Synthesis of Trisubstituted Oxazoles via Aryne Induced [2,3] Sigmatropic Rearrangement-Annulation Cascade

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Supporting Information

1. General Information

Unless otherwise specified, all reactions were carried out under an atmosphere of nitrogen in flame-dried reaction vessels with Teflon screw caps. 25 °C Corresponds to the room temperature (rt) of the lab when the experiments were carried out. For reactions that required heating, pre-heated oil bath was used. THF was freshly purified by distillation over Na-benzophenone and was transferred under nitrogen. 18-Crown-6 was recrystallized from dry CH_3CN, and KF was dried by heating at 110 °C for 12 h and left to cool under nitrogen and stored in nitrogen filled glove-box. PhCN was used as received from the Spectrochem. All the acetophenone derivatives were purchased from commercial sources and were used without further purification. The 2-(trimethylsilyl)phenyl trifluoromethane sulfonate **2a** and the other symmetrical and unsymmetrical aryne precursors were synthesized following the literature procedure.[1]

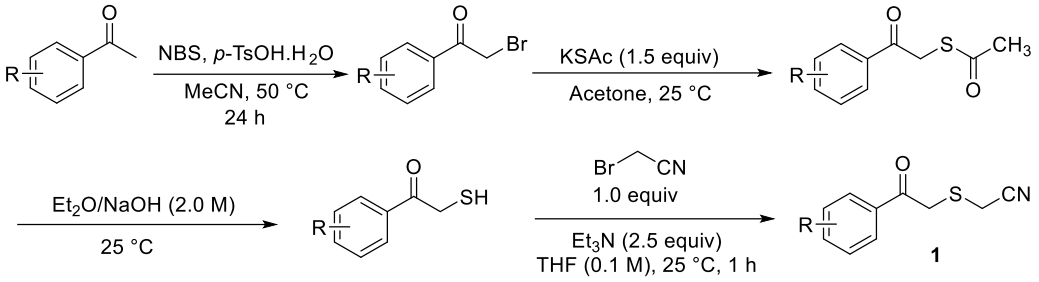
Analytical thin layer chromatography was performed on TLC Silica gel 60 F_{254}. Visualization was accomplished with short wave UV light or $KMnO_4$ staining solutions followed by heating. Flash chromatography was performed on silica gel (230-400 mesh) by standard techniques eluting with Pet. Ether-EtOAc solvent system.

All compounds were fully characterized. ^1H and ^{13}C NMR spectra were recorded on a Bruker Ultrashield spectrometer in $CDCl_3$ as solvent. Chemical shifts (δ) are given in ppm. The residual solvent signals were used as references and the chemical shifts converted to the TMS scale ($CDCl_3$: δ_H = 7.26 ppm, δ_C = 77.16 ppm). Infrared (FT-IR) spectra were recorded on a Bruker alpha FT-IR spectrophotometer, ν-max in cm^{-1}. HRMS (ESI) data were recorded on a Waters Xevo G2-XS Q-TOF instrument.

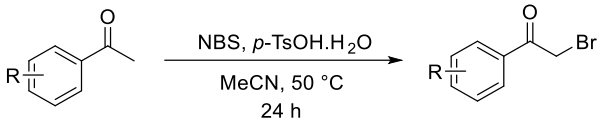
[1] (a) Sato, Y.; Tamura, T.; Kinbara, A; Morib, M. *Adv. Synth. Catal.* **2007**, *349*, 647. (b) Peña, D.; Cobas, A.; Pérez, D.; Guitián, E. *Synthesis*, **2002**, 1454.

2. General Procedure for the Synthesis of 2-Substituted Thio-acetonitriles

The 2-substituted thio-acetonitrile derivatives used for the present study were prepared from the commercially available acetophenone derivatives following the known four-step procedure.[2-5]

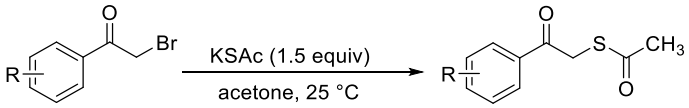


Procedure for Synthesis of α-Bromoacetophenones[2]



α-Bromoacetophenones were synthesized following the literature procedure (**CAUTION:** *α-Bromoacetophenones are powerful lachrymators*).[2] To a solution of the acetophenone derivative (9.7 mmol, 1 equiv) in 25 mL of CH_3CN were added NBS (1.7 g, 9.7 mmol, 1.0 equiv) and *p*-TsOH.H_2O (1.8 g, 9.7 mmol, 1.0 equiv). The reaction mixture was stirred at 50 °C for 24 h in a pre-heated oil bath. Then, the solvent was evaporated under reduced pressure. A saturated solution of $NaHCO_3$ (30 mL) was then added, and the solution was extracted with CH_2Cl_2 (3×30 mL). The organic layers were combined and dried over Na_2SO_4. The solvent was evaporated, and the residue was subjected to column chromatography (silica gel) using hexanes/CH_2Cl_2 (from 9:1 to 4:1) as eluent. These compounds exhibited physical and spectral data in agreement with those reported.

General Procedure for the Synthesis of Thioacetate Derivatives[3]

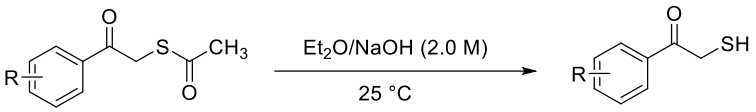


All thioacetate derivatives were synthesized following the modified literature procedure.[3] To the bromide (10 mmol) in acetone (100 mL) was added *S*-potassium thioacetate (1.5 equiv) at

[2] Borzecka, W.; Lavandera, I.; Gotor, V. *J. Org. Chem*. **2013**, *78*, 7312.
[3] Miao, P.; Li, R.; Lin, X.; Rao, L.; Sun, Z. *Green Chem.* **2021**, *23*, 1638.

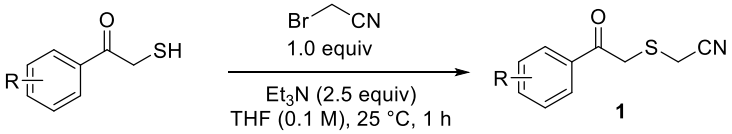
room temperature. The reaction progress was monitored by TLC (1-3 h). After consumption of starting material, the reaction mixture was filtered, and the solvent was removed under vacuum. The resulting residue was distributed between water (100 mL) and CH_2Cl_2 (300 mL), and the combined organic layer was washed with brine, dried over Na_2SO_4, and concentrated in vacuo to give the thioacetate. The crude product was sufficiently pure and directly used for the next step without further purification.

General Procedure for Synthesis of 2-Mercaptoacetophenones [4]



The 2-mercaptoacetophenones were synthesized following the modified literature procedure.[4] To the solution of thioacetate (9 mmol, 1 equiv) in Et_2O (9 mL, 1M) was added 2M aqueous solution of NaOH (9 mL) and the resulting biphasic mixture was stirred vigorously at room temperature. The progress of the reaction was monitored by TLC (1-5 h). Next, the aqueous phase was separated, acidified with 1M HCl and extracted with CH_2Cl_2 (2×15 mL). The organic phase was washed with distilled water (2×10 mL), dried over Na_2SO_4, and concentrated in vacuo to afford the crude product. Pure compound was isolated by flash chromatography (eluent: Pet. ether /EtOAc 10:1). These compounds exhibited physical and spectral data in agreement with those reported.

General Procedure for Synthesis of 2-Substituted Thio-acetonitrile Derivatives[5]



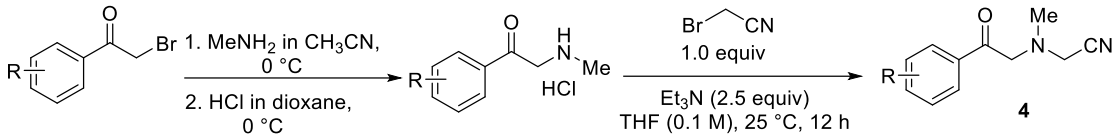
The 2-substituted thio-acetonitrile derivatives were synthesized following the modified literature procedure.[5] 2-Mercaptoacetophenones (4.94 mmol, 1.0 equiv) were dissolved in THF (0.1 M) under nitrogen atmosphere, then bromo acetonitrile (1.0 equiv) was added at 25 °C under nitrogen atmosphere. To the above stirring solution NEt_3 (2.5 equiv) was added. Then the reaction mixture was allowed to stir at 25 °C for 1 h. After completion of reaction time, the solvent was

[4] Przydacz, A.; Kowalczyk, R.; Albrecht, Ł. *Org. Biomol. Chem.* **2017**, *15*, 9566.
[5] Sachse, F.; Gebauer, K.; Schneider, C. *Eur. J. Org. Chem.* **2021**, *2021*, 64.

