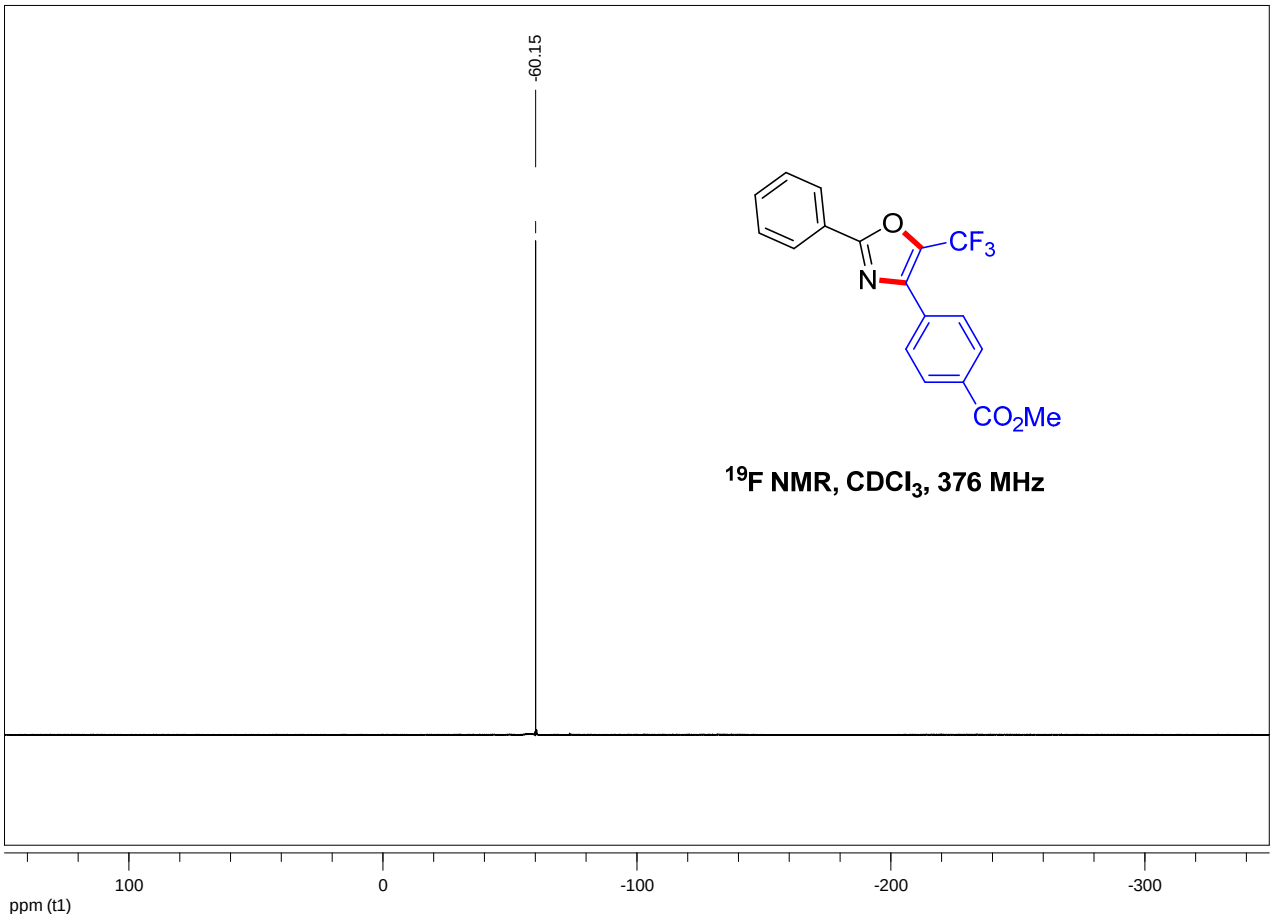


^{19}F NMR, $CDCl_3$, 376 MHz

methyl 4-(2-phenyl-5-(trifluoromethyl)oxazol-4-yl)benzoate (3i)

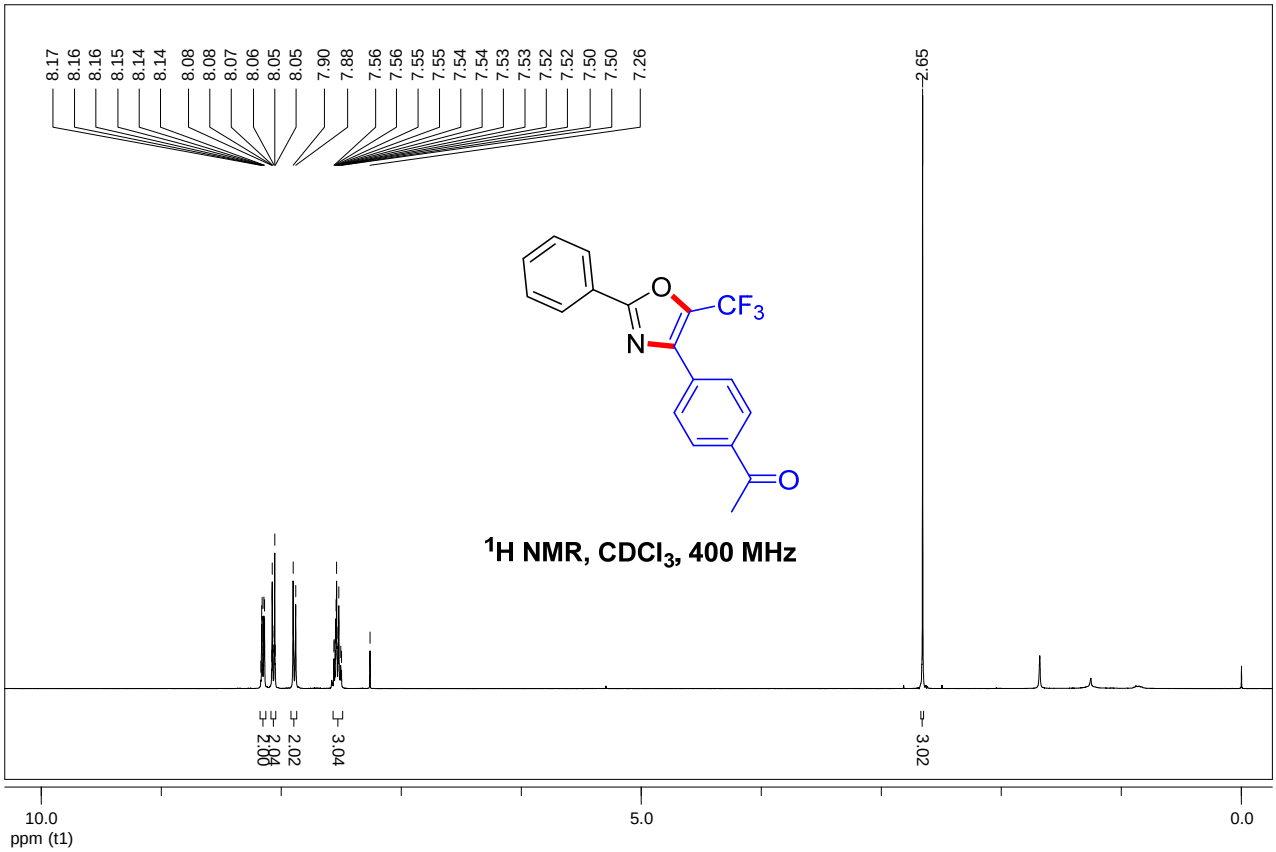


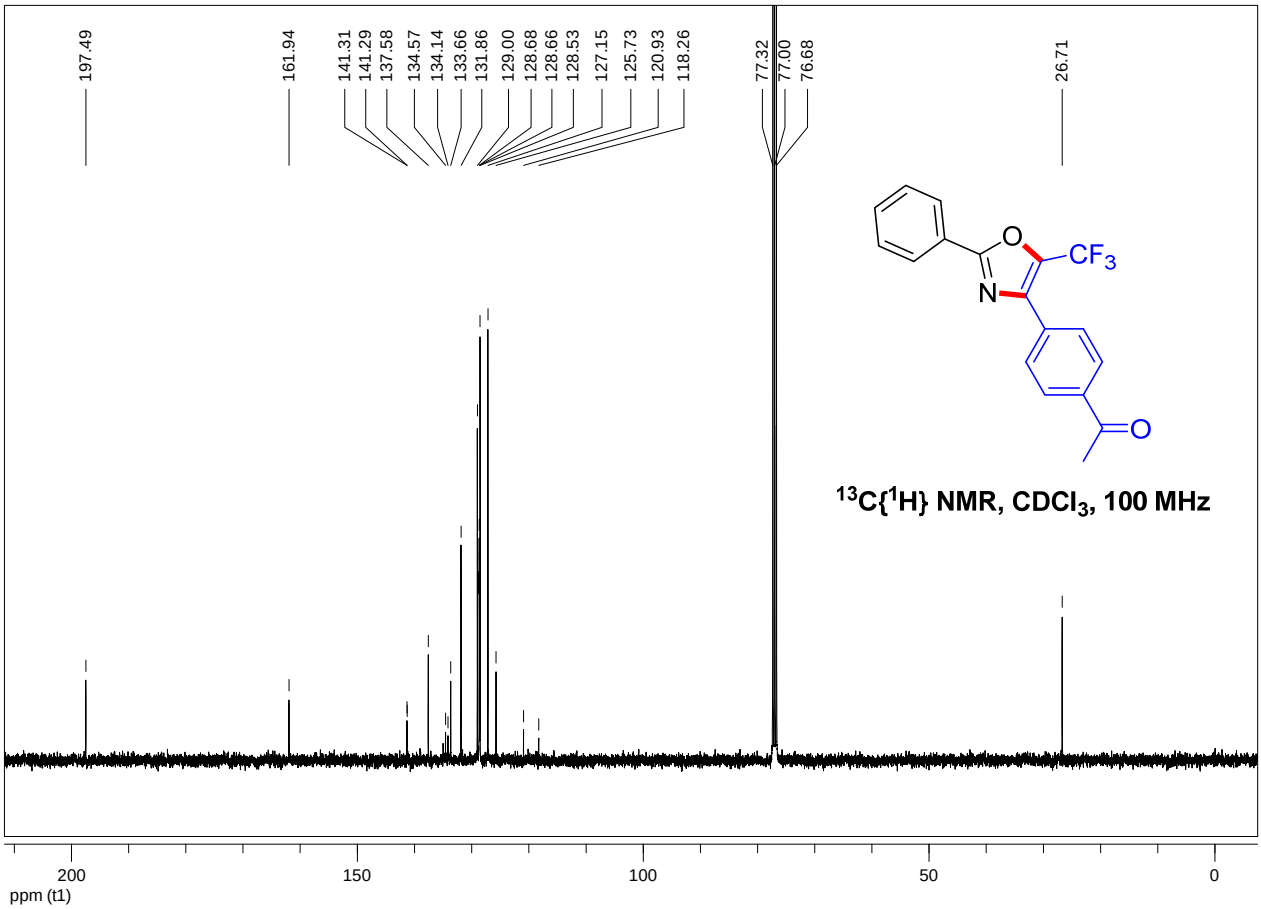


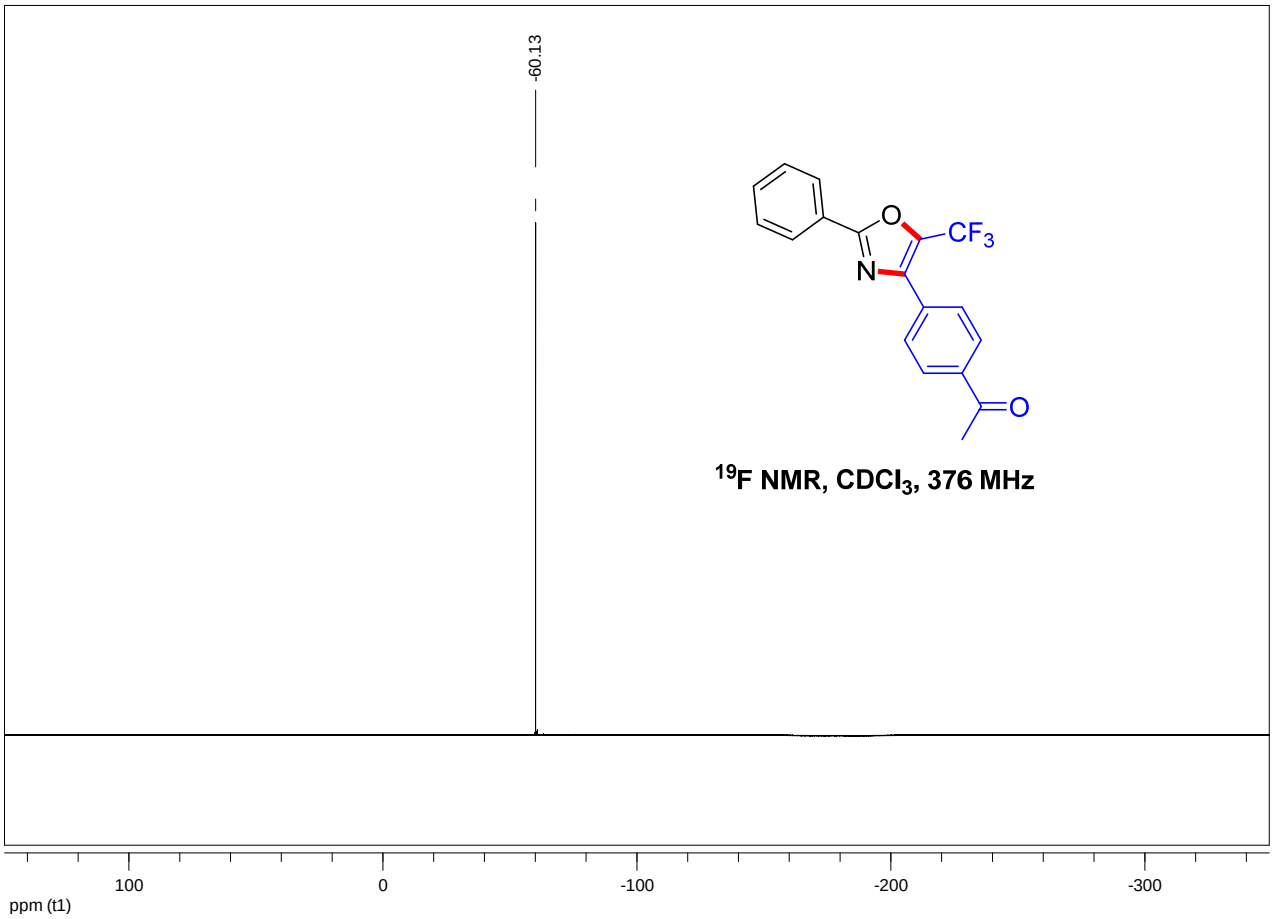


^{19}F NMR, $CDCl_3$, 376 MHz

1-(4-(2-phenyl-5-(trifluoromethyl)oxazol-4-yl)phenyl)ethan-1-one (3j)

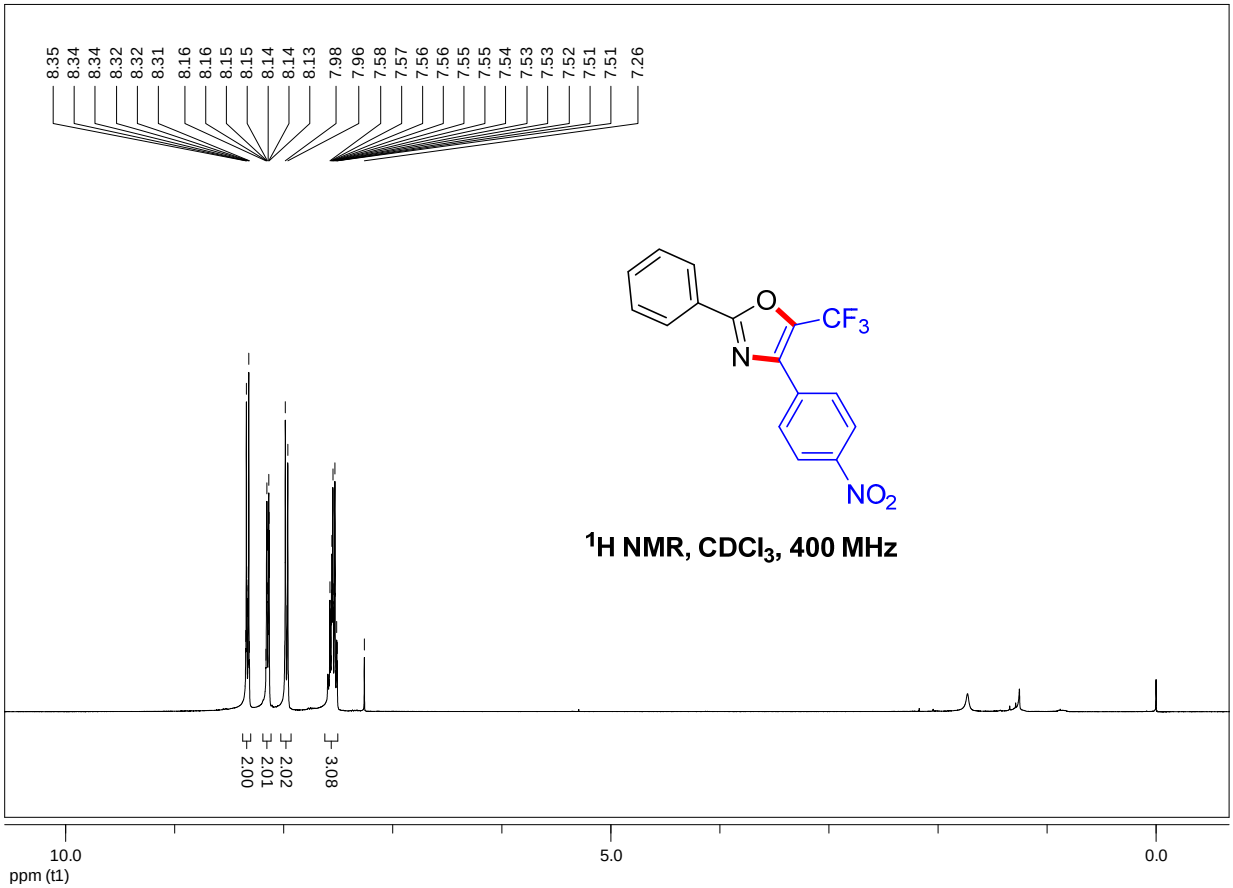


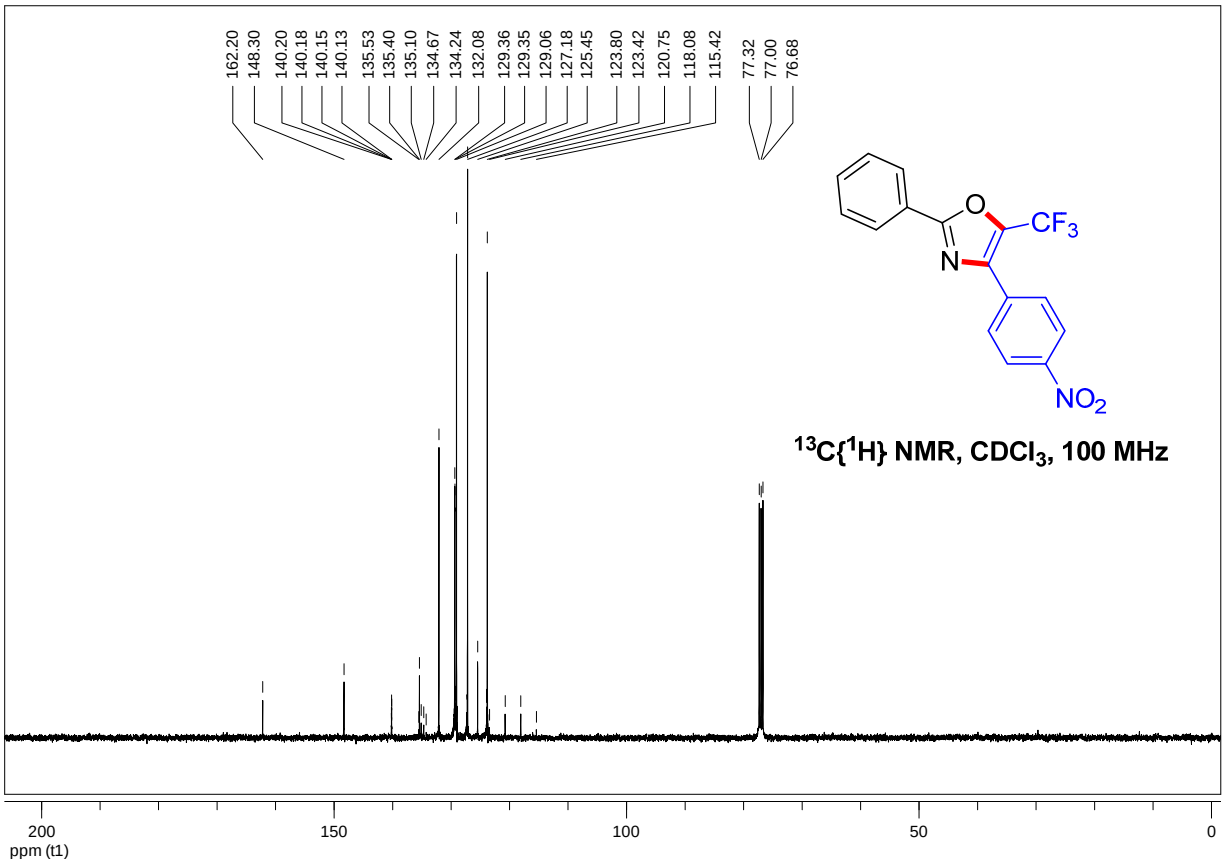


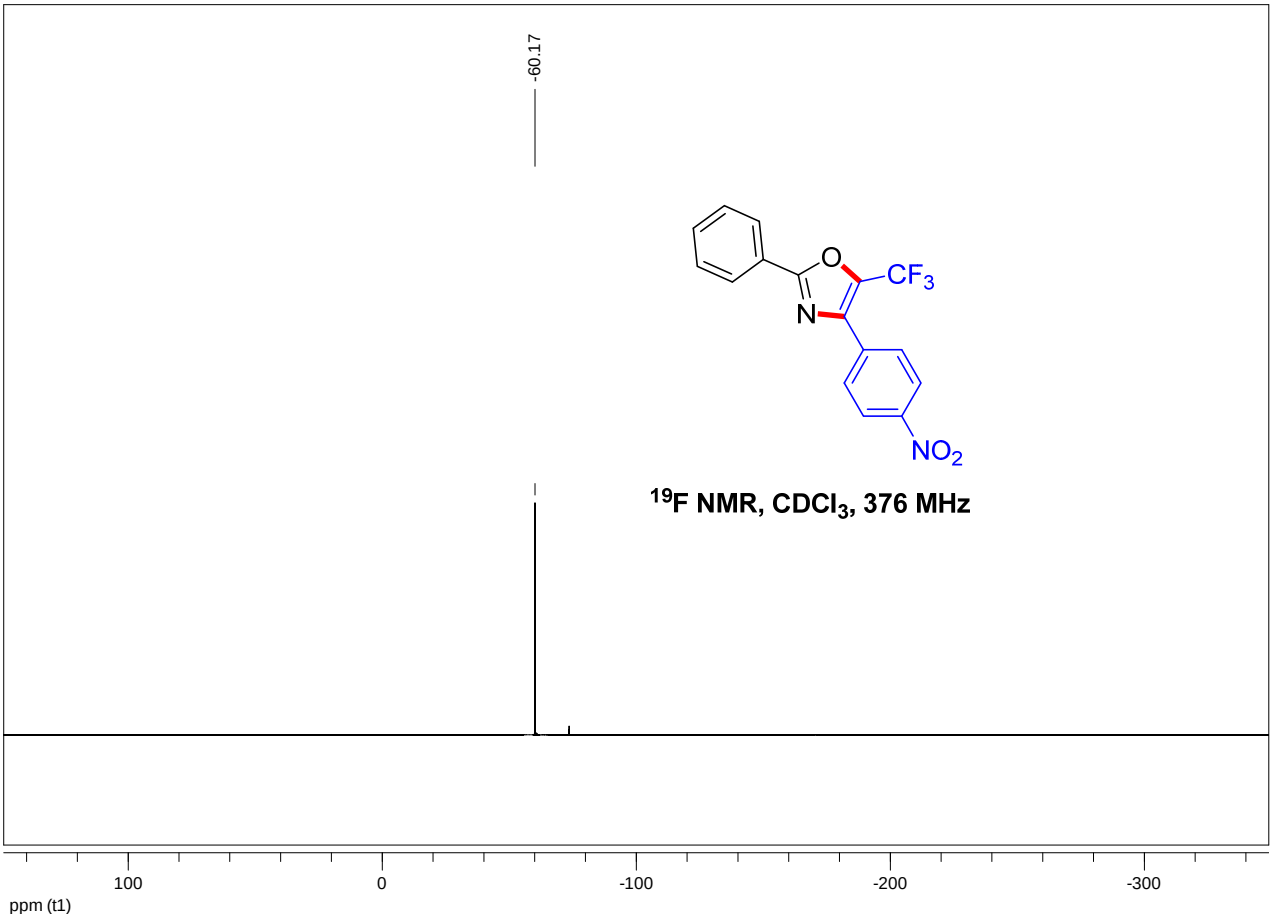


^{19}F NMR, $CDCl_3$, 376 MHz

4-(4-nitrophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3k)

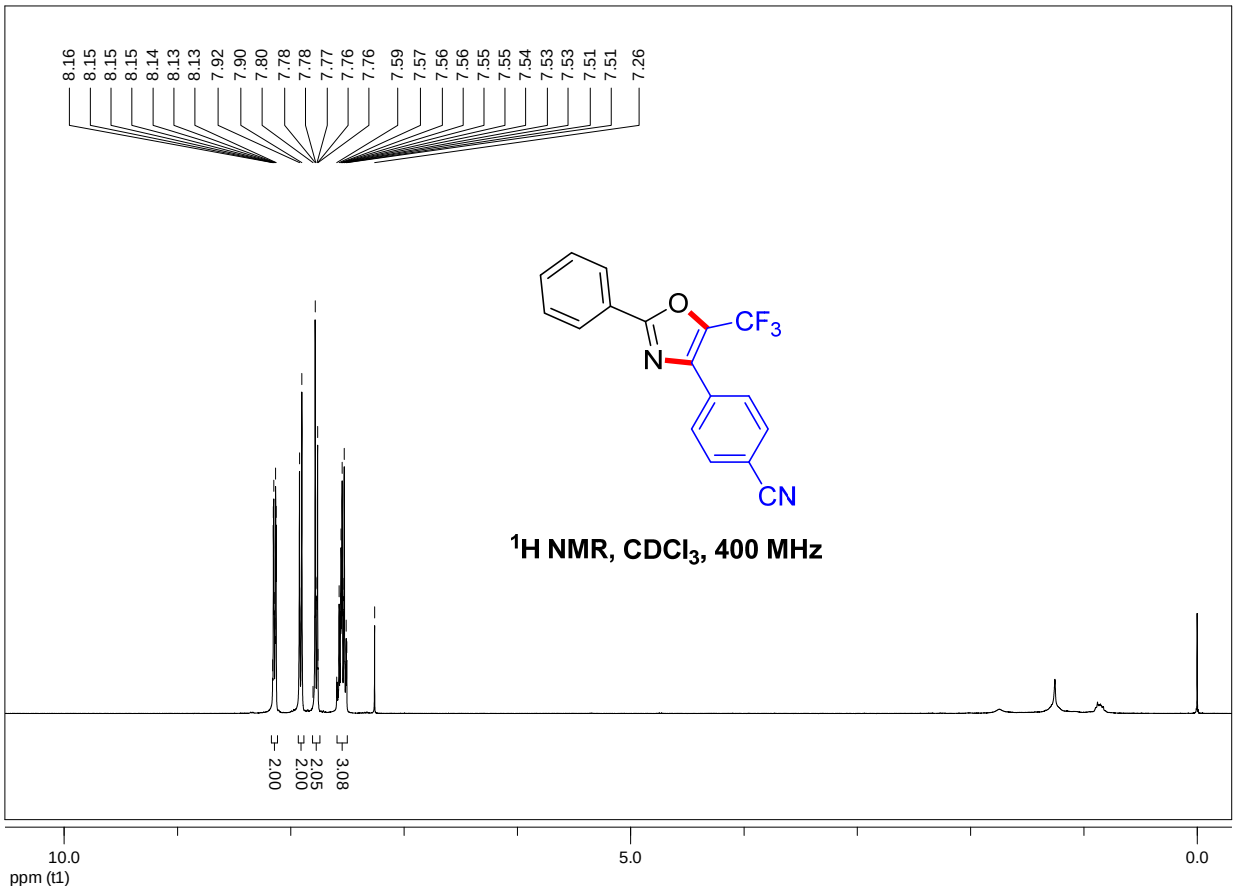




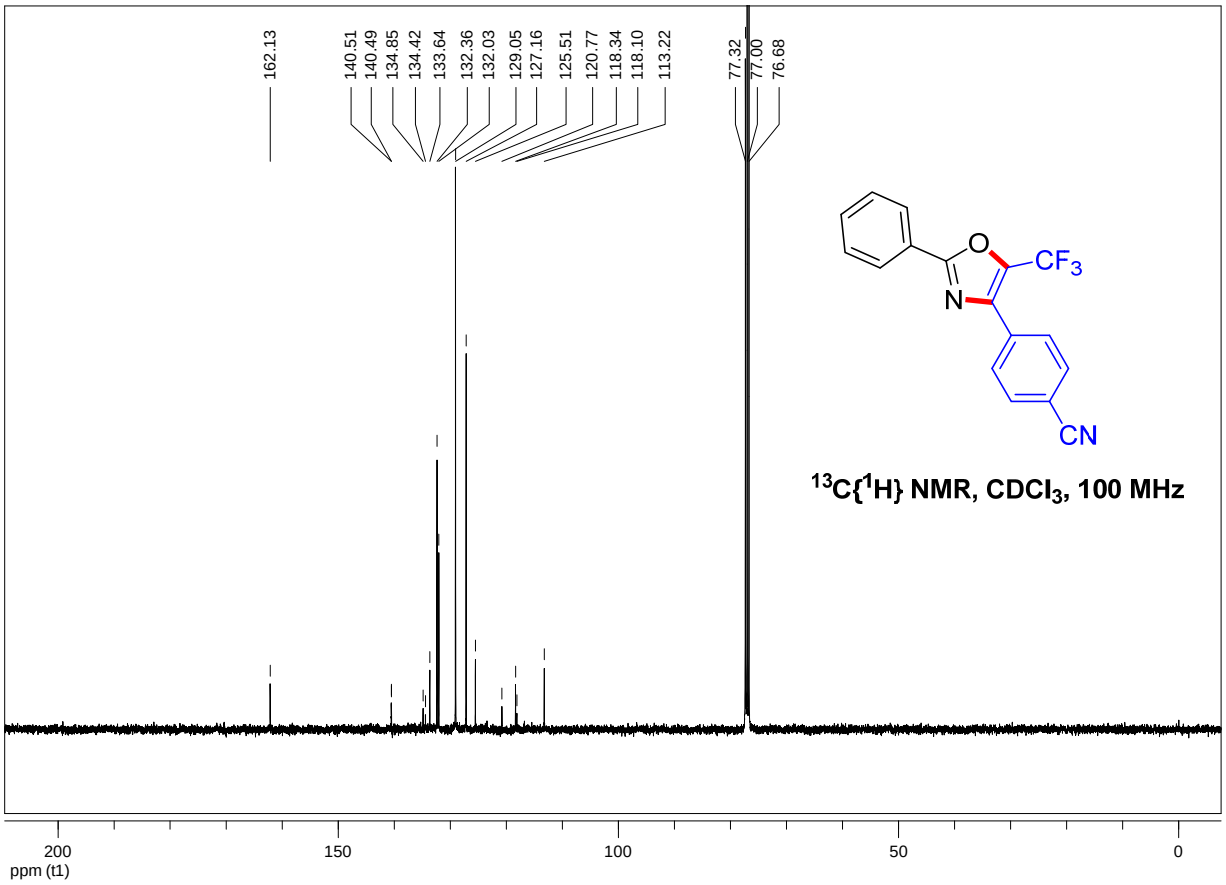


^{19}F NMR, $CDCl_3$, 376 MHz

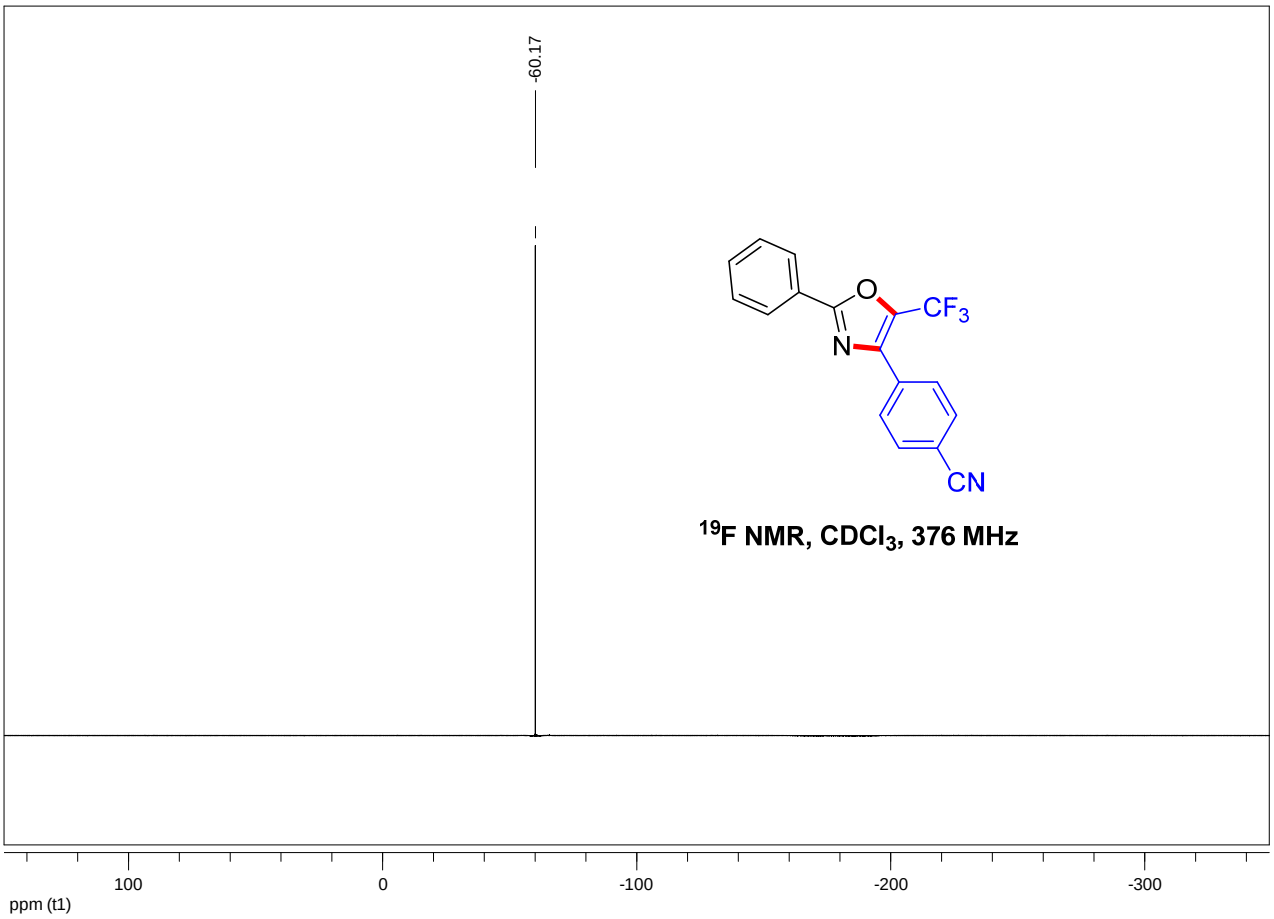
4-(2-phenyl-5-(trifluoromethyl)oxazol-4-yl)benzonitrile (3l)



^{1}H NMR, $CDCl_3$, 400 MHz

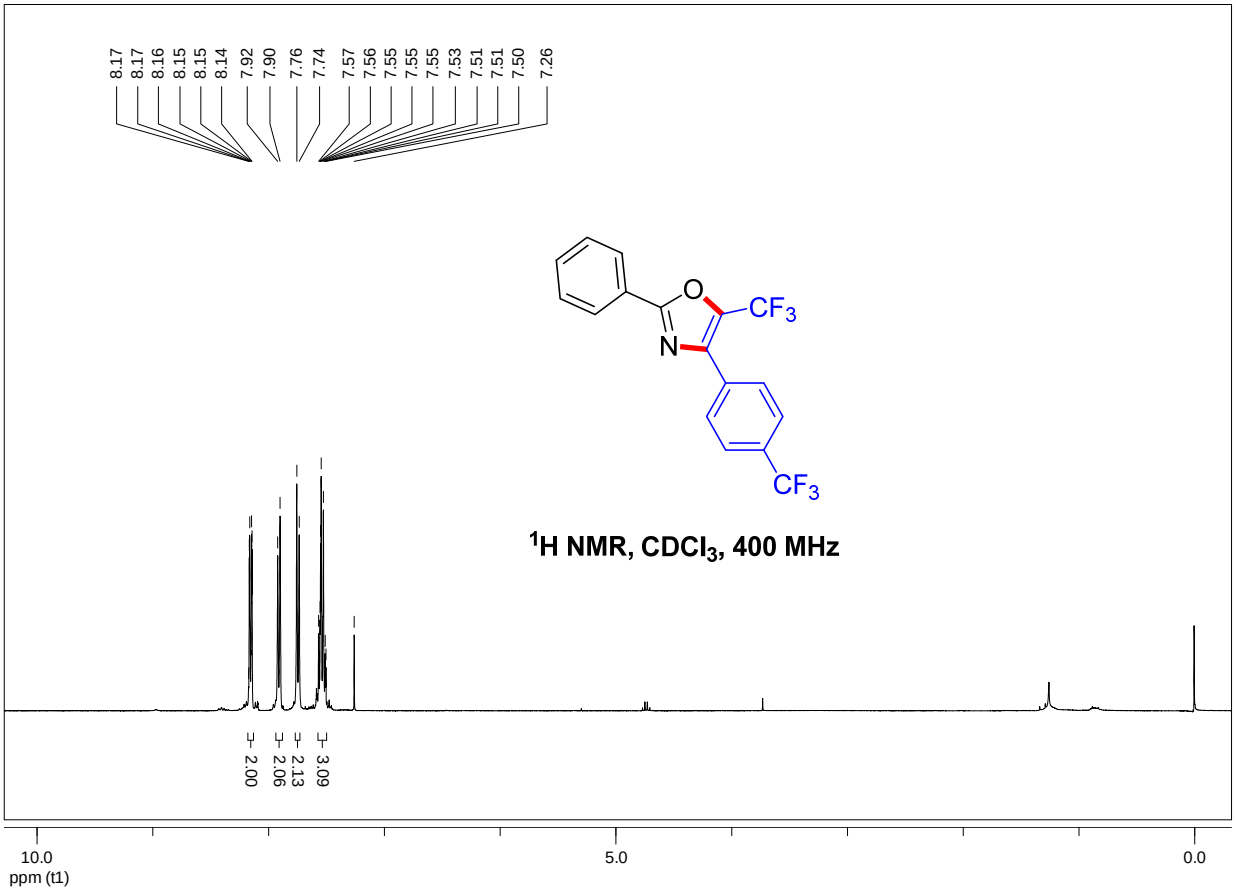


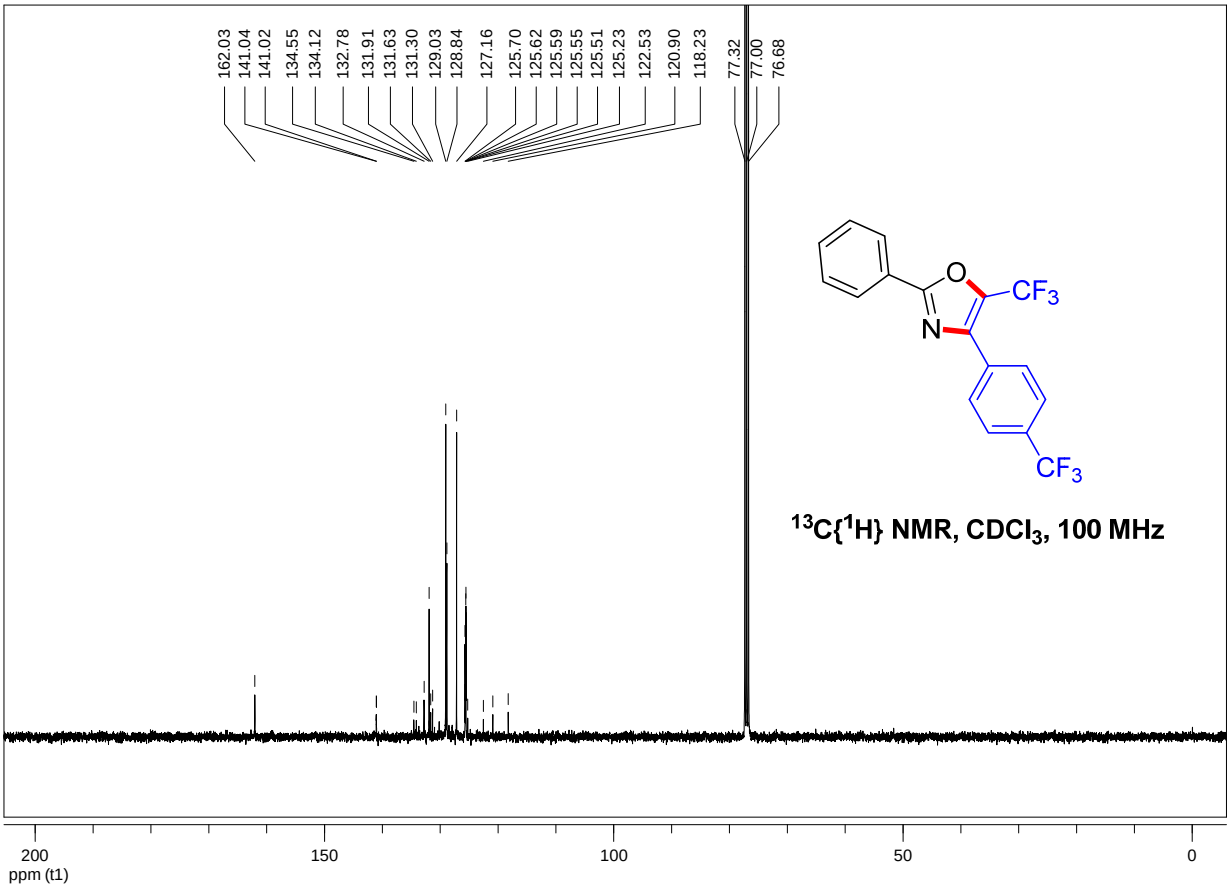
$^{13}C\{^{1}H\}$ NMR, $CDCl_3$, 100 MHz

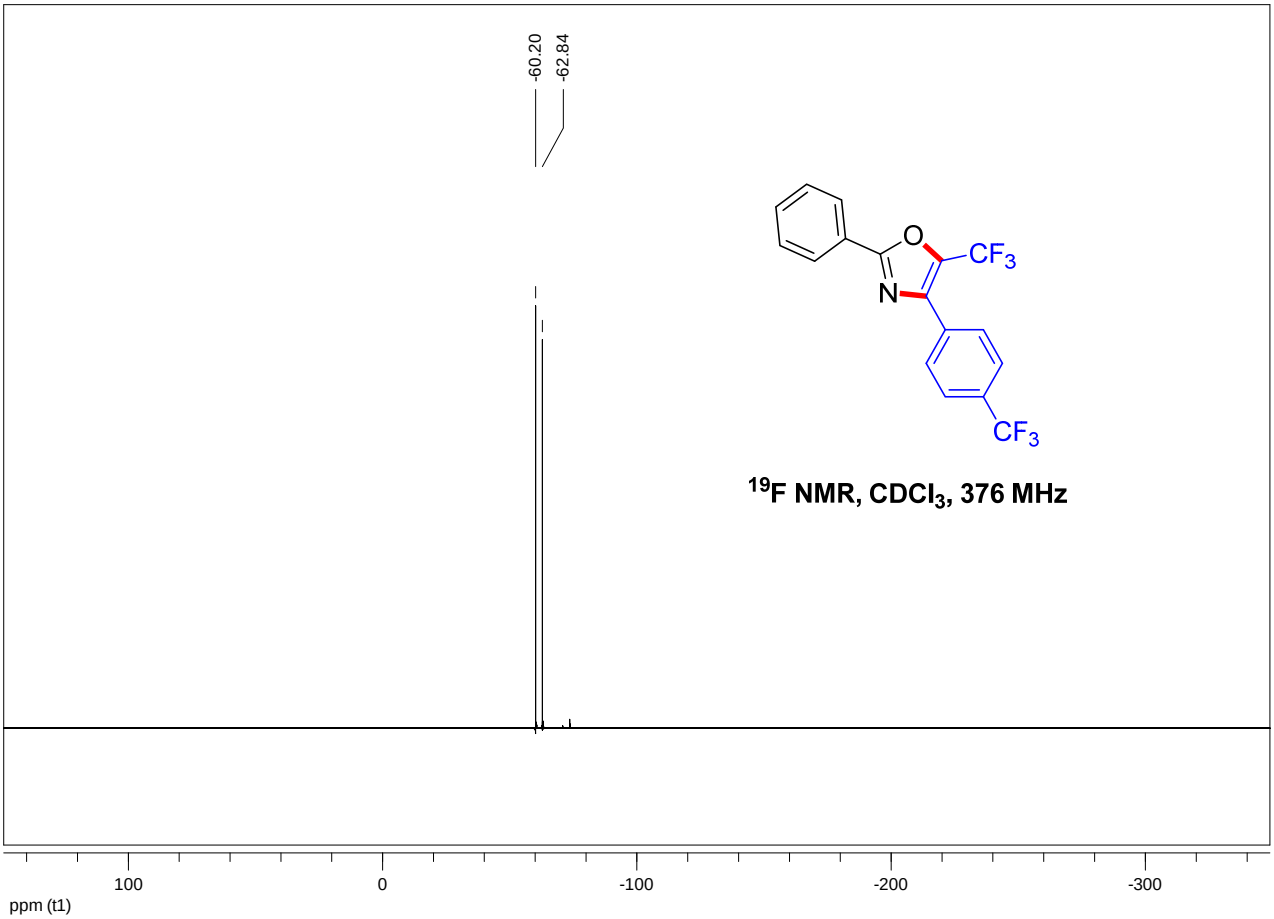


^{19}F NMR, $CDCl_3$, 376 MHz

2-phenyl-5-(trifluoromethyl)-4-(4-(trifluoromethyl)phenyl)oxazole (3m)

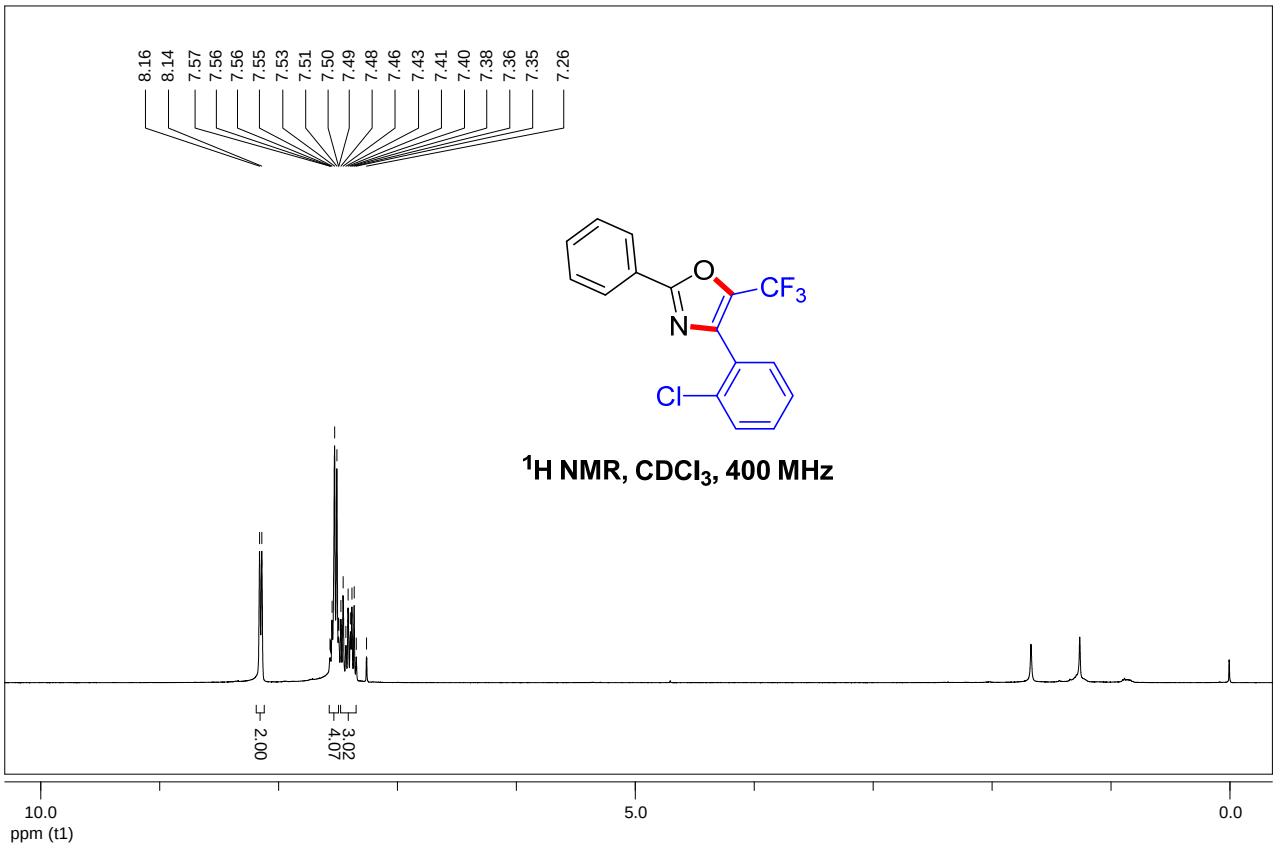


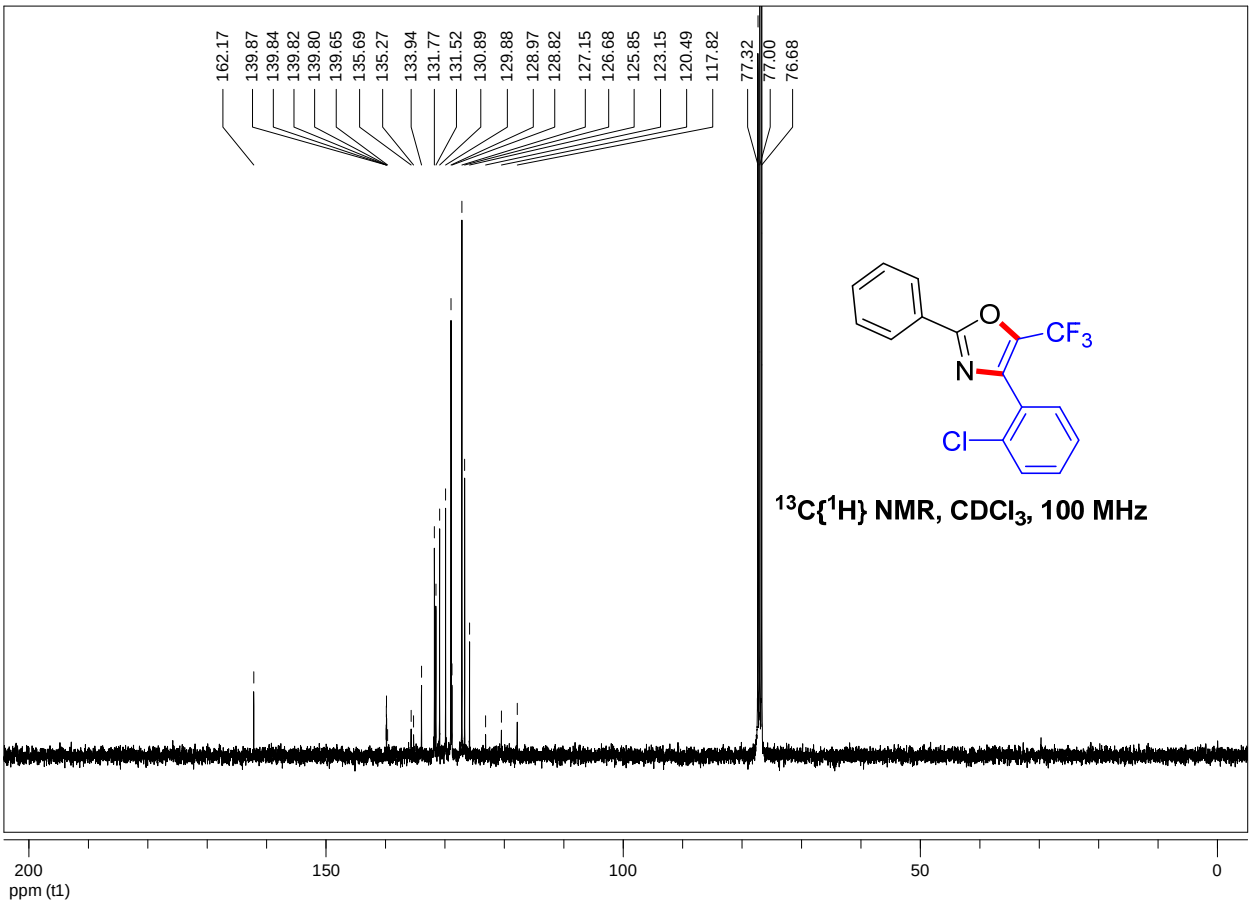


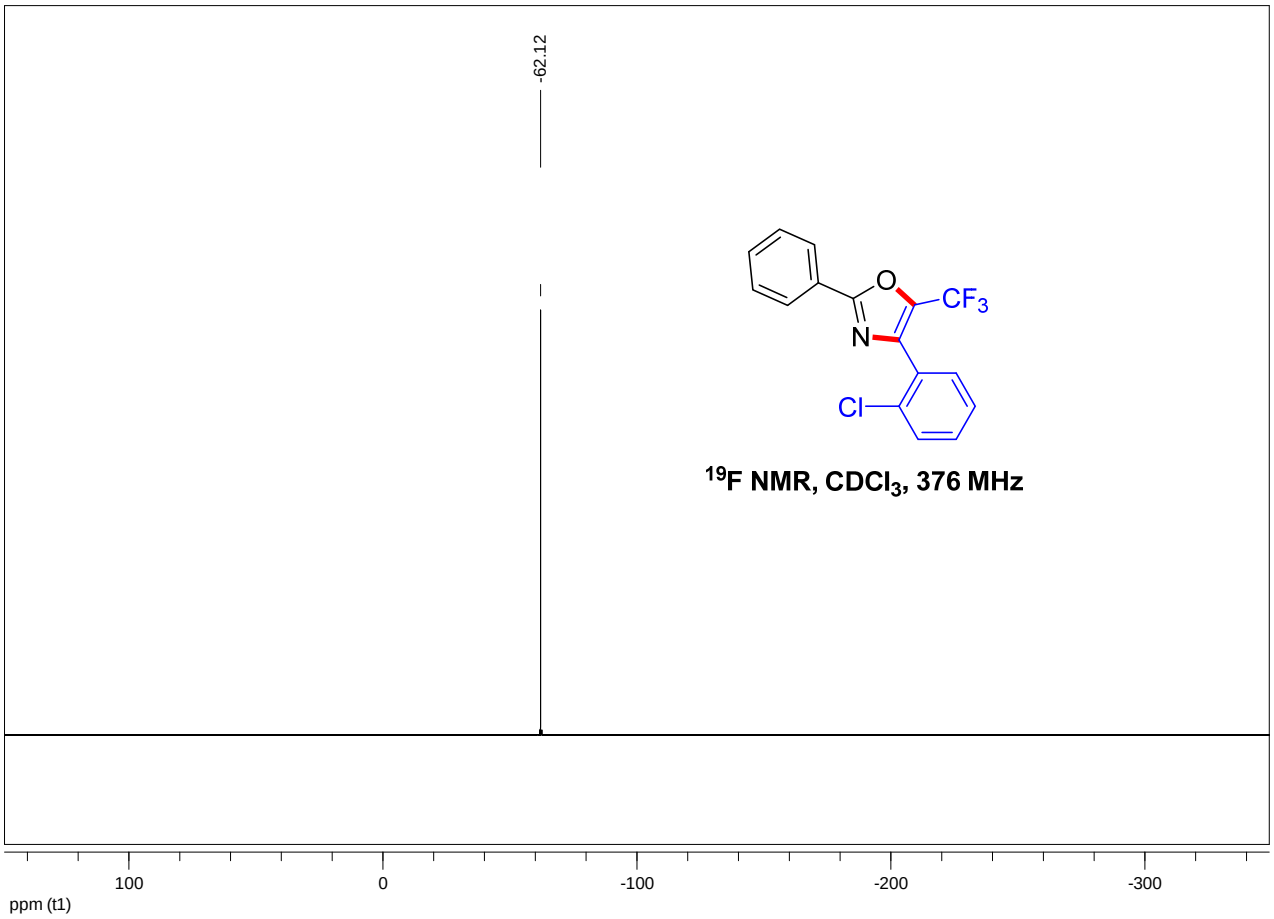


^{19}F NMR, $CDCl_3$, 376 MHz

4-(2-chlorophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3n)

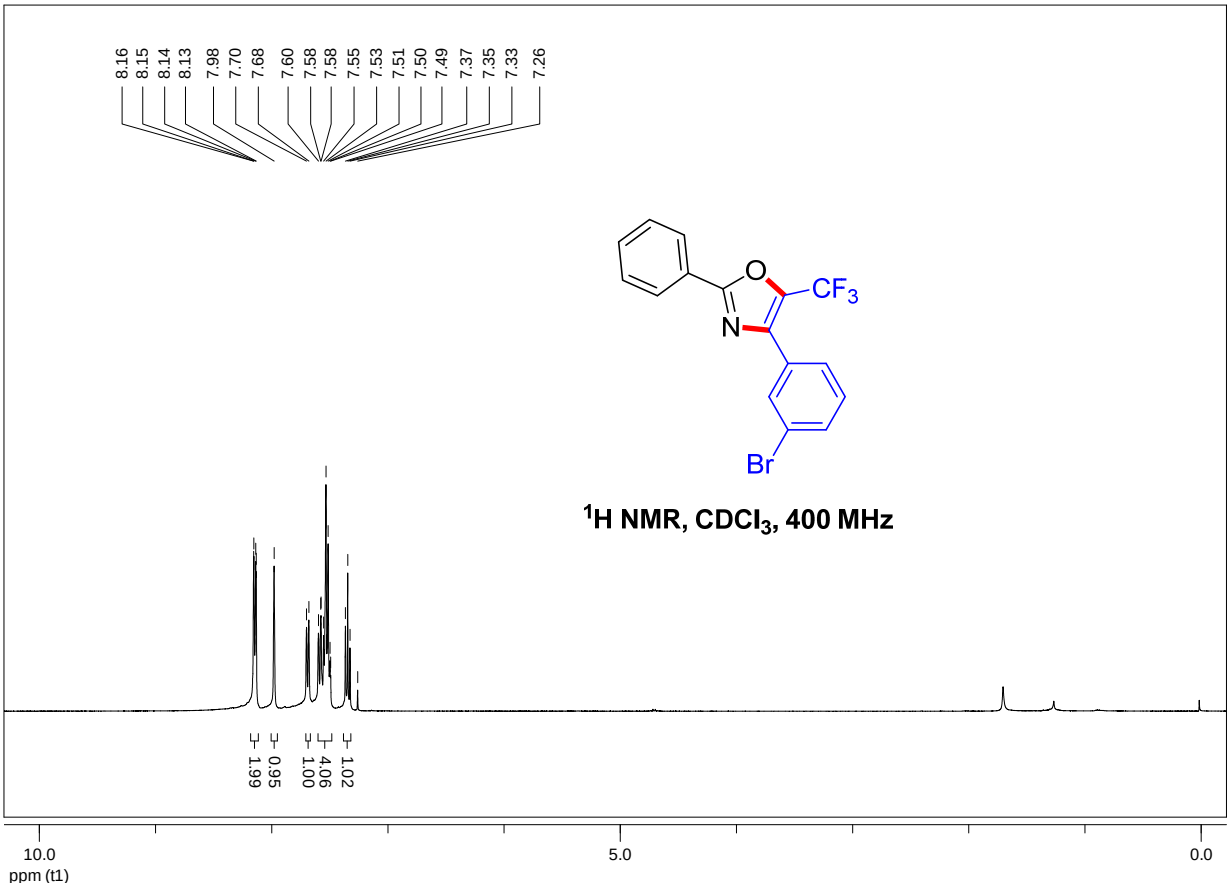


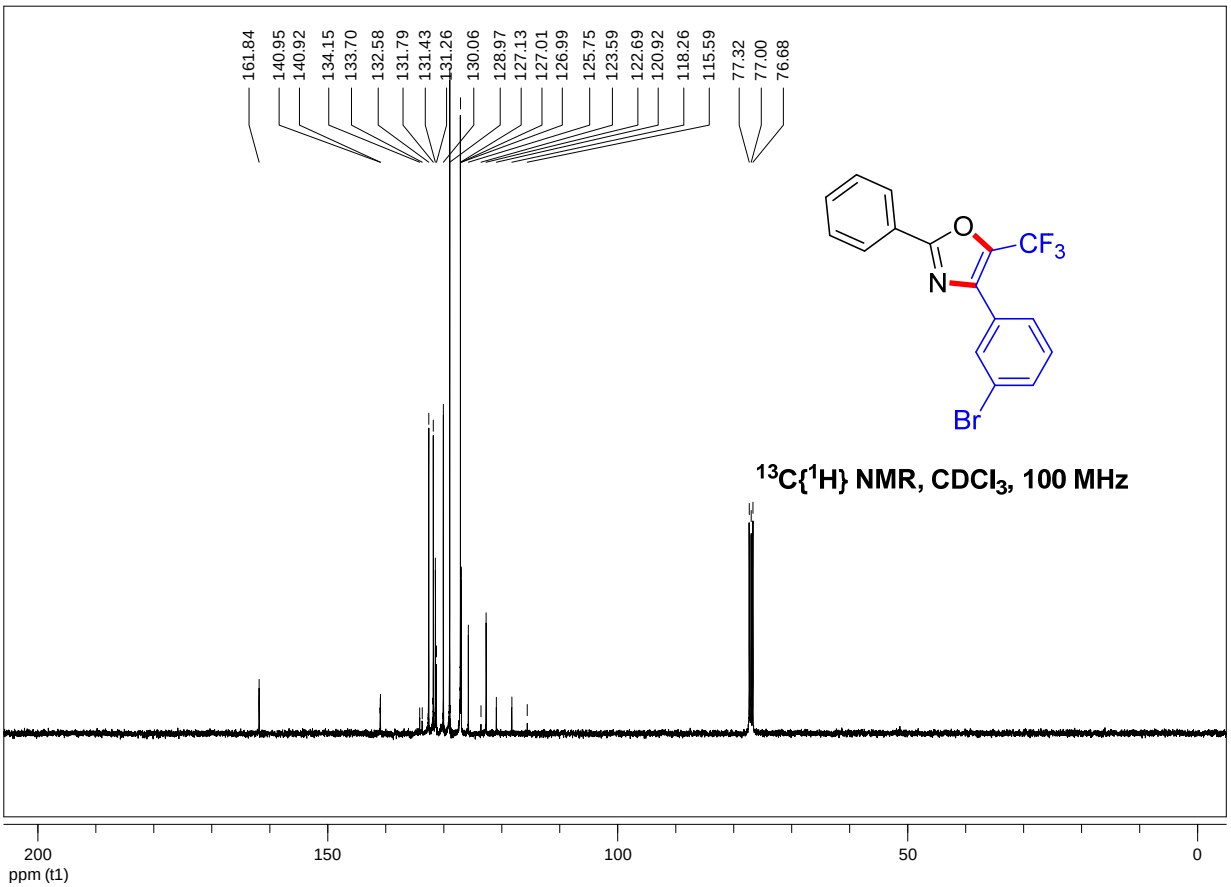


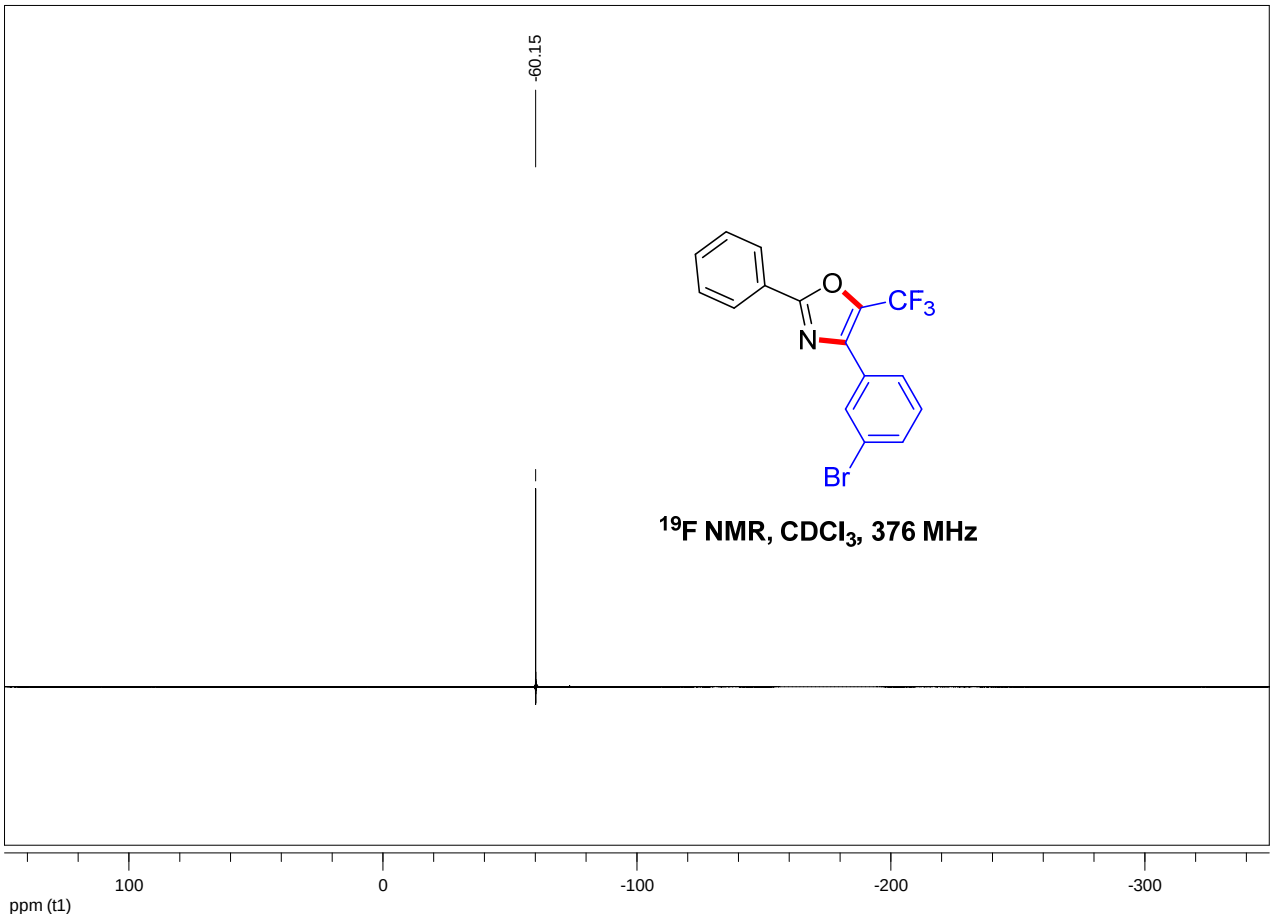


^{19}F NMR, $CDCl_3$, 376 MHz

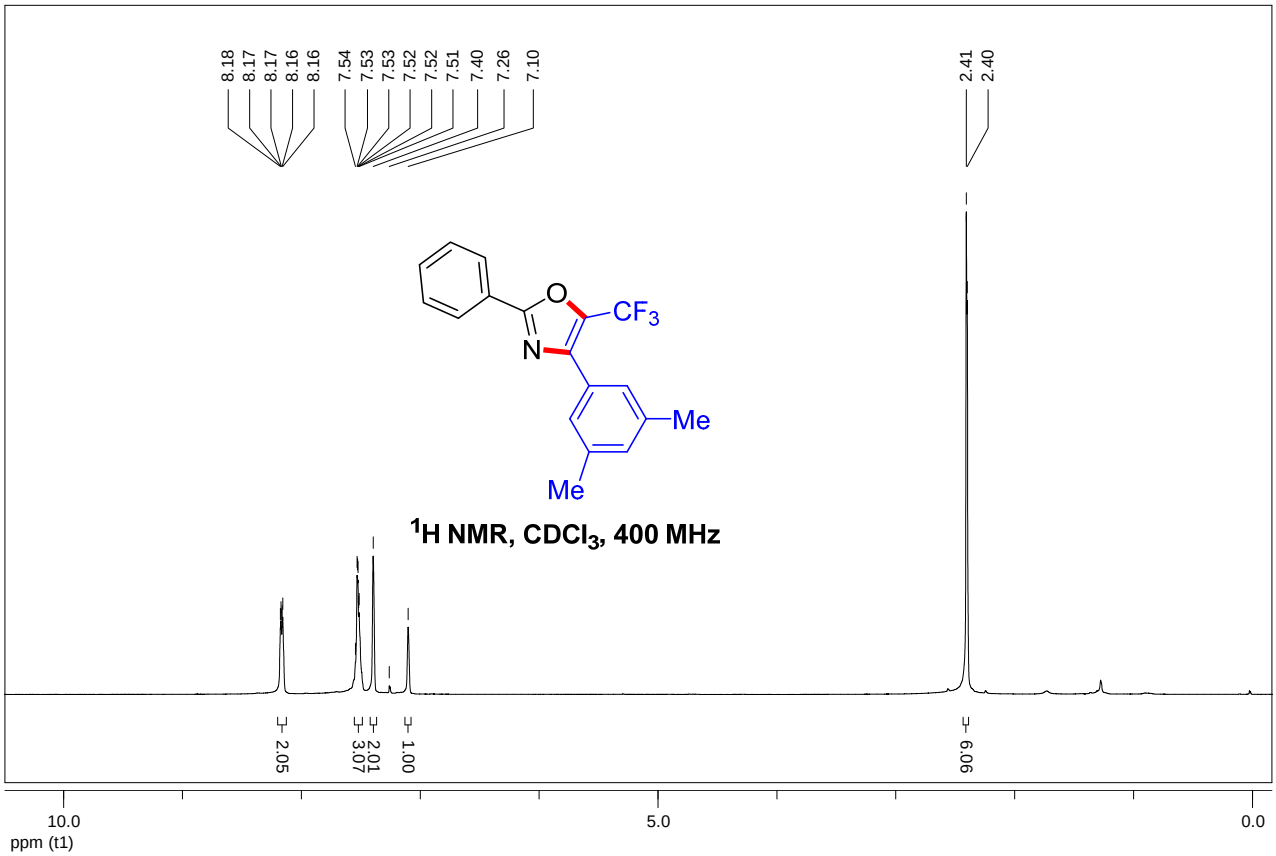
4-(3-bromophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3o)

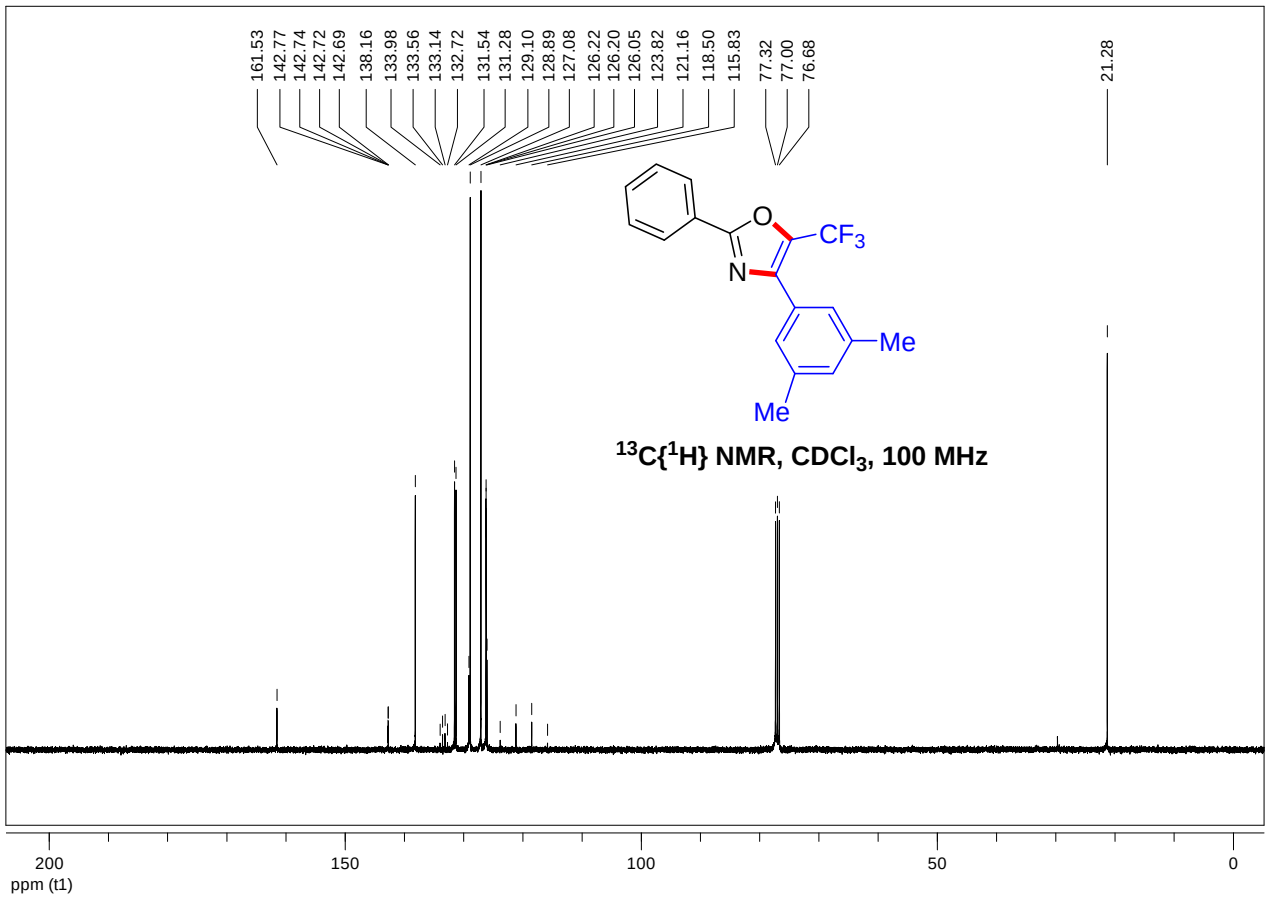


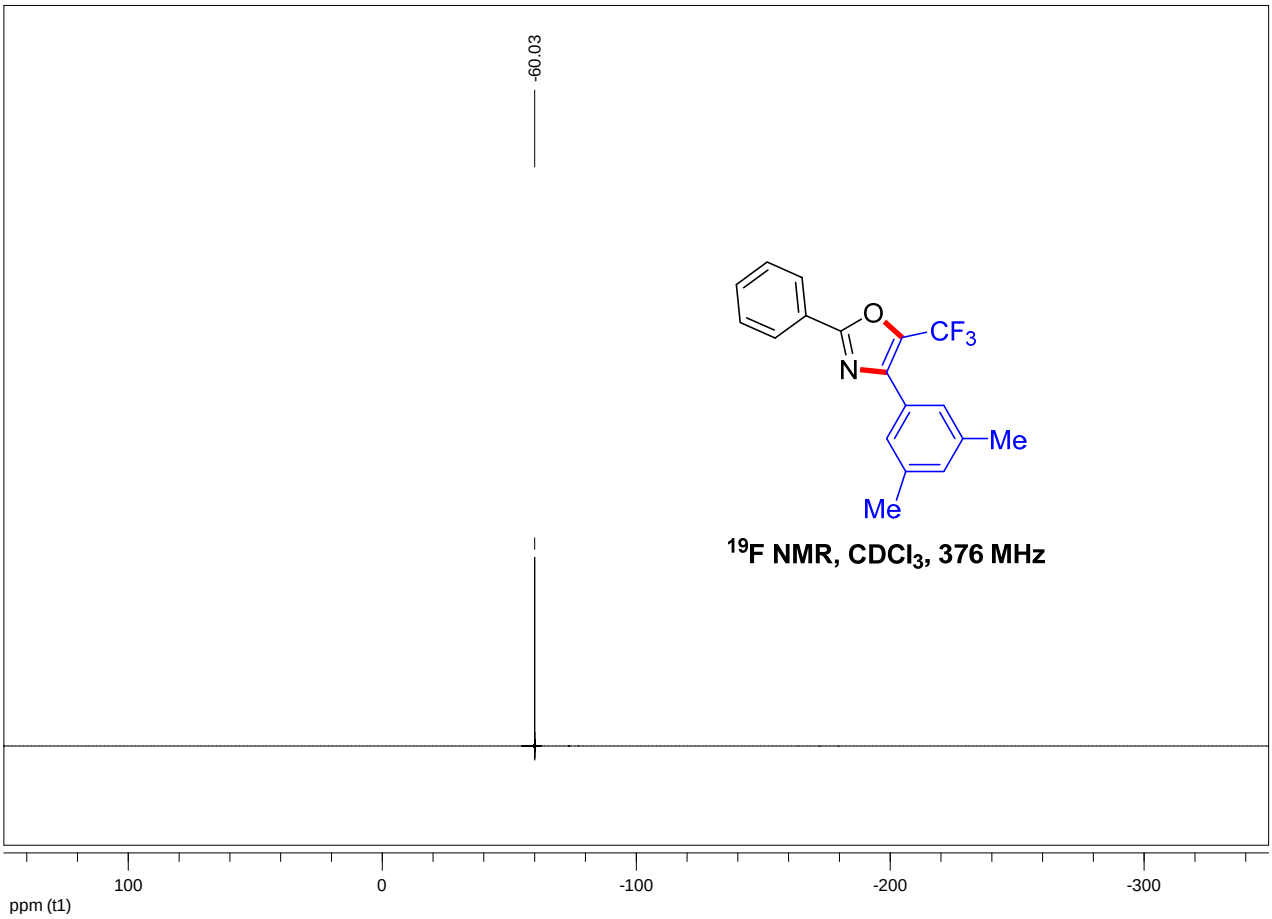



-60.15
O
N
CF3
Br
19F NMR, CDCl3, 376 MHz
100
0
-100
-200
-300
ppm (t1)

4-(3,5-dimethylphenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3p)

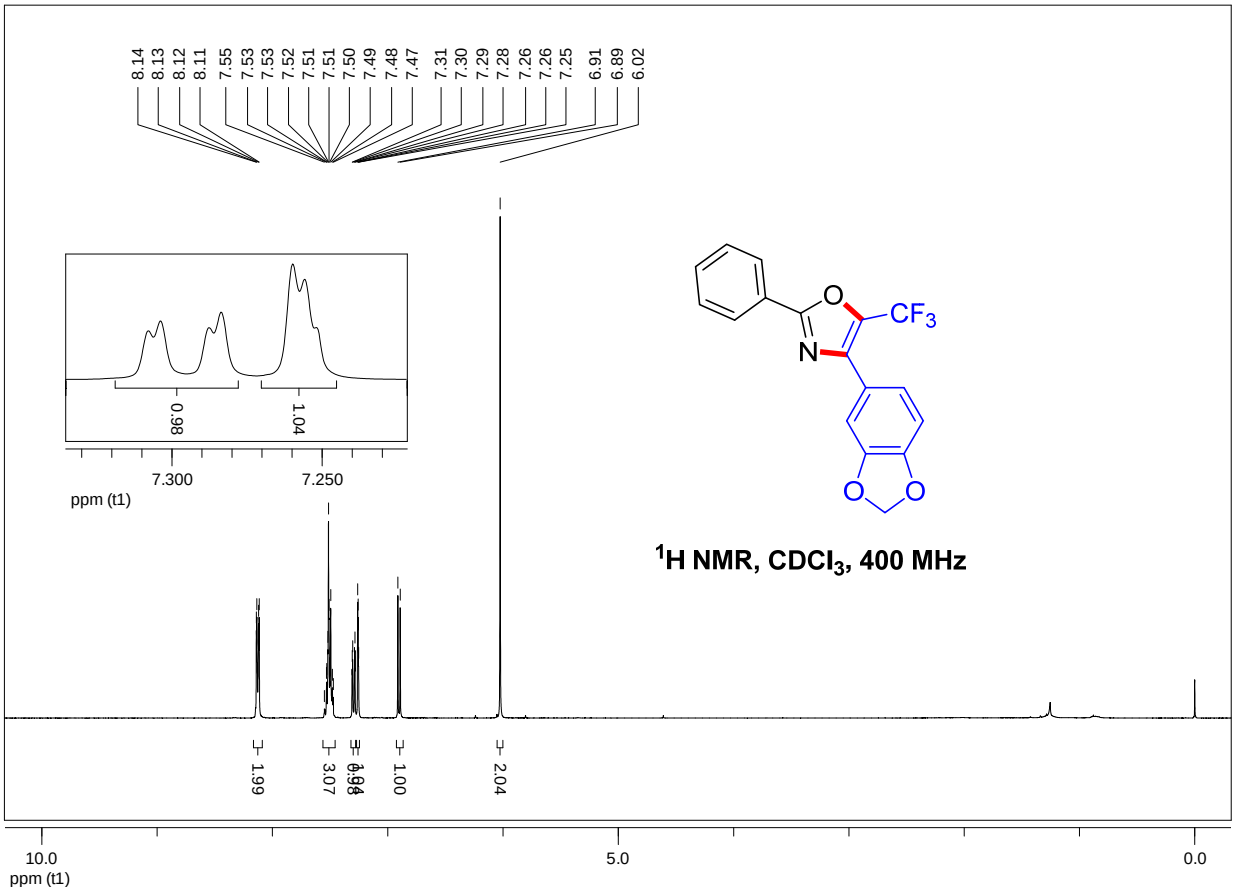


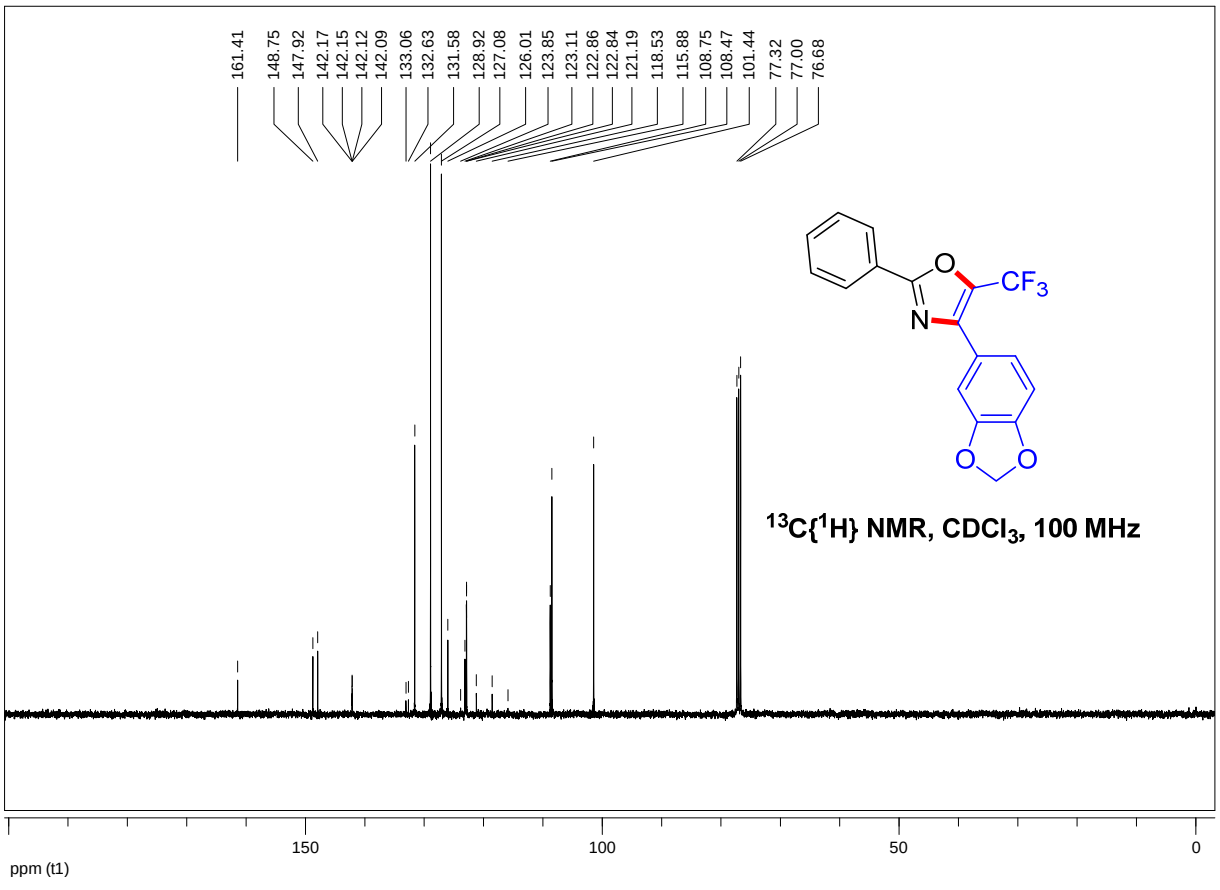


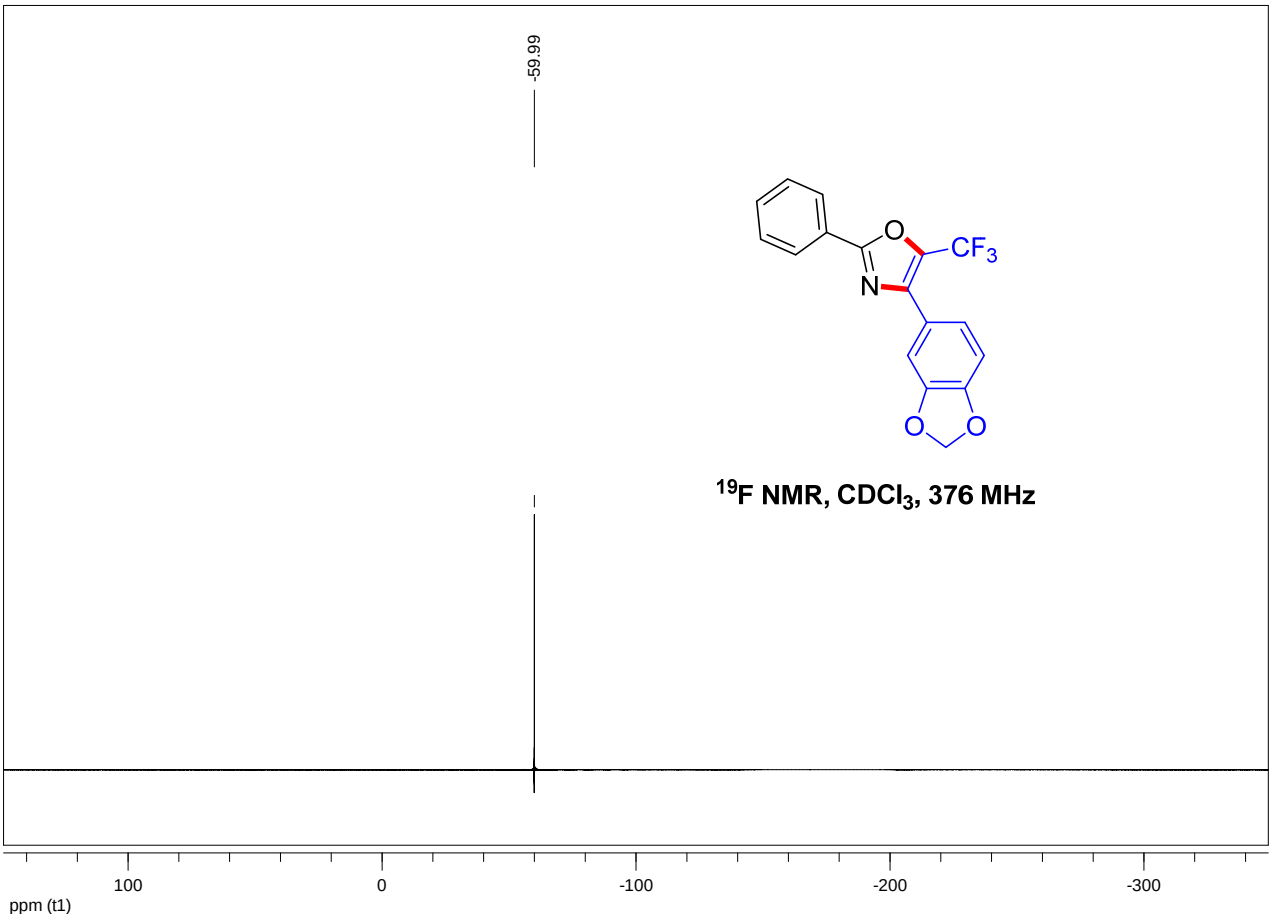


^{19}F NMR, $CDCl_3$, 376 MHz

4-(benzo[d][1,3]dioxol-5-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3q)

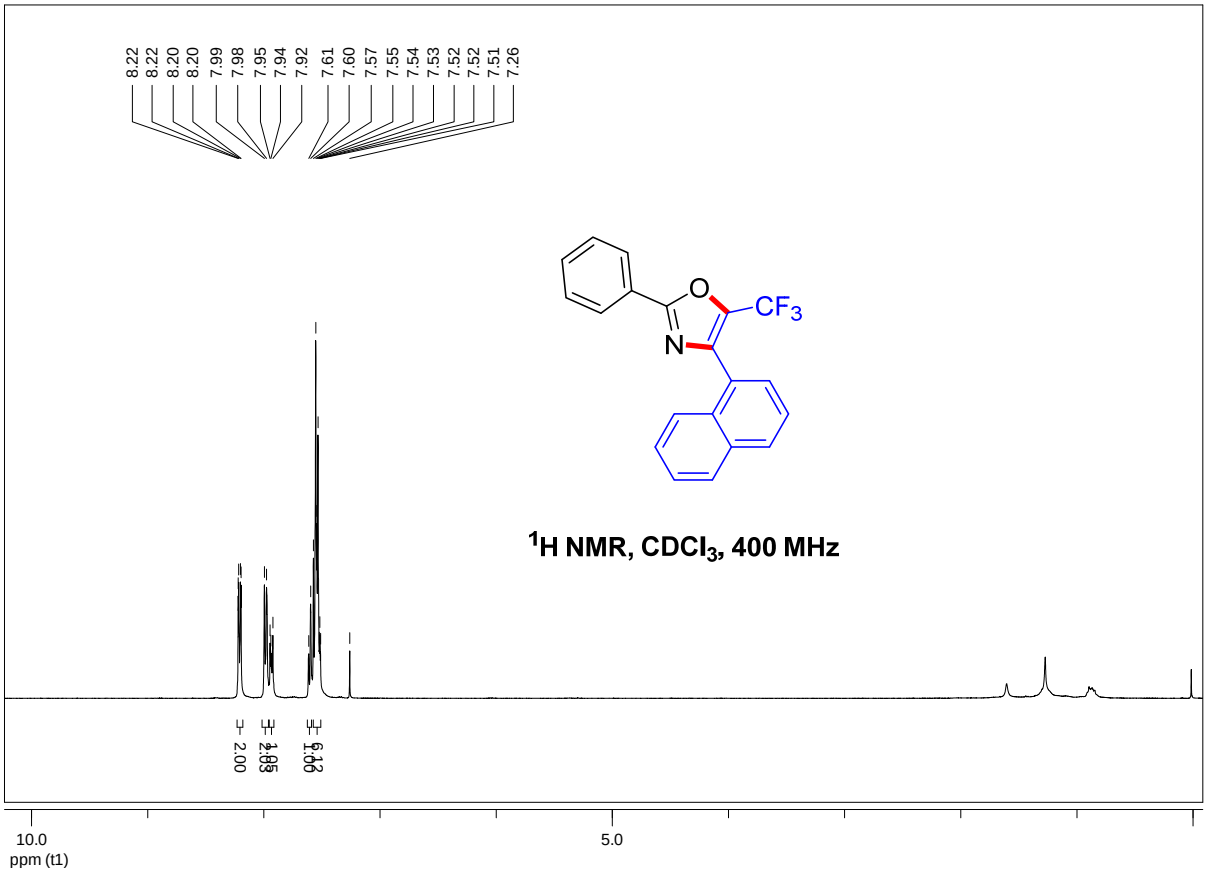




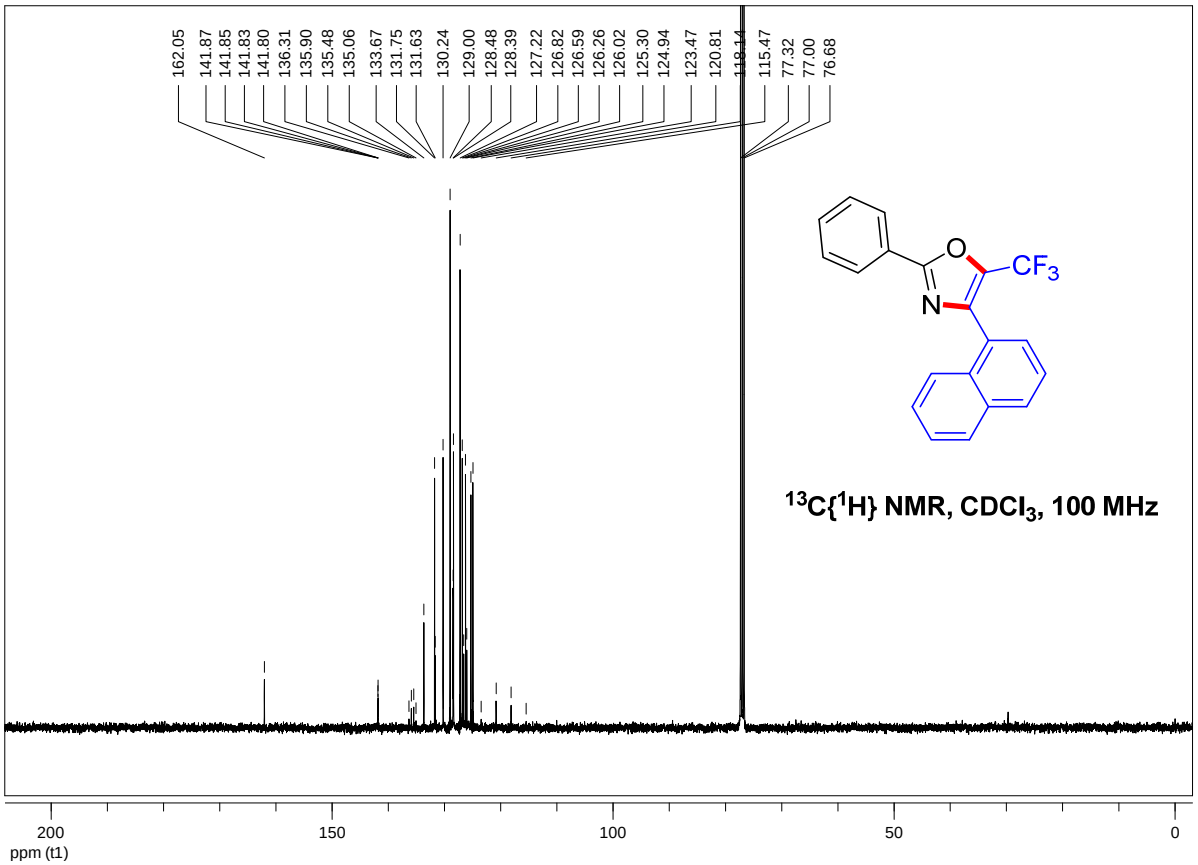


^{19}F NMR, $CDCl_3$, 376 MHz

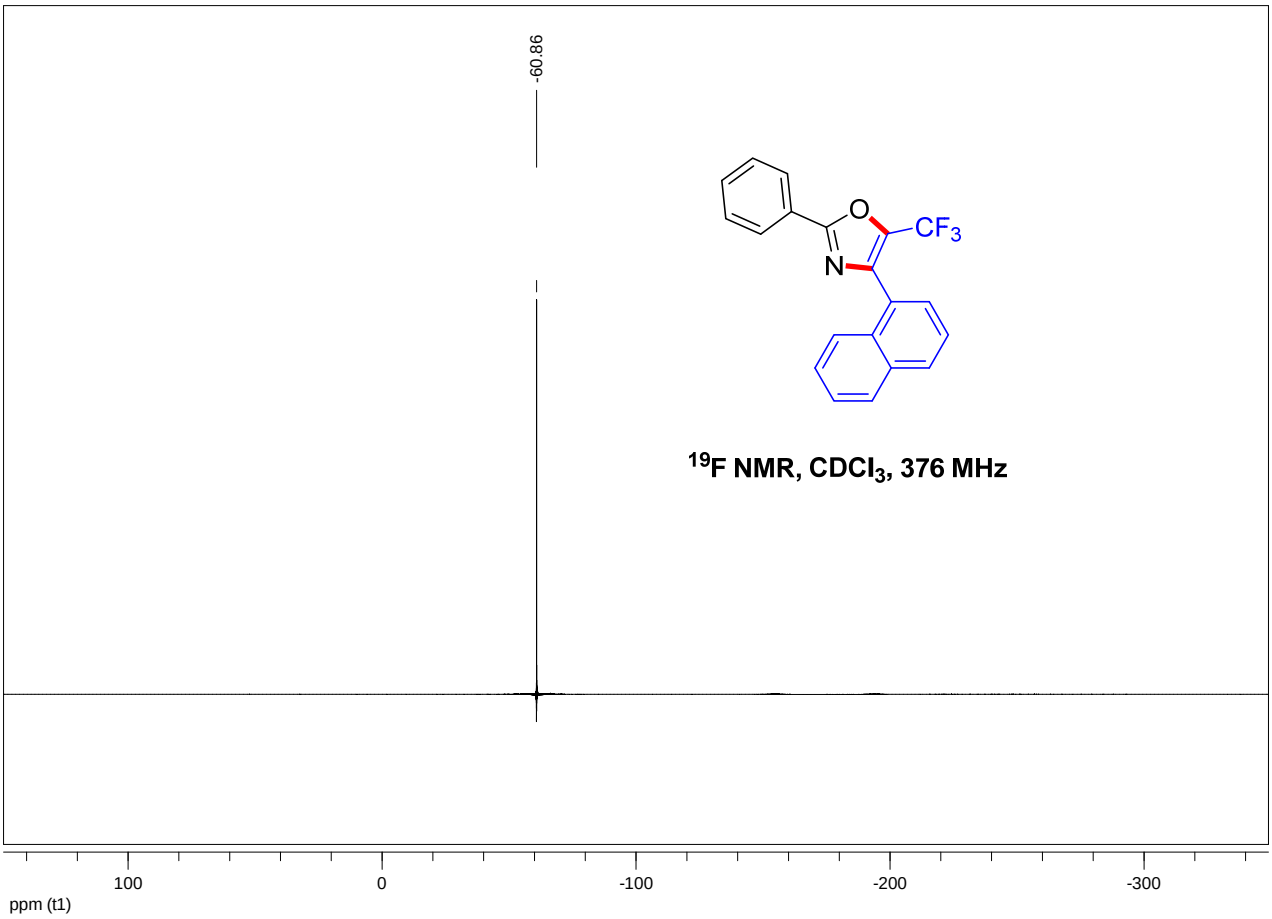
4-(naphthalen-1-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3r)



^{1}H NMR, $CDCl_3$, 400 MHz

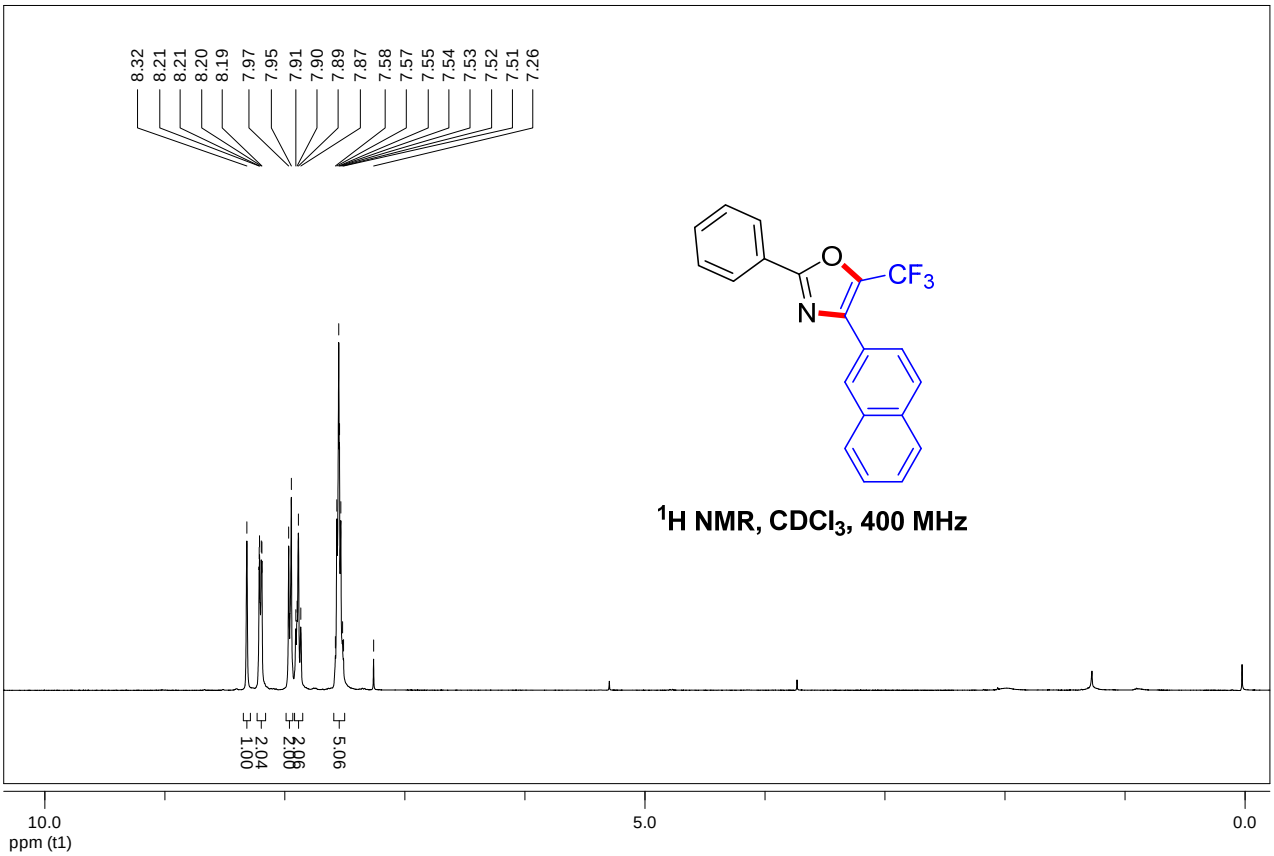


$^{13}C\{^{1}H\}$ NMR, $CDCl_3$, 100 MHz

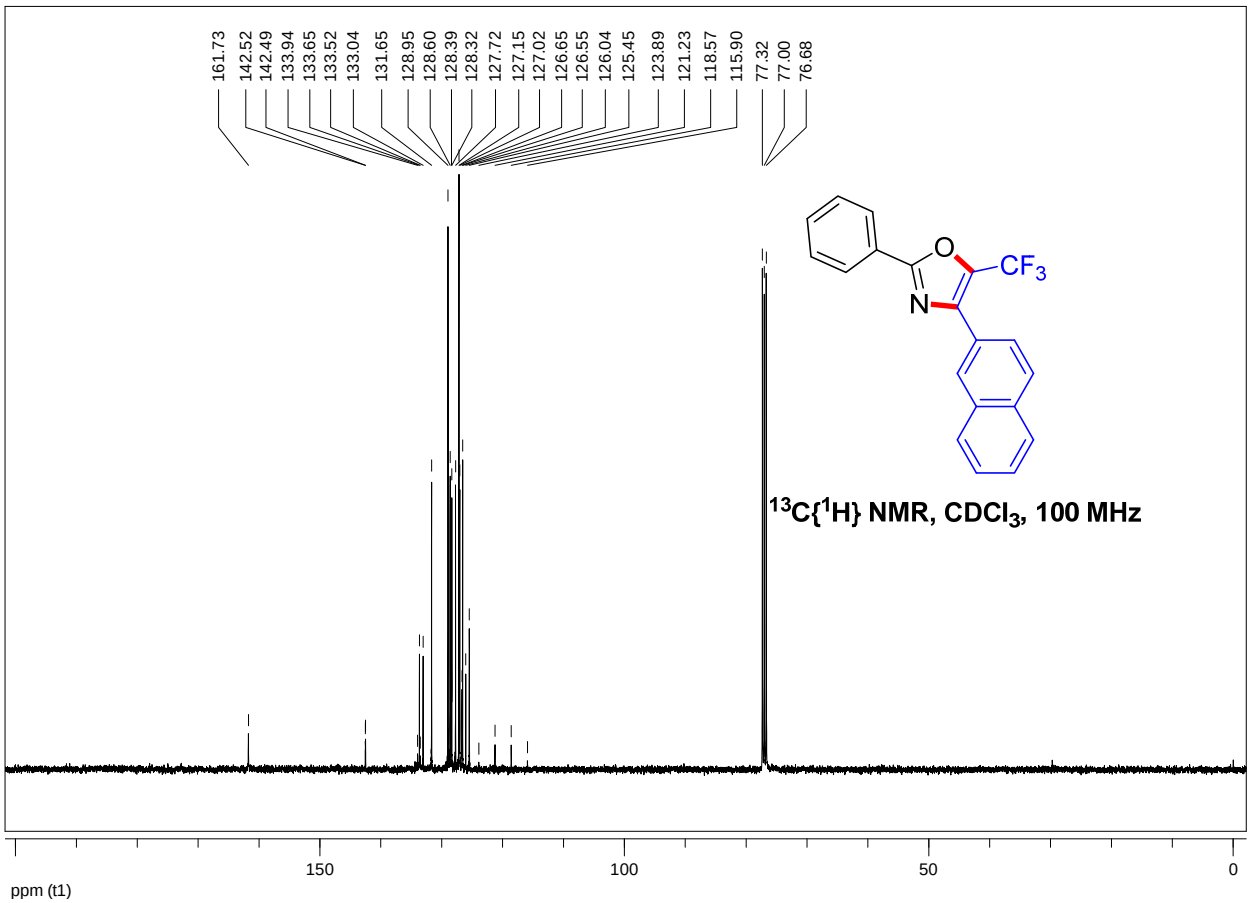


^{19}F NMR, $CDCl_3$, 376 MHz

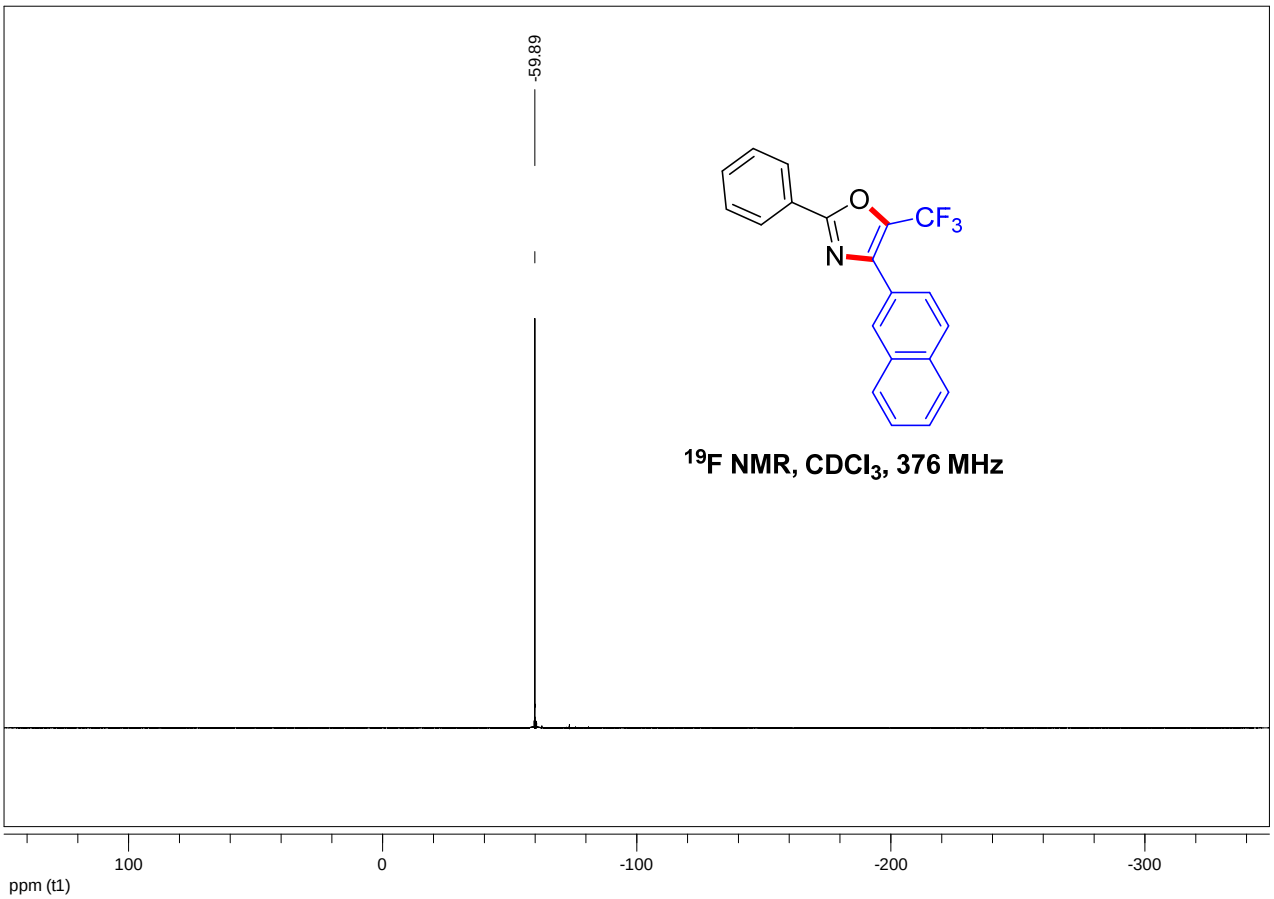
4-(naphthalen-2-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3s)