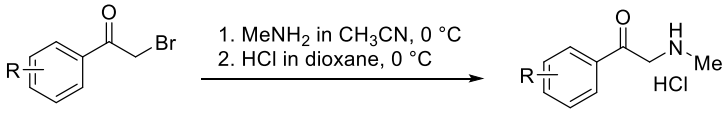
evaporated and crude residue pre-adsorbed on silica gel and purified by flash column chromatography on silica gel (Pet. ether/EtOAc = 85/15 as the eluent) to afford the corresponding thioether derivative **1**.

3. General Procedure for the Preparation of the β-Keto Amines

The β-keto amines used for the present study have been prepared from commercially available acetophenone derivatives following the two-step procedure.[6]

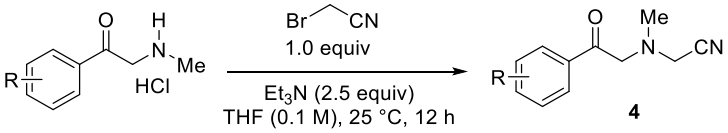


General Procedure for Synthesis of a-Secondary Amino Ketone Hydrochlorides[6]



The α-secondary amino ketone hydrochlorides were synthesized following the modified literature procedure.[6] A solution of 2-bromoacetophenone (2 g, 10 mmol) in CH_3CN (4 mL) was added to a solution of methylamine (33% solution in absolute alcohol, 2.5 mL, 25 mmol, 2.5 equiv) in CH_3CN (3 mL) at 0 °C. The solution was stirred at 0 °C for 5 min (or monitored by TLC until complete conversion). Dry diethyl ether (100 mL) was added and the resulting precipitates were filtered. The solution was cooled to 0 °C and HCl (4 M in dioxane; 2.0 mL) was slowly added dropwise. The formed precipitate was filtered and purified by trituration with acetone.

General Procedure for Synthesis of β-Keto Amines

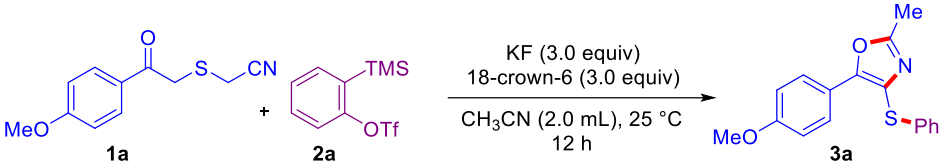


To a solution of α-secondary amino ketone hydrochlorides (2.3 mmol, 1.0 equiv) in THF (0.1 M) under nitrogen atmosphere was added NEt_3 (2.5 equiv) at 25 °C. Then reaction mixture was stirred for 1h at room temperature. To the above stirring solution was added bromo acetonitrile

[6] Shang, G.; Liu, D.; Allen, S. E.; Yang, Q.; Zhang, X. *Chem. - Eur. J.* **2007**, *13*, 7780.

(1.0 equiv). Then the reaction mixture was allowed to stir at 25 °C for 12 h. After completion of the reaction, the solvent was evaporated and crude residue was pre-adsorbed on silica gel and purified by flash column chromatography on silica gel (Pet. ether/EtOAc = 80/20 as the eluent) to afford the corresponding thioether derivative.

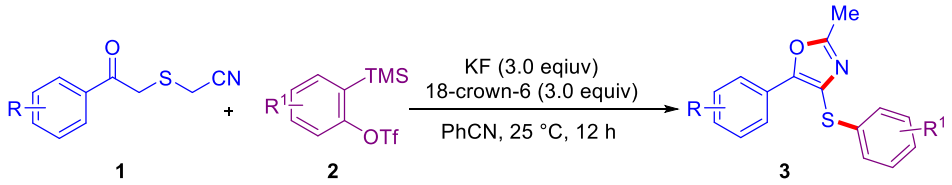
4. General Procedure for the Optimization of the Reaction Conditions



1a 2a 3a

To a flame-dried screw-capped test tube equipped with a magnetic stir bar was added the 18-crown-6 (0.198 g, 0.75 mmol), KF (0.044 g, 0.75 mmol) inside the glove-box. The mixture was dissolved in 2.0 mL of CH_3CN outside the glove-box under nitrogen atmosphere. To this mixture was added the 2-((2-(4-methoxyphenyl)-2-oxoethyl)thio)acetonitrile **1a** (0.055 g, 0.25 mmol) and 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **2a** (0.112 g, 0.091 μL, 0.375 mmol) subsequently. Then the reaction mixture was stirred at 25 °C for 12. The reaction mixture was diluted with CH_2Cl_2 (2.0 mL) and filtered through a short pad of silica gel and eluted with CH_2Cl_2 (10.0 mL). The solvent was evaporated to obtain the crude product whose yield was determined by ^1H NMR analysis using CH_2Br_2 (18 μL, 0.25 mmol) as the internal standard.

5. General Procedure for the Synthesis of Trisubstituted Oxazole Derivatives

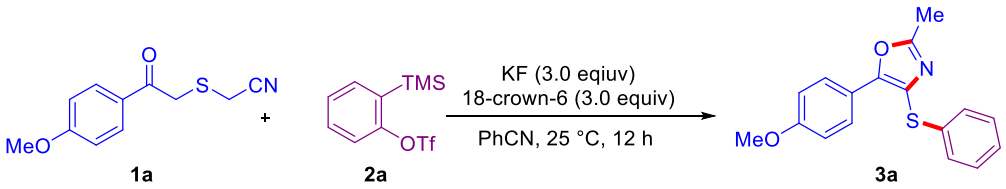


1 2 3

To a flame-dried screw-capped test tube equipped with a magnetic stir bar was added the 18-crown-6 (0.198 g, 0.75 mmol), KF (0.044 g, 0.75 mmol) inside the glove-box. The mixture was dissolved in 2.0 mL of PhCN outside the glove-box under nitrogen atmosphere. To this mixture was added the thioether **1** (0.25 mmol) and aryne precursor **2** (0.375 mmol) subsequently. Then stirring was started and the reaction mixture was stirred at 25 °C for 12 h. After 12 h, the reaction was stopped, the solvent was evaporated, and the crude residue was purified by flash column

chromatography on silica gel (using Pet.ether-EtOAc as the eluent) to afford the corresponding oxazole derivatives **3**.

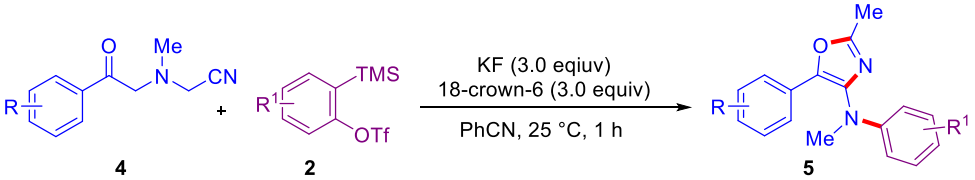
Procedure for the Synthesis of 3a in 2.0 mmol Scale



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

To a flame-dried screw-capped test tube equipped with a magnetic stir bar was added the 18-crown-6 (1.6 g, 6.0 mmol), KF (0.348 g, 6.0 mmol) inside the glove-box. The mixture was dissolved in 16.0 mL of PhCN outside the glove-box under nitrogen atmosphere. To this mixture was added the 2-((2-(4-methoxyphenyl)-2-oxoethyl)thio)acetonitrile **1a** (0.443 g, 2.0 mmol) and 2- (trimethylsilyl)phenyl trifluoromethanesulfonate **2a** (0.895 g, 728 µL, 3.0 mmol) subsequently. Then stirring was started and the reaction mixture was stirred at 25 °C for 12 h. Subsequently, the reaction was stopped, the solvent was evaporated and the crude residue was purified by flash column chromatography (Pet. ether/EtOAc = 90/10) on silica gel to afford the 5-(4-methoxyphenyl)-2-methyl-4-(phenylthio)oxazole **3a** as a colorless oil (0.470 g, 79% yield).