^{1}H NMR, $CDCl_3$, 400 MHz

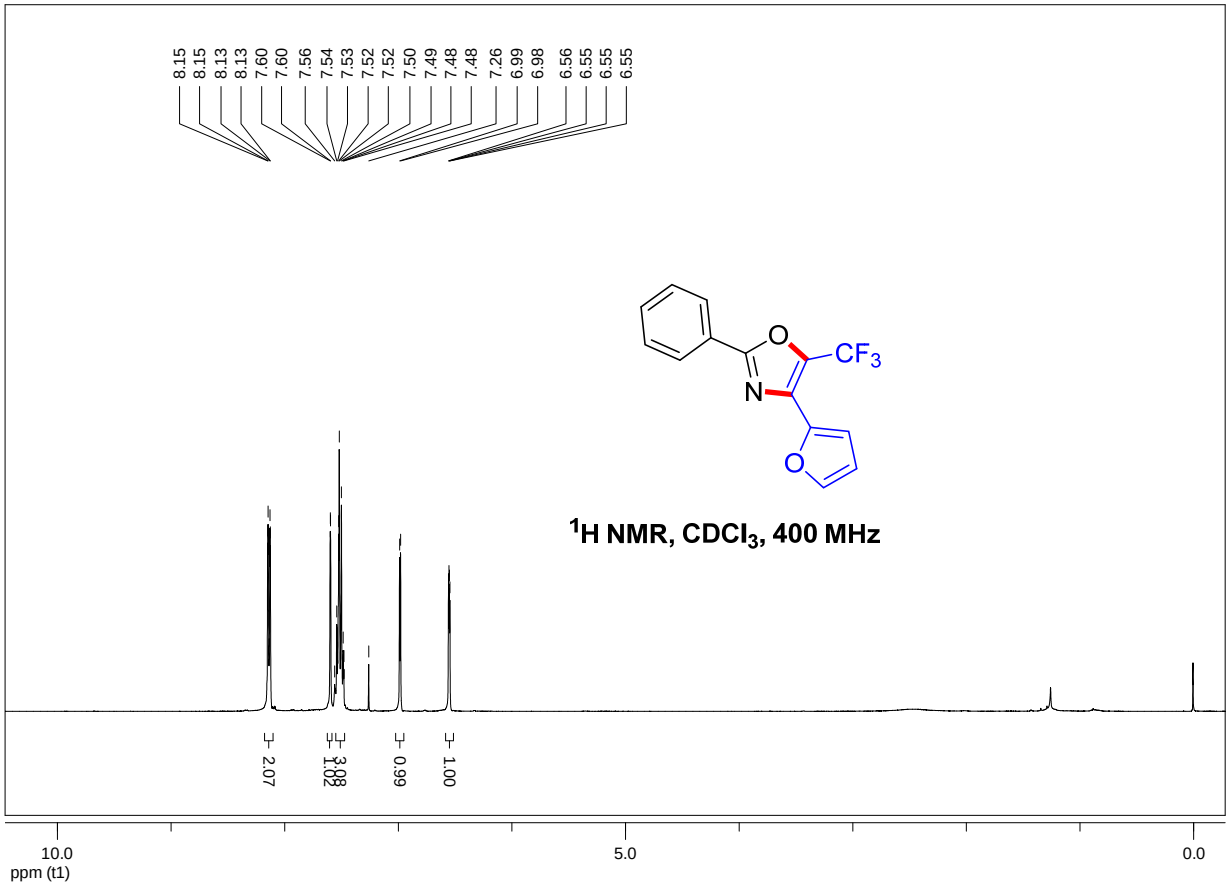


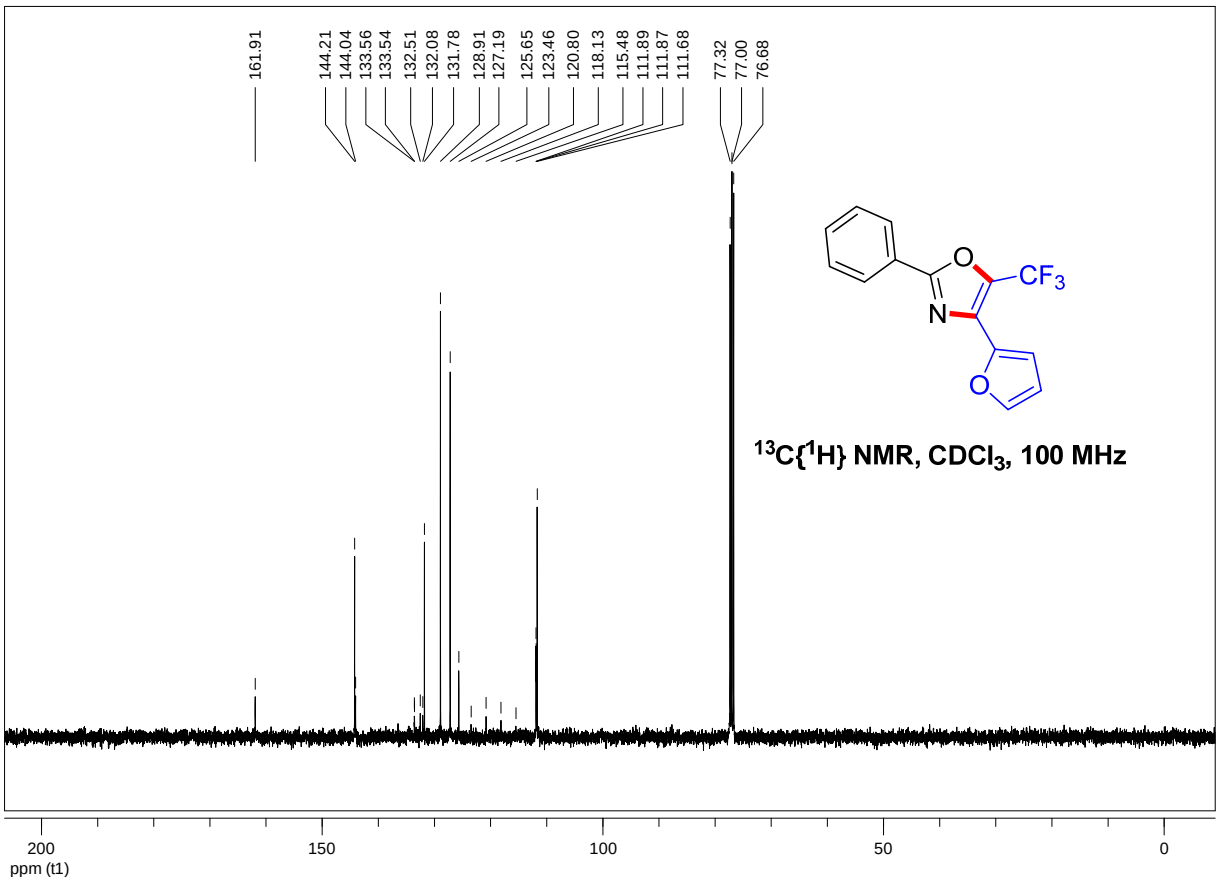
$^{13}C\{^{1}H\}$ NMR, $CDCl_3$, 100 MHz

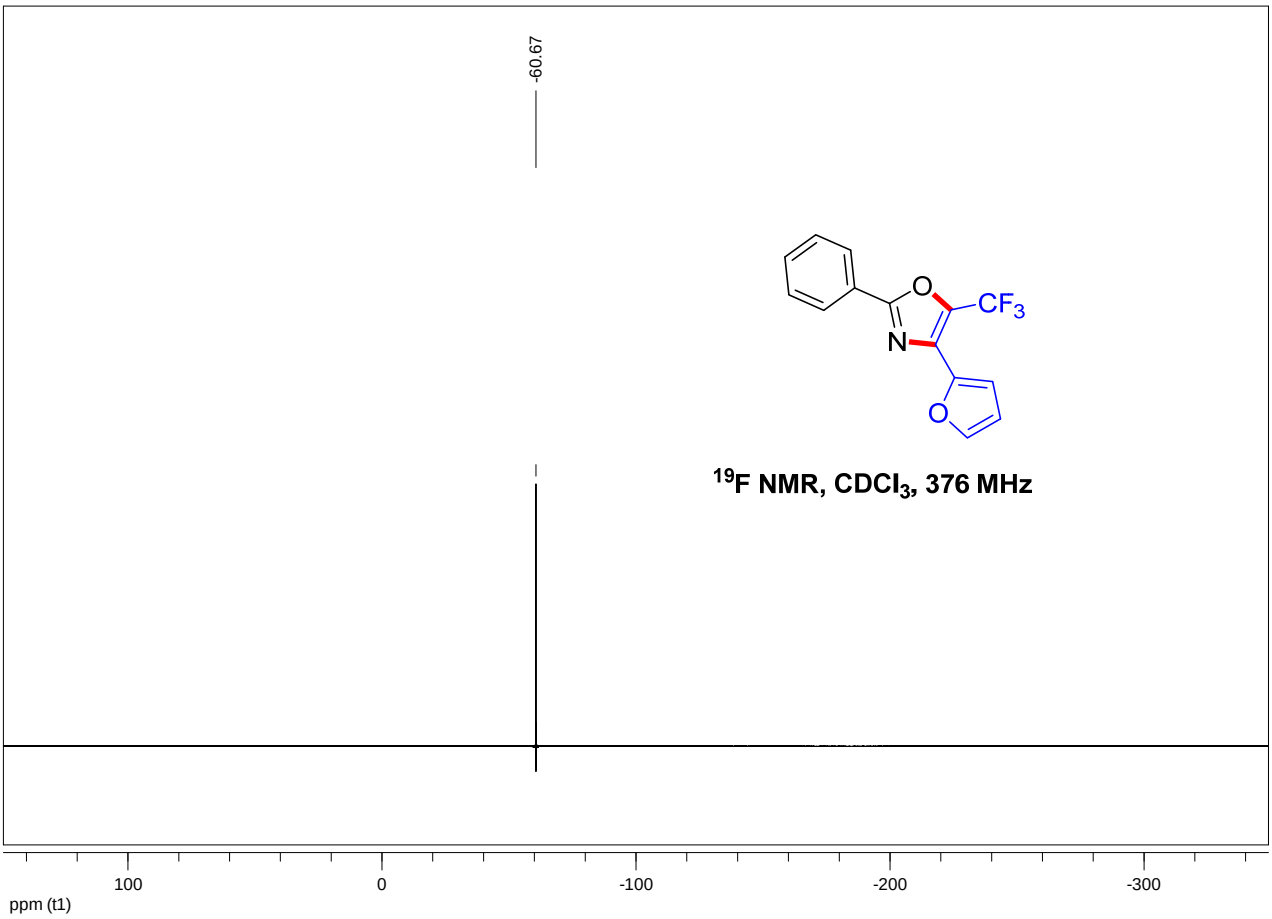


^{19}F NMR, $CDCl_3$, 376 MHz

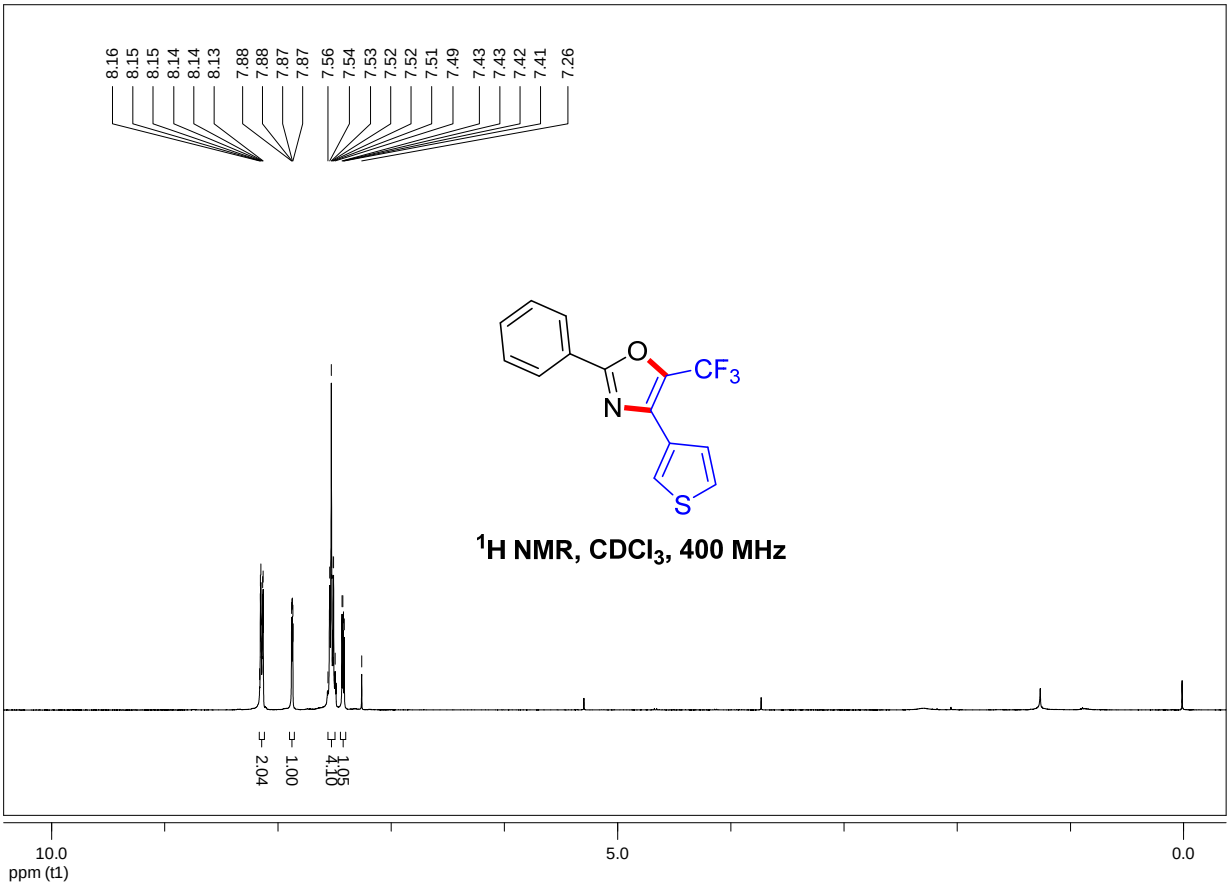
4-(furan-2-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3t)

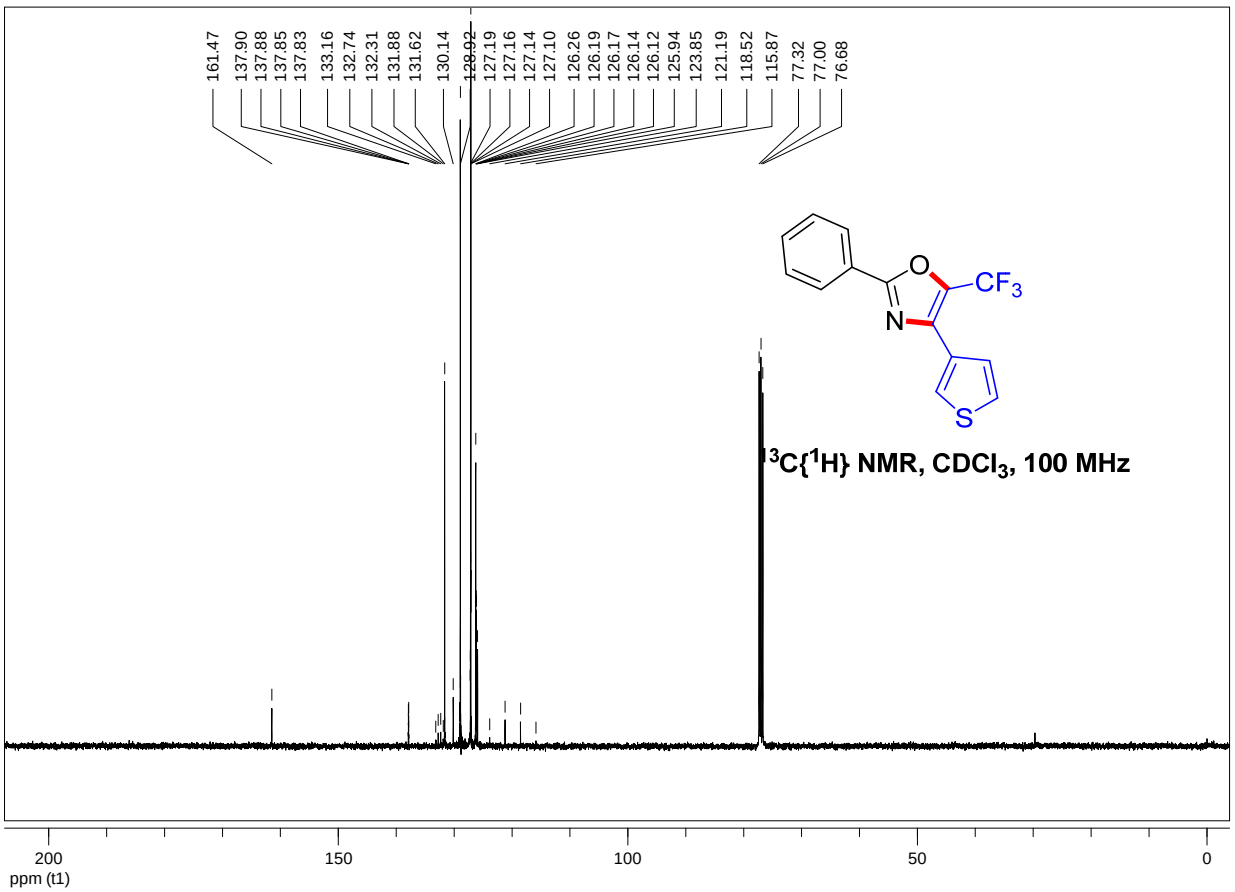


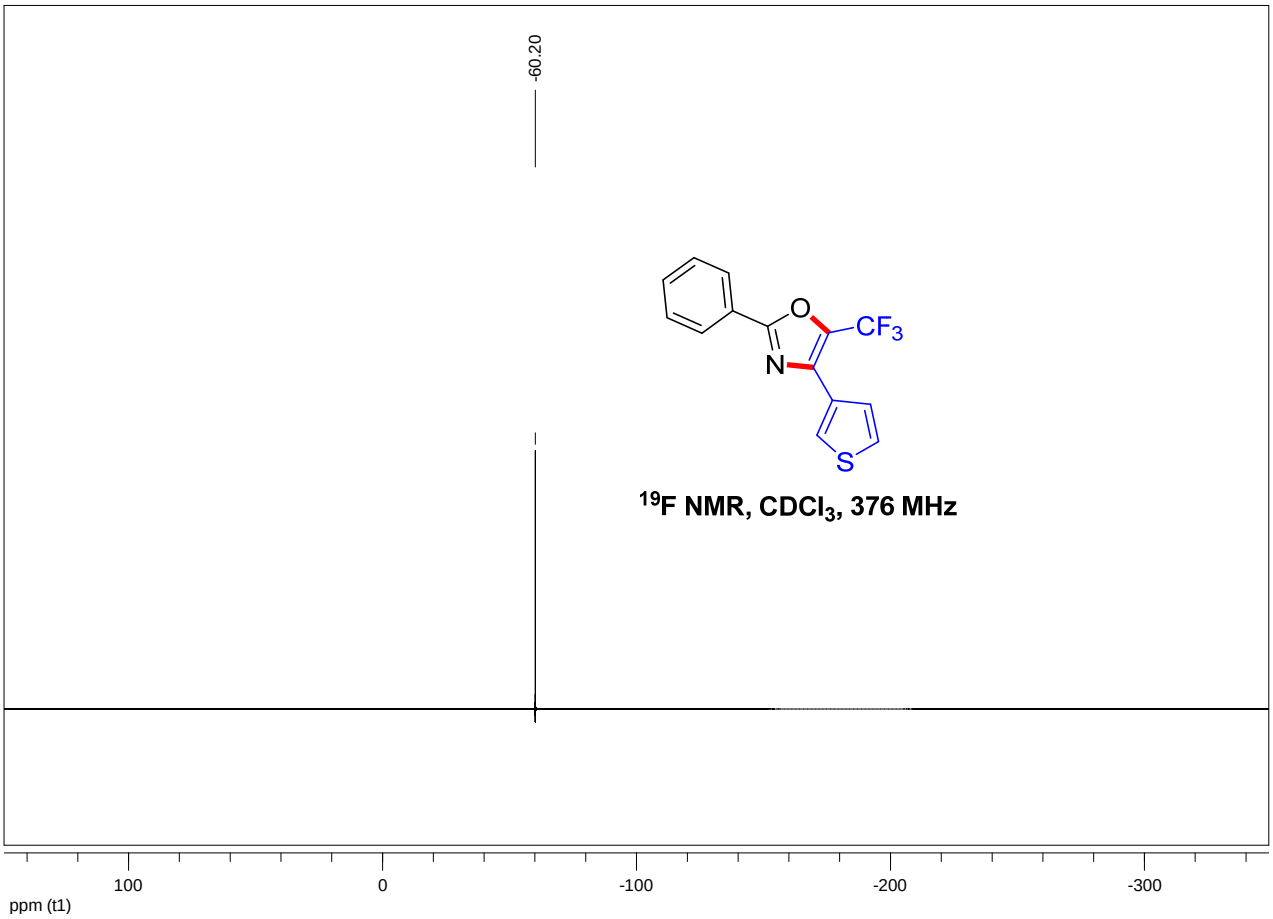



-60.67
O
CF3
N
O
19F NMR, CDCl3, 376 MHz
100
0
-100
-200
-300
ppm (t1)

2-phenyl-4-(thiophen-3-yl)-5-(trifluoromethyl)oxazole (3u)

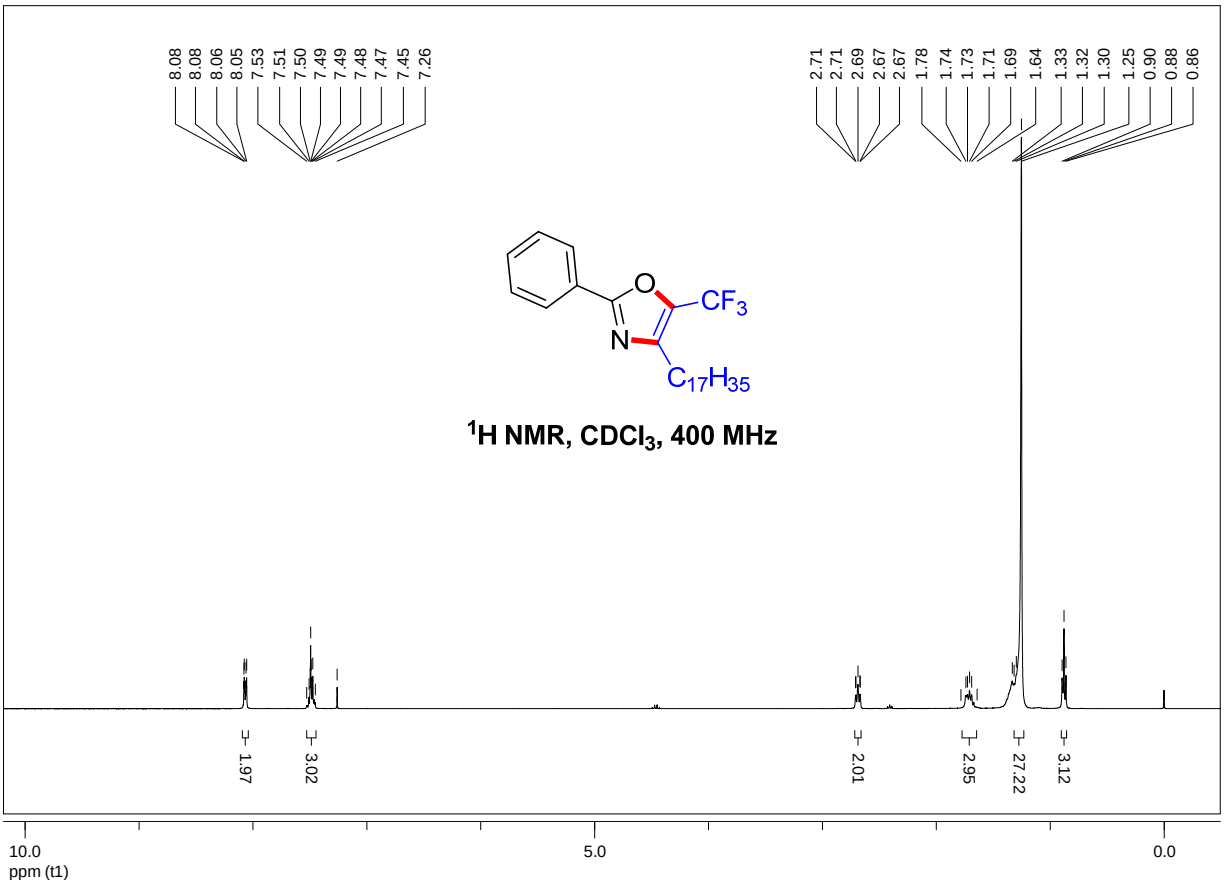


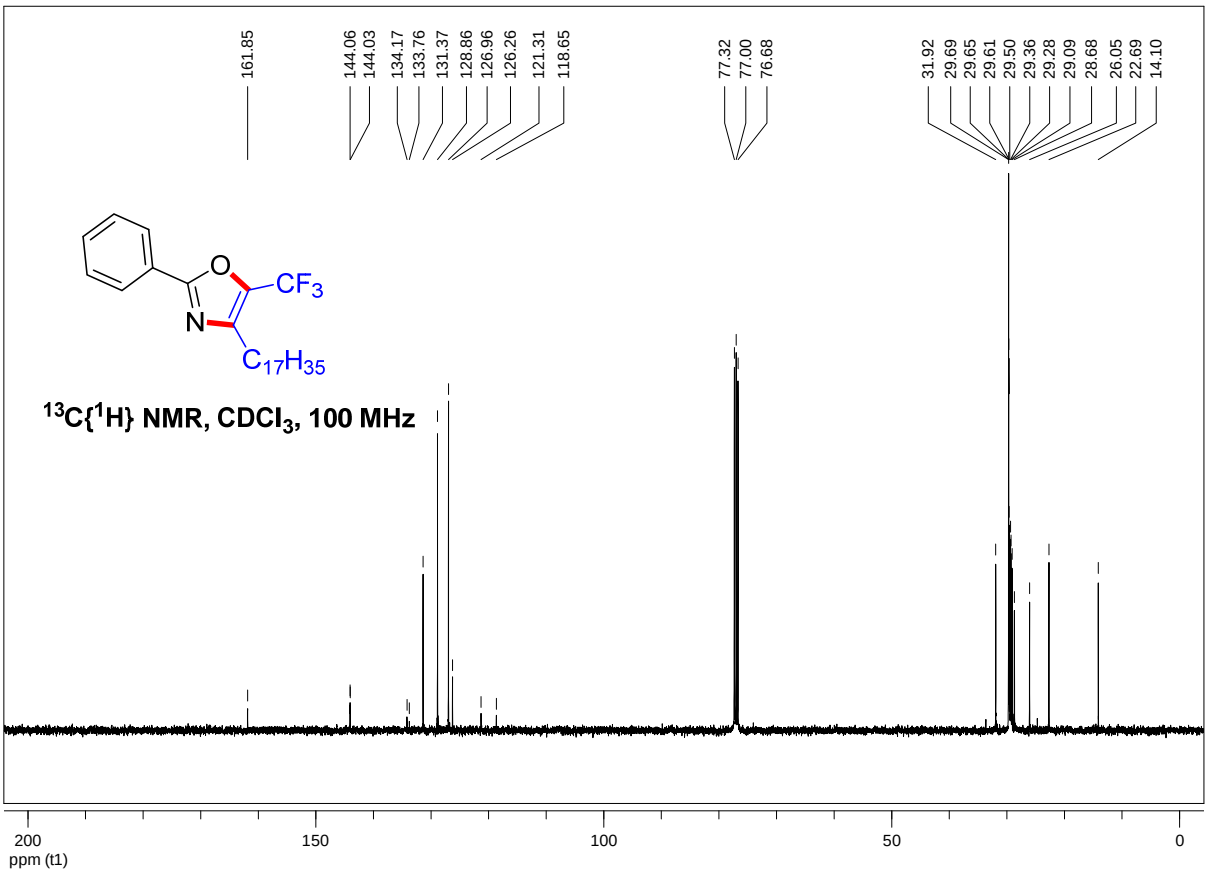


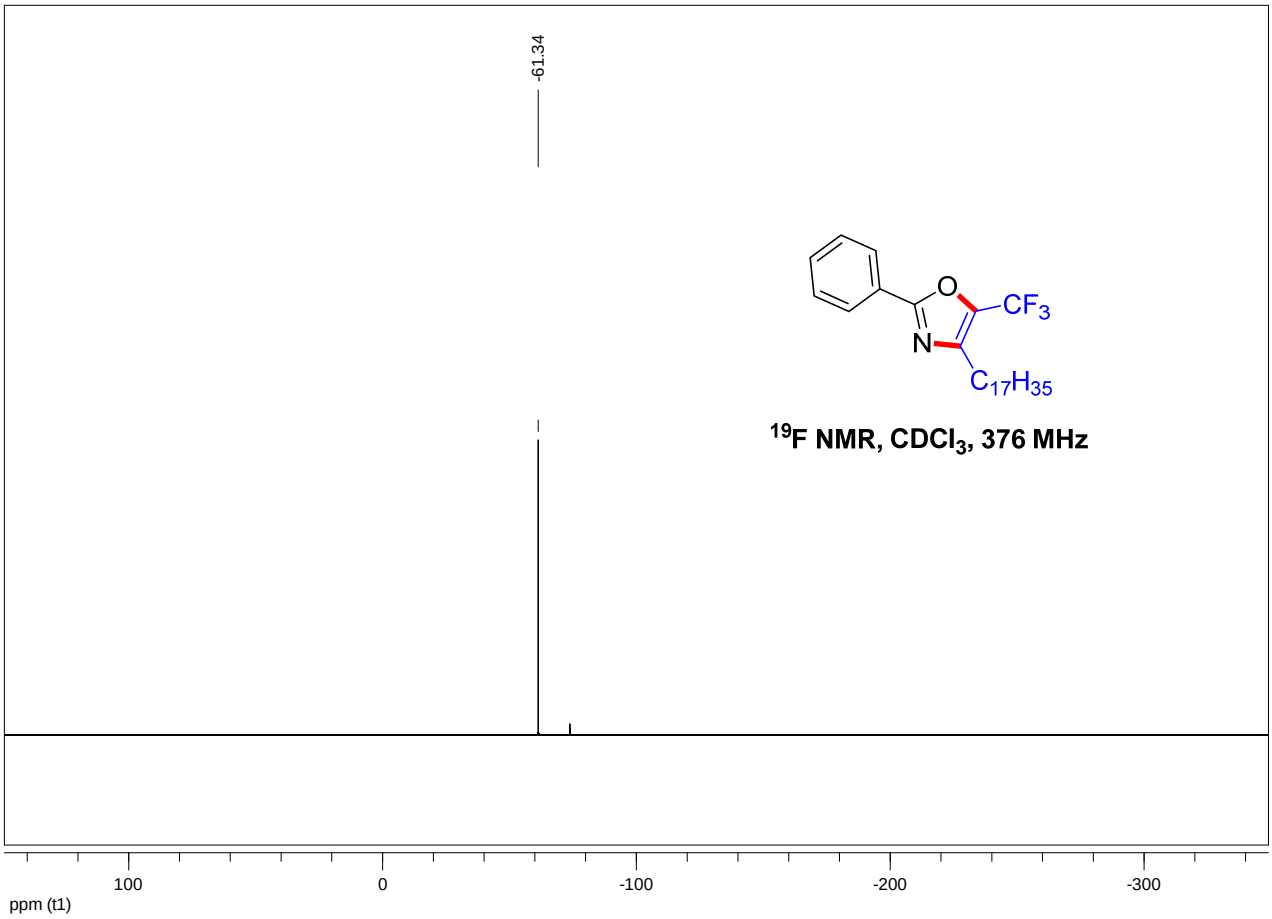


^{19}F NMR, $CDCl_3$, 376 MHz

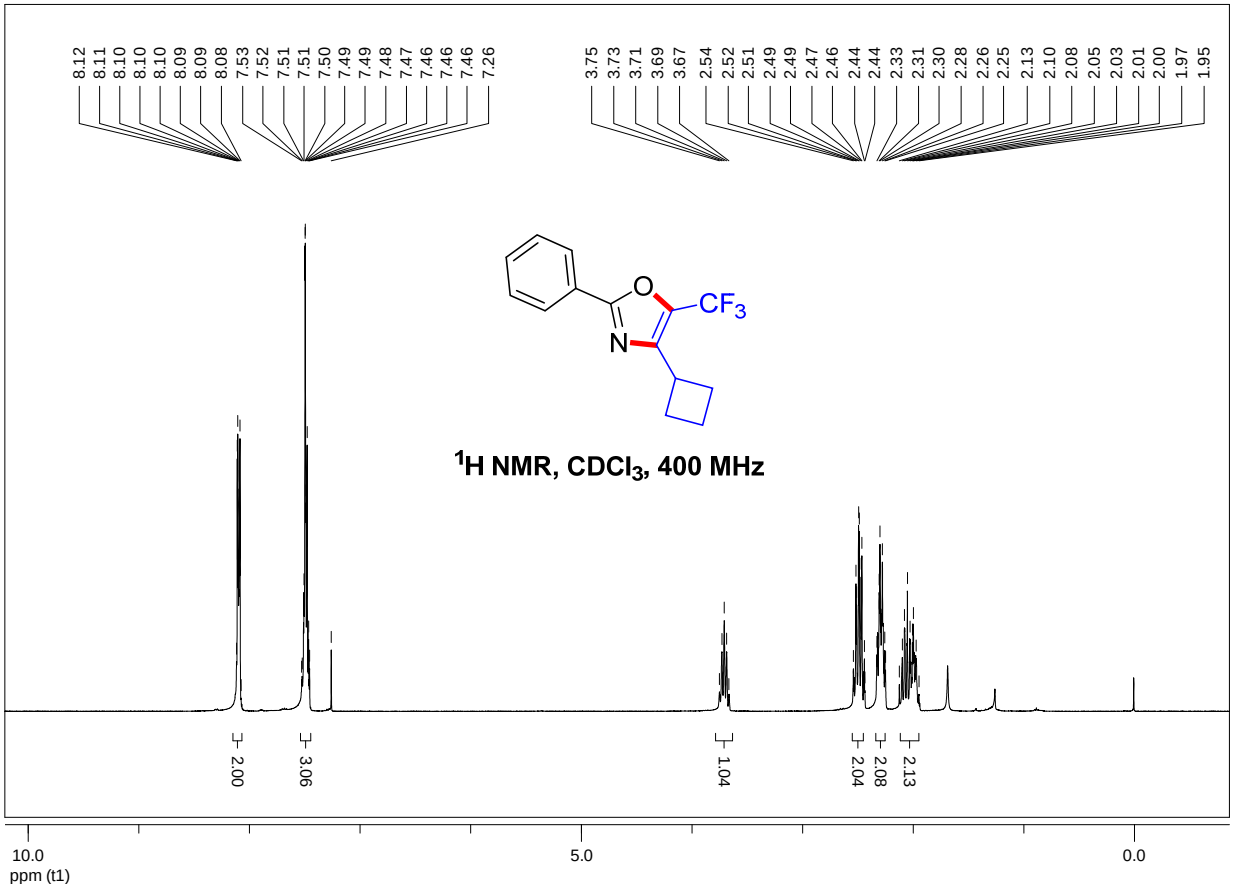
4-heptadecyl-2-phenyl-5-(trifluoromethyl)oxazole (3v)

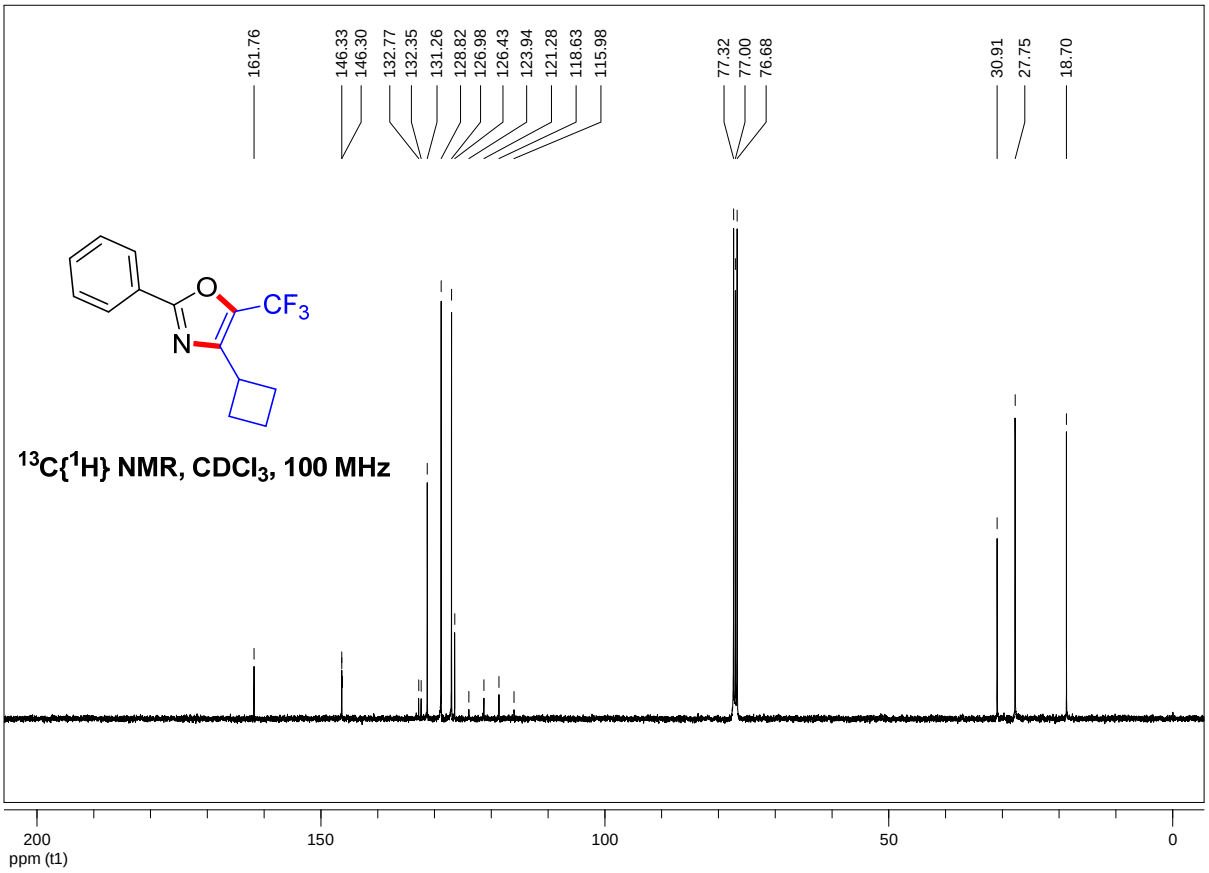


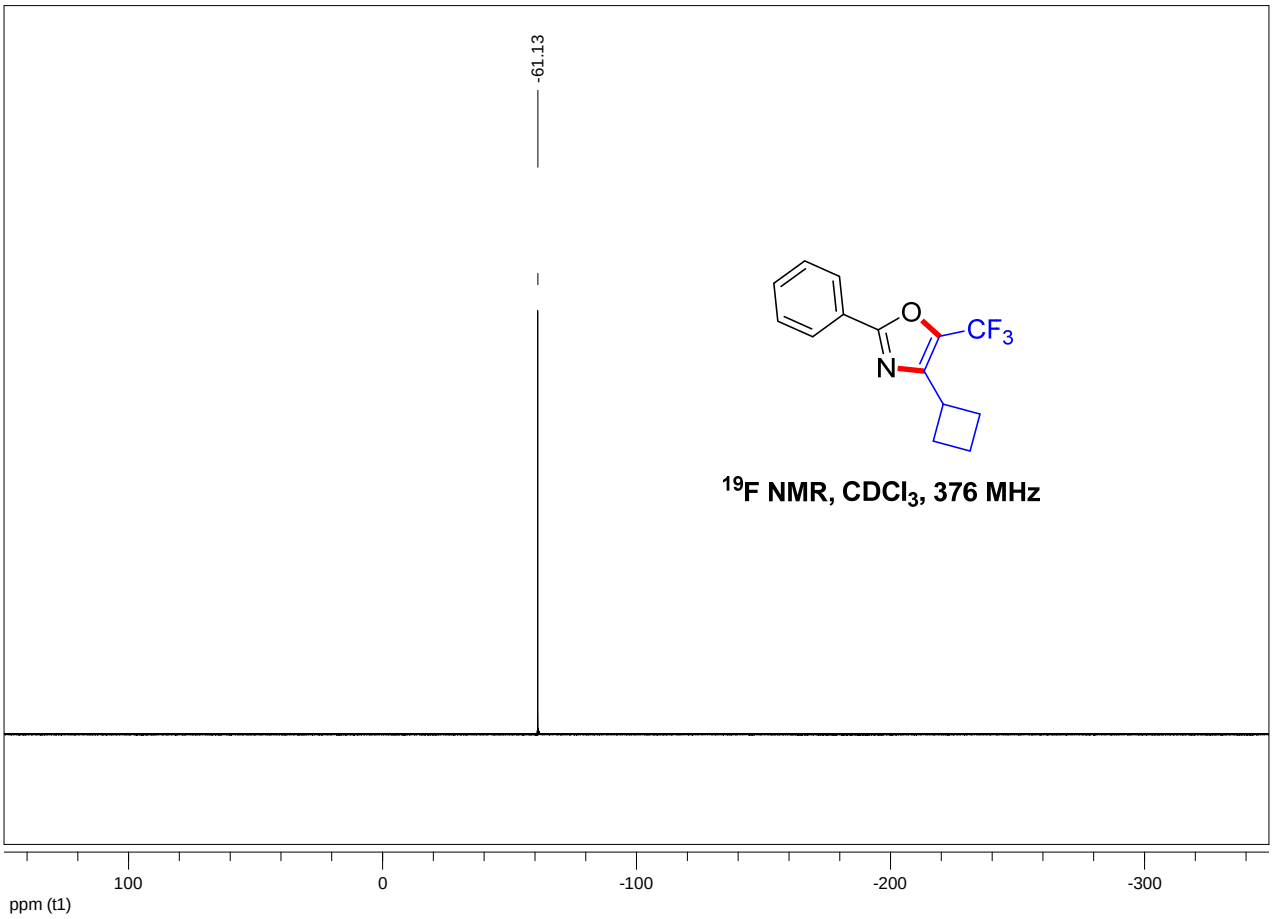



-61.34
O
N
CF3
C17H35
19F NMR, CDCl3, 376 MHz
100
0
-100
-200
-300
ppm (t1)

4-cyclobutyl-2-phenyl-5-(trifluoromethyl)oxazole (3w)

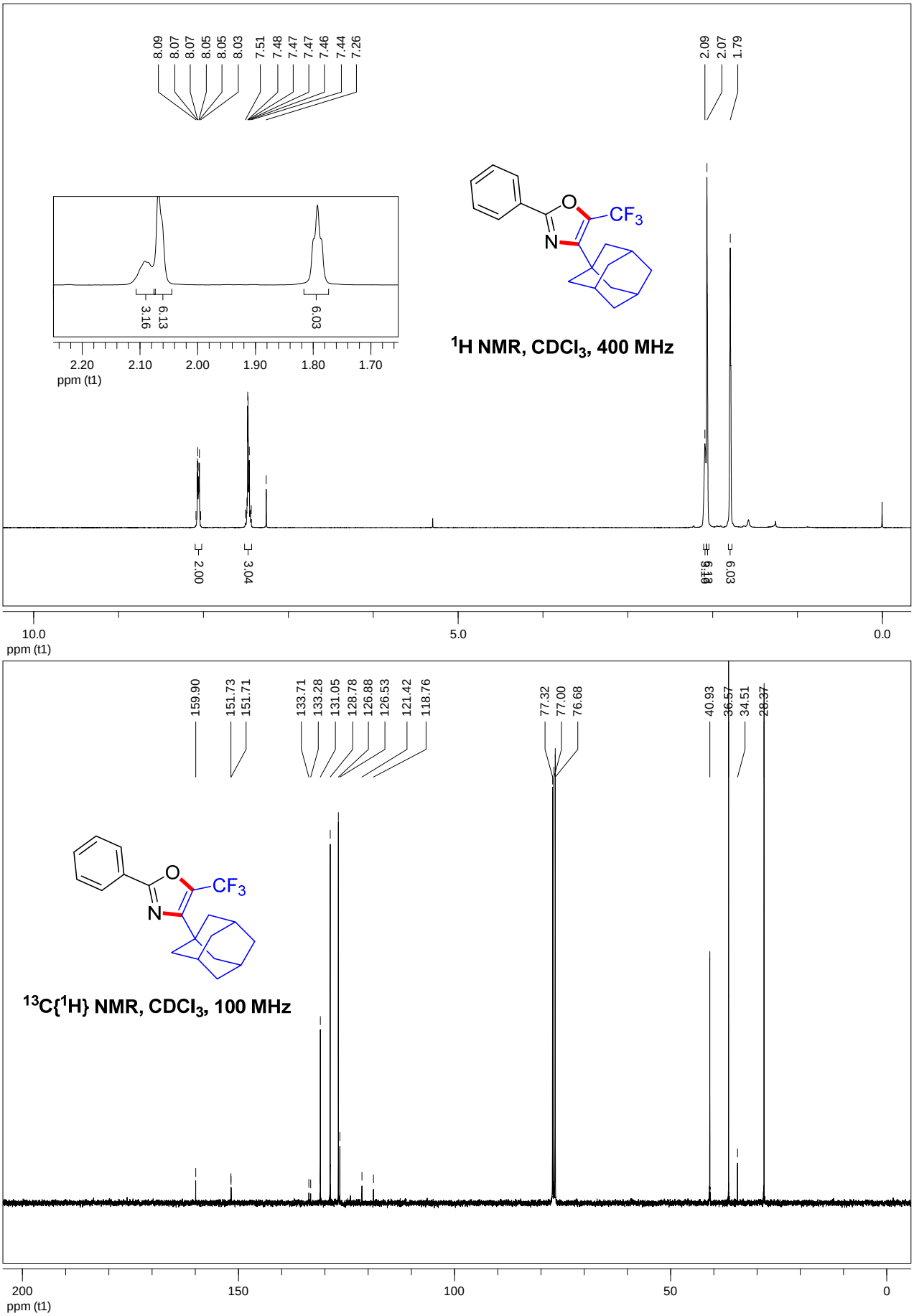


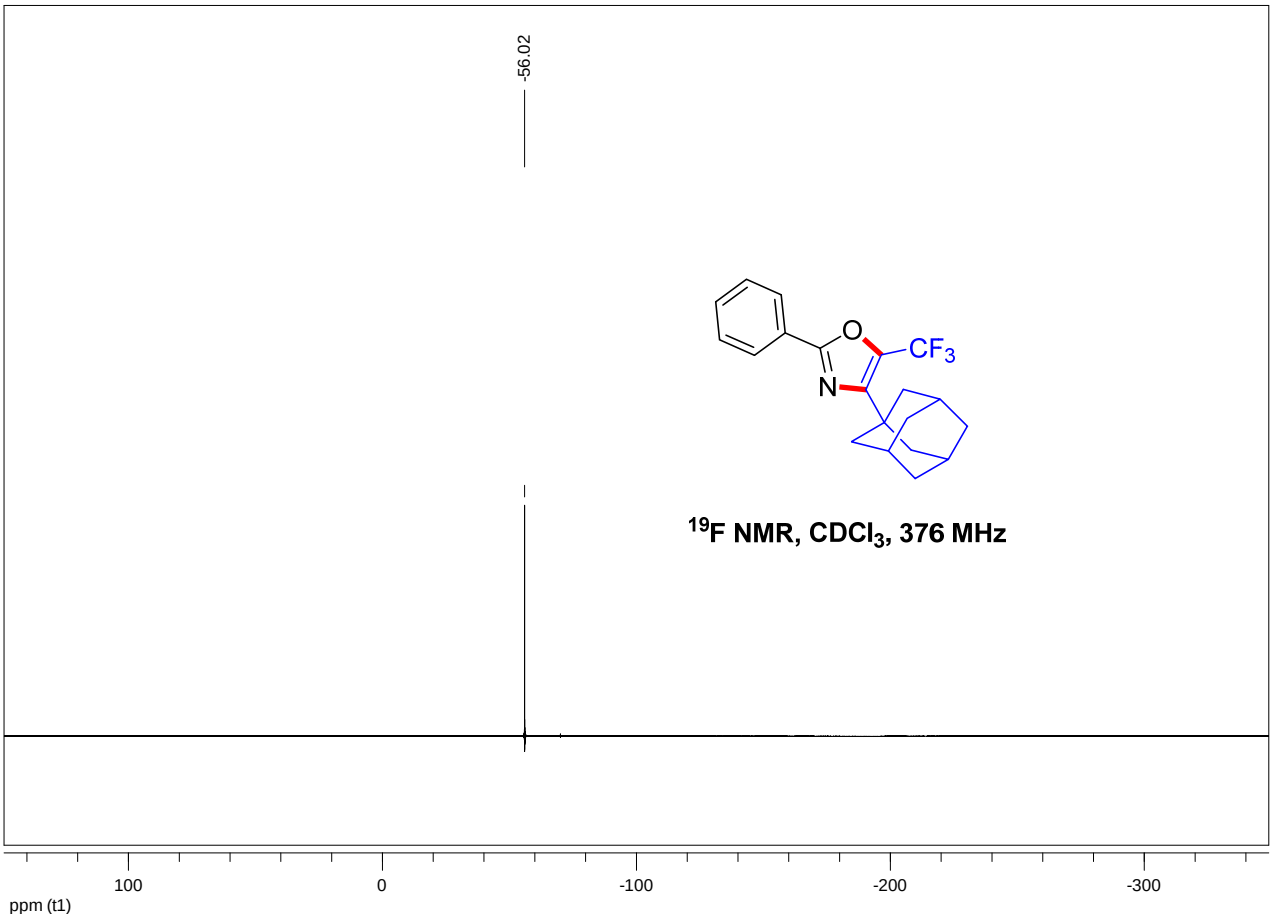




^{19}F NMR, $CDCl_3$, 376 MHz

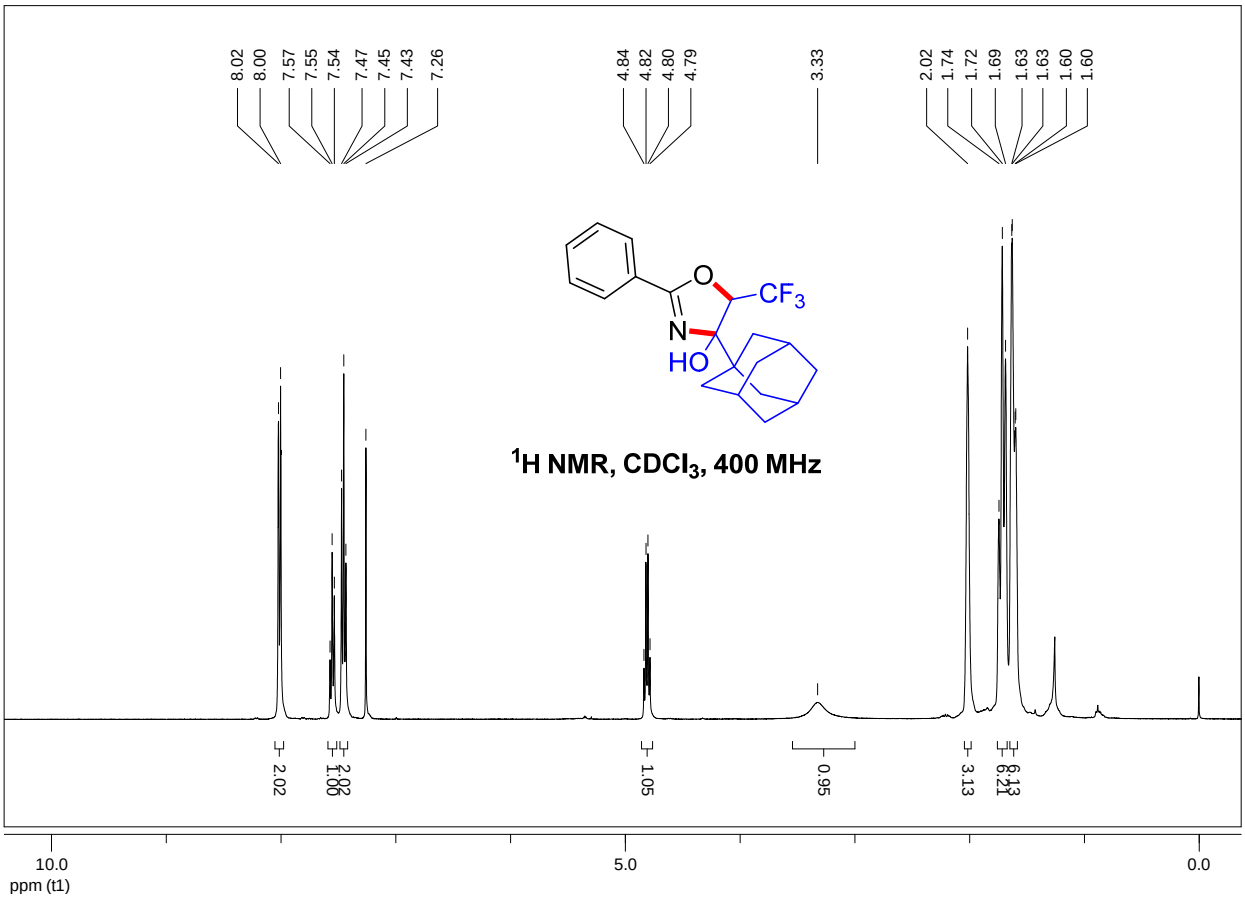
4-((3r,5r,7r)-adamantan-1-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3x)

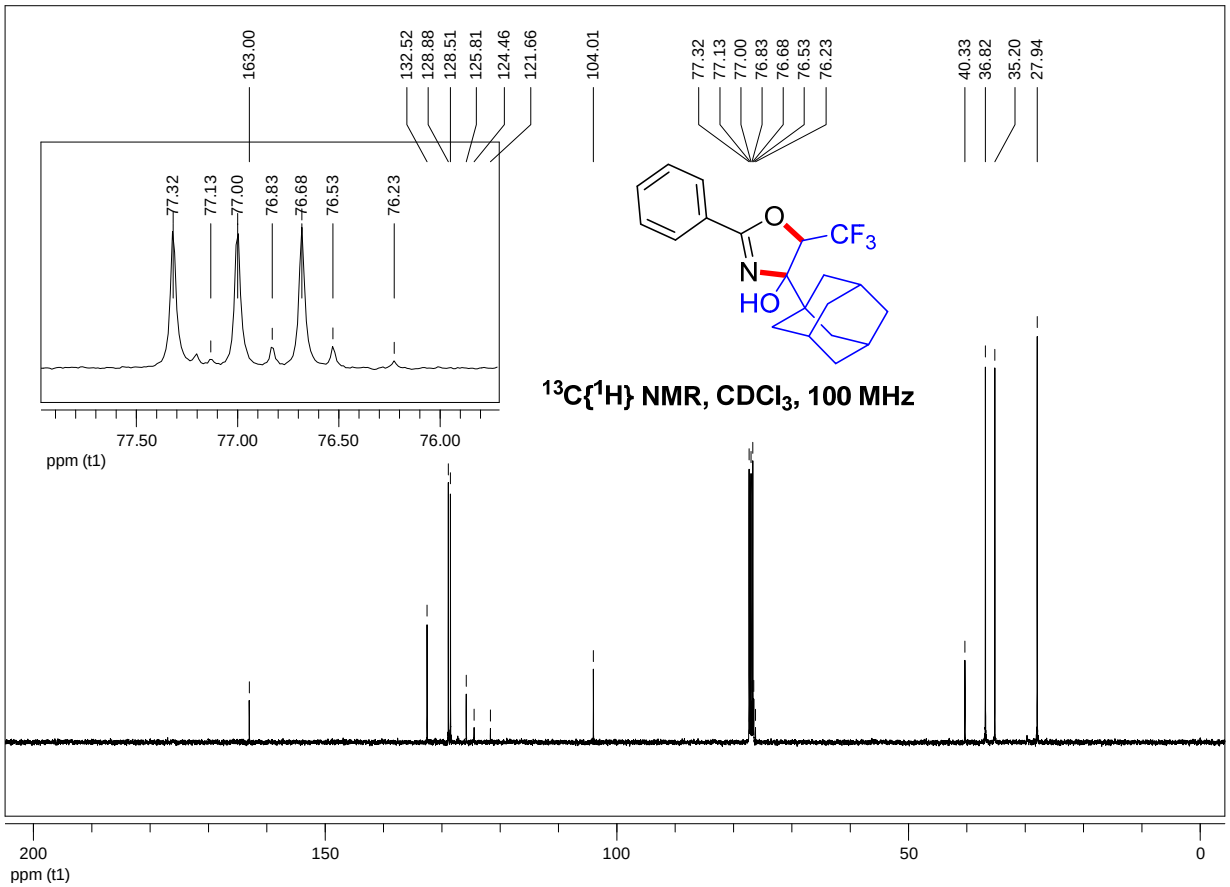


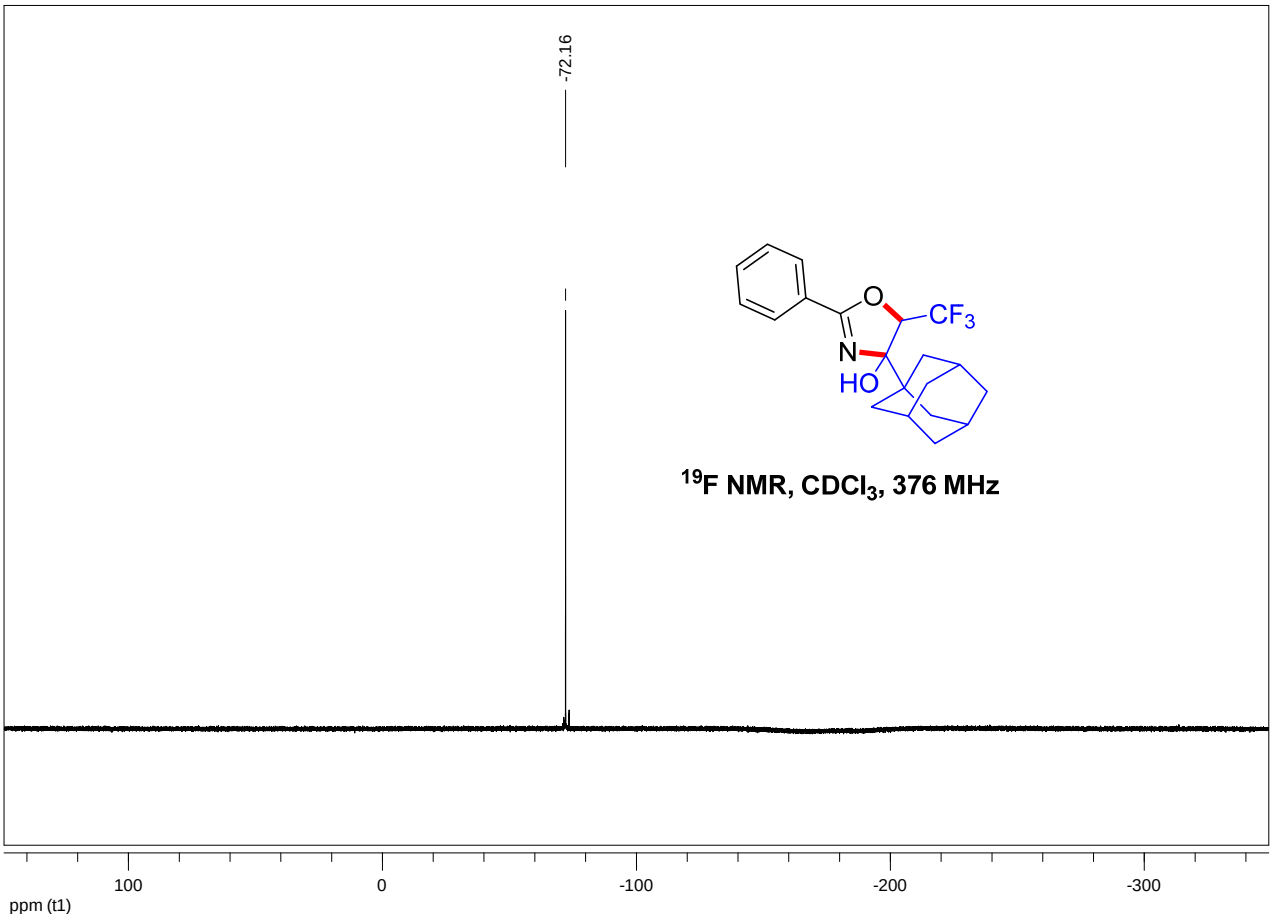


^{19}F NMR, $CDCl_3$, 376 MHz

4-((3r,5r,7r)-adamantan-1-yl)-2-phenyl-5-(trifluoromethyl)-4,5-dihydrooxazol-4-ol (3x')

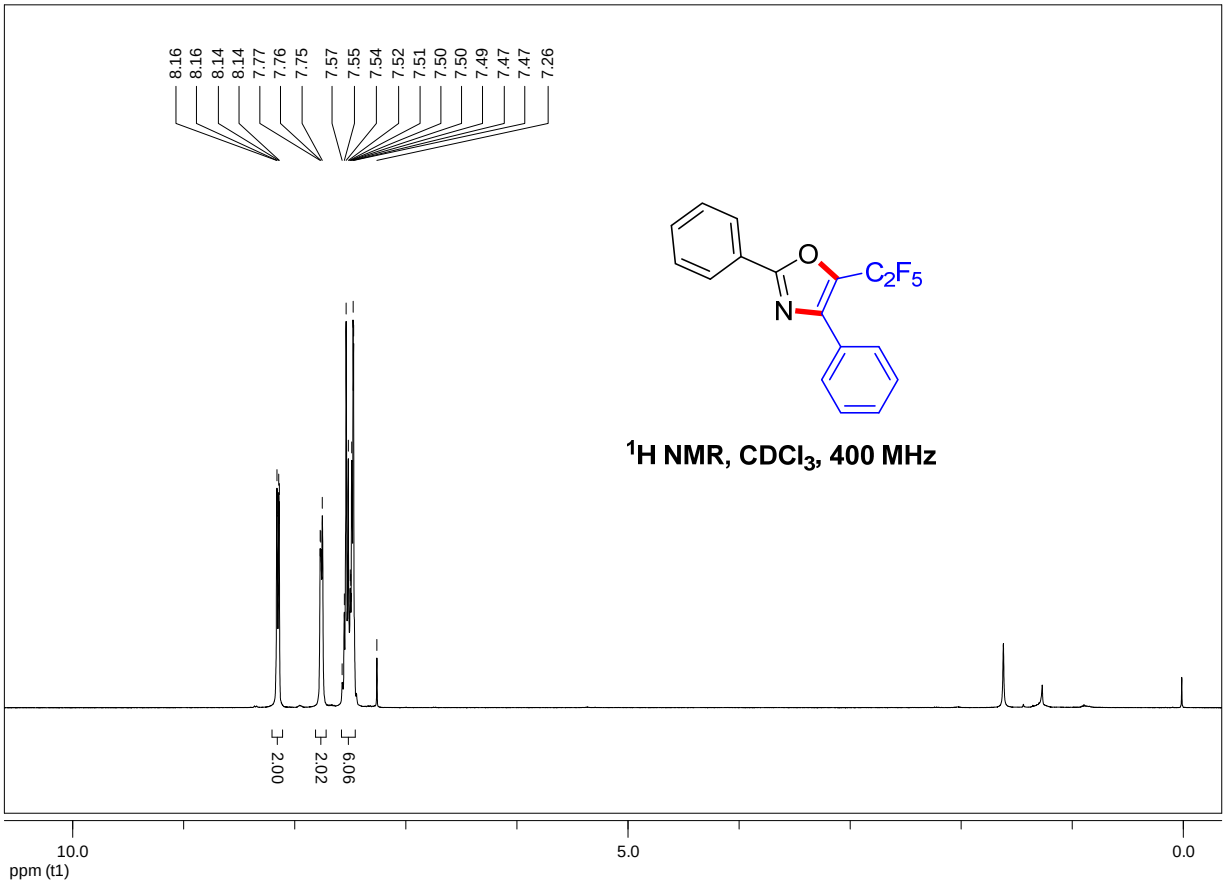




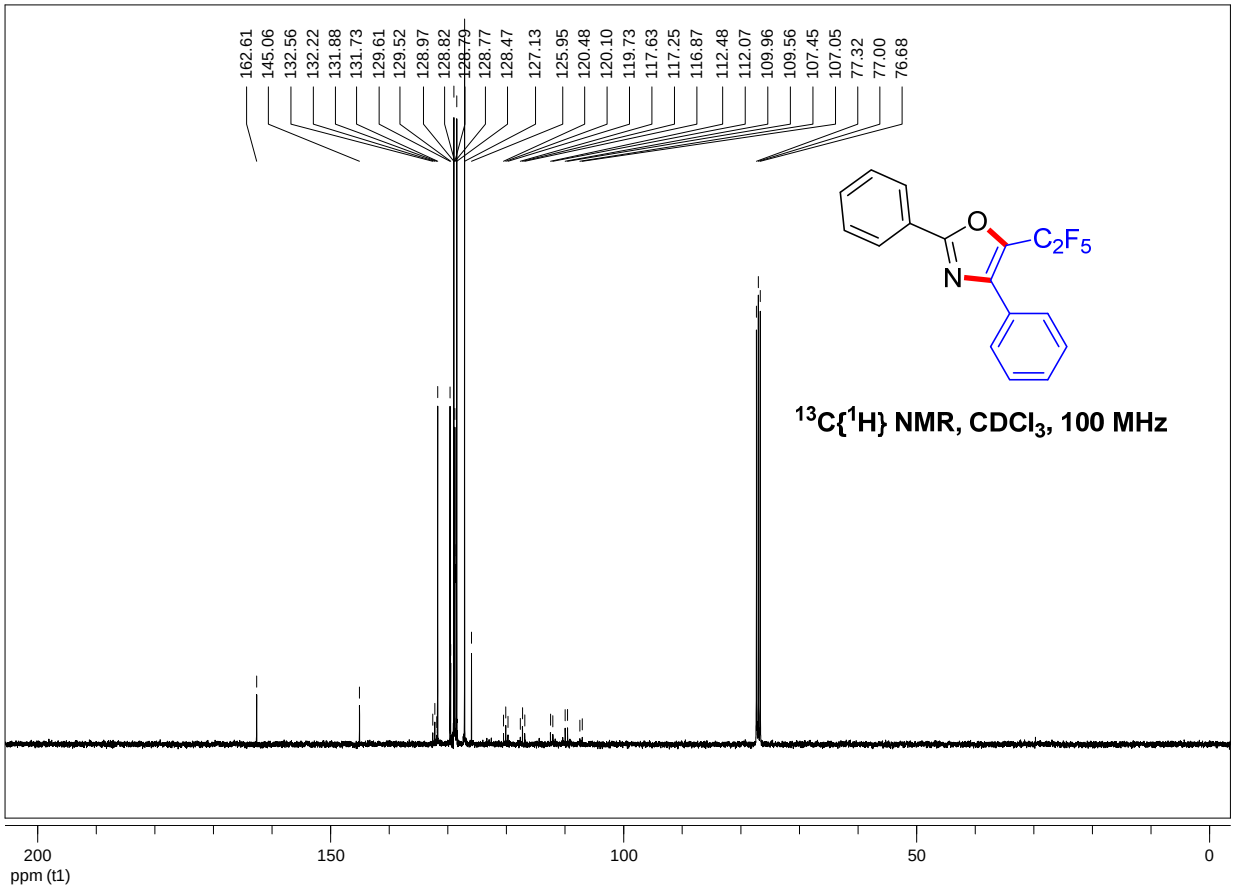


^{19}F NMR, $CDCl_3$, 376 MHz

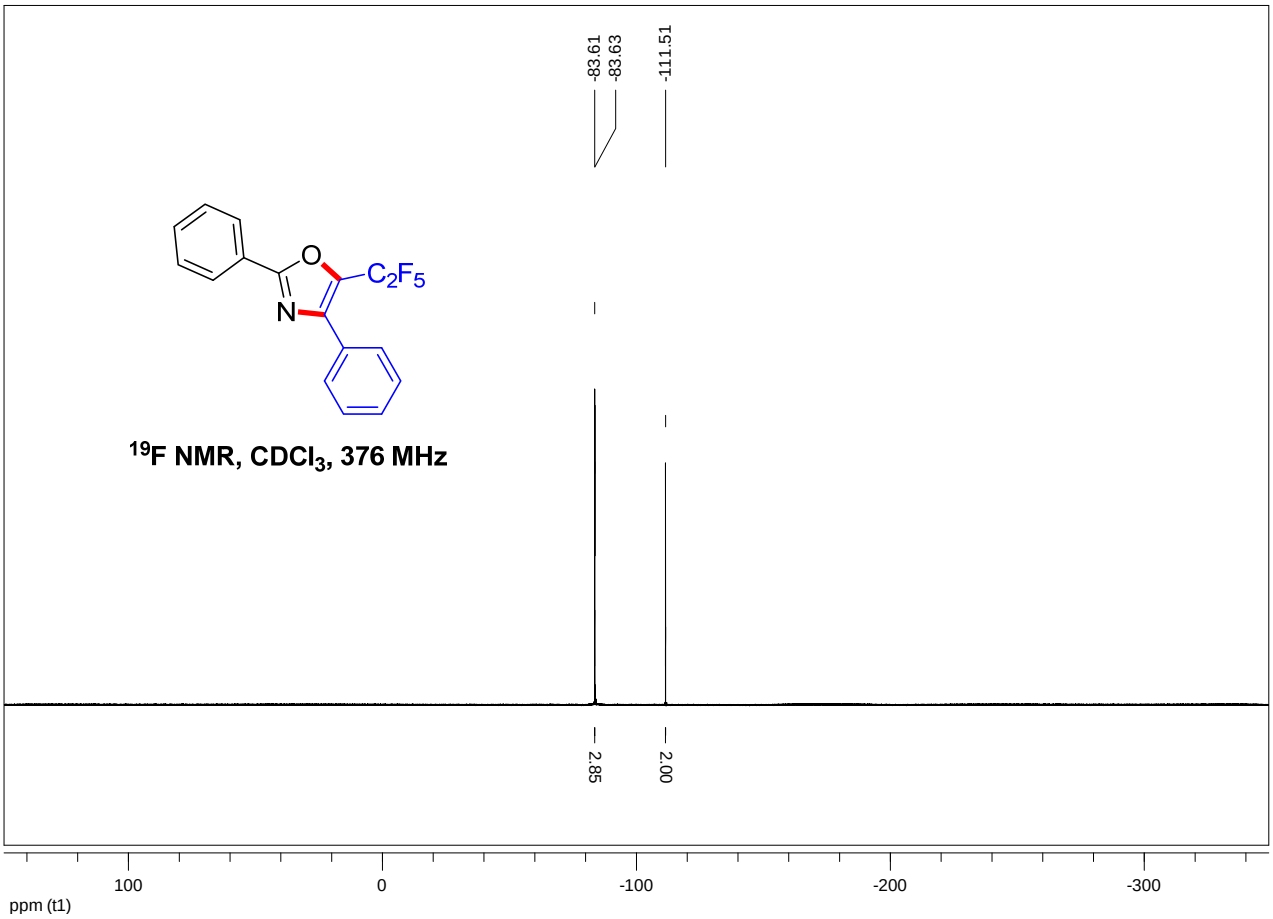
5-(perfluoroethyl)-2,4-diphenyloxazole (3y)



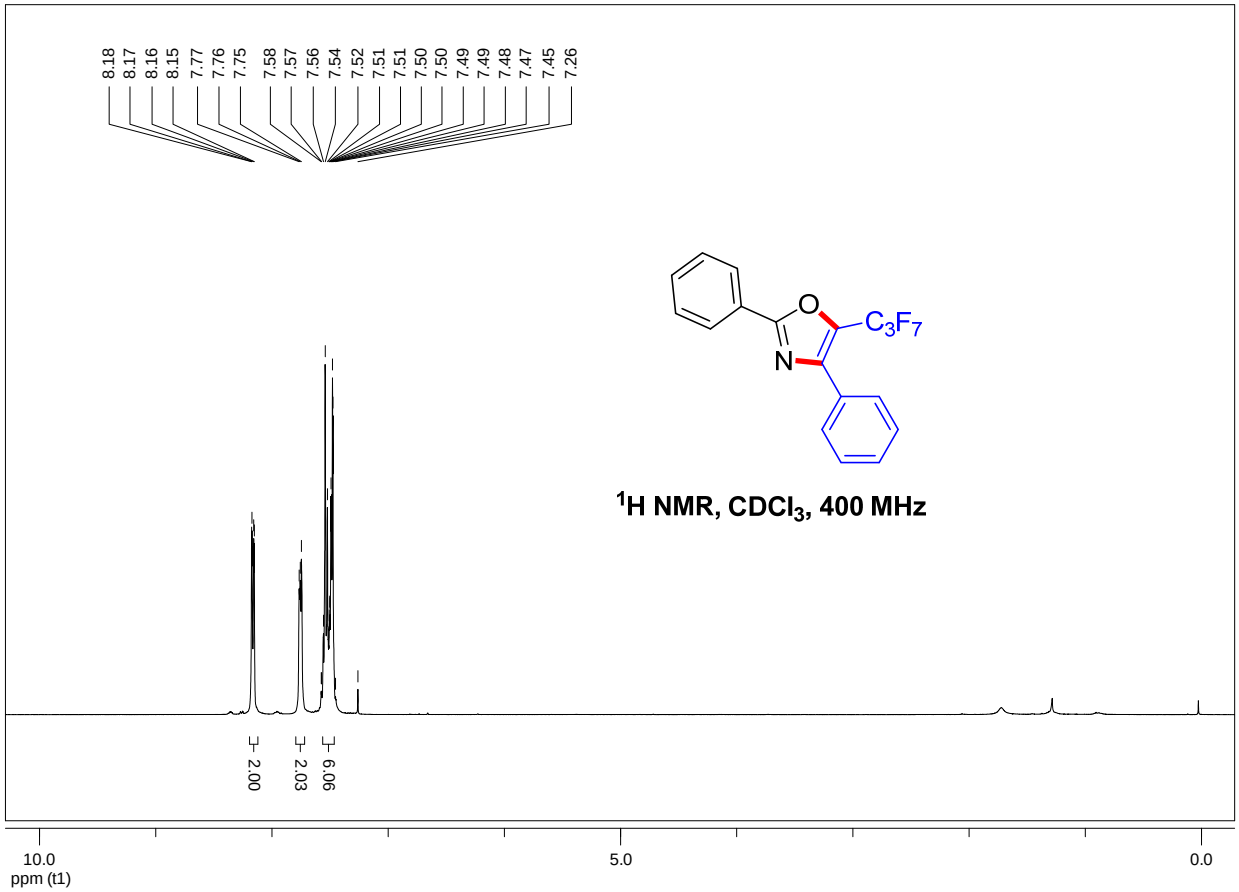
^{1}H NMR, $CDCl_3$, 400 MHz



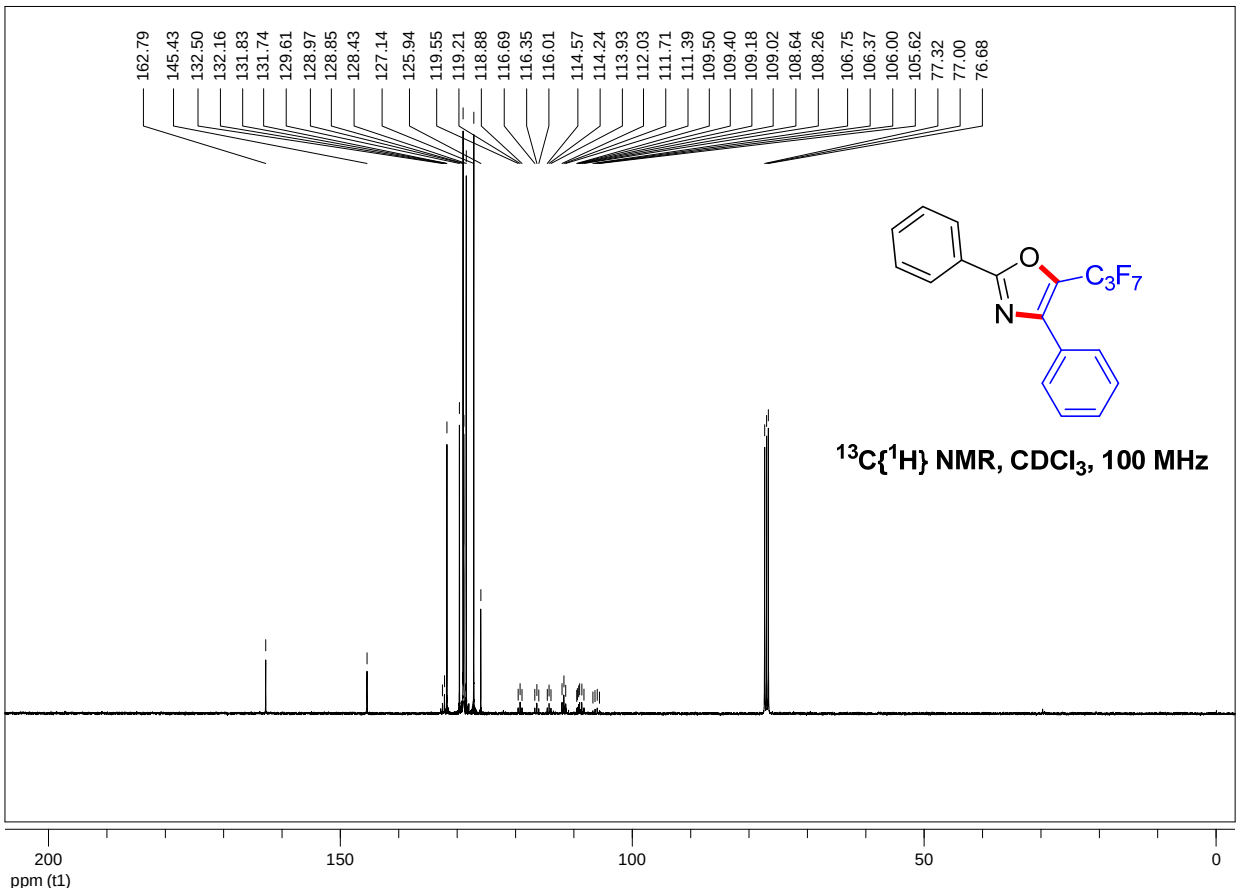
^{13}C{^{1}H} NMR, $CDCl_3$, 100 MHz


-83.61
-83.63
-111.51
O
N
C_2F_5
^{19}F NMR, $CDCl_3$, 376 MHz
2.85
2.00
100
0
-100
-200
-300
ppm (t1)

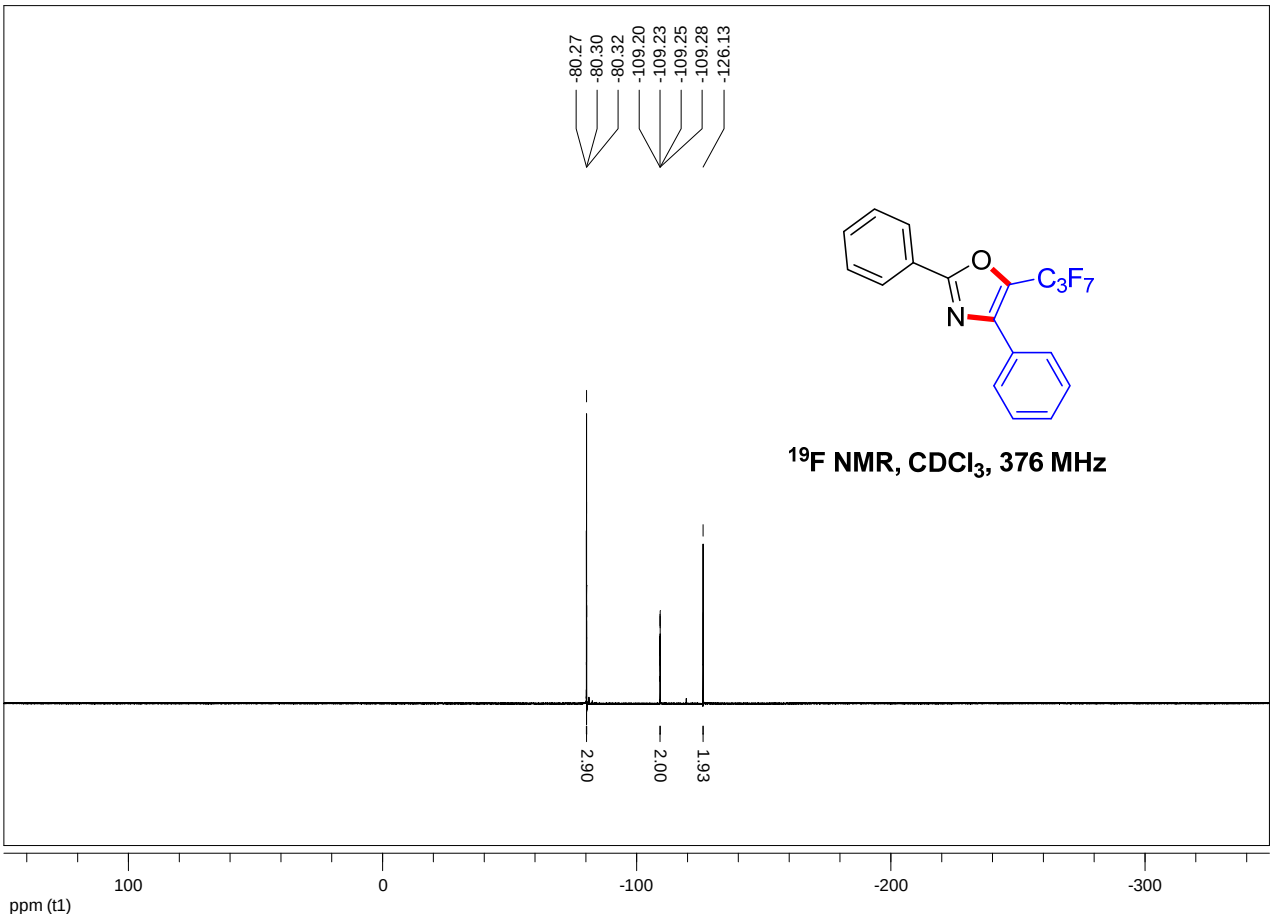
5-(perfluoropropyl)-2,4-diphenyloxazole (3z)



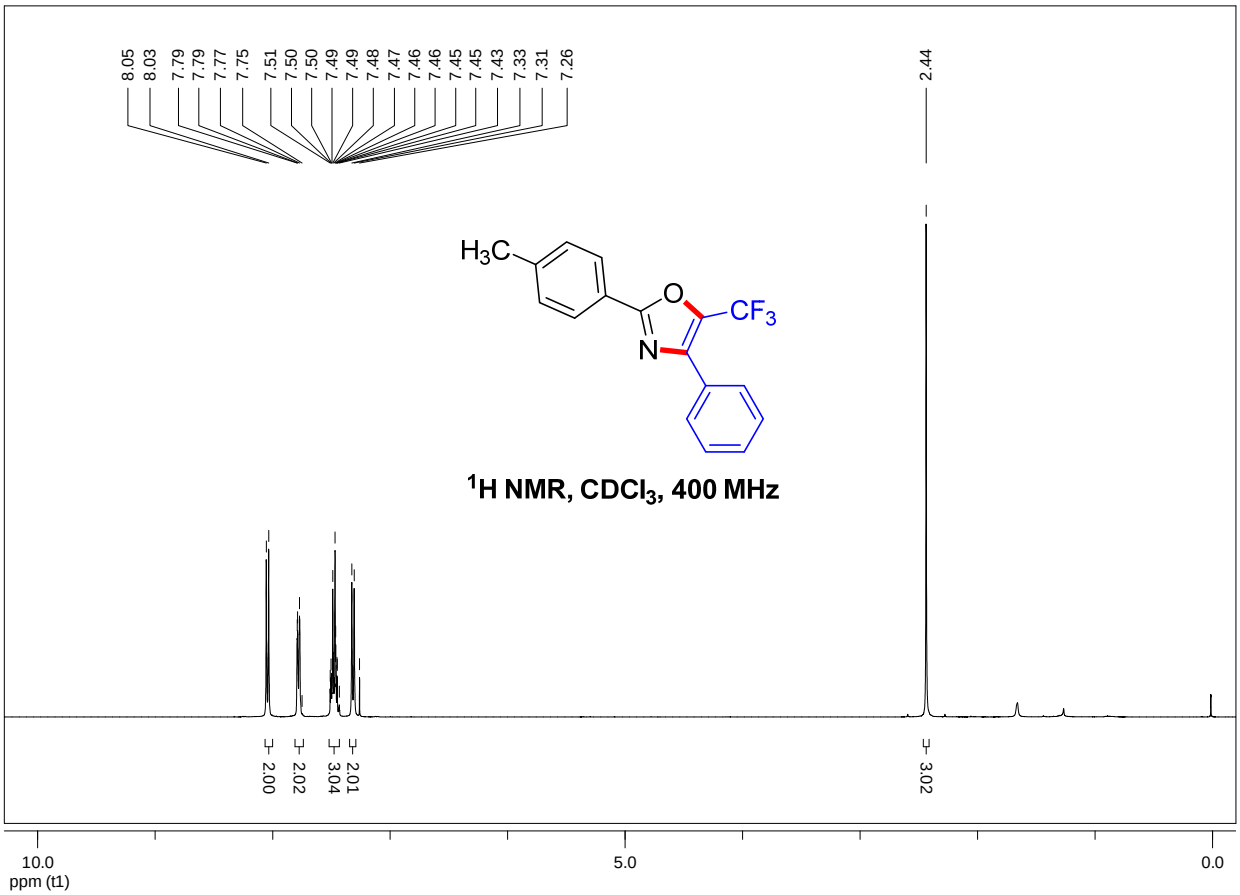
^{1}H NMR, $CDCl_3$, 400 MHz

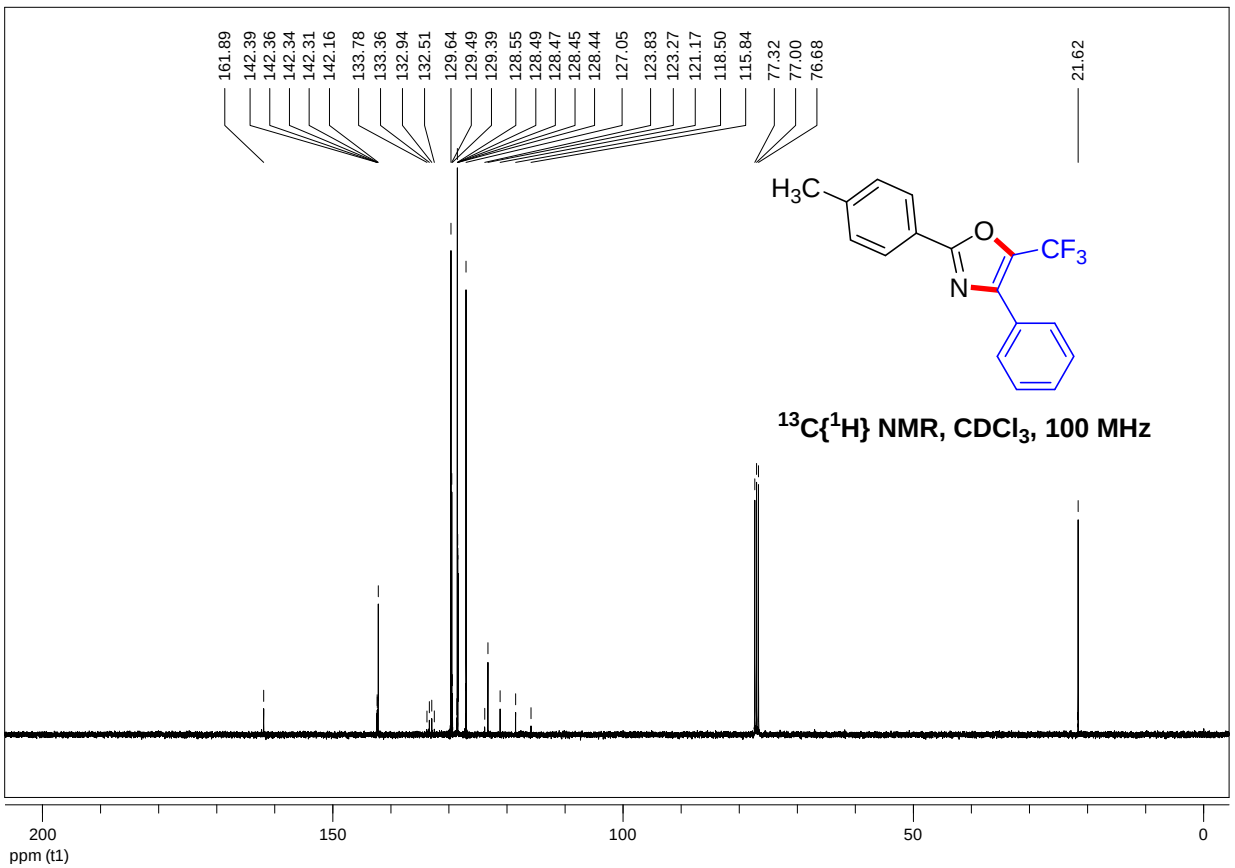


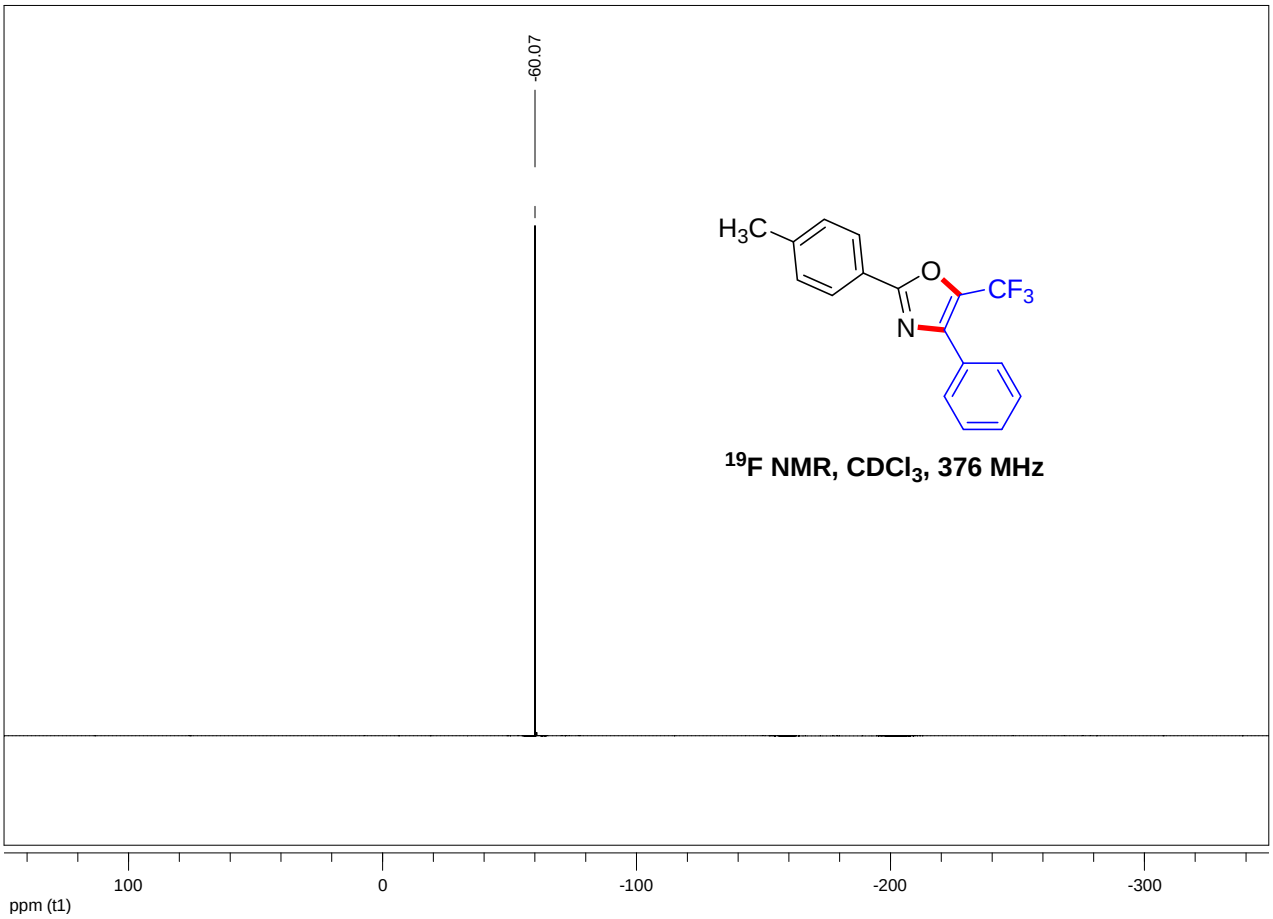
^{13}C{^{1}H} NMR, $CDCl_3$, 100 MHz


-80.27
-80.30
-80.32
-109.20
-109.23
-109.25
-109.28
-126.13
O
N
C_3F_7
^{19}F NMR, $CDCl_3$, 376 MHz
2.90
2.00
1.93
100
0
-100
-200
-300
ppm (t1)

4-phenyl-2-(p-tolyl)-5-(trifluoromethyl)oxazole (5a)

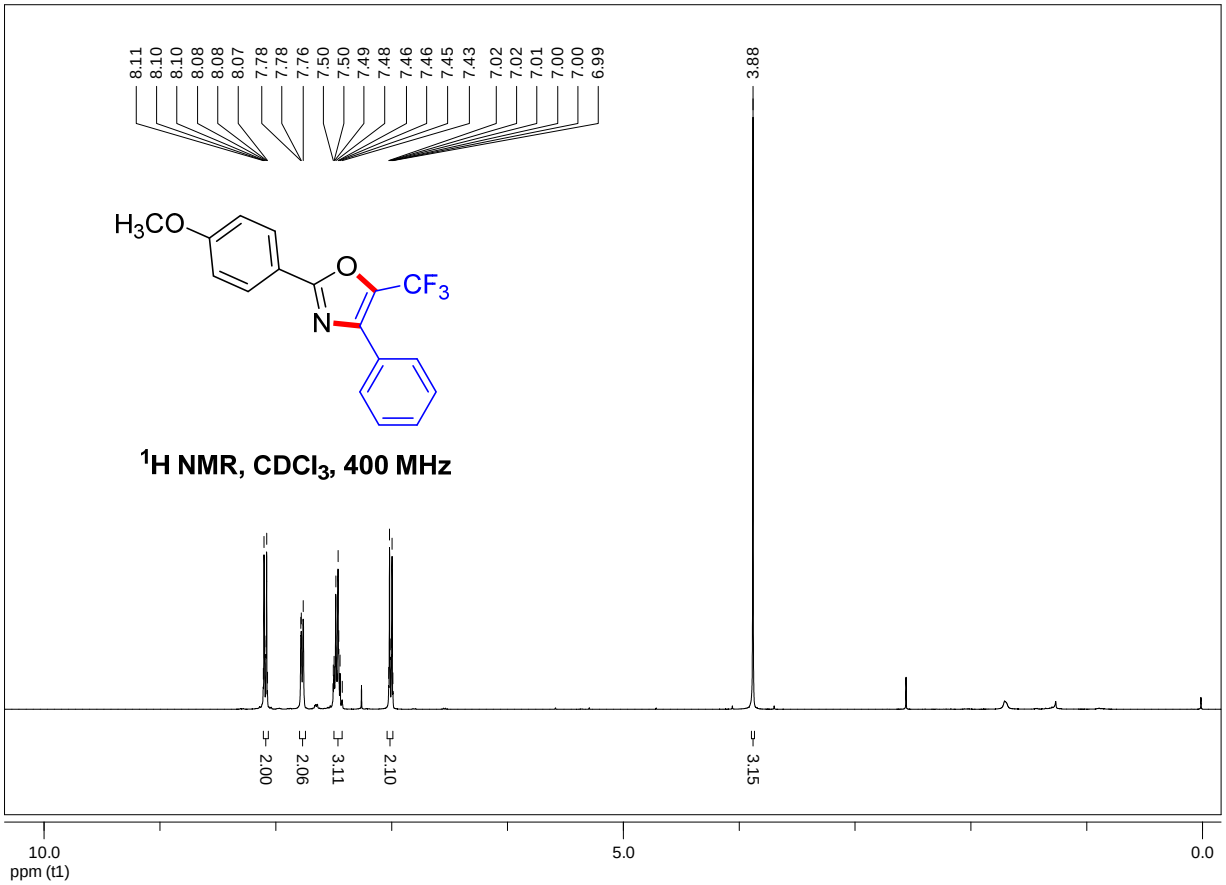


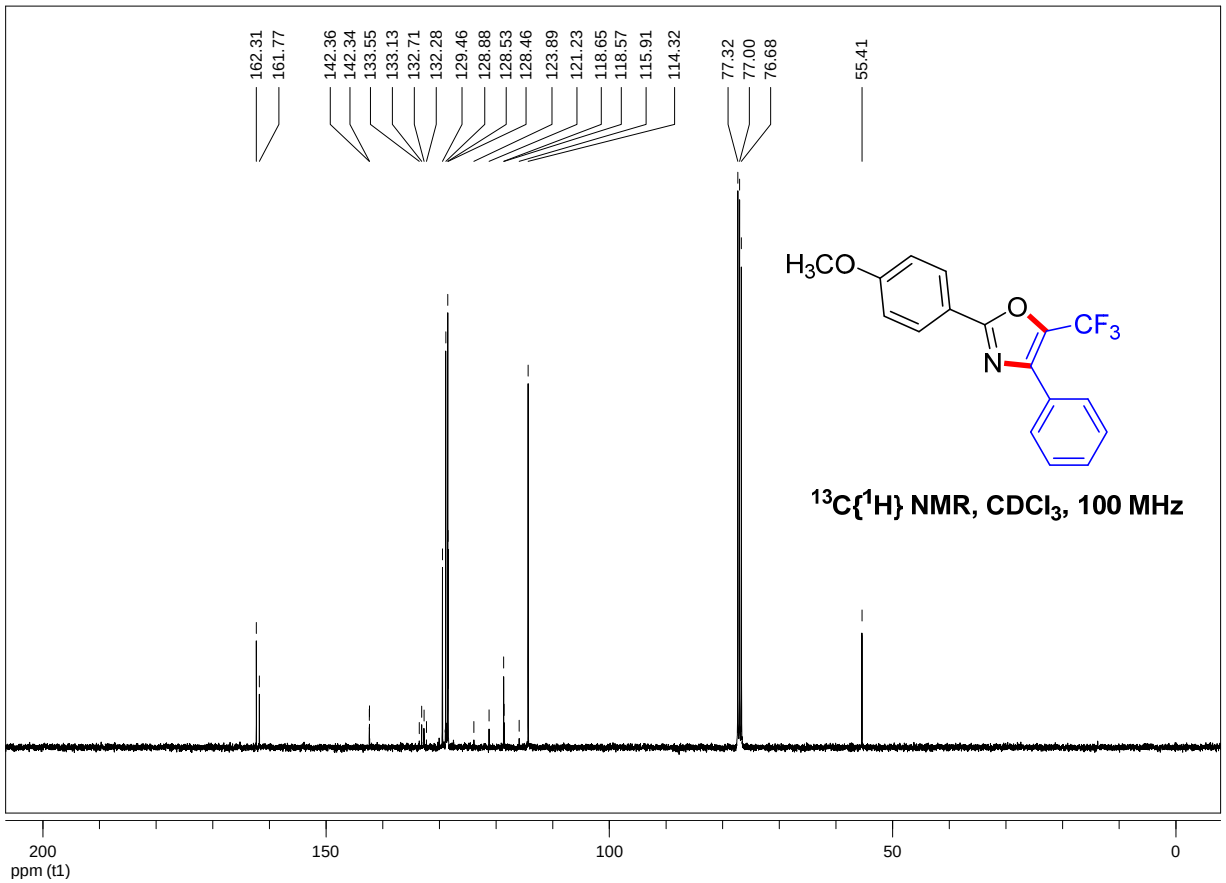


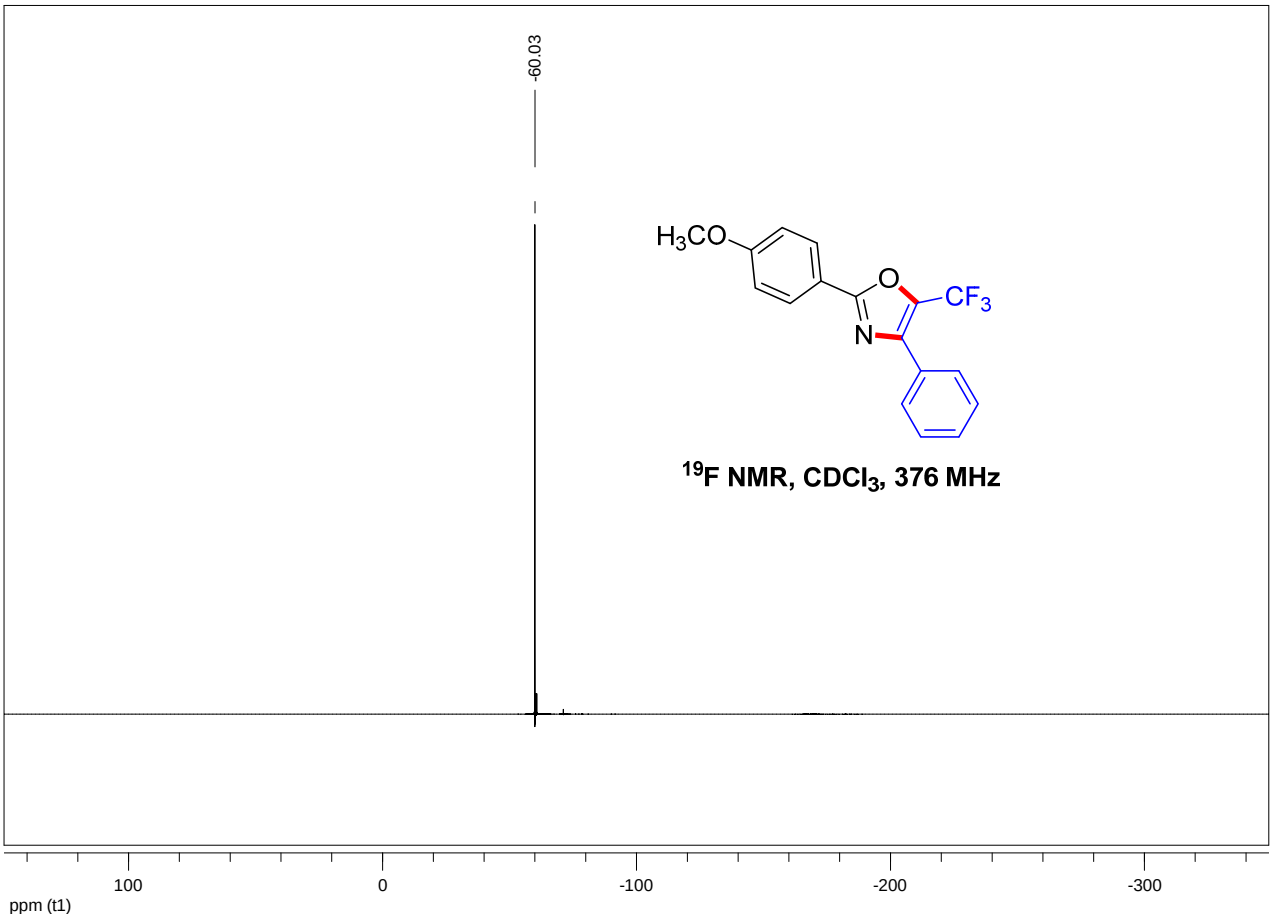


^{19}F NMR, $CDCl_3$, 376 MHz

2-(4-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5b)

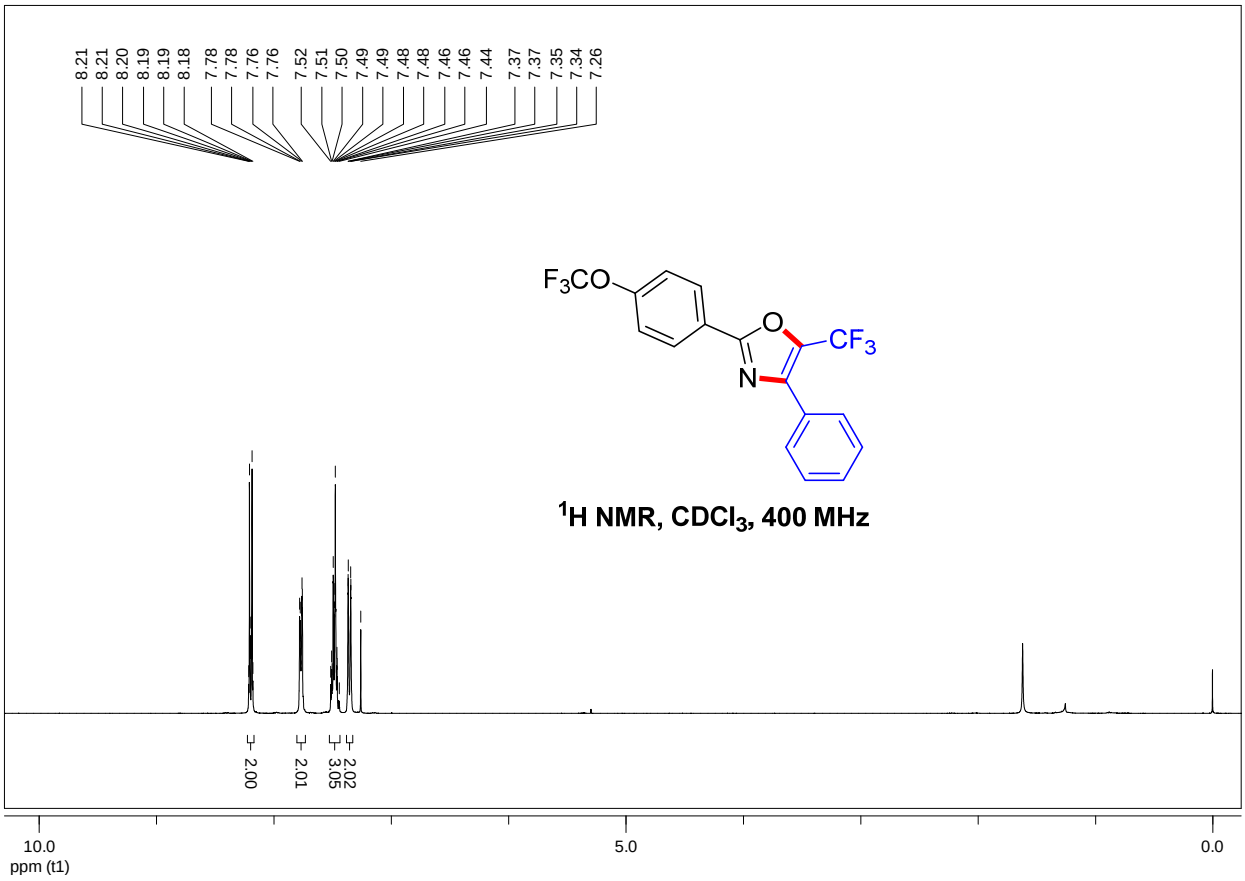




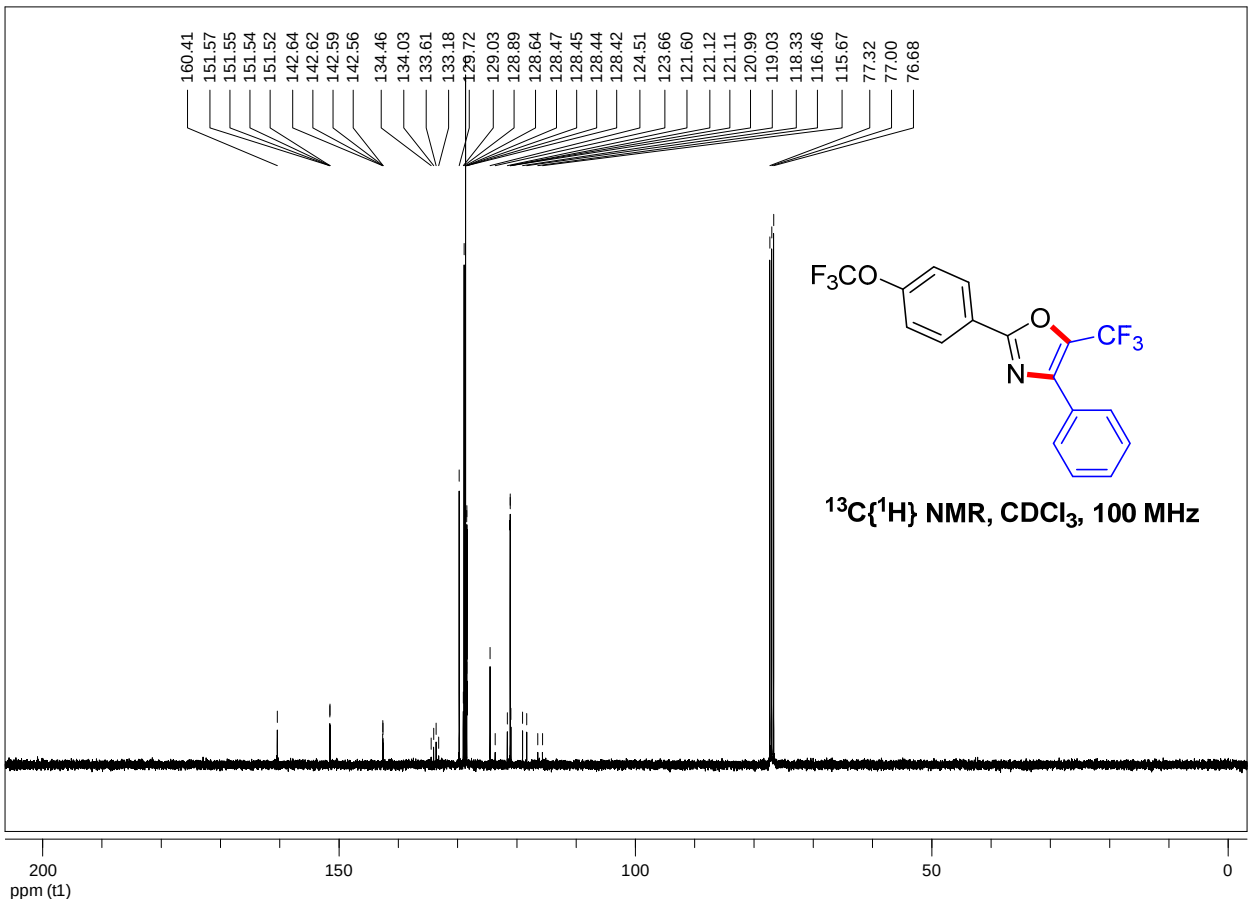


^{19}F NMR, $CDCl_3$, 376 MHz

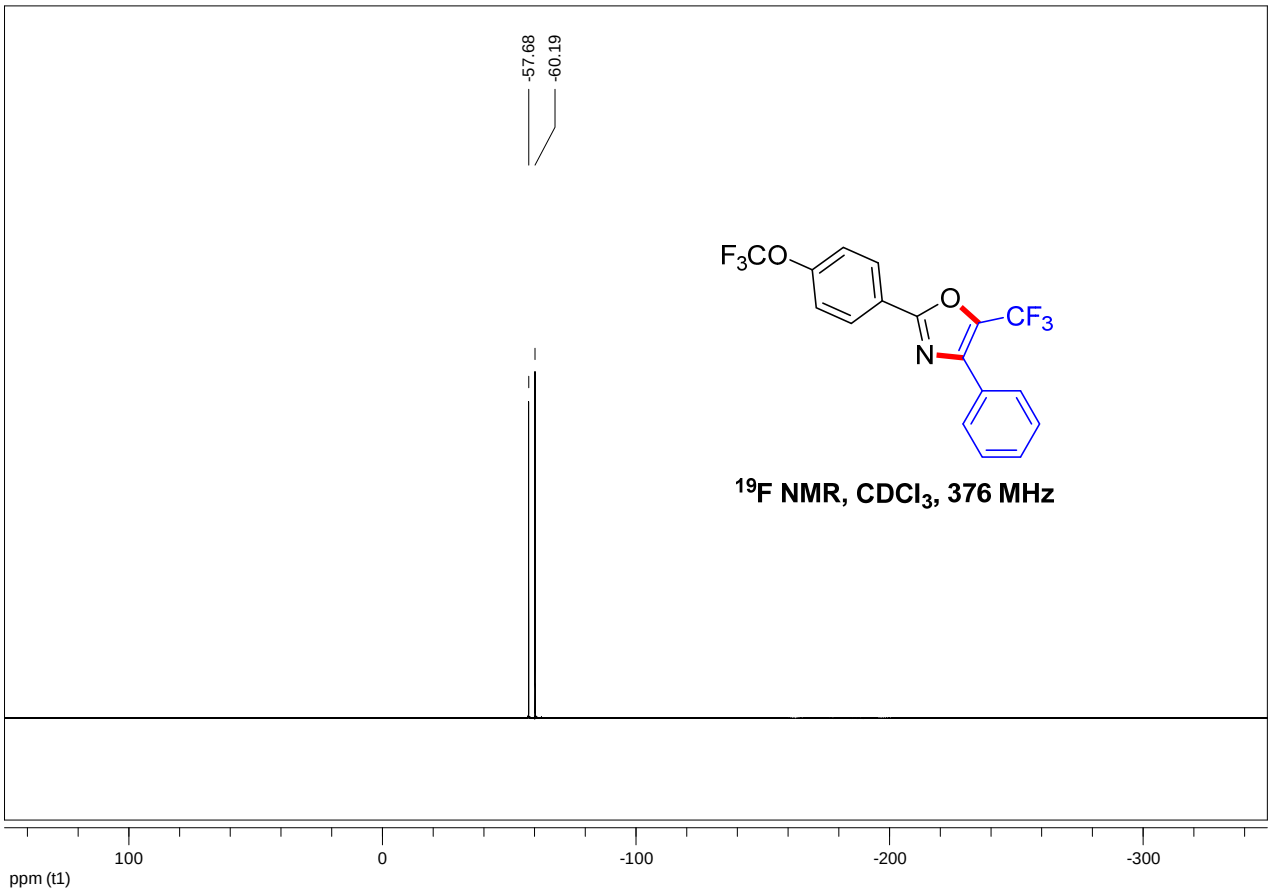
4-phenyl-2-(4-(trifluoromethoxy)phenyl)-5-(trifluoromethyl)oxazole (5c)



^{1}H NMR, $CDCl_3$, 400 MHz

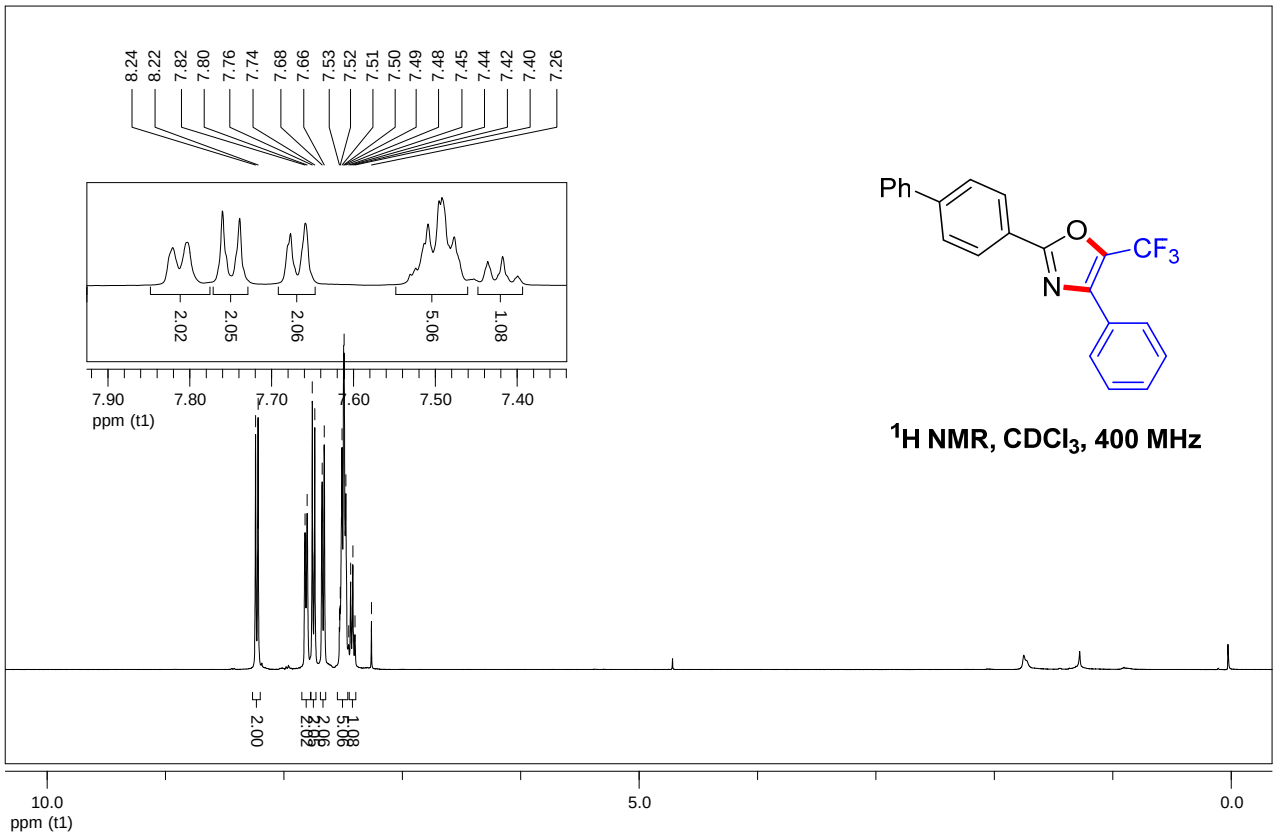


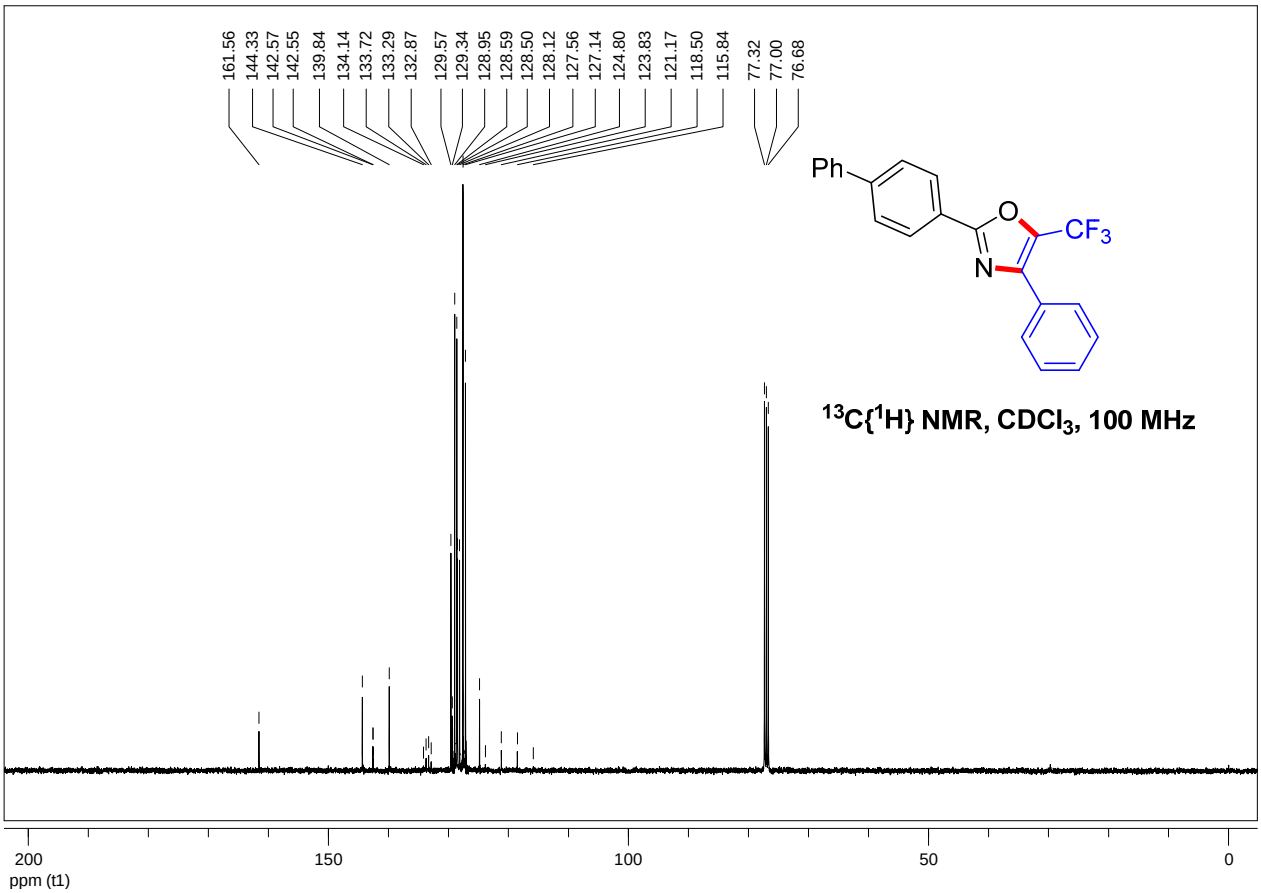
^{13}C{^{1}H} NMR, $CDCl_3$, 100 MHz

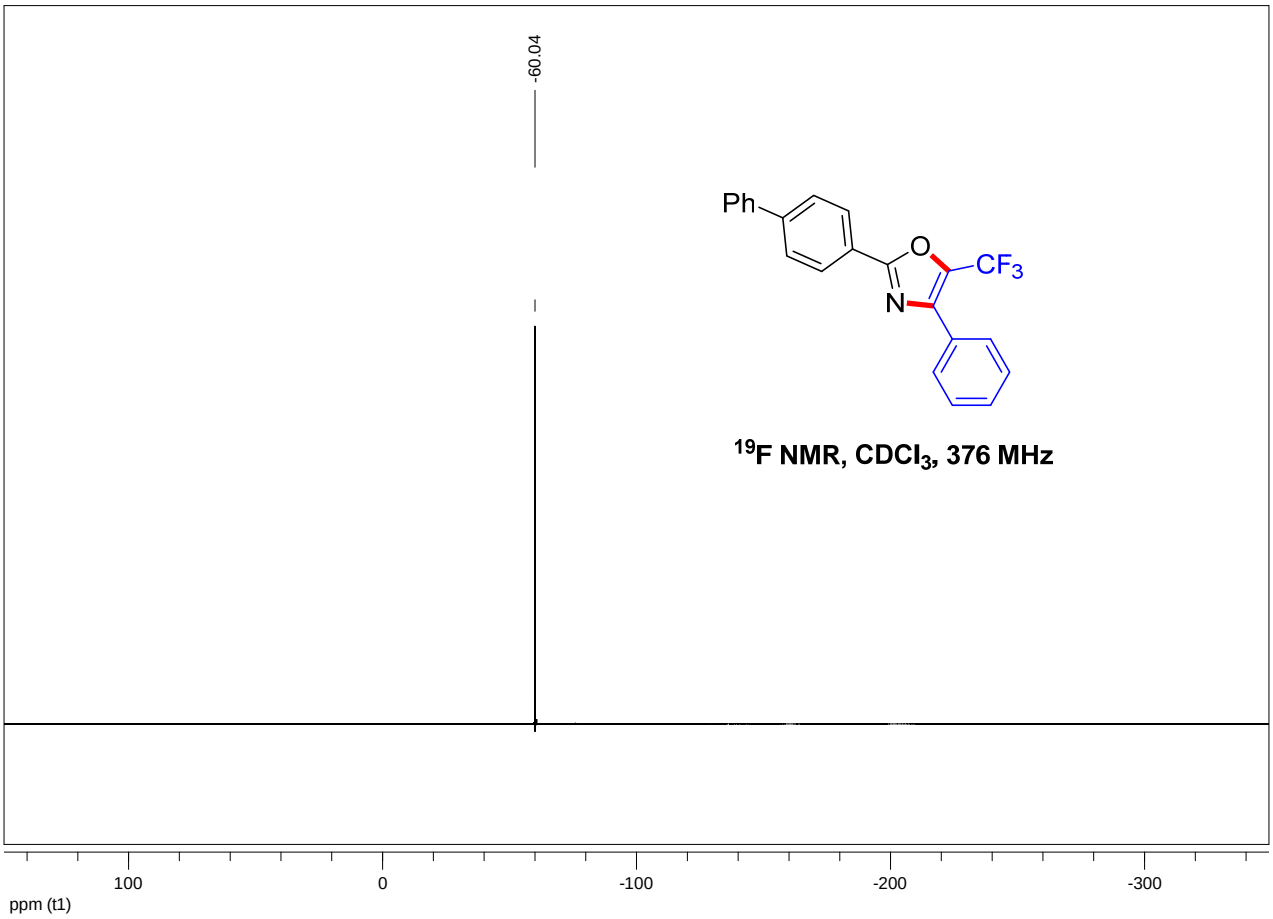


^{19}F NMR, $CDCl_3$, 376 MHz

2-([1,1'-biphenyl]-4-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5d)

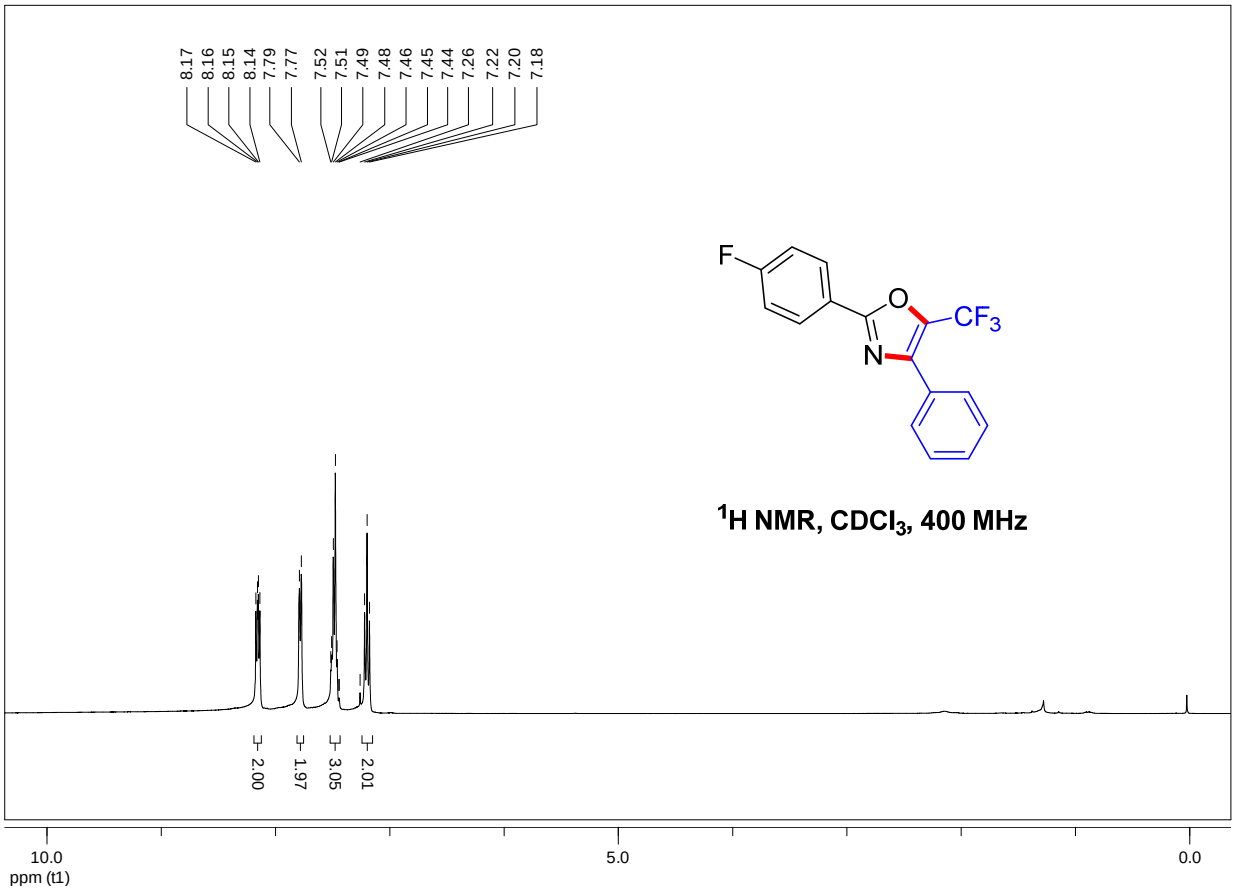




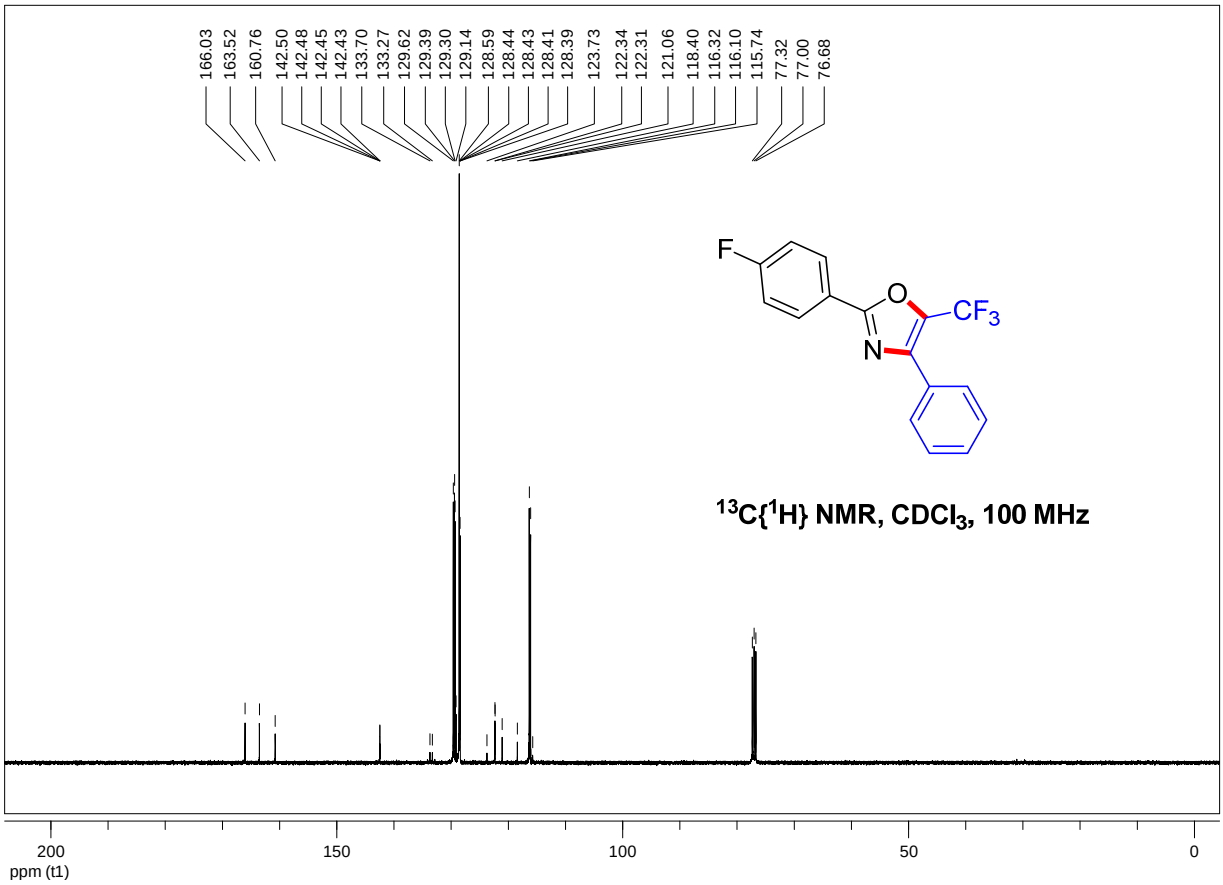


^{19}F NMR, $CDCl_3$, 376 MHz

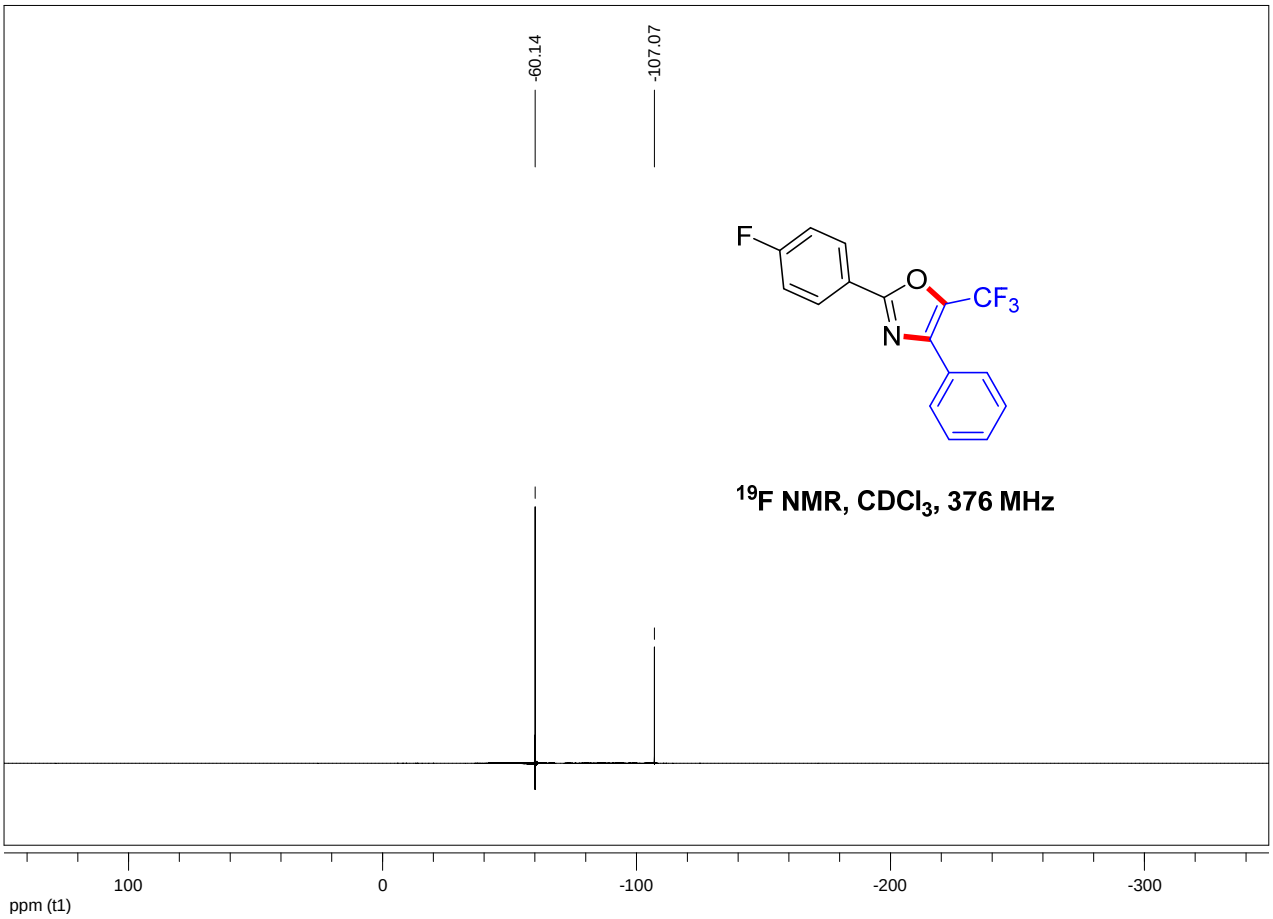
2-(4-fluorophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5e)



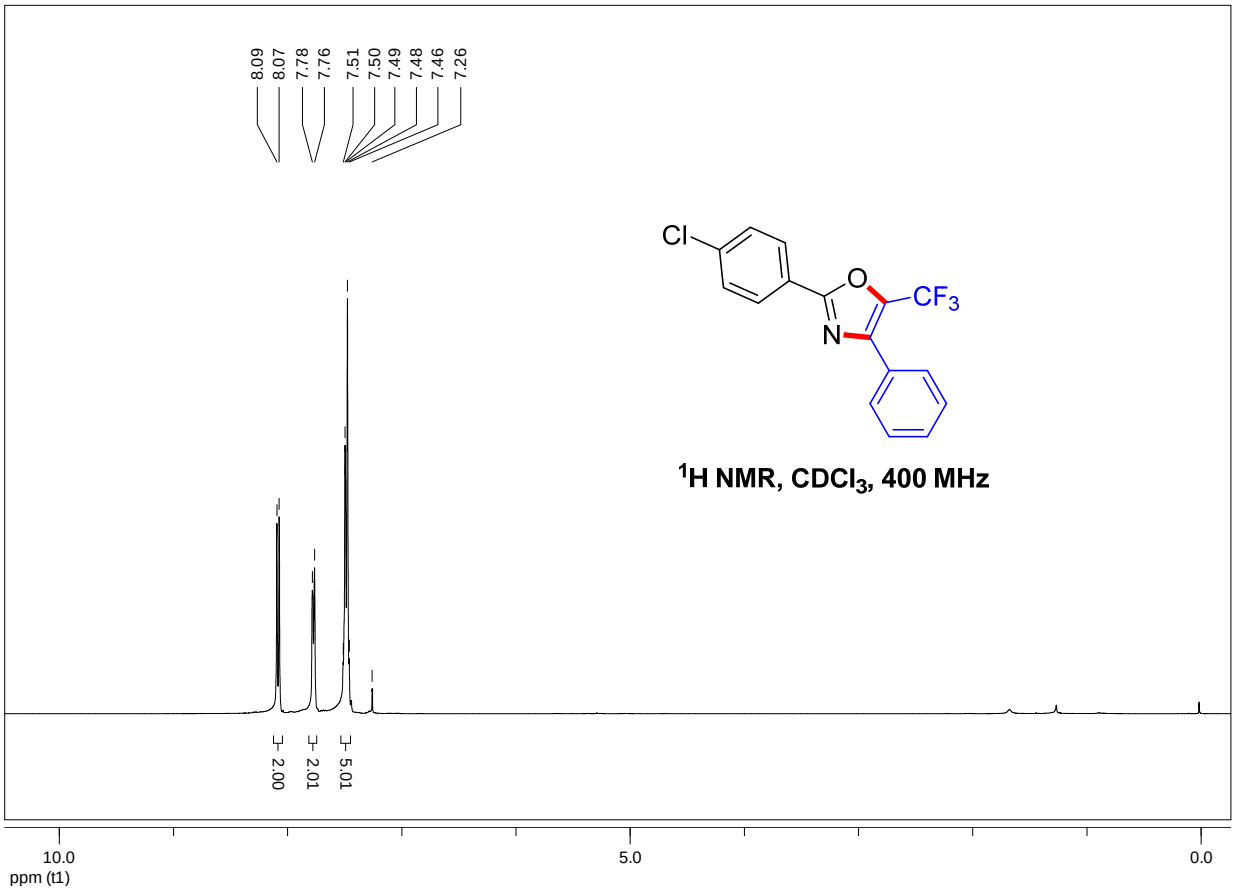
^{1}H NMR, $CDCl_3$, 400 MHz



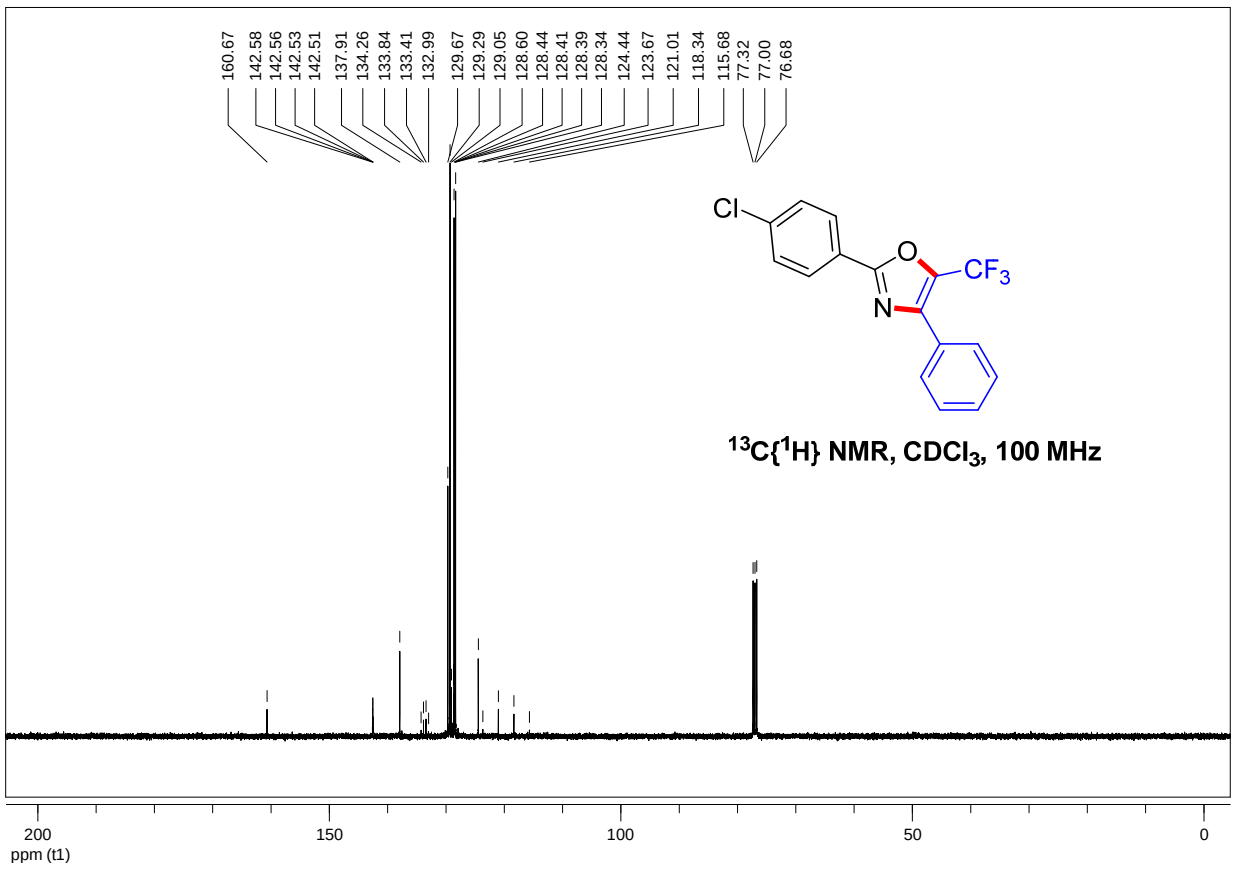
^{13}C{^{1}H} NMR, $CDCl_3$, 100 MHz


-60.14
-107.07
F
O
CF3
N
19F NMR, CDCl3, 376 MHz
100
0
-100
-200
-300
ppm (t1)

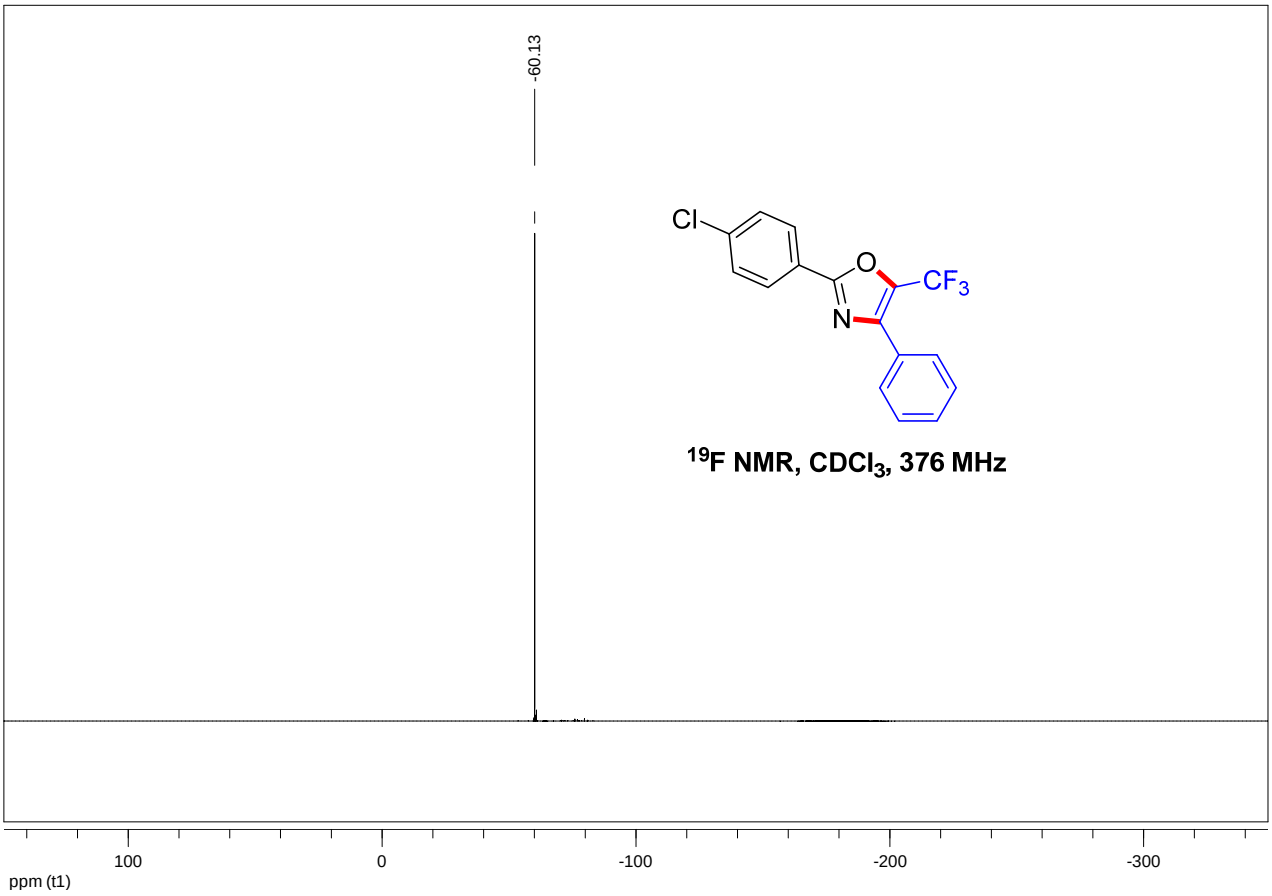
2-(4-chlorophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5f)



^{1}H NMR, $CDCl_3$, 400 MHz

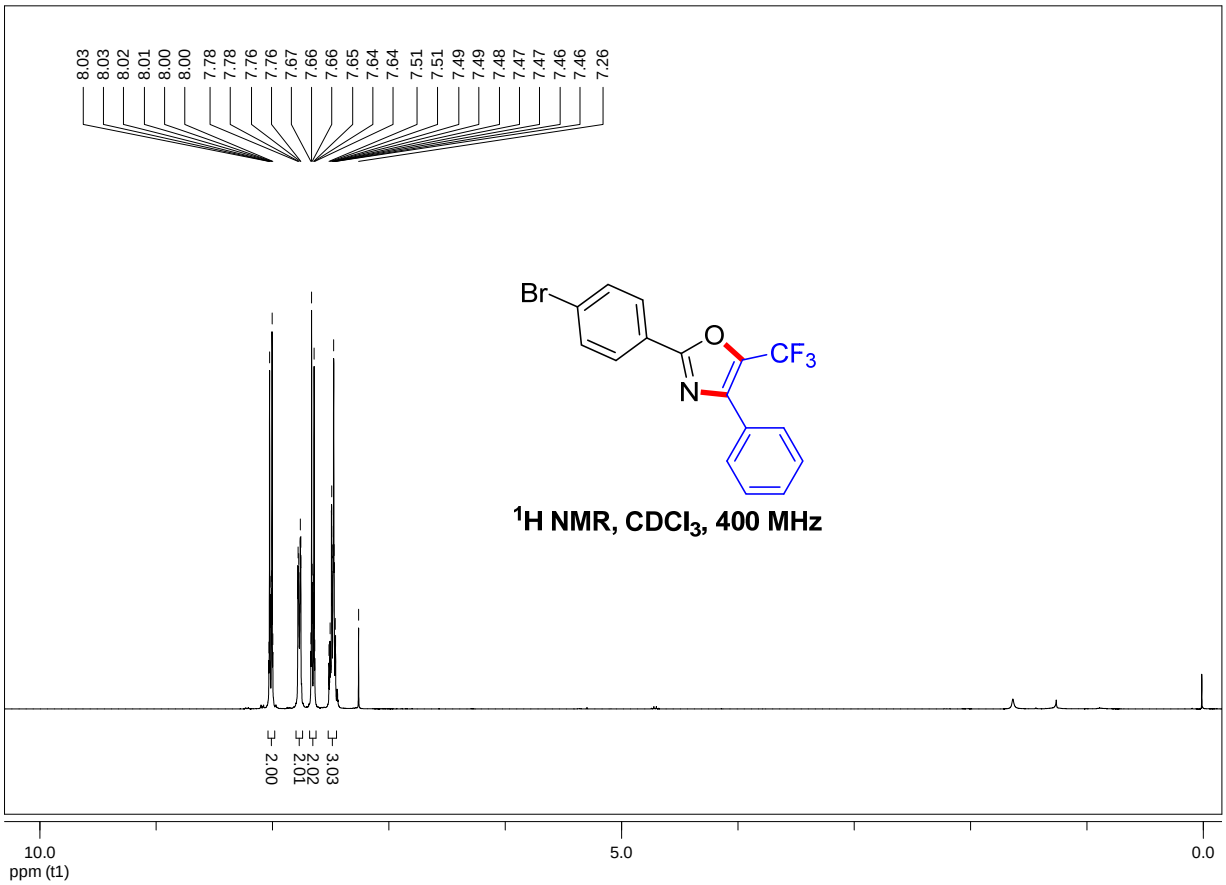


$^{13}C\{^{1}H\}$ NMR, $CDCl_3$, 100 MHz

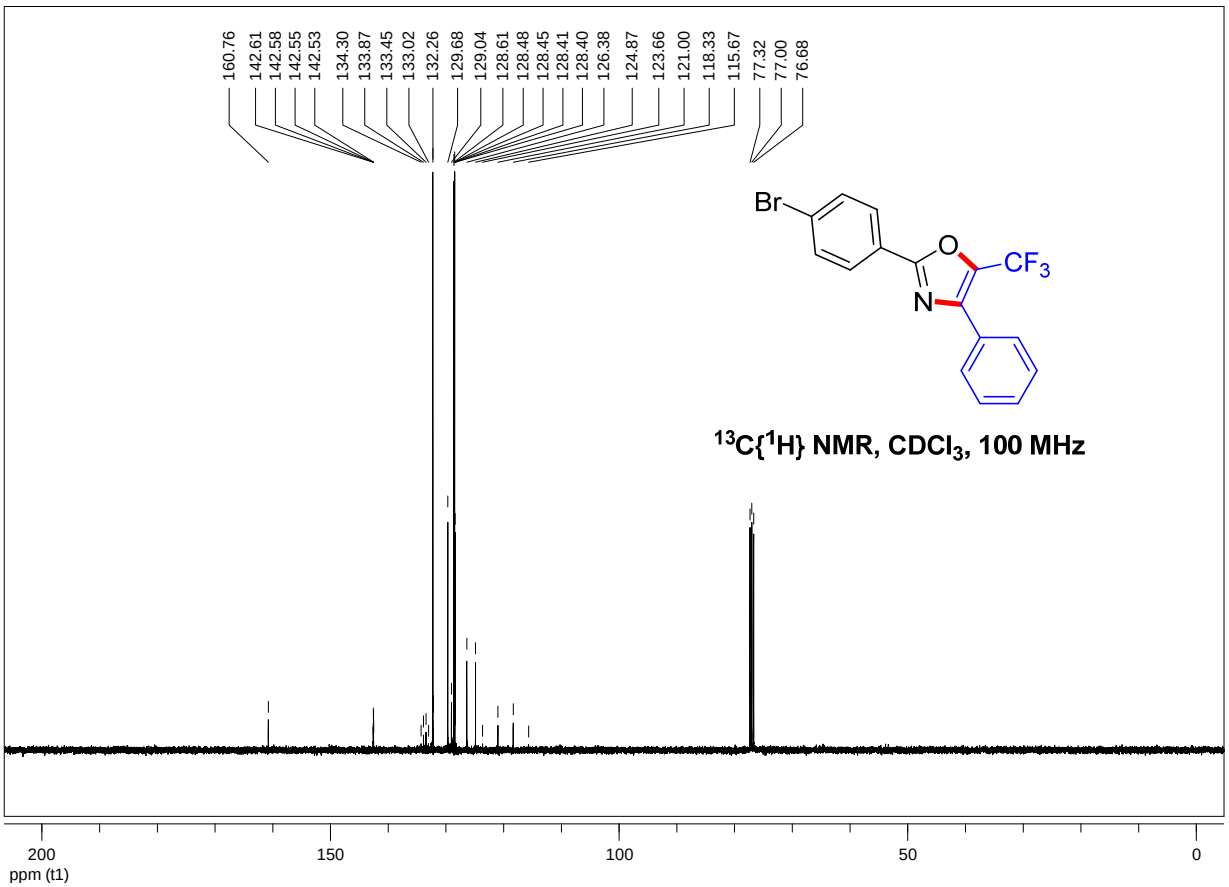


^{19}F NMR, $CDCl_3$, 376 MHz

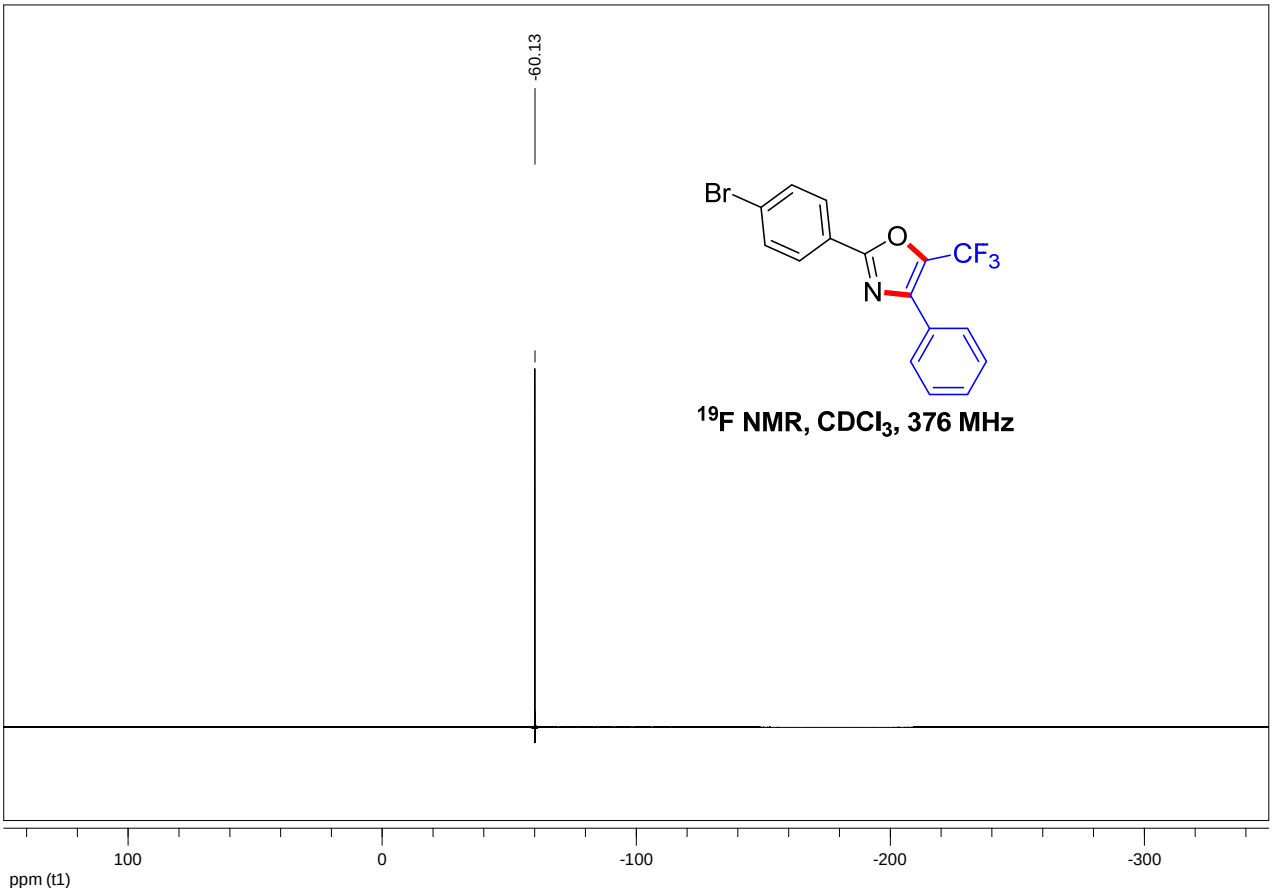
2-(4-bromophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5g)



^{1}H NMR, $CDCl_3$, 400 MHz

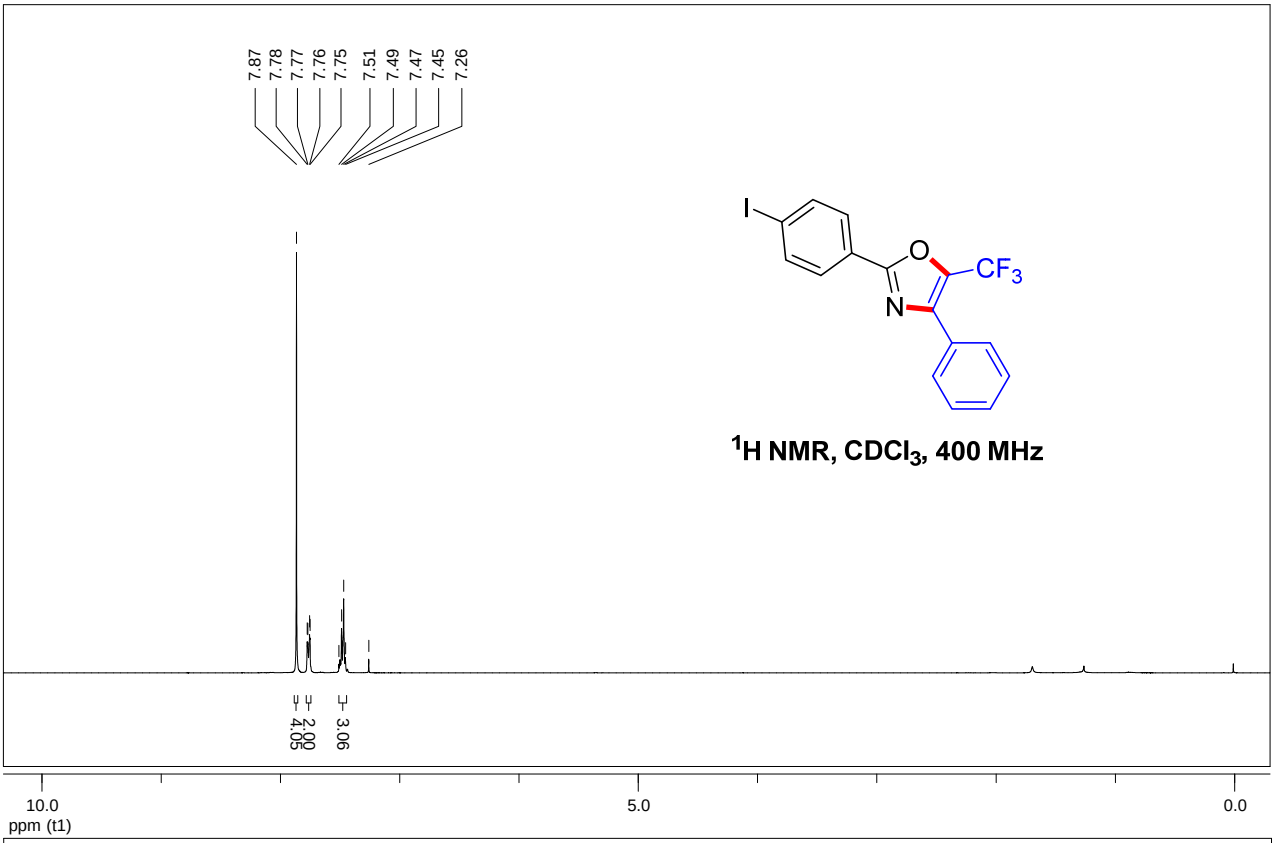


^{13}C{^{1}H} NMR, $CDCl_3$, 100 MHz

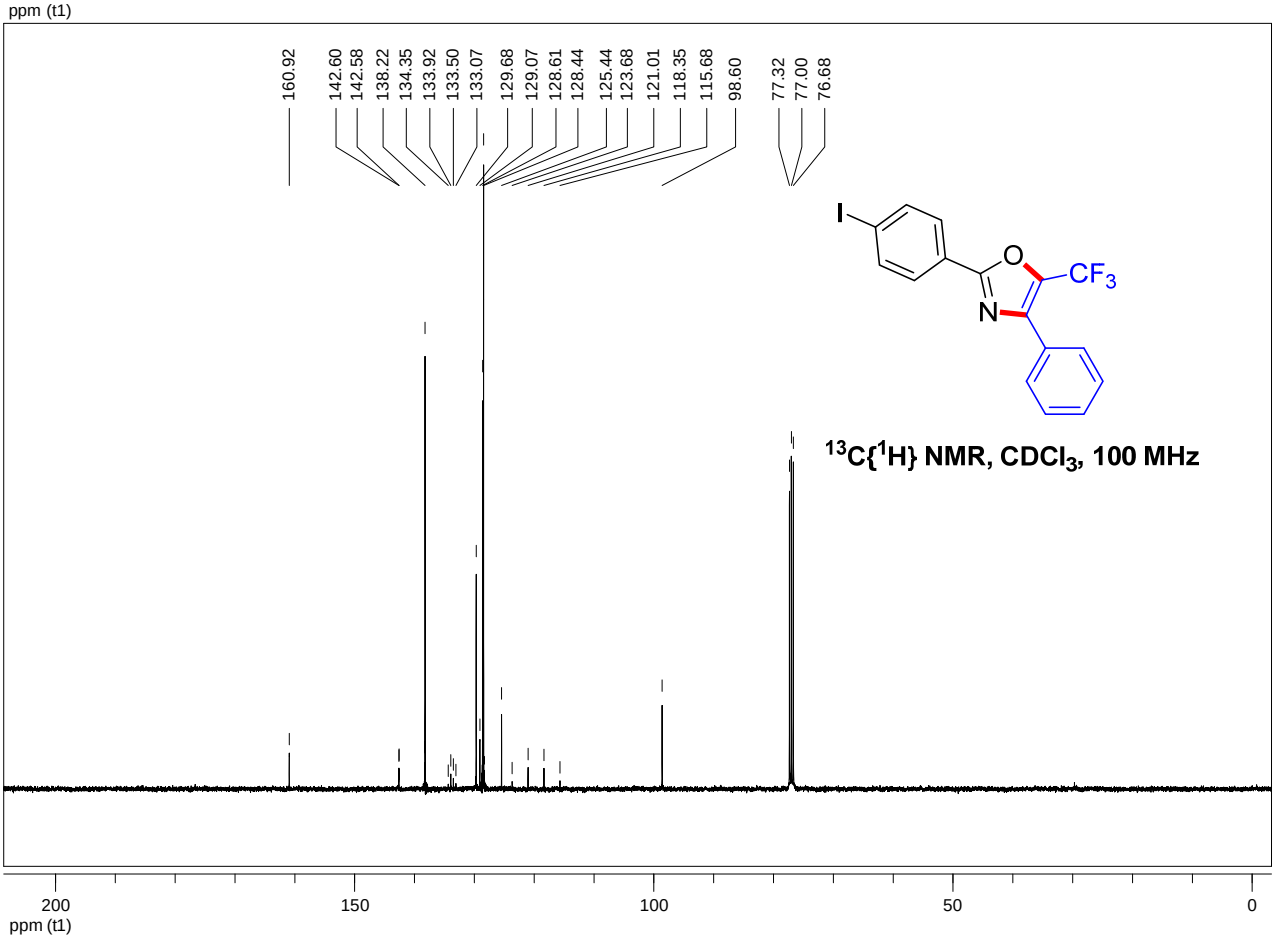


^{19}F NMR, $CDCl_3$, 376 MHz

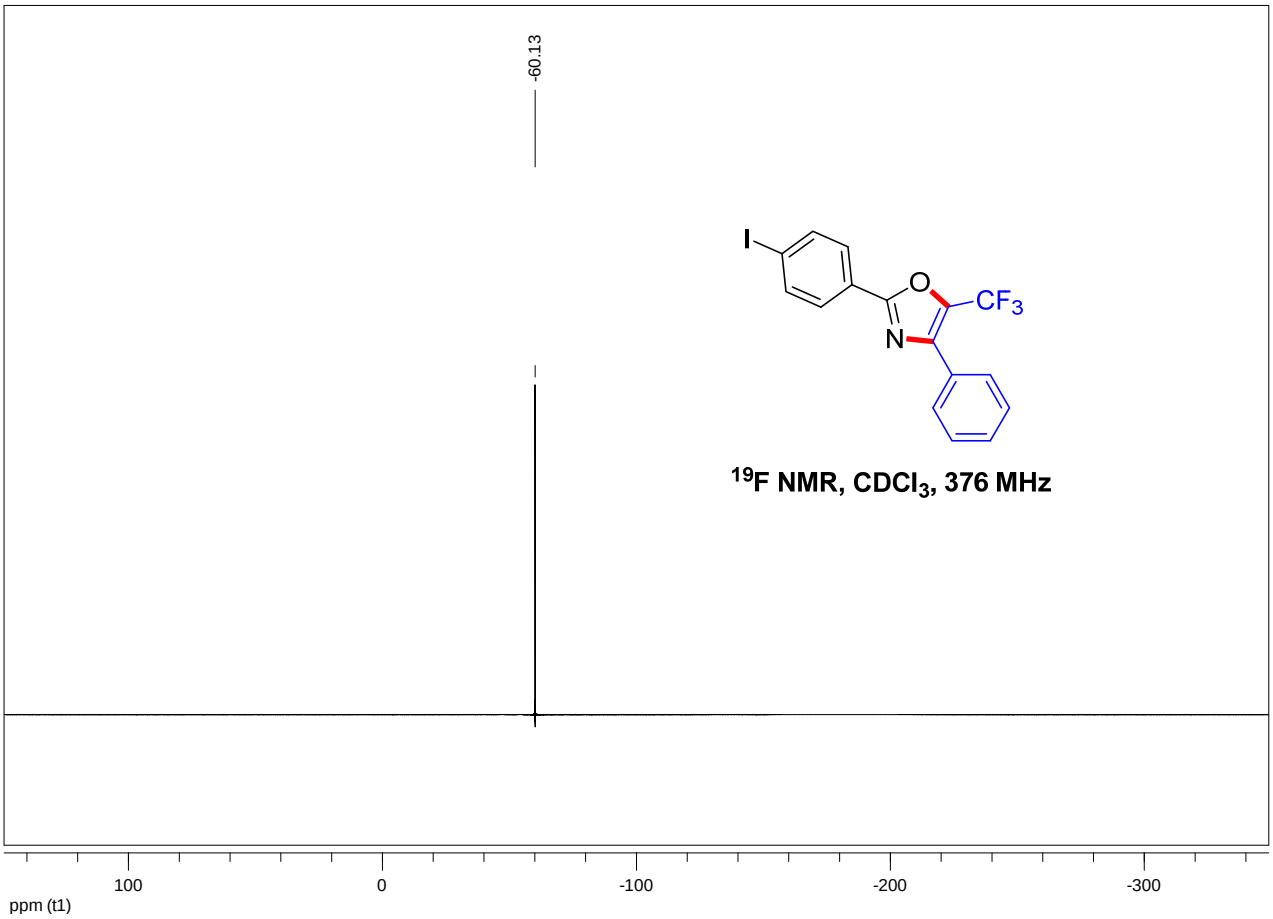
2-(4-iodophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5h)



^{1}H NMR, $CDCl_3$, 400 MHz

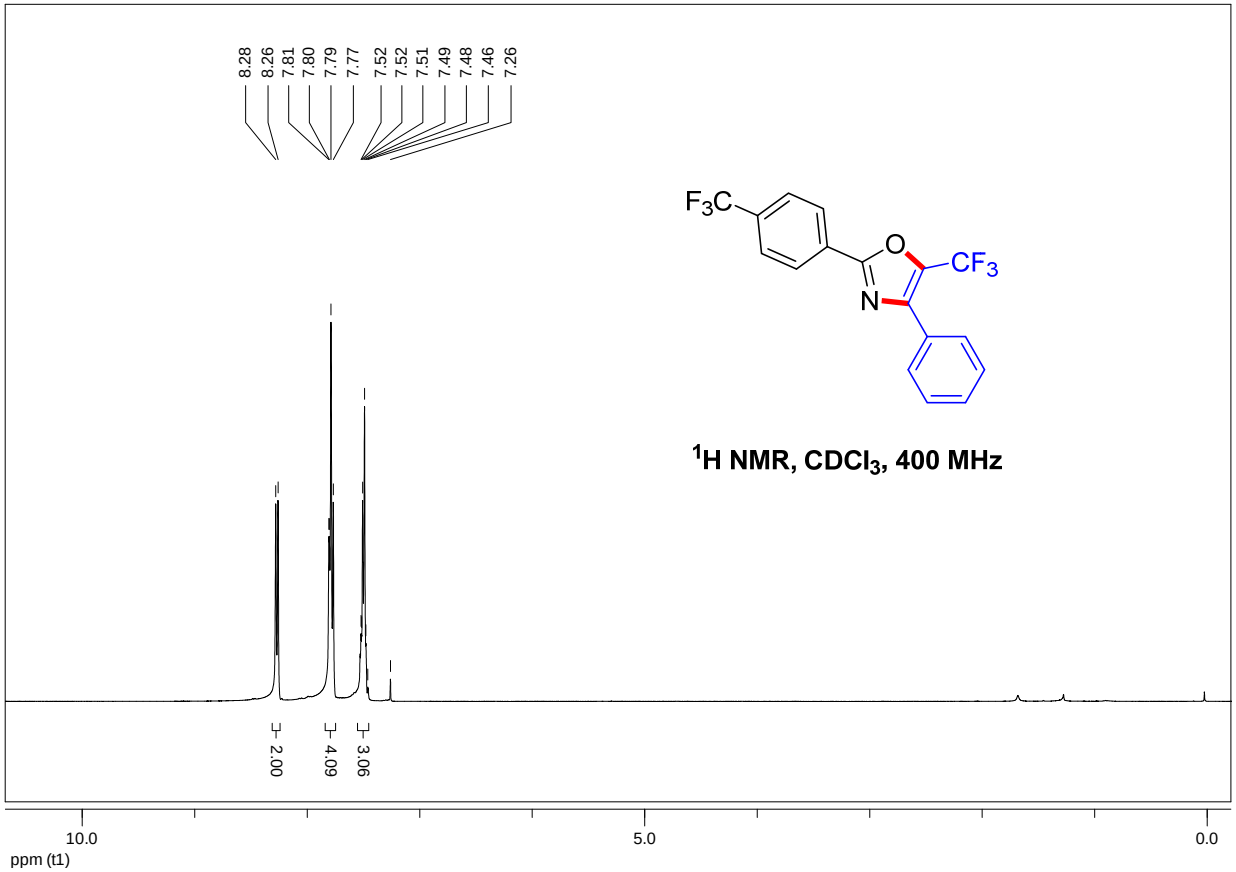


$^{13}C\{^{1}H\}$ NMR, $CDCl_3$, 100 MHz

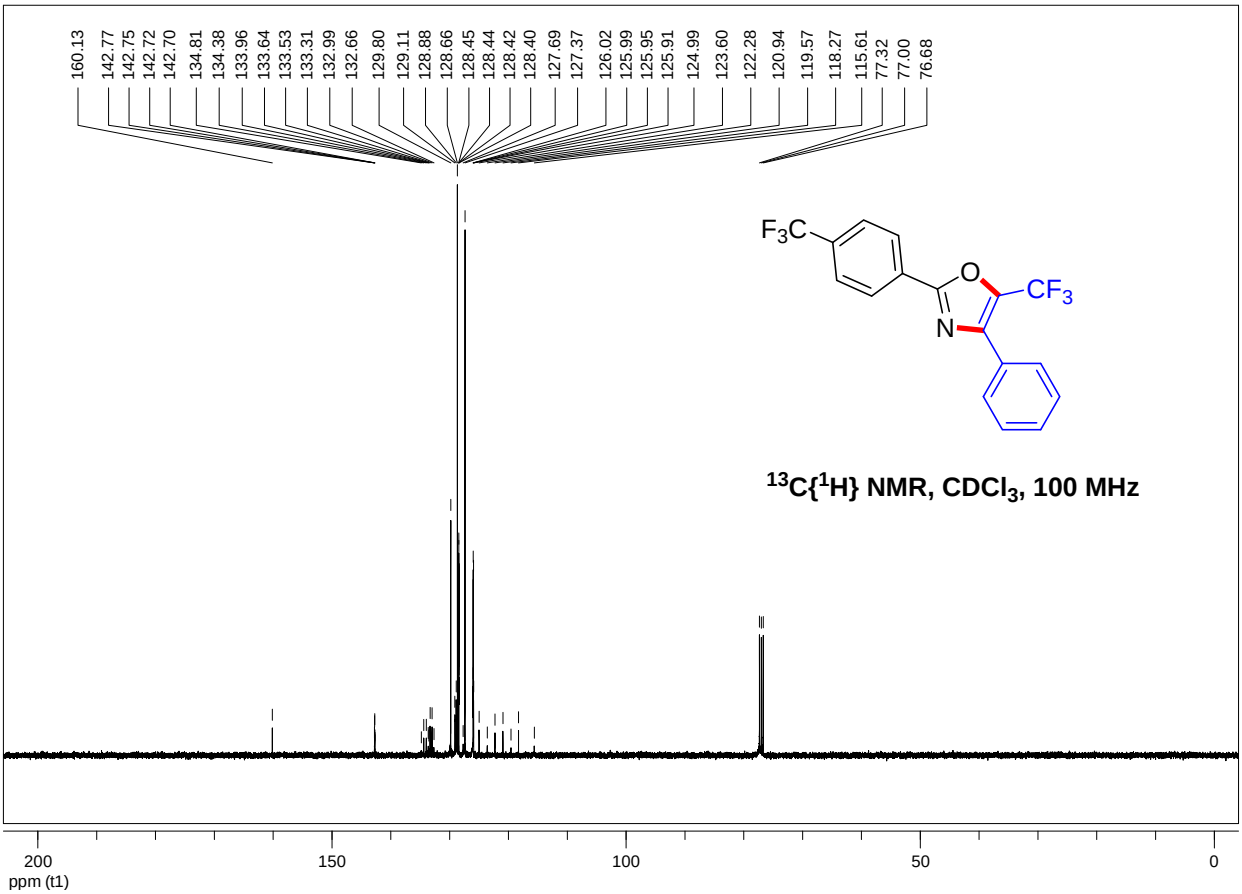


^{19}F NMR, $CDCl_3$, 376 MHz

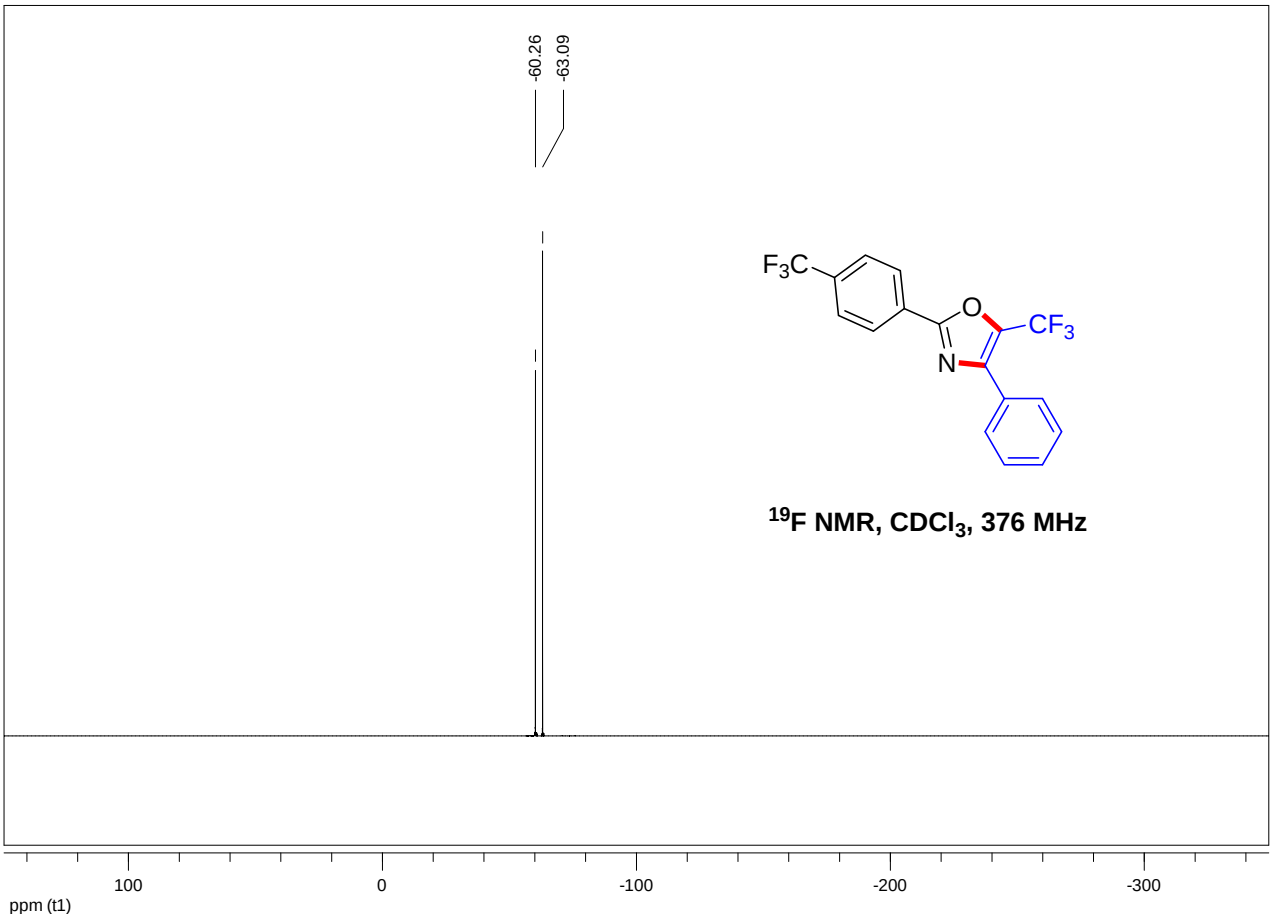
4-phenyl-5-(trifluoromethyl)-2-(4-(trifluoromethyl)phenyl)oxazole (5i)



^{1}H NMR, $CDCl_3$, 400 MHz

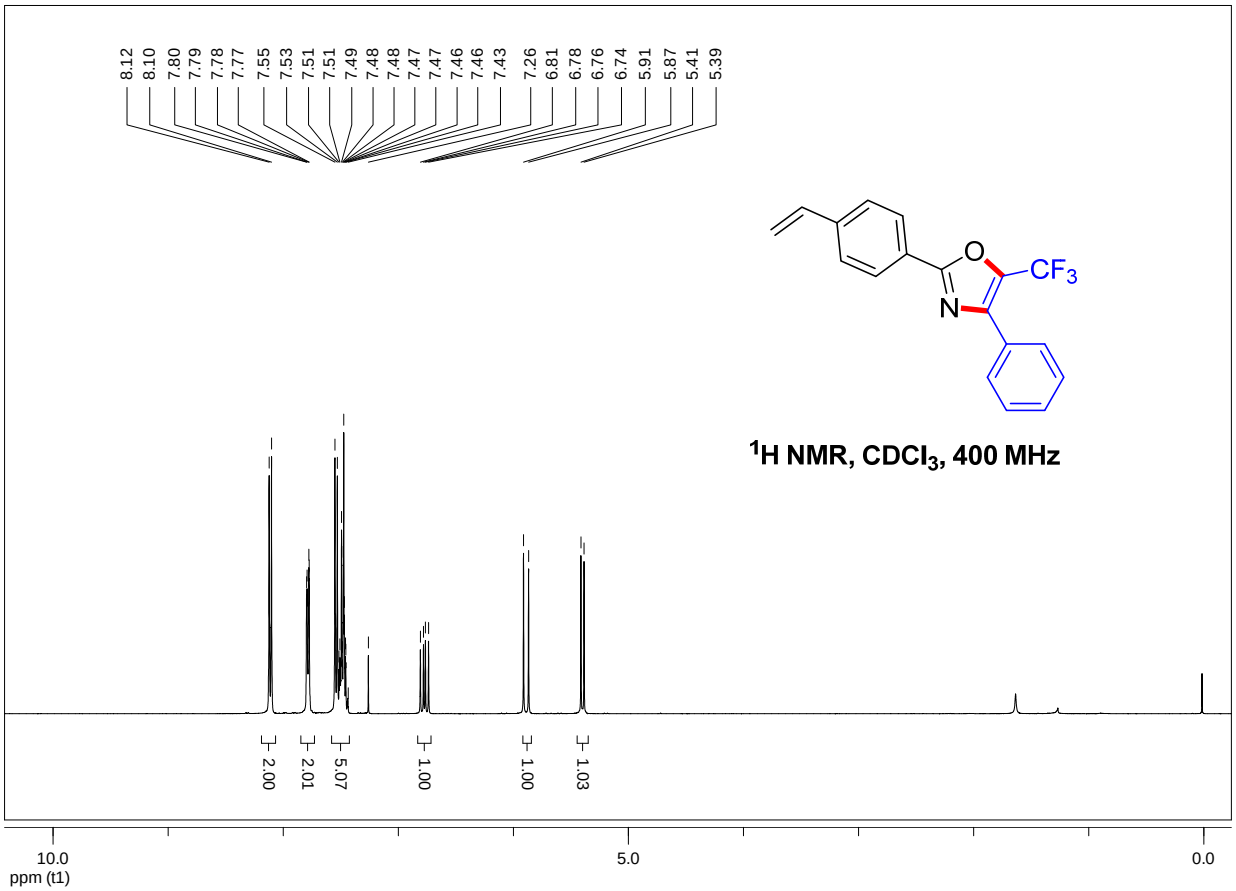


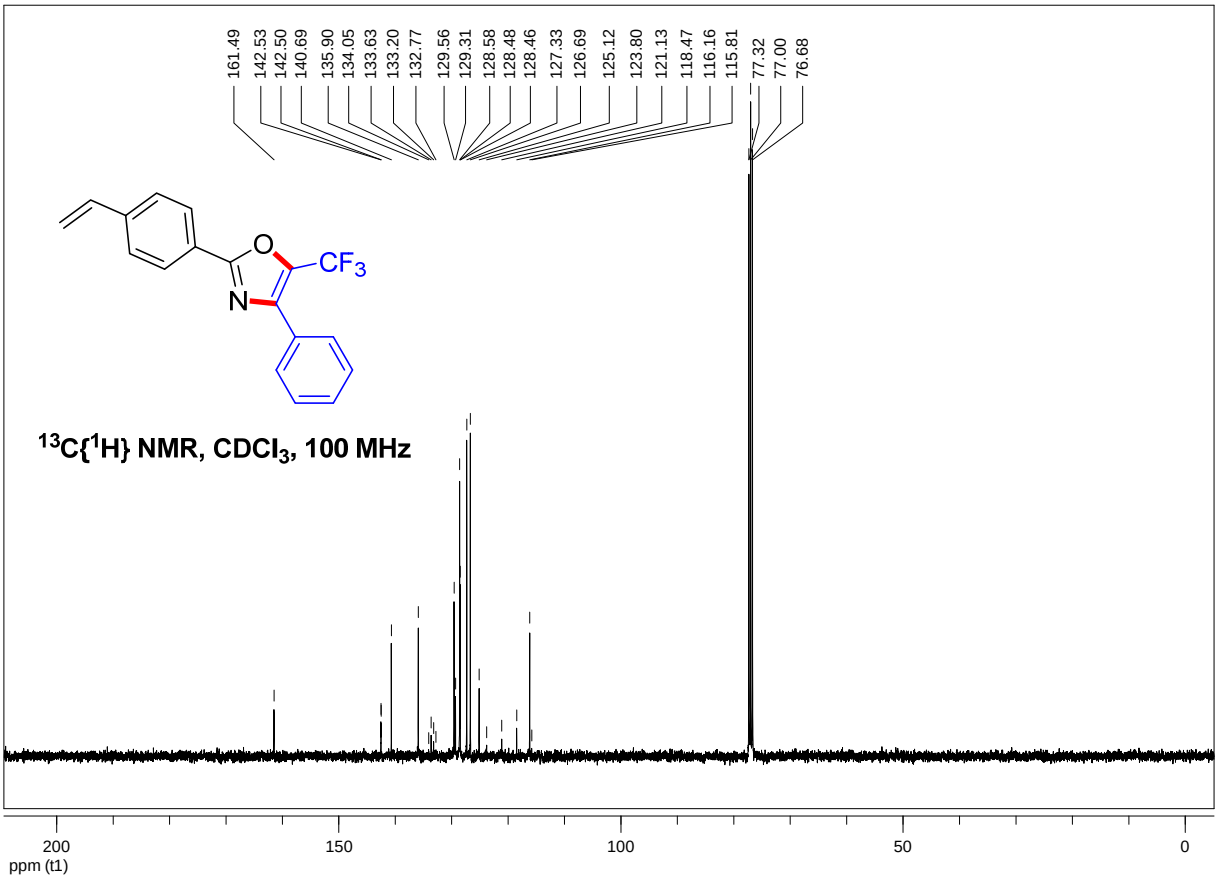
^{13}C{^{1}H} NMR, $CDCl_3$, 100 MHz

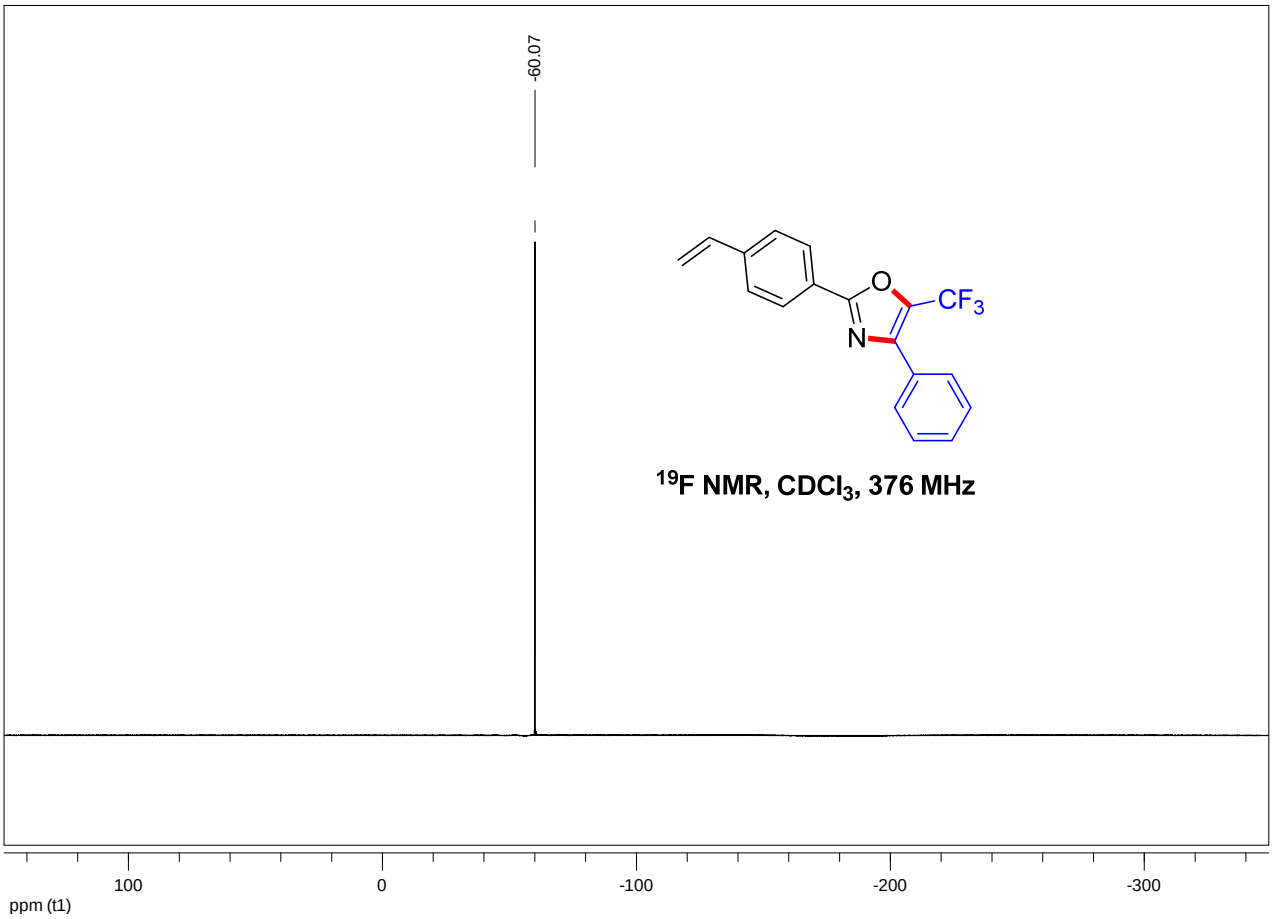


^{19}F NMR, $CDCl_3$, 376 MHz

4-phenyl-5-(trifluoromethyl)-2-(4-vinylphenyl)oxazole (5j)

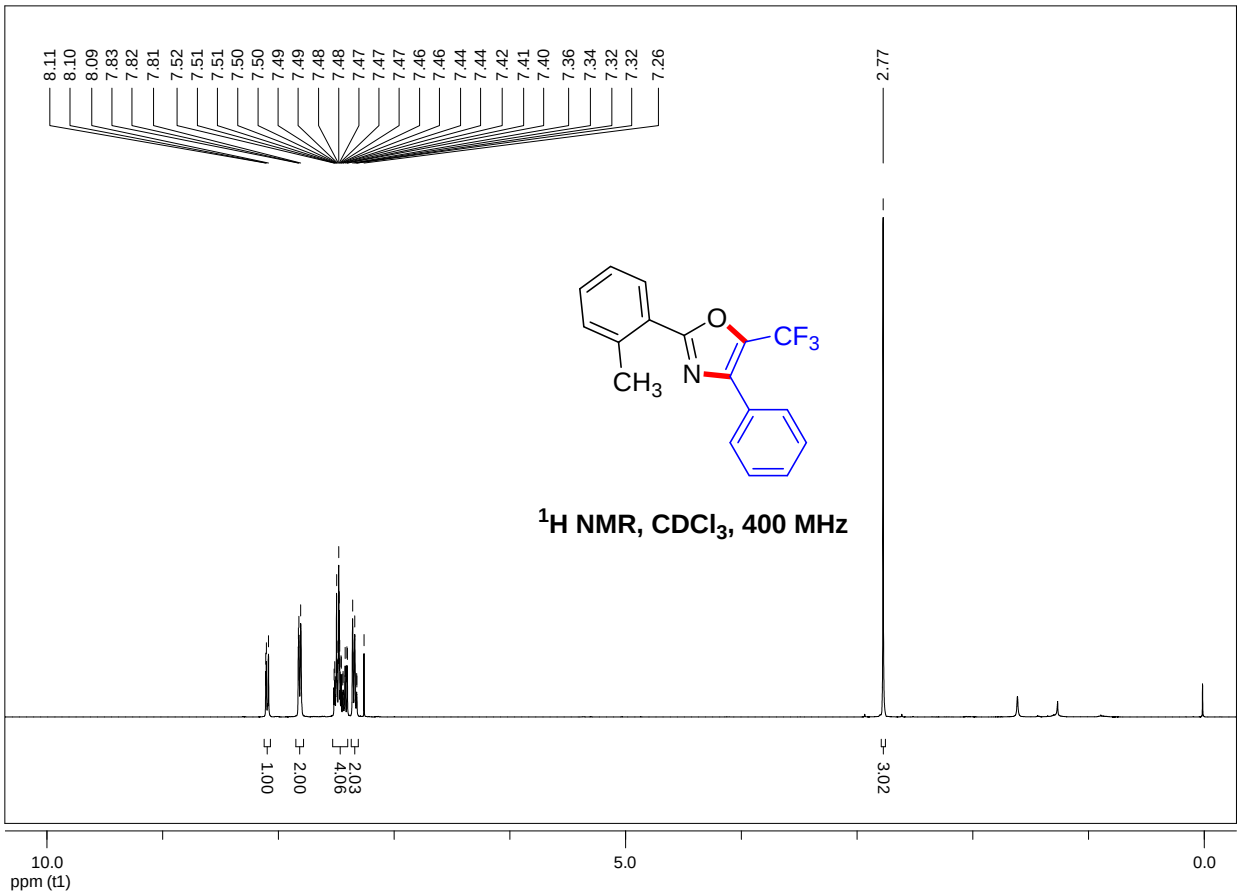




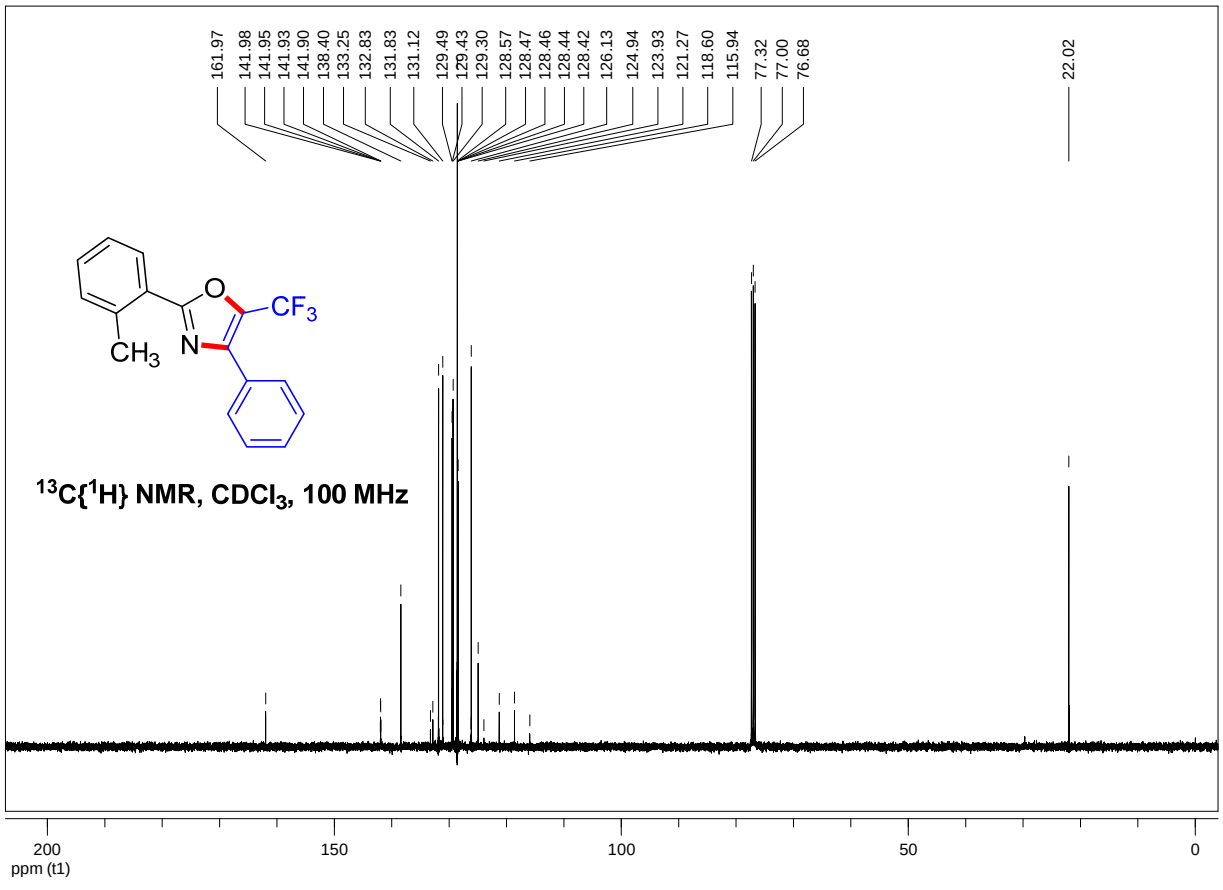


^{19}F NMR, $CDCl_3$, 376 MHz

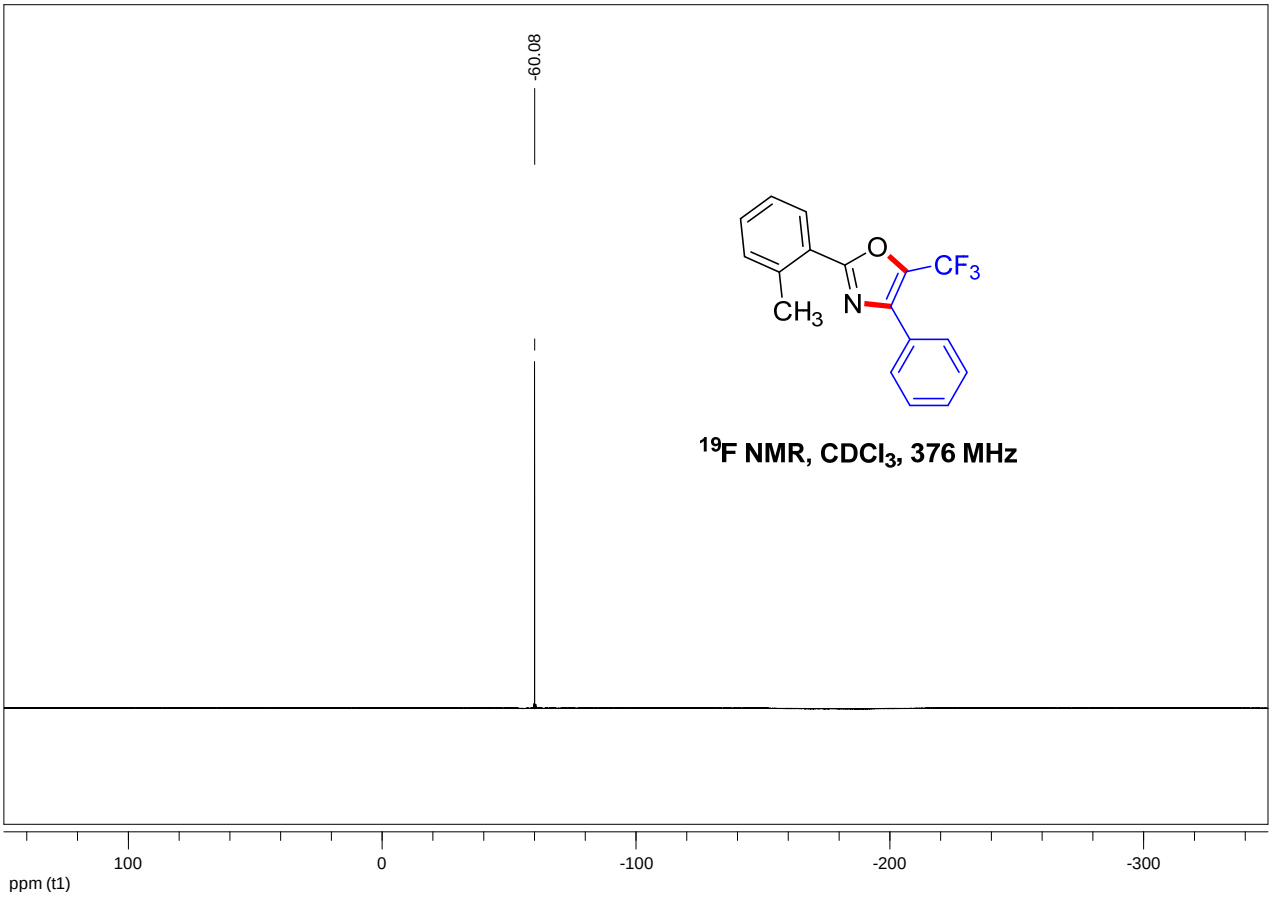
4-phenyl-2-(o-tolyl)-5-(trifluoromethyl)oxazole (5k)



^{1}H NMR, $CDCl_3$, 400 MHz

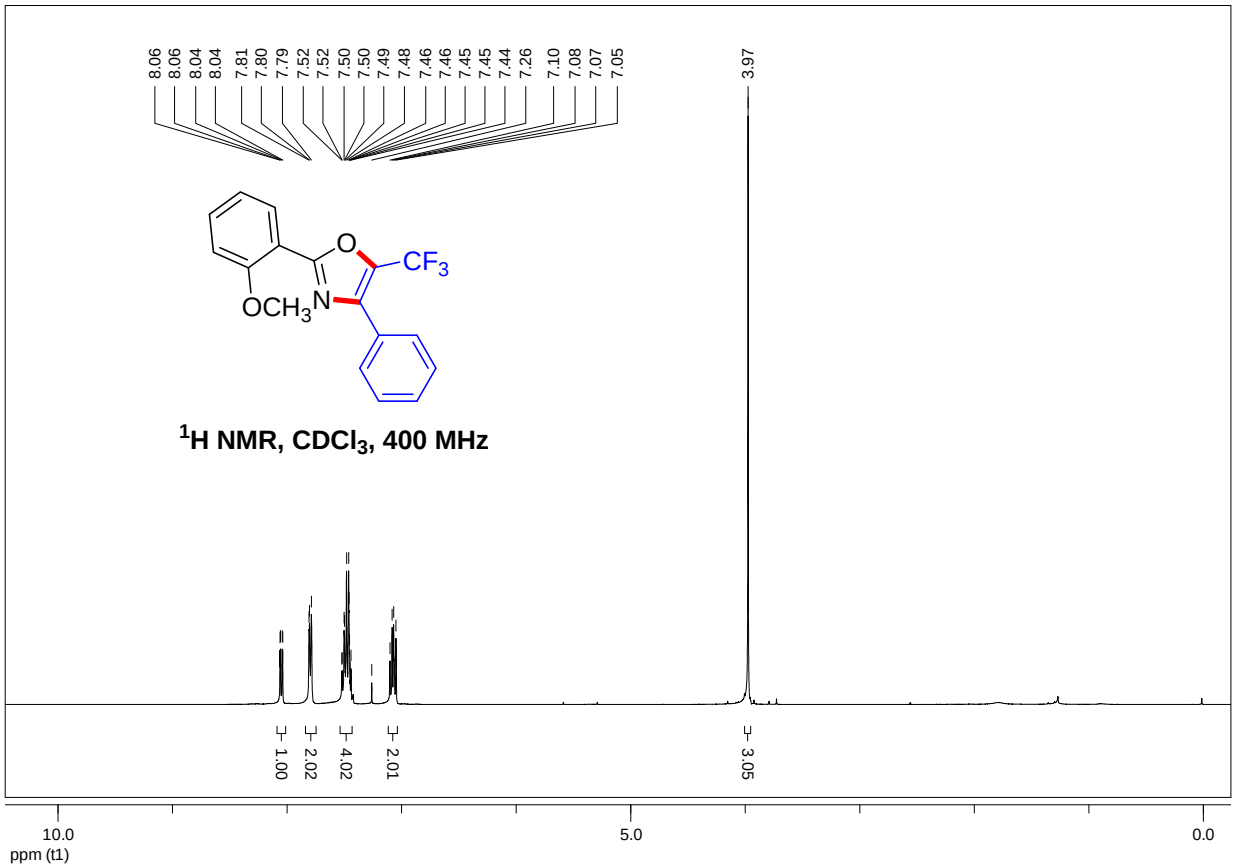


^{13}C{^{1}H} NMR, $CDCl_3$, 100 MHz

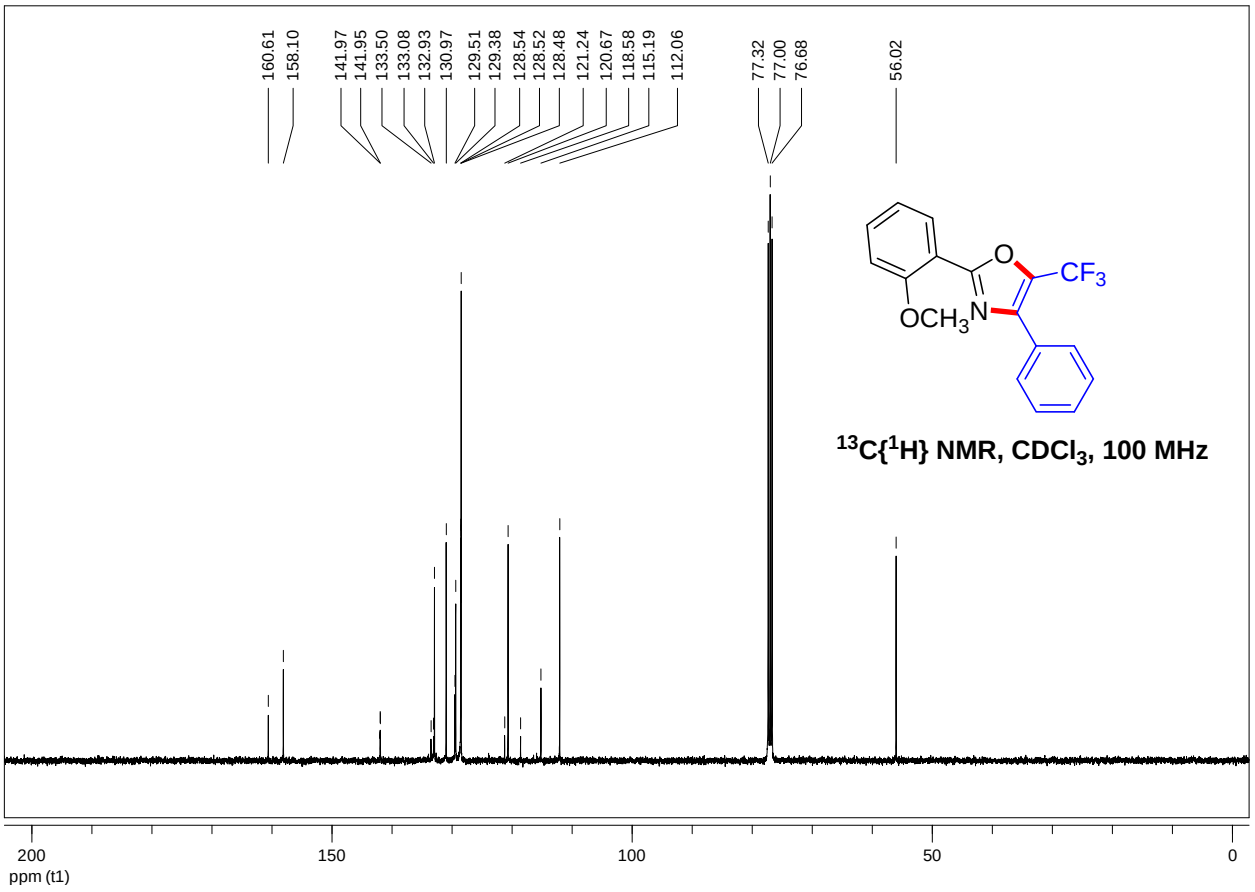


^{19}F NMR, $CDCl_3$, 376 MHz

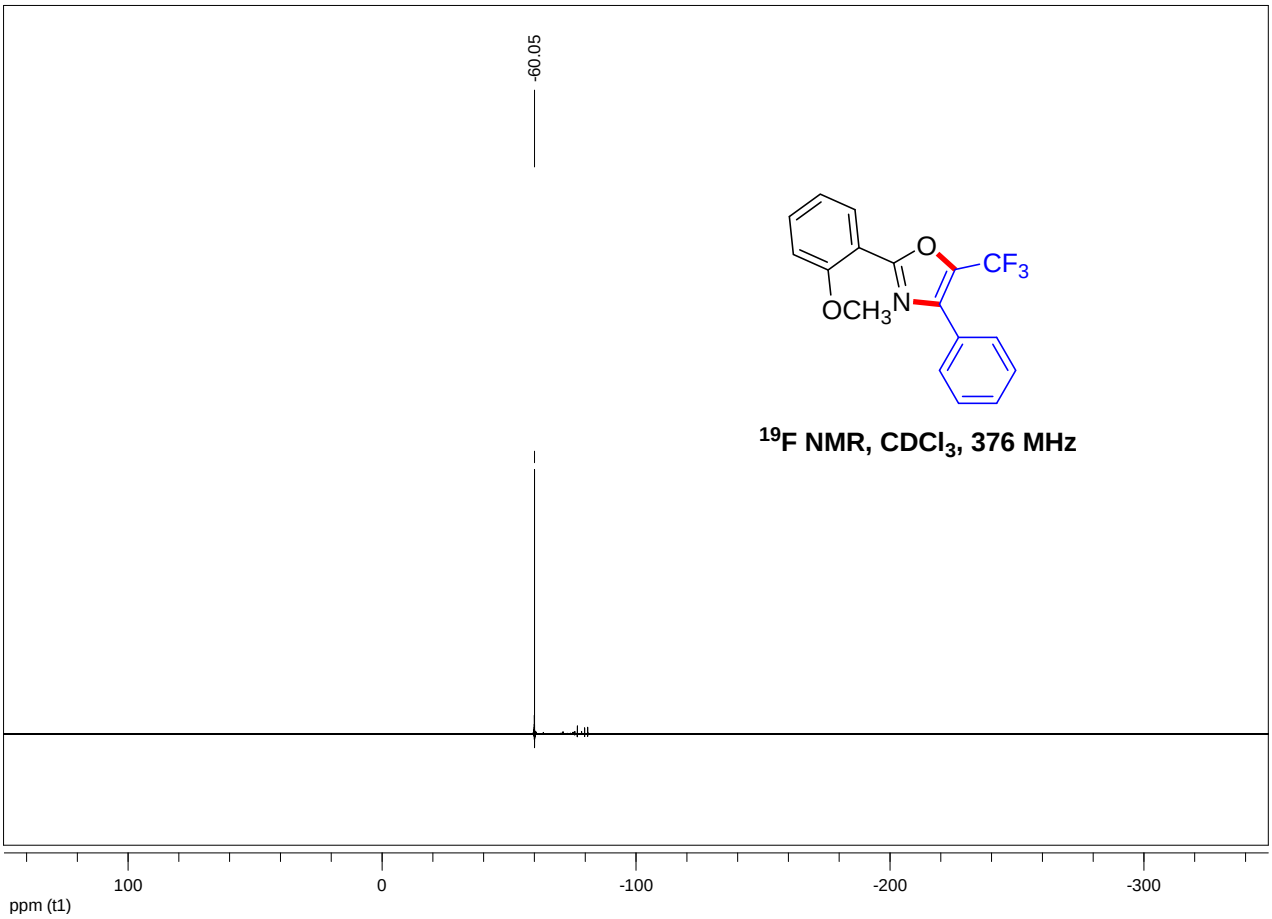
2-(2-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5l)