6. General Procedure for the Synthesis of 4-Aminotrisubstituted Oxazoles

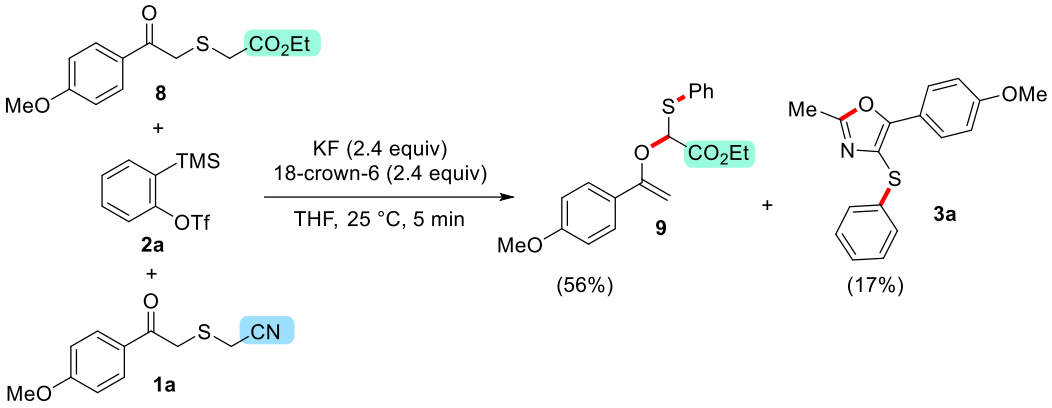


4 **2** **5**

To a flame-dried screw-capped test tube equipped with a magnetic stir bar was added the 18-crown-6 (0.198 g, 0.75 mmol), KF (0.044 g, 0.75 mmol) inside the glove-box. The mixture was dissolved in 2.0 mL of PhCN outside the glove-box under nitrogen atmosphere. To this mixture was added the β-ketoamine **4** (0.25 mmol) and aryne precursor **2** (0.375 mmol) subsequently. Then stirring was started and the reaction mixture was stirred at 25 °C for 1 h. After completion of 1 h the reaction was stopped, the solvent was evaporated, and the crude residue was purified by flash column chromatography on silica gel (using Pet. ether-EtOAc as the eluent) to afford the corresponding oxazole derivatives **5**.

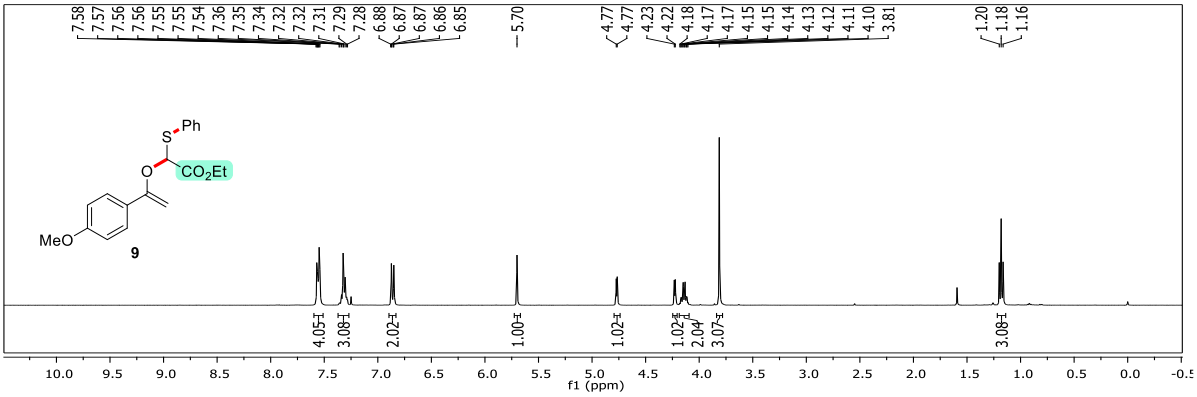
7. Competition Experiment

Competition between oxa-[2,3] and [2,3]-sigmatropic rearrangement

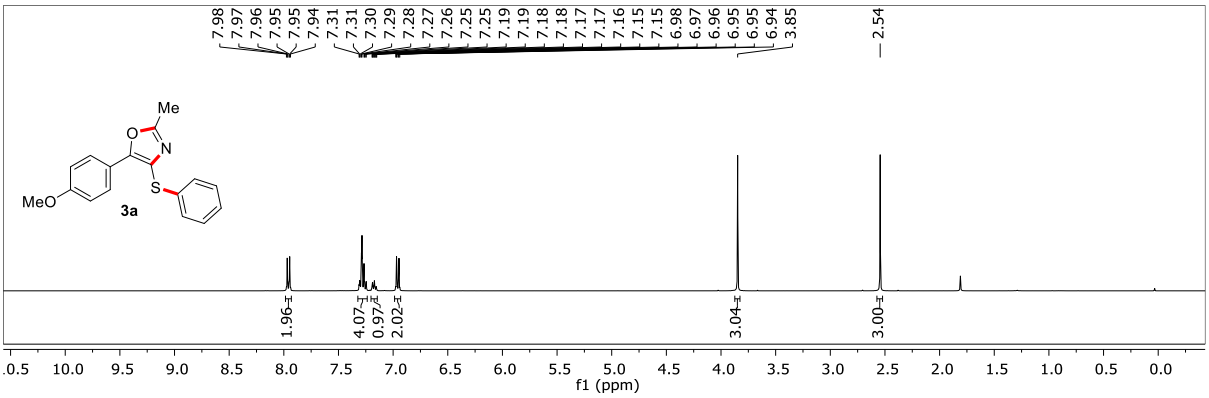


To a flame-dried screw-capped test tube equipped with a magnetic stir bar was added the 18-crown-6 (0.158 g, 0.6 mmol), KF (0.035 g, 0.6 mmol) inside the glove-box. The mixture was dissolved in 1.0 mL of THF outside the glove-box under nitrogen. To this mixture was added ethyl 2-((2-(4-methoxyphenyl)-2-oxoethyl)thio)acetate **8** (0.034 g, 0.125 mmol), 2-((2-(4-methoxyphenyl)-2-oxoethyl)thio)acetonitrile **1a** (0.028 g, 0.125 mmol) and 2-(trimethylsilyl)phenyl trifluoromethane sulfonate **2a** (0.090 g, 73 µL, 0.3 mmol). Then the reaction mixture was stirred at 25 °C for 5 min. After completion of indicated time, the reaction mixture was diluted with CH_2Cl_2 (2.0 mL) and filtered through a short pad of silica gel and eluted with CH_2Cl_2 (15.0 mL). The solvent was evaporated to obtain the crude product, which was analyzed using ^{1}H NMR using CH_2Br_2 (18 µL, 0.25 mmol) as the internal standard. ^{1}H NMR analysis confirmed the formation of two products ethyl 2-((1-(4-methoxyphenyl)vinyl)oxy)-2-(phenylthio)acetate **9** (56% yield) and 5-(4-methoxyphenyl)-2-methyl-4-(phenylthio)oxazole **3a** (17% yield).

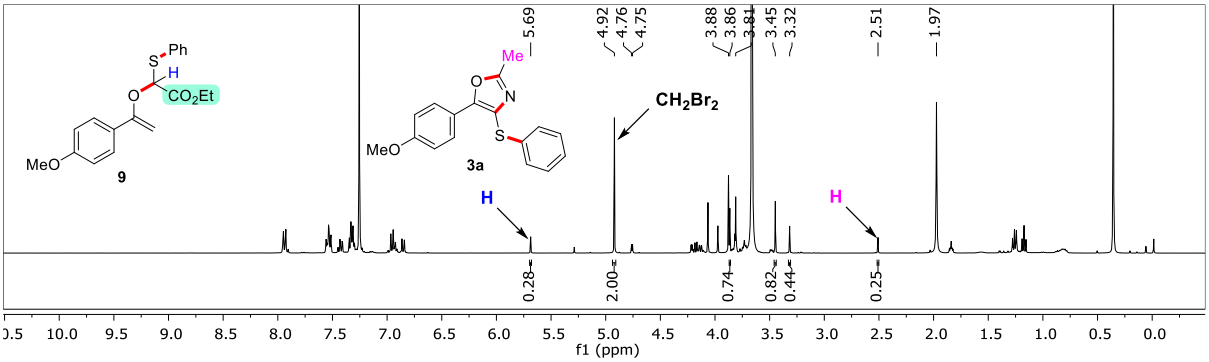
^{1}H-NMR Spectrum of ethyl 2-((1-(4-methoxyphenyl)vinyl)oxy)-2-(phenylthio)acetate (9)



^{1}H-NMR Spectrum of ethyl 2-((1-(4-methoxyphenyl)vinyl)oxy)-2-(phenylthio)acetate (3a)



^{1}H-NMR of Crude Reaction Mixture



Form the above competition experiment, it is likely that the oxa-[2,3] sigmatropic rearrangement proceed approximately three times faster than the [2,3] sigmatropic rearrangement-annulation cascade.

8. X-ray Data of 3f

Single crystal of **3f** (recrystallized from $CDCl_3$ at 25 °C; a sample of chromatographically pure **3f** was dissolved in $CDCl_3$ and was allowed to evaporate slowly at 25 °C) was mounted and the diffraction data was collected at 100 K on a Bruker SMART APEX CCD diffractometer using SMART/SAINT software. Intensity data were collected using graphite-monochromatized Mo-Ka radiation (71.073 pm). The structure was solved by direct methods using the ShelXS and refined with ShelXS.[7] Empirical absorption corrections were applied with SADABS.[8] All Non-hydrogen atoms were refined anisotropically and hydrogen atoms were included in geometric positions.

[7] SHELXS, G.M. Sheldrick, *Acta Cryst.* **2008**, *A64*, 112.
[8] Sheldrick, G. M. SADABS, University of Göttingen, Göttingen, Germany, **1999**.

Structure was drawn using Olex-2 and ORTEP-3. The crystallographic refinement parameters are given below:

Table S1 Crystal data and structure refinement for 3f

CCDC	2111261
Identification code	**3f**
Empirical formula	$C_{16}H_{13}NOS$
Formula weight	267.33
Temperature/K	100(2)
Crystal system	monoclinic
Space group	P $2_1/c$
a/Å	13.4701(2)
b/Å	5.6180(10)
c/Å	17.8943(3)
α/°	90
β/°	104.498(10)
γ/°	90
Volume/$Å^3$	1311.03(4)
Z	4
$\rho_{calc}mg/mm^3$	1.354
m/mm^{-1}	0.237
F(000)	560.0
2Θ range for data collection	1.561 to 30.632°
Index ranges	$-19 \leq h \leq 19, -8 \leq k \leq 8, -25 \leq l \leq 25$
Reflections collected	28641
Independent reflections	4026[R(int) = 0.0313]
Data/restraints/parameters	4026/0/172
Goodness-of-fit on F^2	1.039
Final R indexes [I>=2σ (I)]	$R_1 = 0.0387$, $wR_2 = 0.1103$
Final R indexes [all data]	$R_1 = 0.0451$, $wR_2 = 0.1152$
Largest diff. peak/hole / e $Å^{-3}$	0.72/-0.76

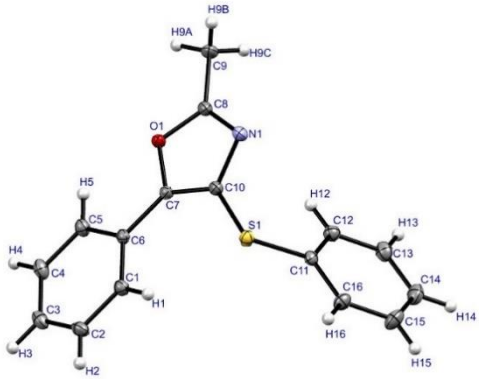
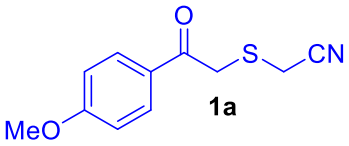


Figure S1. Crystal Structure of **3f** (Thermal ellipsoids are shown with 50% probability)

9. Synthesis and Characterization of 2-Substituted Thio-acetonitriles

2-((2-(4-Methoxyphenyl)-2-oxoethyl)thio)acetonitrile (1a)

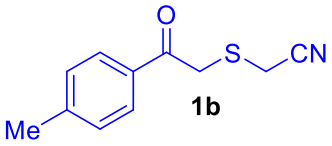


1a

Following the general procedure, treatment of 2-mercapto-1-(4-methoxyphenyl)ethan-1-one (0.9 g, 4.94 mmol), 2-bromo acetonitrile (0.59 g, 0.34 mL, 4.94 mmol) and Et_3N (1.25 g, 1.7 mL, 12.34 mmol) in THF (0.1 M) at ambient temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 80/20) of the crude reaction mixture using silica gel afforded 2-((2-(4-methoxyphenyl)-2-oxoethyl)thio)acetonitrile **1a** as yellow solid (0.95 g, 87 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.25; Melting point: 65-67 °C. **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.94 (d, *J* = 8.9 Hz, 2H), 6.96 (d, *J* = 8.9 Hz, 2H), 4.07 (s, 2H), 3.88 (s, 3H), 3.45 (s, 2H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 191.9, 164.3, 131.1, 128.0, 116.2, 114.2, 55.7, 37.1, 17.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{11}H_{12}NO_2S$ 222.0583; Found: 222.0585. **FTIR (cm^{-1})** 2938, 2243, 1680, 1598, 1511, 1331, 1170, 1028.

2-((2-Oxo-2-(*p*-tolyl)ethyl)thio)acetonitrile (1b)

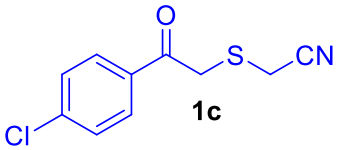


1b

Following the known procedure, treatment of 2-mercapto-1-(*p*-tolyl)ethan-1-one (1.0 g, 6.01 mmol), 2-bromo acetonitrile (0.72 g, 0.42 mL, 6.01 mmol) and Et_3N (1.5 g, 2.1 mL, 15.03 mmol) in THF (0.1 M) at ambient temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 85/15) of the crude reaction mixture using silica gel afforded 2-((2-oxo-2-(*p*-tolyl)ethyl)thio)acetonitrile **1b** as yellow solid (1.1 g, 89 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.30; Melting point: 77-79 °C. **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.86 (d, *J* = 8.2 Hz, 2H), 7.29 (d, *J* = 8.0 Hz, 2H), 4.09 (s, 2H), 3.45 (s, 2H), 2.43 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 193.0, 145.2, 132.6, 129.7, 128.8, 116.2, 37.3, 21.9, 17.3. **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{11}H_{11}NNaOS$ 228.0454; Found: 228.0455. **FTIR (cm^{-1})** 2944, 2240, 1685, 1606, 1369, 1202, 904.

2-((2-(4-chlorophenyl)-2-oxoethyl)thio)acetonitrile (1c)



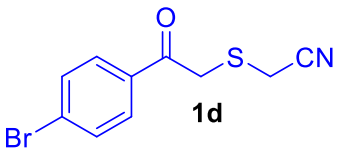
1c

Following the general procedure, treatment of 1-(4-chlorophenyl)-2-mercaptoethan-1-one (0.560 g, 3.0 mmol), 2-bromo acetonitrile (0.36 g, 3.0 mmol) and Et_3N (0.759 g, 7.5 mmol) in THF (0.1 M) at ambient

temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 80/20) of the crude reaction mixture using silica gel afforded 2-((2-(4-chlorophenyl)-2-oxoethyl)thio) acetonitrile **1c** as yellow oil (0.542 g, 88% yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.27; **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.91 (d, *J* = 8.6 Hz, 2H), 7.48 (d, *J* = 8.7 Hz, 2H), 4.09 (s, 2H), 3.45 (s, 2H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 192.1, 140.8, 133.5, 130.1, 129.4, 115.9, 37.2, 17.3. **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{10}H_8ClNNaOS$ 247.9907; Found: 247.9912. **FTIR (cm^{-1})** 3593, 2920, 2364, 2340, 2247, 1670, 1579.