^{1}H NMR, $CDCl_3$, 400 MHz

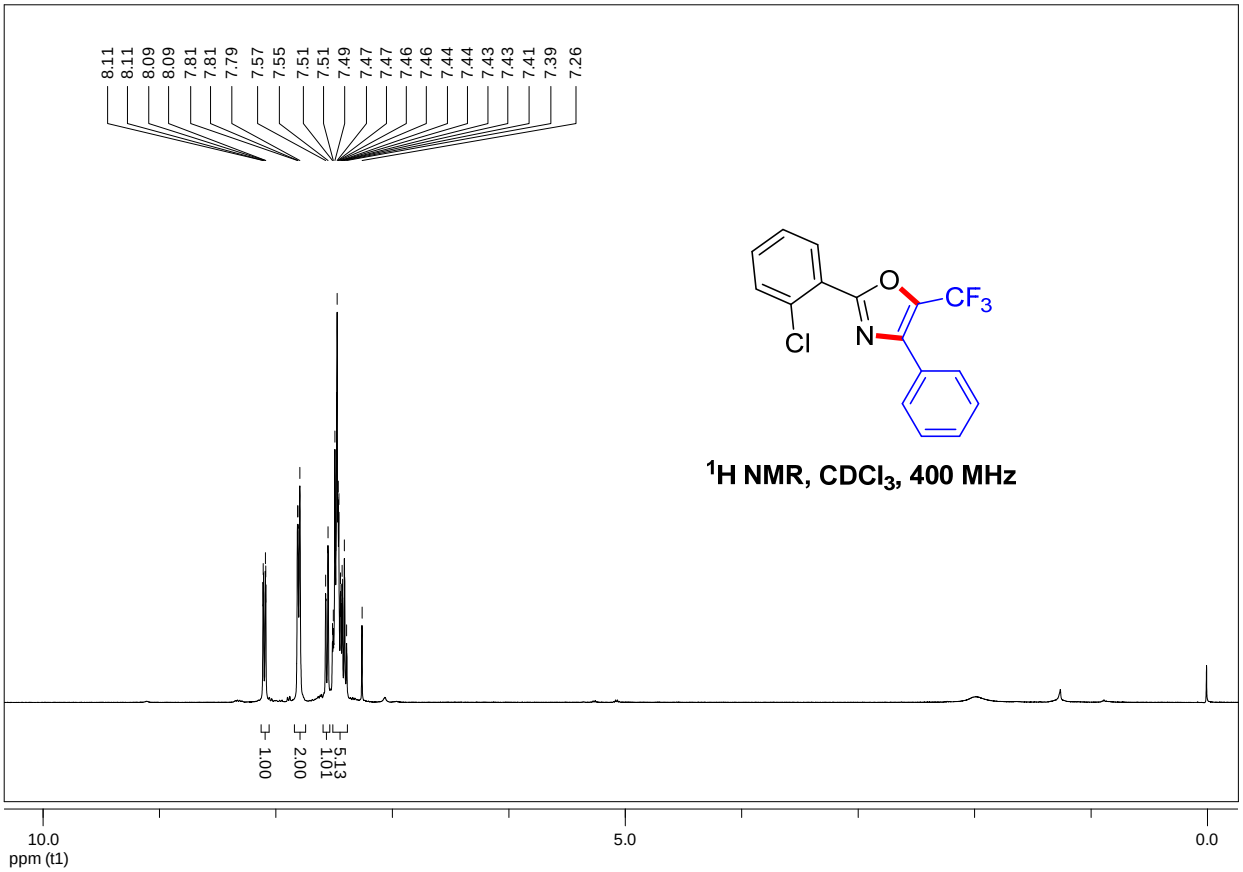


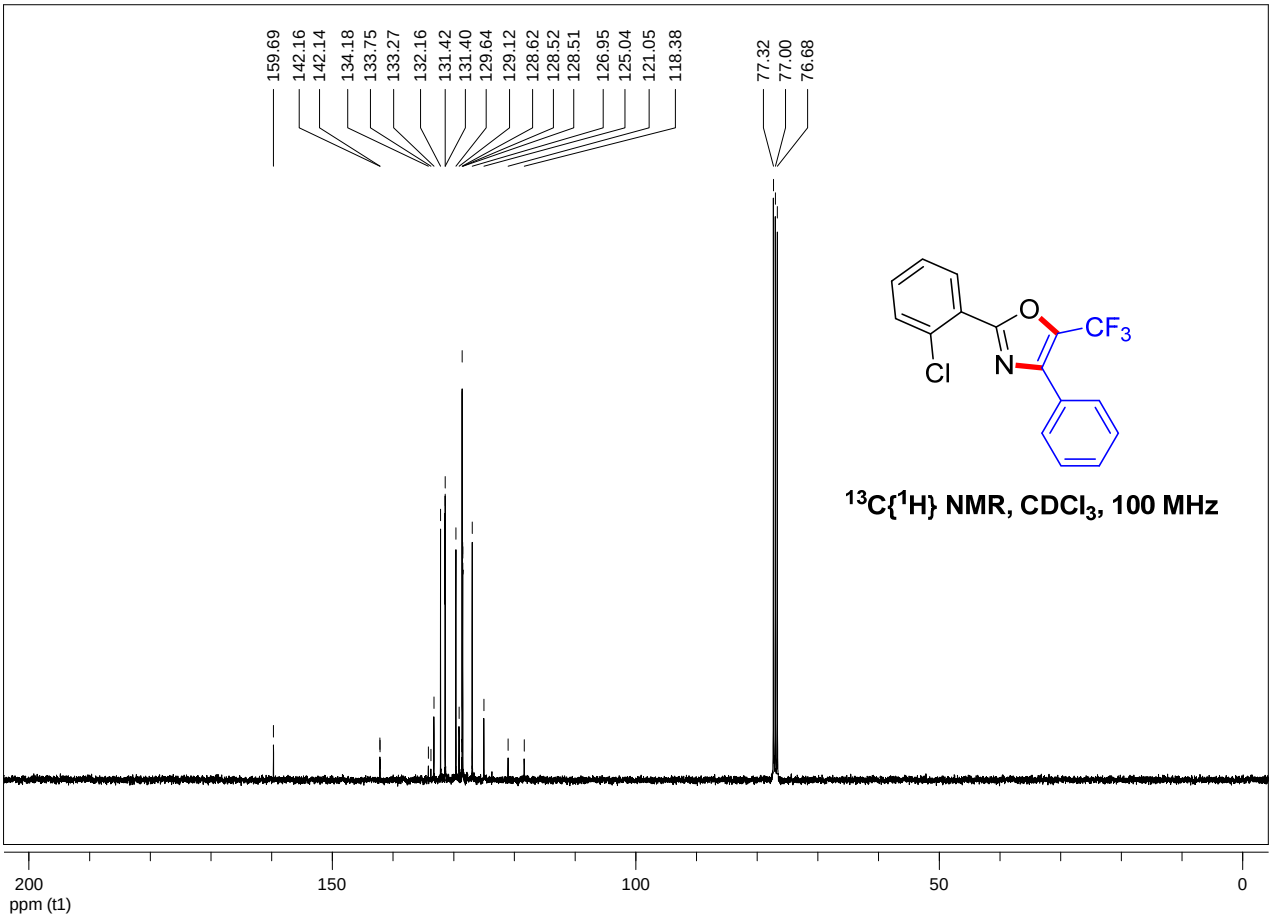
$^{13}C\{^{1}H\}$ NMR, $CDCl_3$, 100 MHz

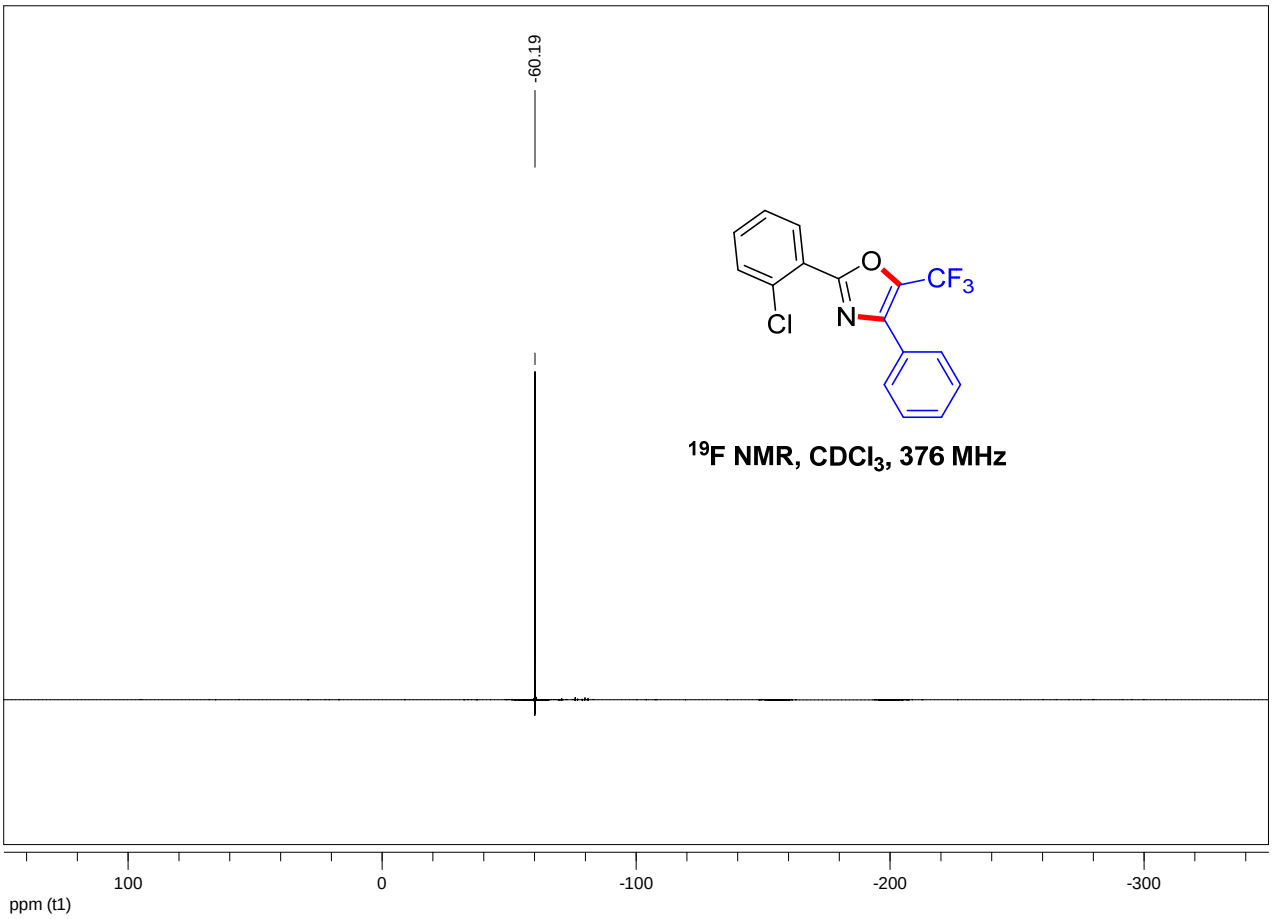


^{19}F NMR, $CDCl_3$, 376 MHz

2-(2-chlorophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5m)

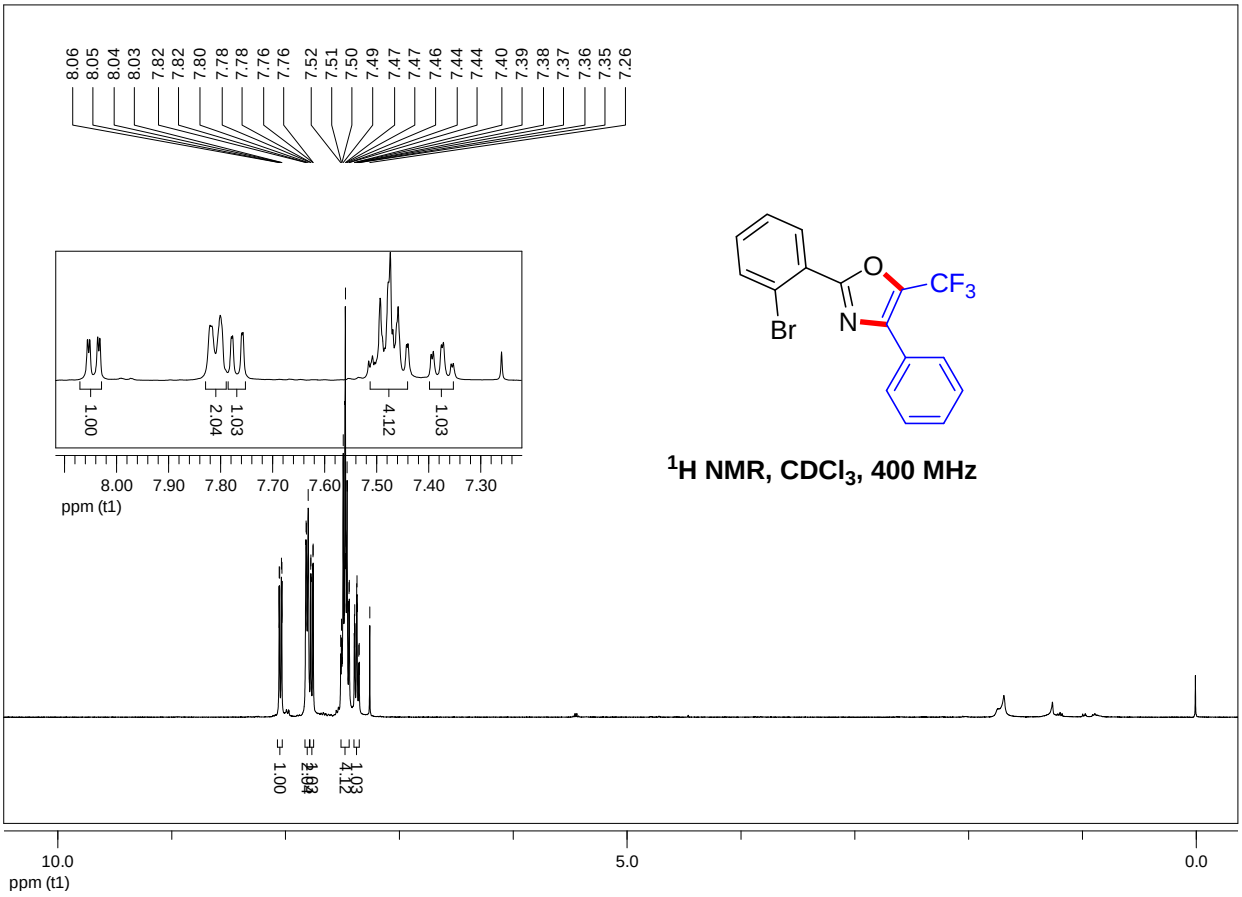




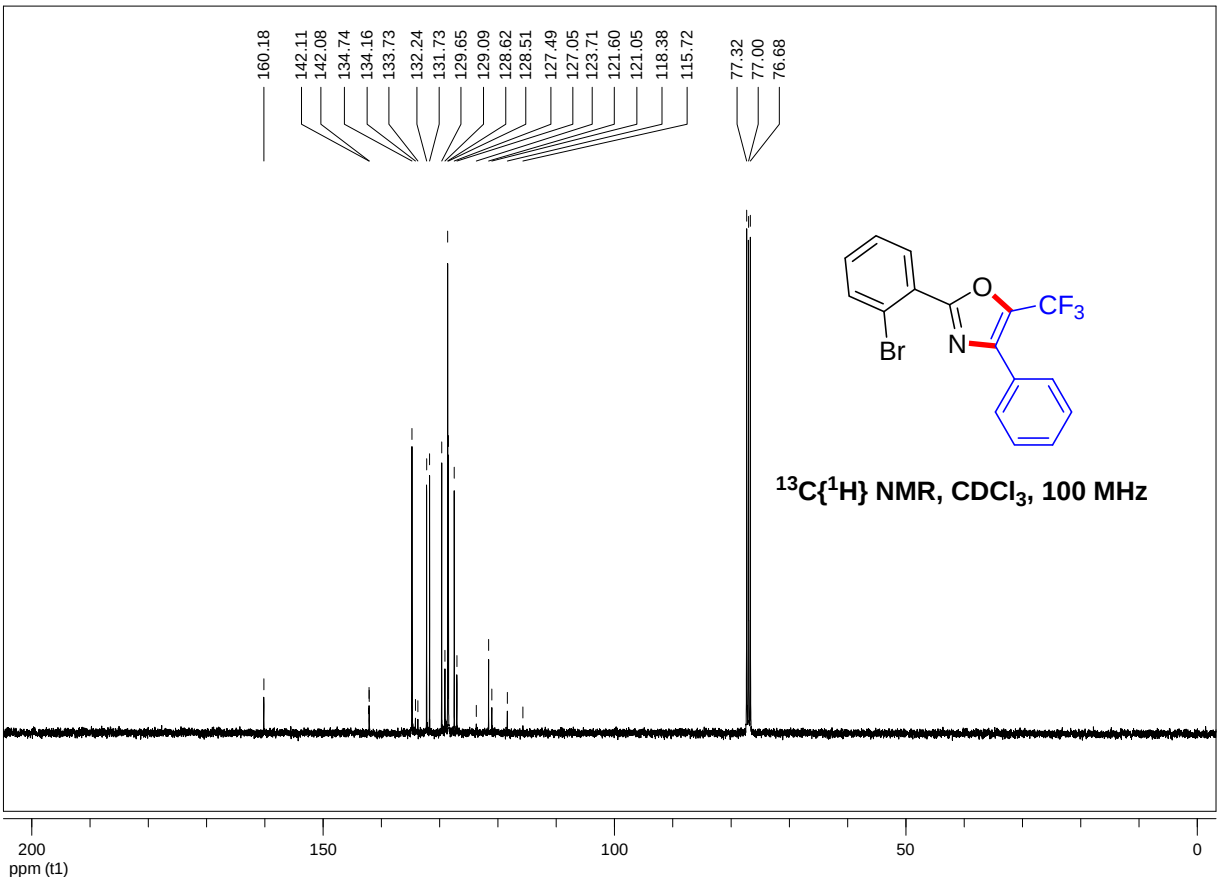


^{19}F NMR, $CDCl_3$, 376 MHz

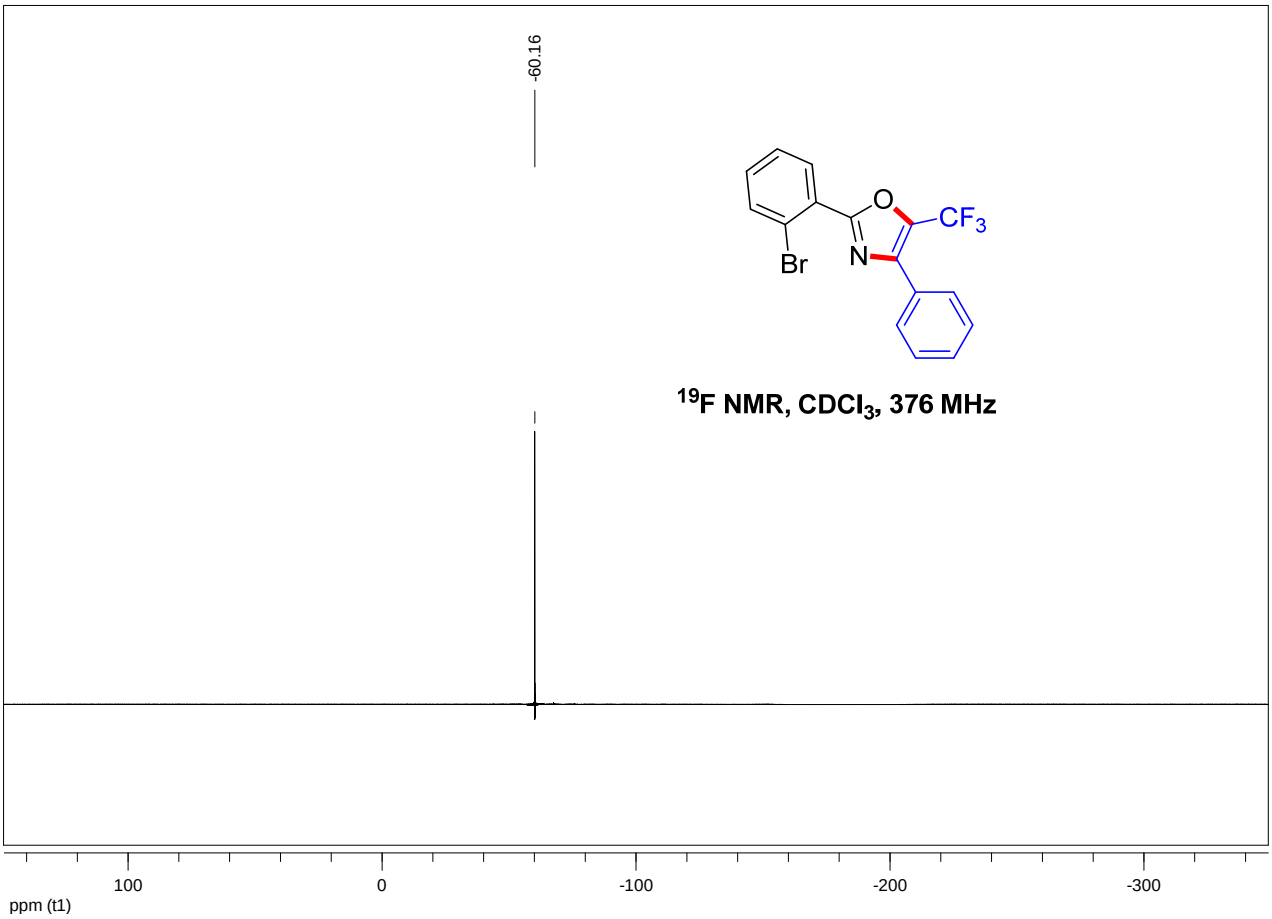
2-(2-bromophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5n)



^{1}H NMR, $CDCl_3$, 400 MHz

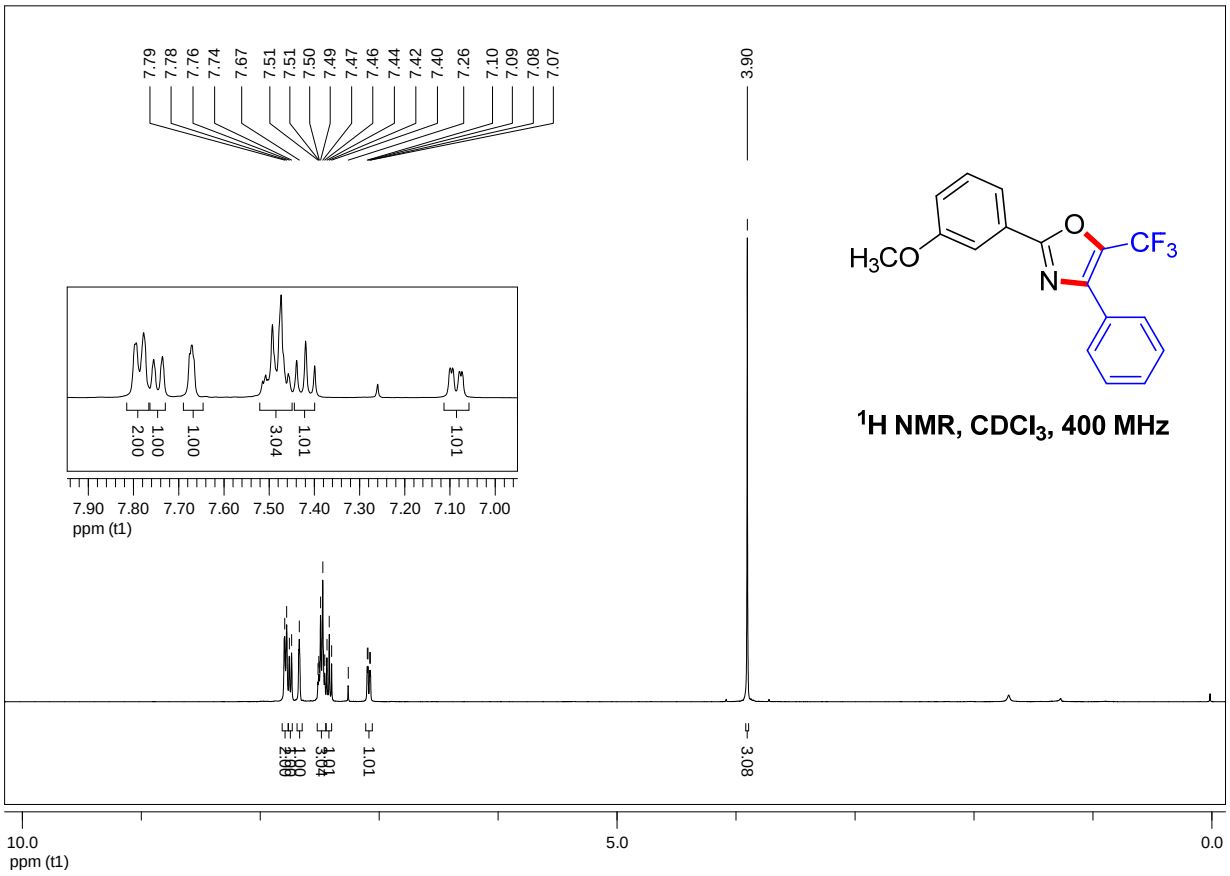


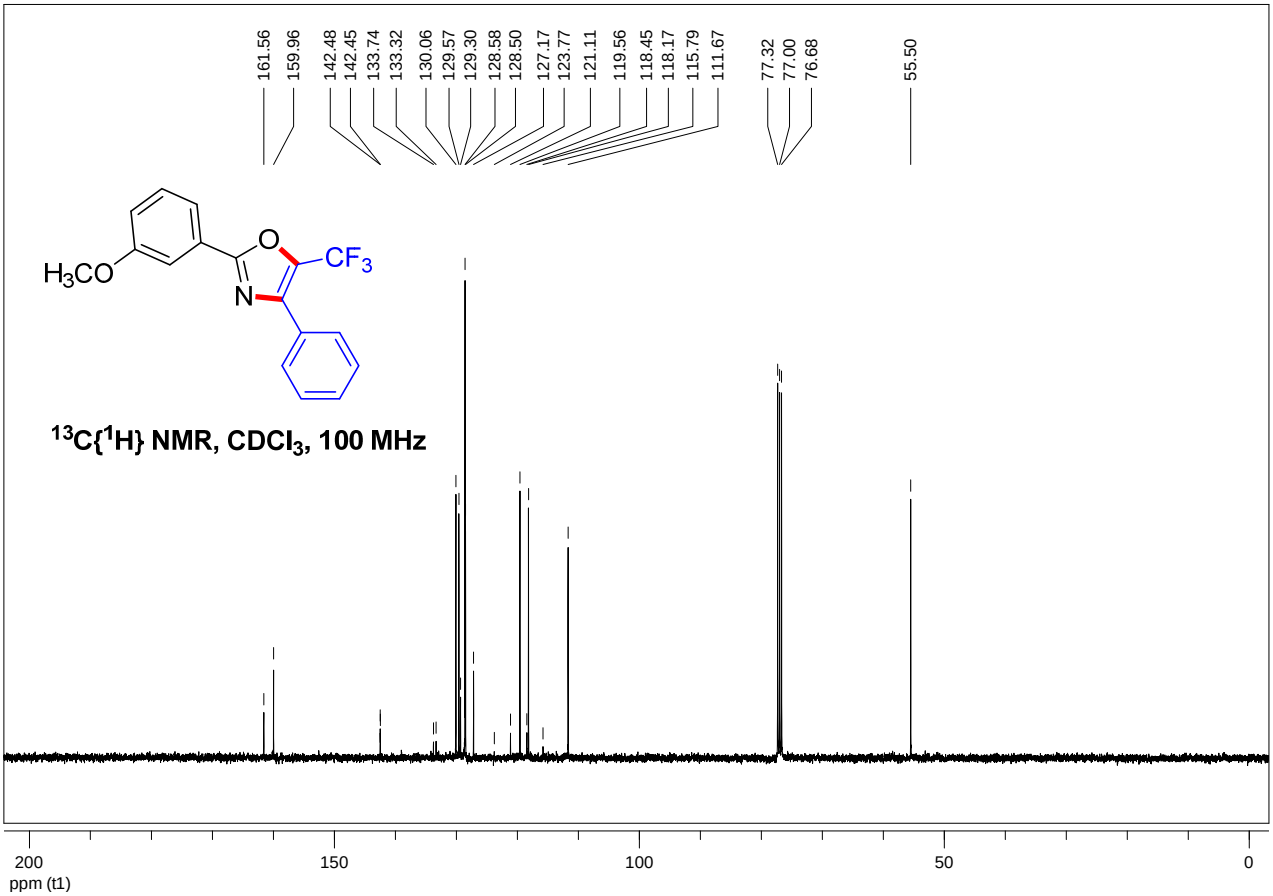
$^{13}C\{^{1}H\}$ NMR, $CDCl_3$, 100 MHz

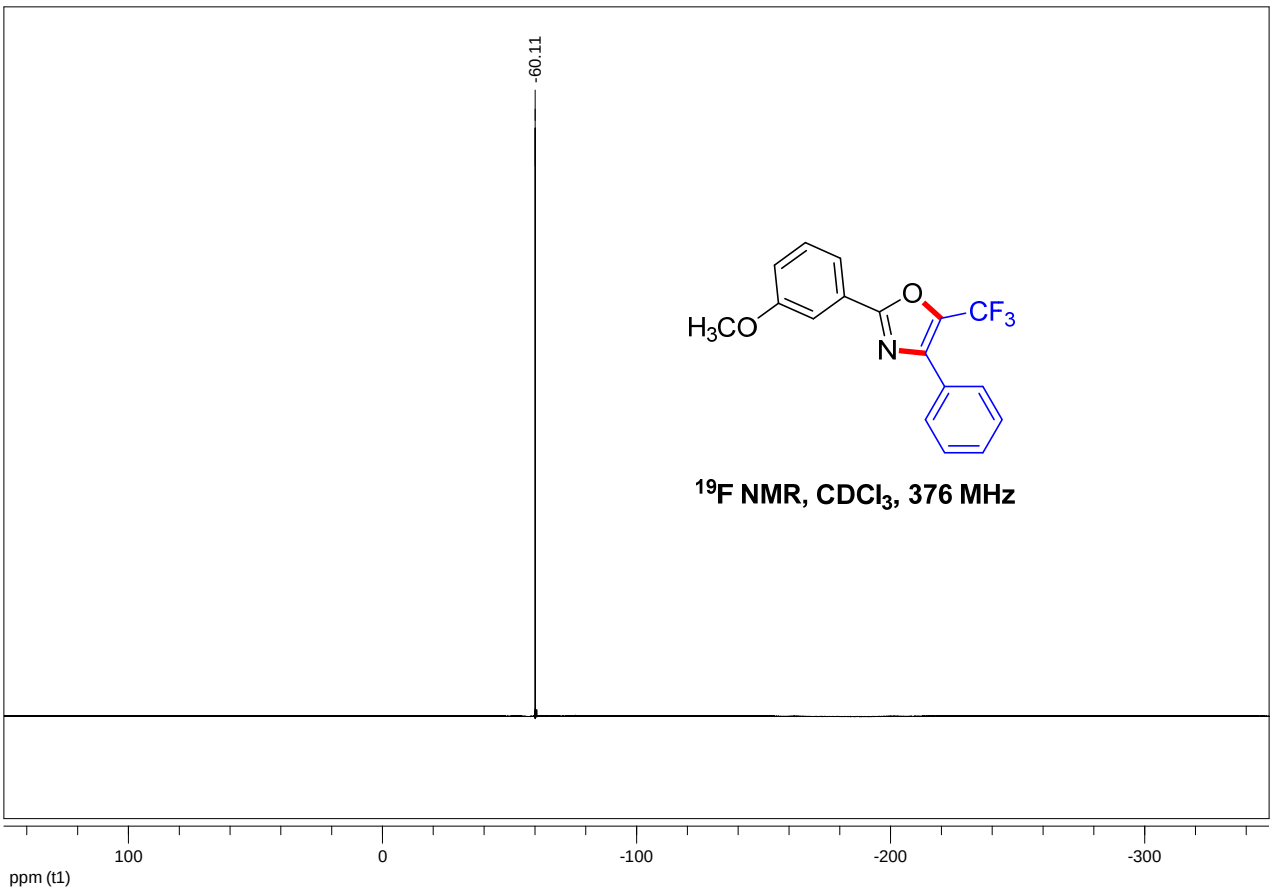


^{19}F NMR, $CDCl_3$, 376 MHz

2-(3-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5o)

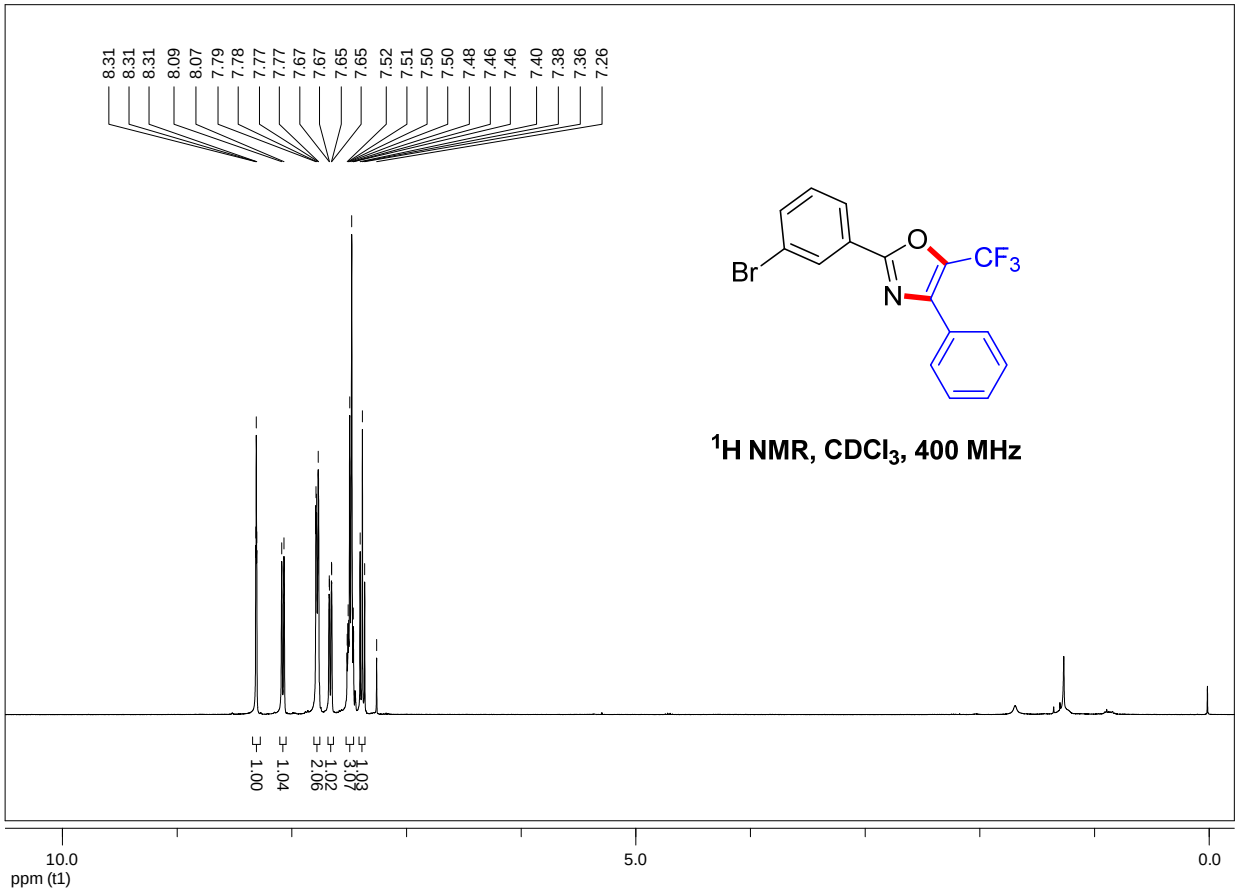




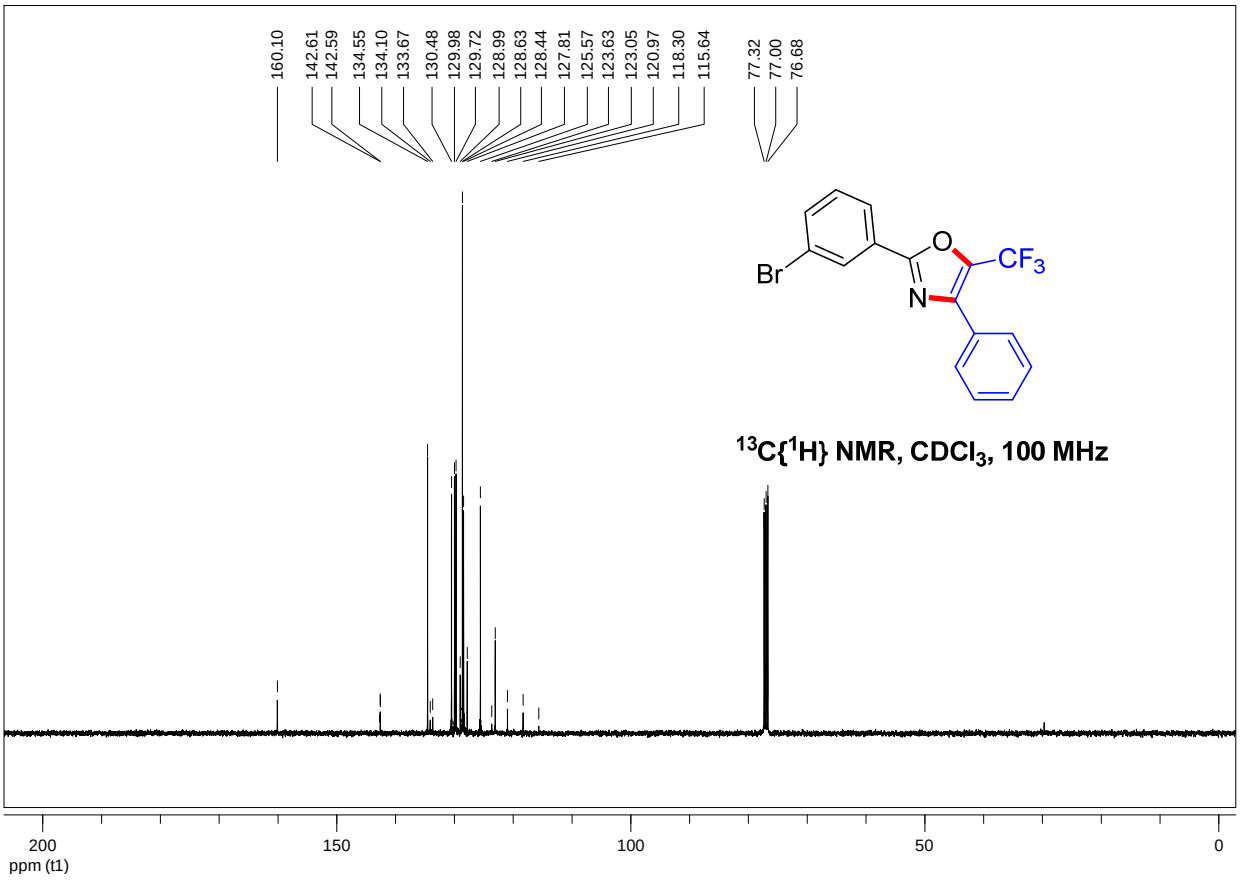


^{19}F NMR, $CDCl_3$, 376 MHz

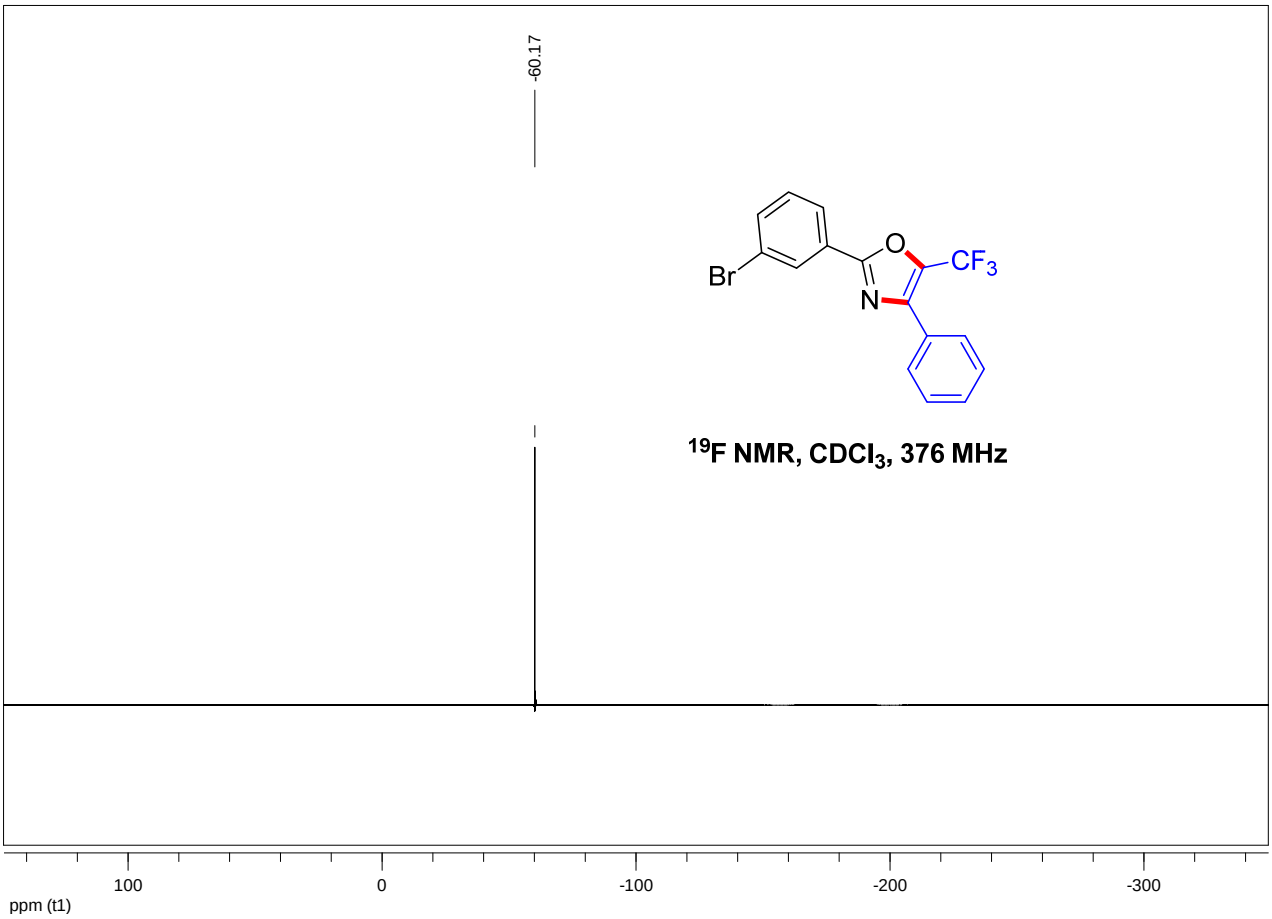
2-(3-bromophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5p)



^{1}H NMR, $CDCl_3$, 400 MHz

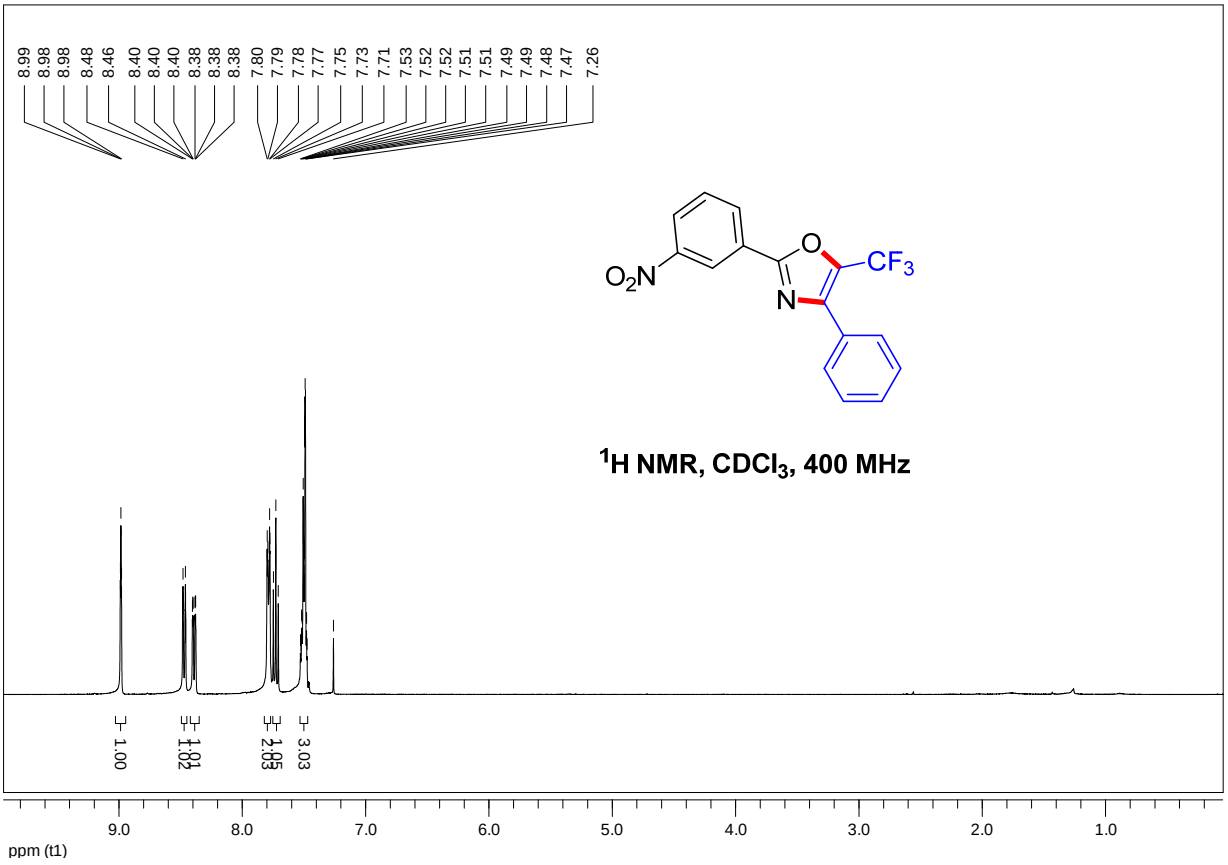


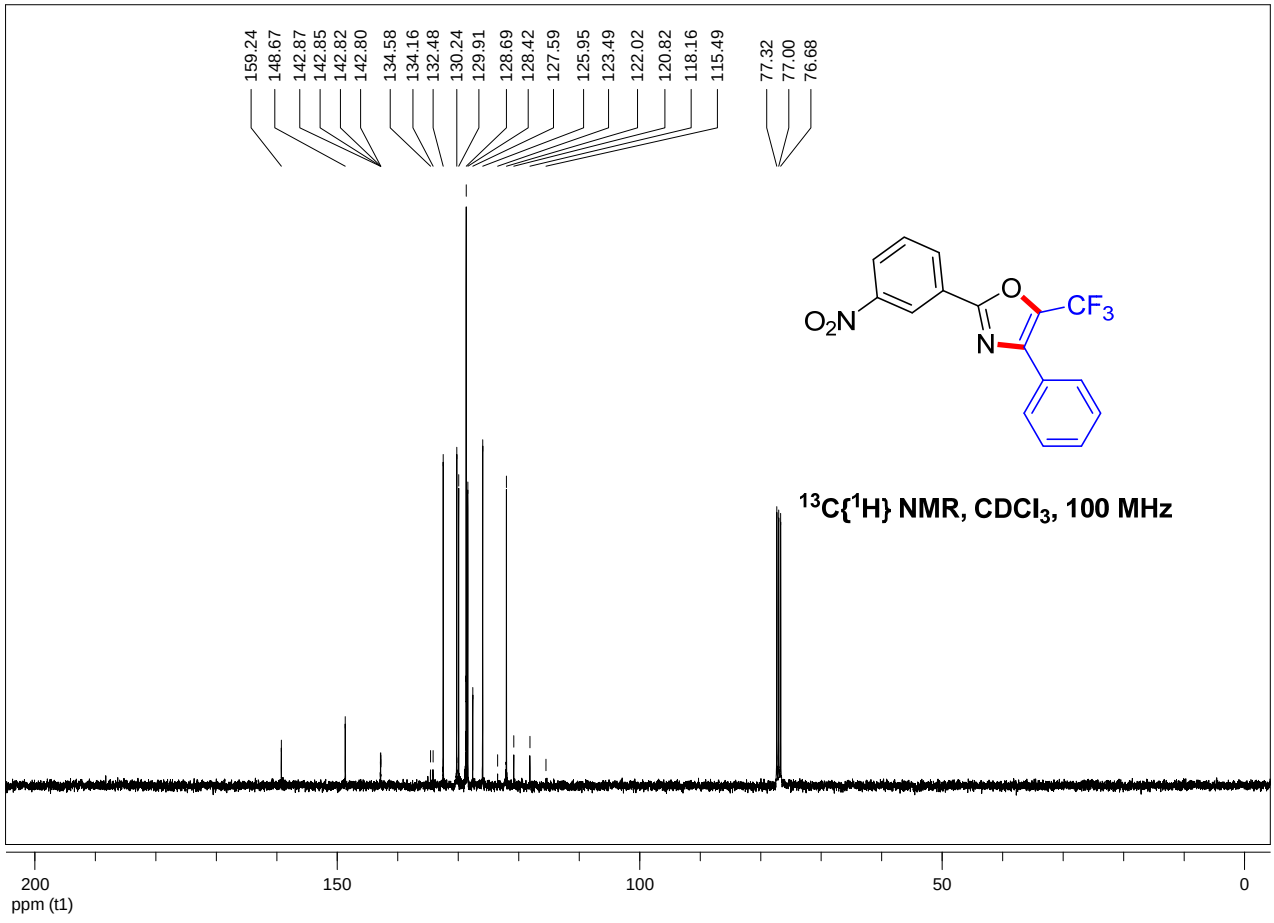
$^{13}C\{^{1}H\}$ NMR, $CDCl_3$, 100 MHz

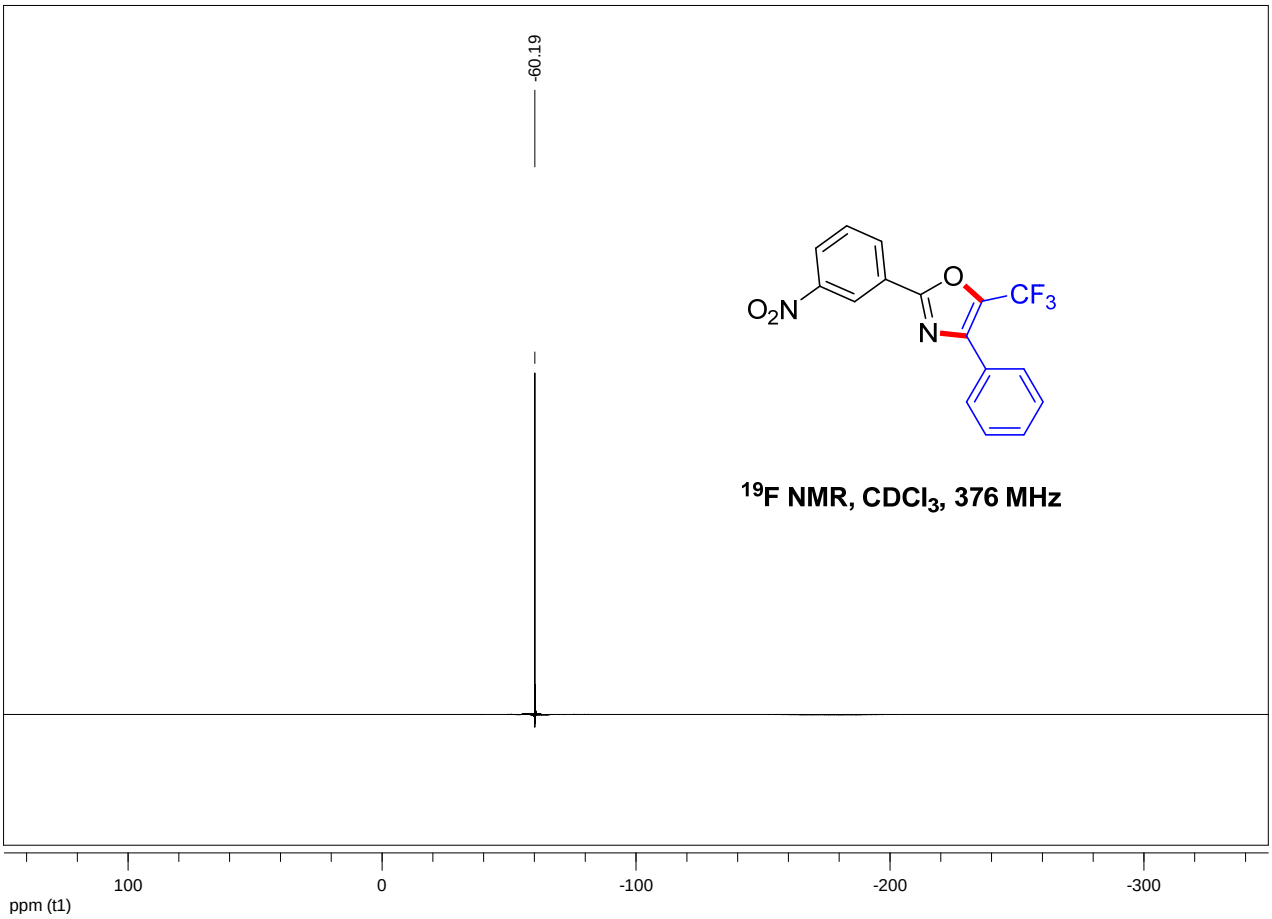


^{19}F NMR, $CDCl_3$, 376 MHz

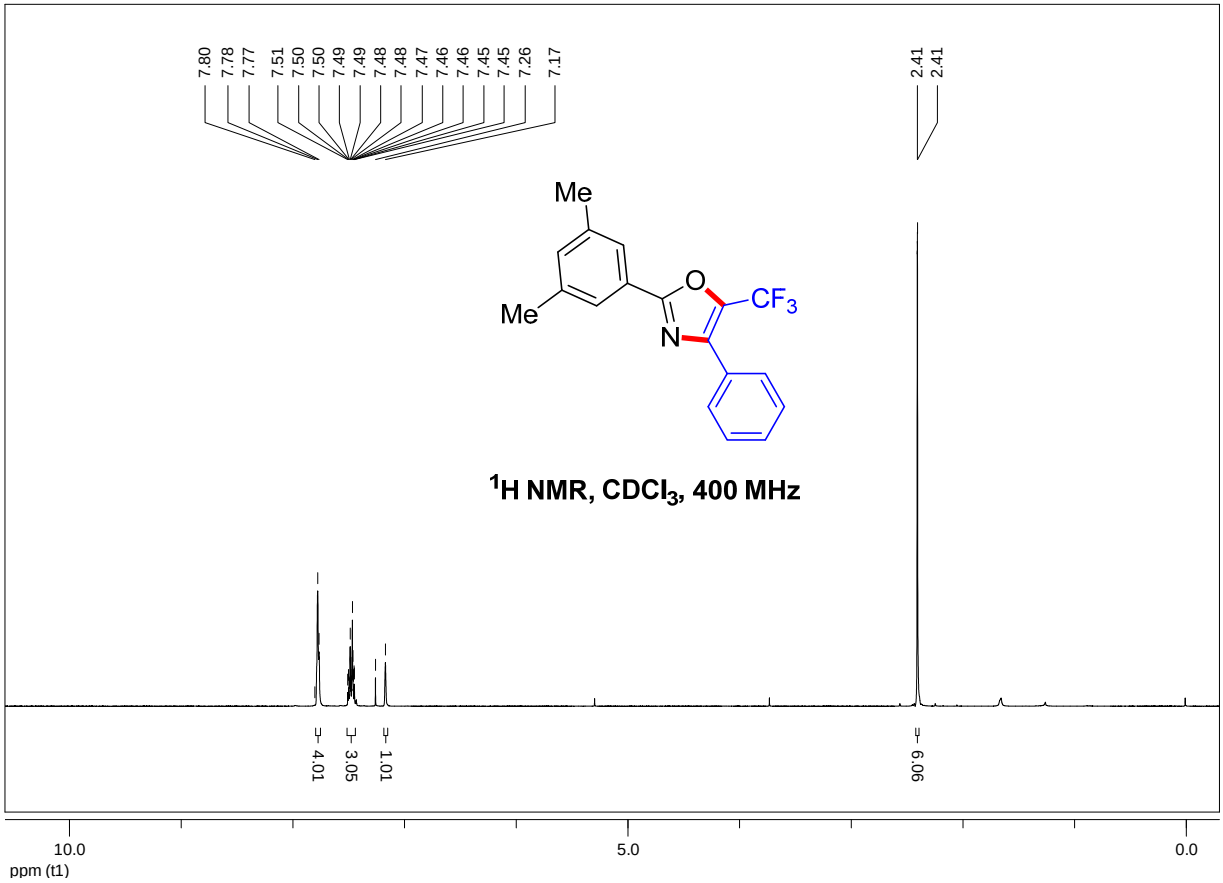
2-(3-nitrophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5q)

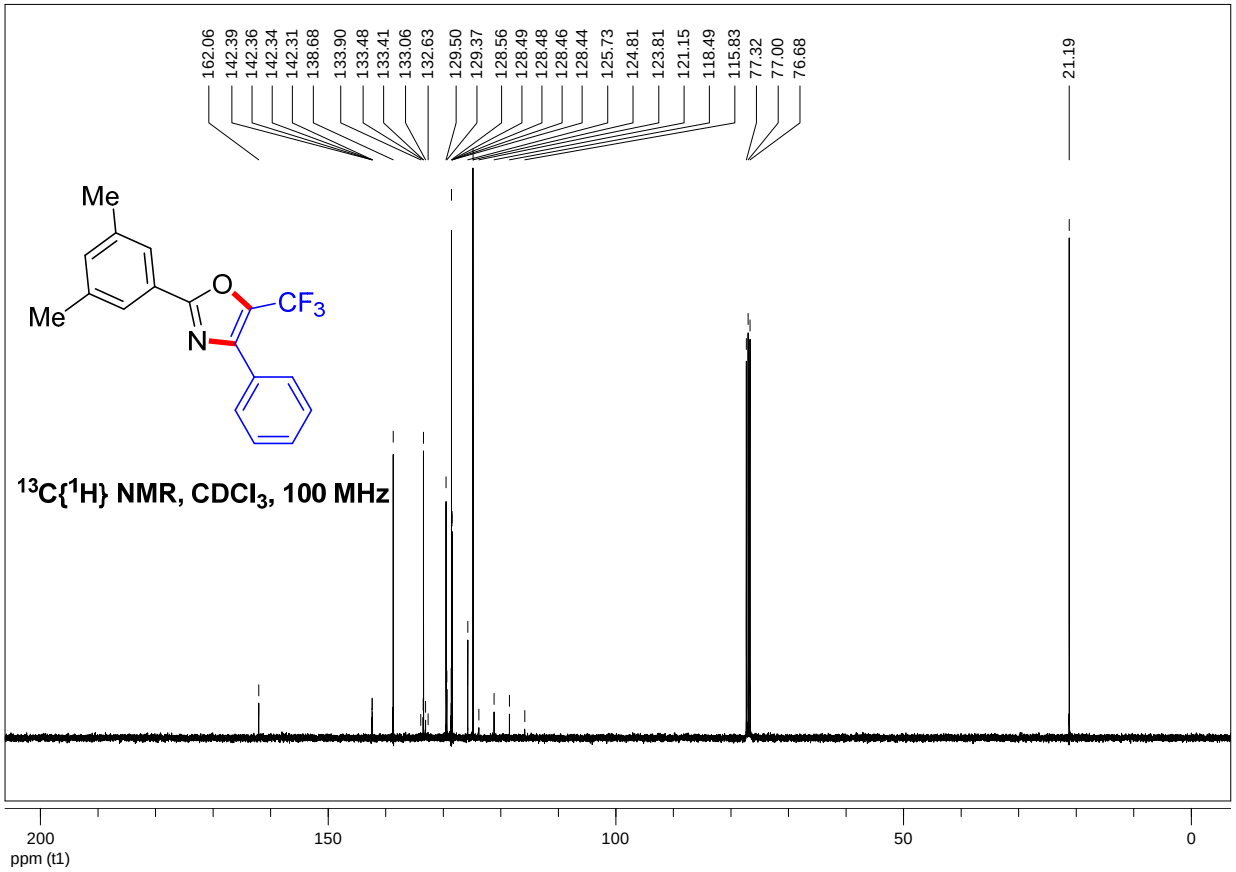


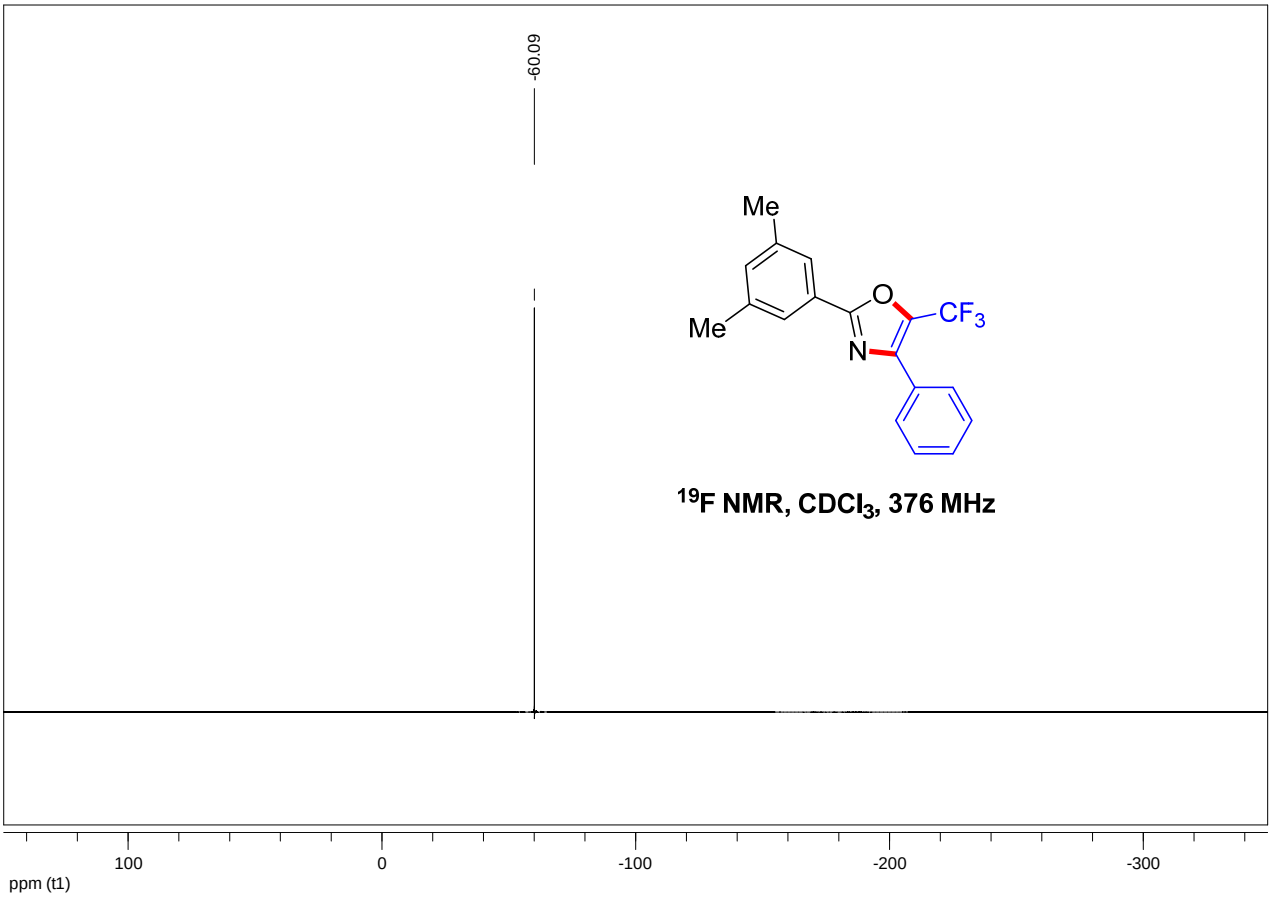



-60.19
O2N
O
CF3
N
19F NMR, CDCl3, 376 MHz
100
0
-100
-200
-300
ppm (t1)

2-(3,5-dimethylphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5r)

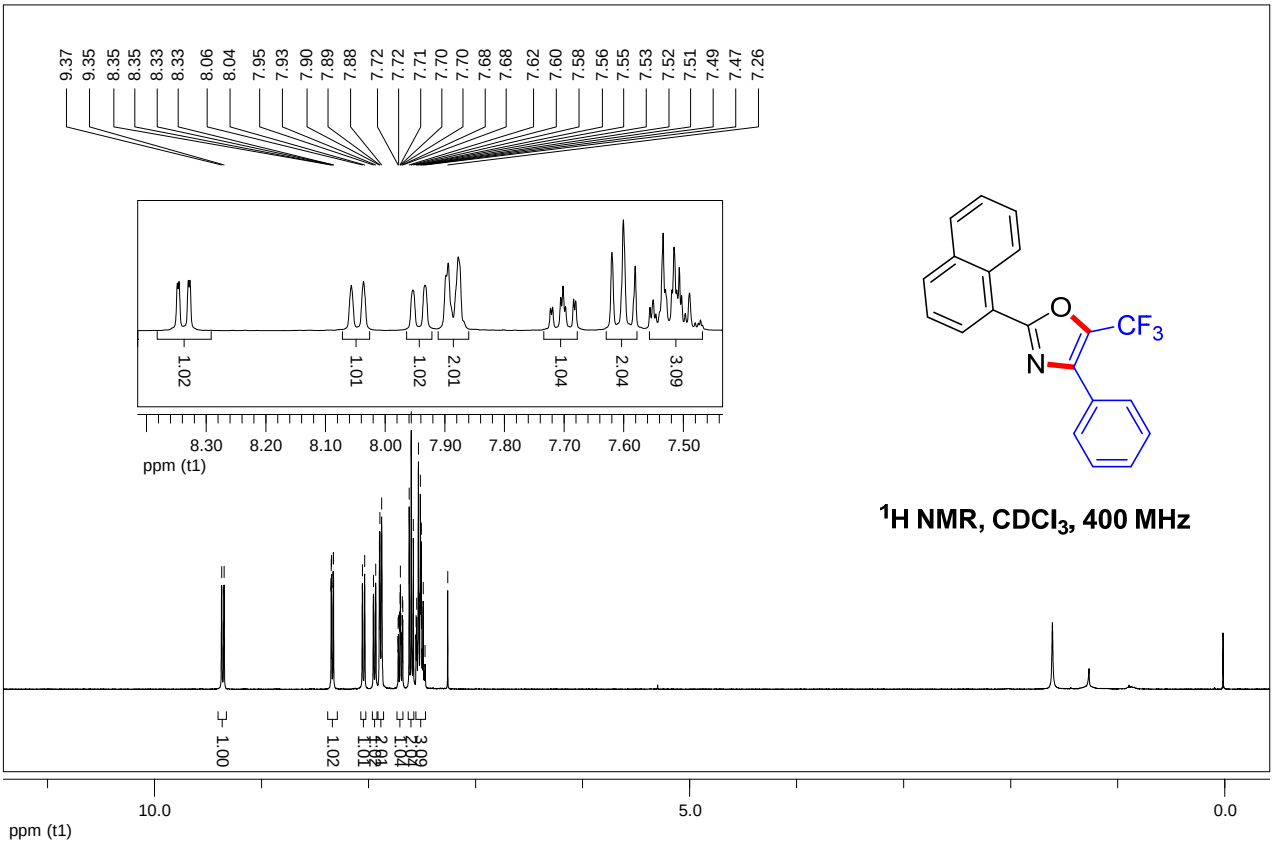


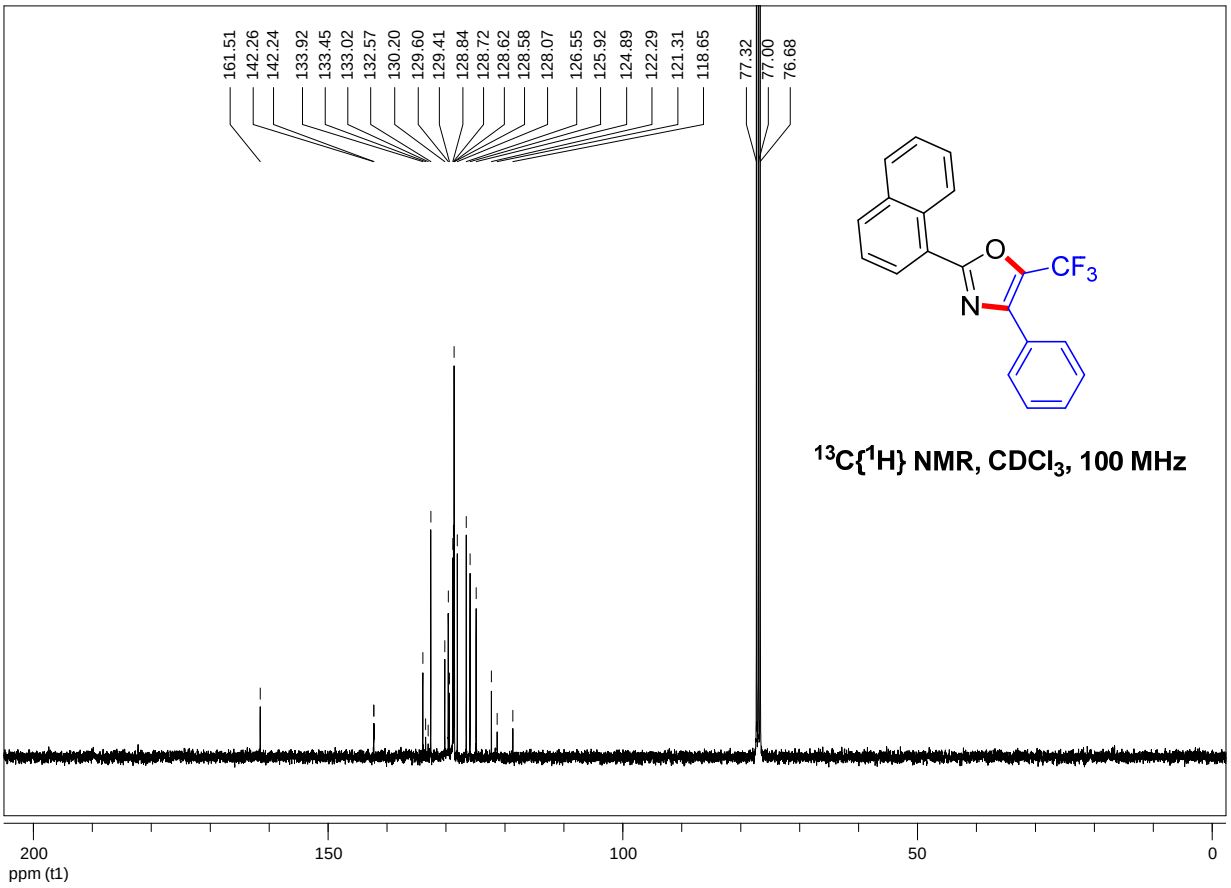


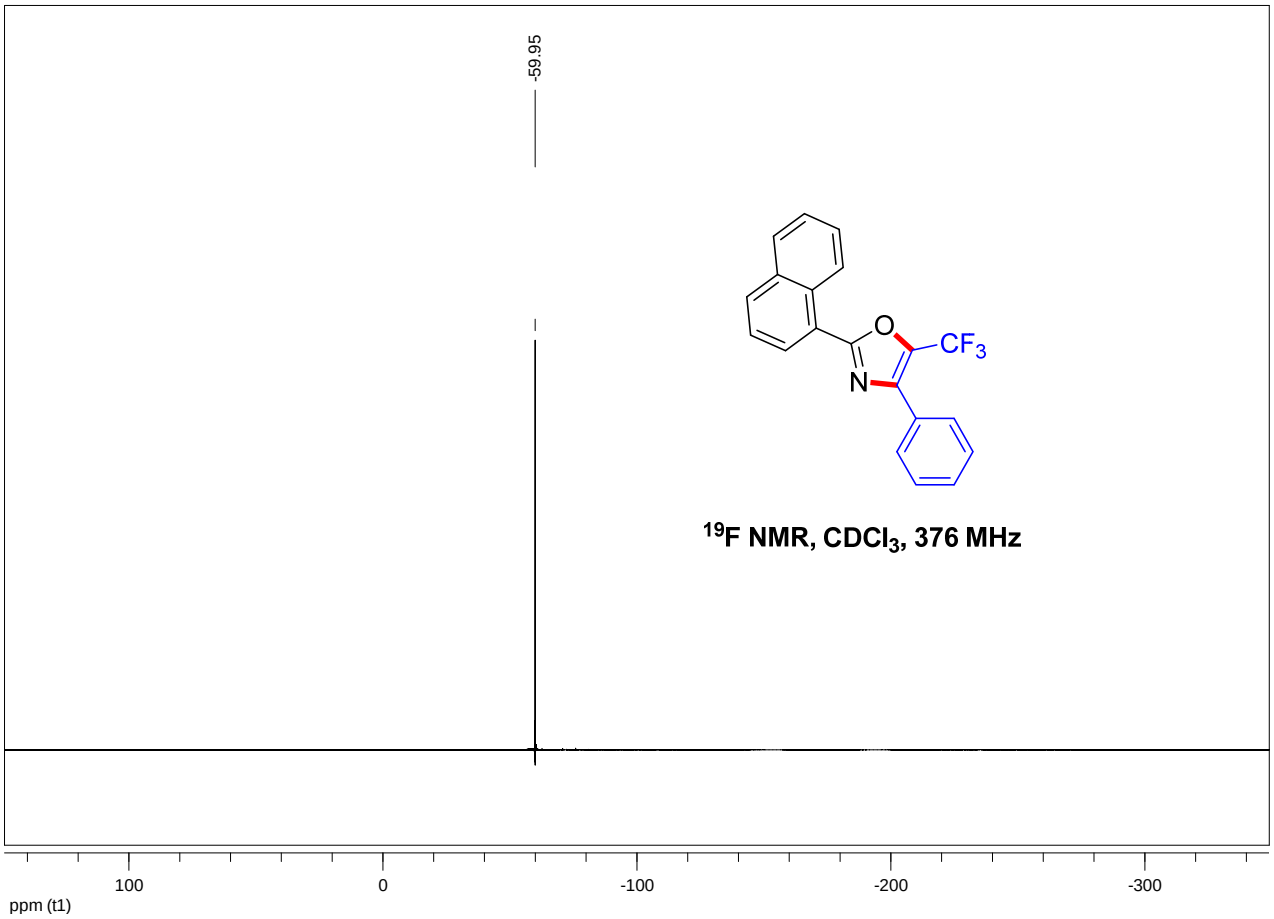


^{19}F NMR, $CDCl_3$, 376 MHz

2-(naphthalen-1-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5s)

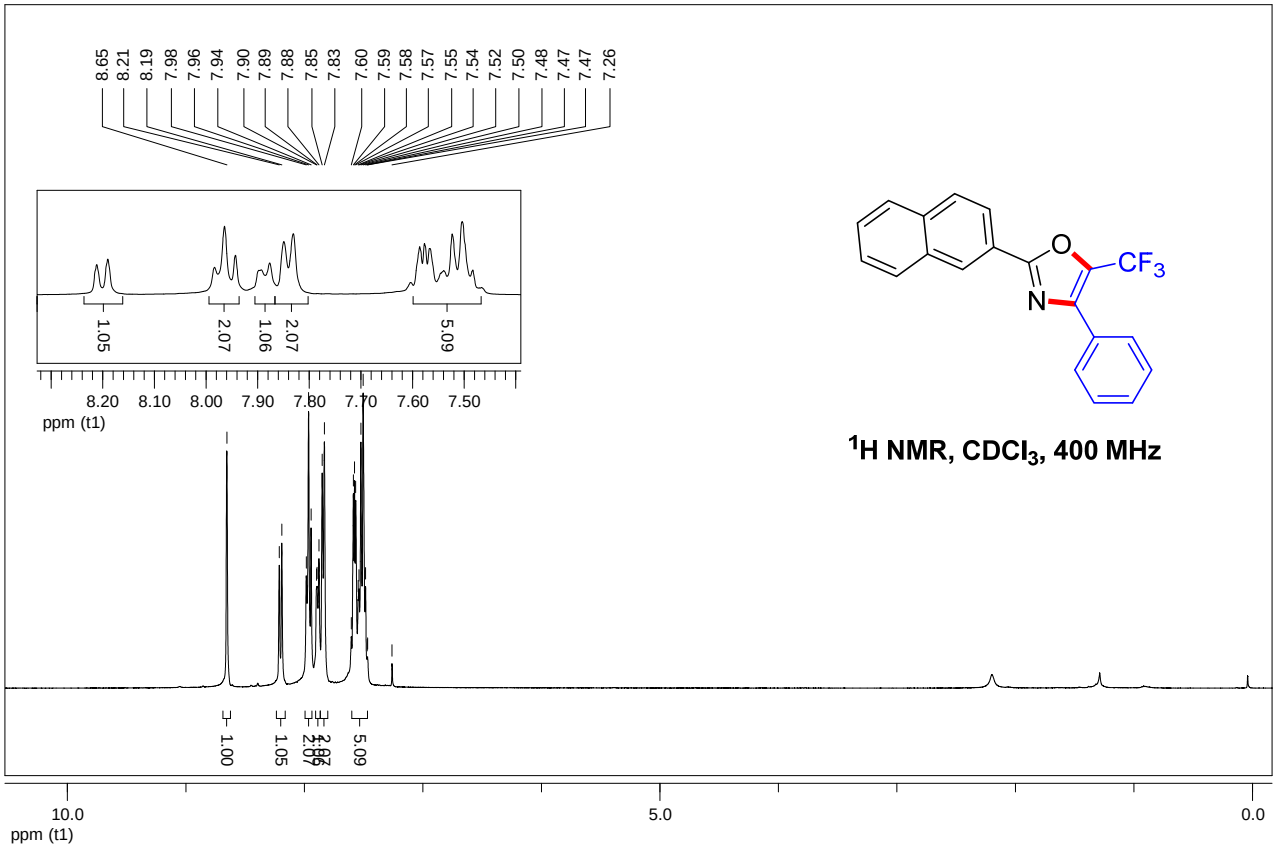


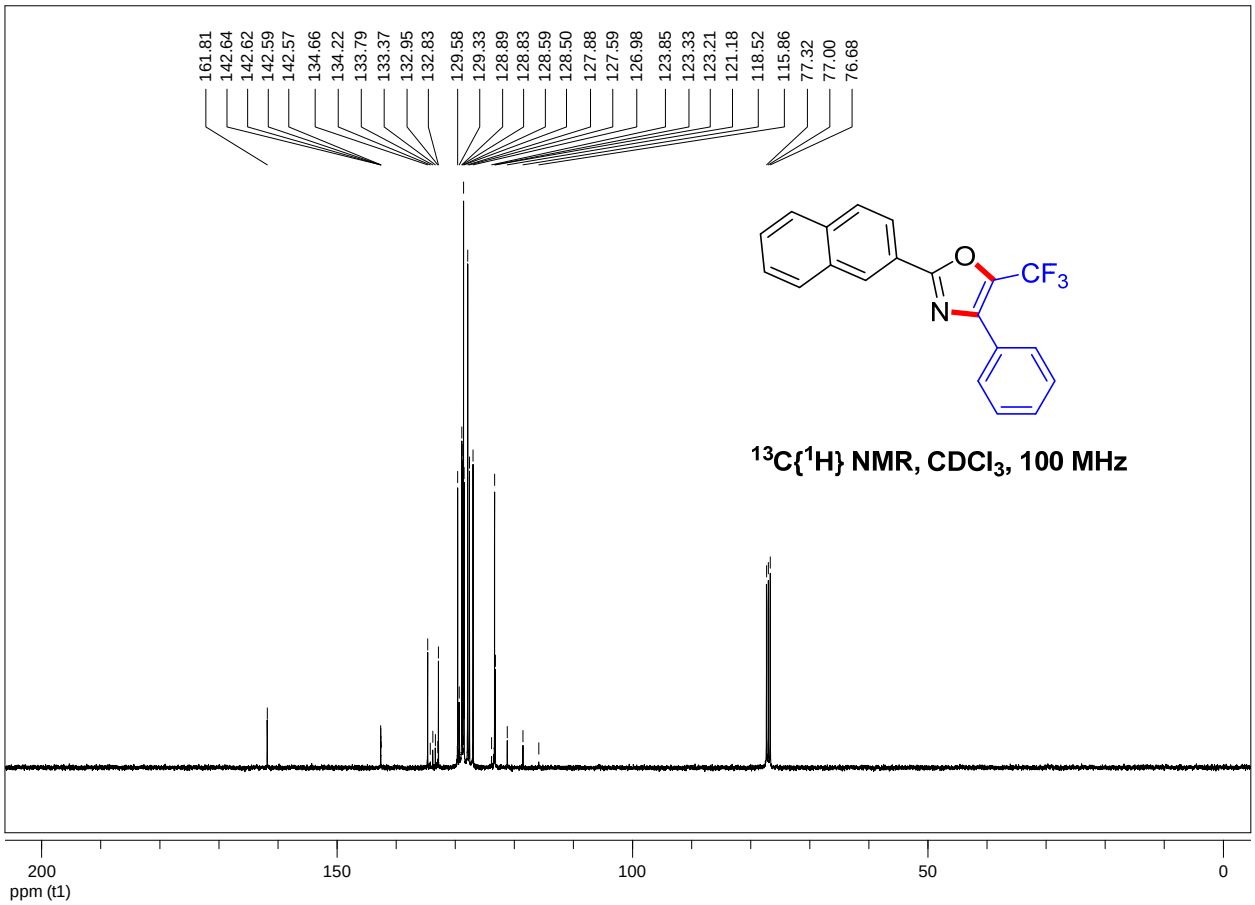


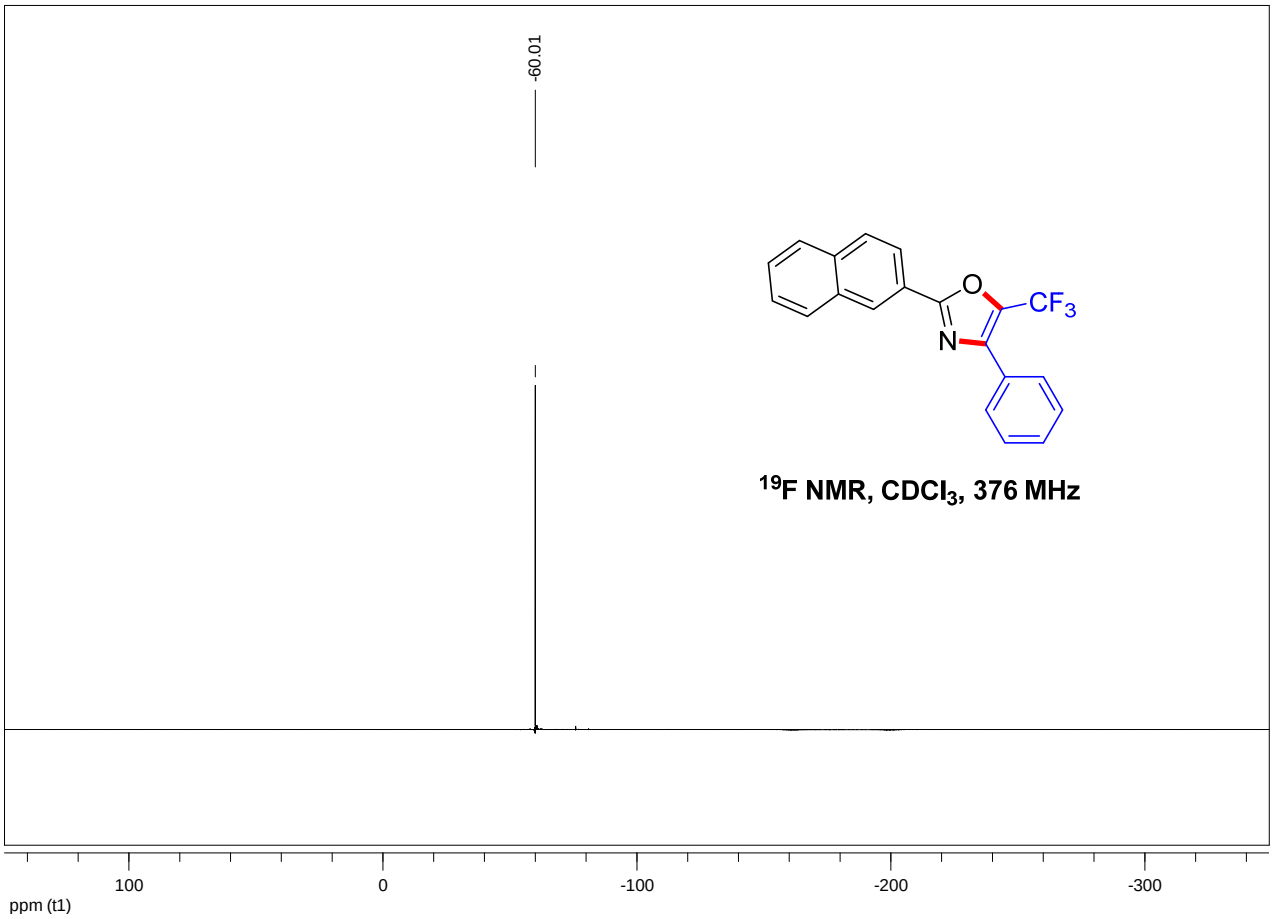


^{19}F NMR, $CDCl_3$, 376 MHz

2-(naphthalen-2-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5t)

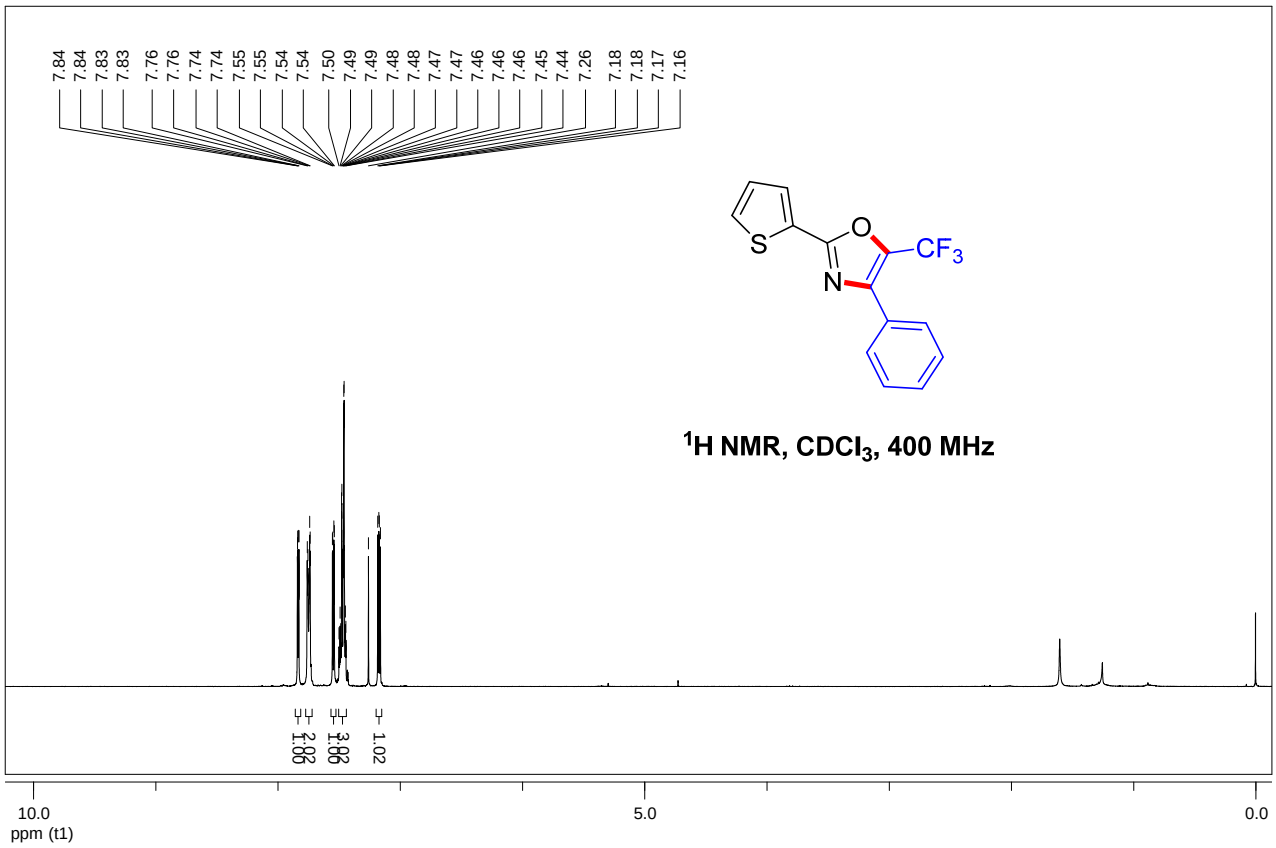




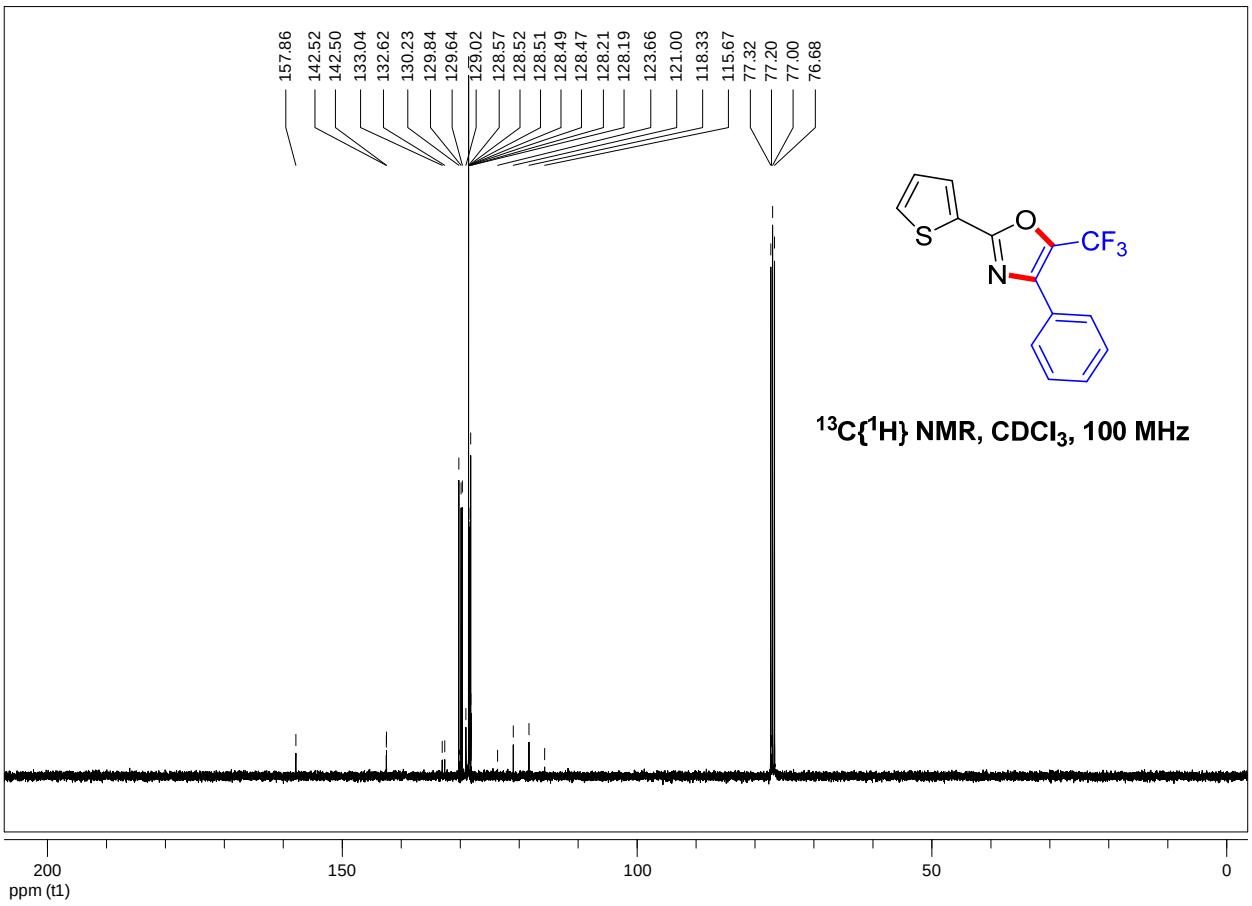


^{19}F NMR, $CDCl_3$, 376 MHz

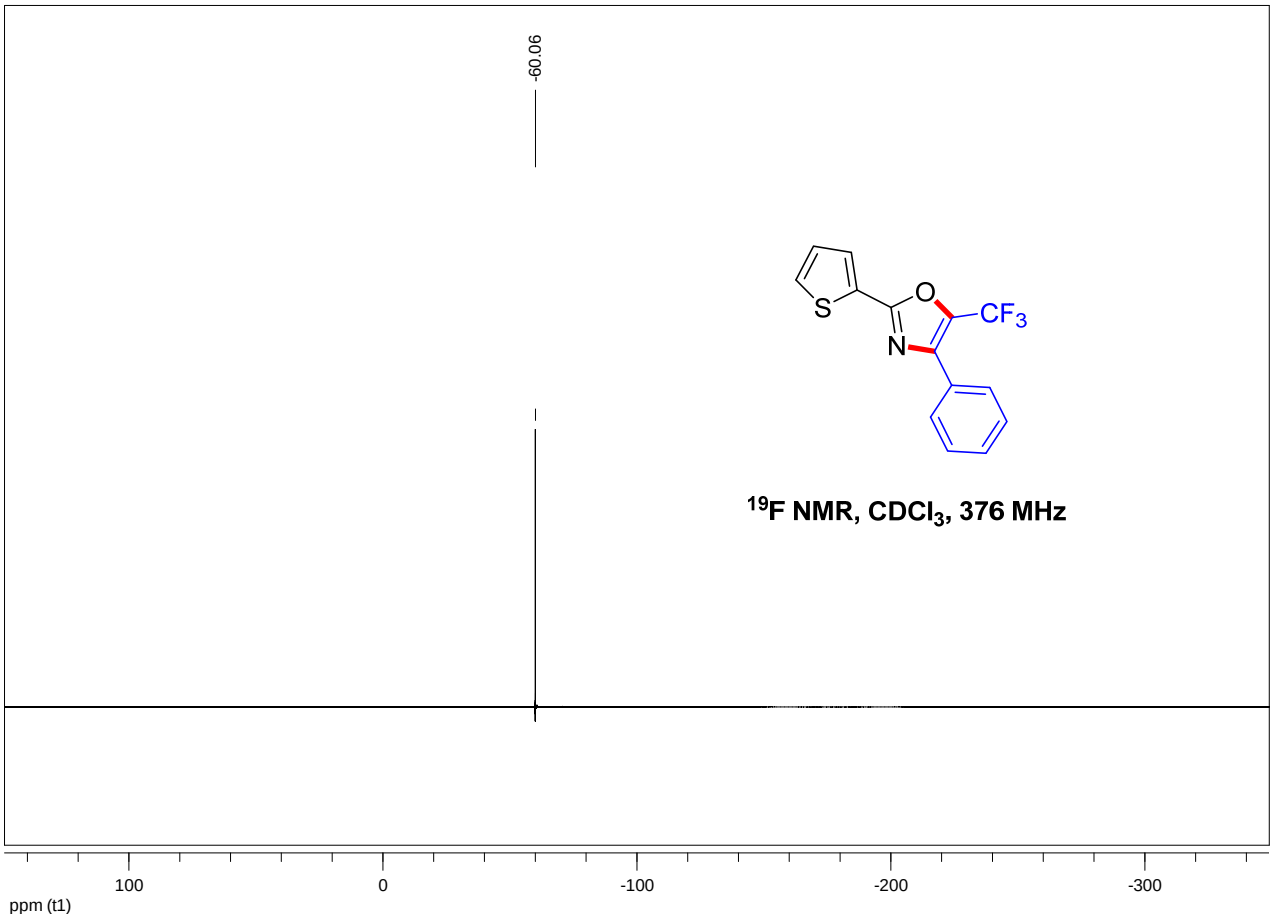
4-phenyl-2-(thiophen-2-yl)-5-(trifluoromethyl)oxazole (5u)



^{1}H NMR, $CDCl_3$, 400 MHz

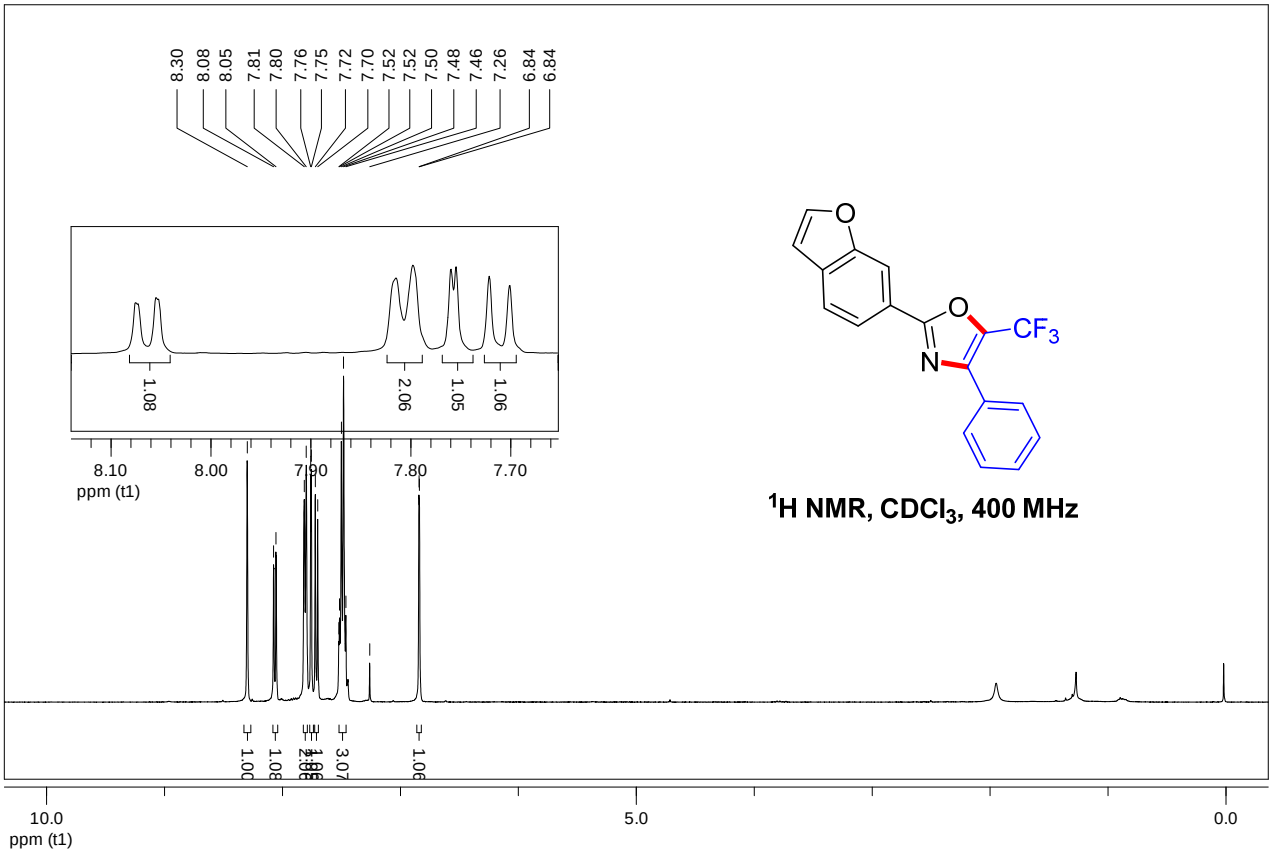


$^{13}C\{^{1}H\}$ NMR, $CDCl_3$, 100 MHz

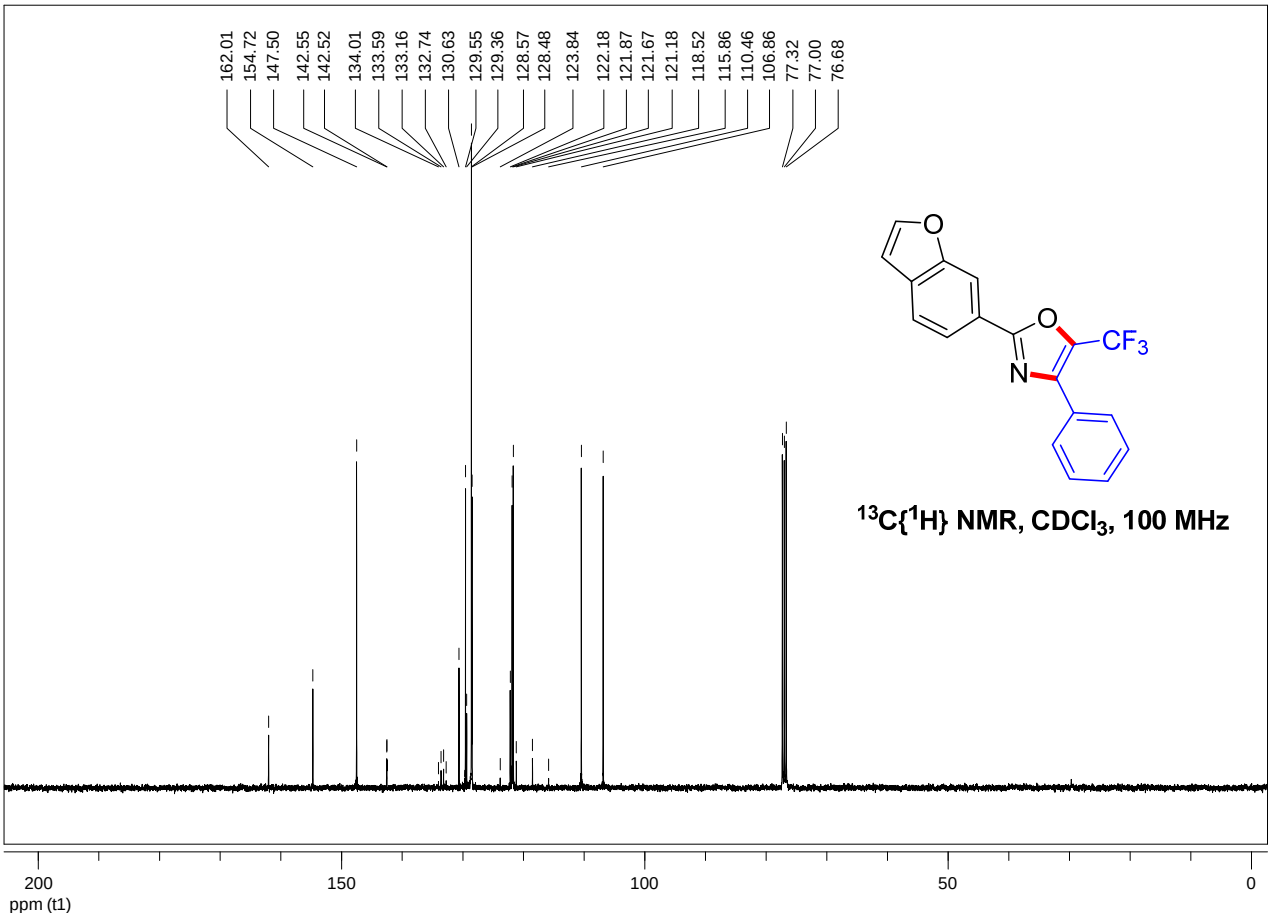


^{19}F NMR, $CDCl_3$, 376 MHz

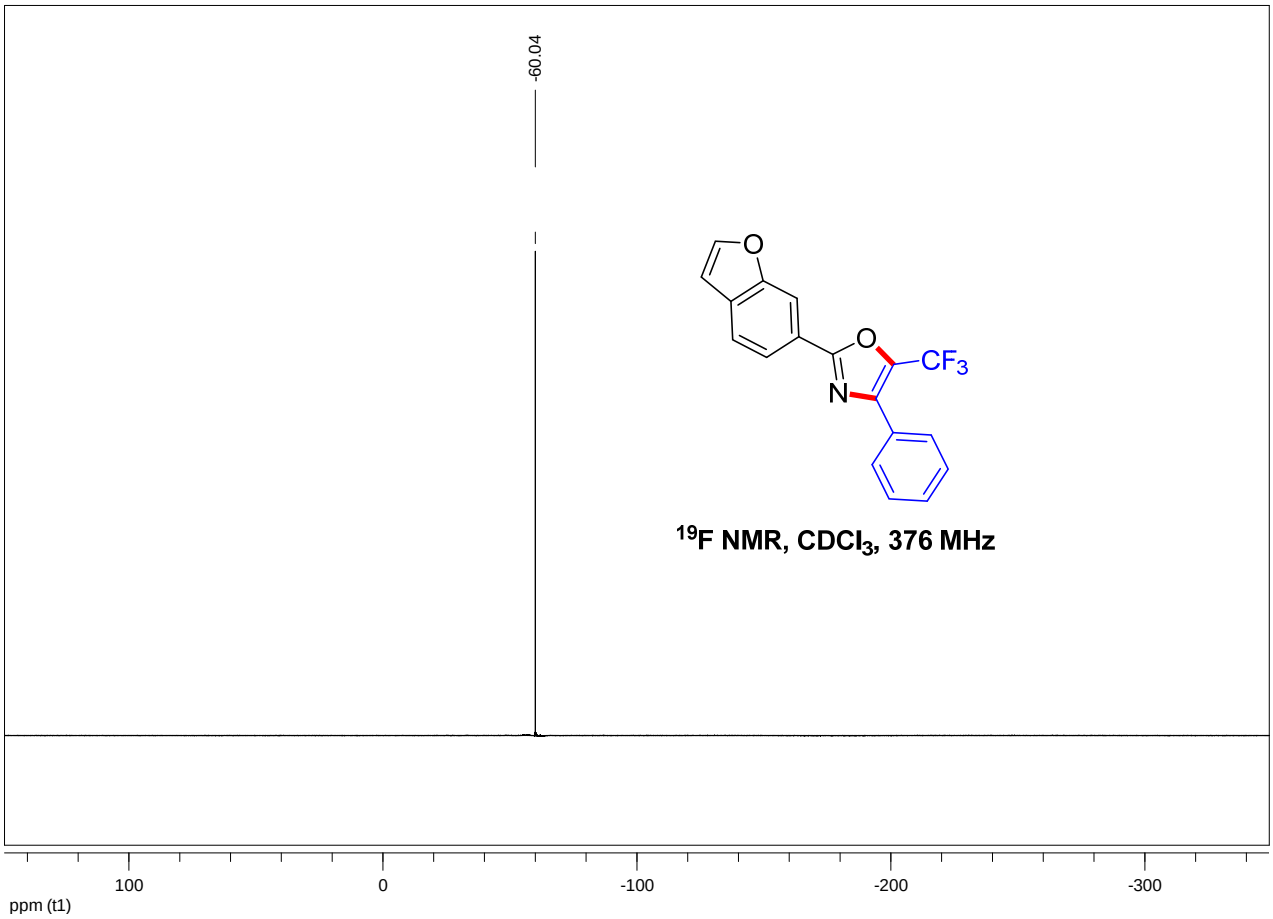
2-(benzofuran-6-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5v)