2-((2-(4-Bromophenyl)-2-oxoethyl)thio)acetonitrile (1d)

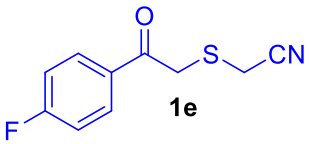


1d

Following the general procedure, treatment of 1-(4-bromophenyl)-2-mercaptoethan-1-one (0.693 g, 3.0 mmol), 2-bromo acetonitrile (0.36 g, 3.0 mmol) and Et_3N (0.759 g, 7.5 mmol) in THF (0.1 M) at ambient temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 82/18) of the crude reaction mixture using silica gel afforded 2-((2-(4-bromophenyl)-2-oxoethyl)thio) acetonitrile **1d** as yellow solid (0.737 g, 91 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.27; Melting point: 83-85 °C. **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.82 (d, *J* = 8.7 Hz, 2H), 7.63 (d, *J* = 8.3 Hz, 2H), 4.07 (s, 2H), 3.44 (s, 2H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 192.3, 133.7, 132.4, 130.2, 129.5, 115.9, 37.3, 17.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{10}H_9BrNOS$ 269.9583; Found: 269.9584. **FTIR (cm^{-1})** 3581, 2919, 2364, 2332, 2243, 1667, 1585, 1484.

2-((2-(4-Fluorophenyl)-2-oxoethyl)thio)acetonitrile (1e)



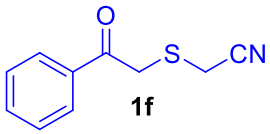
1e

Following the known procedure, treatment of 1-(4-fluorophenyl)-2-mercaptoethan-1-one (1.5 g, 8.8 mmol), 2-bromo acetonitrile (1.06 g, 0.6 mL, 8.8 mmol) and Et_3N (2.2 g, 3.0 mL, 22.0 mmol) in THF (0.1 M) at ambient temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 85/15) of the crude reaction mixture using silica gel afforded 2-((2-(4-fluorophenyl)-2-oxoethyl) thio)acetonitrile **1e** as yellow solid (1.49 g, 83 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.30; Melting point: 63-65 °C. **^{1}H NMR (400 MHz, $CDCl_3$)** δ 8.00-7.97 (m, 2H), 7.18-7.13 (m, 2H), 4.09 (s, 2H), 3.44 (s, 2H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 191.8, 166.3 (d, *J* = 256.7 Hz), 131.4, 131.38, (d, *J* = 9.5 Hz) 116.2 (d, *J* = 21.9 Hz), 37.3, 17.2.

HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{10}H_9FNOS$ 210.0383; Found: 210.0389. **FTIR (cm^{-1})** 2975, 2245, 1676, 1596, 1506, 1413, 1280, 1158.

2-((2-Oxo-2-phenylethyl)thio)acetonitrile (1f)[5]

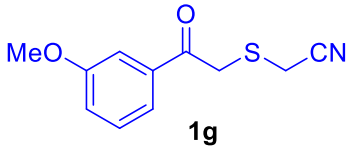


1f

Following the known procedure, treatment of 2-mercapto-1-(4-methoxyphenyl)ethan-1-one (0.5 g, 3.28 mmol), 2-bromo acetonitrile (0.39 g, 0.23 mL, 3.28 mmol) and Et_3N (0.83 g, 1.1 mL, 8.2 mmol) in THF (0.1 M) at ambient temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 85/15) of the crude reaction mixture using silica gel afforded 2-((2-oxo-2-phenylethyl)thio)acetonitrile **1f** as yellow solid (0.52 g, 83 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.25; Melting point: 43-45 °C. **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.97-7.95 (m, 2H), 7.64-7.60 (m, 1H), 7.51-7.48 (m, 2H), 4.12 (s, 2H), 3.45 (s, 2H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 193.3, 135.0, 134.1, 129.0, 128.7, 116.1, 37.4, 17.2. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{10}H_{10}NOS$ 192.0478; Found: 192.0480. **FTIR (cm^{-1})** 2972, 2244, 1689, 1598, 1448, 1279, 1205, 922.

2-((2-(3-Methoxyphenyl)-2-oxoethyl)thio)acetonitrile (1g)

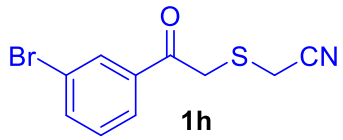


1g

Following the general procedure, treatment of 2-mercapto-1-(3-methoxyphenyl)ethan-1-one (0.95 g, 5.2 mmol), 2-bromo acetonitrile (0.62 g, 0.36 mL, 5.2 mmol) and Et_3N (1.32 g, 1.82 mL, 13.0 mmol) in THF (0.1 M) at ambient temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 80/20) of the crude reaction mixture using silica gel afforded 2-((2-(3-methoxyphenyl)-2-oxoethyl)thio)acetonitrile **1g** as light yellow solid (1.02 g, 89 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.25; Melting point: 64-66 °C. **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.52-7.47 (m, 2H), 7.42-7.37 (m, 1H), 7.16-7.14 (m, 1H), 4.10-4.09 (m, 2H), 3.86-3.85 (m, 3H), 3.45-3.44 (m, 2H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 193.2, 160.1, 136.3, 130.0, 121.2, 120.6, 120.6, 116.1, 112.9, 55.6, 37.5, 37.4, 17.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{11}H_{12}NO_2S$ 222.0583; Found: 222.0588. **FTIR (cm^{-1})** 3075, 2919, 2364, 2244, 1666, 1587, 1428, 1159.

2-((2-(3-Bromophenyl)-2-oxoethyl)thio)acetonitrile (1h)

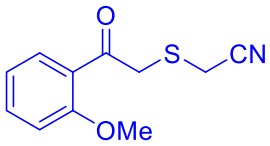


1h

Following the general procedure, treatment of 1-(3-bromophenyl)-2-mercaptoethan-1-one (0.693 g, 3.0 mmol), 2-bromo acetonitrile (0.36 g, 3.0 mmol) and Et_3N (0.759 g, 7.5 mmol) in THF (0.1 M) at ambient temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 82/18) of the crude reaction mixture using silica gel afforded 2-((2-(3-bromophenyl)-2-oxoethyl)thio)acetonitrile **1h** as yellow solid (0.721 g, 89 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.27; Melting point: 112-114 °C. **^{1}H NMR (400 MHz, $CDCl_3$)** δ 8.02 (d, *J* = 1.4 Hz, 1H), 7.83 (d, *J* = 7.8 Hz, 1H), 7.67 (d, *J* = 8.3 Hz, 1H), 7.35-7.31 (m, 1H), 4.07 (s, 2H), 3.41 (s, 2H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 192.0, 136.9, 136.7, 131.6, 130.6, 127.2, 123.3, 115.9, 37.3, 17.2. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{10}H_9BrNOS$ 269.9583; Found: 269.9585. **FTIR (cm^{-1})** 3581, 2920, 2364, 2332, 2245, 1668, 1561, 1470.

2-((2-(2-Methoxyphenyl)-2-oxoethyl)thio)acetonitrile (1i)

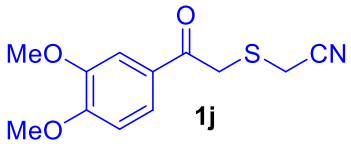


1i

Following the general procedure, treatment of 2-mercapto-1-(2-methoxyphenyl)ethan-1-one (0.88 g, 4.9 mmol), 2-bromo acetonitrile (0.59 g, 0.34 mL, 4.9 mmol) and Et_3N (1.24 g, 1.7 mL, 12.25 mmol) in THF (0.1 M) at ambient temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 80/20) of the crude reaction mixture using silica gel afforded 2-((2-(2-methoxyphenyl)-2-oxoethyl)thio)acetonitrile **1i** as light yellow sticky solid (0.85 g, 78 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.25; **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.80 (dd, J_1= 6.7 Hz, J_2 = 1.6 Hz, 1H), 7.52-7.48 (m, 1H), 7.02-6.96 (m, 2H), 4.11 (s, 2H), 3.90 (s, 3H), 3.36 (s, 2H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 194.4, 158.9, 134.9, 131.2, 125.2, 120.9, 116.4, 111.7, 55.7, 42.3, 16.9. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{11}H_{12}NO_2S$ 222.0583; Found: 222.0591. **FTIR (cm^{-1})** 3074, 2919, 2363, 1663, 1594, 1435, 1153.