^{1}H NMR, $CDCl_3$, 400 MHz

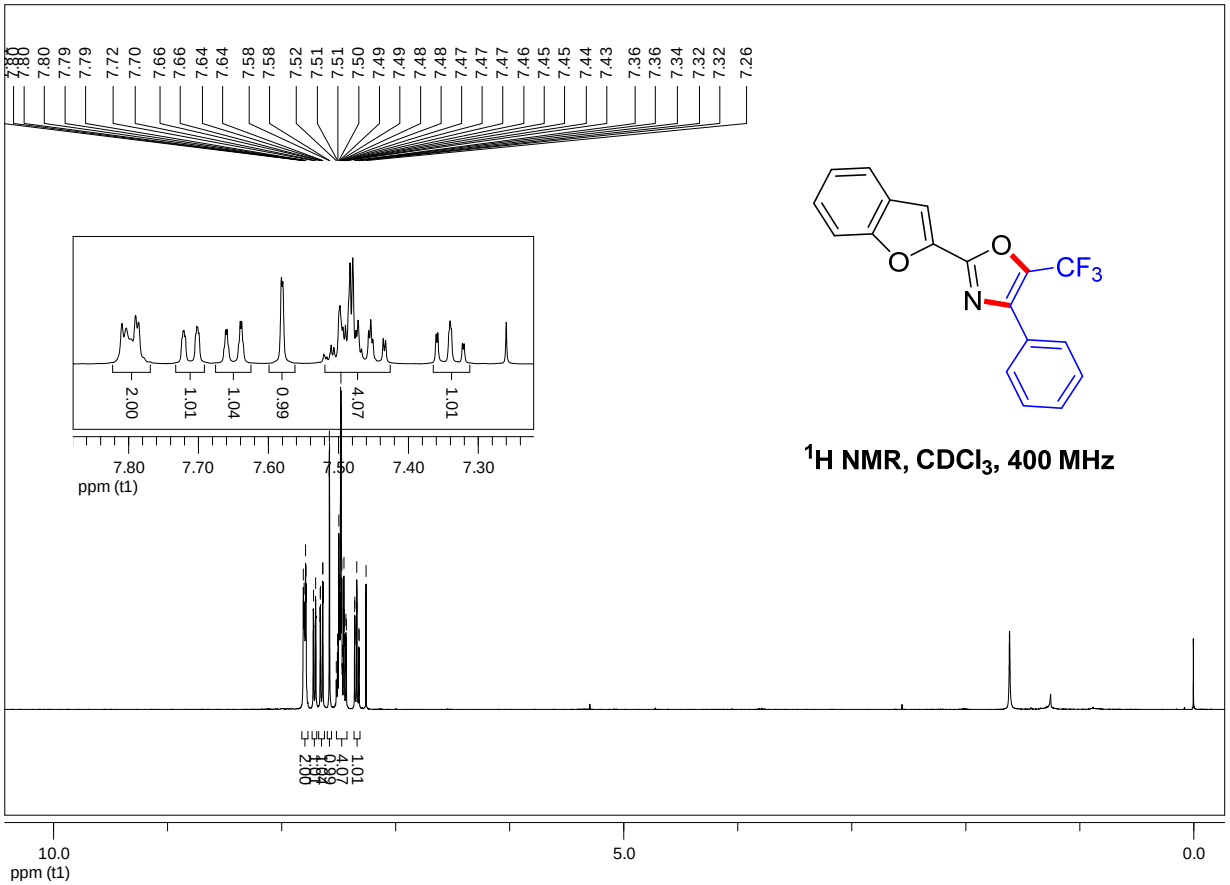


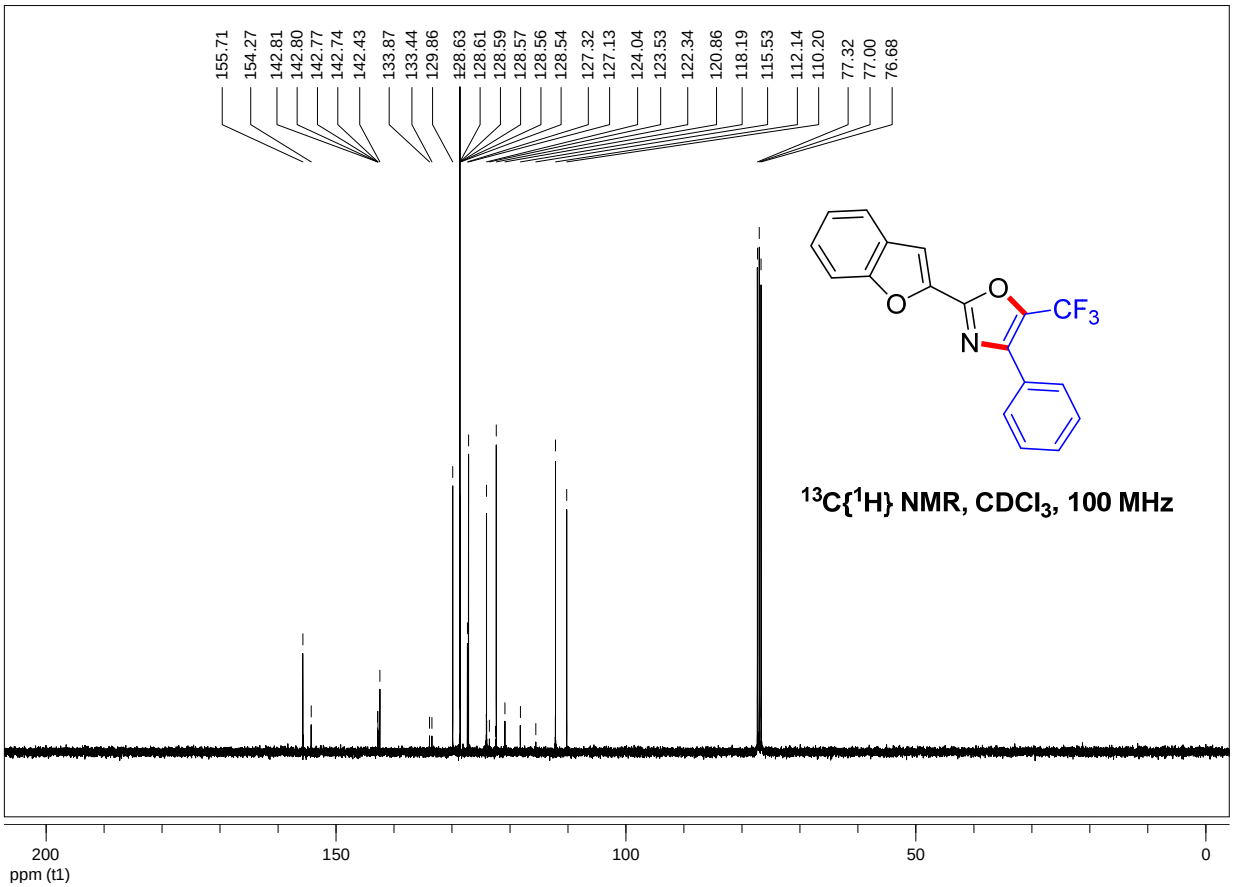
$^{13}C\{^{1}H\}$ NMR, $CDCl_3$, 100 MHz

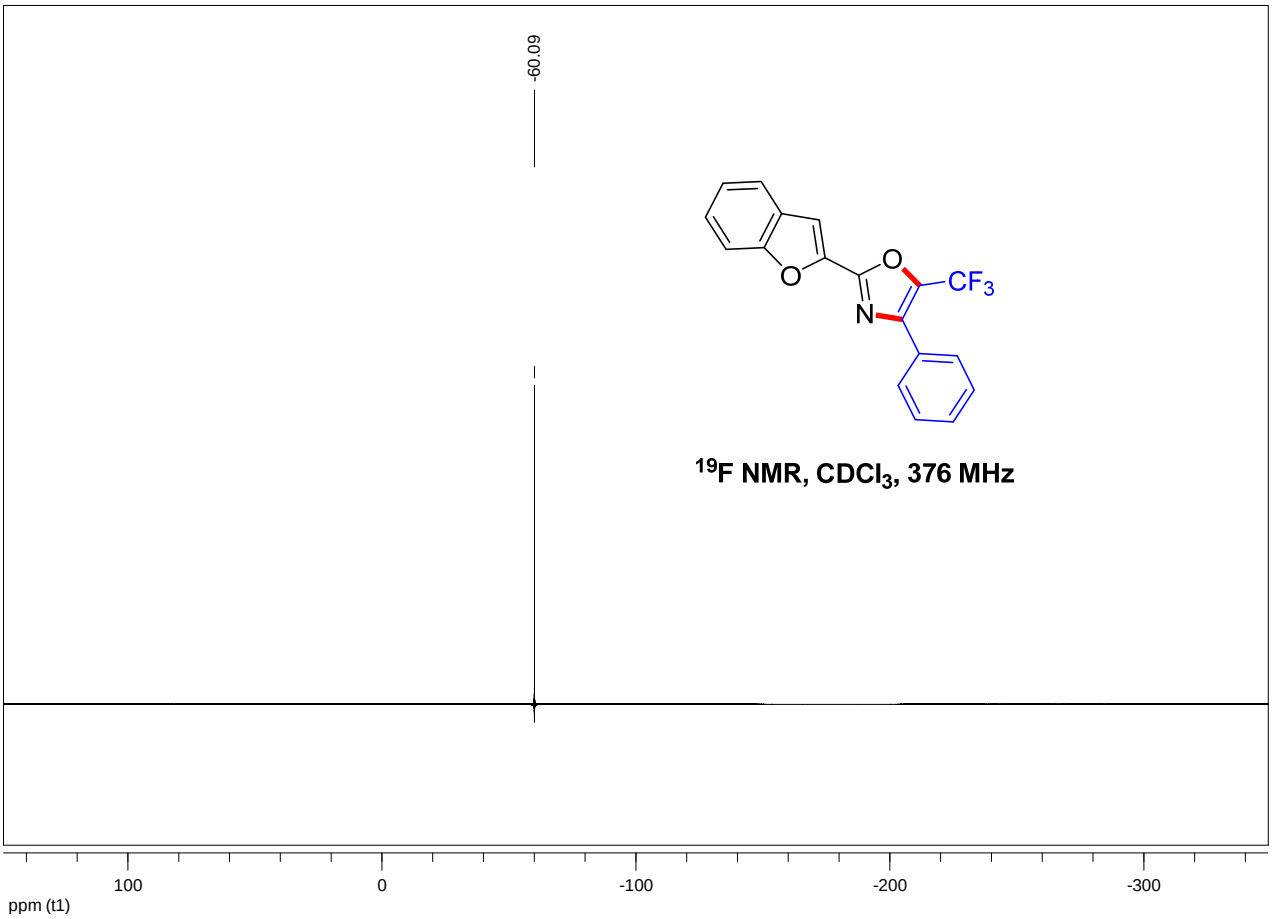


^{19}F NMR, $CDCl_3$, 376 MHz

2-(benzofuran-2-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5w)

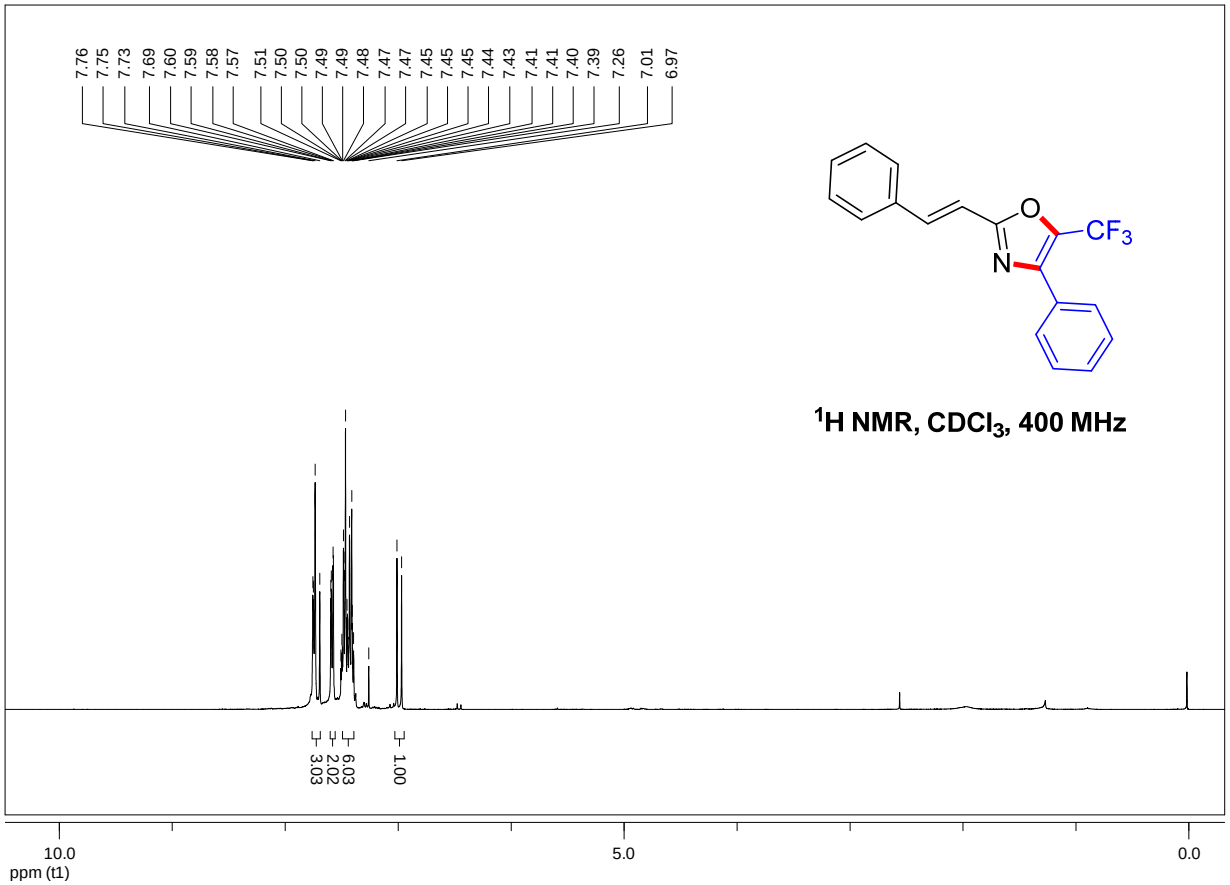


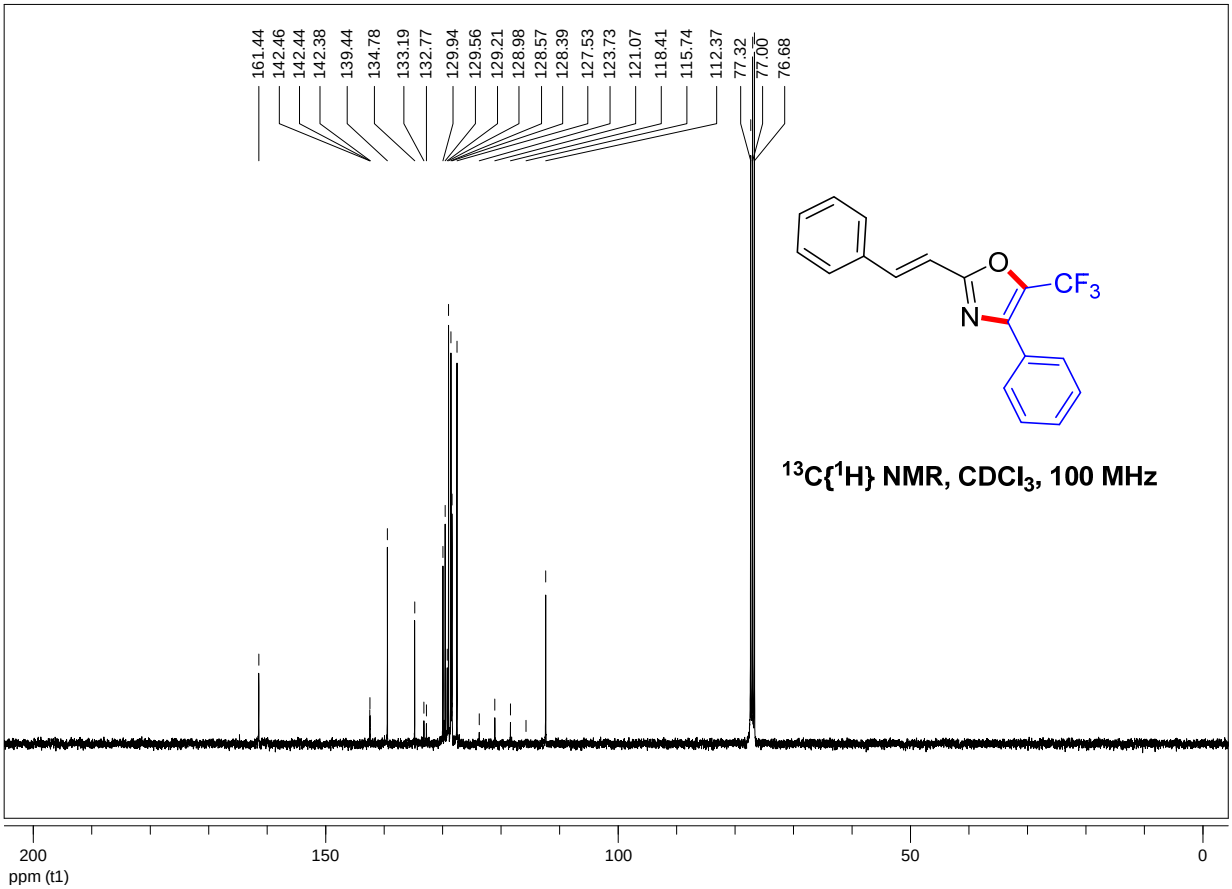


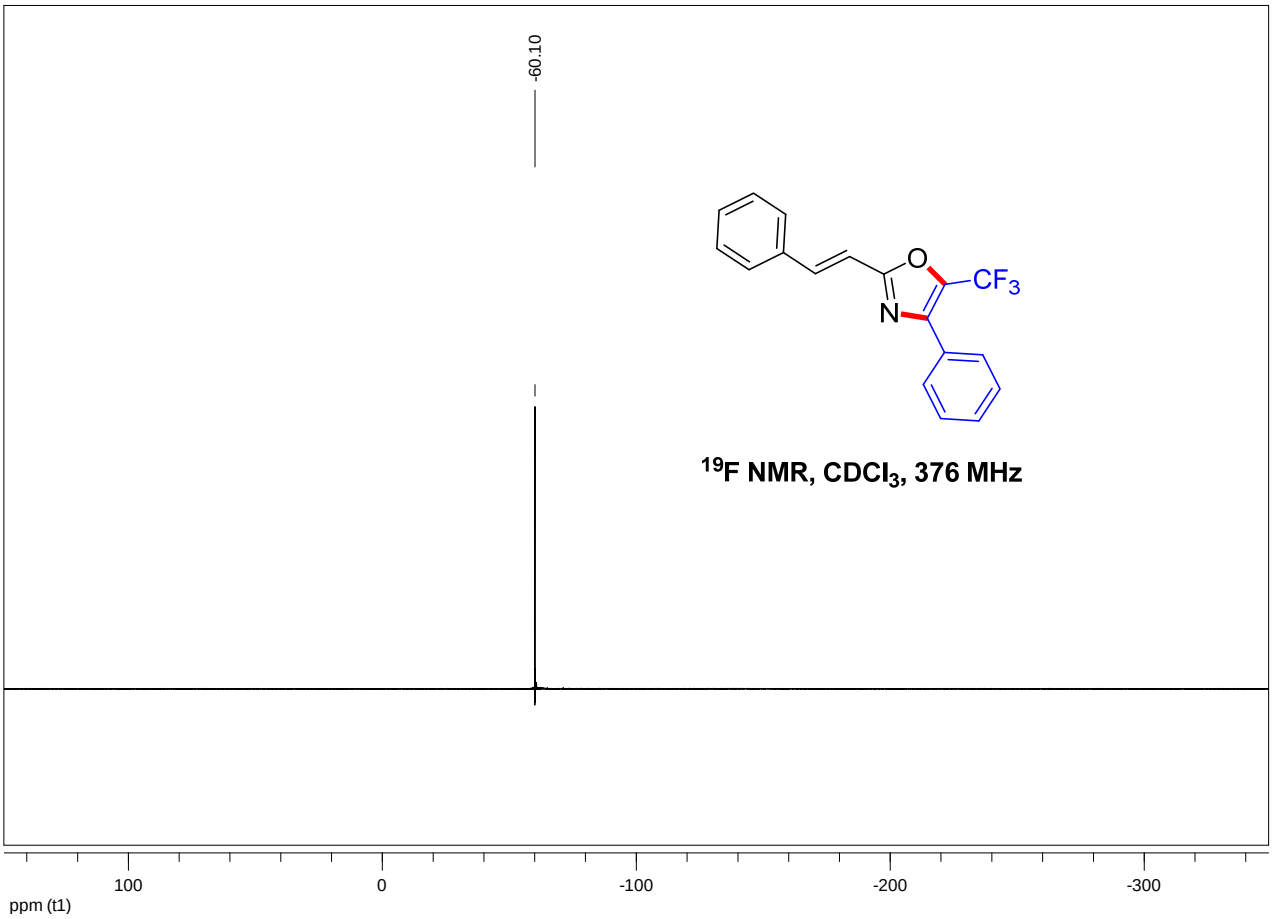


^{19}F NMR, $CDCl_3$, 376 MHz

(*E*)-4-phenyl-2-styryl-5-(trifluoromethyl)oxazole (5x)

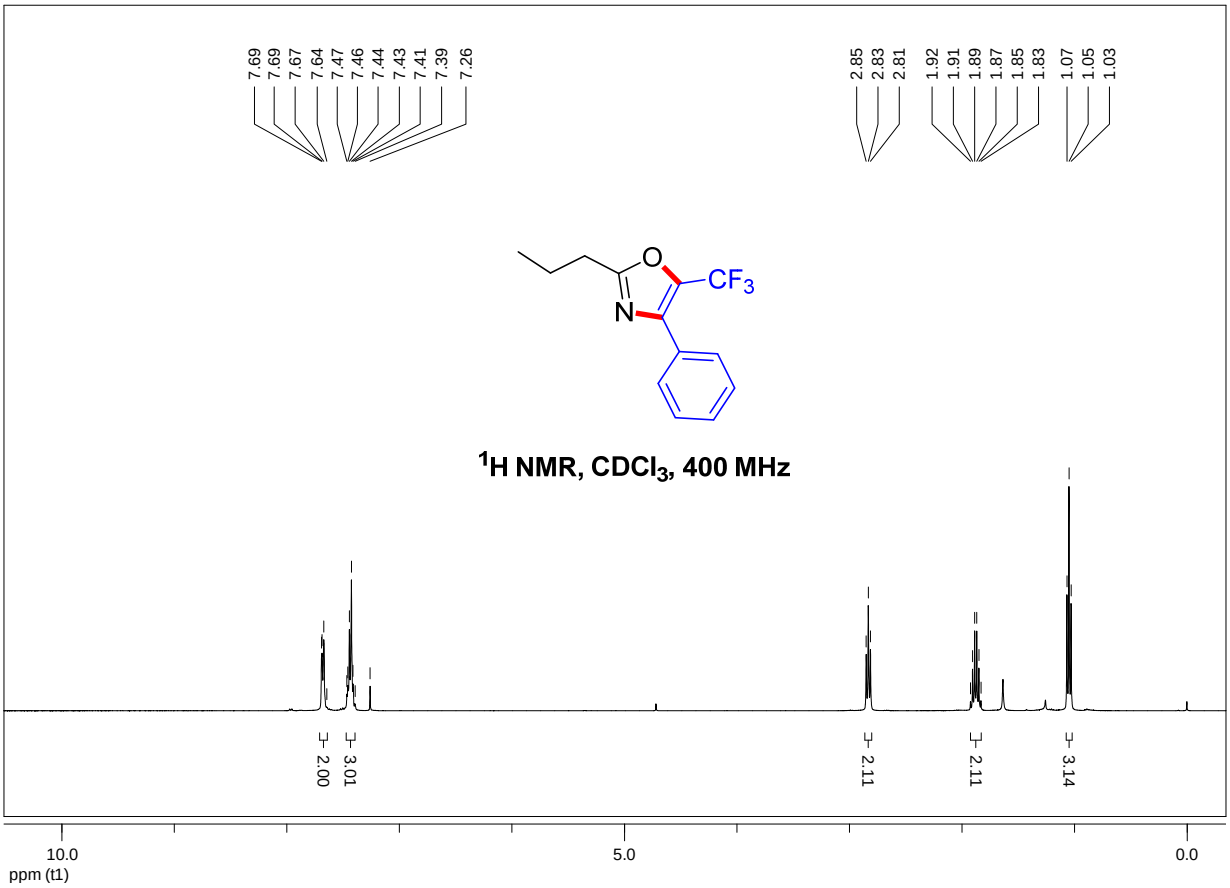


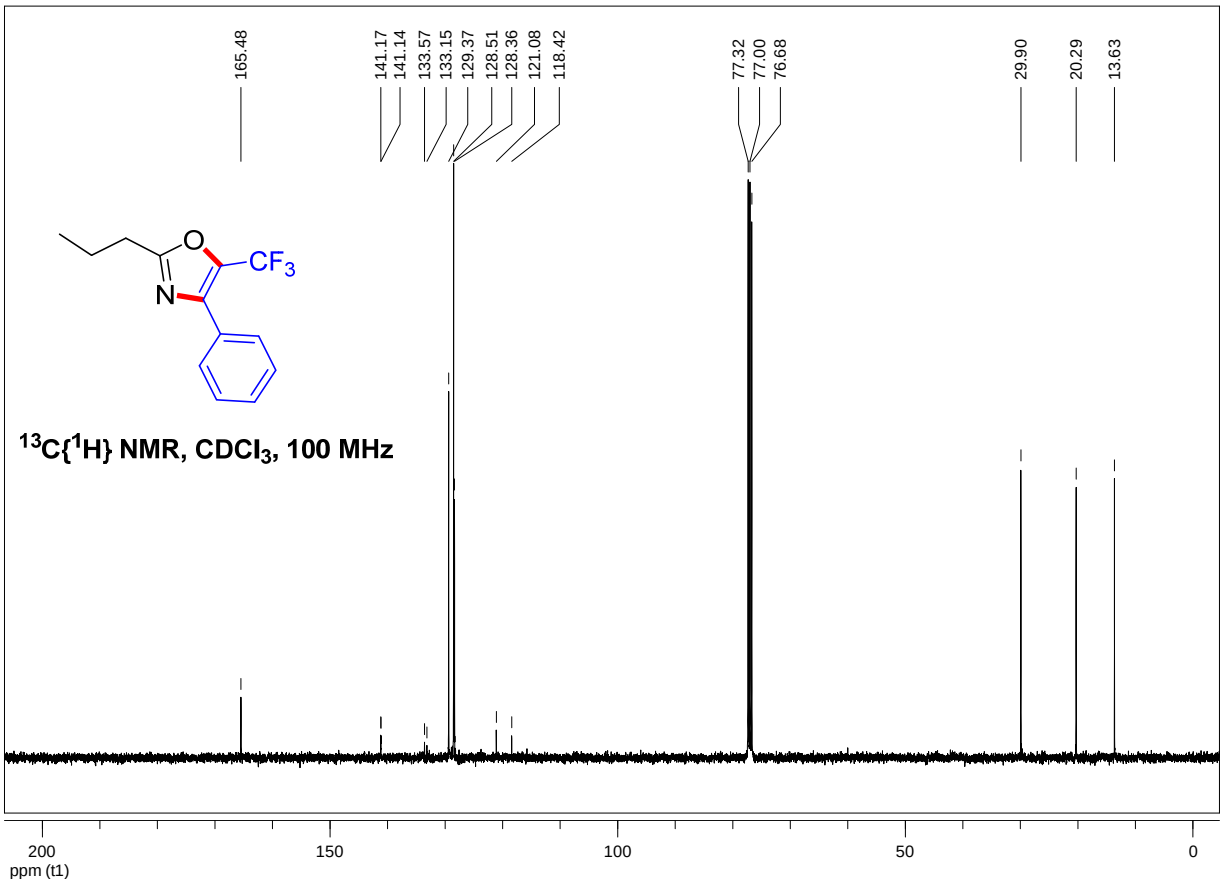


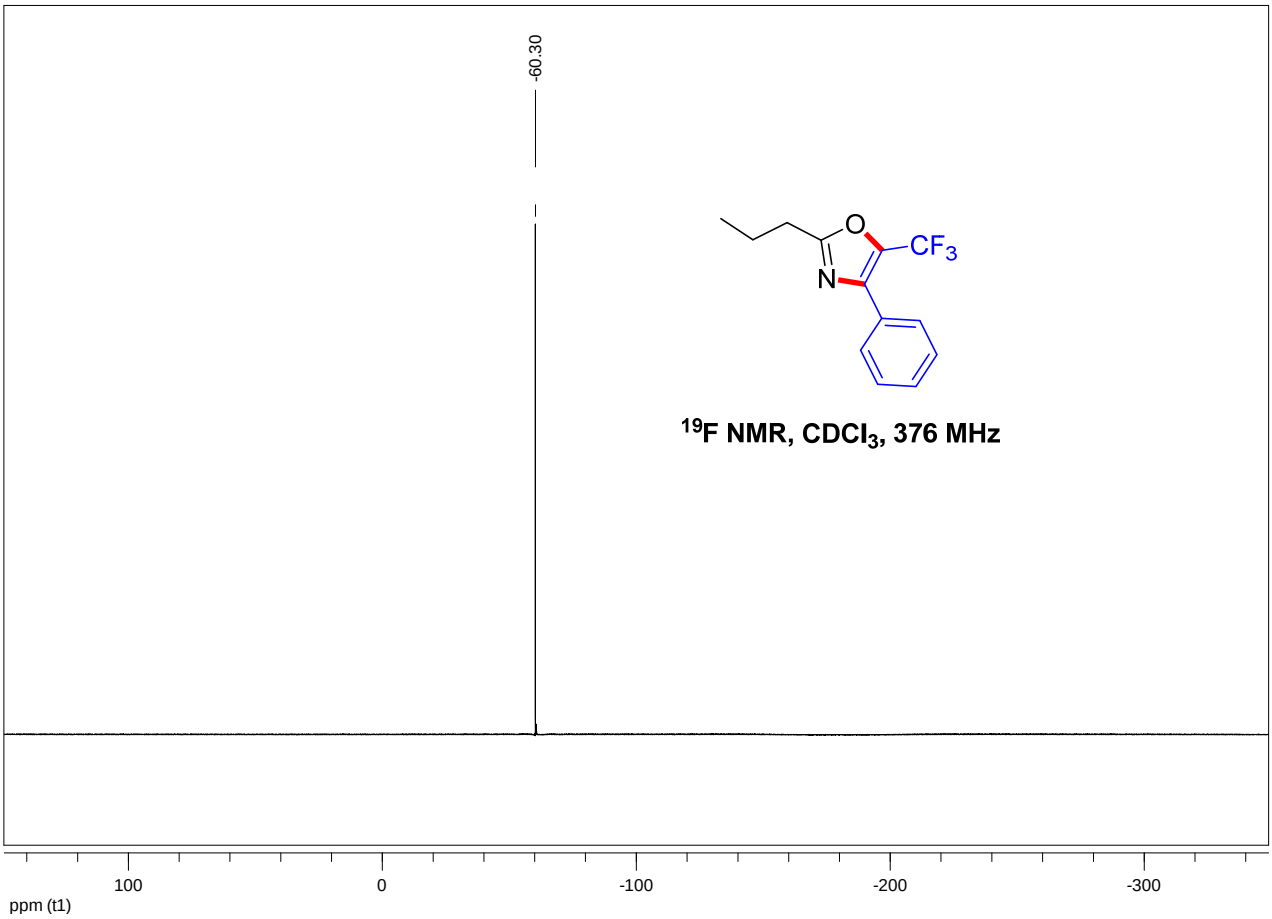


^{19}F NMR, $CDCl_3$, 376 MHz

4-phenyl-2-propyl-5-(trifluoromethyl)oxazole (5y)

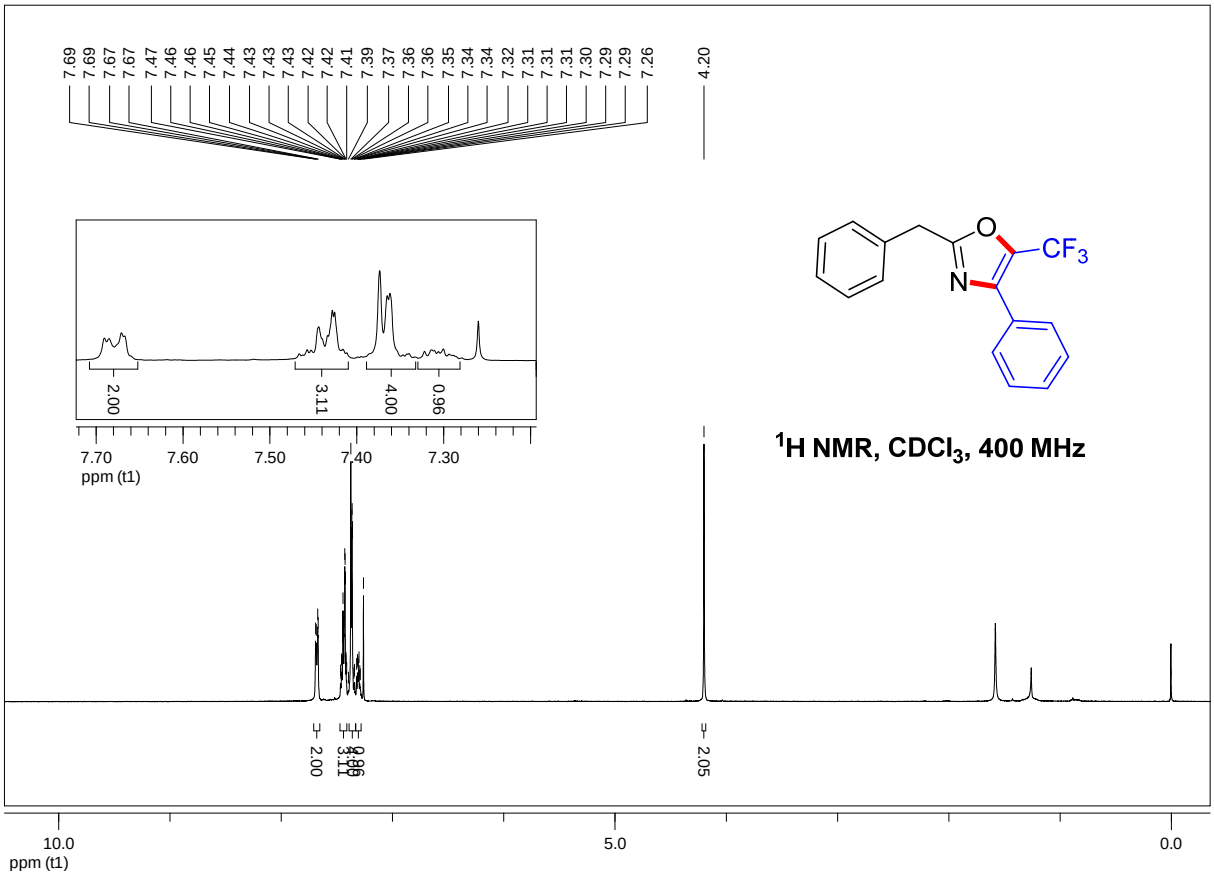


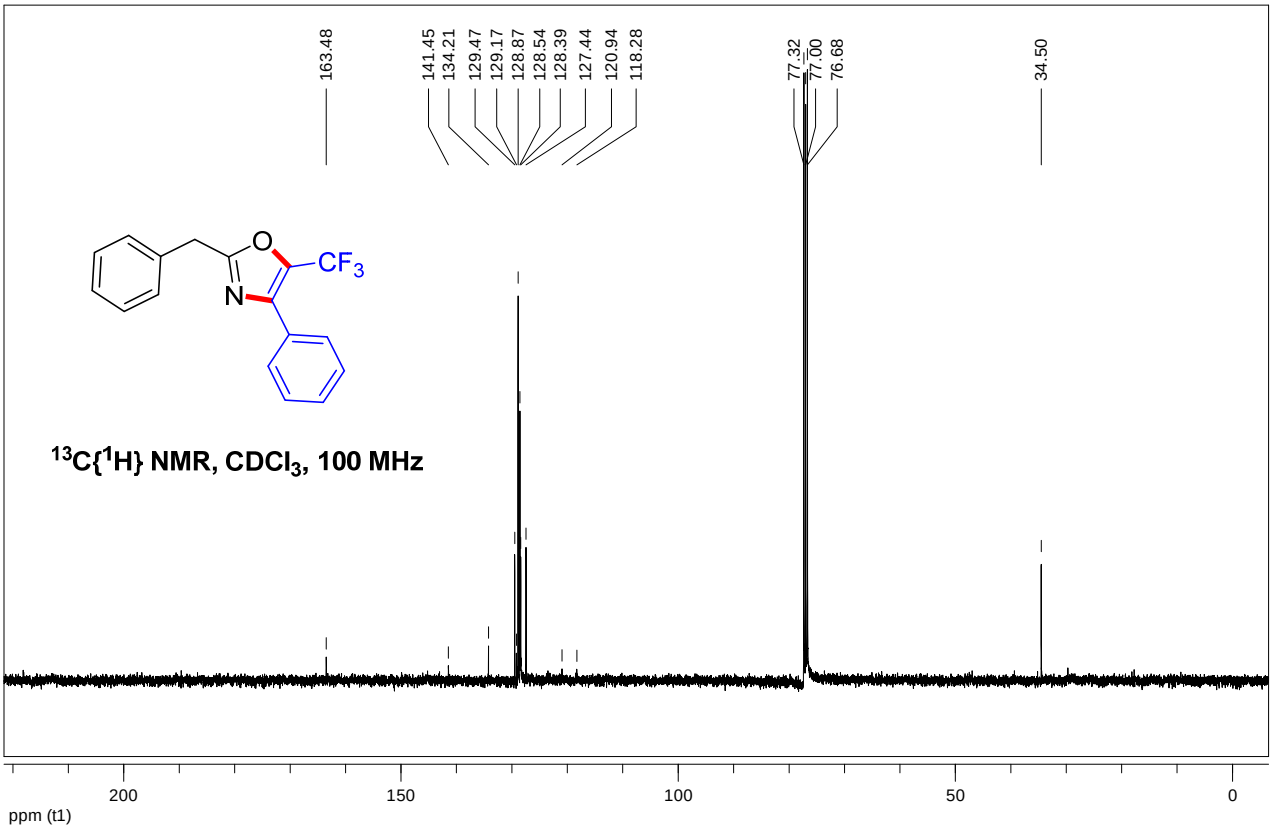


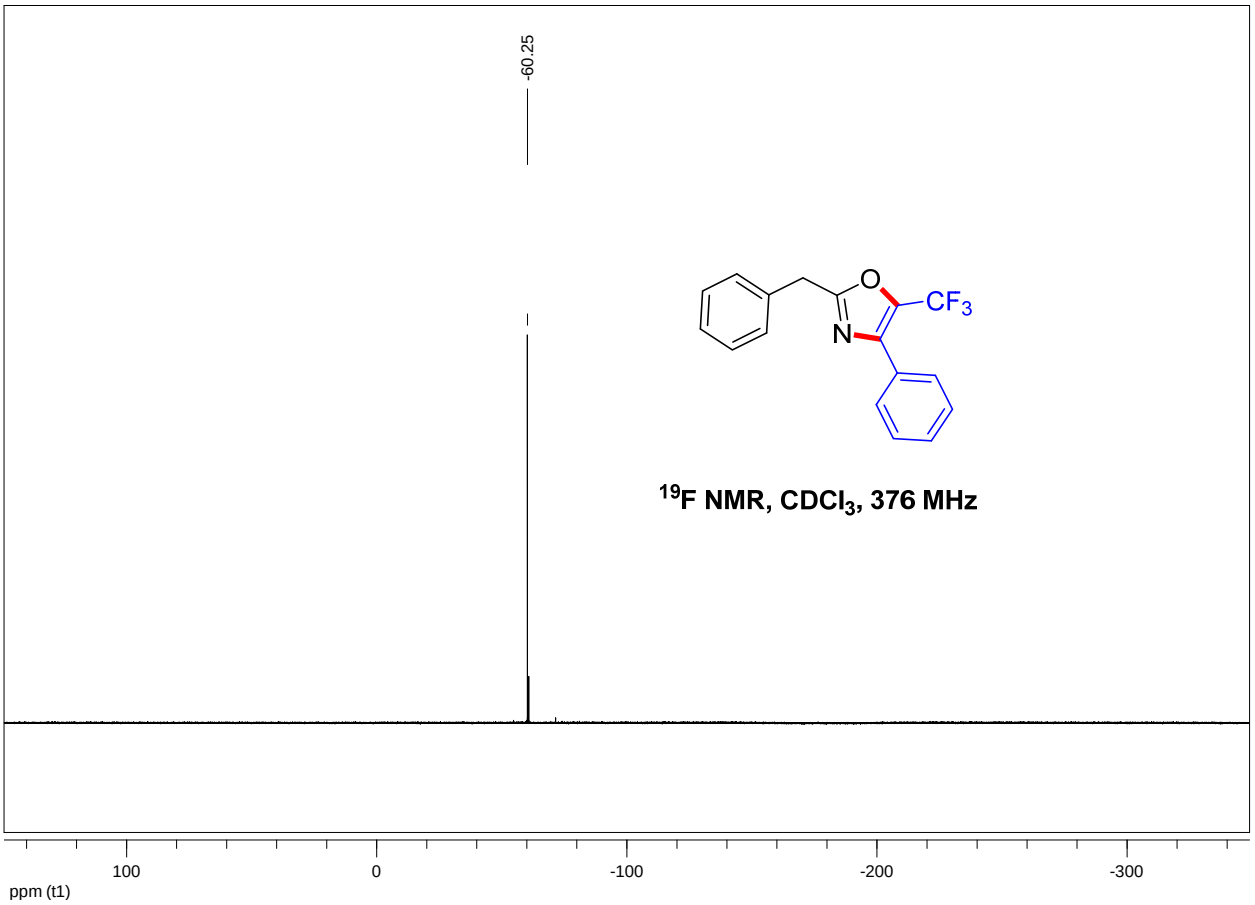


^{19}F NMR, $CDCl_3$, 376 MHz

2-benzyl-4-phenyl-5-(trifluoromethyl)oxazole (5z)

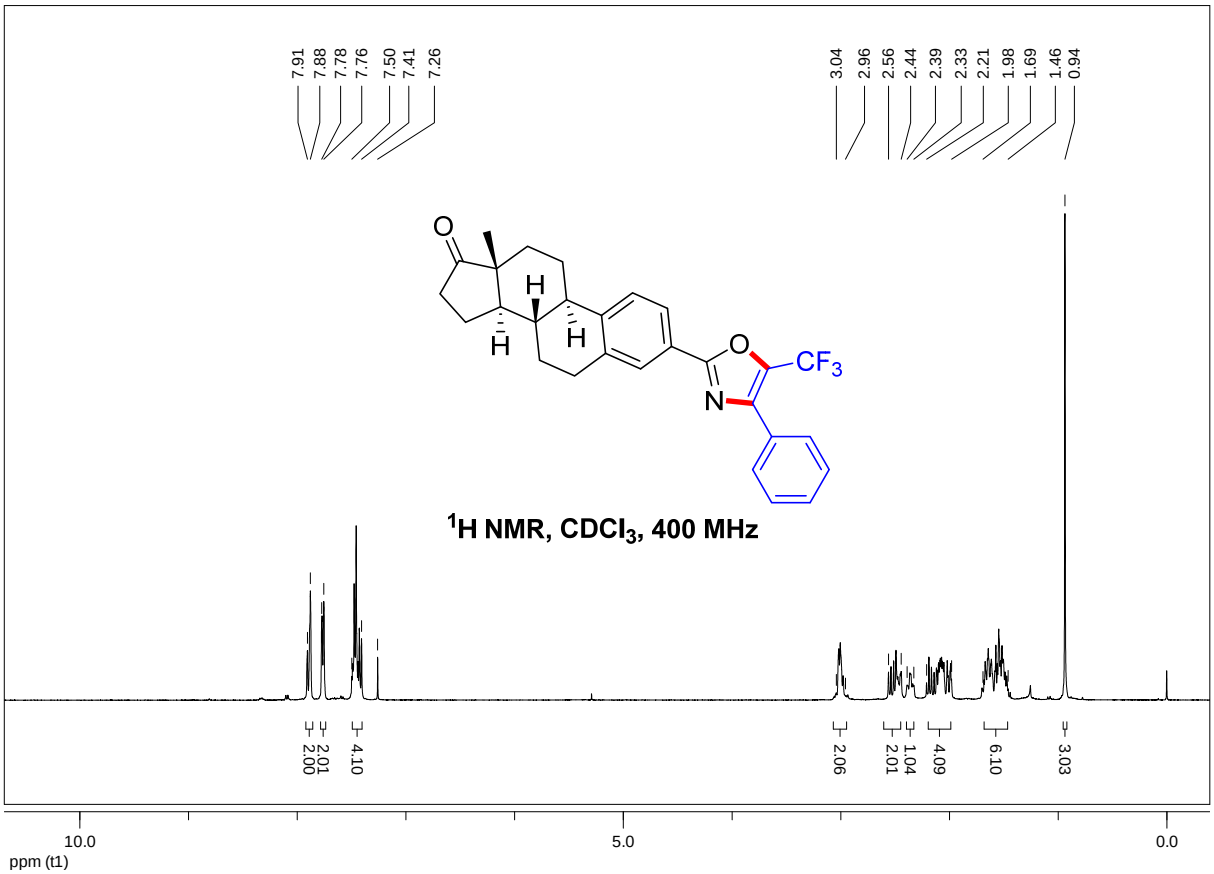


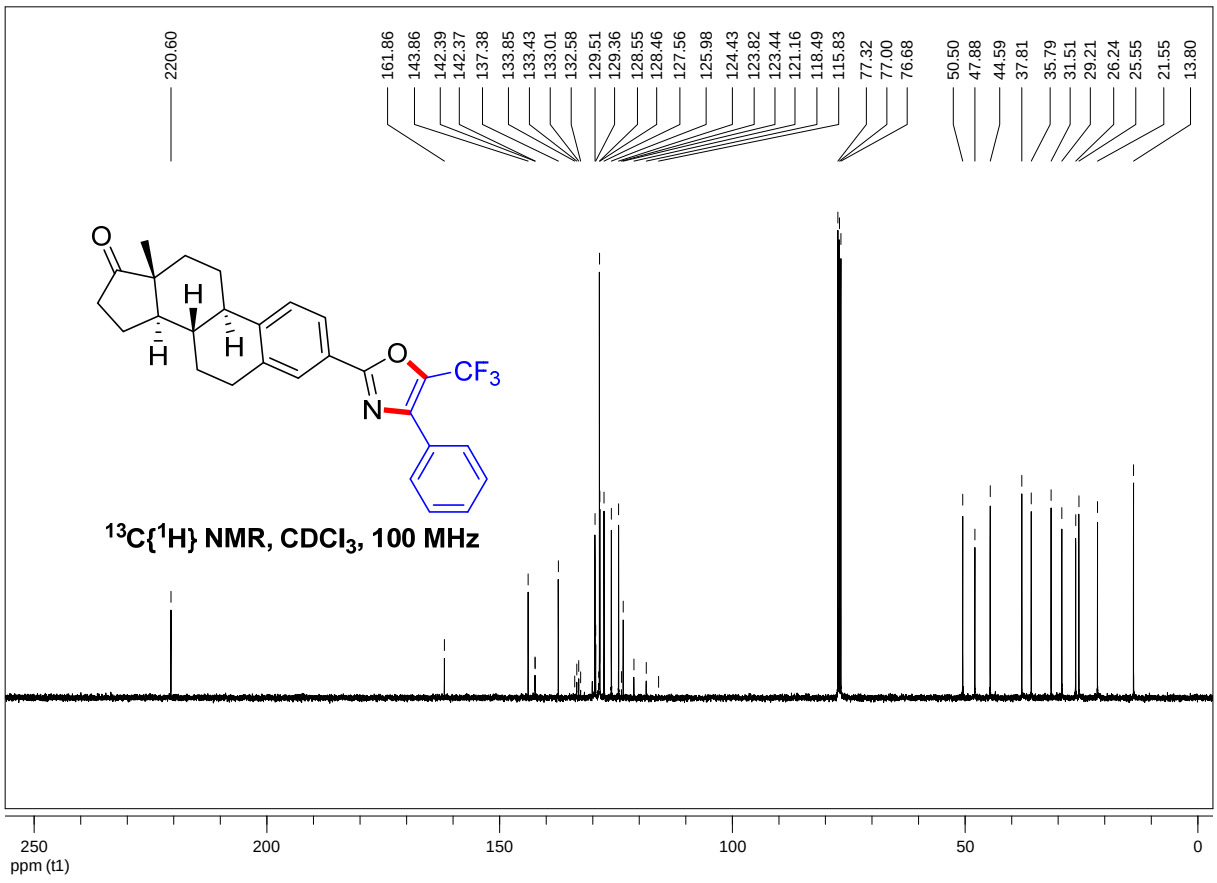


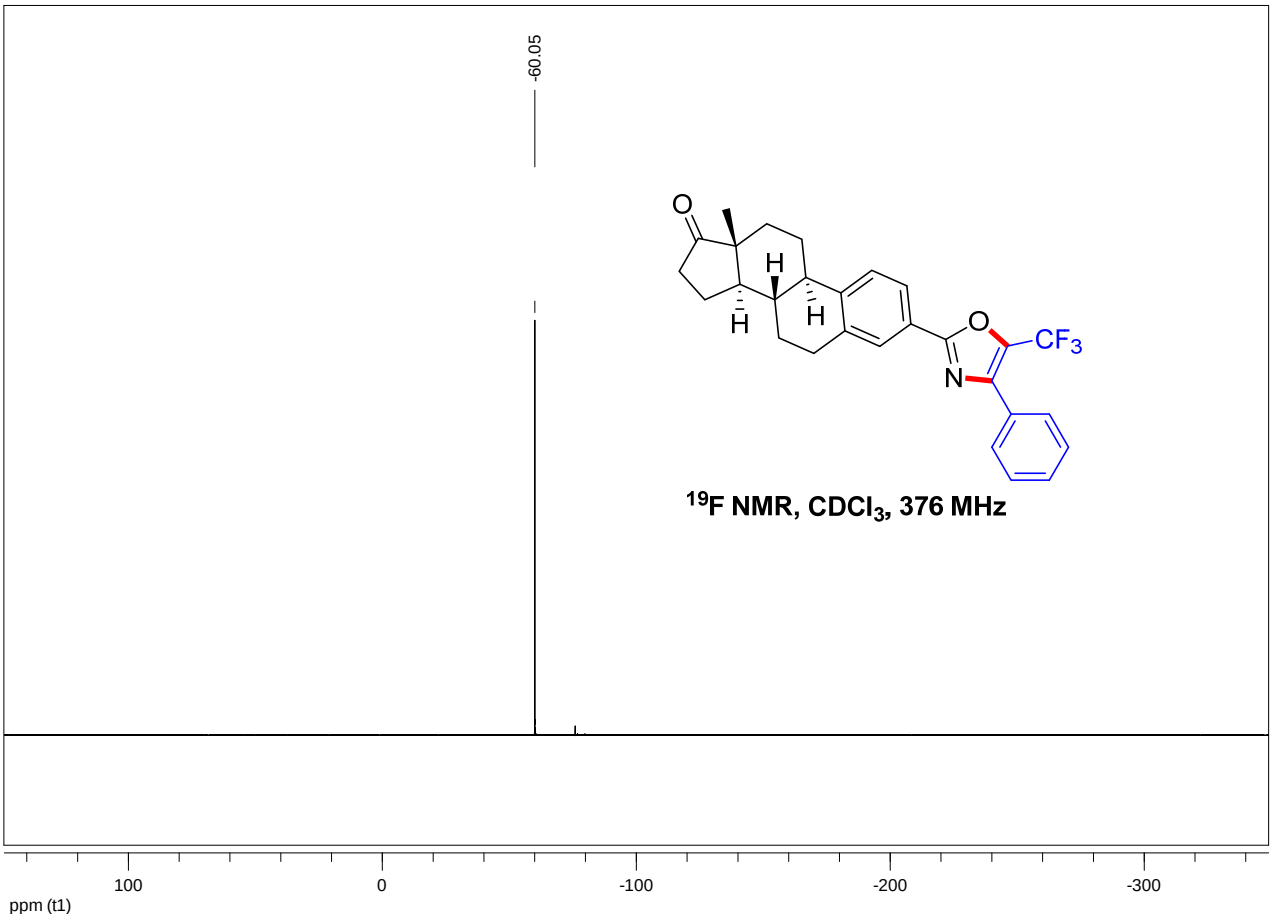


^{19}F NMR, $CDCl_3$, 376 MHz

(8S,9R,13R,14R)-13-methyl-3-(4-phenyl-5-(trifluoromethyl)oxazol-2-yl)-6,7,8,9,11,12,13,14,15,16-decahydro-17H-cyclopenta[a]phenanthren-17-one (5aa)

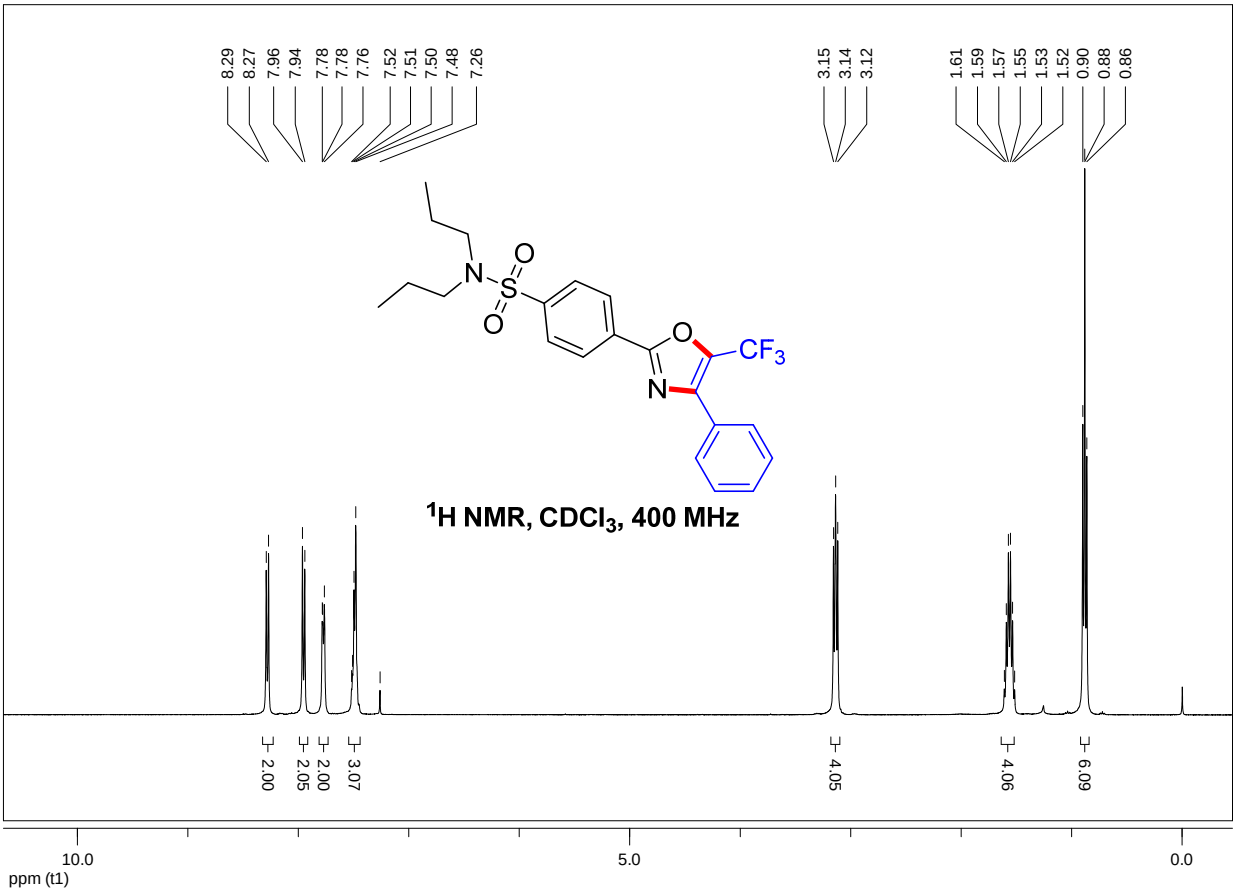


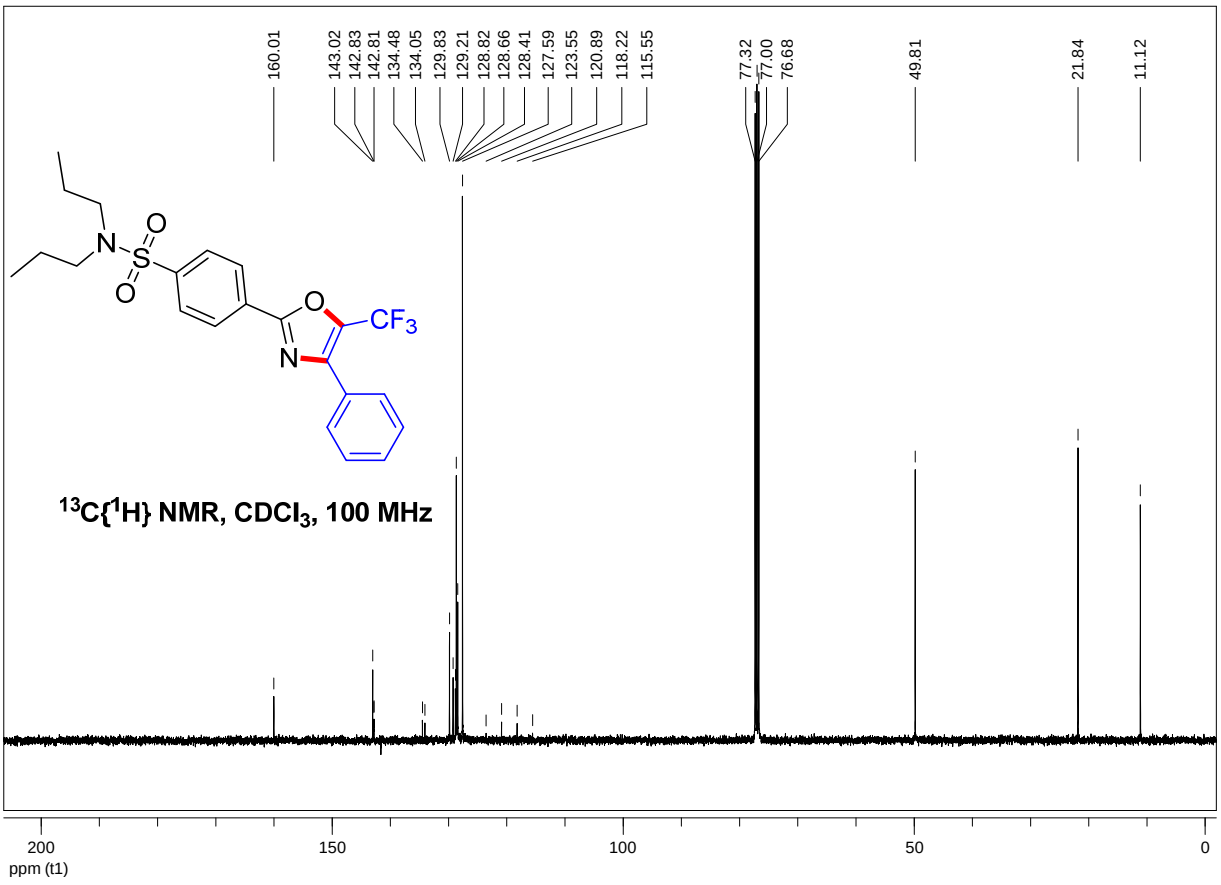


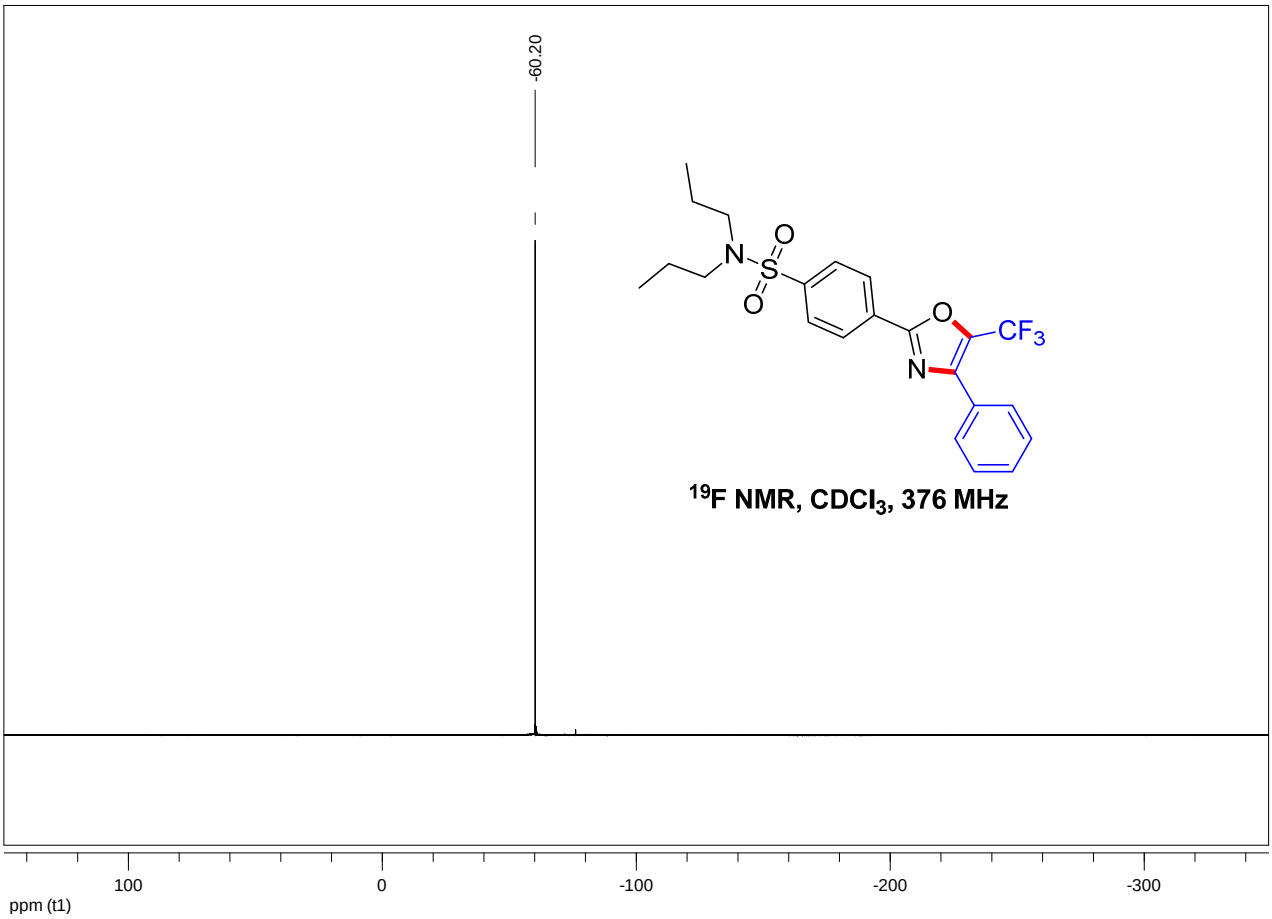


^{19}F NMR, $CDCl_3$, 376 MHz

4-(4-phenyl-5-(trifluoromethyl)oxazol-2-yl)-N,N-dipropylbenzenesulfonamide (5ab)

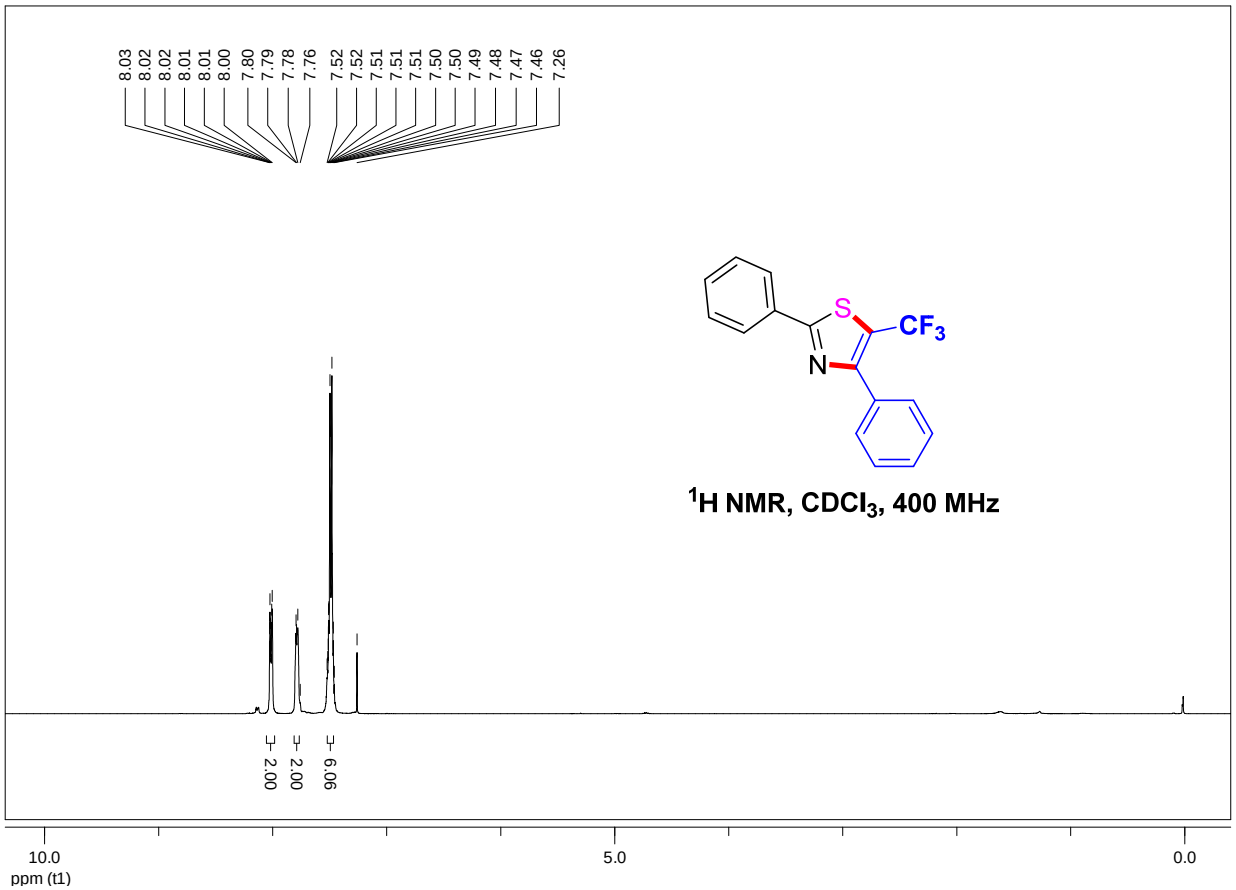


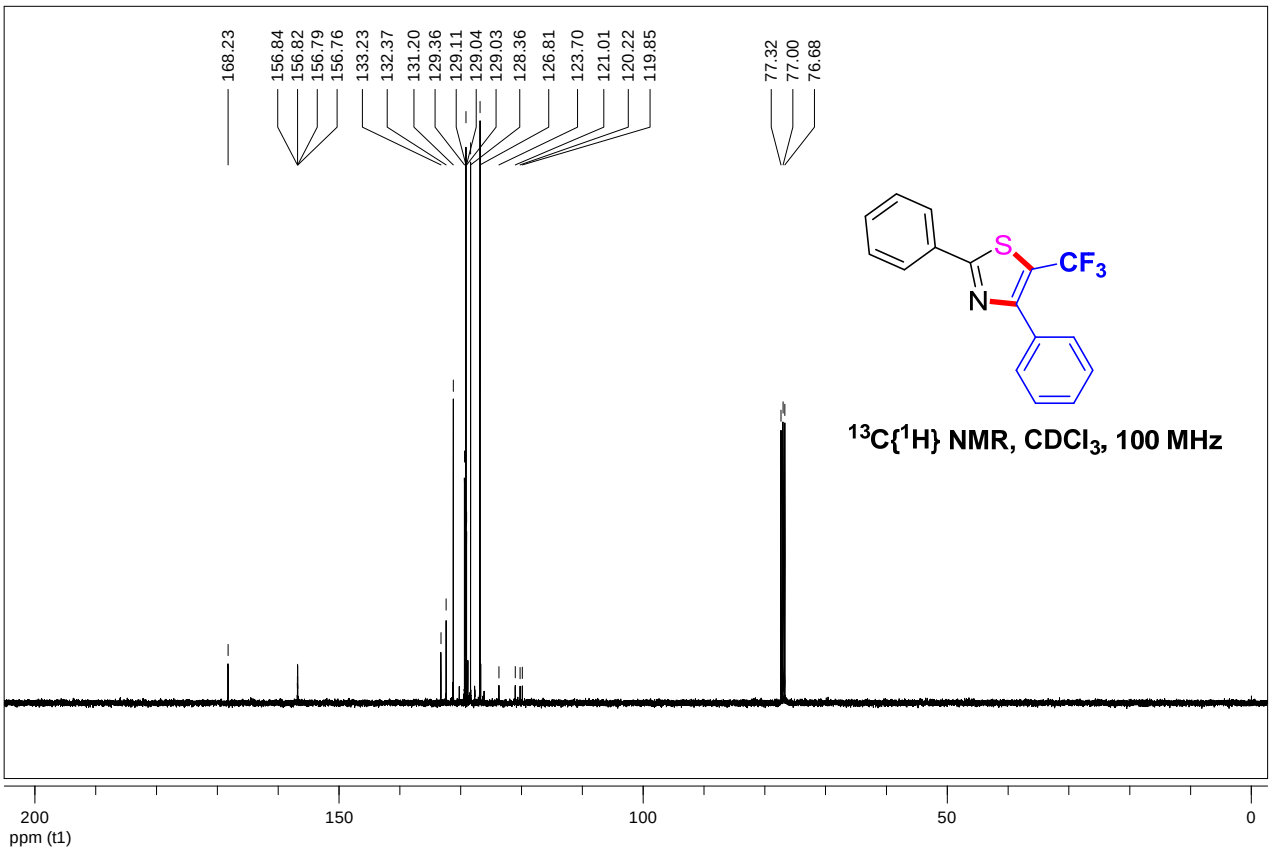


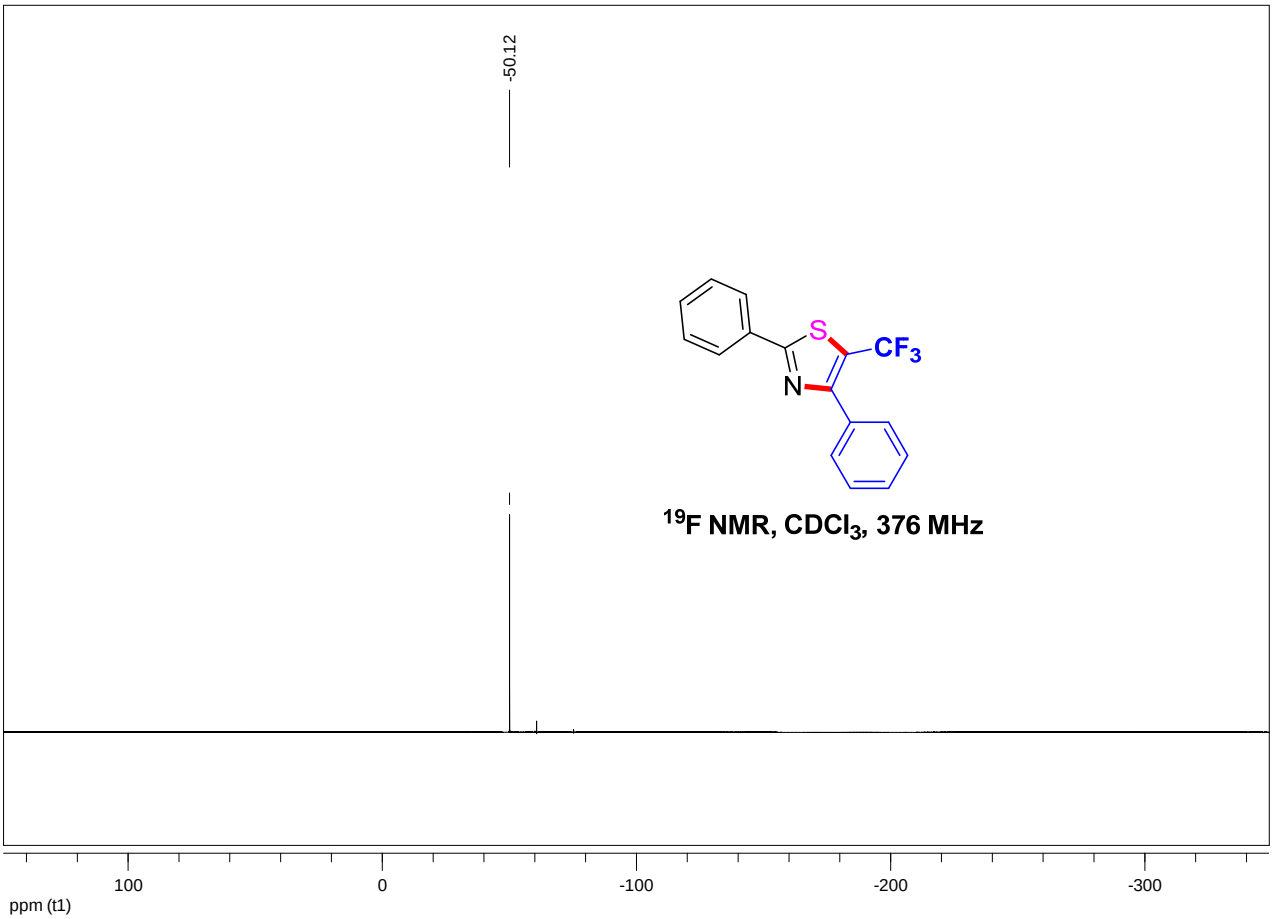


^{19}F NMR, $CDCl_3$, 376 MHz

2,4-diphenyl-5-(trifluoromethyl)thiazole (7a)

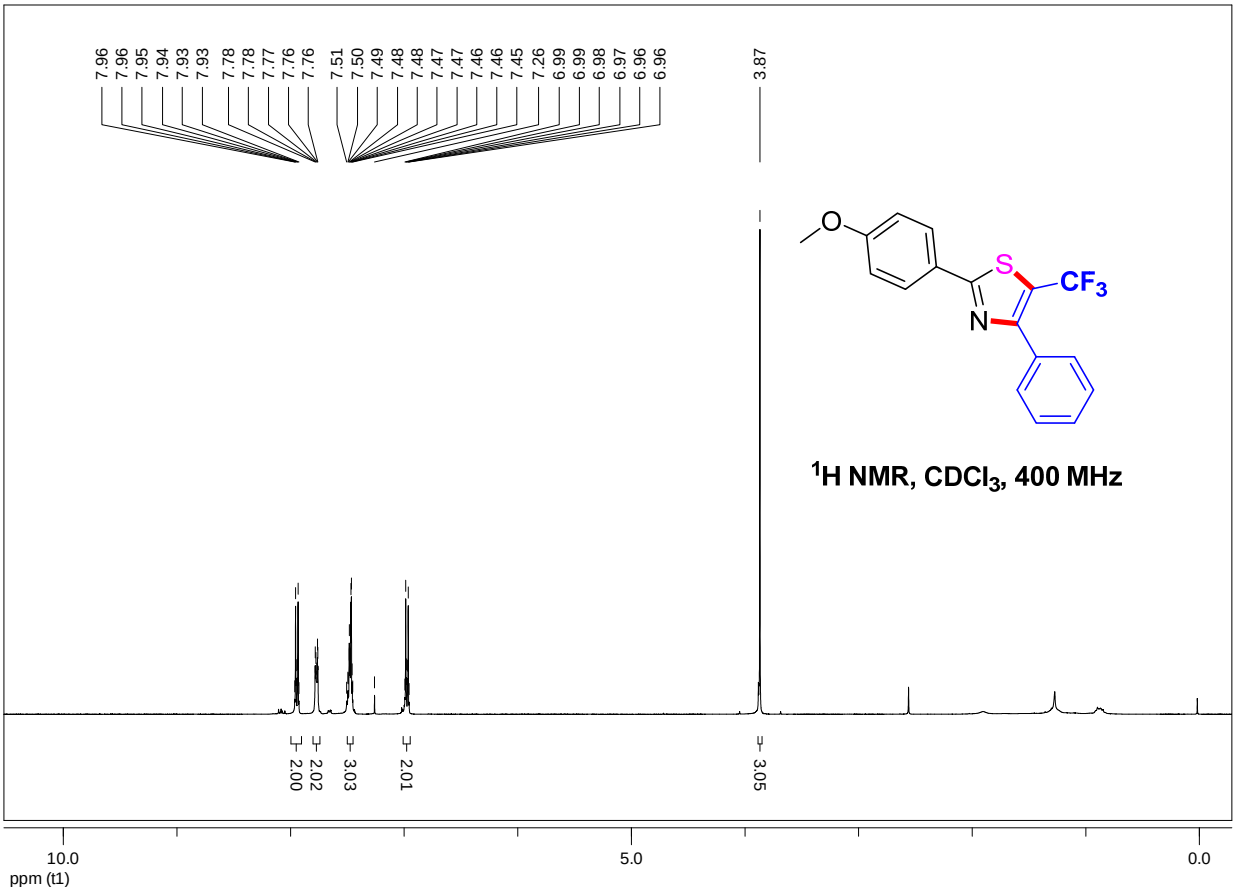


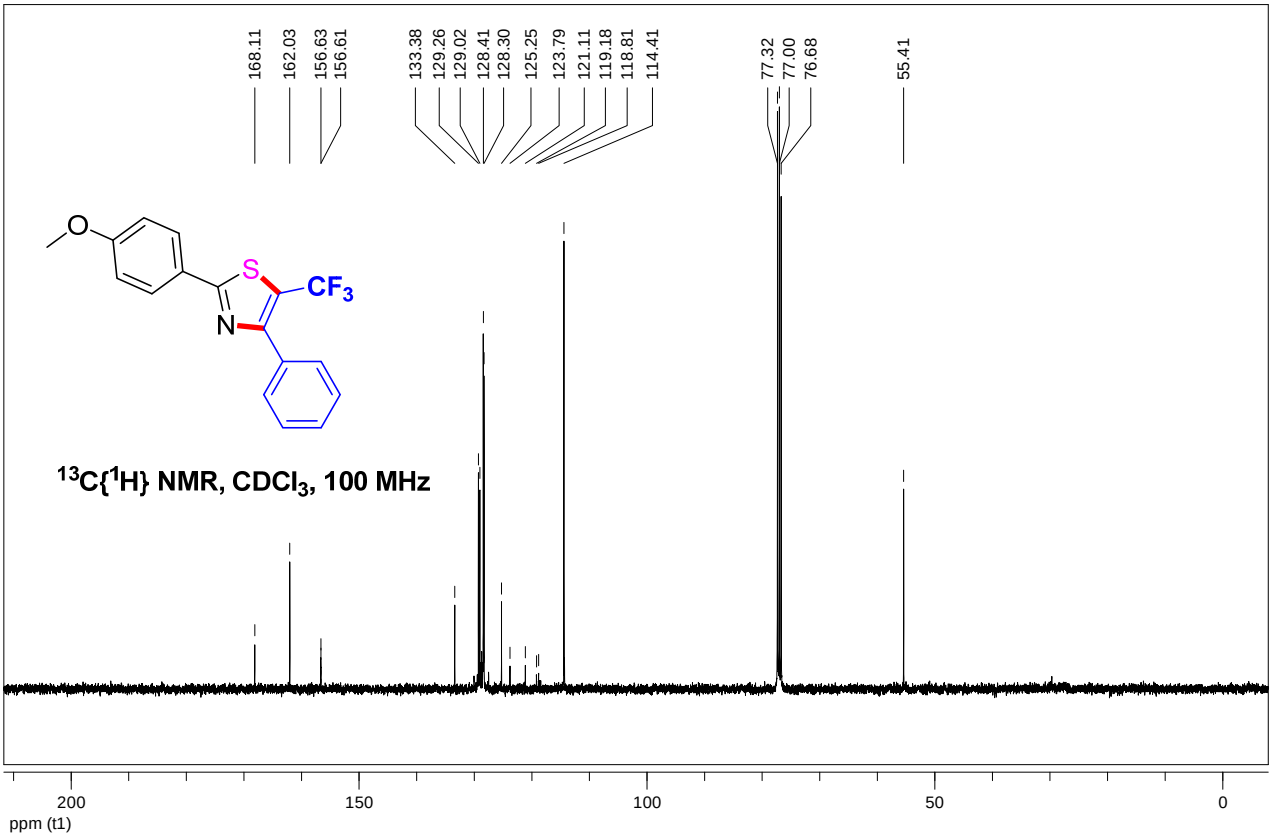


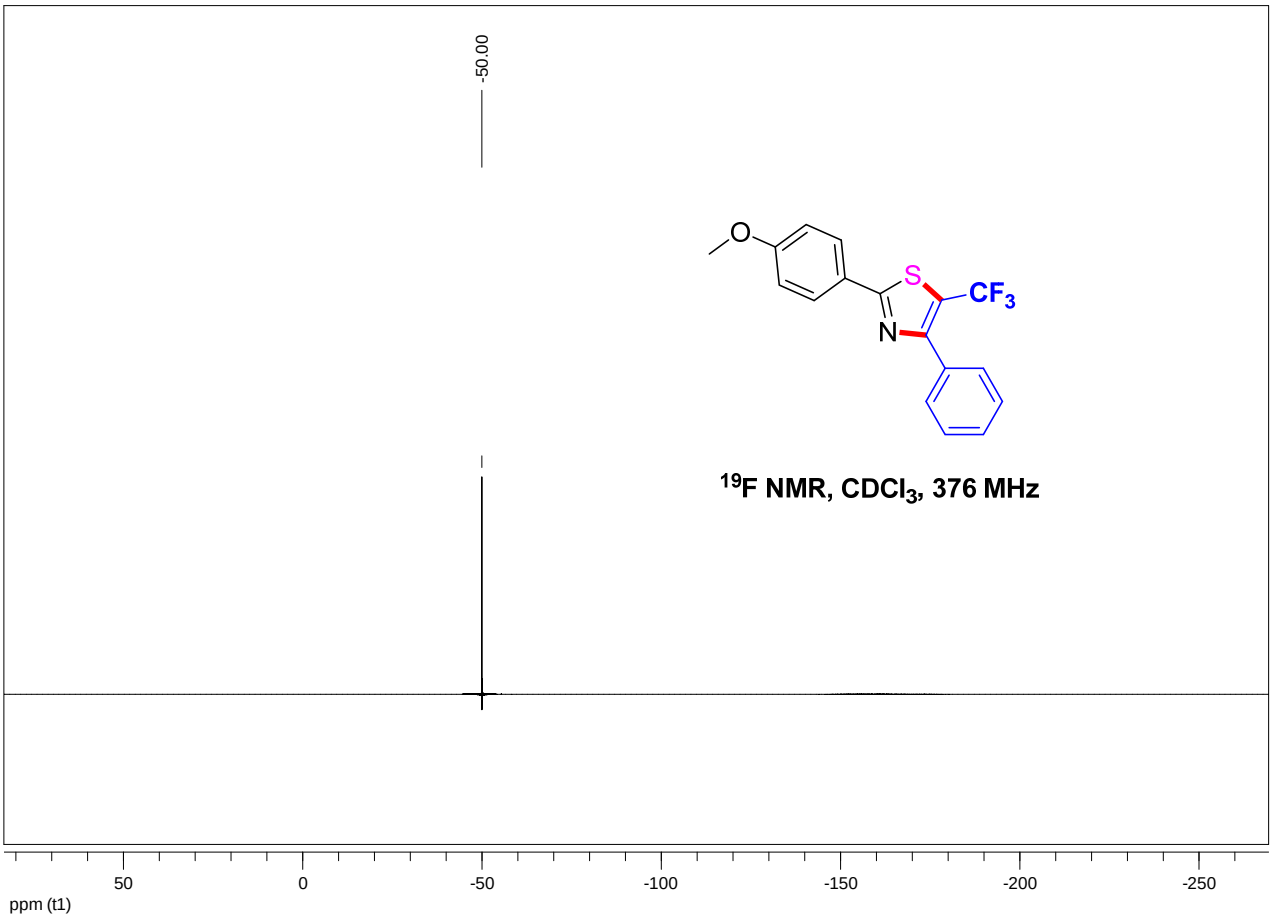


^{19}F NMR, $CDCl_3$, 376 MHz

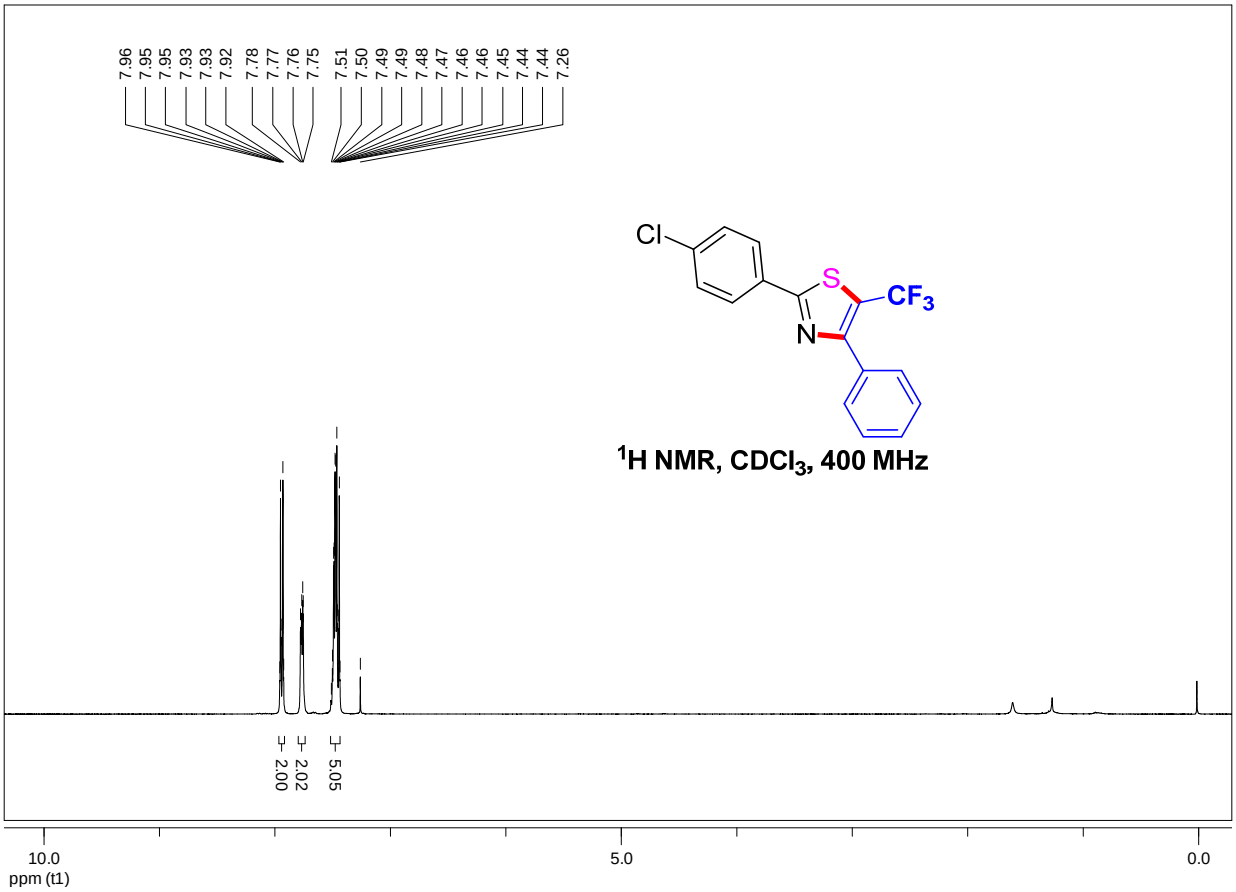
2-(4-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)thiazole (7b)

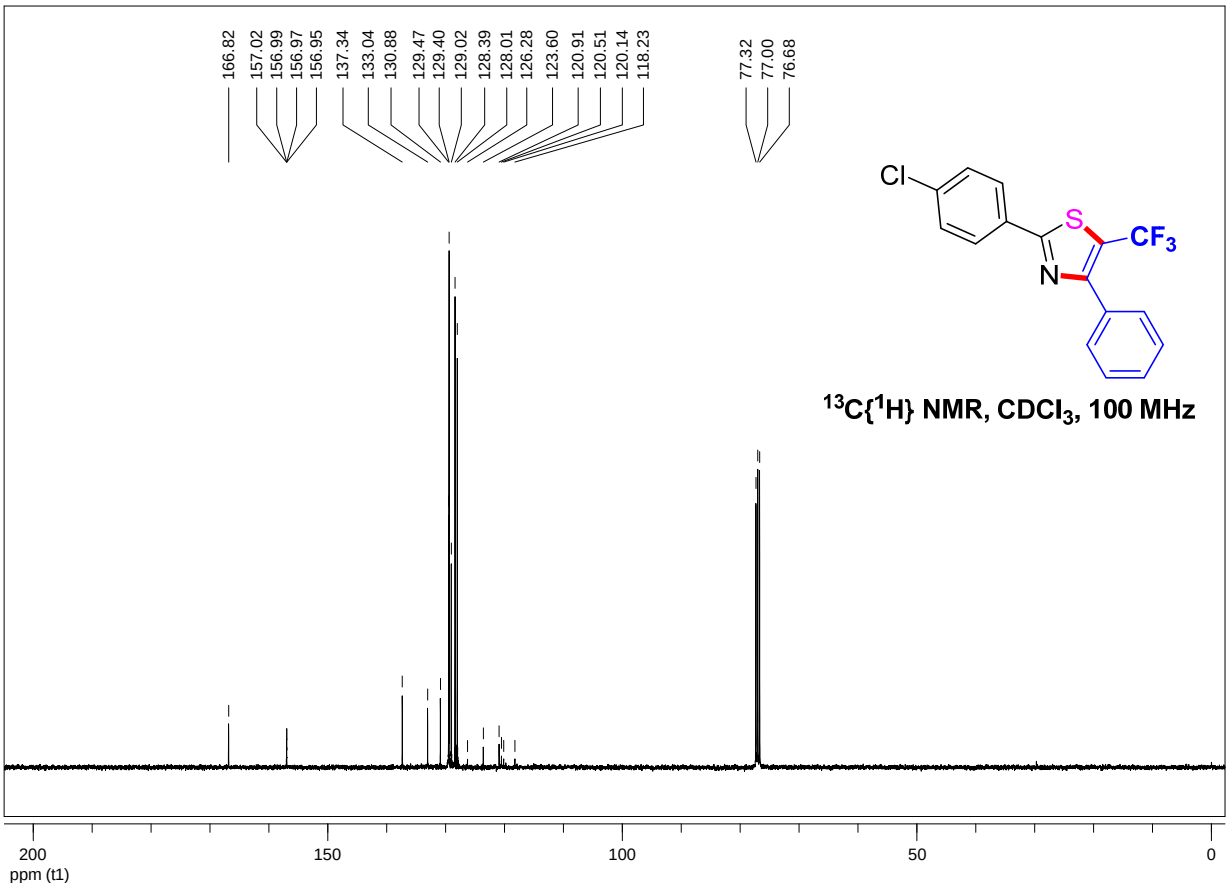


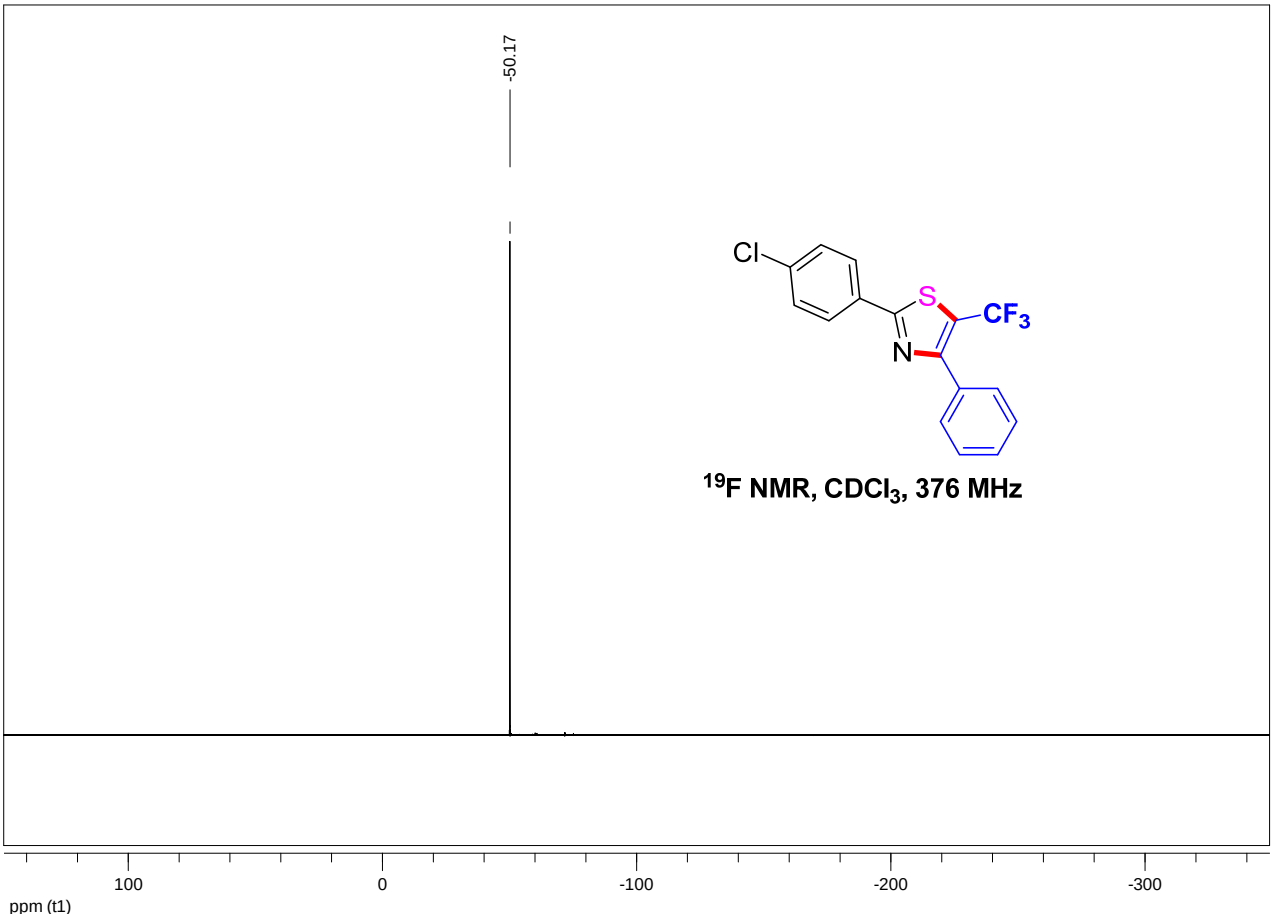



-50.00
O
S
N
CF3
19F NMR, CDCl3, 376 MHz
50
0
-50
-100
-150
-200
-250
ppm (t1)

2-(4-chlorophenyl)-4-phenyl-5-(trifluoromethyl)thiazole (7c)

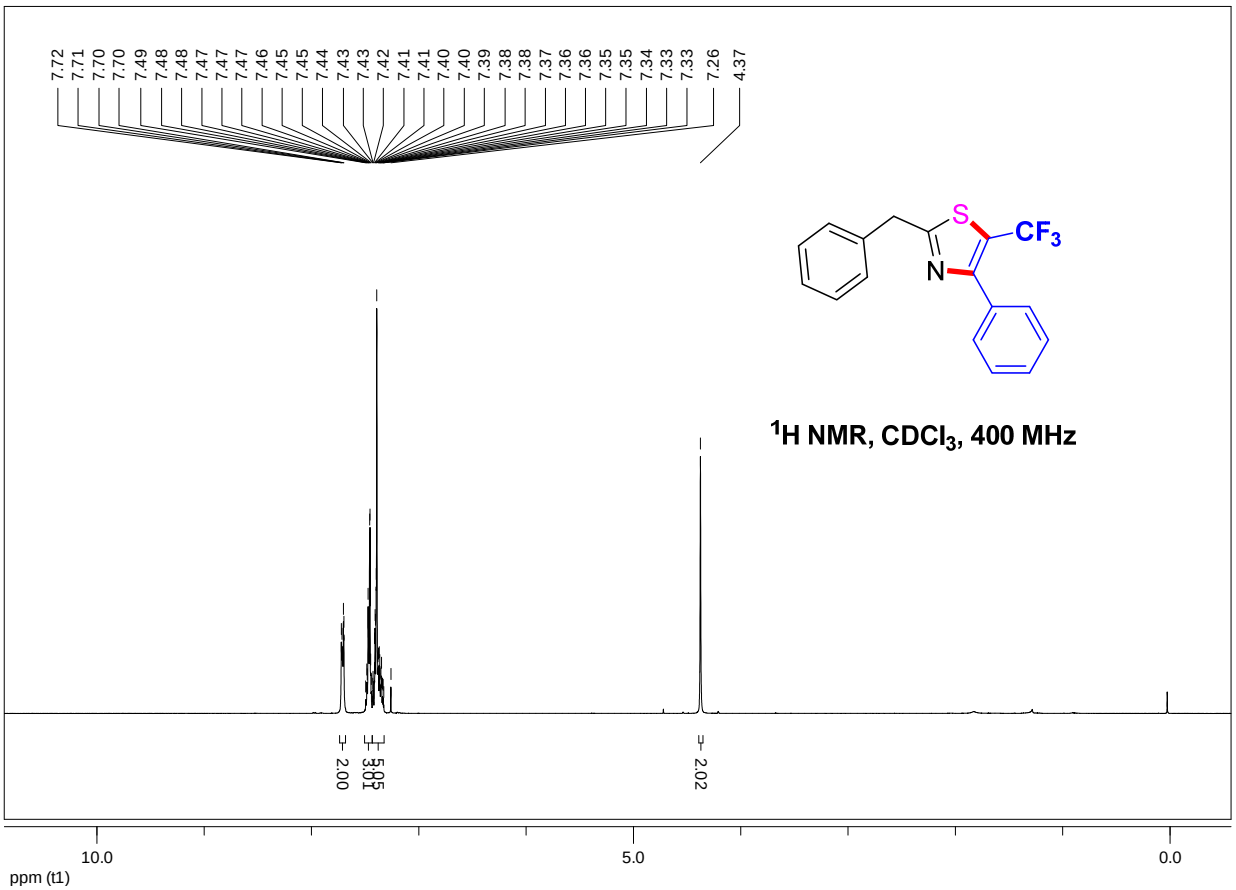


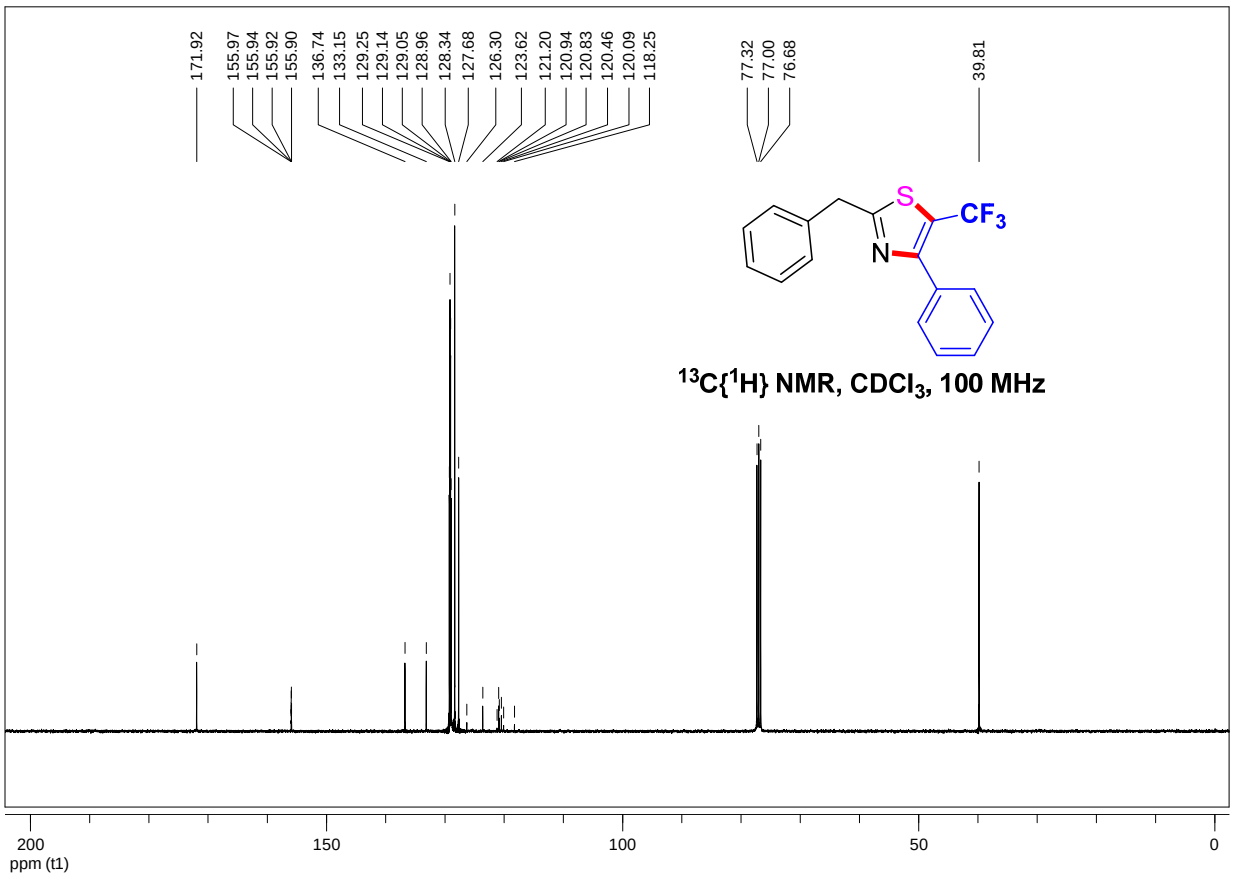


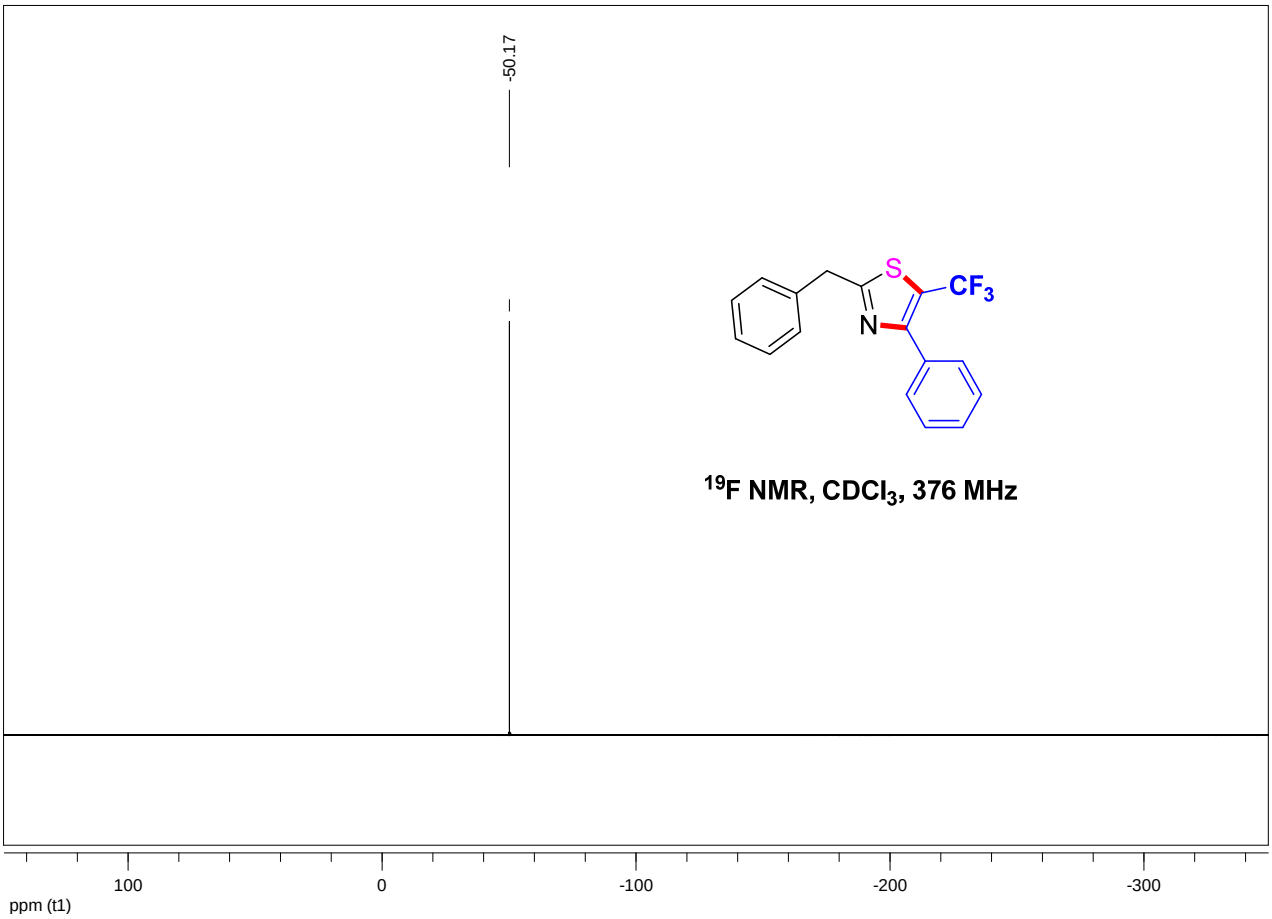


^{19}F NMR, $CDCl_3$, 376 MHz

2-benzyl-4-phenyl-5-(trifluoromethyl)thiazole (7d)