2-((2-(3,4-Dimethoxyphenyl)-2-oxoethyl)thio)acetonitrile (1j)



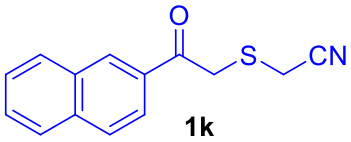
1j

Following the general procedure, treatment of 1-(3,4-dimethoxyphenyl)-2-mercaptoethan-1-one (0.3 g, 1.4 mmol), 2-bromo acetonitrile (0.168 g, 0.1 mL, 1.4 mmol) and Et_3N (0.354 g,

0.49 mL, 3.5 mmol) in THF (0.1 M) at ambient temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 75/25) of the crude reaction mixture using silica gel afforded 2-((2-(3,4-dimethoxyphenyl)-2-oxoethyl)thio)acetonitrile **1j** as white solid (0.28 g, 80 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.20; Melting point: 114-116 °C. **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.57 (d, *J* = 8.5 Hz, 1H), 7.52 (s, 1H), 6.91 (d, *J* = 8.6 Hz, 1H), 4.08 (s, 2H), 3.96 (s, 3H), 3.94 (s, 3H), 3.46 (s, 2H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 192.1, 154.3, 149.5, 128.2, 123.6, 116.2, 110.6, 110.3, 56.3, 56.2, 36.9, 17.4. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{12}H_{14}NO_3S$ 252.0689; Found: 252.0691. **FTIR (cm^{-1})** 2970, 2243, 1665, 1588, 1418, 1270, 1153.

2-((2-(Naphthalen-2-yl)-2-oxoethyl)thio)acetonitrile (1k)

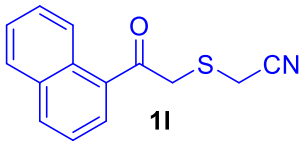


1k

Following the general procedure, treatment of 2-mercapto-1-(naphthalen-2-yl)ethan-1-one (0.693 g, 3.0 mmol), 2-bromo acetonitrile (0.36 g, 3.0 mmol) and Et_3N (0.759 g, 7.5 mmol) in THF (0.1 M) at ambient temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 92/08) of the crude reaction mixture using silica gel afforded 2-((2-(naphthalen-2-yl)-2-oxoethyl)thio)acetonitrile **1k** as yellow solid (0.492 g, 81 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.29; Melting point: 61-63 °C. **^{1}H NMR (400 MHz, CDCl$_3$)** δ 8.46 (s, 1H), 8.00-7.95 (m, 2H), 7.91-7.86 (m, 2H), 7.64-7.55 (m, 2H), 4.24 (s, 2H), 3.48 (s, 2H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 193.3, 135.9, 132.4, 132.3, 130.7, 129.7, 129.1, 128.9, 127.9, 127.2, 123.9, 116.2, 37.5, 17.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{14}H_{12}NOS$ 242.0634; Found: 242.0641. **FTIR (cm^{-1})** 3058, 2693, 2924, 2851, 2365, 2244, 1682, 1625.

2-((2-(Naphthalen-1-yl)-2-oxoethyl)thio)acetonitrile (1l)



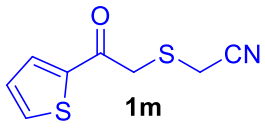
1l

Following the general procedure, treatment of 2-mercapto-1-(naphthalen-1-yl)ethan-1-one (0.45 g, 2.22 mmol), 2-bromo acetonitrile (0.27 g, 0.15 mL, 2.22 mmol) and Et_3N (0.56 g, 0.77 mL, 5.55 mmol) in THF (0.1 M) at ambient temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 92/08) of the crude reaction mixture using silica gel afforded 2-((2-(naphthalen-1-yl)-2-oxoethyl)thio)acetonitrile **1l** as yellow oil (0.43 g, 80 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.29; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 8.65 (d, *J* = 8.7 Hz, 1H), 8.05 (d, *J* = 8.3 Hz, 1H), 7.95-7.89 (m, 2H), 7.65-7.50 (m, 3H), 4.21 (s, 2H), 3.52 (s, 2H). **^{13}C**

NMR (100 MHz, $CDCl_3$) δ 196.9, 134.1, 133.4, 130.5, 129.8, 128.8, 128.7, 128.7, 126.9, 125.6, 124.4, 116.2, 40.2, 17.4. **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{14}H_{11}NaNOS$ 264.0454; Found: 264.0461. **FTIR (cm^{-1})** 2920, 2364, 2245, 1647, 1511, 1461, 1146.

2-((2-Oxo-2-(thiophen-2-yl)ethyl)thio)acetonitrile (1m)

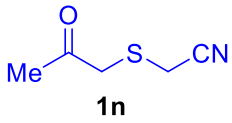


1m

Following the known procedure, treatment of 2-mercapto-1-(thiophen-2-yl)ethan-1-one (0.67 g, 4.24 mmol), 2-bromo acetonitrile (0.51 g, 0.30 mL, 4.24 mmol) and Et_3N (1.07 g, 1.5 mL, 10.6 mmol) in THF (0.1 M) at ambient temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 85/15) of the crude reaction mixture using silica gel afforded 2-((2-oxo-2-(thiophen-2-yl)ethyl)thio)acetonitrile **1m** as yellow solid (0.7 g, 84 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.35; Melting point: 71-73 °C. **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.77-7.76 (m, 1H), 7.33-7.72 (m, 1H), 7.18-7.16 (m, 1H), 4.01 (s, 2H), 3.48 (s, 2H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 186.5, 142.0, 135.4, 133.3, 128.6, 116.1, 37.4, 17.4. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_8H_8NOS_2$ 198.0042; Found: 198.0047. **FTIR (cm^{-1})** 2958, 2920, 2364, 1646, 1514, 1379, 1129.

2-((2-Oxopropyl)thio)acetonitrile (1n)



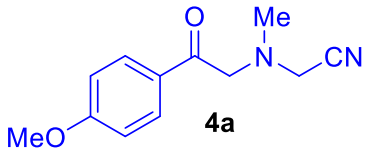
1n

Following the general procedure, treatment of 1-mercaptopropan-2-one (0.5 g, 5.55 mmol), 2-bromo acetonitrile (0.67 g, 0.39 mL, 5.55 mmol) and Et_3N (1.4 g, 1.9 mL, 13.86 mmol) in THF (0.1 M) at ambient temperature for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 80/20) of the crude reaction mixture using silica gel afforded 2-((2-oxopropyl)thio)acetonitrile **1n** as yellow oil (0.29 g, 40 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.25; **^{1}H NMR (400 MHz, $CDCl_3$)** δ 3.50 (s, 2H), 3.33 (s, 2H), 2.25 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 202.0, 116.0, 41.3, 28.6, 16.8. **LC-MS (ESI)** m/z: $[M]^+$ Calcd for C_5H_7NOS 129.02; Found: 129.05. **FTIR (cm^{-1})** 2944, 2345, 1703, 1381, 1137, 1005.

10. Synthesis and Characterization of β-Keto Amines

2-((2-(4-Methoxyphenyl)-2-oxoethyl)(methyl)amino)acetonitrile (4a)

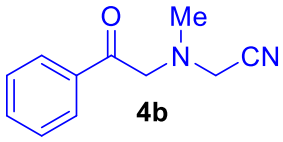


4a

Following the general procedure, treatment of 2-(4-methoxyphenyl)-*N*-methyl-2-oxoethan-1-aminium chloride (0.5 g, 2.3 mmol), Et_3N (0.8 mL, 5.8 mmol) and 2-bromo acetonitrile (0.16 mL, 2.3 mmol) in THF (0.1 M) at ambient temperature for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 80/30) of the crude reaction mixture using silica gel afforded 2-((2-(4-methoxyphenyl)-2-oxoethyl)(methyl)amino)acetonitrile **4a** as yellow liquid (0.325 g, 64 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.20; **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.93 (d, *J* = 8.8 Hz, 2H), 6.93 (d, *J* = 8.8 Hz, 2H), 3.94 (s, 2H), 3.87 (s, 3H), 3.77 (m, 2H), 2.53 (m, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 193.8, 164.1, 130.4, 128.5, 114.9, 114.0, 60.6, 55.6, 45.2, 43.1. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{12}H_{14}N_2NaO_2$ 241.0947; Found: 241.0956. **FTIR (cm^{-1})** 2841, 1683, 1601, 1512, 1262, 1233, 1173, 834.