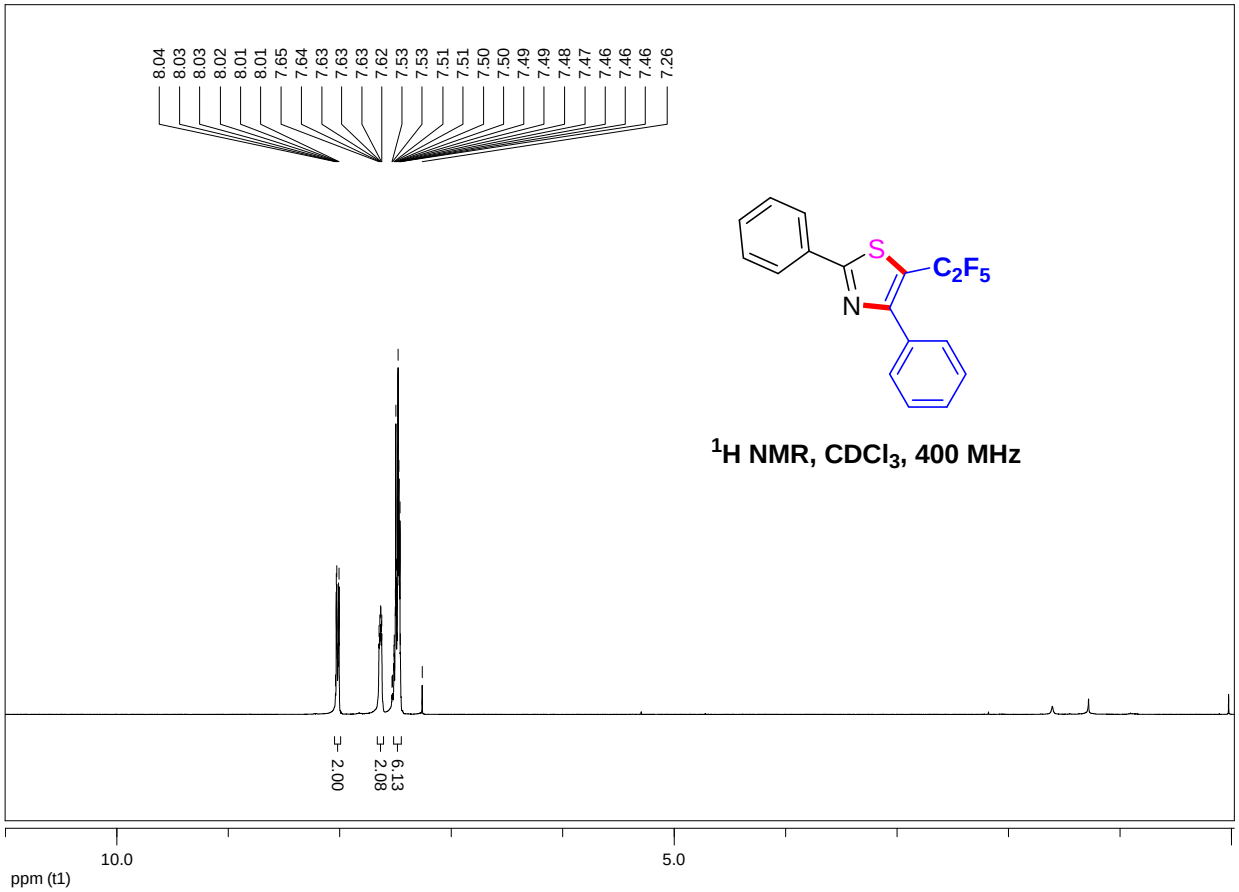




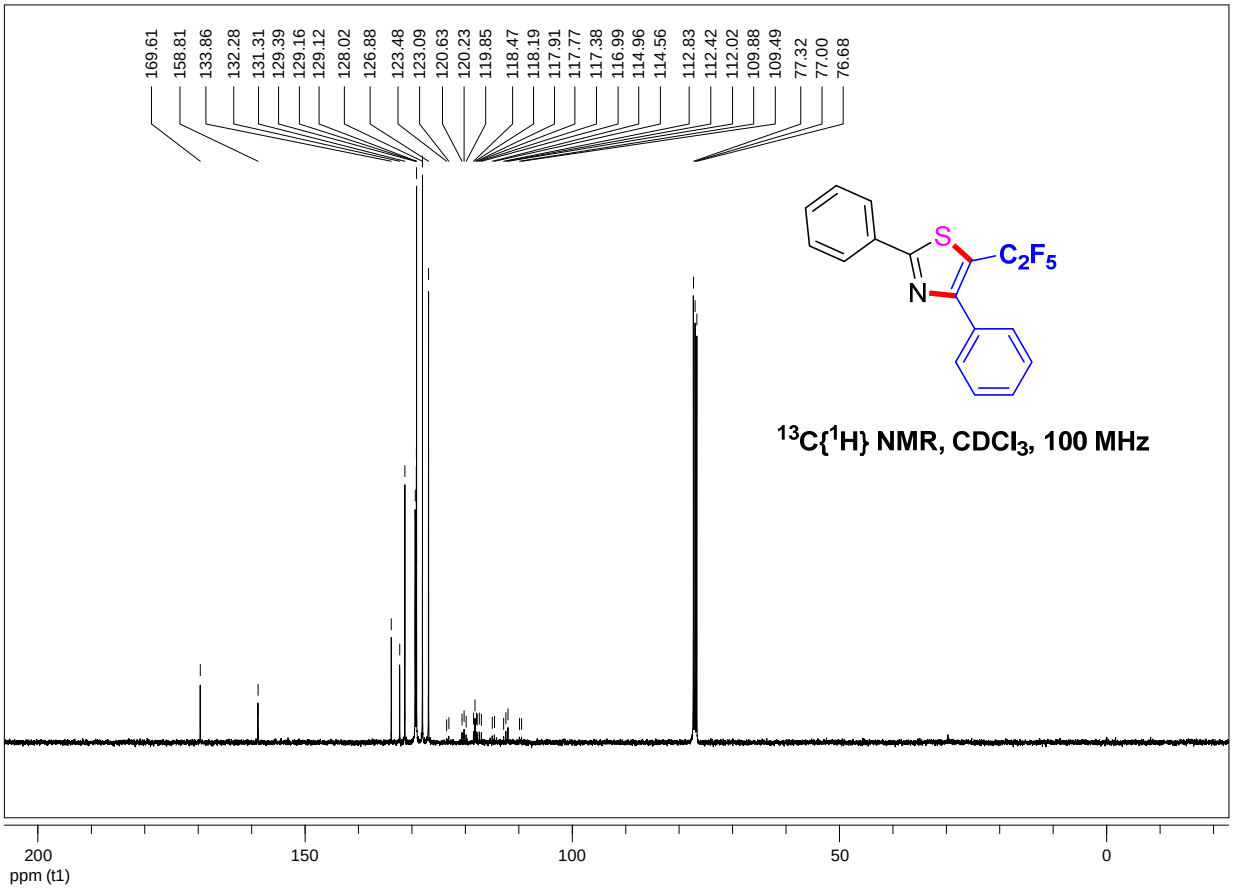


^{19}F NMR, $CDCl_3$, 376 MHz

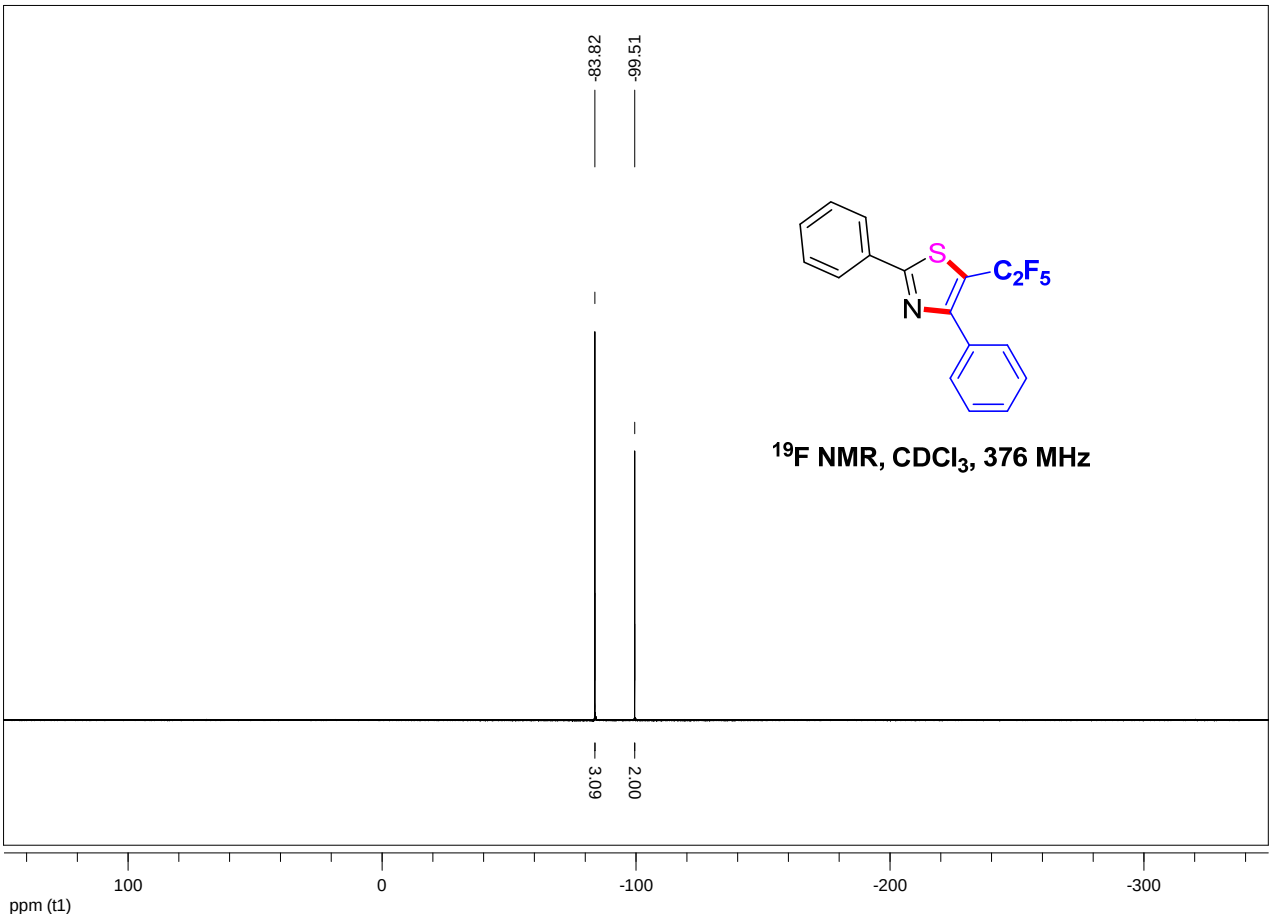
5-(perfluoroethyl)-2,4-diphenylthiazole (7e)



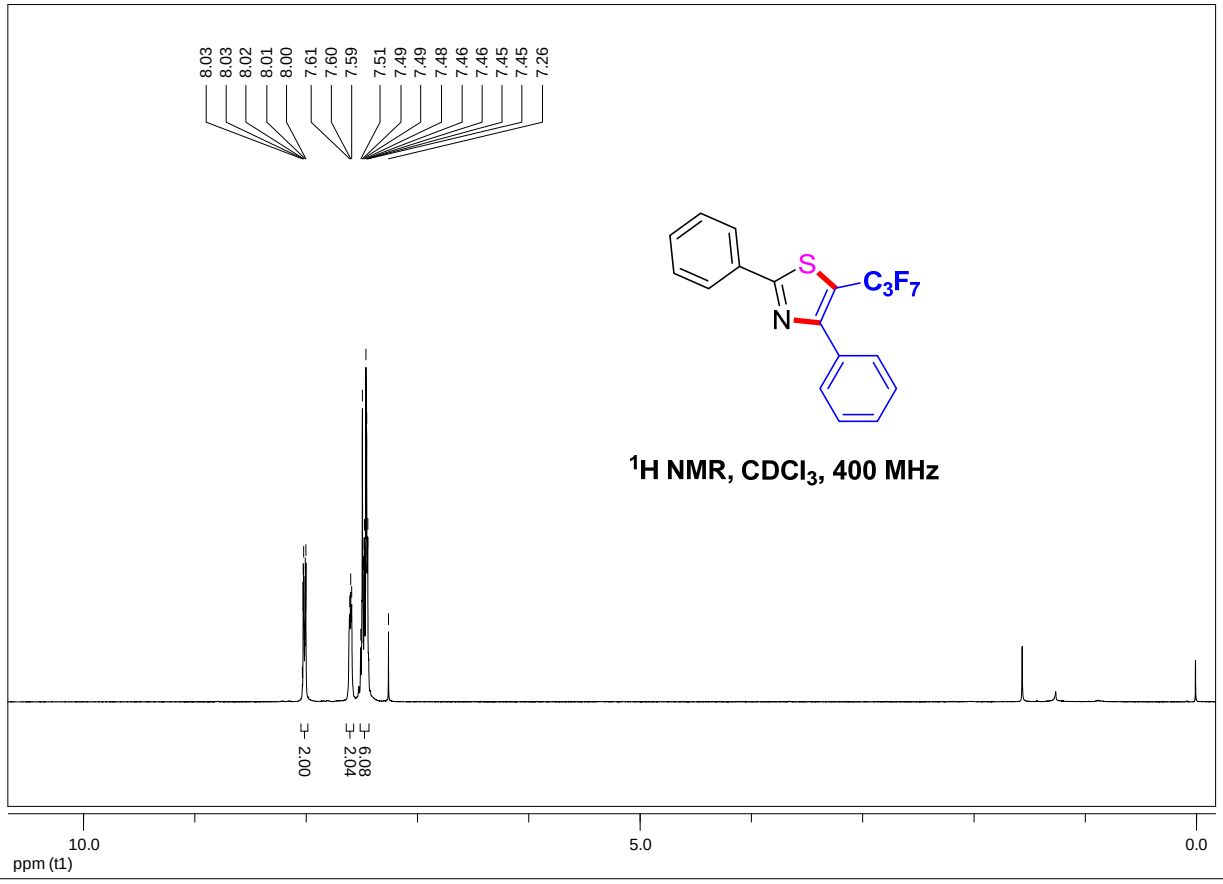
^{1}H NMR, $CDCl_3$, 400 MHz

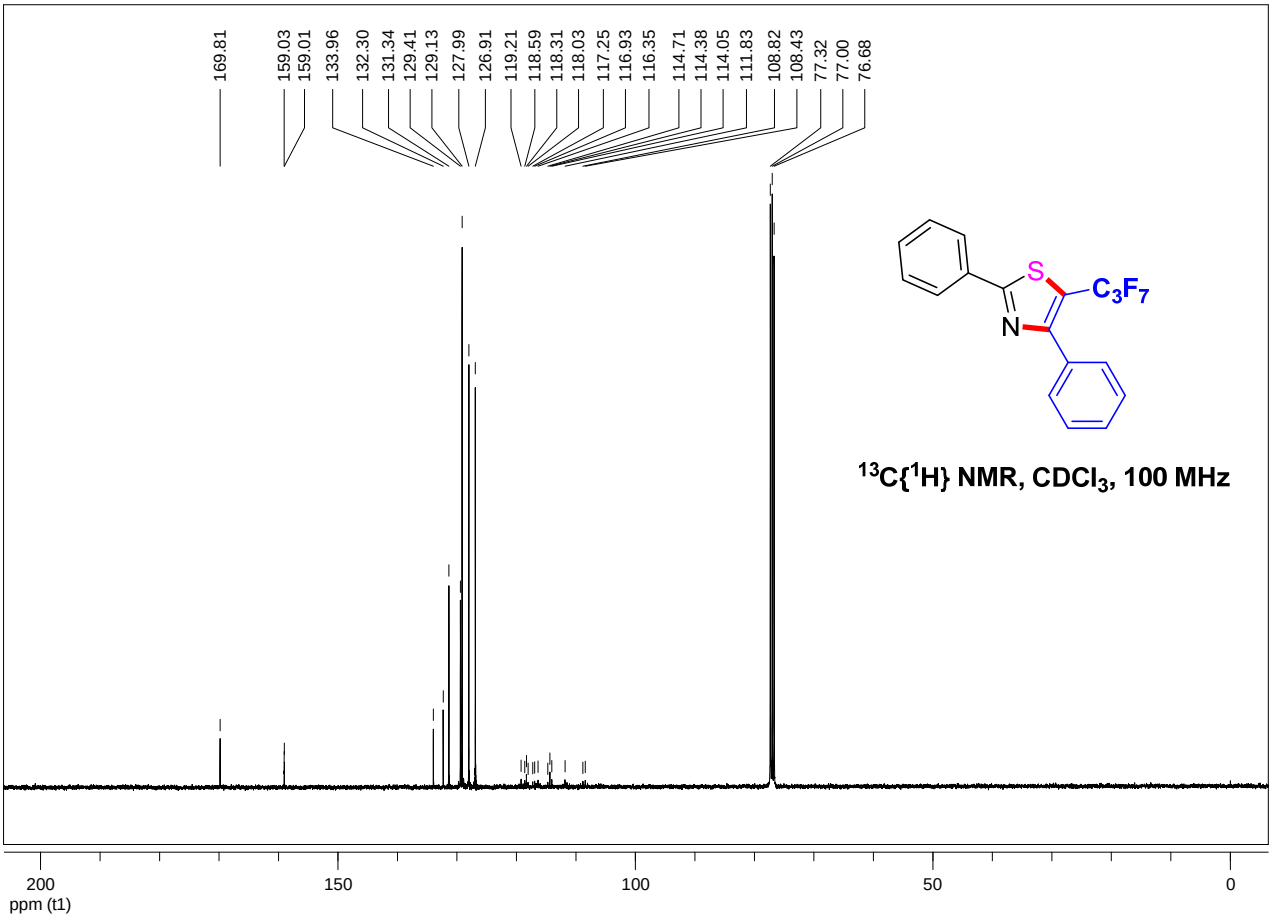


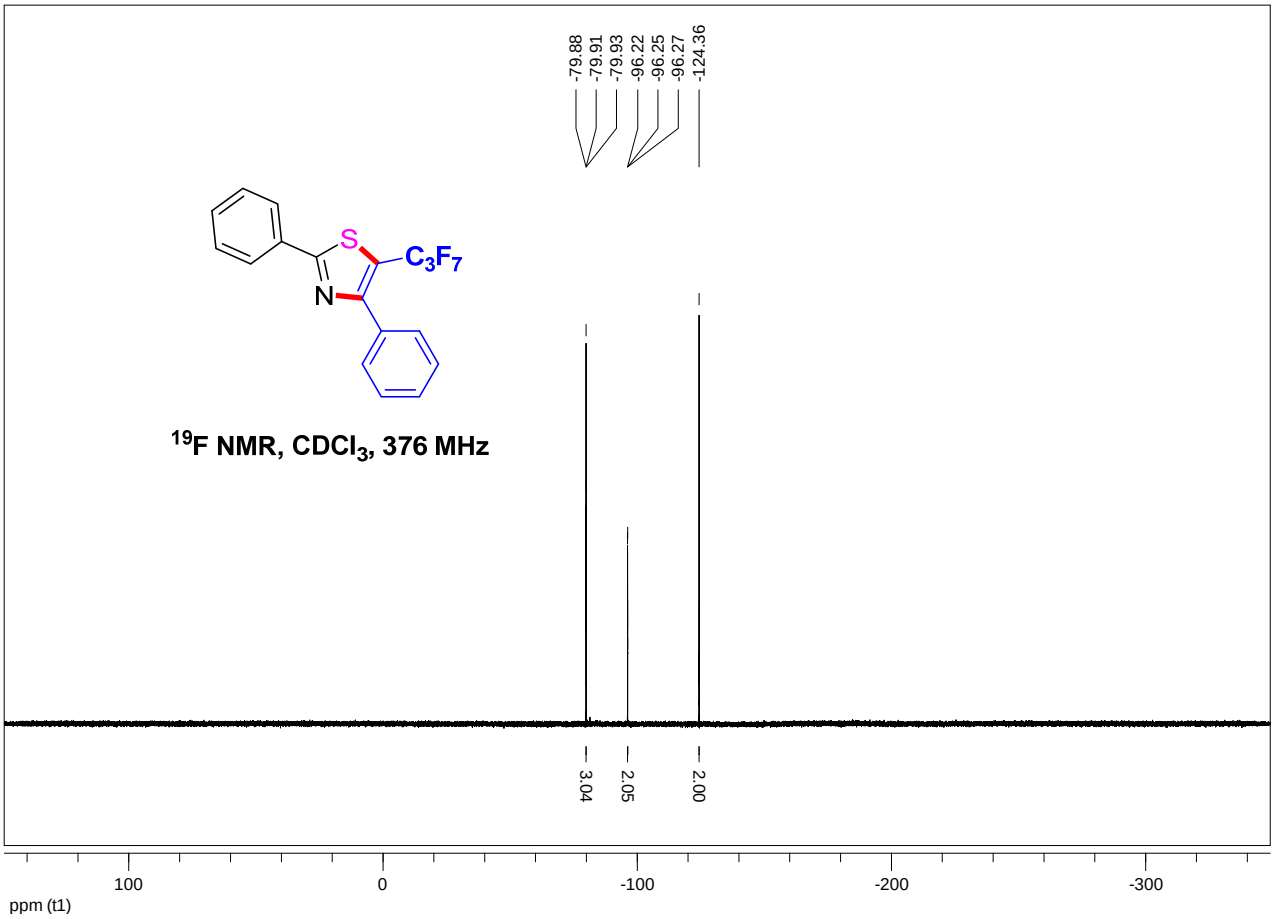
^{13}C{^{1}H} NMR, $CDCl_3$, 100 MHz


-83.82
-99.51
S
N
C_2F_5
^{19}F NMR, $CDCl_3$, 376 MHz
3.09
2.00
100
0
-100
-200
-300
ppm (t1)

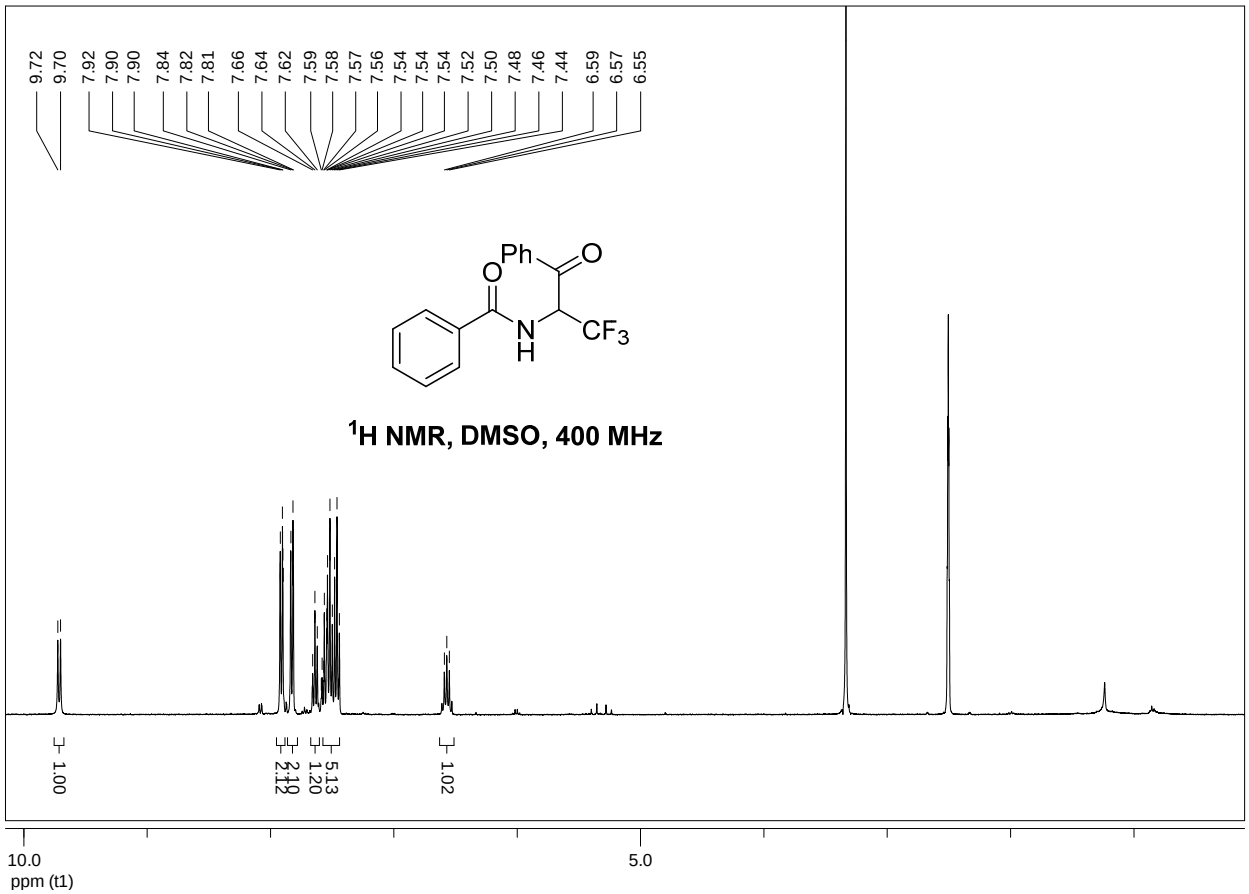
5-(perfluoroethyl)-2,4-diphenylthiazole (7f)

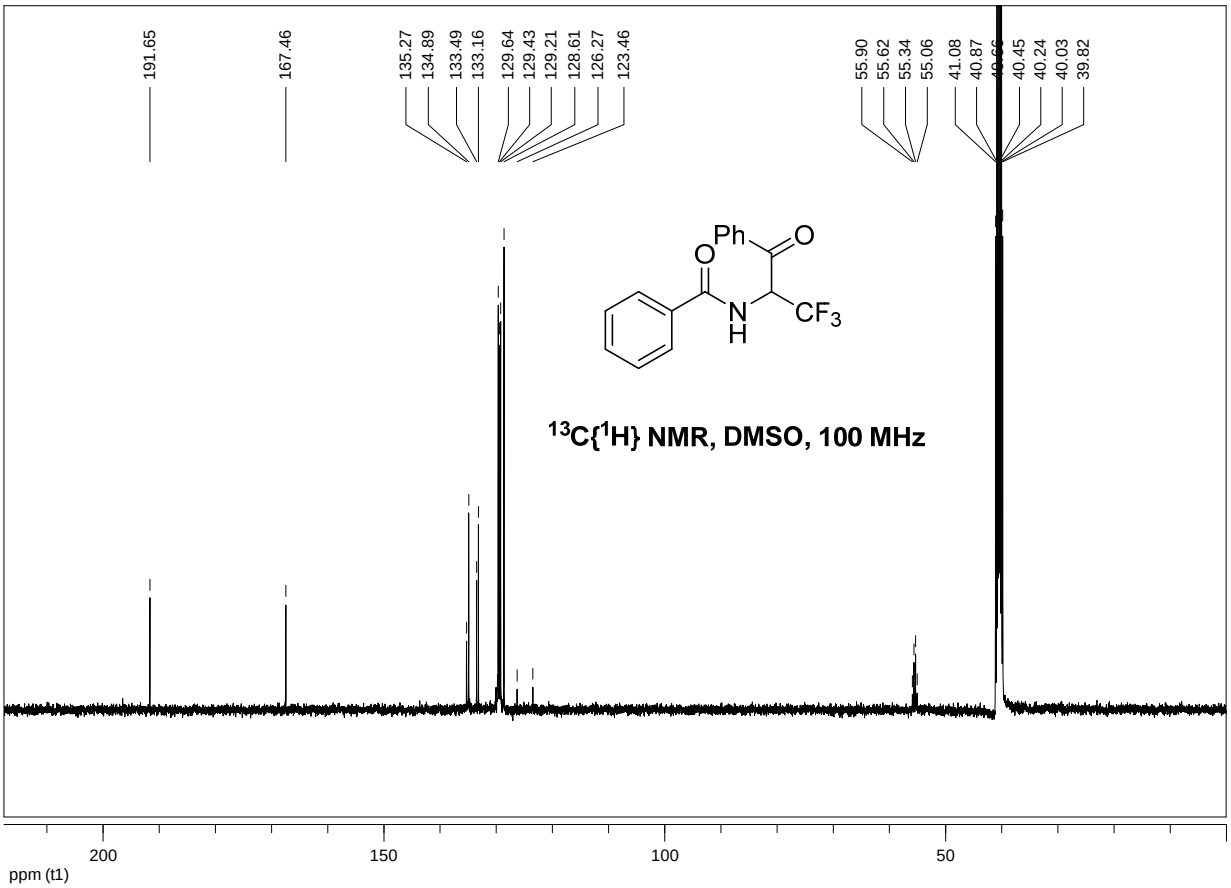


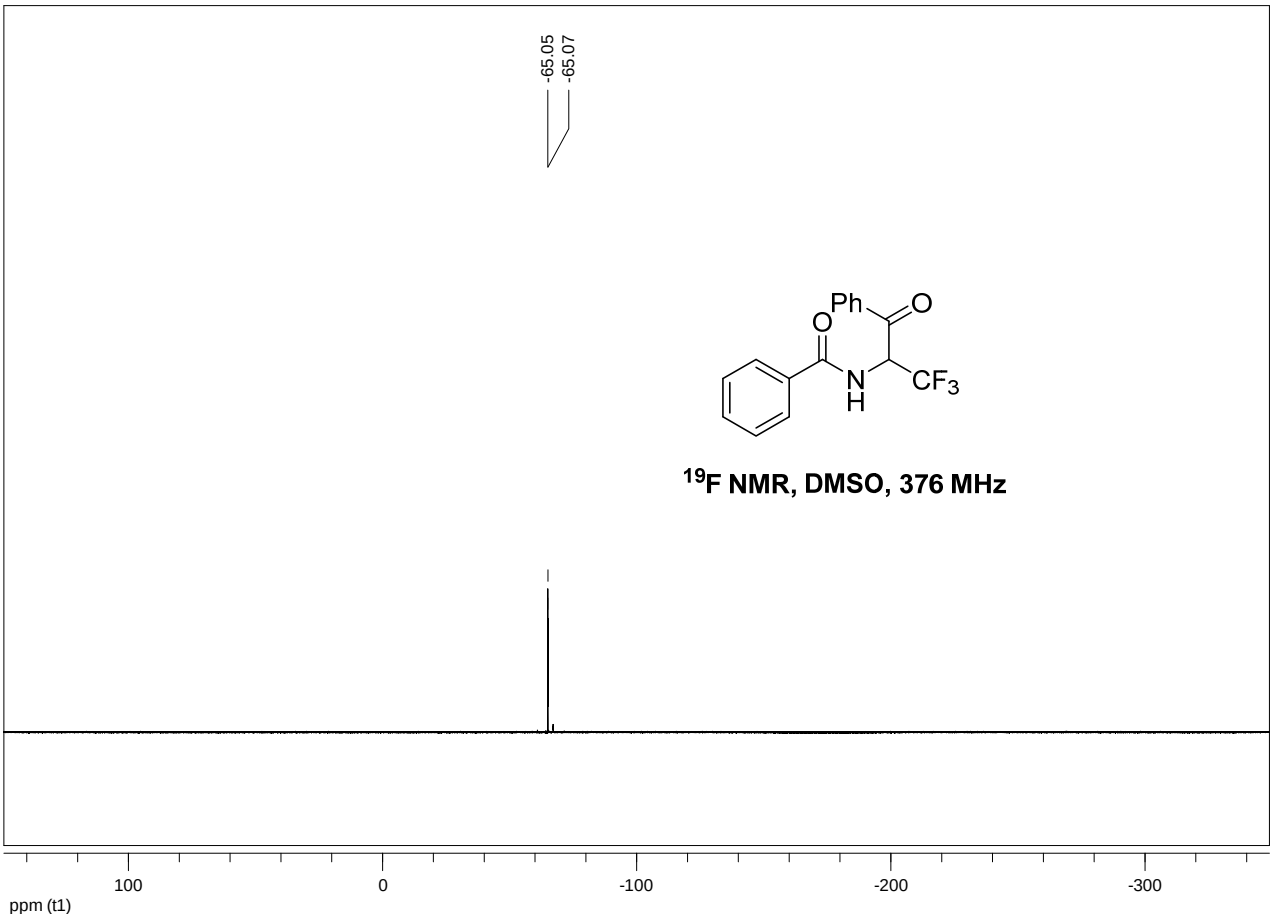



-79.88
-79.91
-79.93
-96.22
-96.25
-96.27
-124.36
S
N
C_3F_7
^{19}F NMR, $CDCl_3$, 376 MHz
3.04
2.05
2.00
100
0
-100
-200
-300
ppm (t1)

N-(1,1,1-trifluoro-3-oxo-3-phenylpropan-2-yl)benzamide (4a)

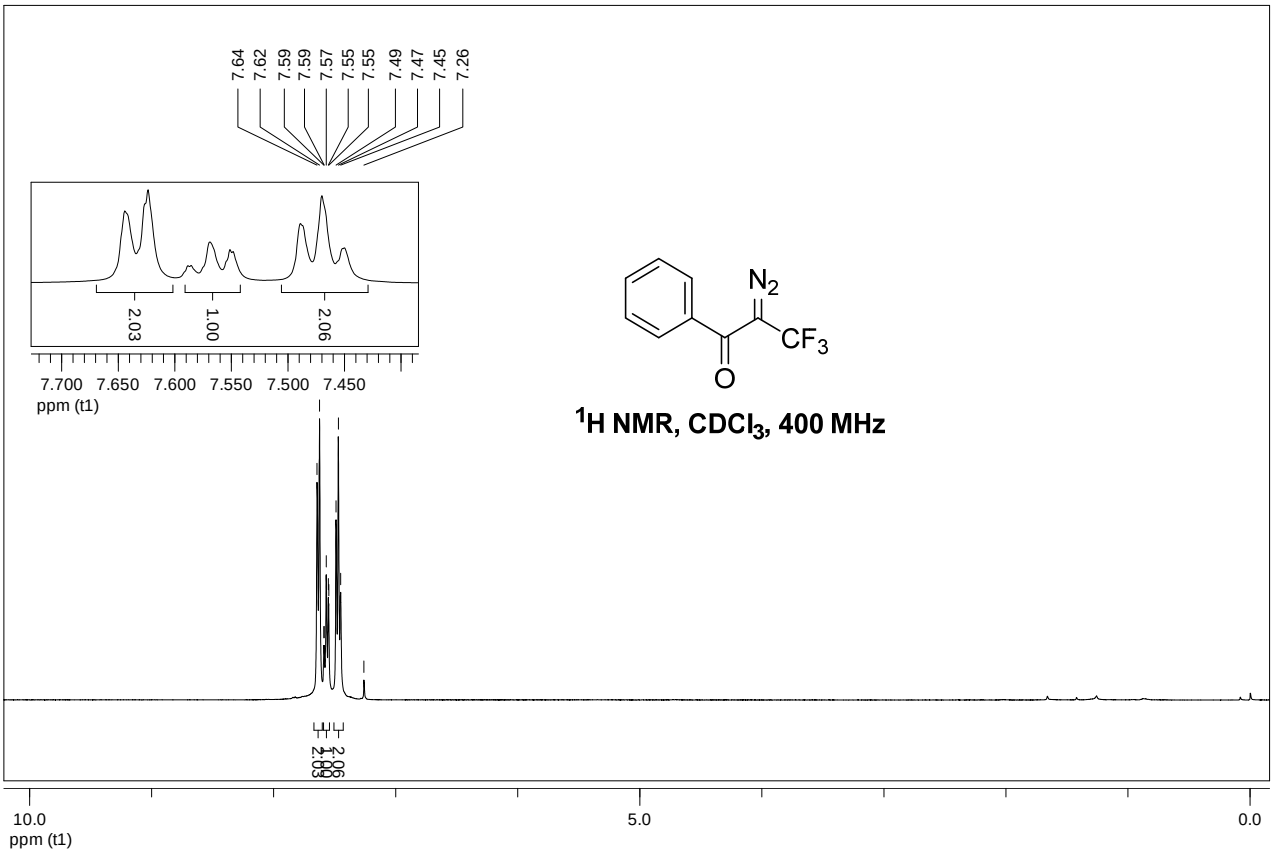


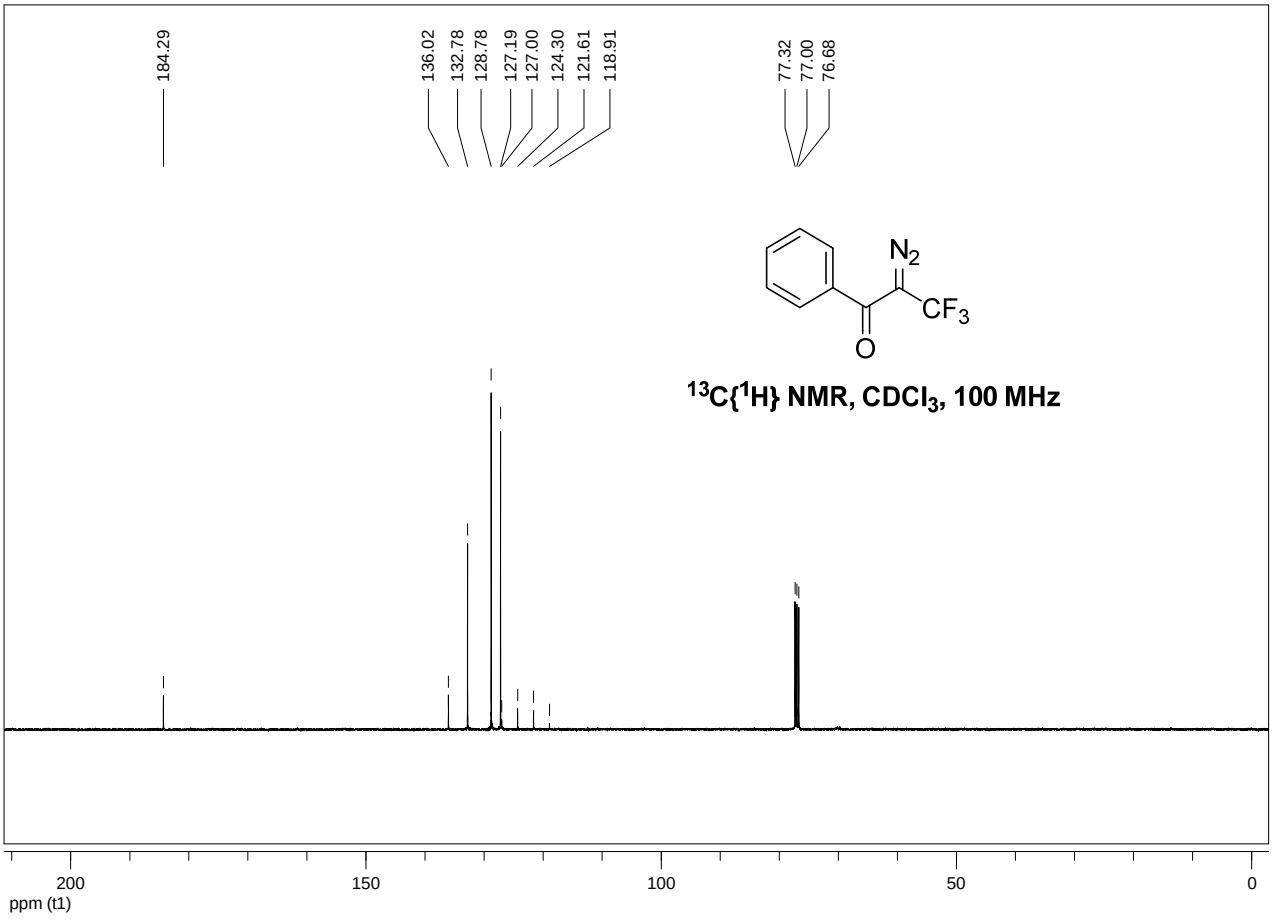


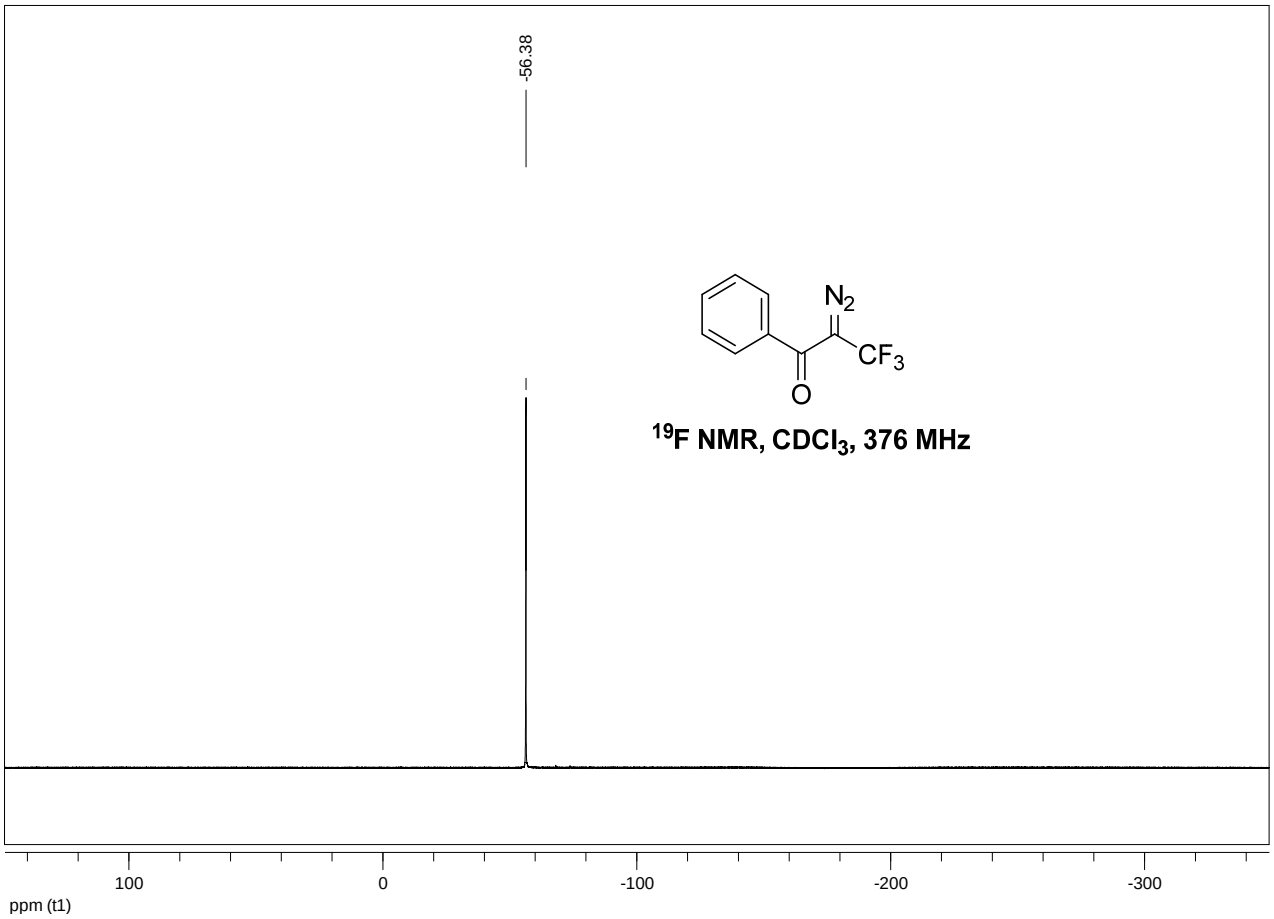


^{19}F NMR, DMSO, 376 MHz

2-diazo-3,3,3-trifluoro-1-phenylpropan-1-one (1a)

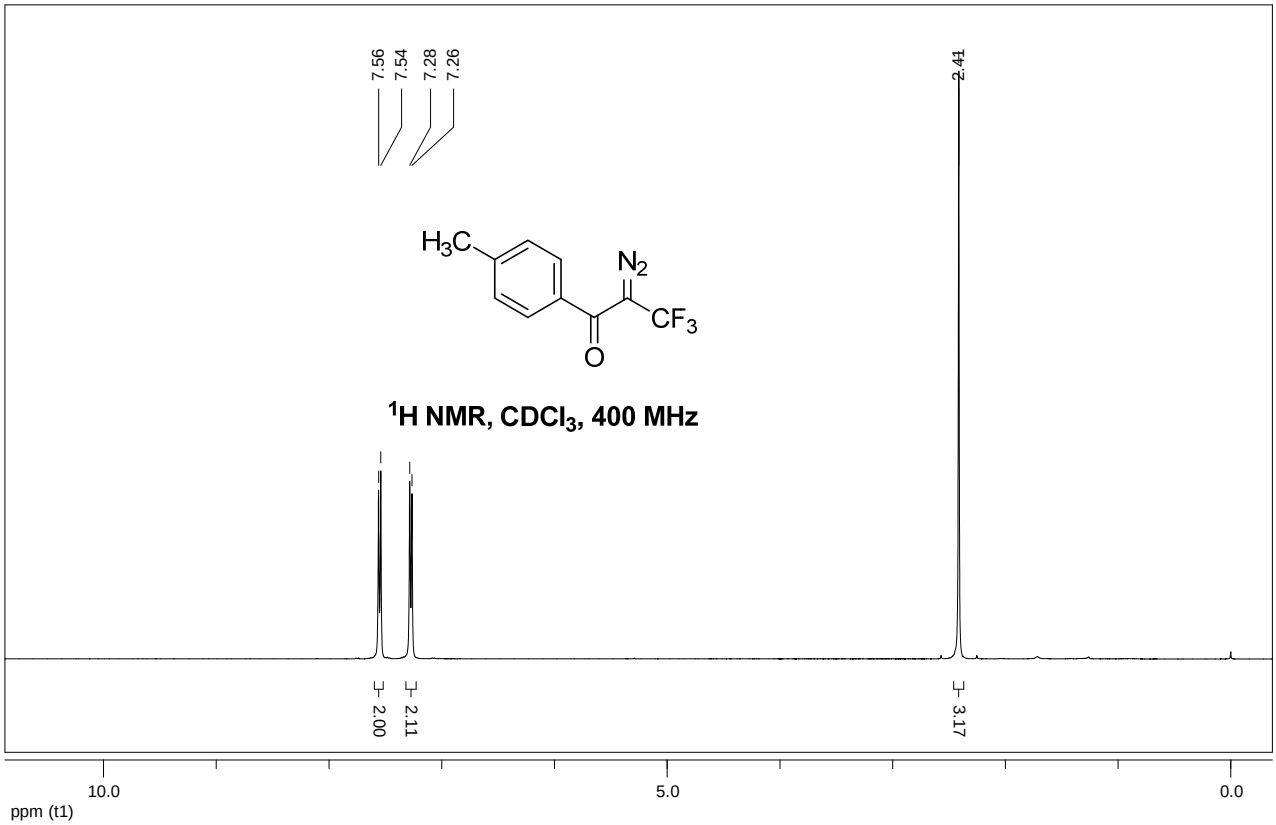


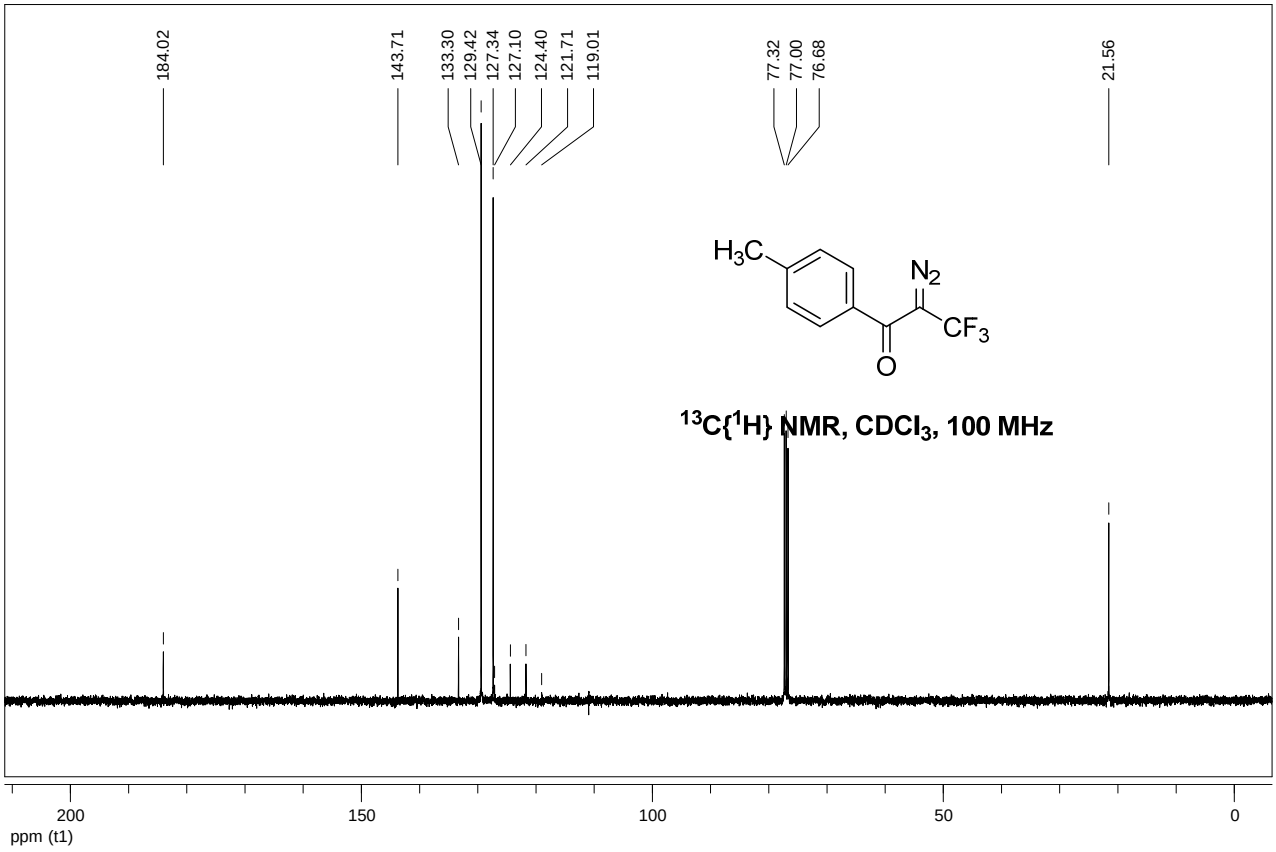


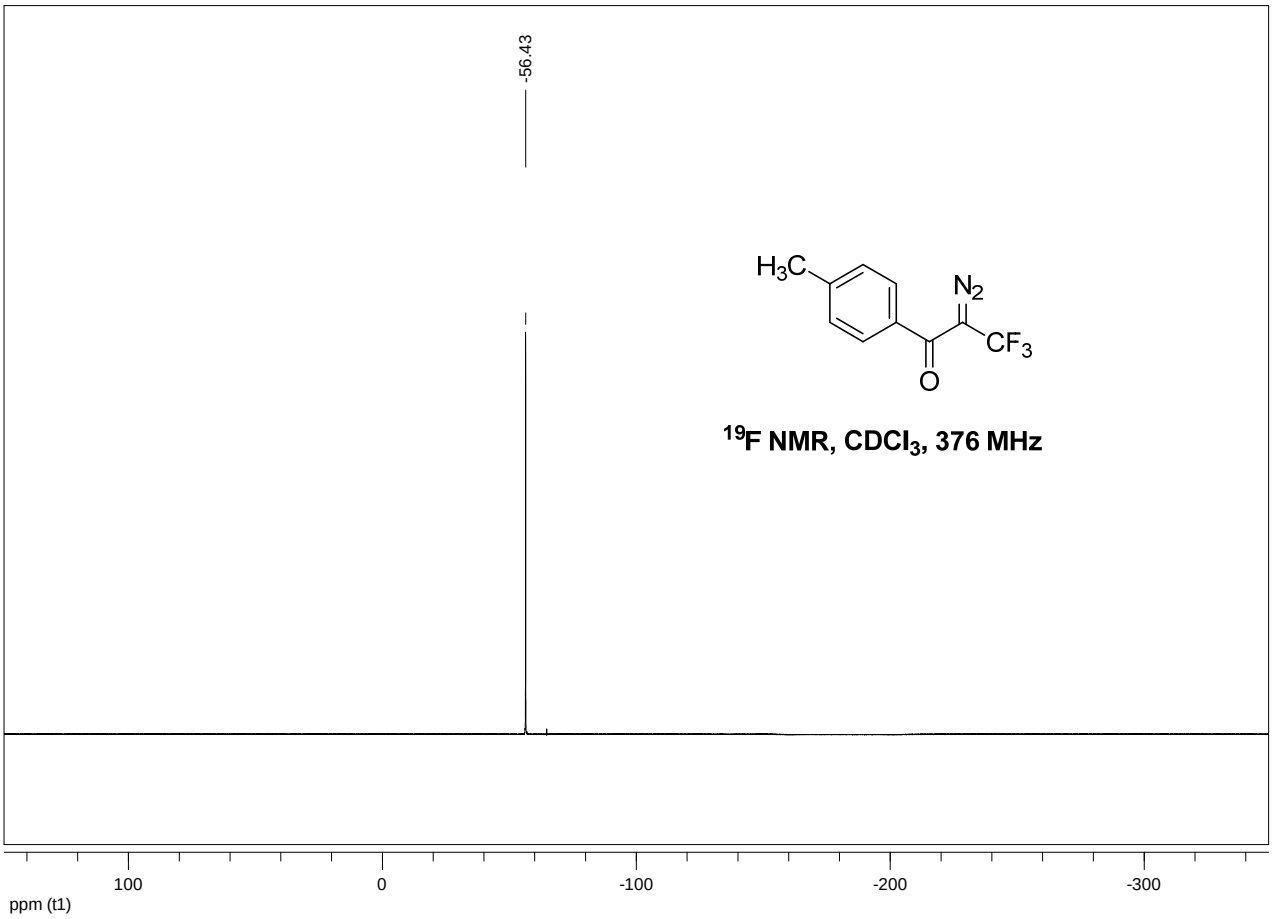


^{19}F NMR, $CDCl_3$, 376 MHz

2-diazo-3,3,3-trifluoro-1-(*p*-tolyl)propan-1-one (1b)

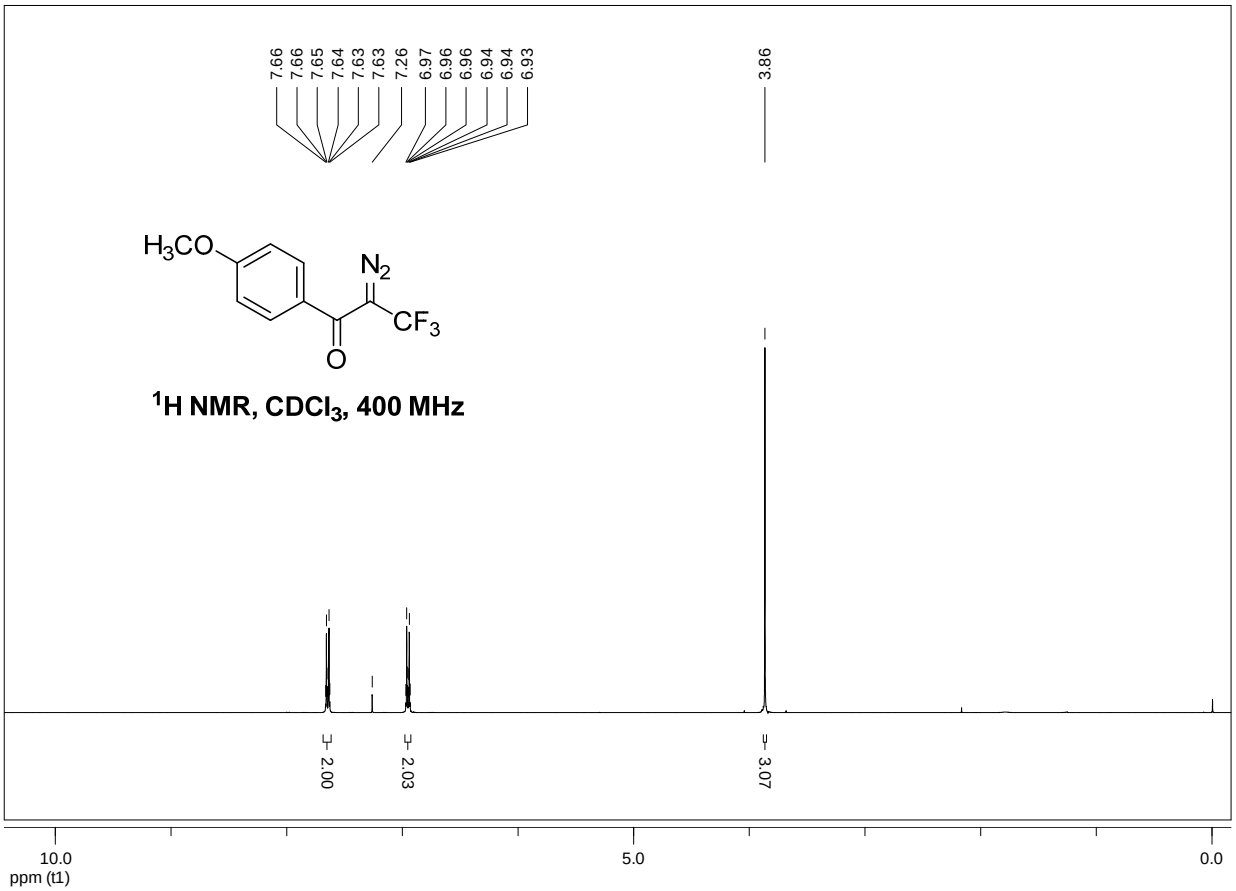




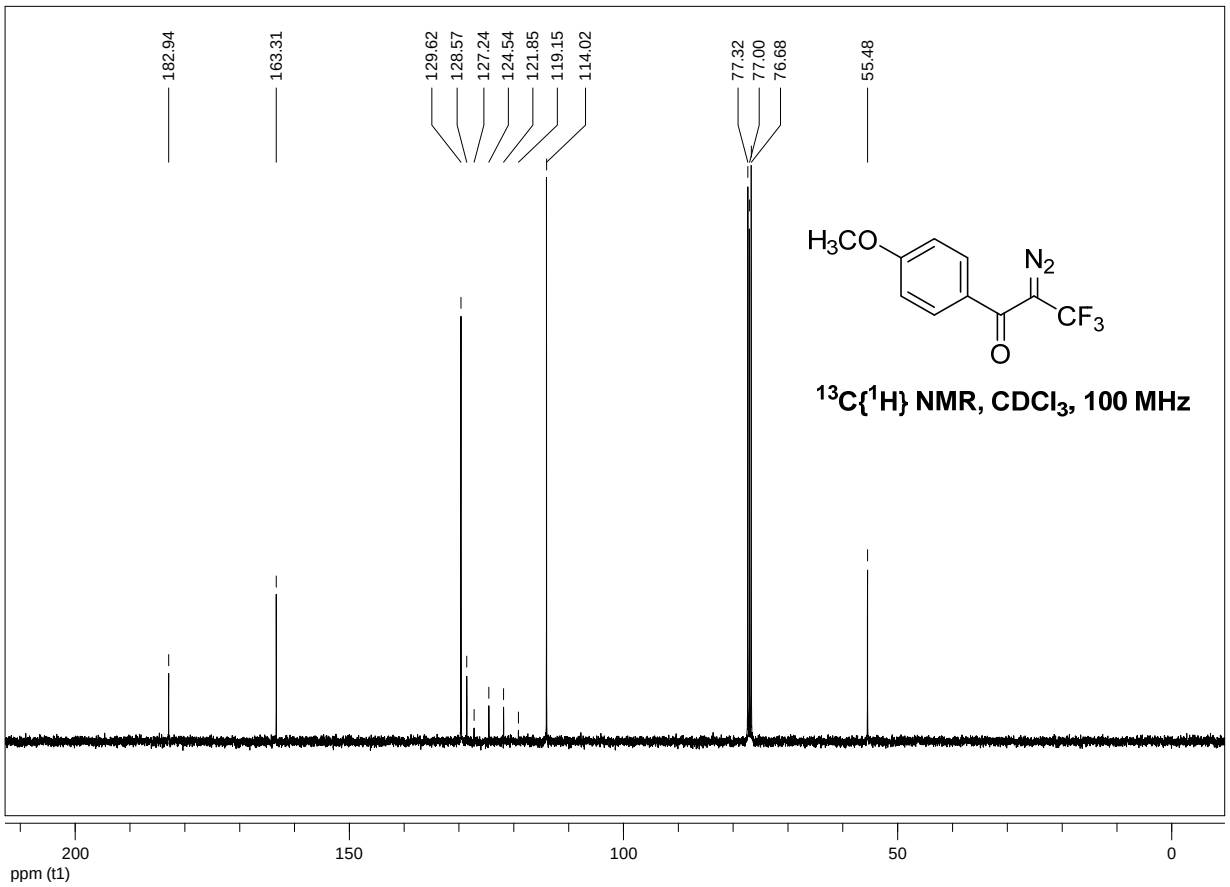


^{19}F NMR, $CDCl_3$, 376 MHz

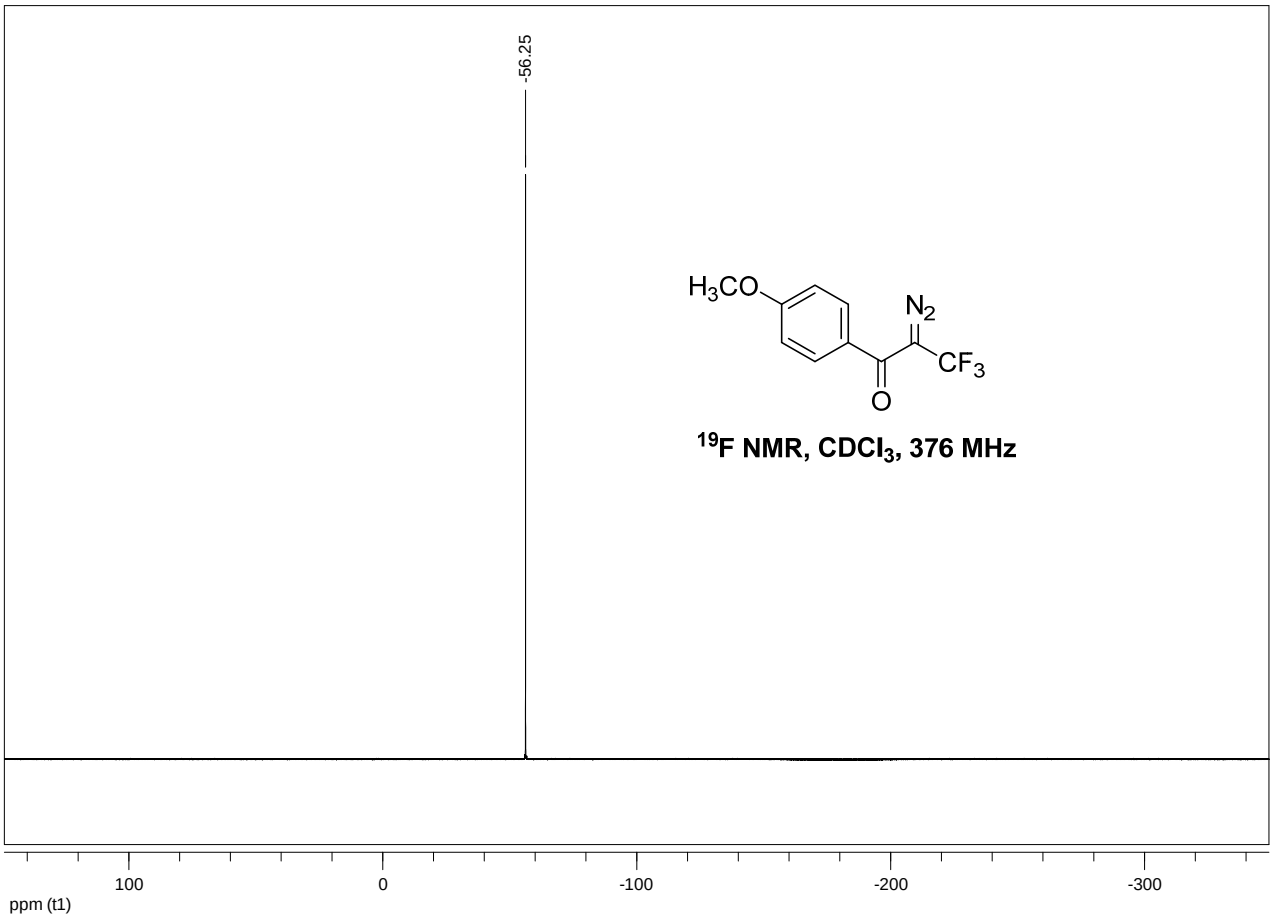
2-diazo-3,3,3-trifluoro-1-(4-methoxyphenyl)propan-1-one (1c)



^{1}H NMR, $CDCl_3$, 400 MHz

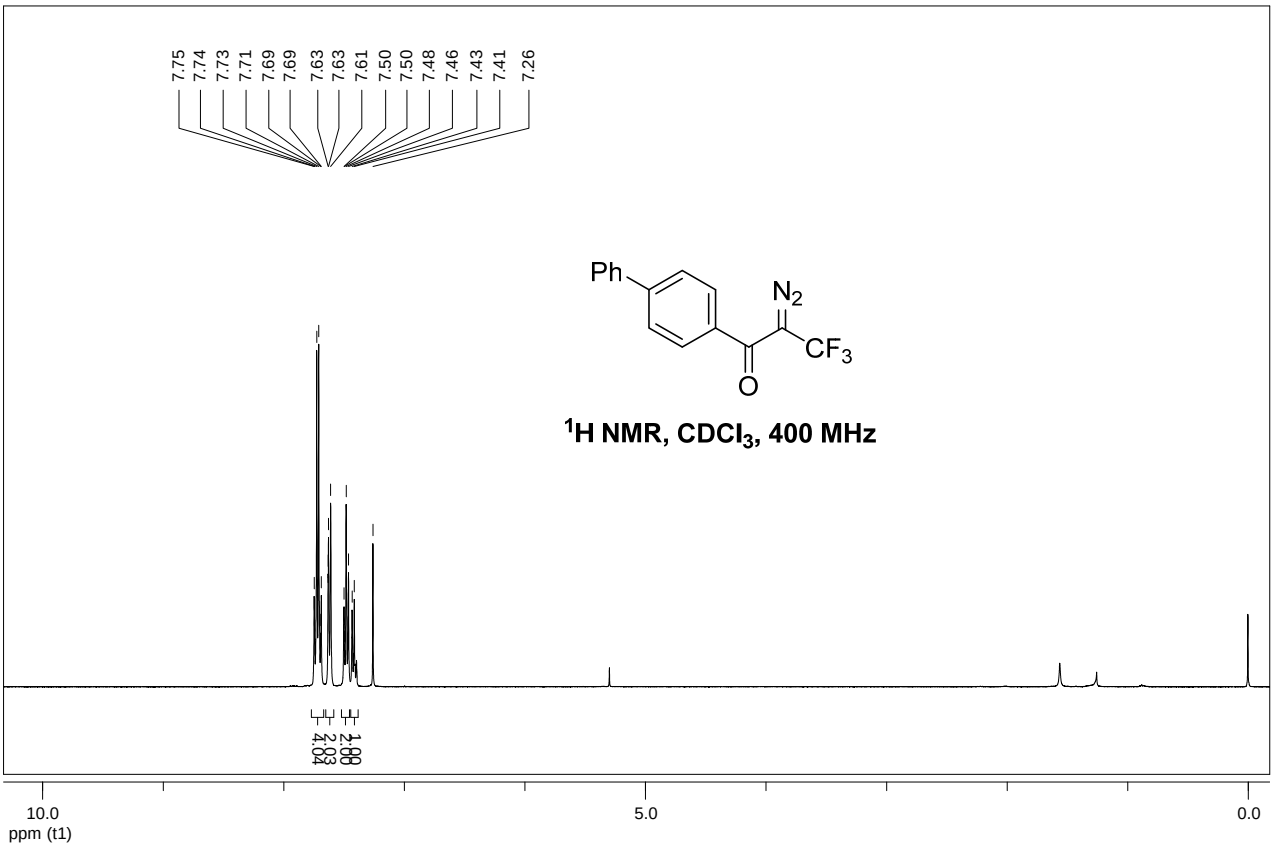


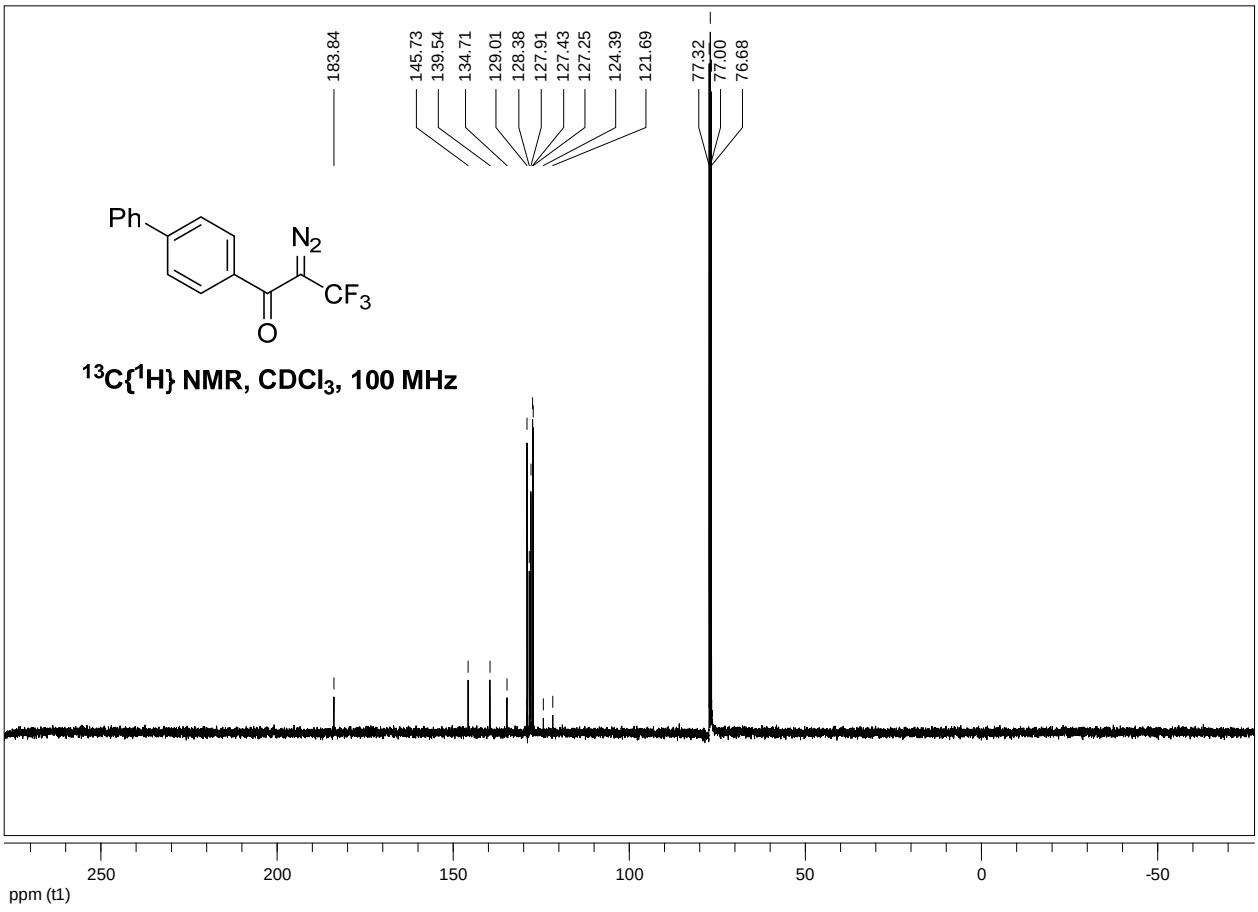
$^{13}C\{^{1}H\}$ NMR, $CDCl_3$, 100 MHz

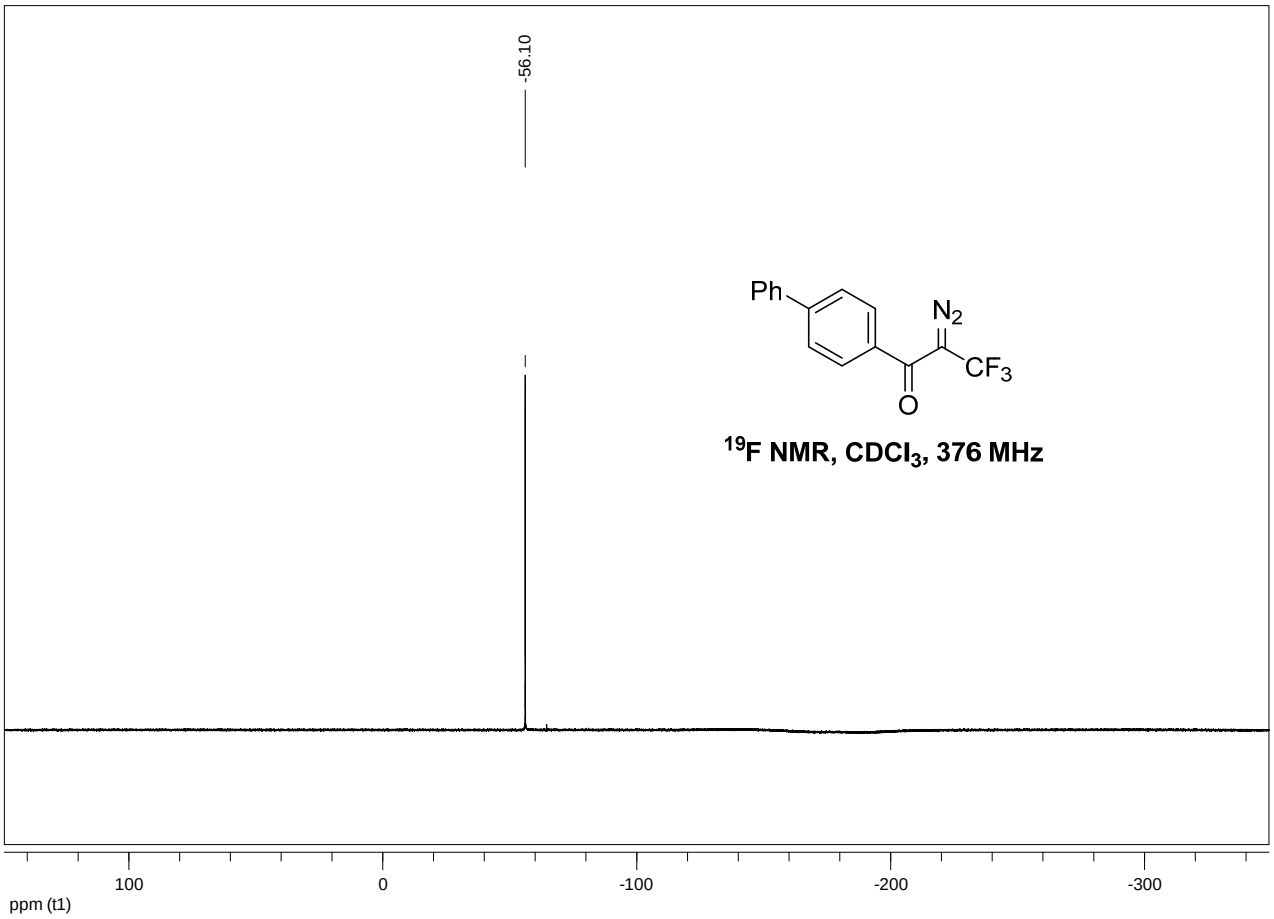


^{19}F NMR, $CDCl_3$, 376 MHz

1-([1,1'-biphenyl]-4-yl)-2-diazo-3,3,3-trifluoropropan-1-one (1d)

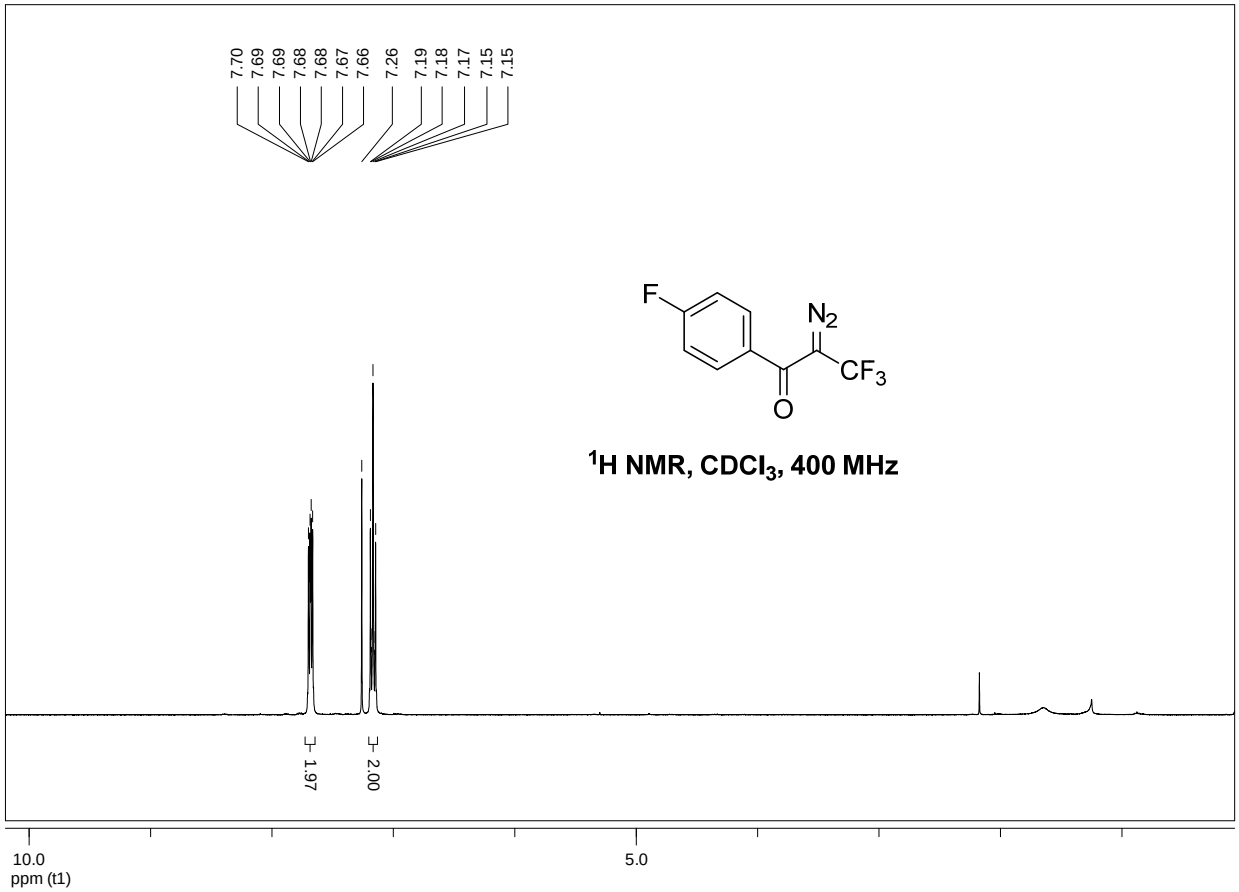


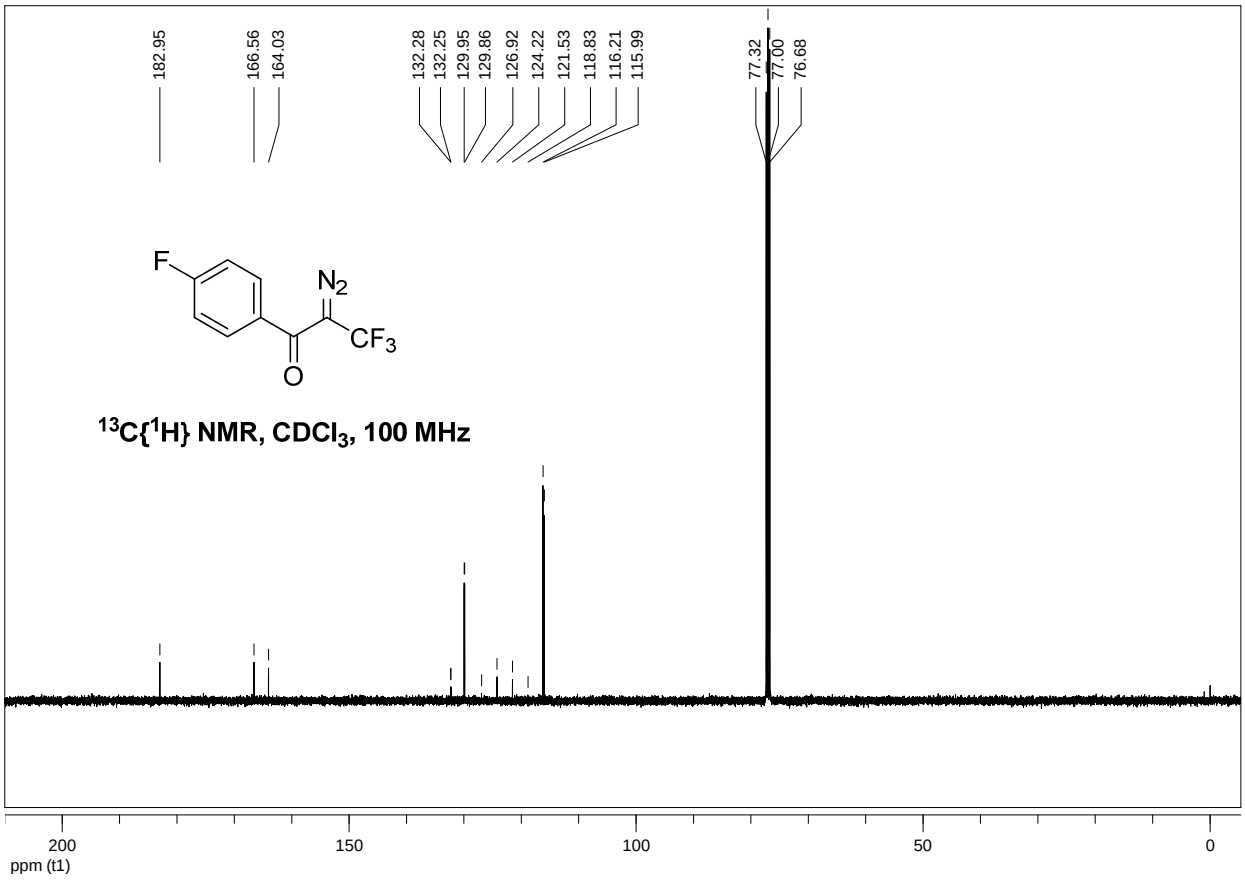


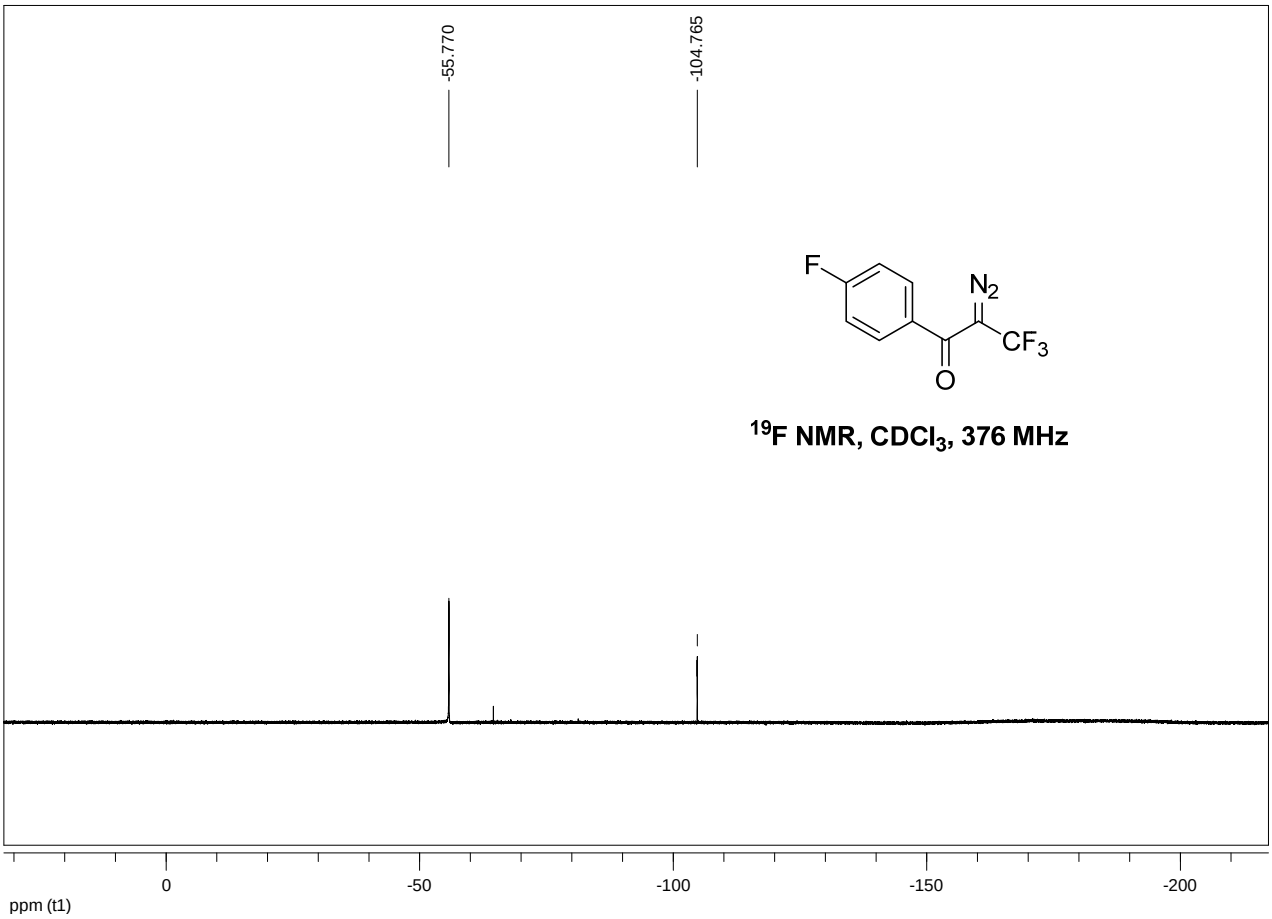


^{19}F NMR, $CDCl_3$, 376 MHz

2-diazo-3,3,3-trifluoro-1-(4-fluorophenyl)propan-1-one (1e)

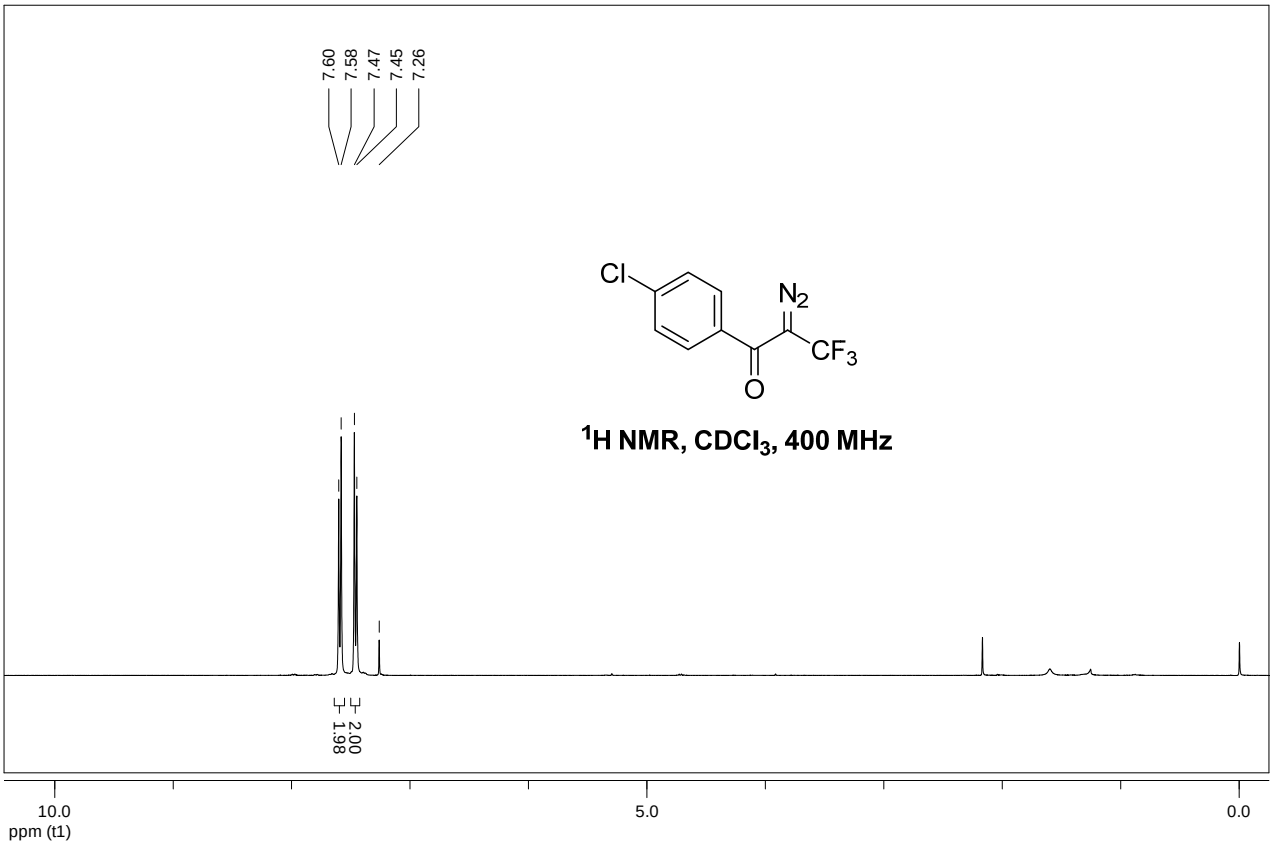


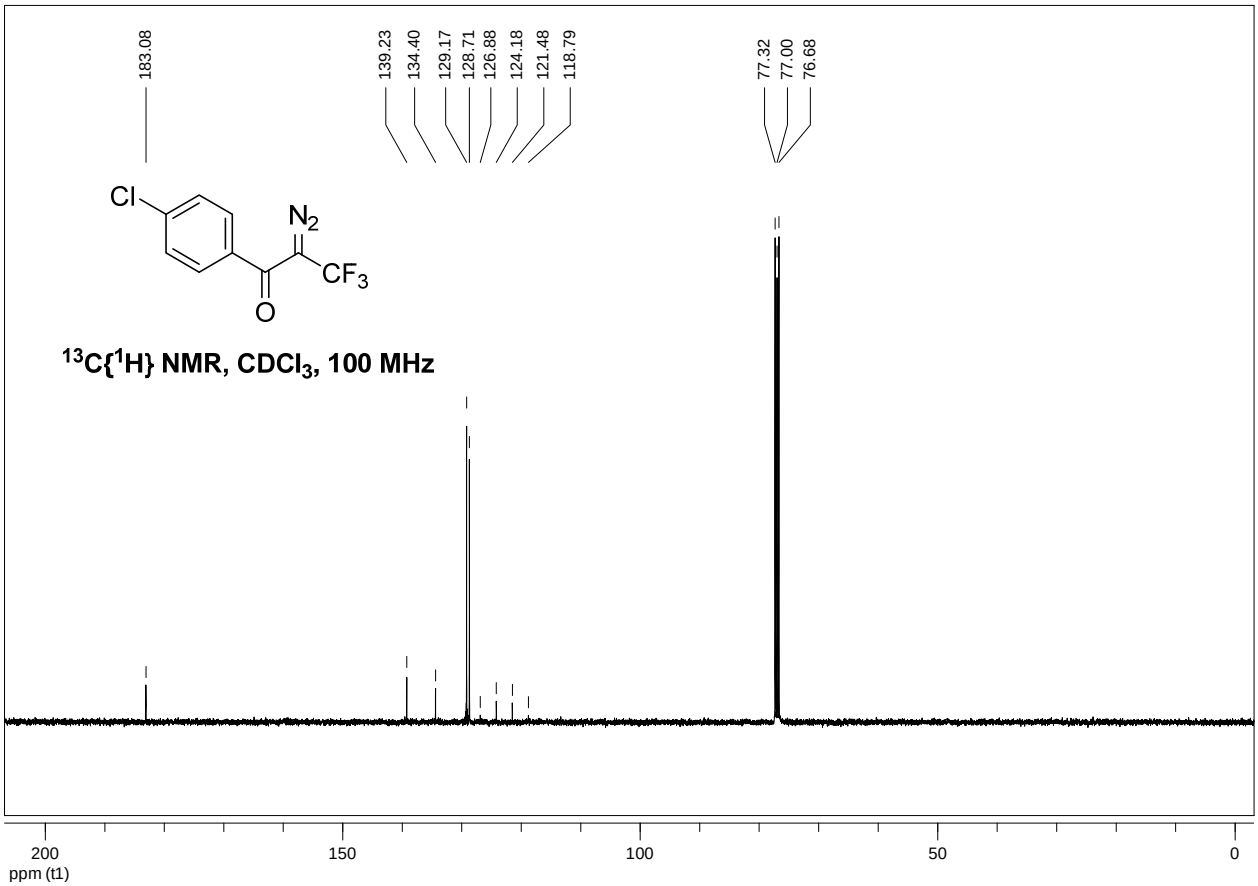


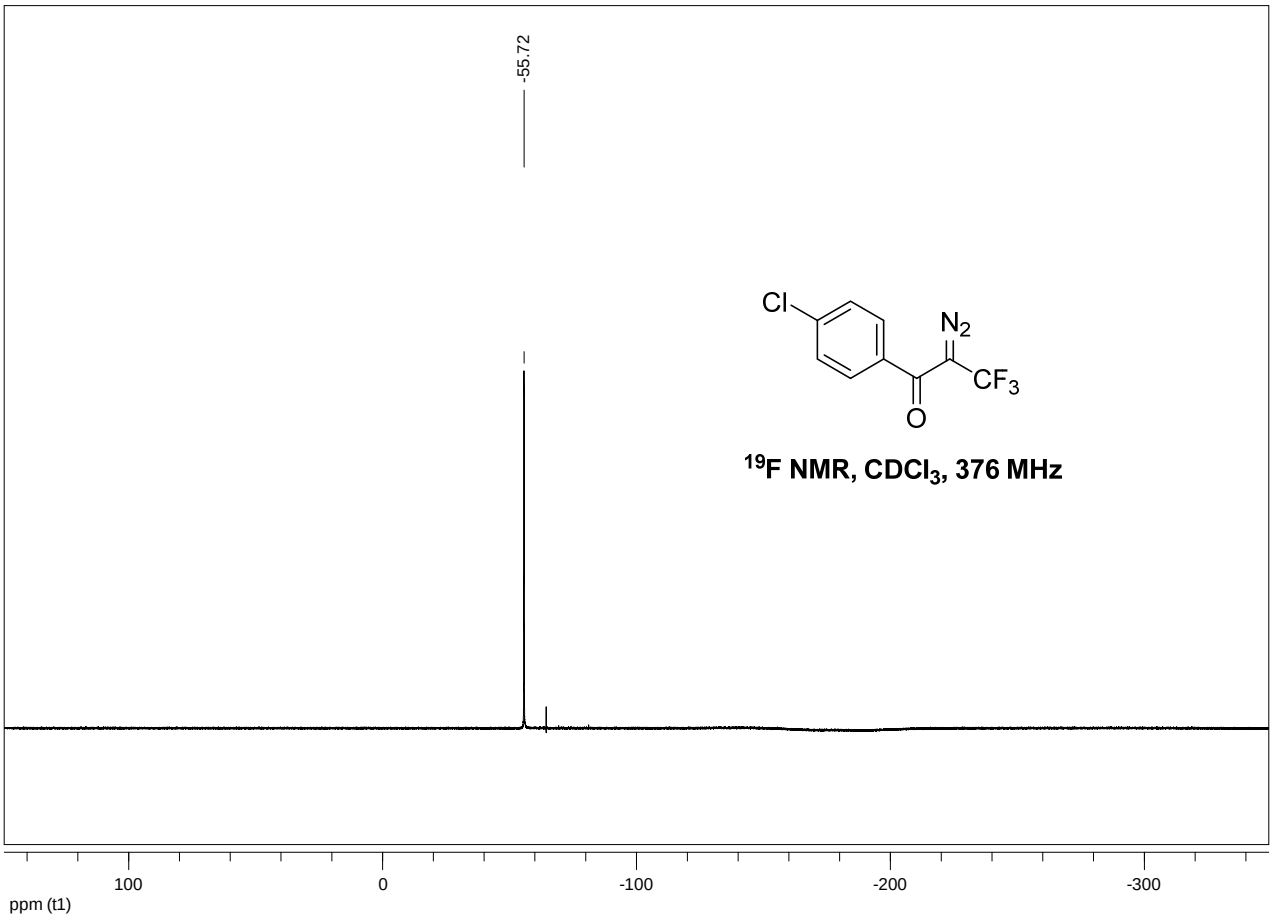


^{19}F NMR, $CDCl_3$, 376 MHz

1-(4-chlorophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1f)