2-(Methyl(2-oxo-2-phenylethyl)amino)acetonitrile (4b)



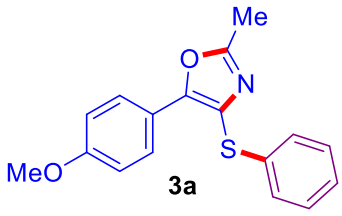
4b

Following the general procedure, treatment of *N*-methyl-2-oxo-2-phenylethan-1-aminium chloride (0.5 g, 2.7 mmol), Et_3N (0.92 mL, 6.7 mmol) and 2-bromo acetonitrile (0.19 mL, 2.7 mmol) in THF (0.1 M) at ambient temperature for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 80/20) of the crude reaction mixture using silica gel afforded 2-(methyl(2-oxo-2-phenylethyl)amino)acetonitrile **4b** as yellow liquid (0.275 g, 54 % yield).

***R*f** (Pet. ether /EtOAc = 80/20): 0.27; **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.95-7.93 (m, 2H), 7.61-7.57 (m, 1H), 7.49-7.45 (m, 2H), 4.01(s, 2H), 3.79 (s, 2H), 2.54 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 195.3, 135.4, 133.9, 128.9, 128.0, 114.8, 60.9, 45.2, 43.1. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{11}H_{13}N_2O$ 189.1022; Found: 189.1028. **FTIR (cm^{-1})** 2798, 1693, 1599, 1451, 1227, 757, 691.

11. Synthesis and Characterization of Functionalized Oxazole Derivatives

5-(4-Methoxyphenyl)-2-methyl-4-(phenylthio)oxazole (3a)

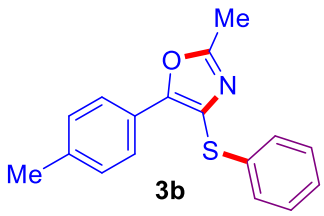


3a

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 μL, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl)thio)acetonitrile **1a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 5-(4-methoxyphenyl)-2-methyl-4-(phenylthio)oxazole **3a** as a light yellow oil (0.058 g, 78% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.28; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.98-7.94 (m, 2H), 7.31-7.25 (m, 4H), 7.19-7.15 (m, 1H), 6.98-6.94 (m, 2H), 3.85 (s, 3H), 2.54 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 160.2, 160.1, 152.8, 135.7, 129.2, 127.8, 127.6, 126.2, 123.5, 120.4, 114.2, 55.4, 14.2. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{16}NO_2S$ 298.0896; Found 298.0899. **FTIR (cm^{-1})** 3610, 3582, 2921, 1610, 1580, 1497, 1248, 830.

2-Methyl-4-(phenylthio)-5-(*p*-tolyl)oxazole (3b)

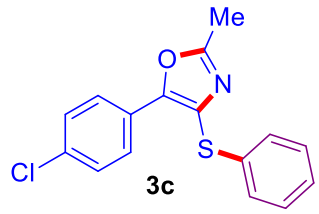


3b

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 μL, 0.375 mmol) with 2-((2-oxo-2-(*p*-tolyl)ethyl)thio)acetonitrile **1b** (0.051 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 2-methyl-4-(phenylthio)-5-(*p*-tolyl)oxazole **3b** as a light yellow solid (0.046 g, 66% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.28; Melting point: 64-66 °C. **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.91 (d, *J* = 8.2 Hz, 2H), 7.32-7.24 (m, 6H), 7.20-7.16 (m, 1H), 2.55 (s, 3H), 2.40 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 160.4, 152.8, 139.1, 135.6, 129.5, 129.2, 128.0, 126.3, 126.0, 124.9, 124.7, 21.5, 14.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{16}NOS$ 282.0947; Found 282.0953. **FTIR (cm^{-1})** 2922, 2852, 1582, 1502, 1475, 1439, 1171, 1087.

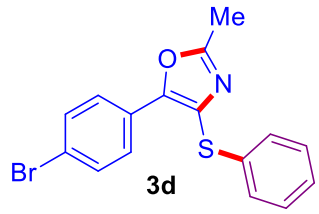
5-(4-Chlorophenyl)-2-methyl-4-(phenylthio)oxazole (3c)



3c

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 µL, 0.375 mmol) with 2-((2-(4-chlorophenyl)-2-oxoethyl)thio)acetonitrile **1c** (0.056 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in CH_3CN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 95/05) of the crude reaction mixture using silica gel afforded 5-(4-chlorophenyl)-2-methyl-4-(phenylthio)oxazole **3c** as a light yellow oil (0.027 g, 36% yield). ***R*f** (Pet. ether /EtOAc = 90/10): 0.60; **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.97 (d, *J* = 8.8 Hz, 2H), 7.40 (d, *J* = 8.8 Hz, 2H), 7.32-7.28 (m, 4H), 7.22-7.18 (m, 1H), 2.56 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 160.9, 151.2, 134.9, 134.8, 129.3, 129.1, 128.3, 127.2, 126.7, 126.3, 126.1, 14.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{13}ClNOS$ 302.0401; Found 302.0404. **FTIR (cm^{-1})** 3587, 3059, 2930, 2350, 1578, 1438, 1401.

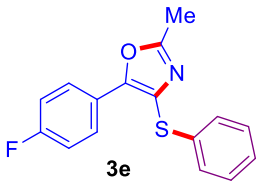
5-(4-Bromophenyl)-2-methyl-4-(phenylthio)oxazole (3d)



3d

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 µL, 0.375 mmol) with 2-((2-(4-bromophenyl)-2-oxoethyl)thio)acetonitrile **1d** (0.068 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 92/08) of the crude reaction mixture using silica gel afforded 5-(4-bromophenyl)-2-methyl-4-(phenylthio)oxazole **3d** as a light yellow oil (0.037 g, 43% yield). ***R*f** (Pet. ether /EtOAc = 90/10): 0.30; **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.84 (d, *J* = 8.5 Hz, 2H), 7.50 (d, *J* = 8.8 Hz, 2H), 7.26-7.20 (m, 4H), 7.16-7.12 (m, 1H), 2.49 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 160.9, 151.2, 134.9, 132.0, 129.3, 128.4, 127.4, 126.7, 126.6, 126.5, 123.1, 14.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{13}BrNOS$ 345.9896; Found 345.9903. **FTIR (cm^{-1})** 3582, 3059, 2925, 2365, 1581, 1478, 1437, 1398.

5-(4-Fluorophenyl)-2-methyl-4-(phenylthio)oxazole (3e)

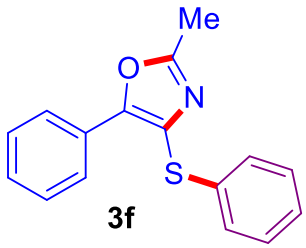


3e

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 µL, 0.375 mmol) with 2-((2-(4-fluorophenyl)-2-oxoethyl)thio)acetonitrile **1e** (0.052 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 5-(4-fluorophenyl)-2-methyl-4-(phenylthio)oxazole **3e** as a light yellow solid (0.041 g, 58% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.32; Melting point: 61-63 °C. **^{1}H NMR (400 MHz, CDCl$_3$)** δ 8.03-7.98 (m, 2H), 7.32-7.26 (m, 4H), 7.21-7.17 (m, 1H), 7.15-7.10 (m, 2H), 2.56 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 162.9 (d, *J* = 250.4 Hz), 160.6, 151.6, 135.1, 129.3, 128.04, 128.0 (d, *J* = 7.5 Hz), 126.5, 125.2, 123.9 (d, *J* = 3.8 Hz), 115.9 (d, *J* = 3.8 Hz), 14.2. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{13}FNOS$ 286.0696; Found 286.0702. **FTIR (cm^{-1})** 3069, 1583, 1500, 1439, 1232, 1164, 1084, 983.

2-Methyl-5-phenyl-4-(phenylthio)oxazole (3f)



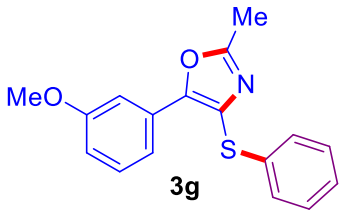
3f

Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **2a** (0.112 g, 91 µL, 0.375 mmol) with 2-((2-oxo-2-phenylethyl)thio)acetonitrile **1f** (0.048 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 2-methyl-5-phenyl-4-(phenylthio)oxazole **3f** as a light yellow solid (0.040 g, 60% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.36; Melting point: 64-66 °C. **^{1}H NMR (400 MHz, CDCl$_3$)** δ 8.04-8.02 (m, 2H), 7.46-7.43 (m, 2H), 7.39-7.35 (m, 1H), 7.34-7.26 (m, 4H), 7.21-7.17 (m, 1H), 2.56 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 160.7, 152.4, 135.3, 129.2, 129.0, 128.8, 128.1, 127.7, 126.4, 126.0, 125.6, 14.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{14}NaOS$ 268.0791; Found 268.0796. **FTIR (cm^{-1})** 2923, 2364, 1580, 1481, 1439, 1252, 1171, 1066.