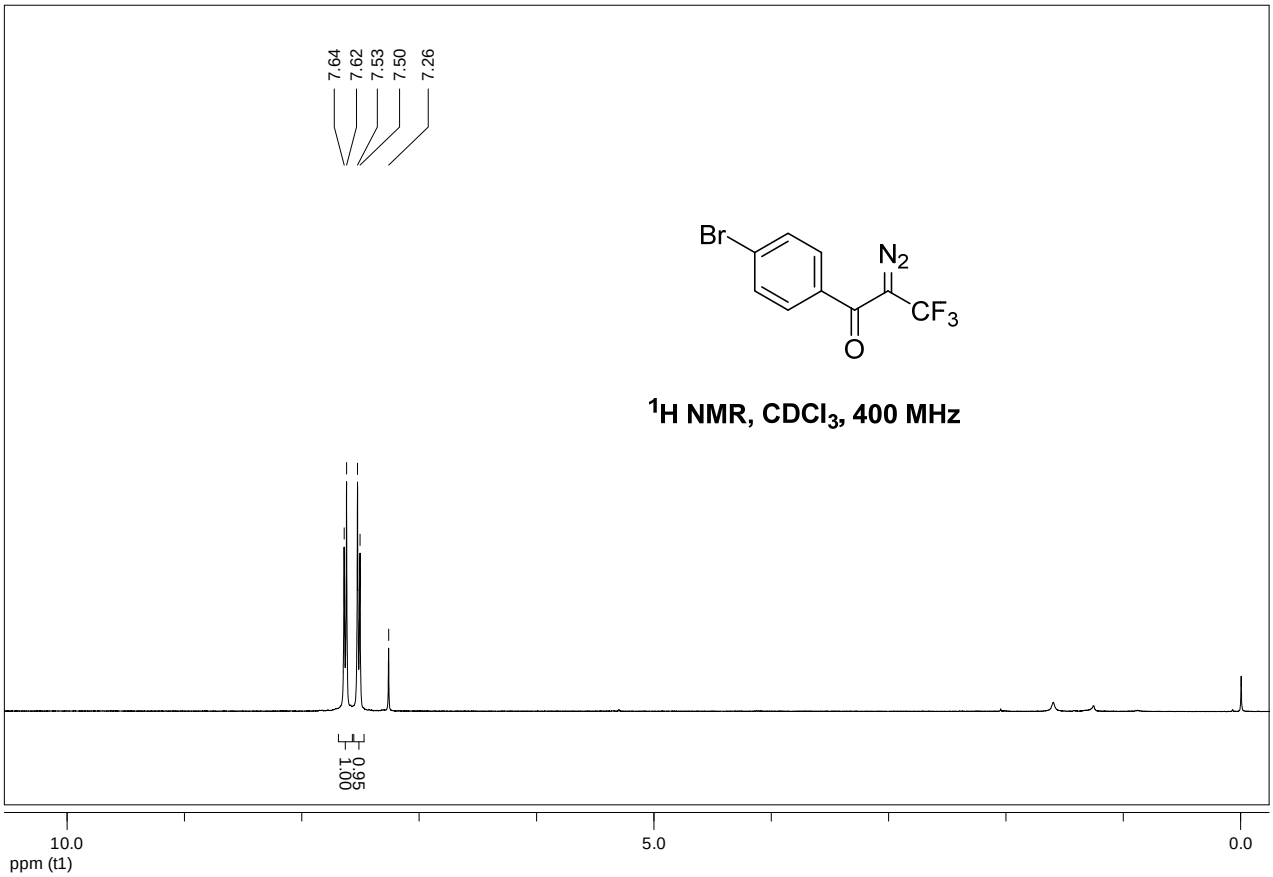




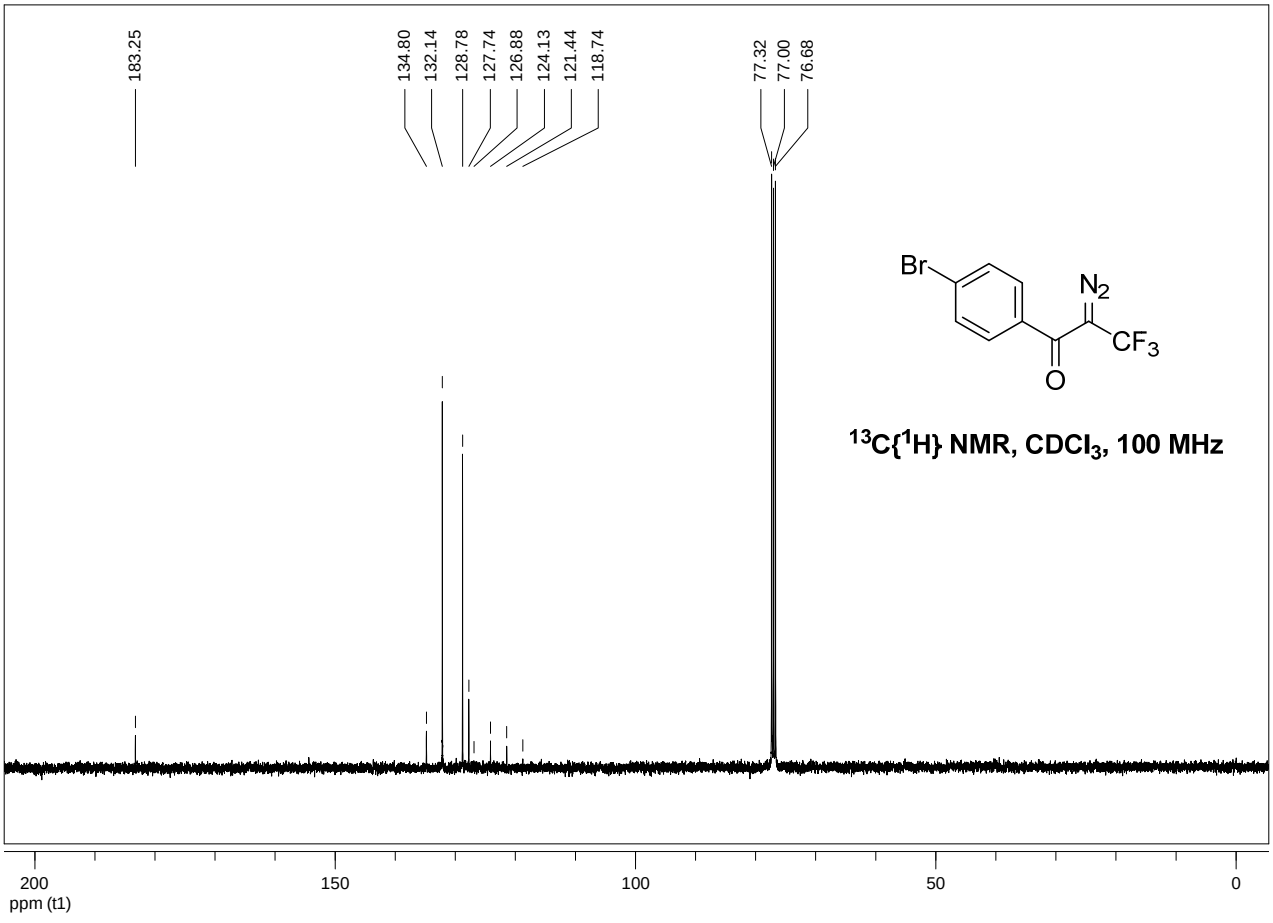


^{19}F NMR, $CDCl_3$, 376 MHz

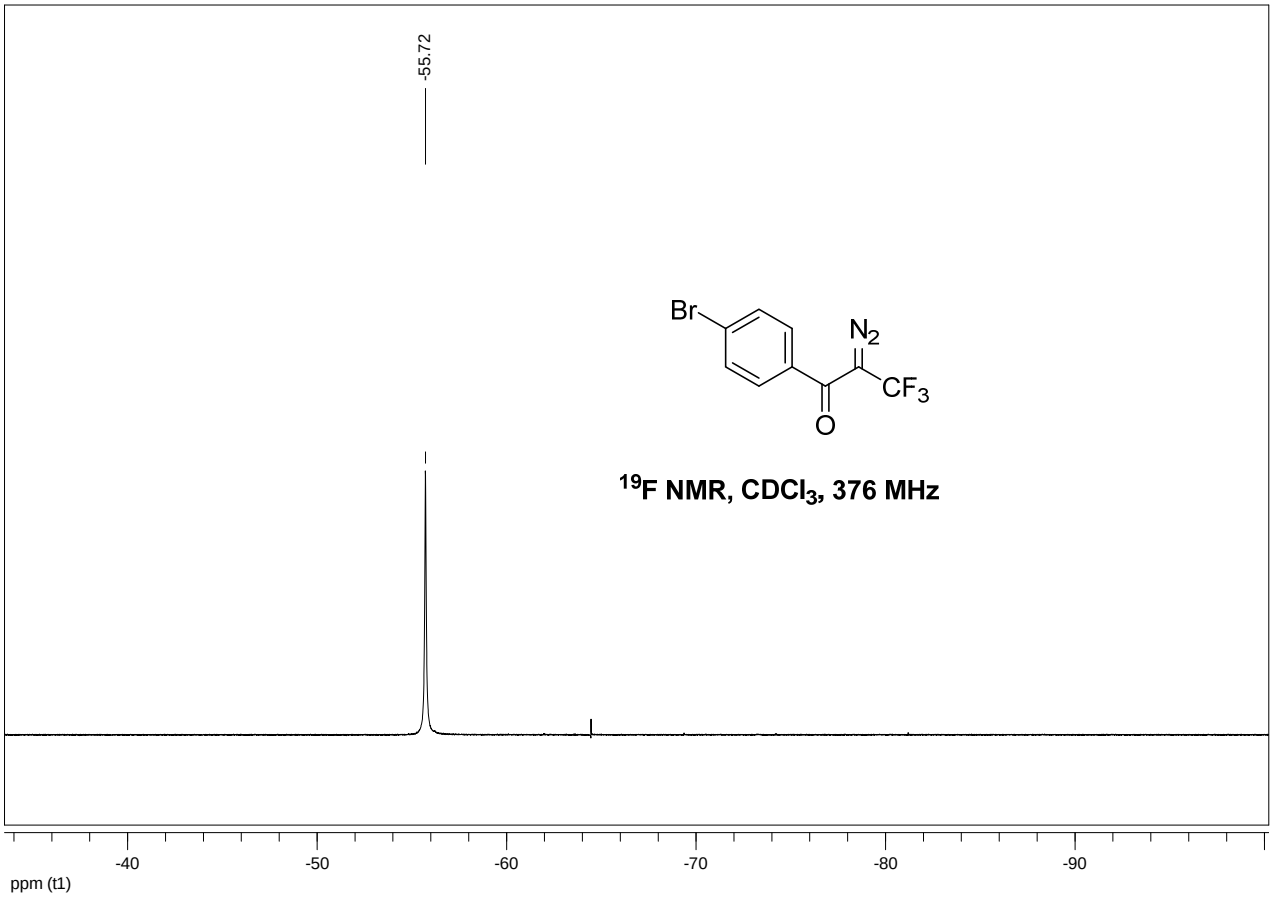
1-(4-bromophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1g)



^{1}H NMR, $CDCl_3$, 400 MHz

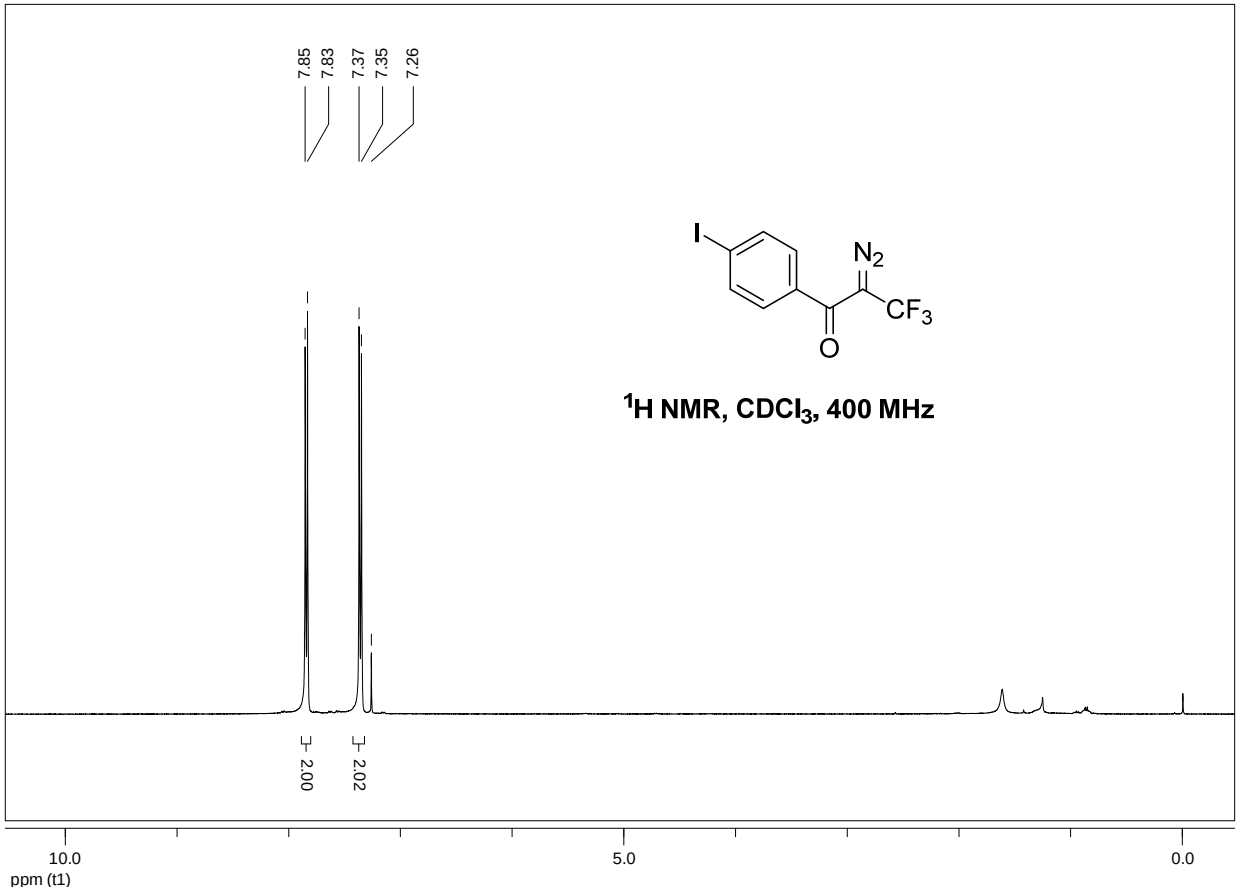


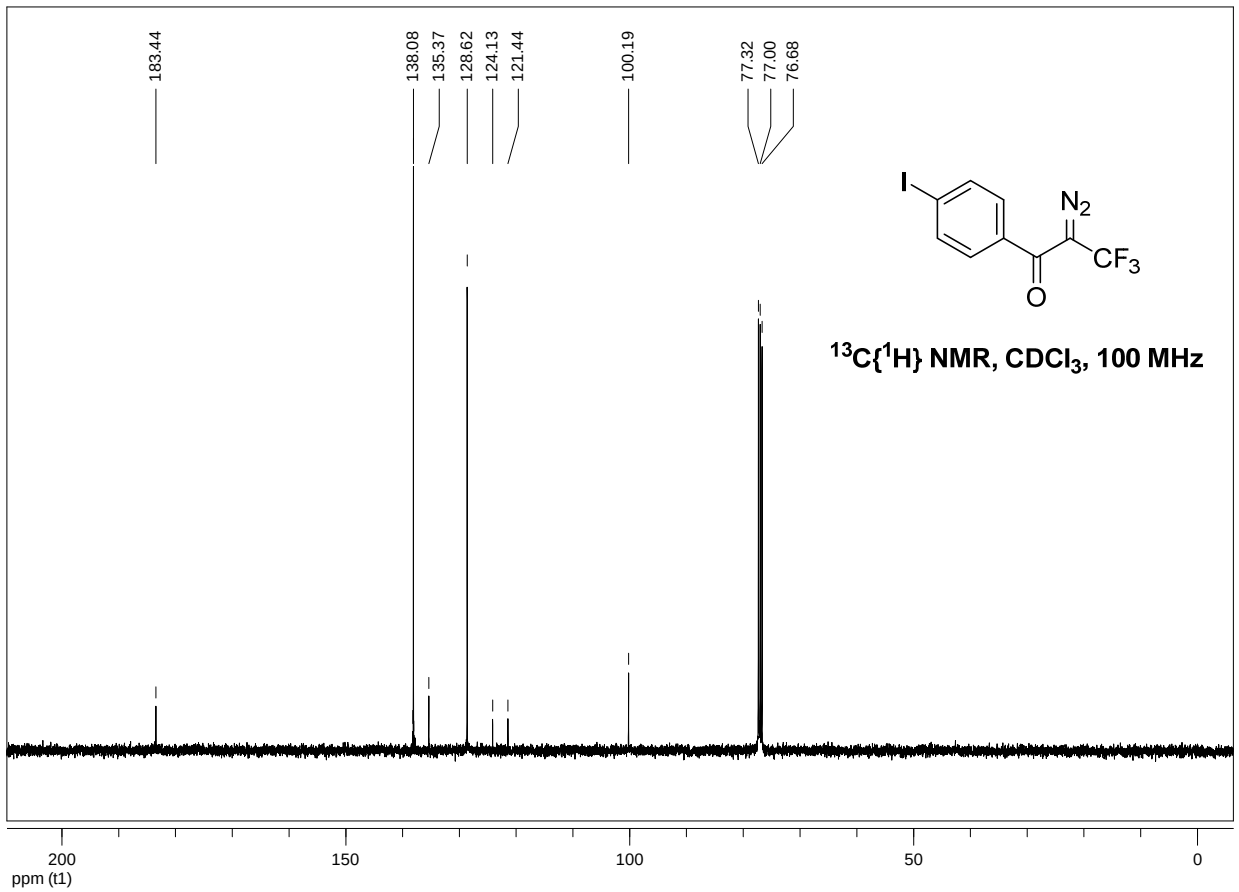
$^{13}C\{^{1}H\}$ NMR, $CDCl_3$, 100 MHz

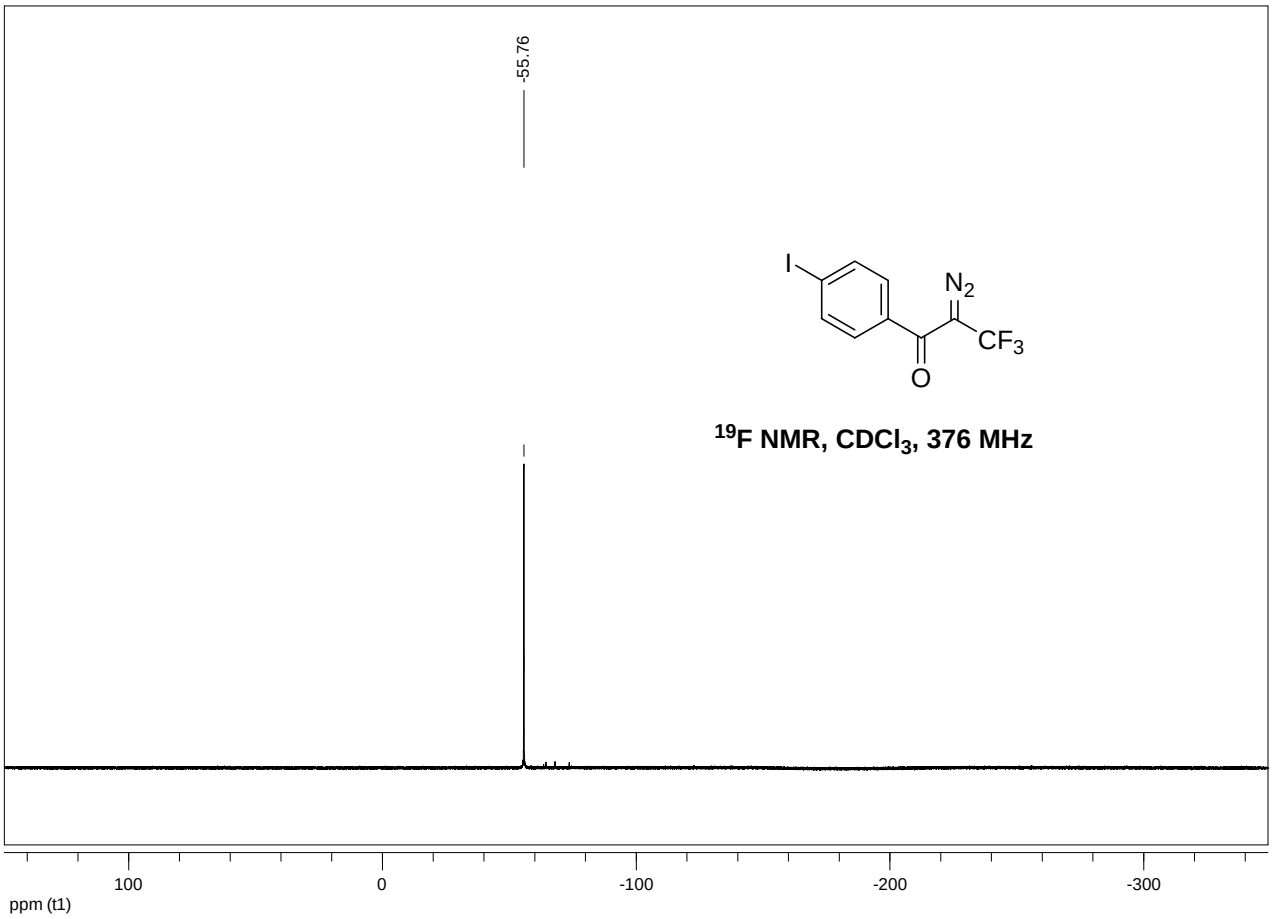


^{19}F NMR, $CDCl_3$, 376 MHz

2-diazo-3,3,3-trifluoro-1-(4-iodophenyl)propan-1-one (1h)

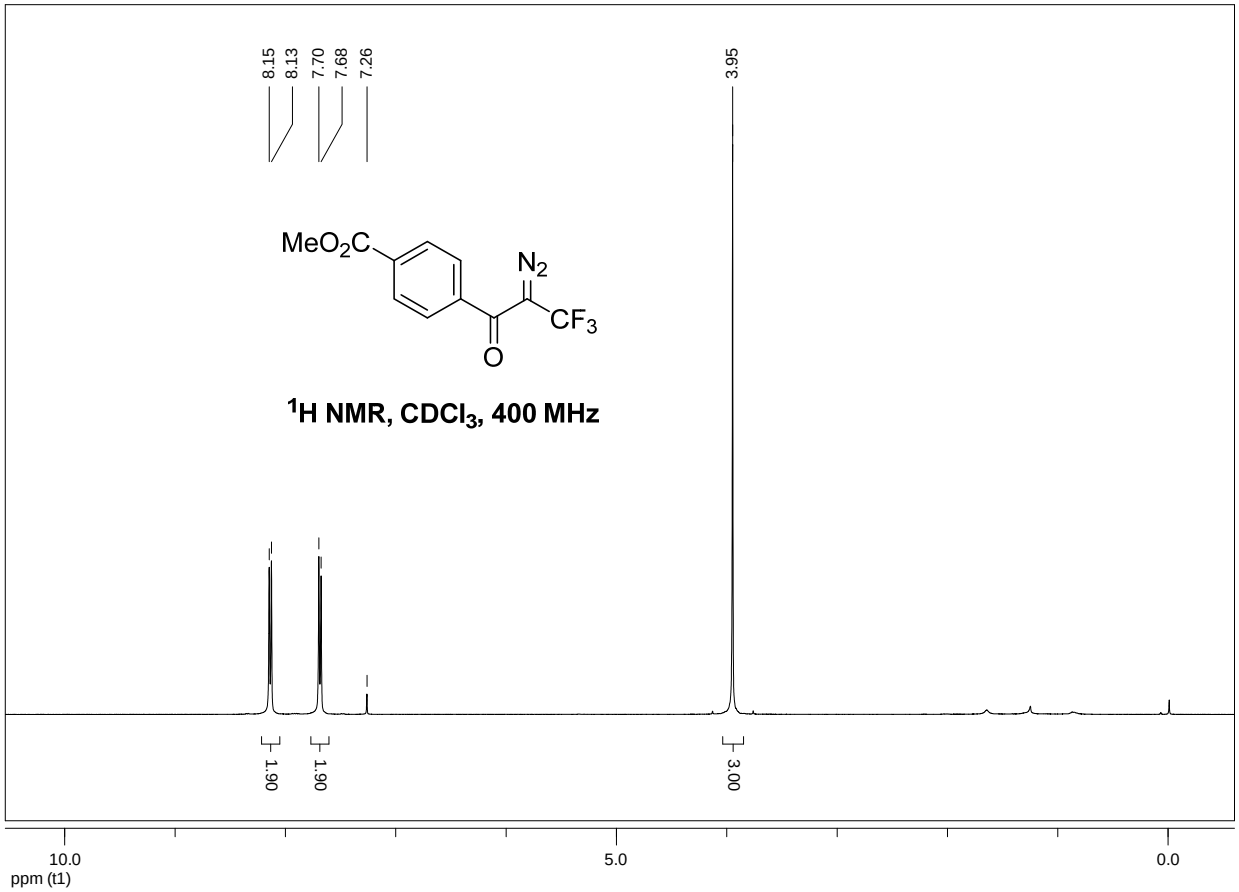


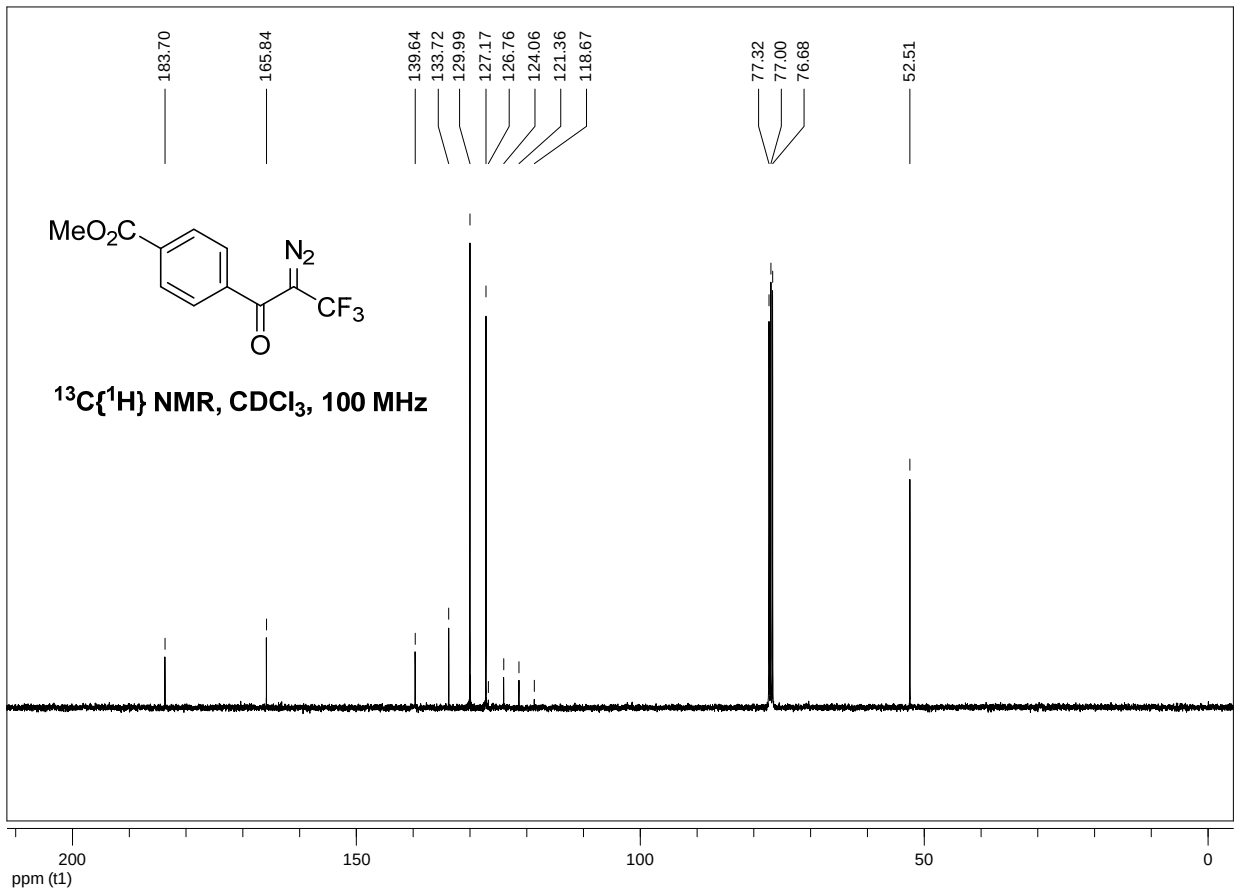


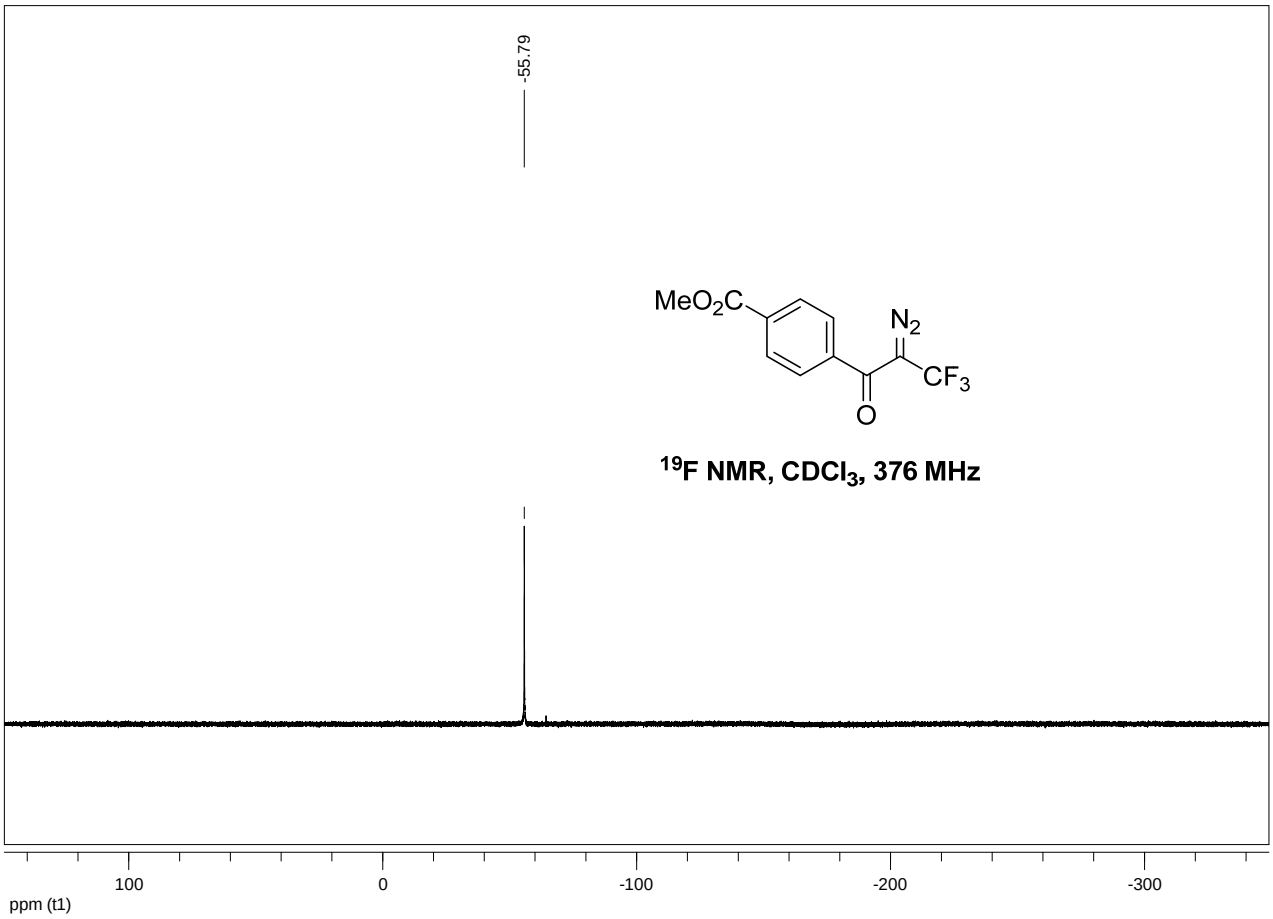


^{19}F NMR, $CDCl_3$, 376 MHz

4-(2-diazo-3,3,3-trifluoropropanoyl)phenyl acetate (1i)

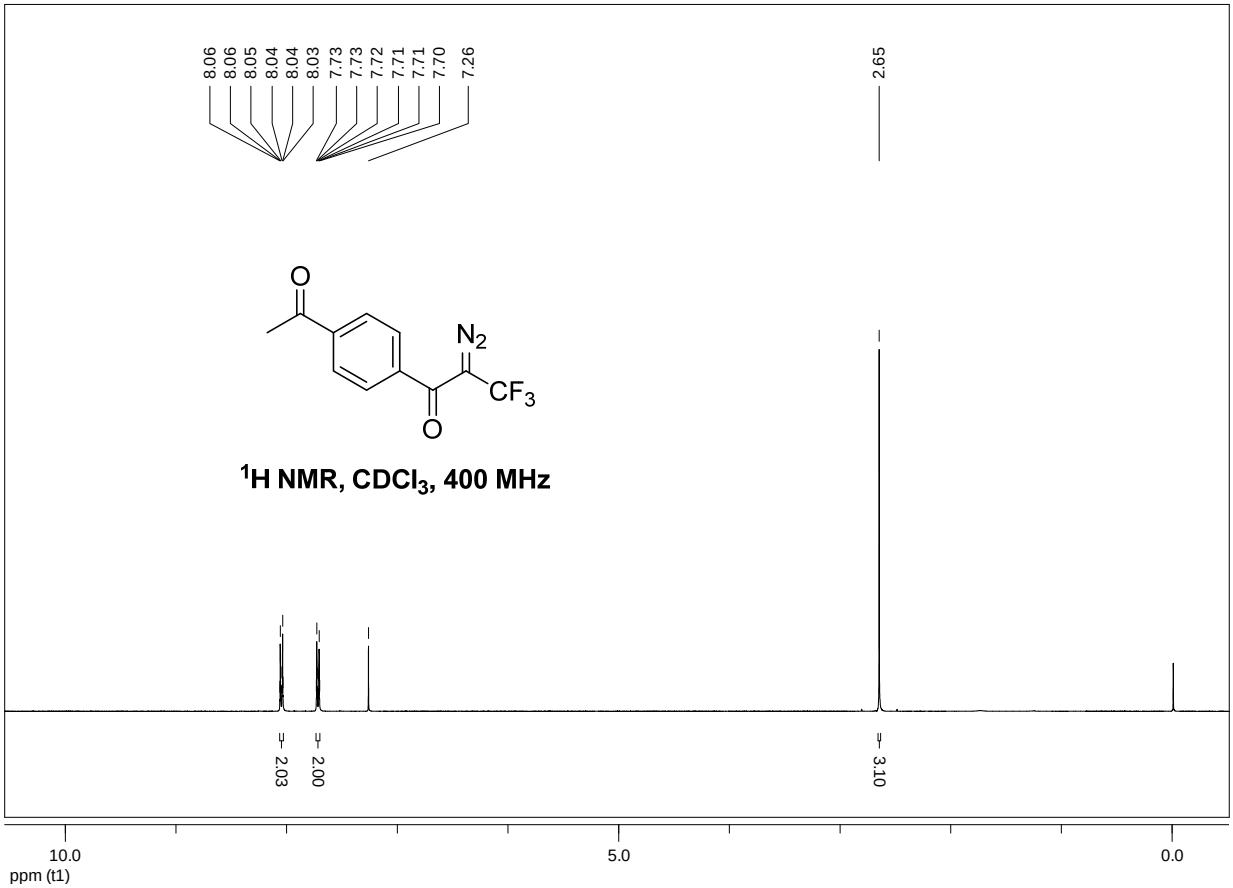


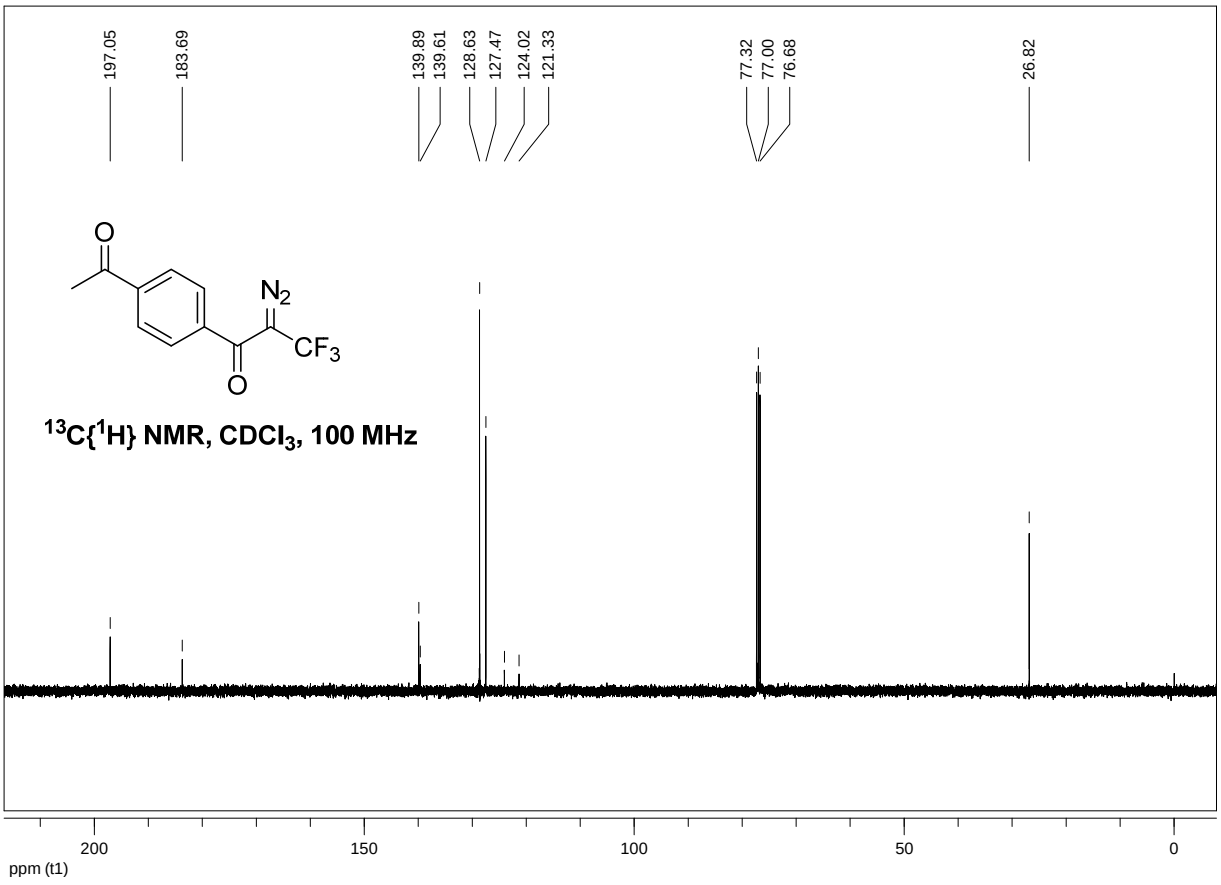


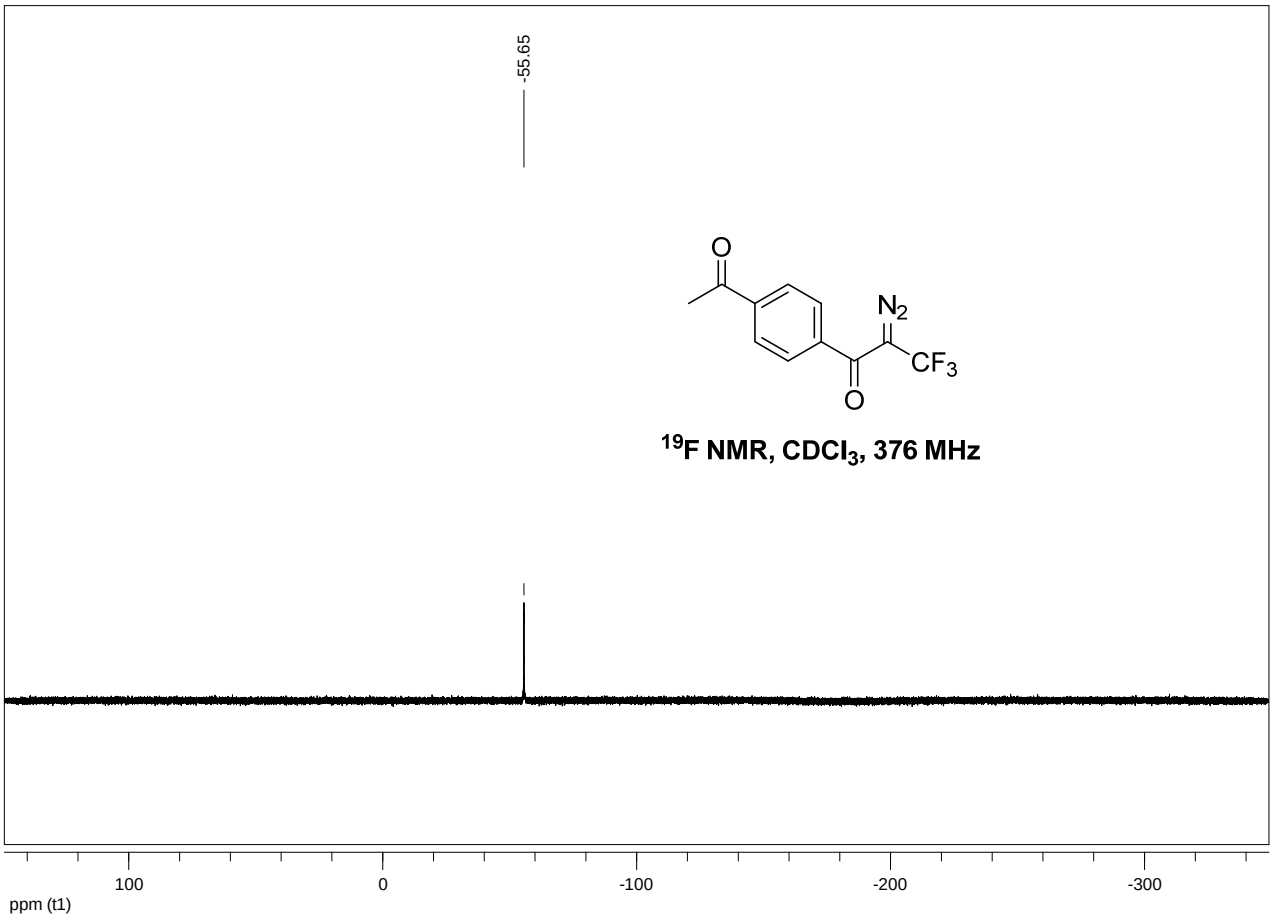


^{19}F NMR, $CDCl_3$, 376 MHz

1-(4-acetylphenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1j)

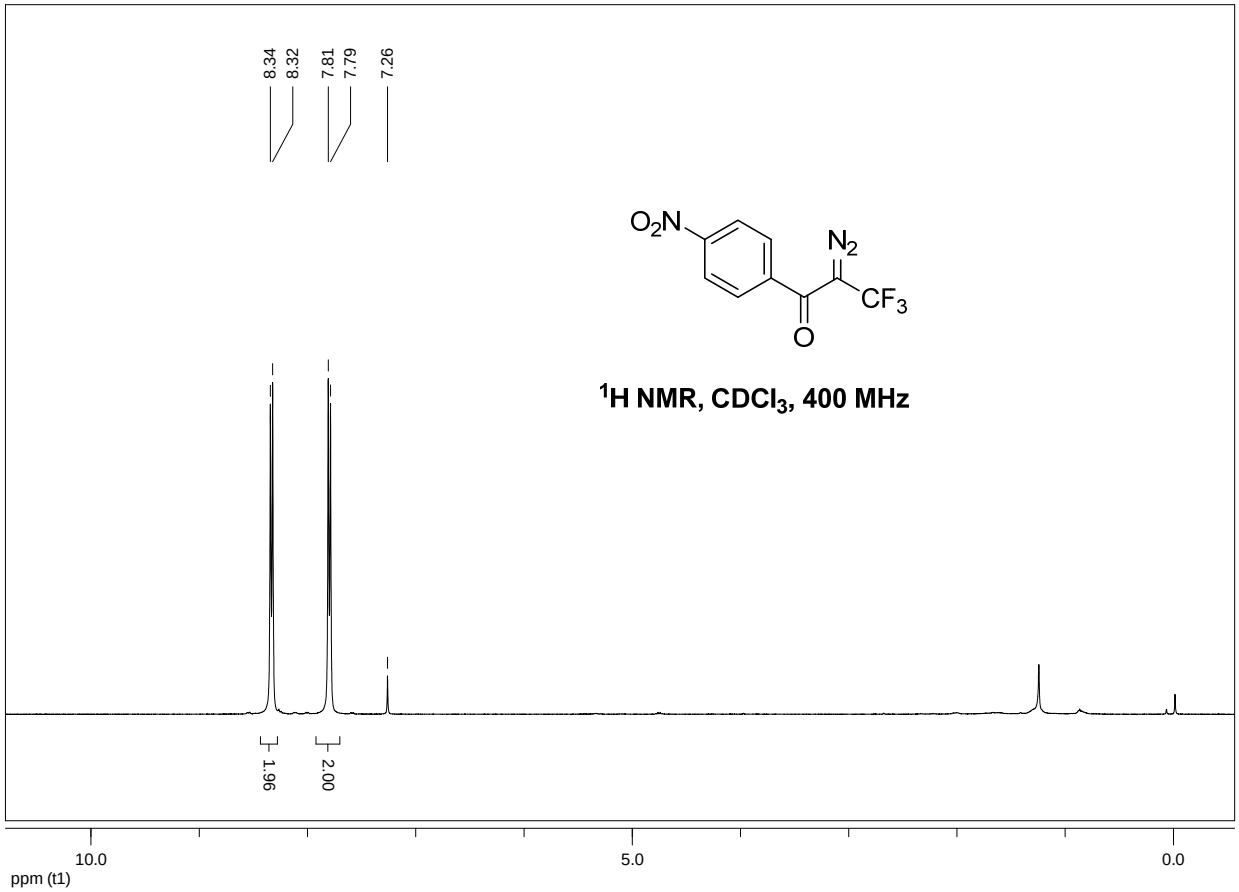


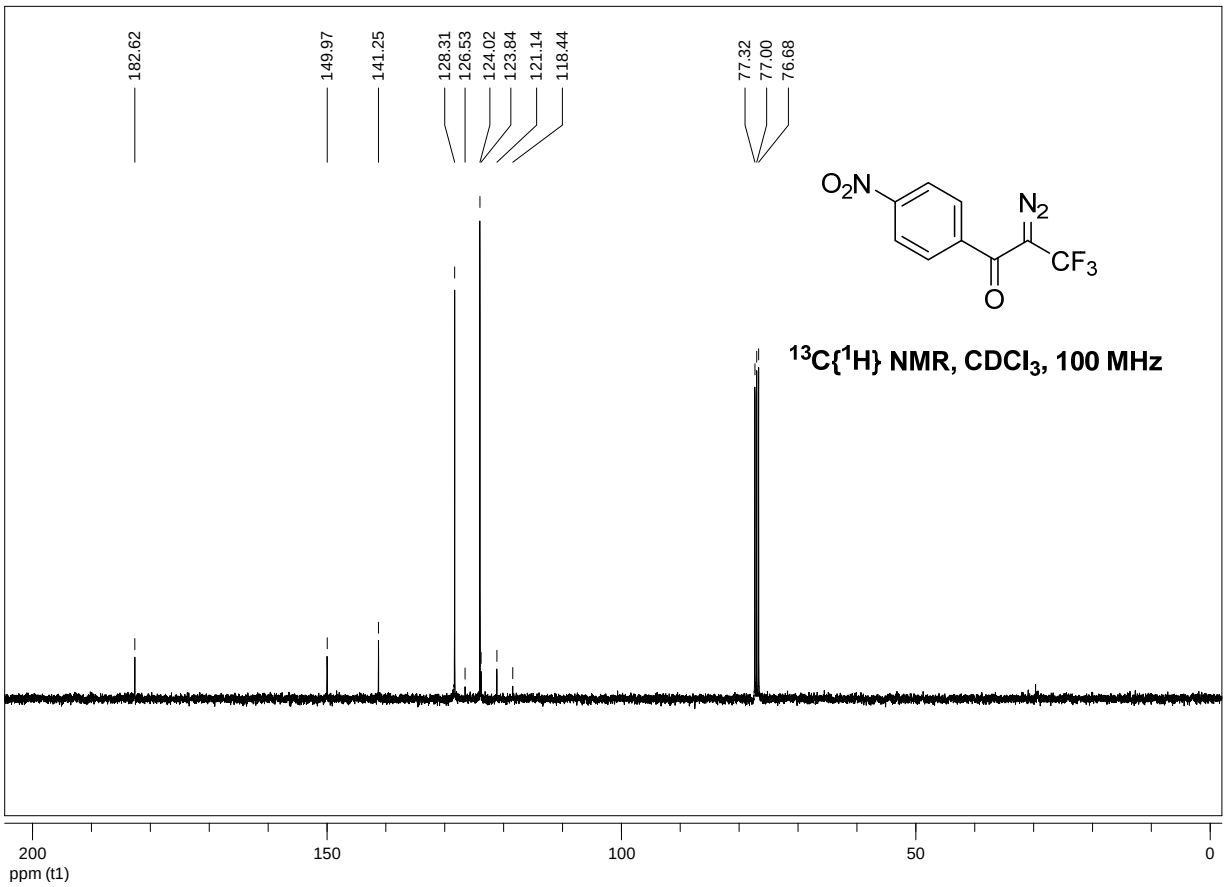


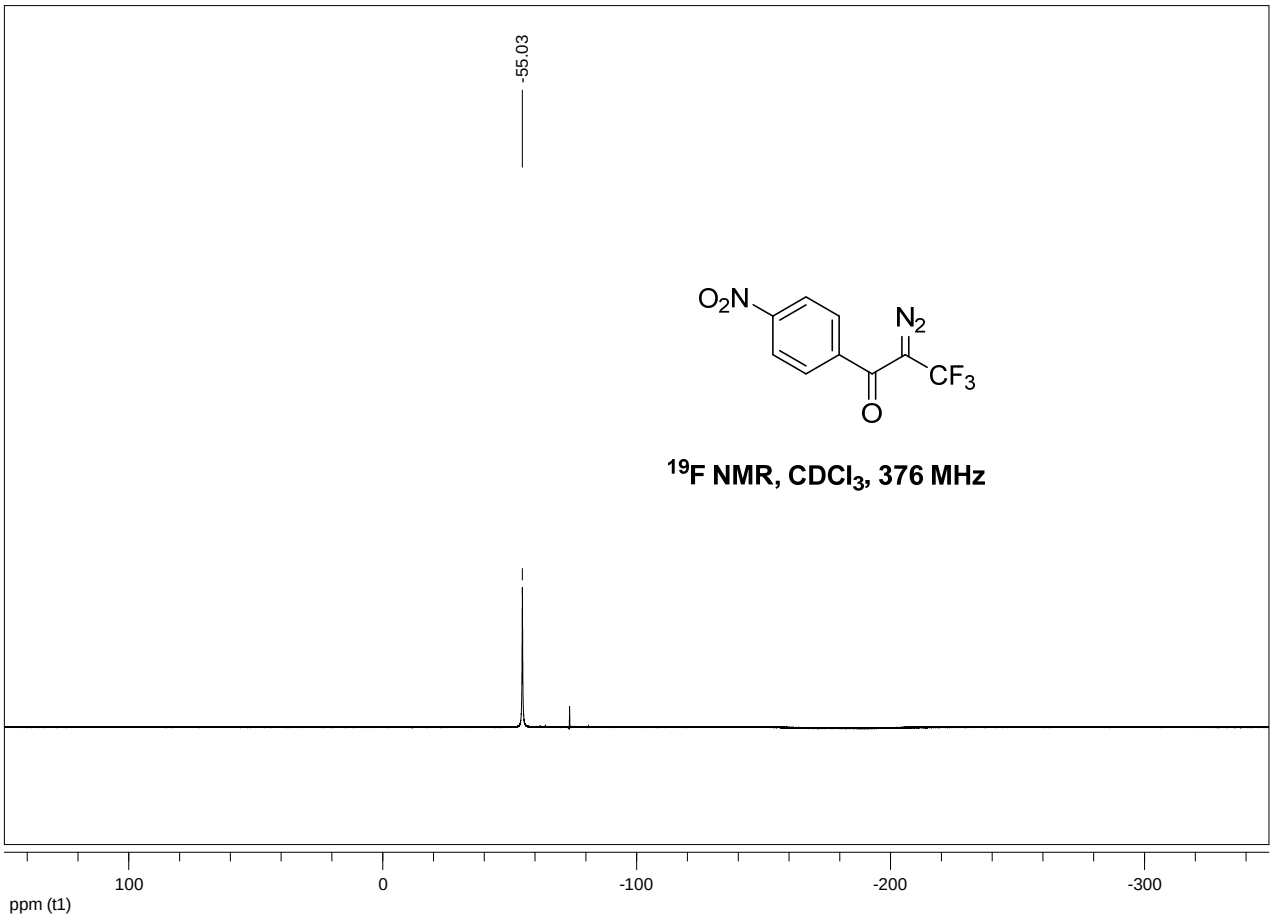


^{19}F NMR, $CDCl_3$, 376 MHz

2-diazo-3,3,3-trifluoro-1-(4-nitrophenyl)propan-1-one (1k)

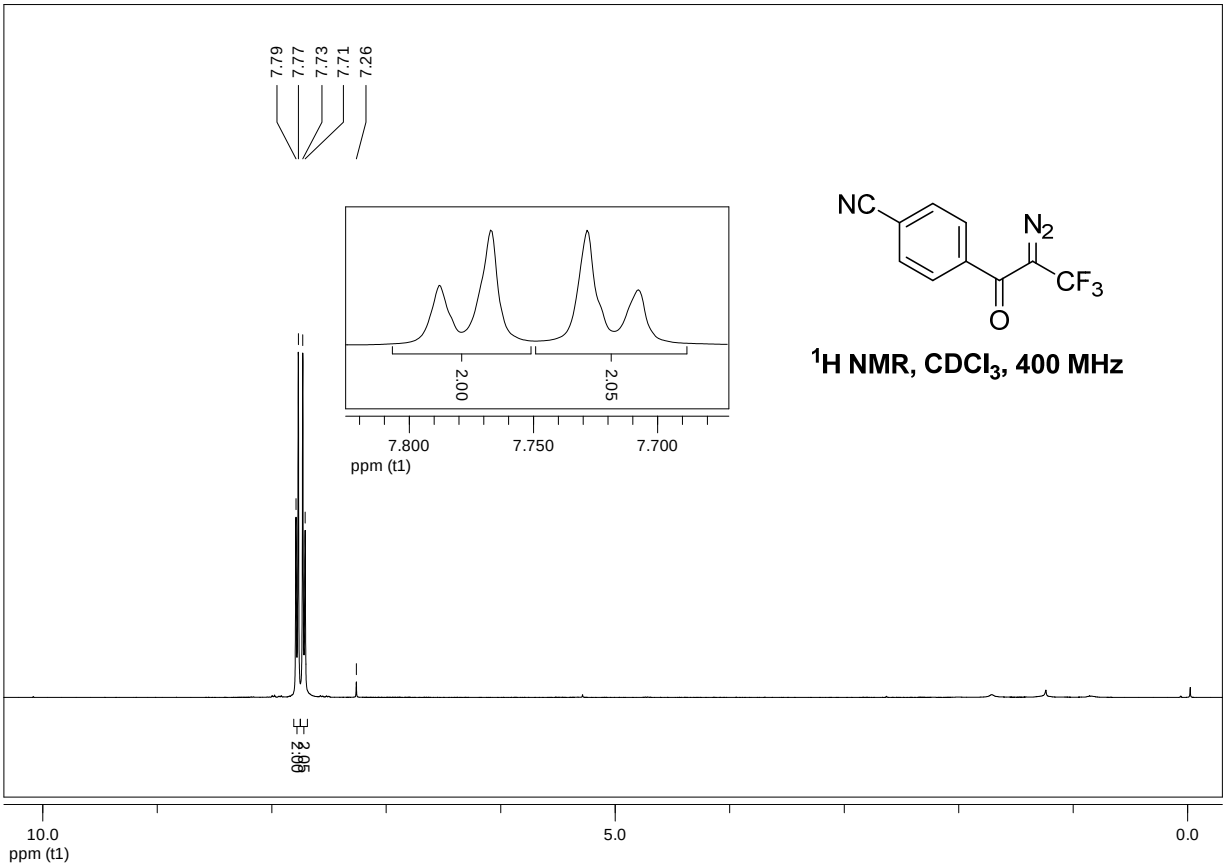


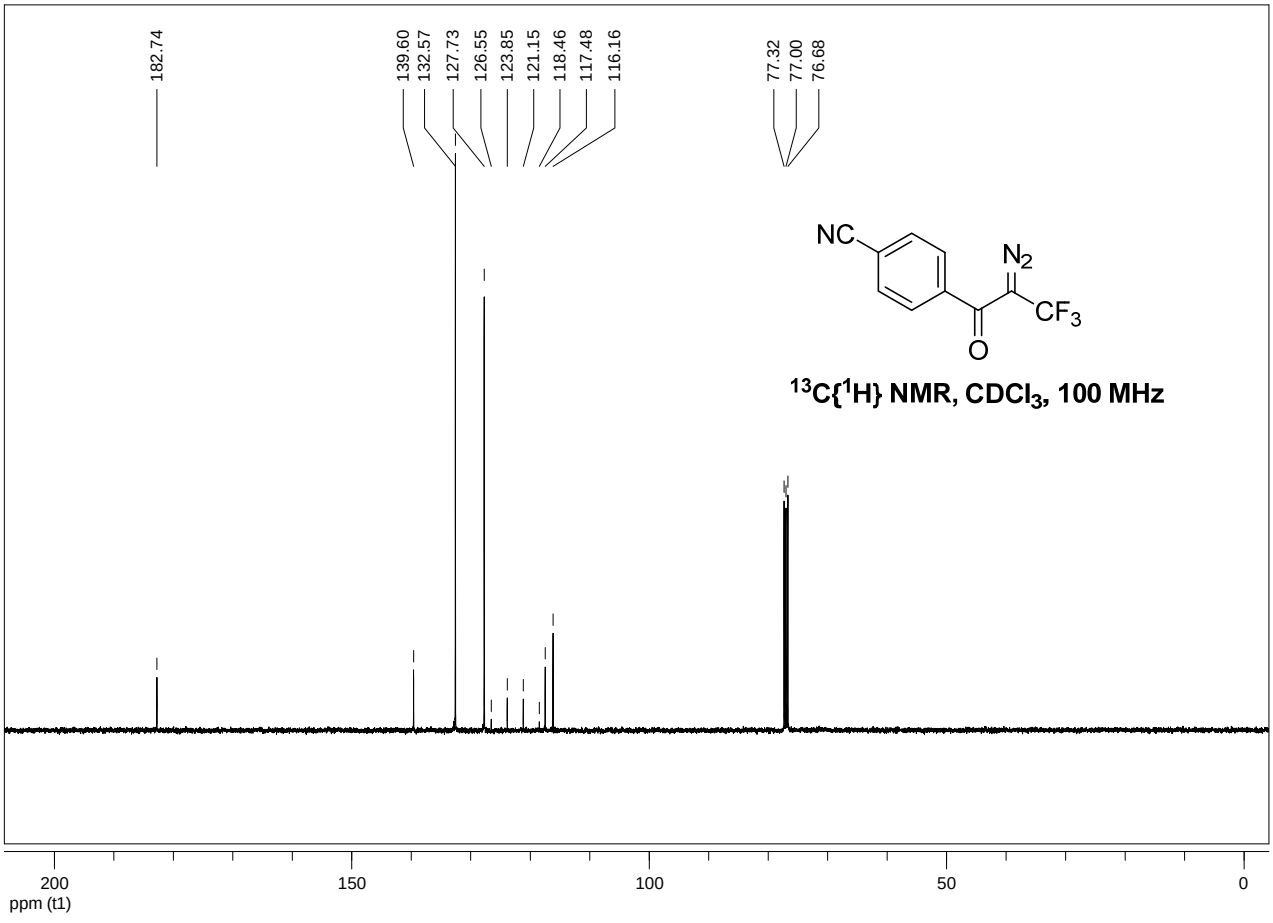


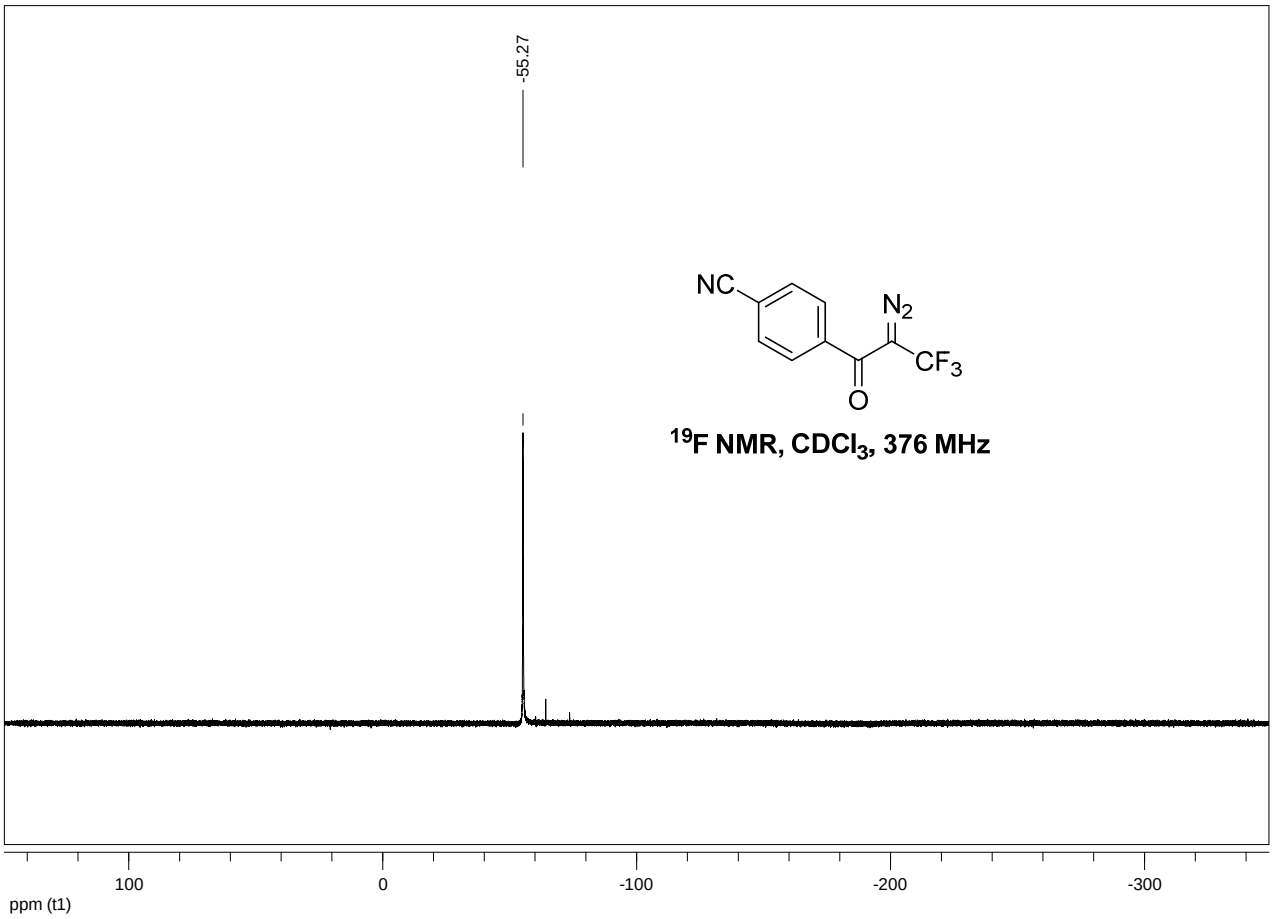


^{19}F NMR, $CDCl_3$, 376 MHz

4-(2-diazo-3,3,3-trifluoropropanoyl)benzonitrile (1l)

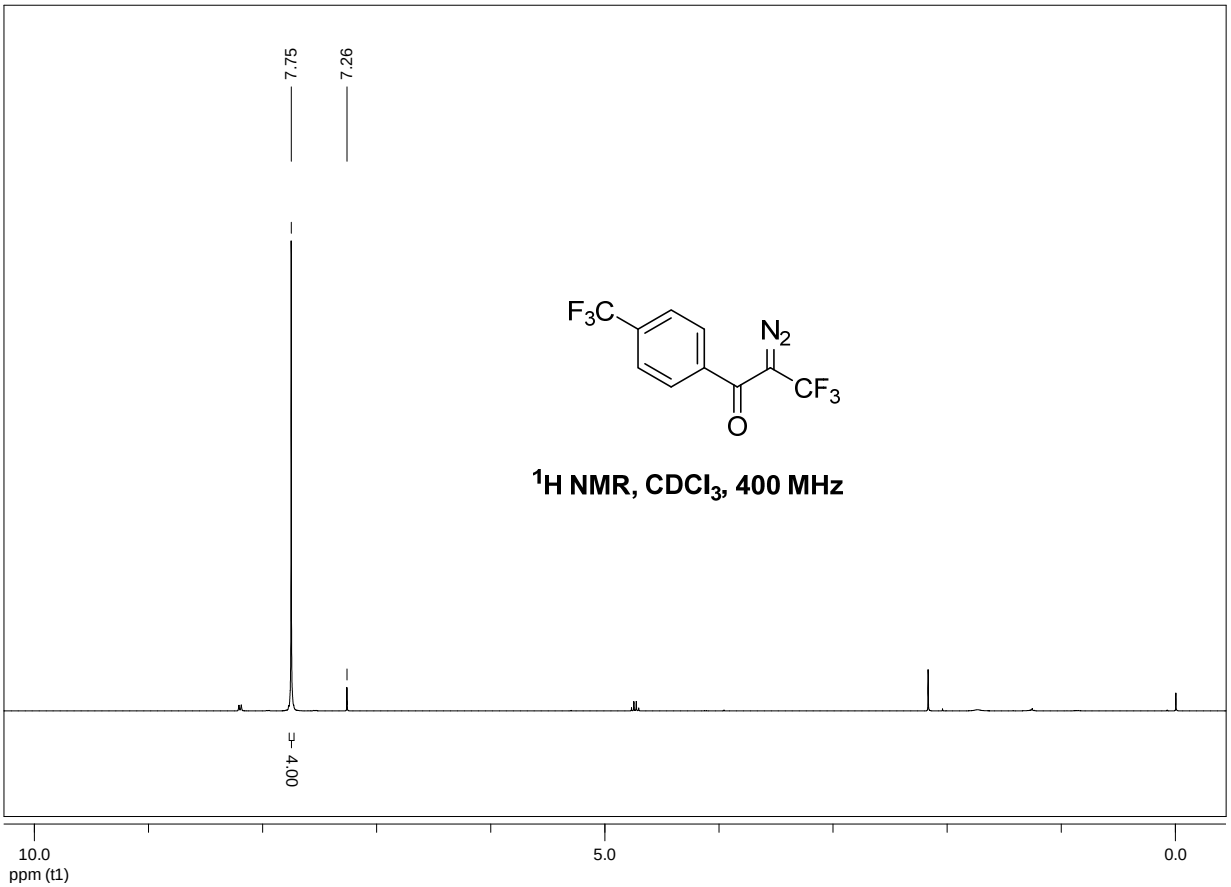




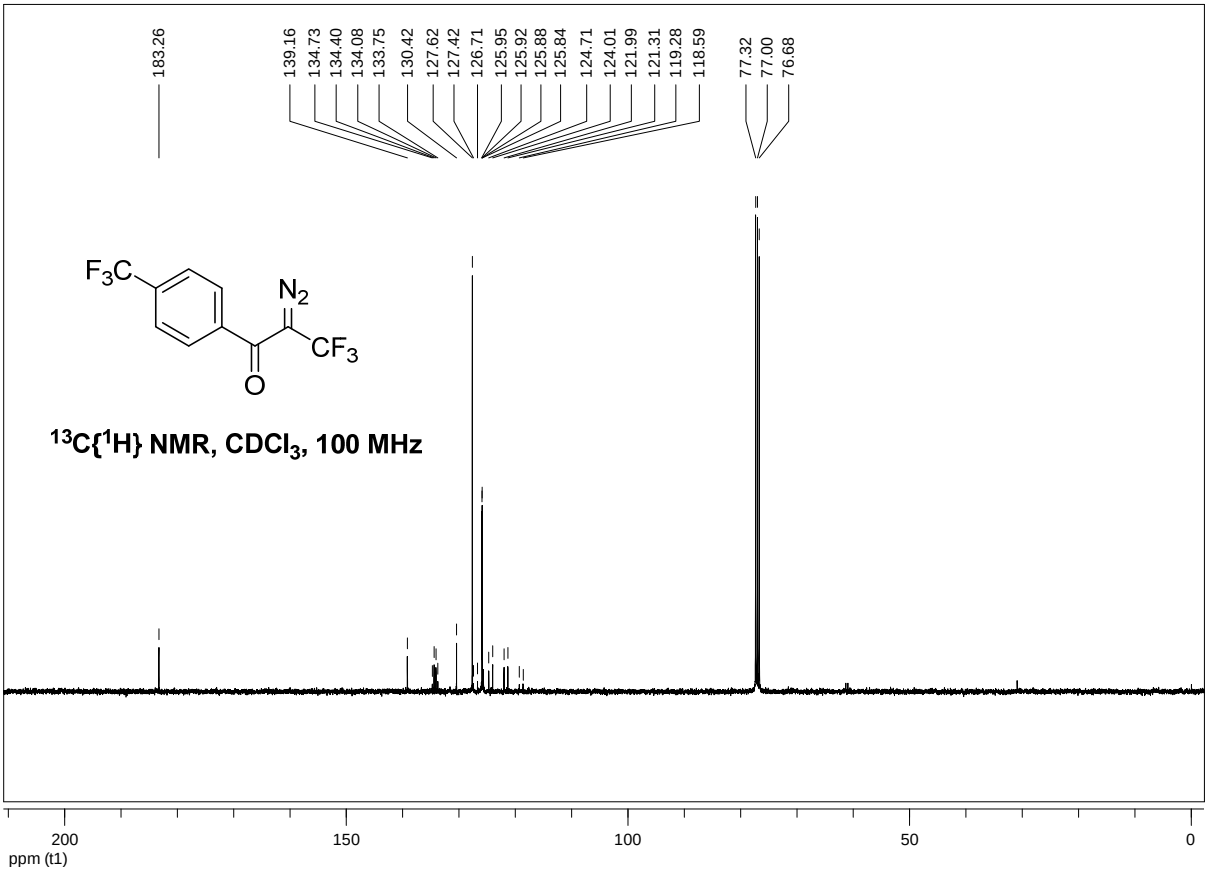


^{19}F NMR, $CDCl_3$, 376 MHz

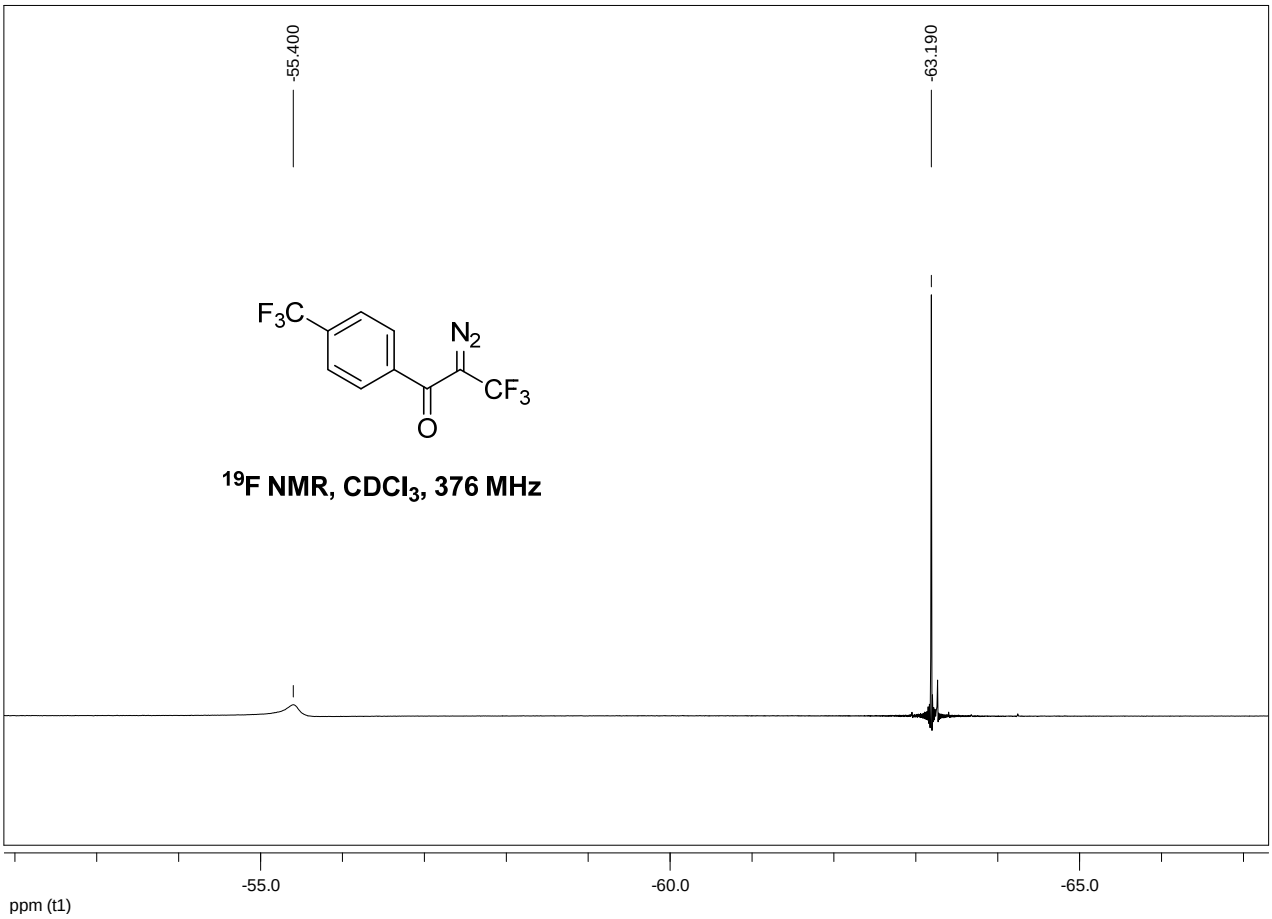
2-diazo-3,3,3-trifluoro-1-(4-(trifluoromethyl)phenyl)propan-1-one (1m)



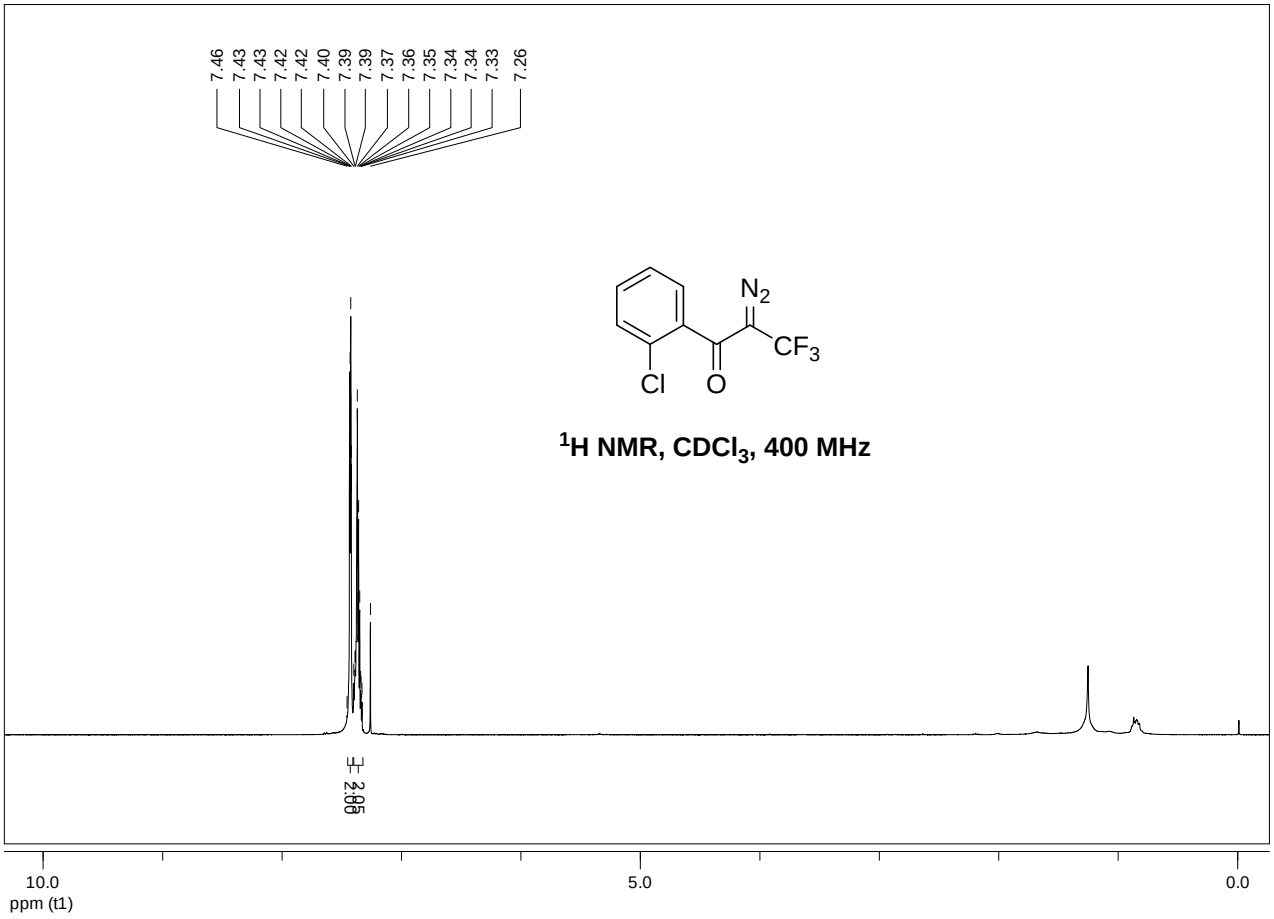
^{1}H NMR, $CDCl_3$, 400 MHz

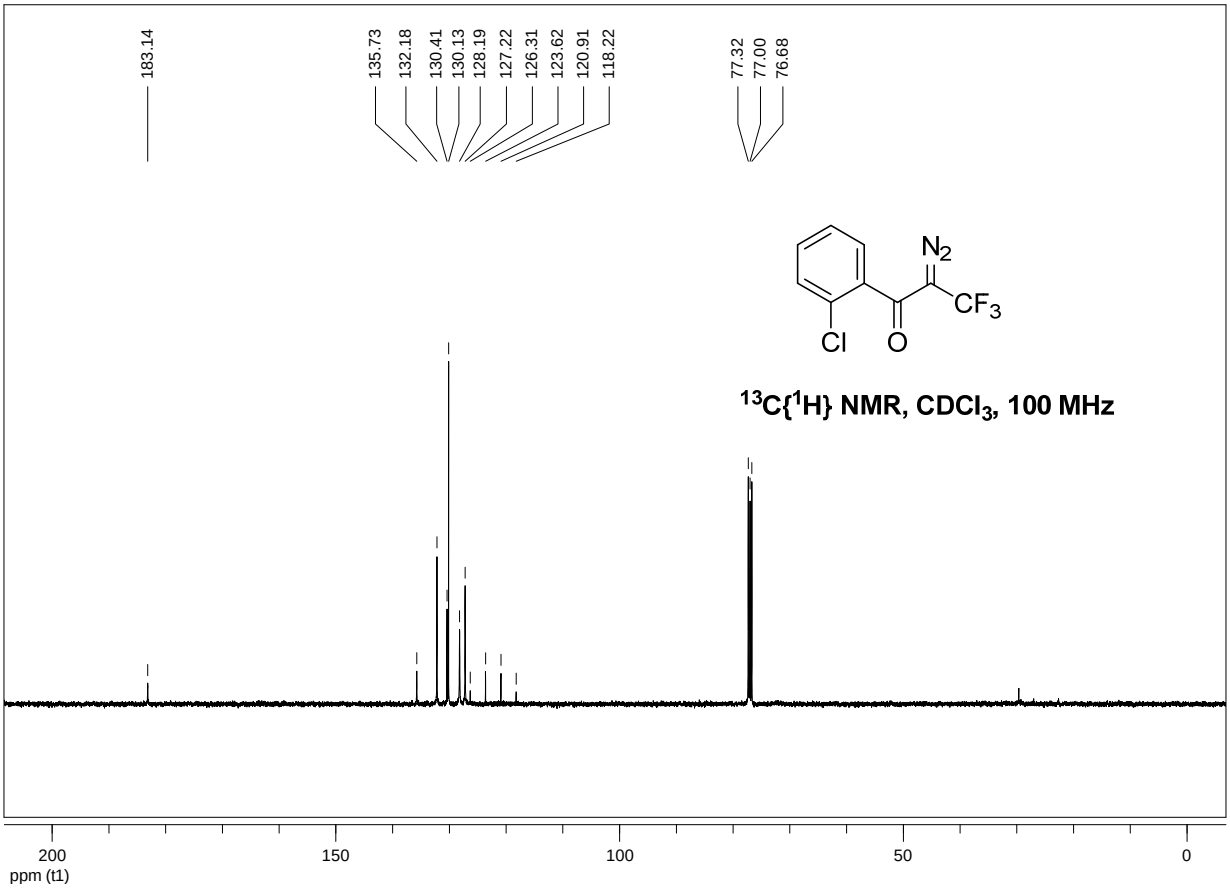


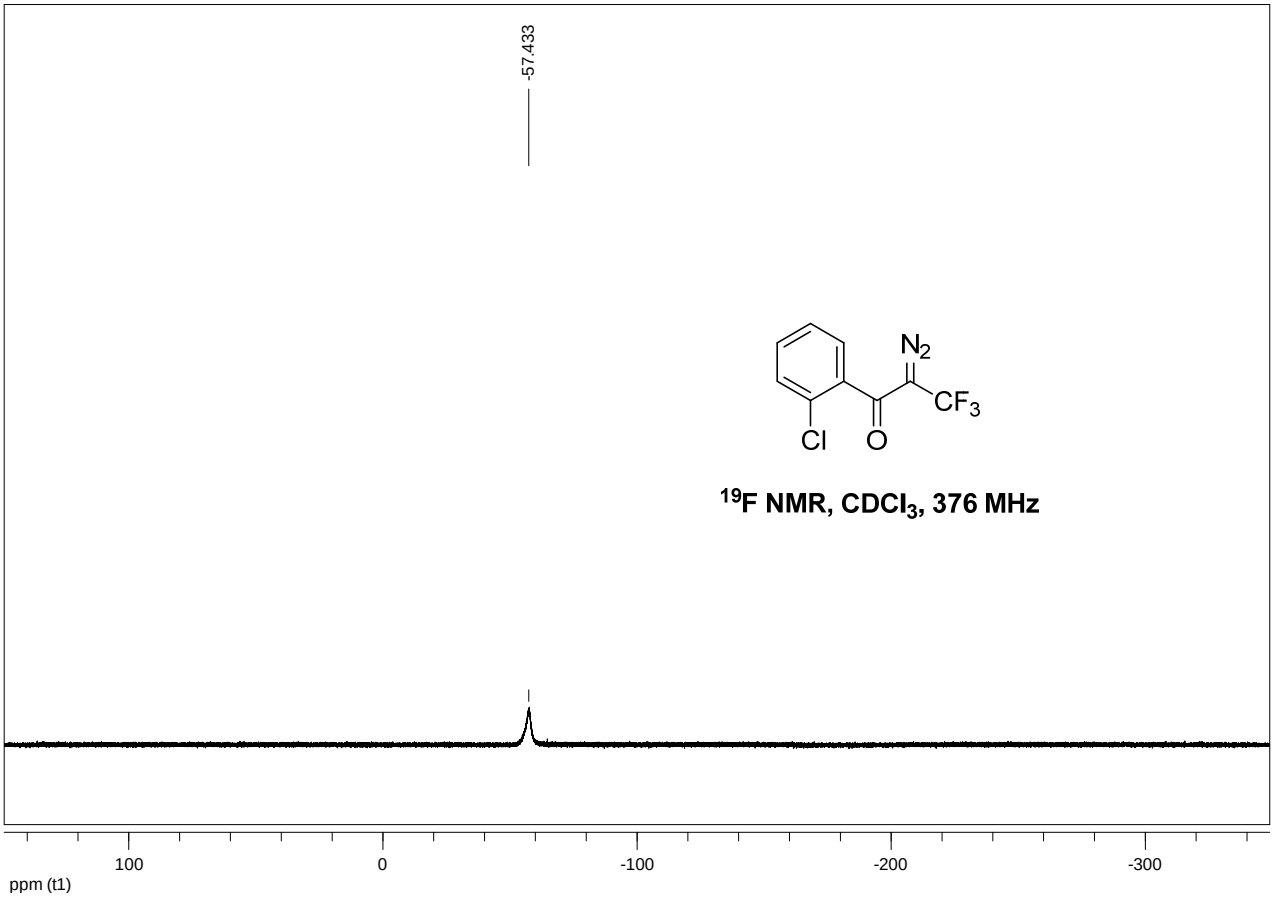
$^{13}C\{^{1}H\}$ NMR, $CDCl_3$, 100 MHz


-55.400
-63.190
F3C
N2
CF3
O
19F NMR, CDCl3, 376 MHz
-55.0
-60.0
-65.0
ppm (t1)

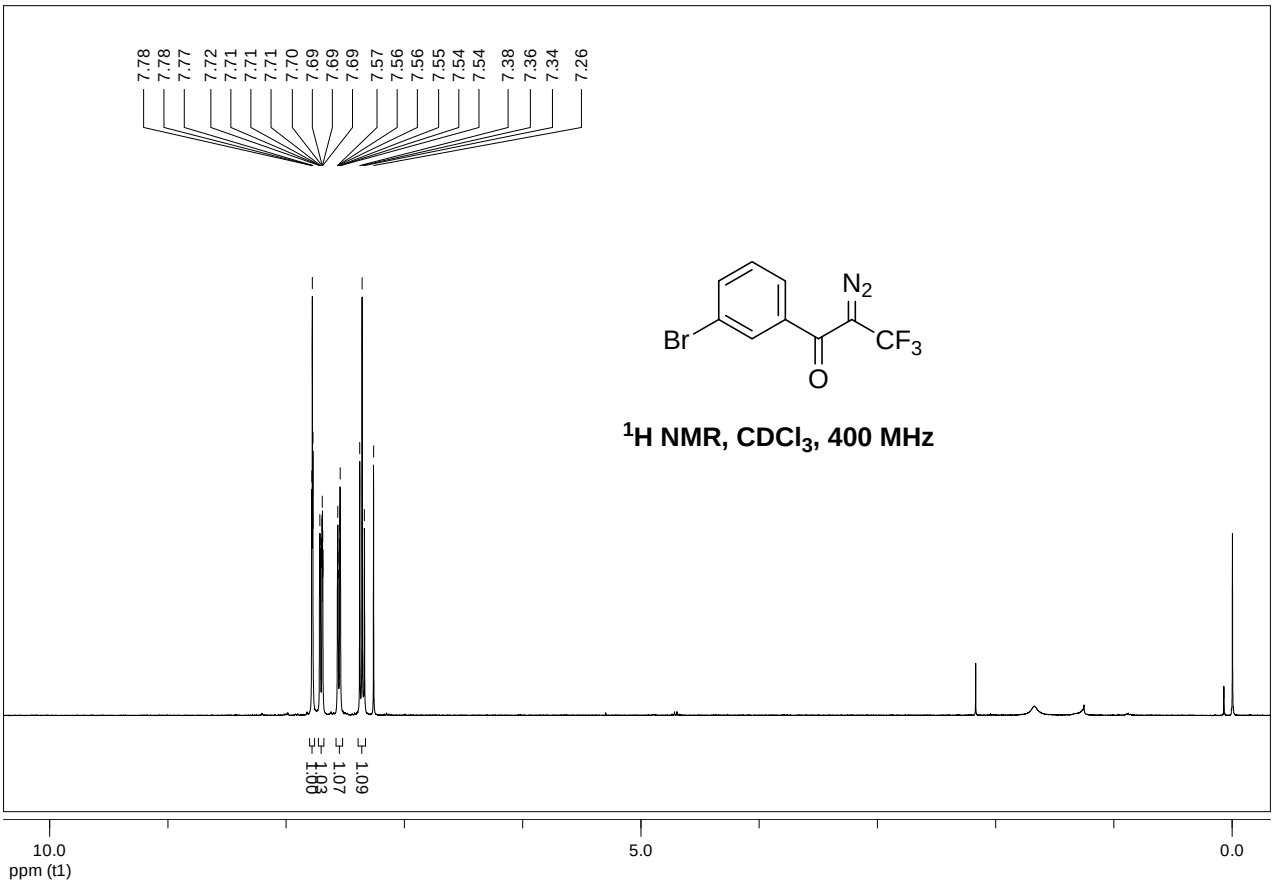
1-(2-chlorophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1n)

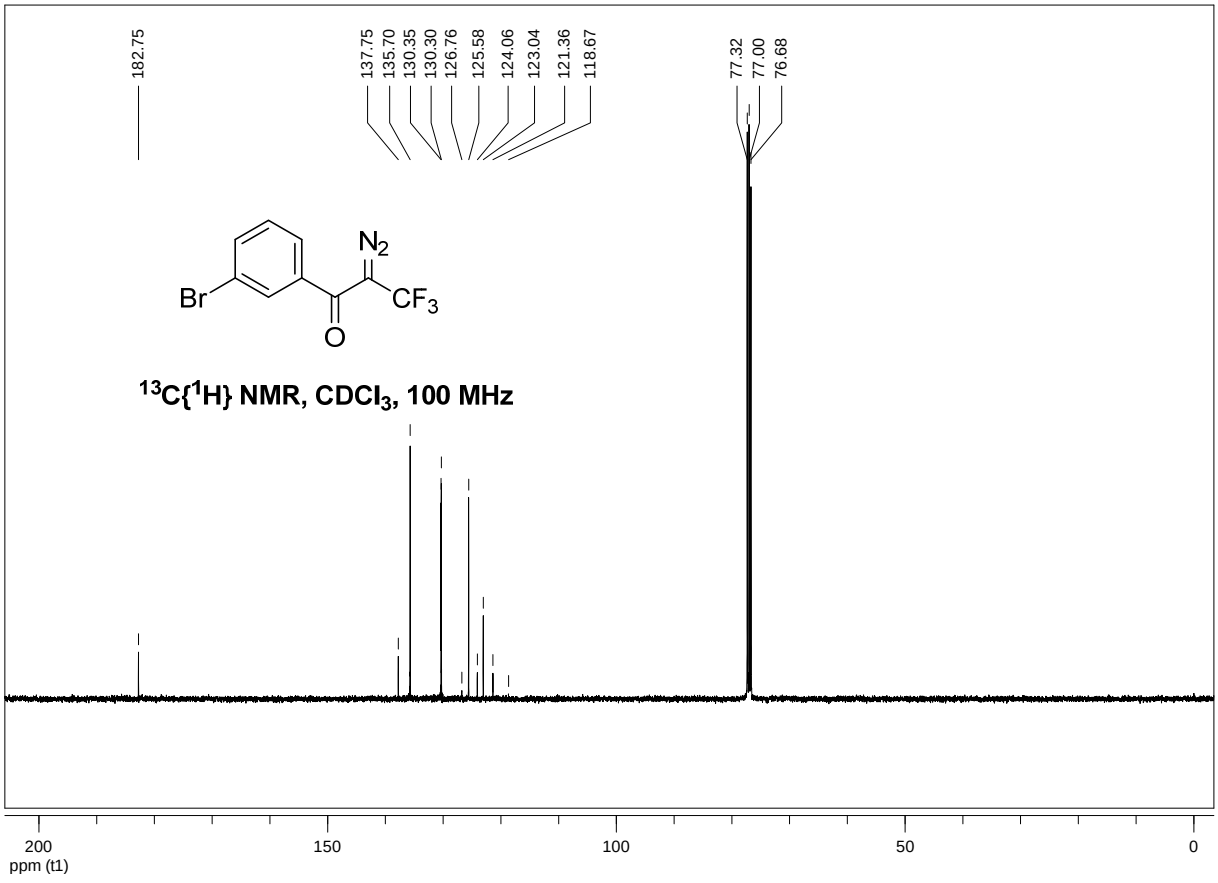


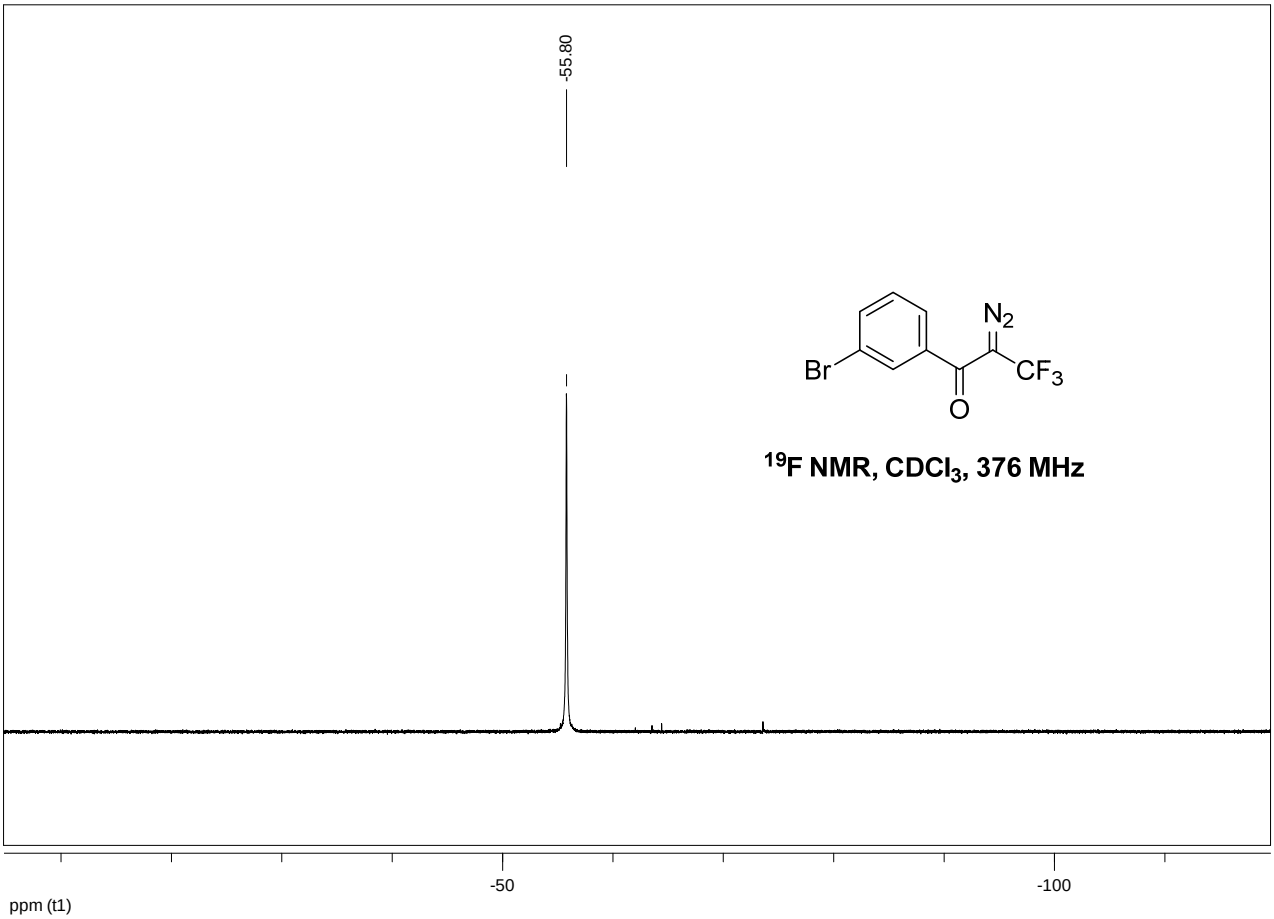



-57.433
N2
CF3
Cl
O
19F NMR, CDCl3, 376 MHz
100
0
-100
-200
-300
ppm (t1)

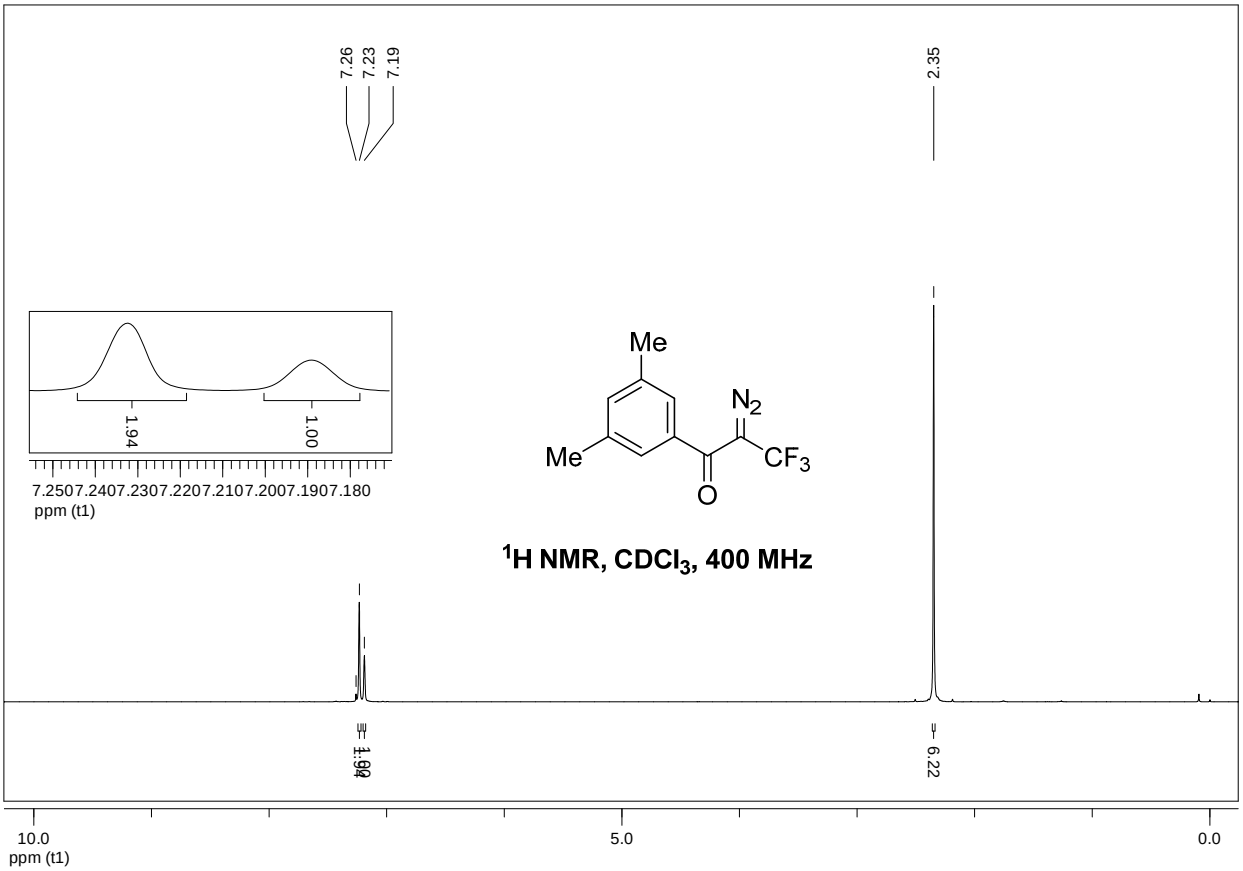
1-(3-bromophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1o)

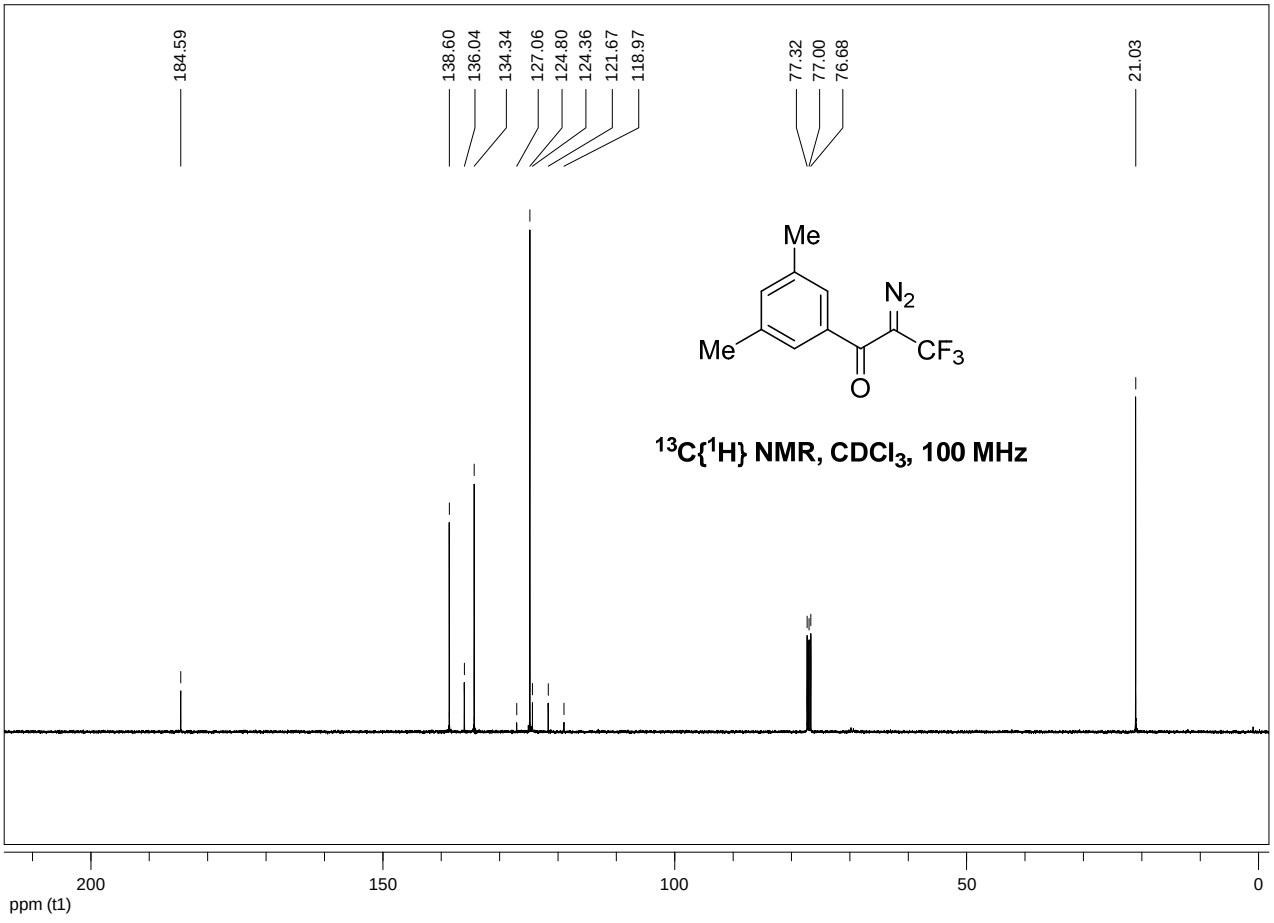


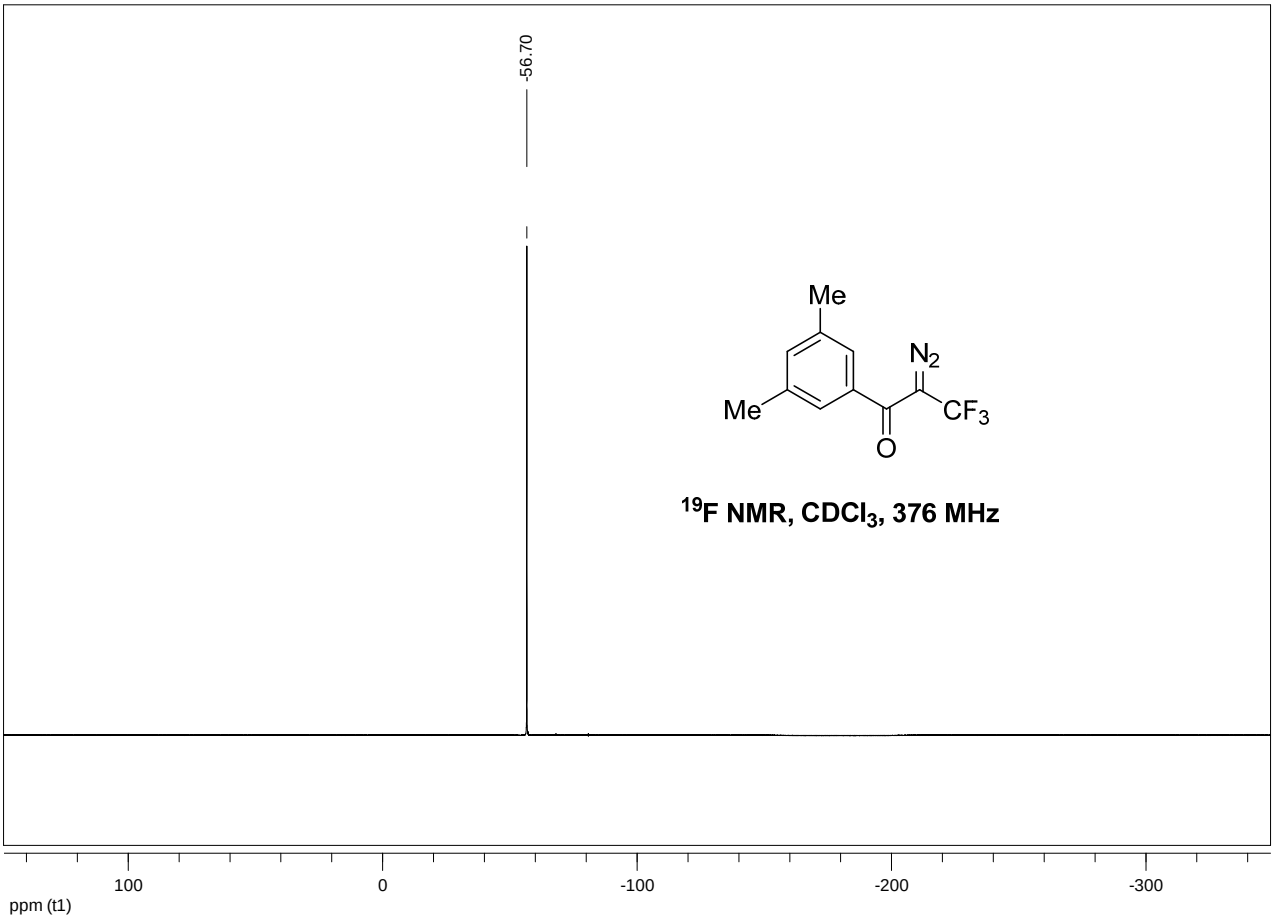



-55.80
Br
N2
CF3
O
19F NMR, CDCl3, 376 MHz
-50
-100
ppm (t1)

2-diazo-1-(3,5-dimethylphenyl)-3,3,3-trifluoropropan-1-one (1p)

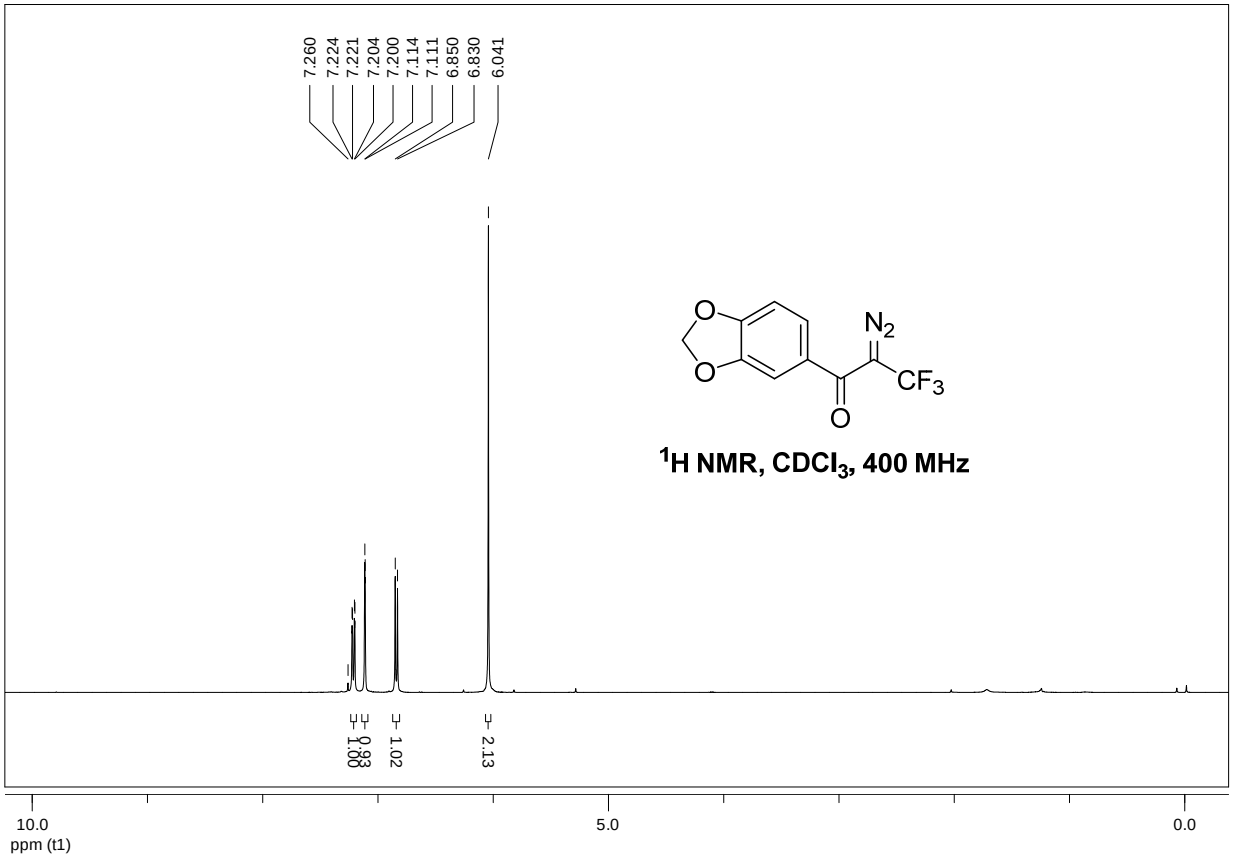


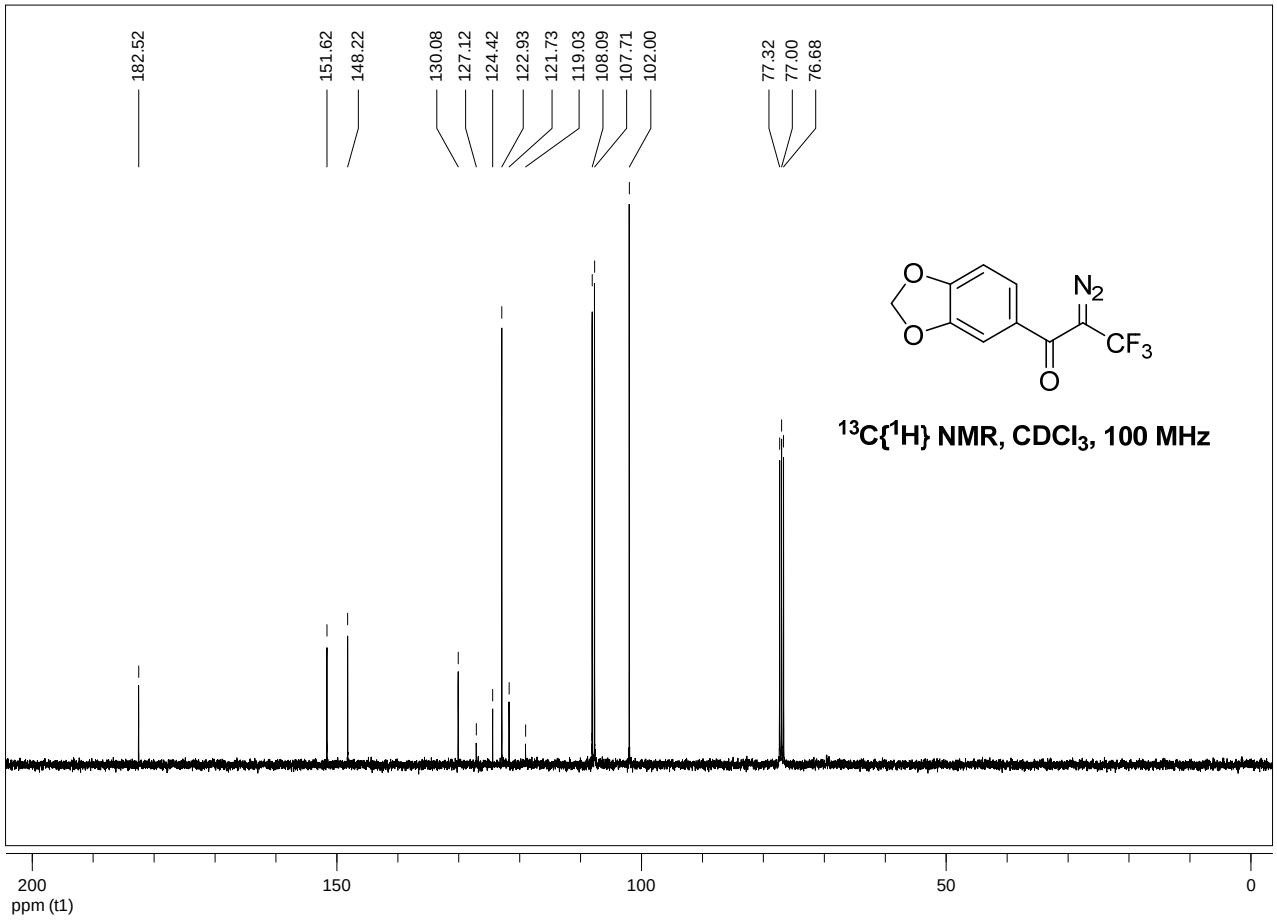


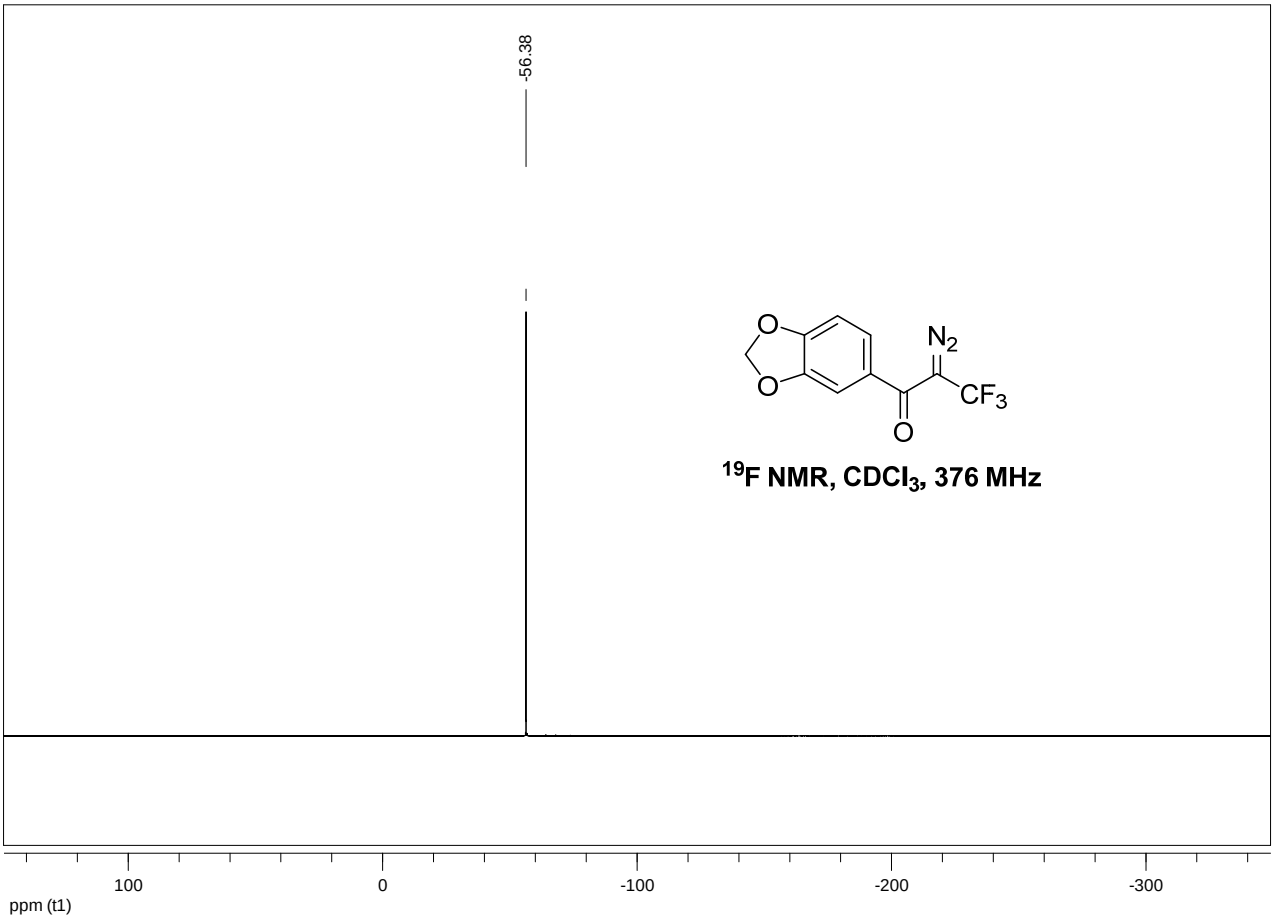


^{19}F NMR, $CDCl_3$, 376 MHz

1-(benzo[*d*][*1,3*]dioxol-5-yl)-2-diazo-3,3,3-trifluoropropan-1-one(1q)

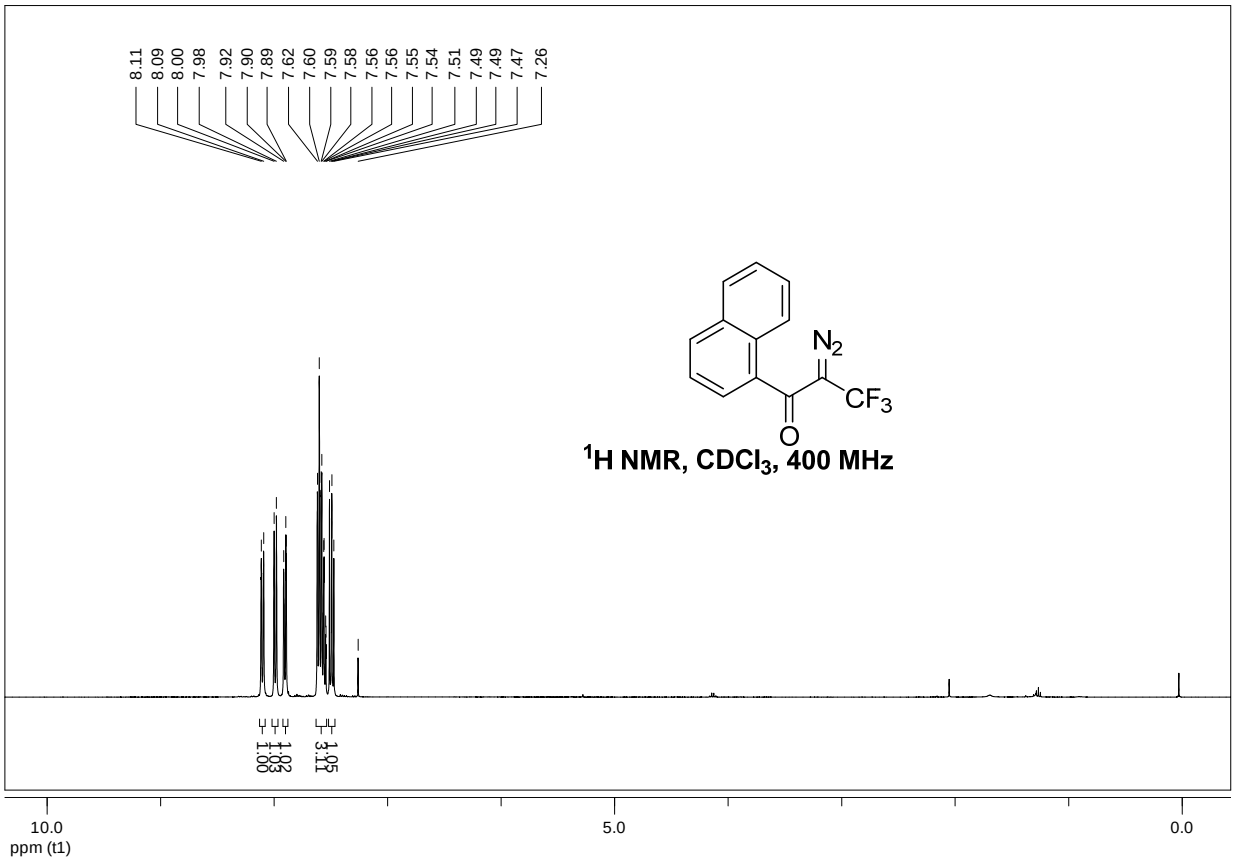


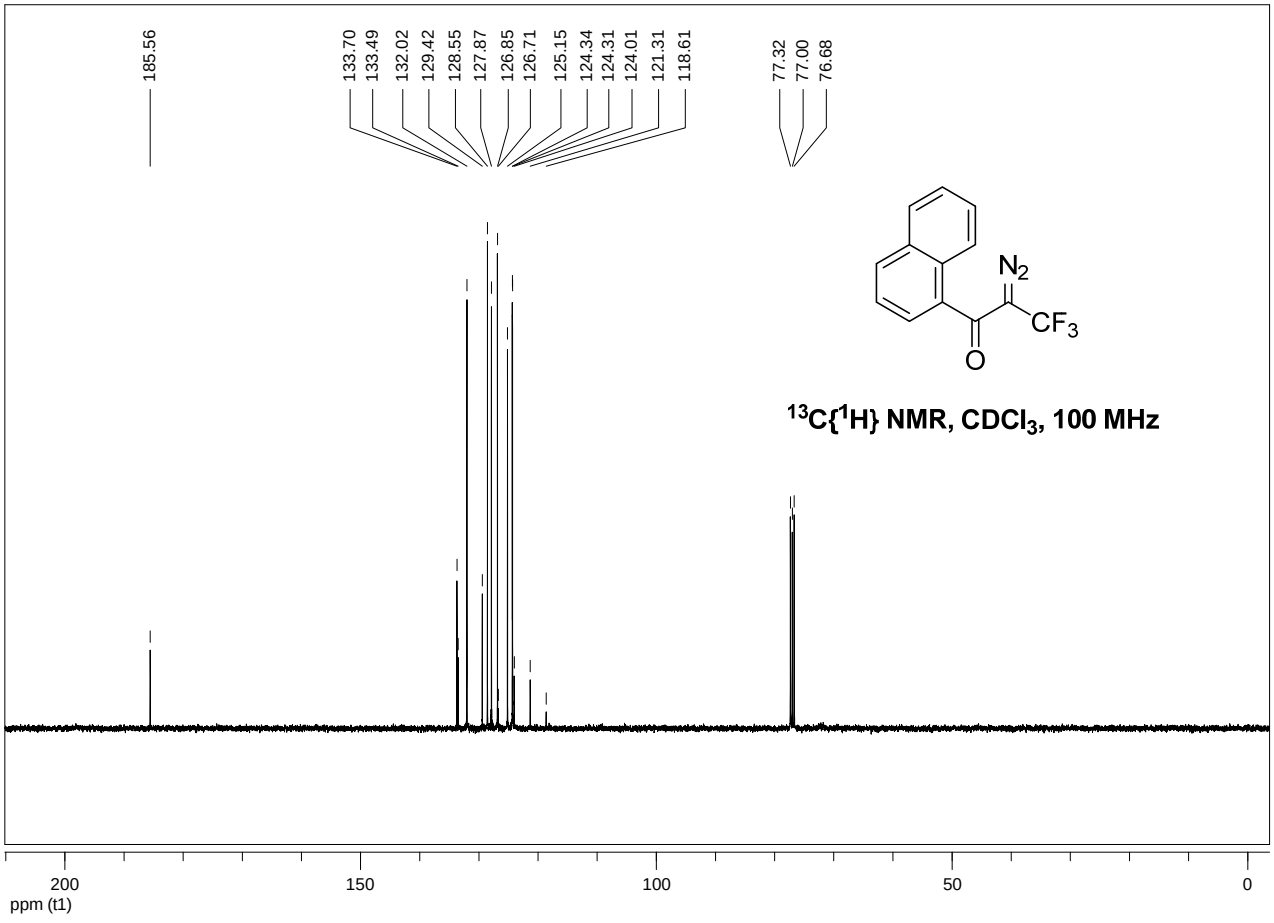


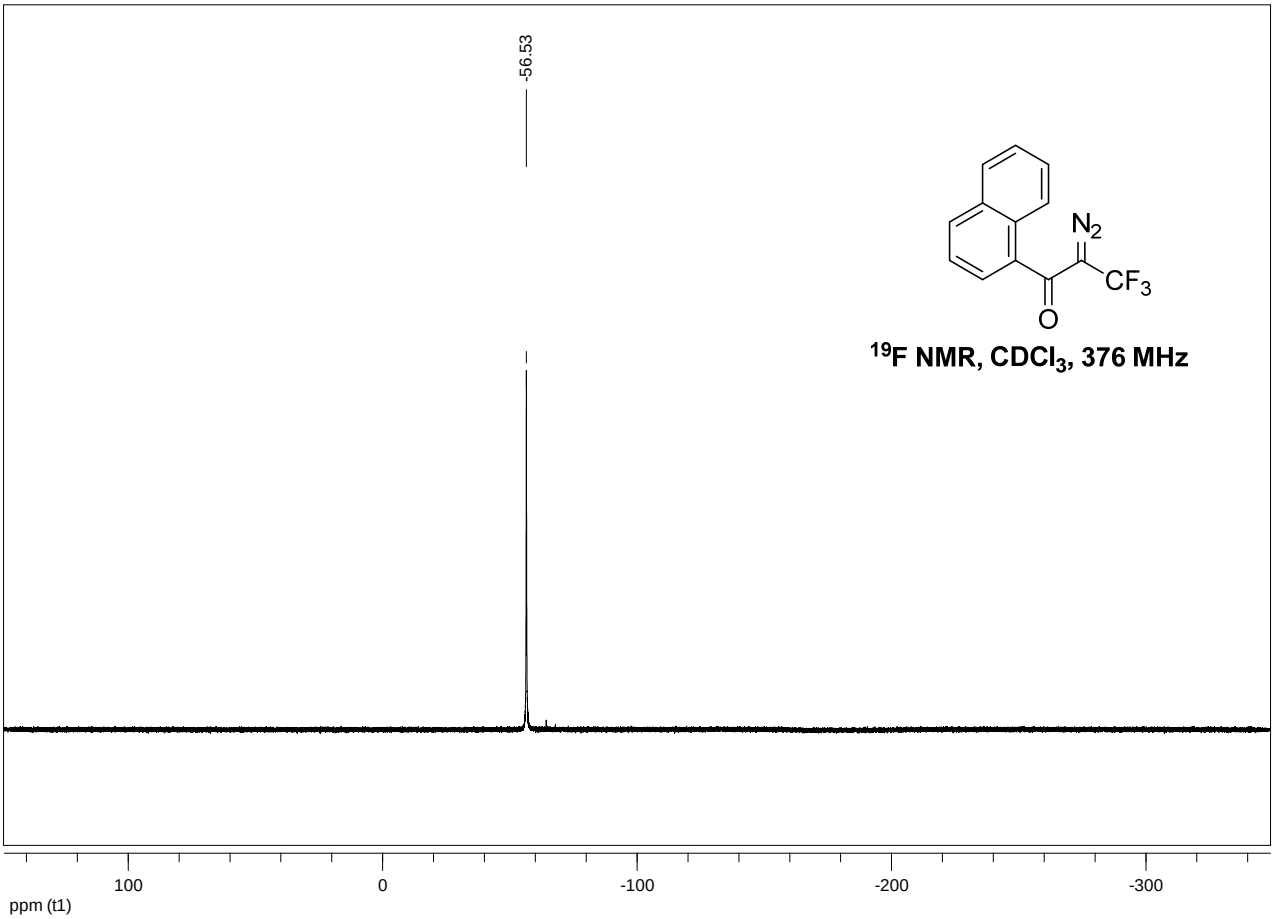


^{19}F NMR, $CDCl_3$, 376 MHz

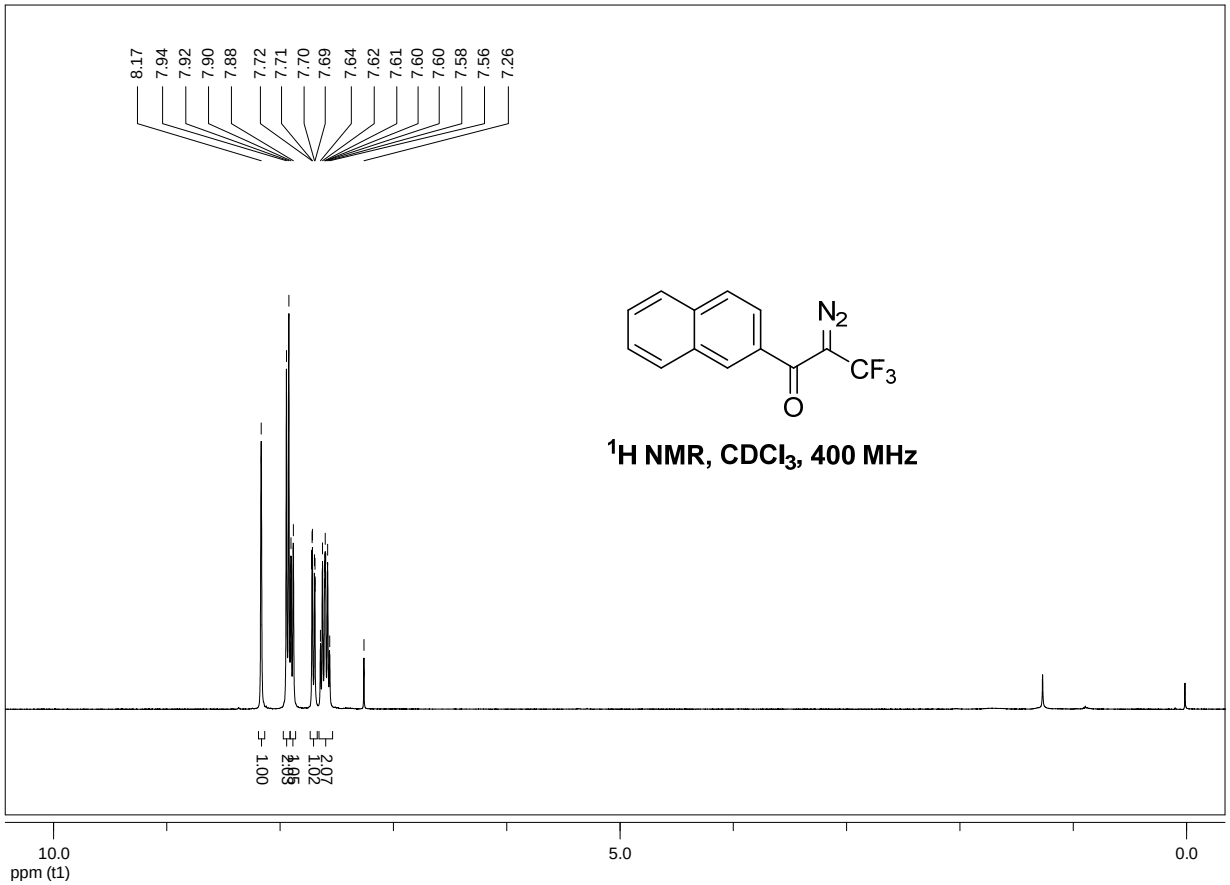
2-diazo-3,3,3-trifluoro-1-(naphthalen-1-yl)propan-1-one (1r)



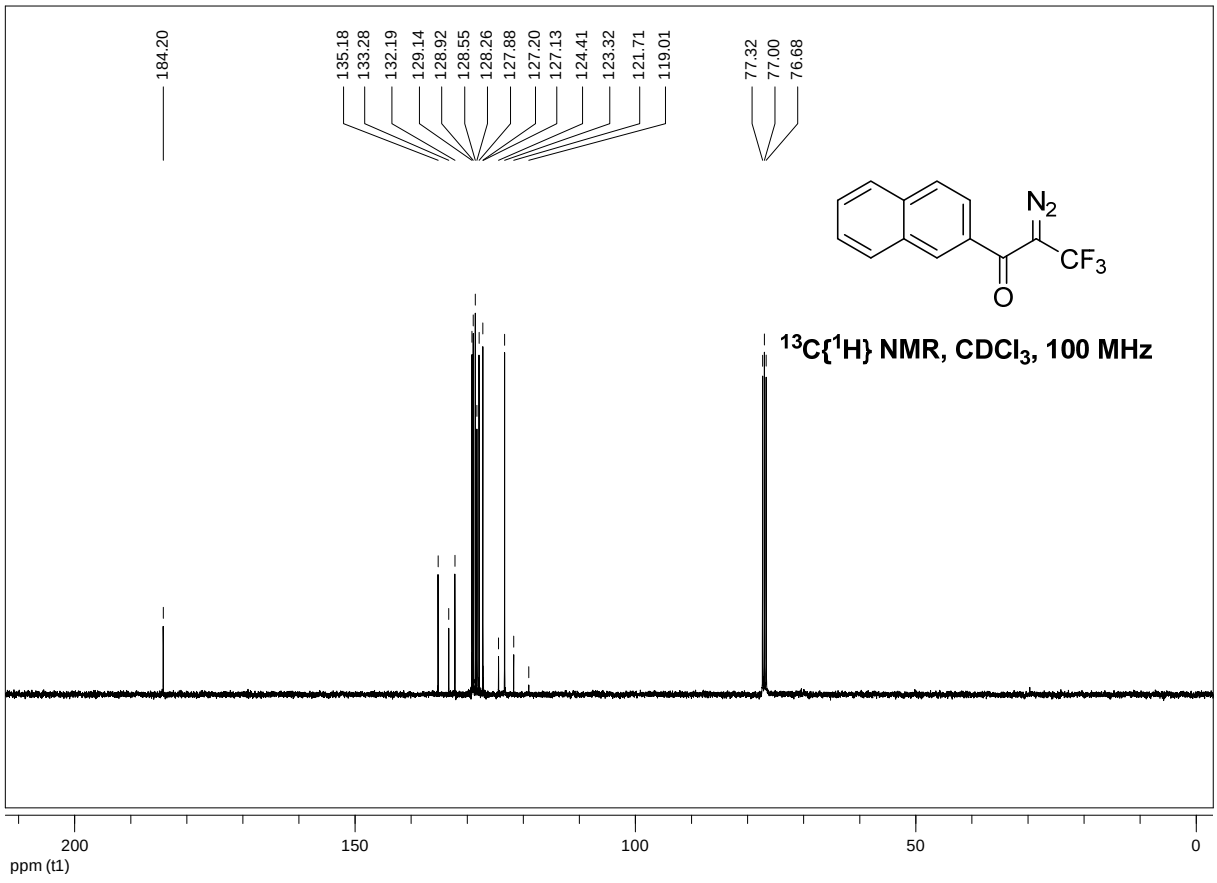



-56.53
N2
CF3
O
19F NMR, CDCl3, 376 MHz
100
0
-100
-200
-300
ppm (t1)

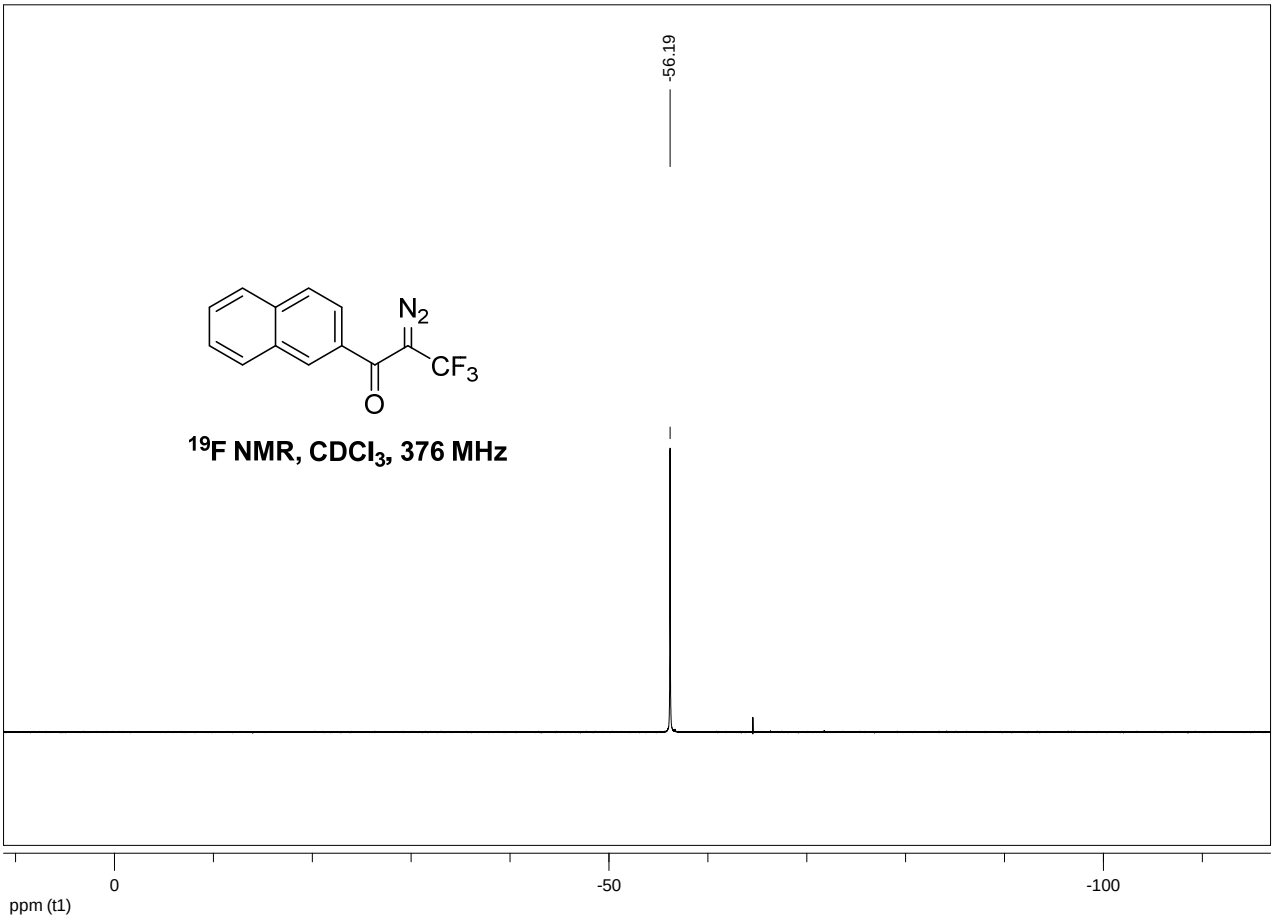
2-diazo-3,3,3-trifluoro-1-(naphthalen-2-yl)propan-1-one (1s)



^{1}H NMR, $CDCl_3$, 400 MHz

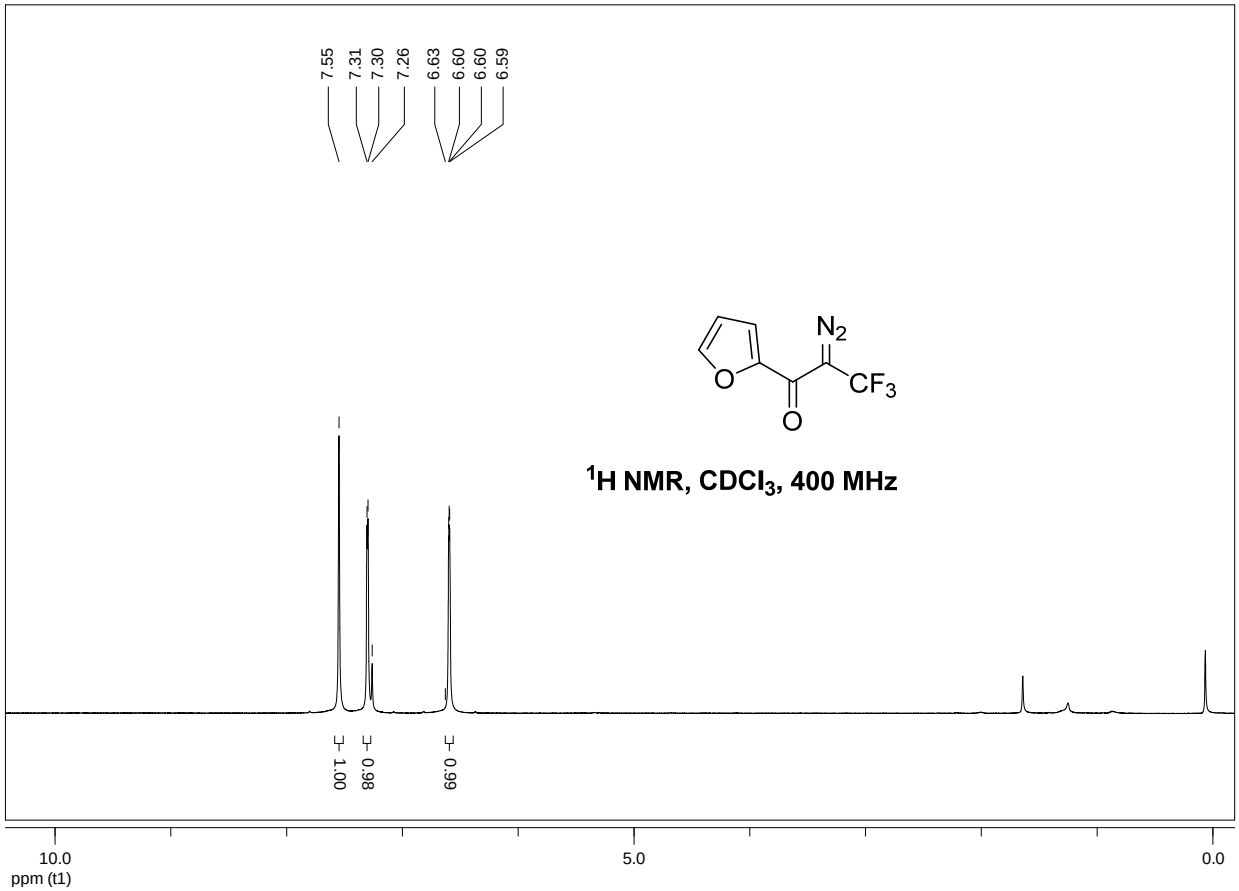


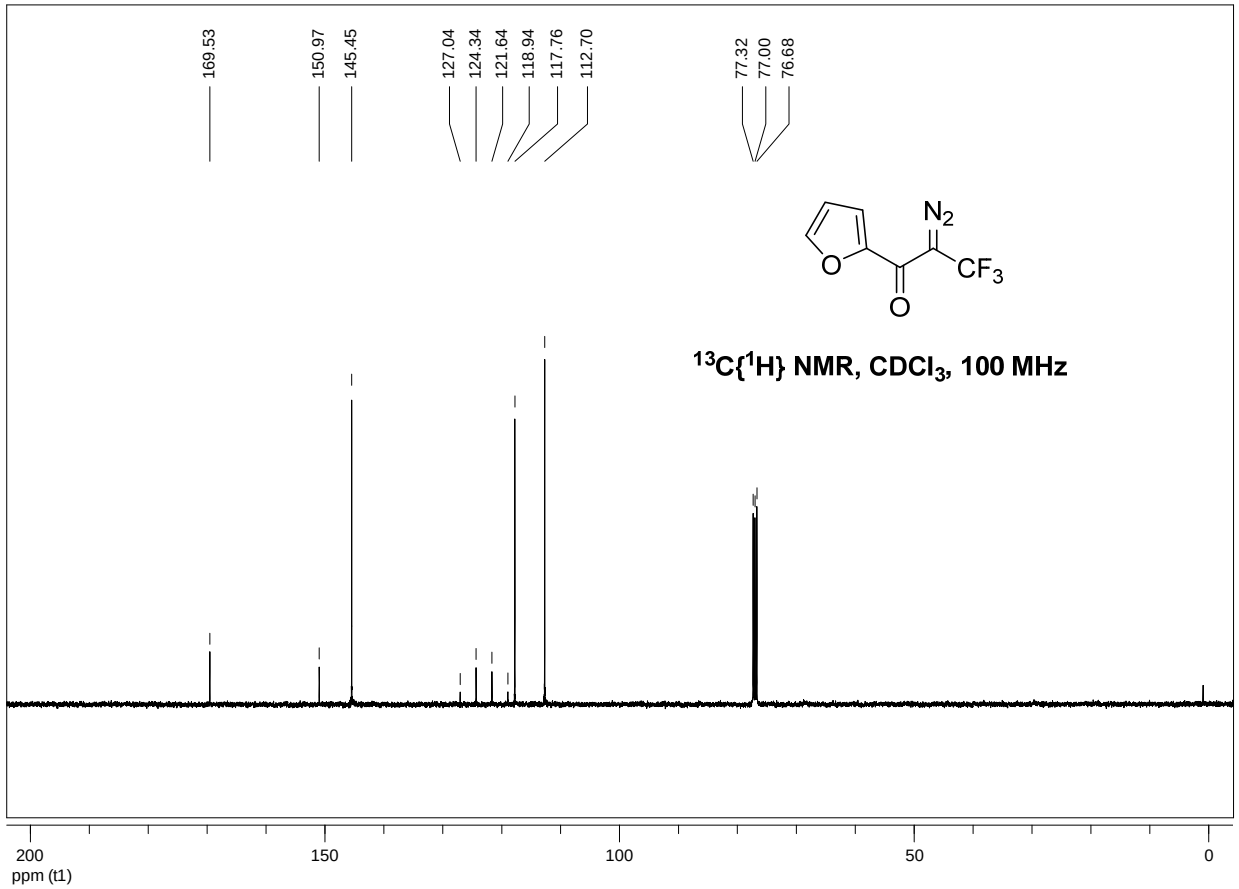
^{13}C{^{1}H} NMR, $CDCl_3$, 100 MHz

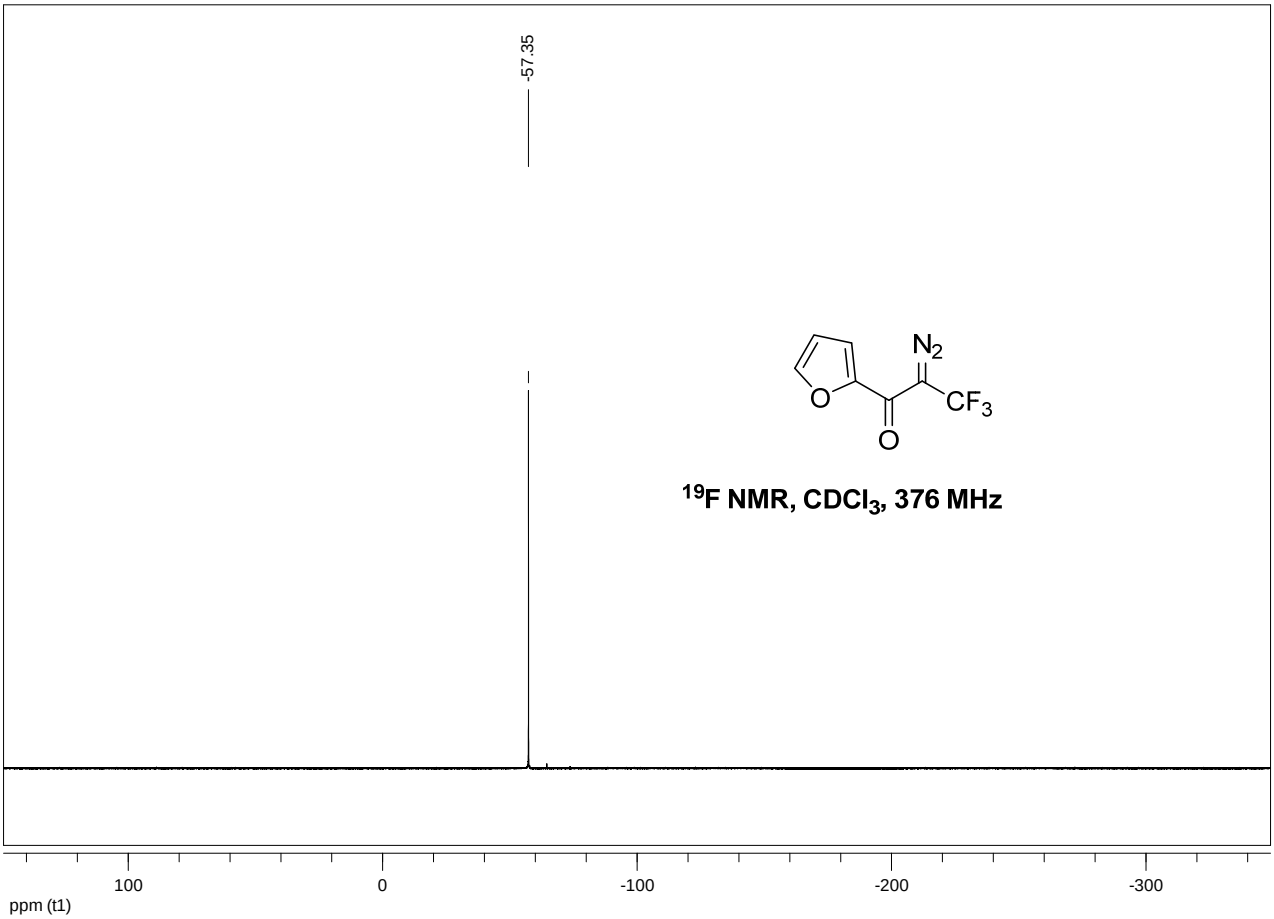


^{19}F NMR, $CDCl_3$, 376 MHz

2-diazo-3,3,3-trifluoro-1-(furan-2-yl)propan-1-one (1t)

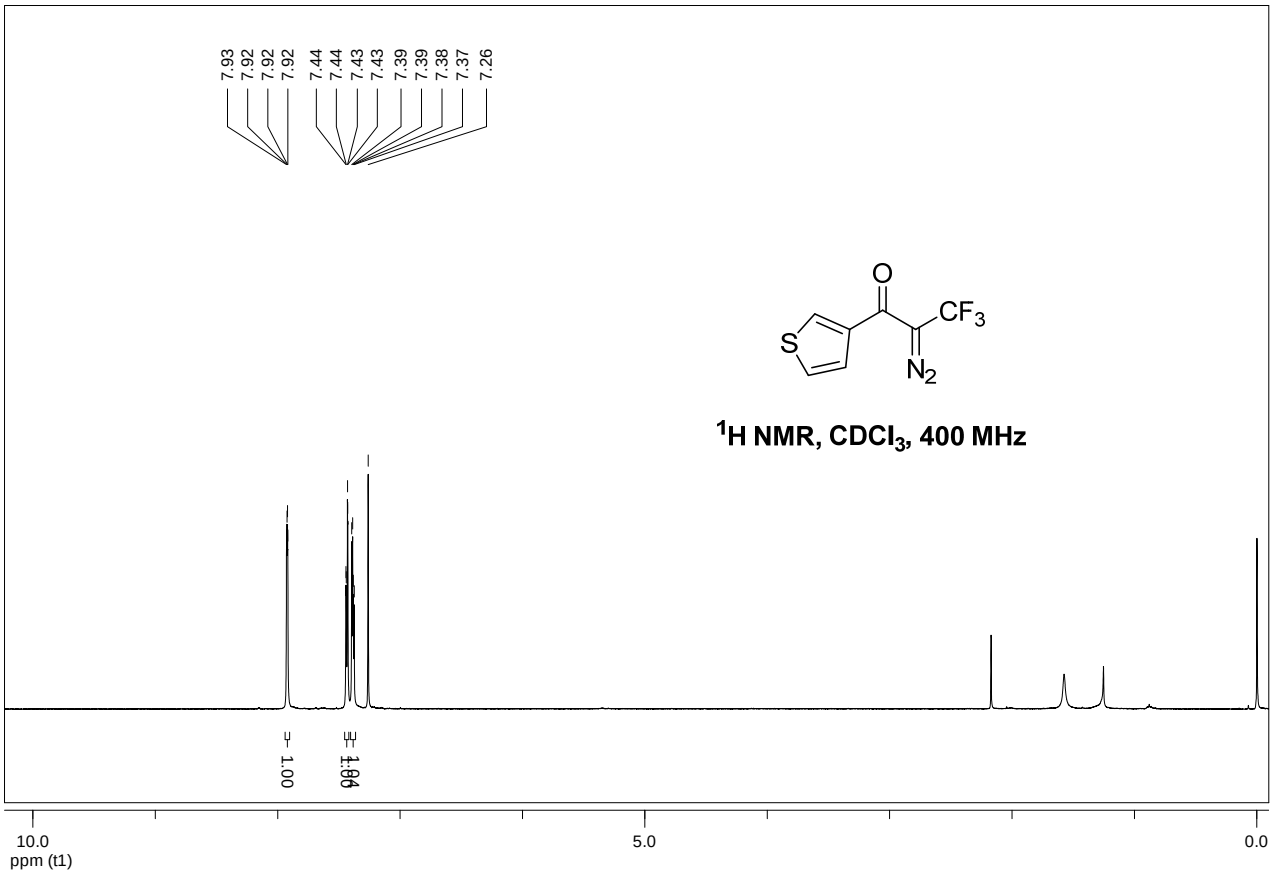


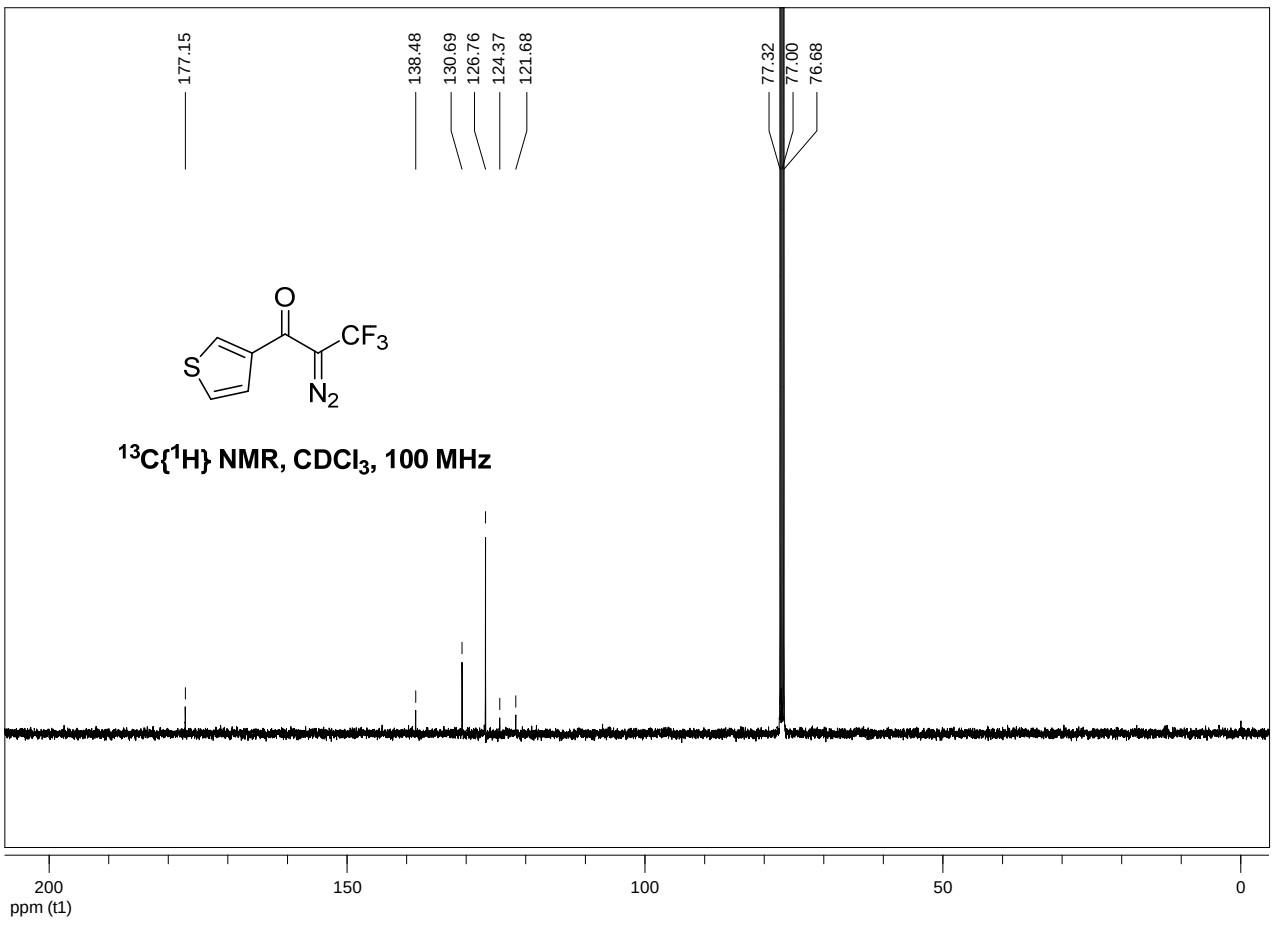


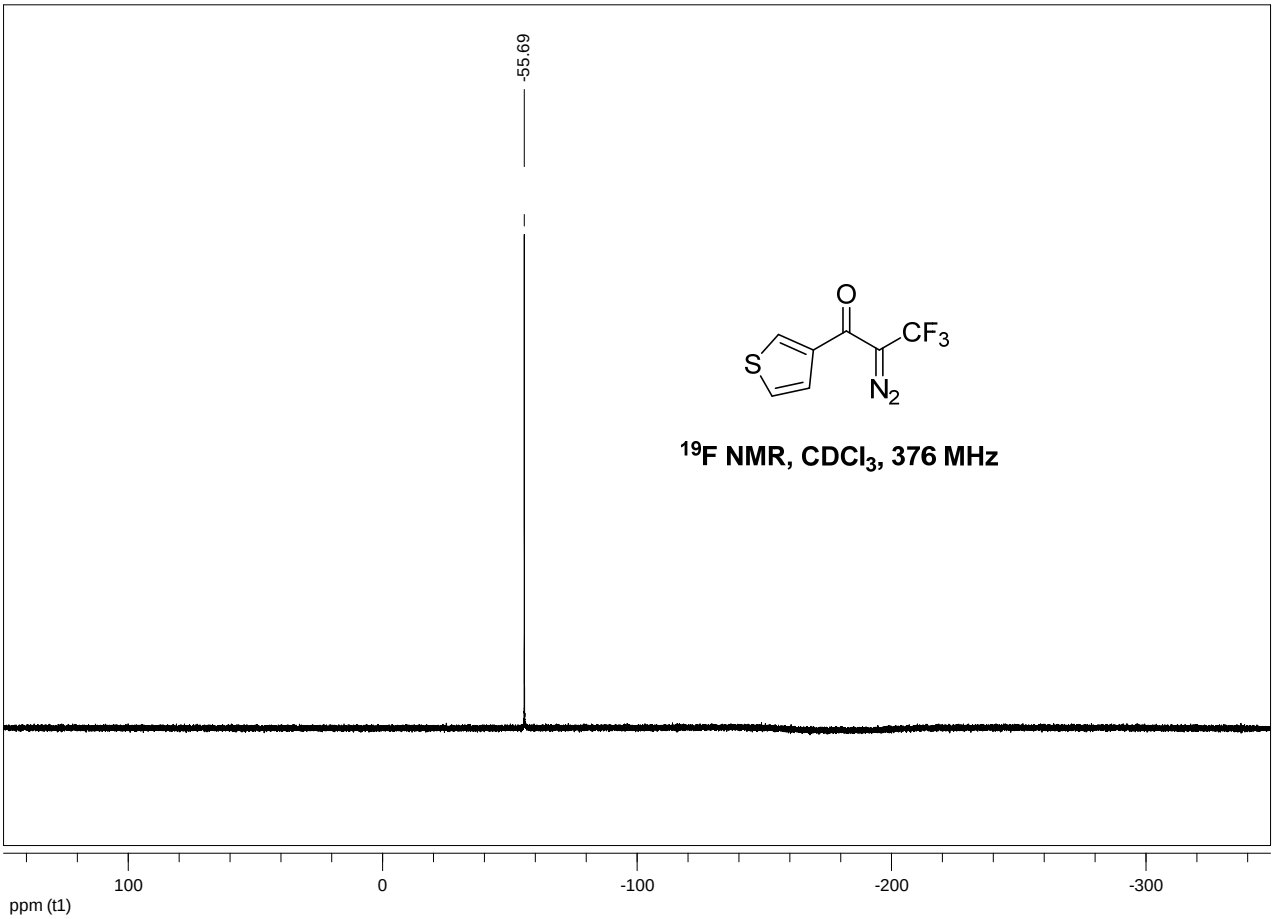


^{19}F NMR, $CDCl_3$, 376 MHz

2-diazo-3,3,3-trifluoro-1-(thiophen-3-yl)propan-1-one (1u)

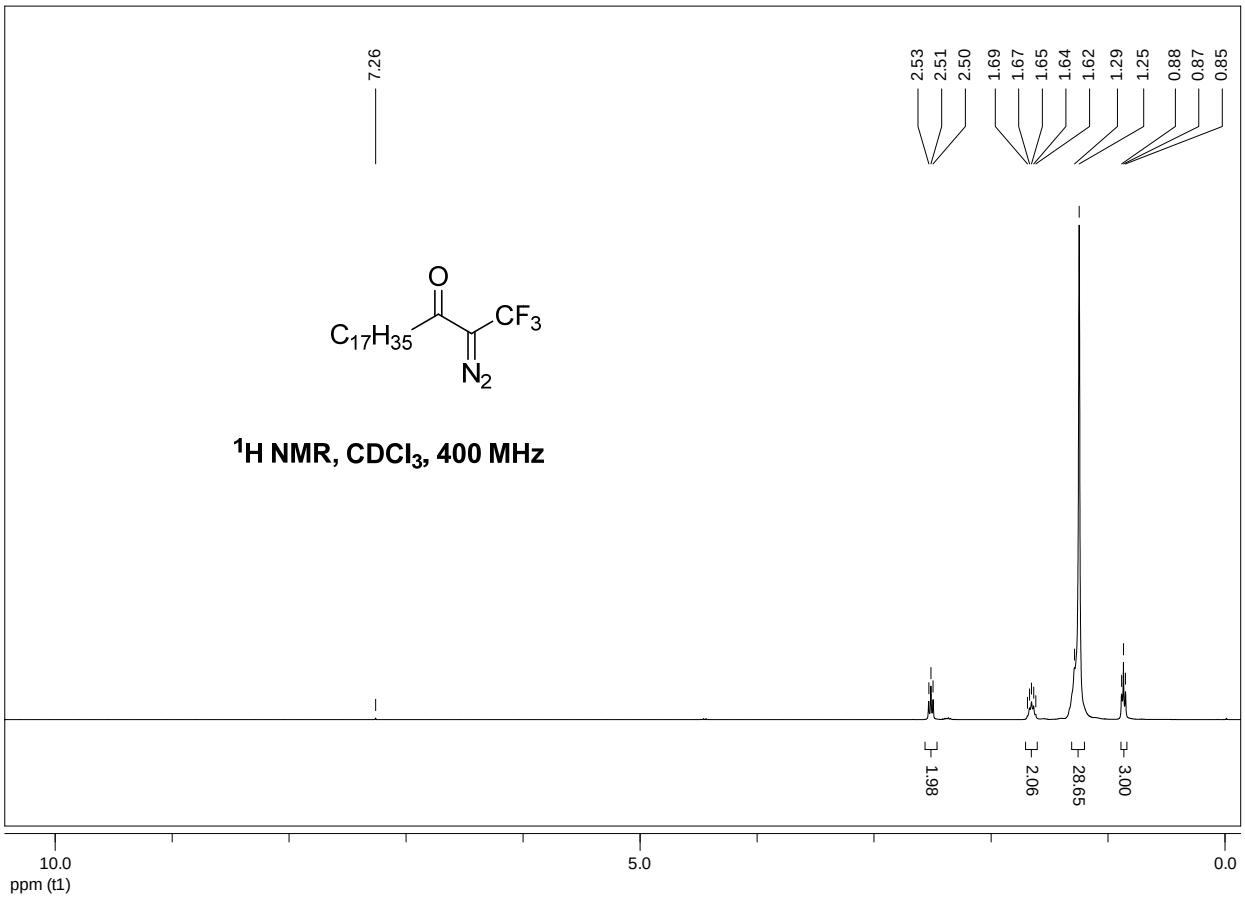


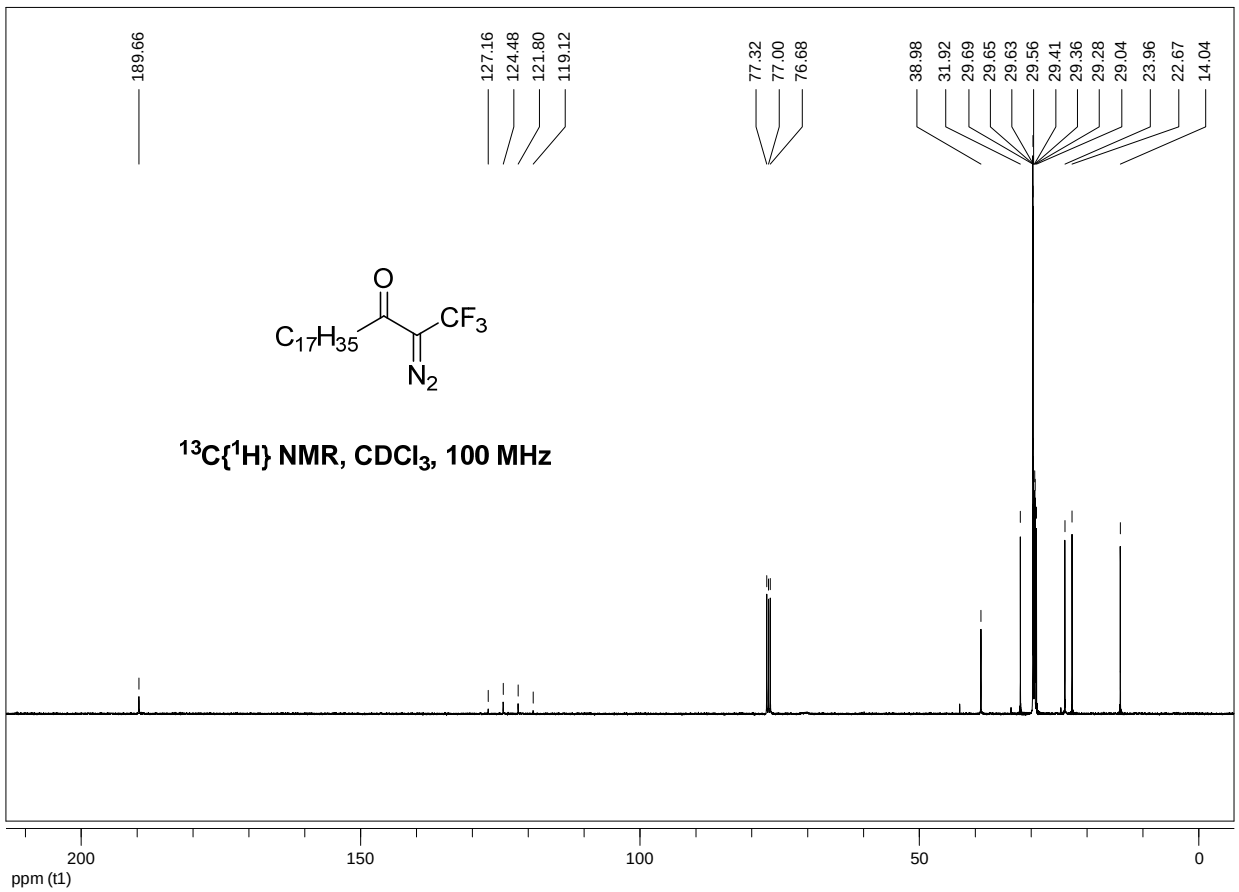


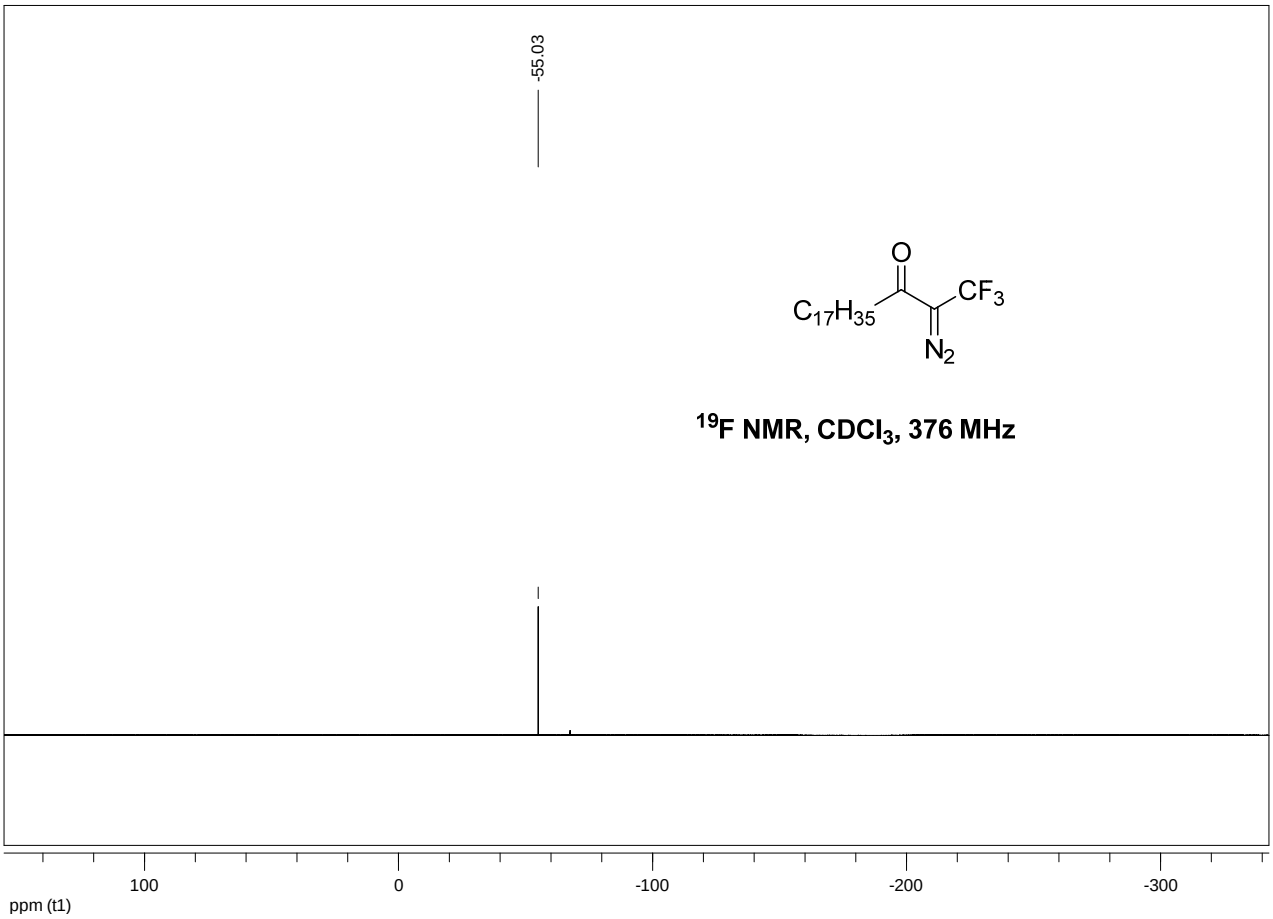


^{19}F NMR, $CDCl_3$, 376 MHz

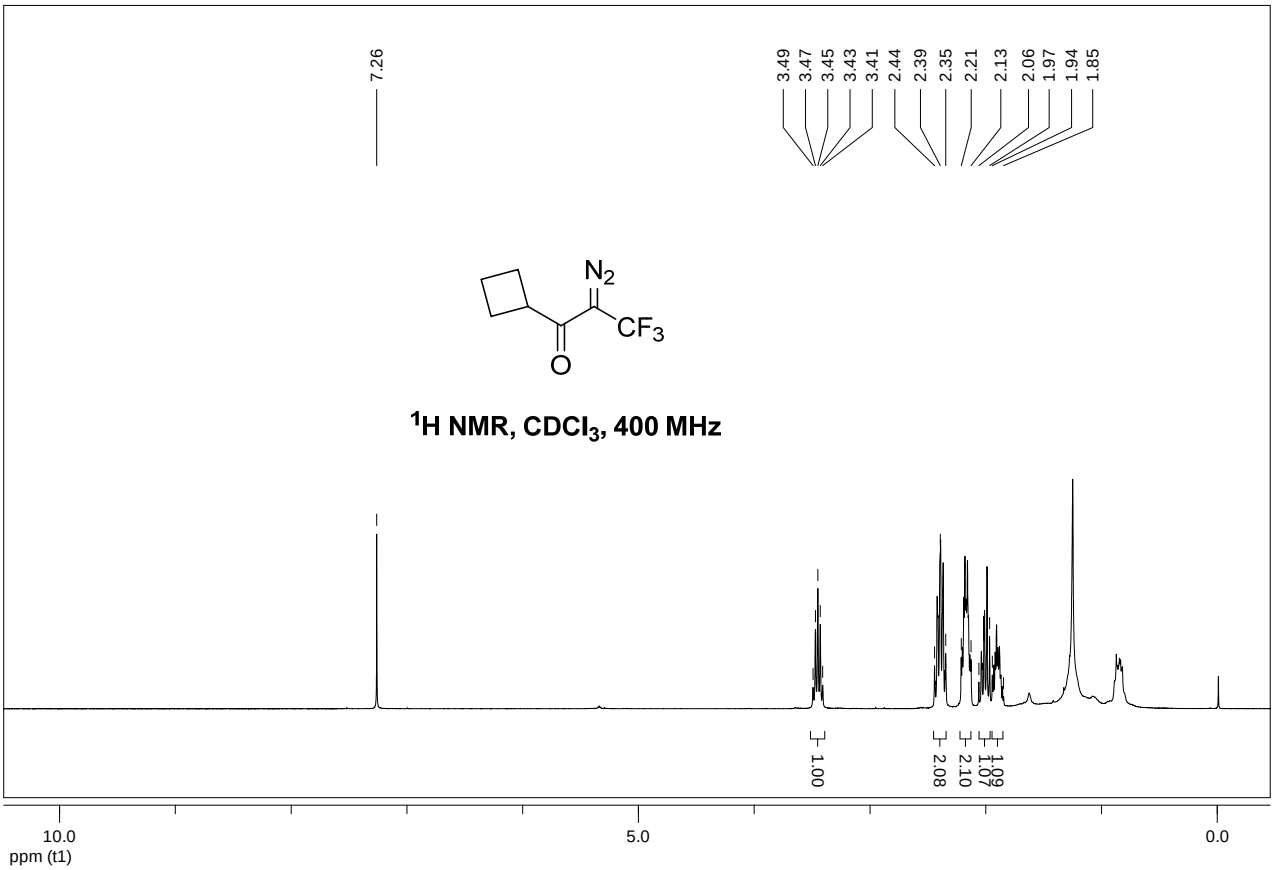
2-diazo-1,1,1-trifluoroicosan-3-one (1v)



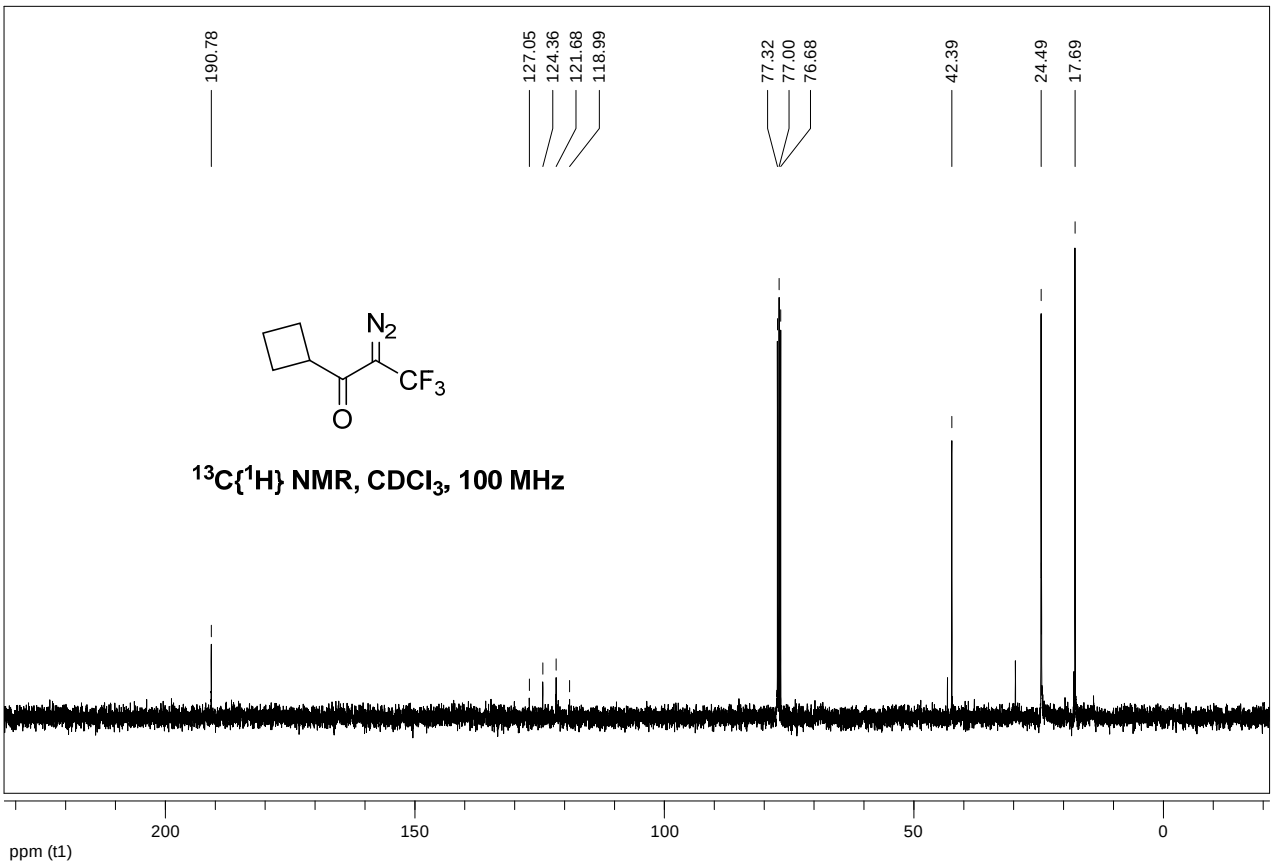



-55.03
O
CF3
C17H35
N2
19F NMR, CDCl3, 376 MHz
100
0
-100
-200
-300
ppm (t1)

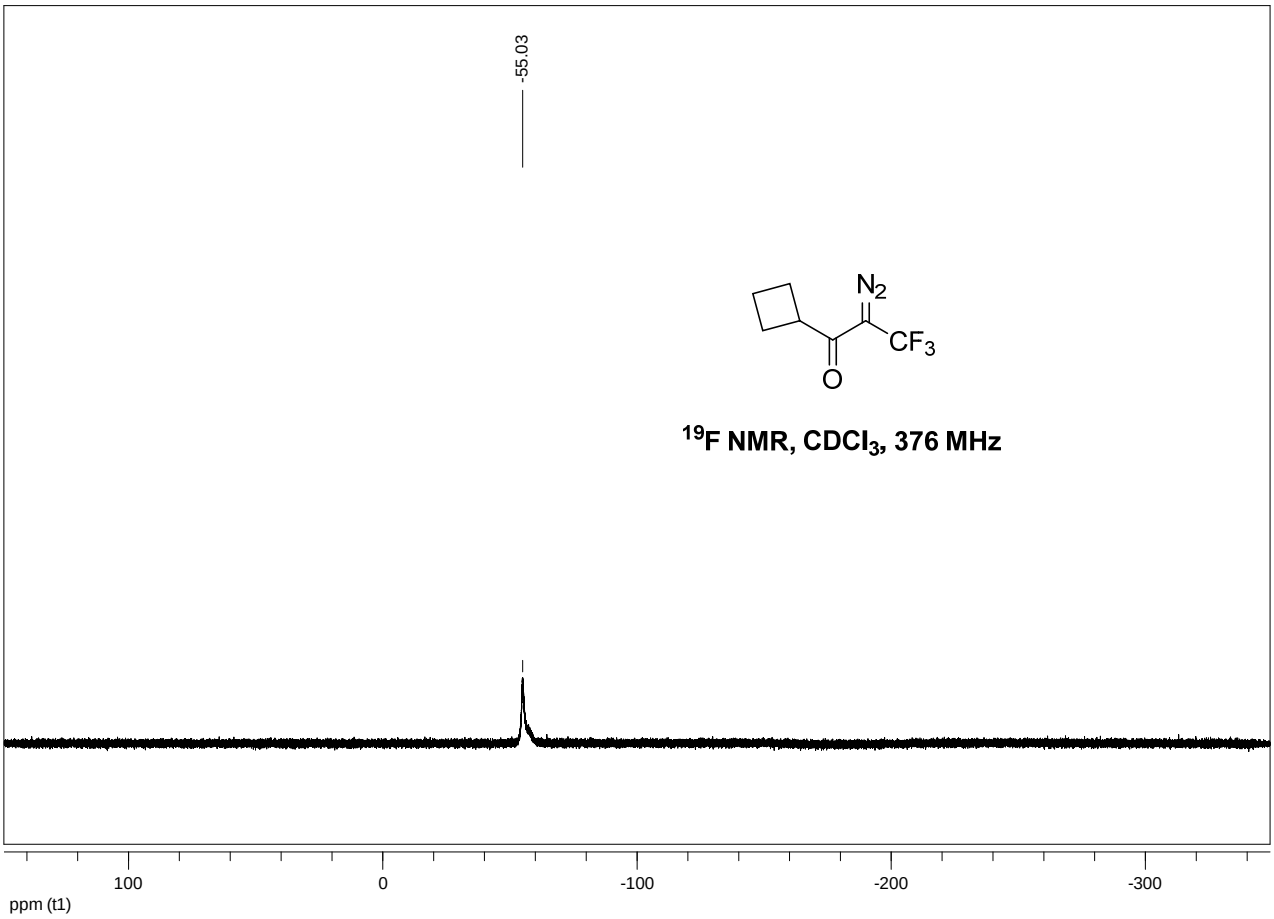
1-cyclobutyl-2-diazo-3,3,3-trifluoropropan-1-one (1w)



^{1}H NMR, $CDCl_3$, 400 MHz

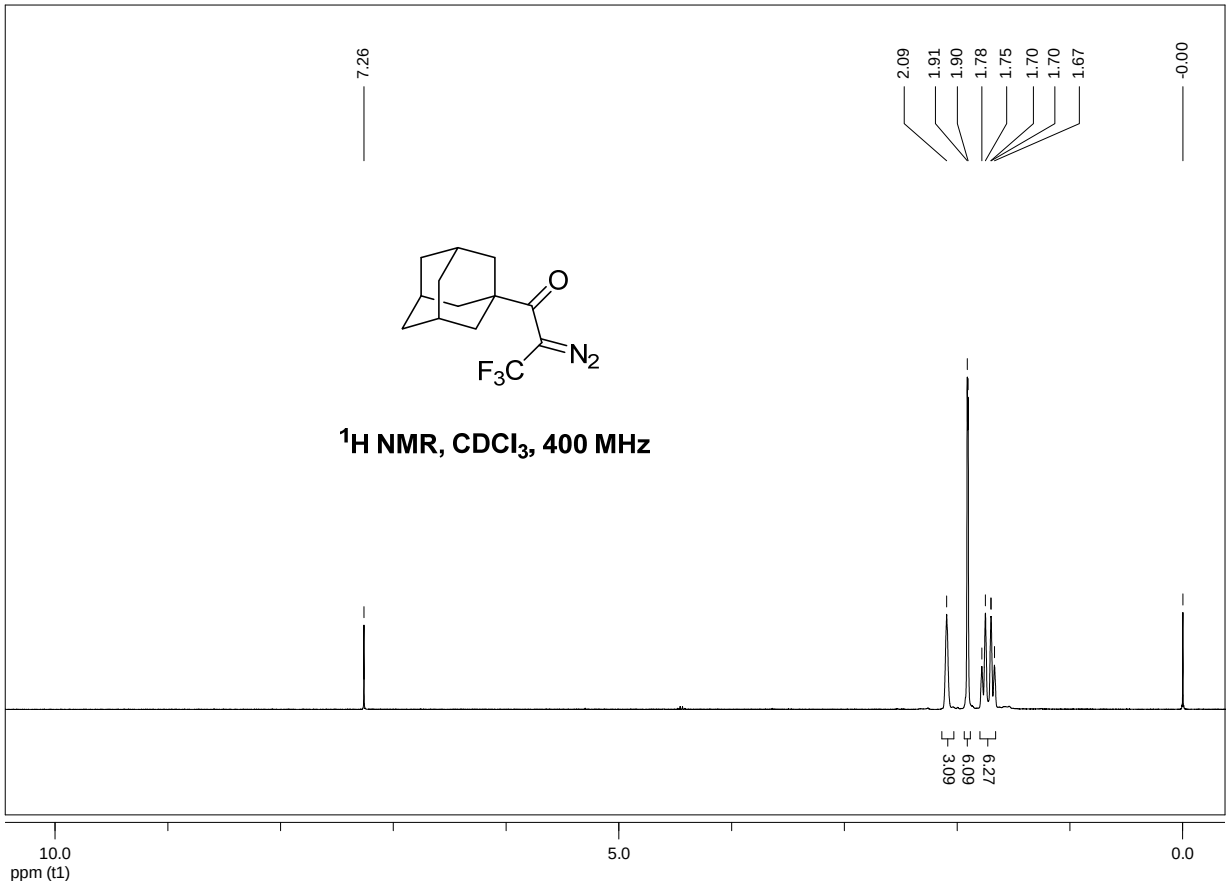


^{13}C{^{1}H} NMR, $CDCl_3$, 100 MHz

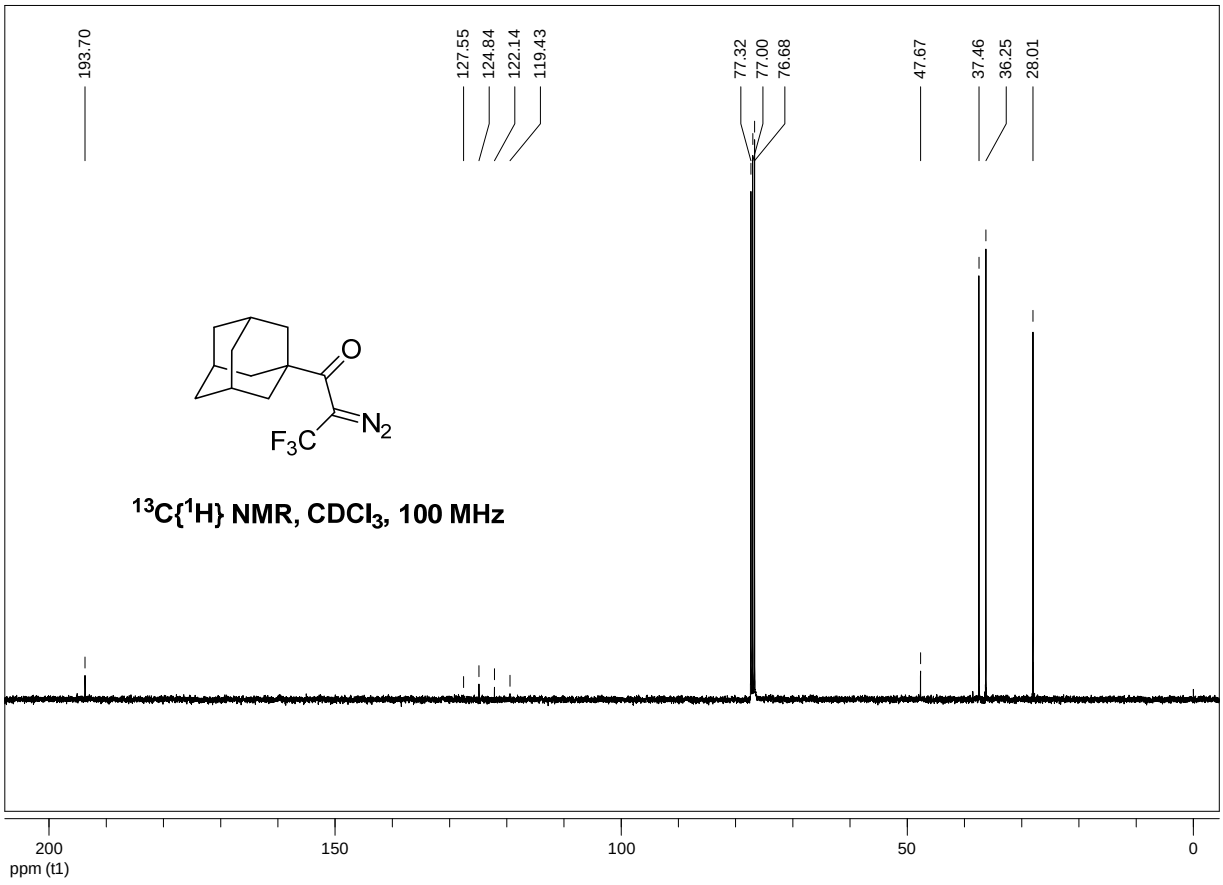


^{19}F NMR, $CDCl_3$, 376 MHz

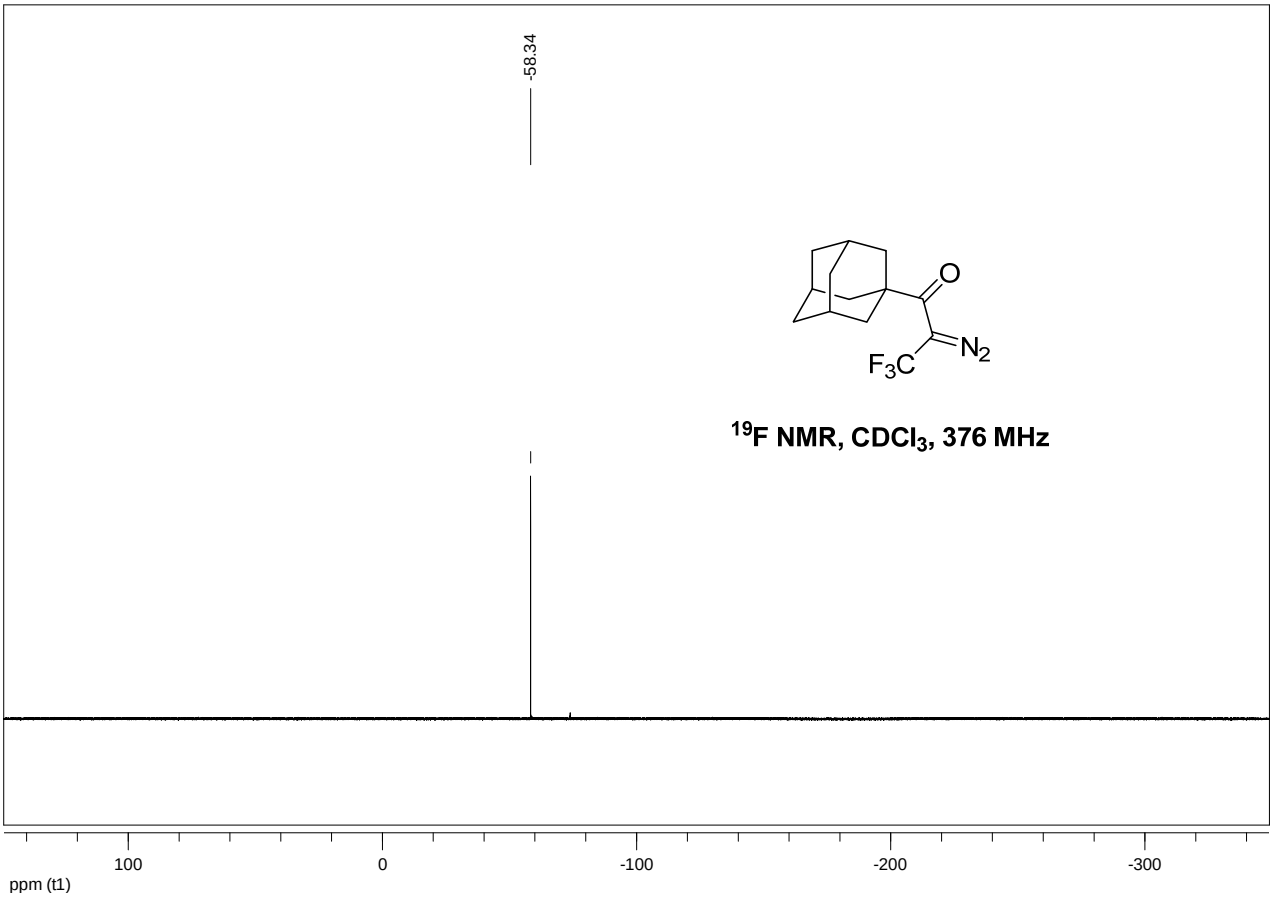
1-(adamantan-1-yl)-2-diazo-3,3,3-trifluoropropan-1-one (1x)



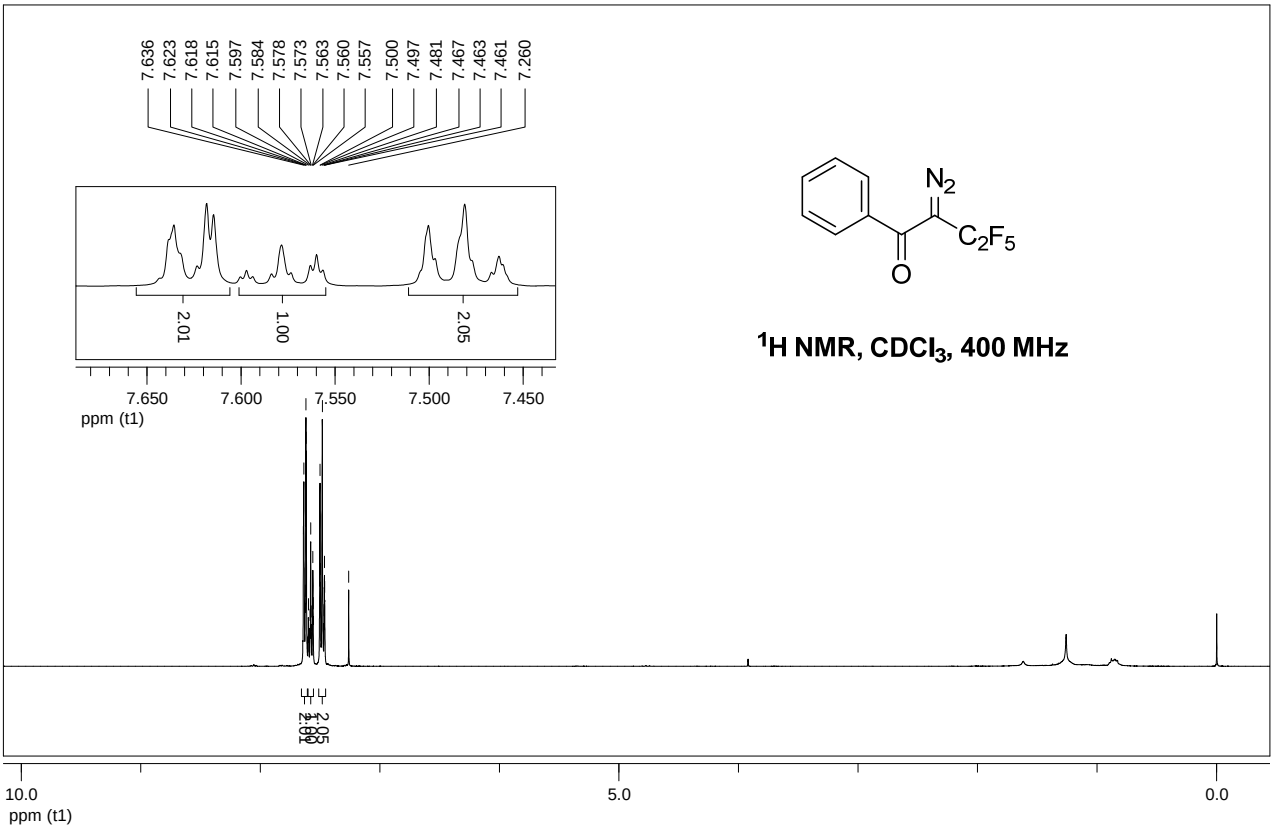
^{1}H NMR, $CDCl_3$, 400 MHz

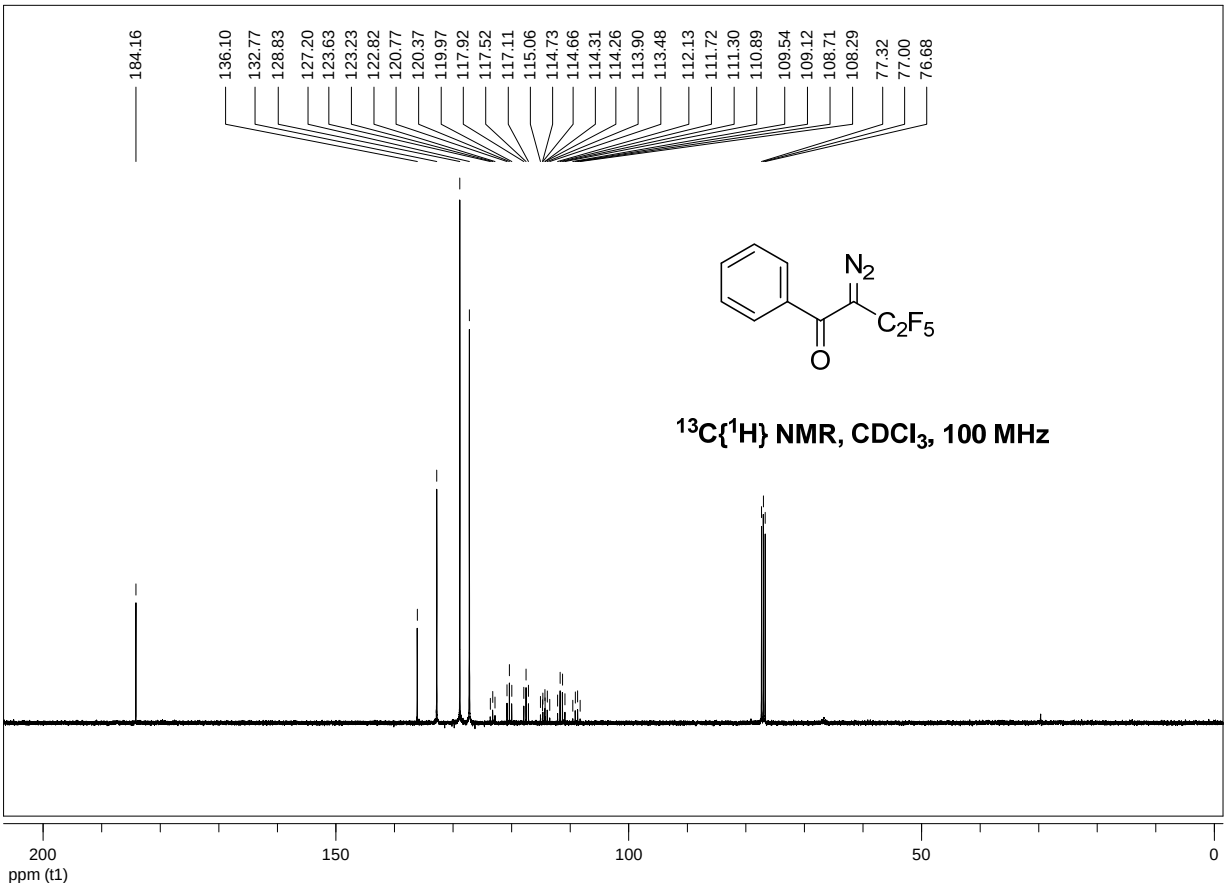


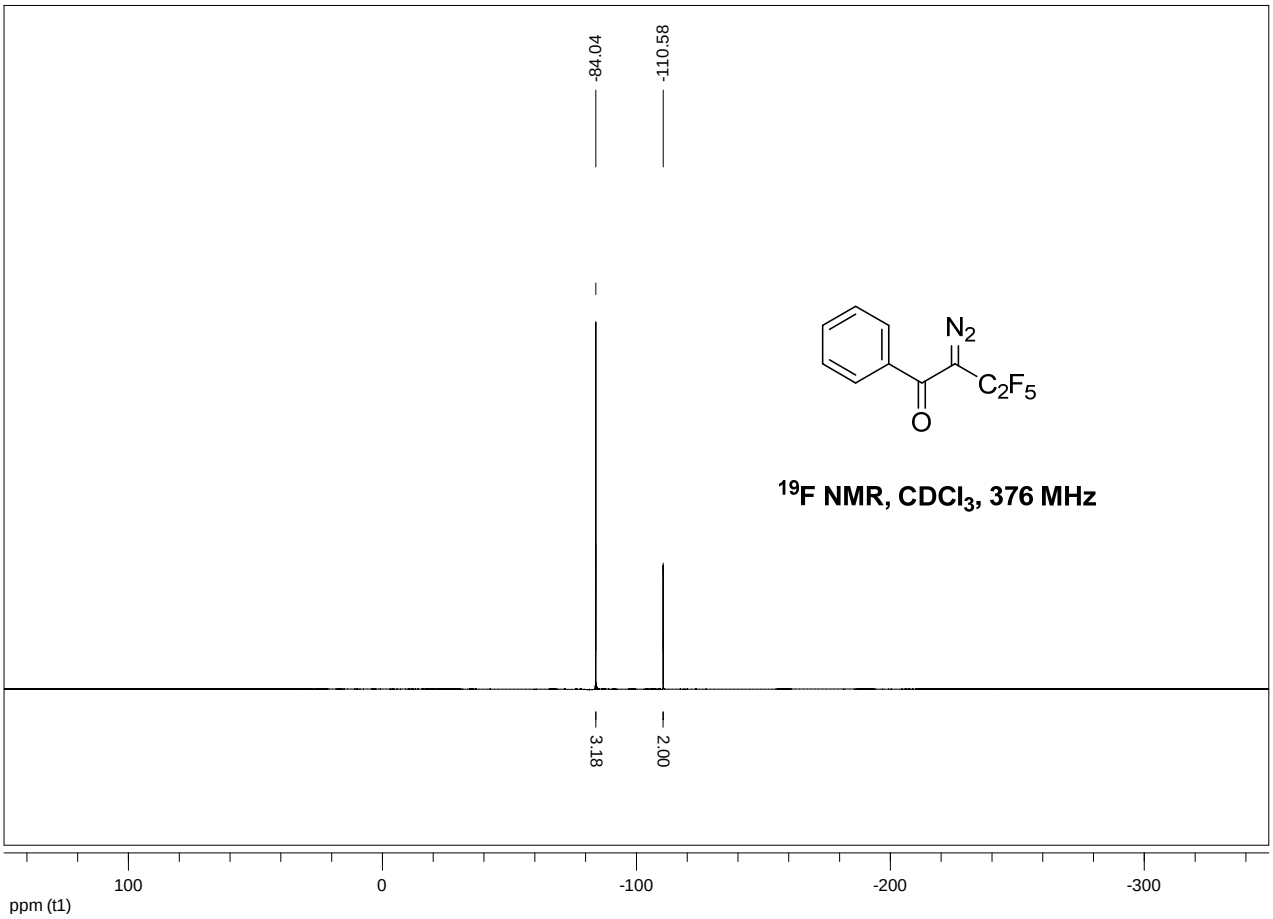
^{13}C{^{1}H} NMR, $CDCl_3$, 100 MHz


-58.34
O
N2
F3C
19F NMR, CDCl3, 376 MHz
100
0
-100
-200
-300
ppm (t1)

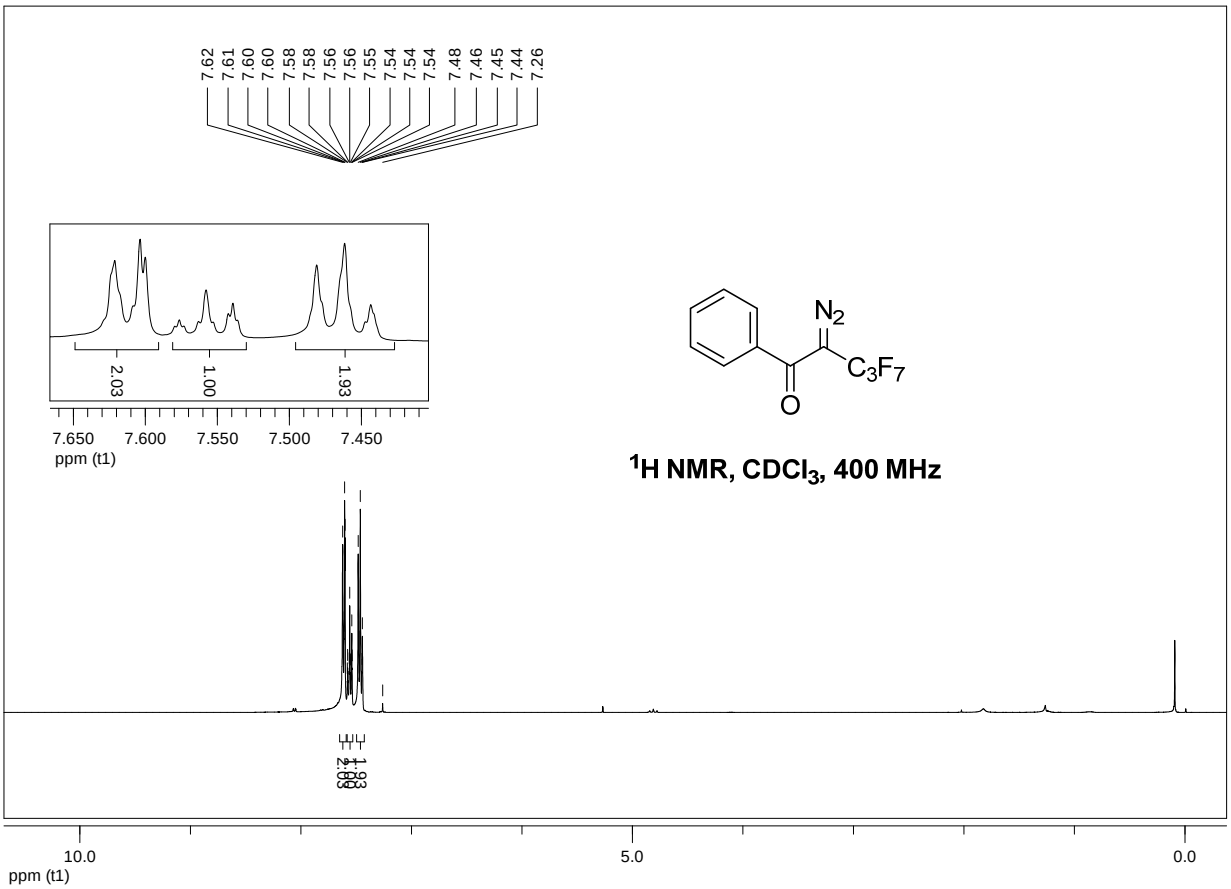
2-diazo-3,3,4,4,4-pentafluoro-1-phenylbutan-1-one(1y)

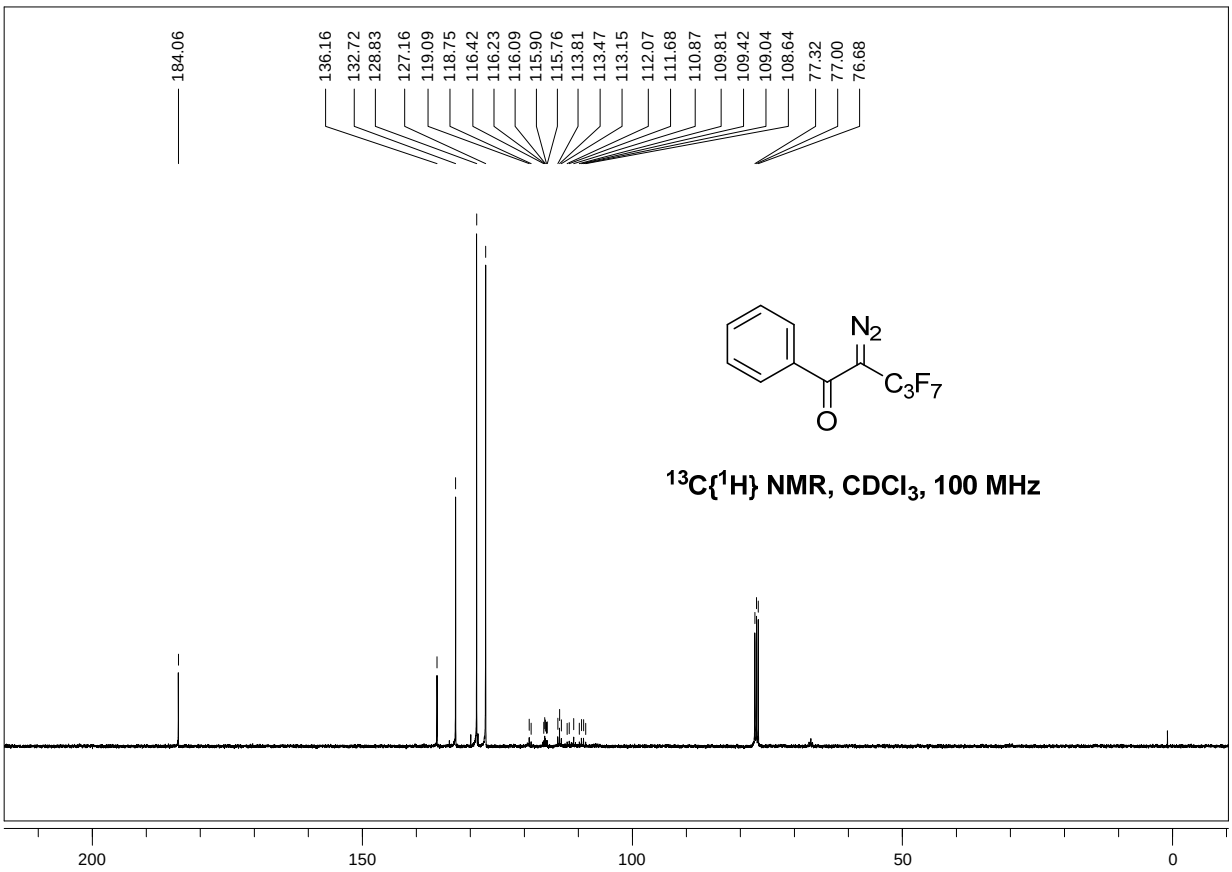


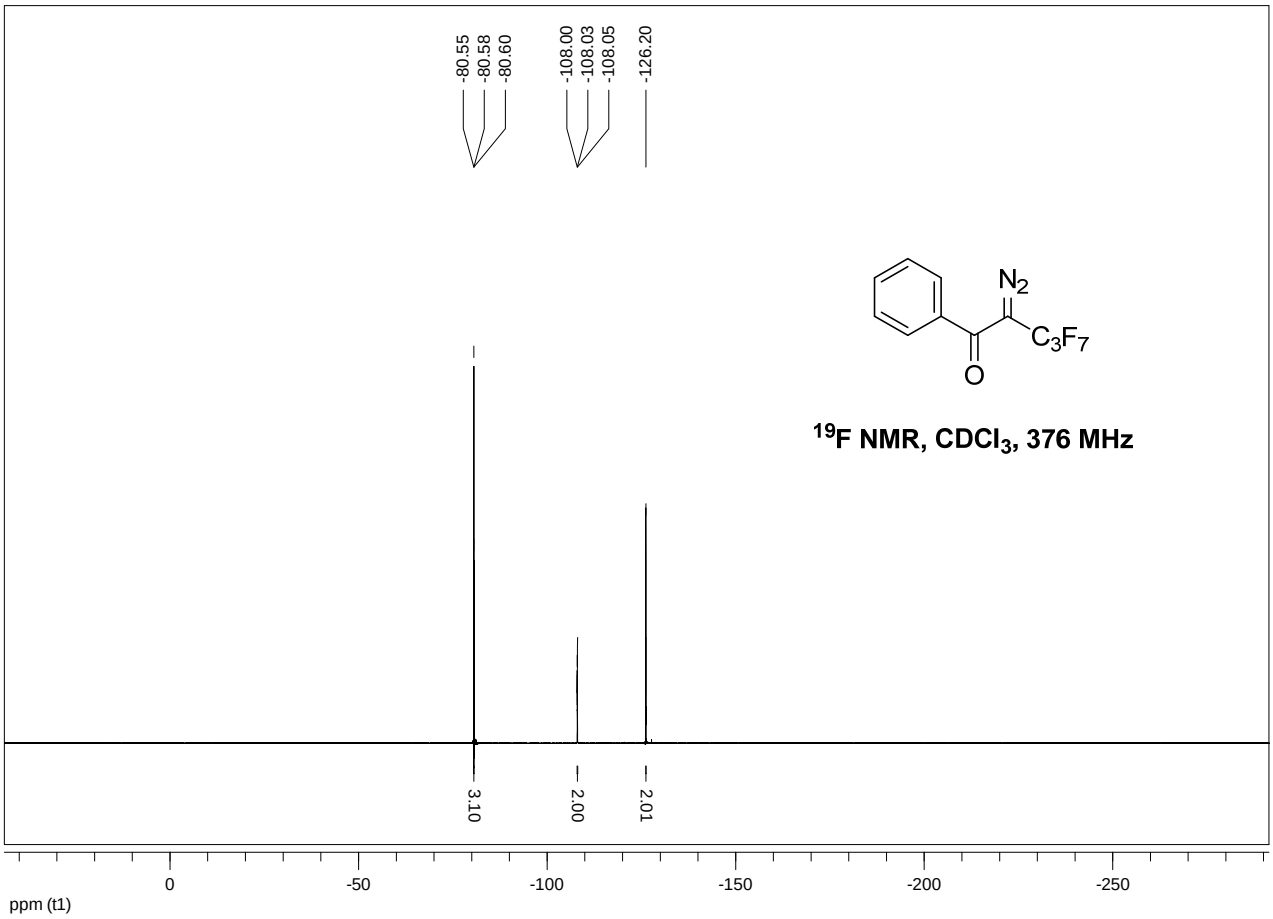



-84.04
-110.58
N2
C2F5
O
19F NMR, CDCl3, 376 MHz
3.18
2.00
100
0
-100
-200
-300
ppm (t1)

2-diazo-3,3,4,4,5,5,5-heptafluoro-1-phenylpentan-1-one(1z)






-80.55
-80.58
-80.60
-108.00
-108.03
-108.05
-126.20
N2
C3F7
O
19F NMR, CDCl3, 376 MHz
3.10
2.00
2.01
0
-50
-100
-150
-200
-250
ppm (t1)

References

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[3] Kawase, M.; Miyamae, H.; Kurihara, T. *Chem. Pharm. Bull.* **1998,** *46*, 749.