5-(3-Methoxyphenyl)-2-methyl-4-(phenylthio)oxazole (3g)

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 µL, 0.375 mmol) with 2-((2-(3-methoxyphenyl)-2-oxoethyl)thio) acetonitrile **1g**



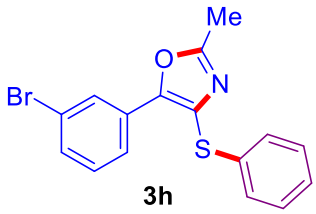
3g

(0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 5-(3-methoxyphenyl)-2-methyl-4-(phenylthio)oxazole **3g** as a yellow solid (0.044 g, 60% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.28; Melting point: 58-60 °C. **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.59-7.55 (m, 2H), 7.33-7.22 (m, 5H), 7.17-7.14 (m, 1H), 6.90-6.87 (dd, J_1 = 8.2 Hz, J_2 = 2.5 Hz, 1H), 3.79 (s, 3H), 2.53 (s, 3H).

^{13}C NMR (100 MHz, CDCl$_3$) δ 160.7, 159.8, 152.1, 135.3, 129.9, 129.2, 128.8, 128.2, 126.5, 125.9, 118.4, 115.1, 111.1, 55.4, 14.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{16}NO_2S$ 298.0896; Found 298.0904. **FTIR (cm^{-1})** 3063, 2920, 2364, 1576, 1432, 1259, 1162.

5-(3-Bromophenyl)-2-methyl-4-(phenylthio)oxazole (3h)



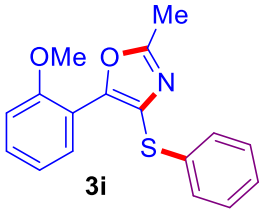
3h

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 μL, 0.375 mmol) with 2-((2-(3-bromophenyl)-2-oxoethyl)thio)acetonitrile **1h** (0.068 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 92/08) of the crude reaction mixture using silica gel afforded 5-(3-bromophenyl)-2-methyl-4-(phenylthio)oxazole **3h** as a light yellow oil (0.047 g, 54% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.30; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 8.10 (s, 1H), 7.94 (d, J = 8.0 Hz, 1H), 7.45-7.43 (m, 1H), 7.30-7.22 (m, 5H), 7.18-7.14 (m, 1H), 2.51 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 161.1, 150.4, 134.7, 131.7, 130.3, 129.6, 129.3, 128.7, 128.7, 127.4, 126.8, 124.4, 122.9, 14.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{16}H_{13}BrNOS$ 345.9896; Found 345.9900. **FTIR (cm^{-1})** 3584, 2958, 2921, 2366, 1577, 1470, 1171, 1136.

5-(2-Methoxyphenyl)-2-methyl-4-(phenylthio)oxazole (3i)

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 μL, 0.375 mmol) with 2-((2-(2-methoxyphenyl)-2-oxoethyl)thio)acetonitrile **1i**

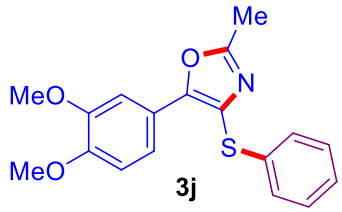


3i

(0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 5-(2-methoxyphenyl)-2-methyl-4-(phenylthio)oxazole **3i** as yellow oil (0.058 g, 78% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.28; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.42-7.36 (m, 2H), 7.28-7.21 (m, 4H), 7.15-7.11 (m, 1H), 7.00-6.94 (m, 2H), 3.75 (s, 3H), 2.52 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 161.5, 157.4, 150.9, 136.2, 131.3, 131.1, 129.0, 128.1, 127.9, 126.0, 120.5, 116.7, 111.5, 55.6, 14.4. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{16}NO_2S$ 298.0896; Found 298.0901. **FTIR (cm^{-1})** 3059, 2924, 2364, 1581, 1434, 1254, 1175.

5-(3,4-Dimethoxyphenyl)-2-methyl-4-(phenylthio)oxazole (3j)



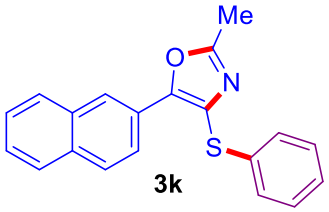
3j

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 µL, 0.375 mmol) with 2-((2-(3,4-dimethoxyphenyl)-2-oxoethyl)thio)acetonitrile **1j** (0.063 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 85/15) of the crude reaction mixture using silica gel afforded 5-(3,4-dimethoxyphenyl)-2-methyl-4-(phenylthio)oxazole **3j** as a yellow solid (0.057 g, 70% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.21; Melting point: 97-99 °C. **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.57-7.55 (m, 2H), 7.28-7.22 (m, 4H), 7.17-7.13 (m, 1H), 6.90 (d, *J* = 9.0 Hz, 1H), 3.90 (s, 3H), 3.85 (s, 3H), 2.54 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 160.0, 152.6, 149.7, 148.9, 135.6, 129.2, 127.7, 126.3, 123.7, 120.4, 119.1, 111.2, 109.1, 56.0, 55.9, 14.2. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{18}H_{18}NO_3S$ 328.1002; Found 328.1010. **FTIR (cm^{-1})** 3057, 2926, 1672, 1582, 1442, 1266, 1142.

2-Methyl-5-(naphthalen-2-yl)-4-(phenylthio)oxazole (3k)

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 µL, 0.375 mmol) with 2-((2-(naphthalen-2-yl)-2-oxoethyl)thio)acetonitrile **1k** (0.060 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75

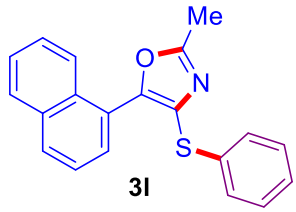


3k

mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 94/06) of the crude reaction mixture using silica gel afforded 2-methyl-5-(naphthalen-2-yl)-4-(phenylthio)oxazole **3k** as a light yellow oil (0.045 g, 57% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.31; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 8.46 (s, 1H), 8.19-8.16 (m, 1H), 7.88-7.82 (m, 3H), 7.51-7.49 (m, 2H), 7.37-7.35 (m, 2H), 7.29-7.25 (m, 2H), 7.20-7.16 (m, 1H), 2.58 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 160.8, 152.3, 135.3, 133.2, 133.2, 129.3, 128.6, 128.5, 128.4, 127.8, 126.9, 126.7, 126.6, 126.2, 125.5, 125.1, 123.3, 14.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{20}H_{16}NOS$ 318.0947; Found 318.0956. **FTIR (cm^{-1})** 3055, 2923, 1581, 1505, 1476, 1438, 1380, 1266.

2-Methyl-5-(naphthalen-1-yl)-4-(phenylthio)oxazole (3l)

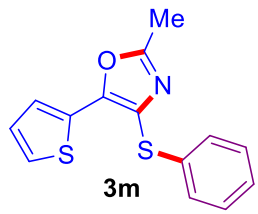


3l

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 µL, 0.375 mmol) with 2-((2-(naphthalen-1-yl)-2-oxoethyl)thio)acetonitrile **1l** (0.06 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 2-methyl-5-(naphthalen-1-yl)-4-(phenylthio)oxazole **3l** as a yellow oil (0.051 g, 64% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.31. **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.95-7.86 (m, 3H), 7.62-7.60 (m, 1H), 7.51-7.46 (m, 3H), 7.28-7.19 (m, 4H), 7.14-7.11 (m, 1H), 2.59 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 161.8, 152.8, 135.5, 133.8, 131.5, 130.5, 129.1, 129.1, 128.6, 128.5, 127.0, 126.4, 126.4, 125.5, 125.1, 124.6, 14.5. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{20}H_{16}NOS$ 318.0947; Found 318.0957. **FTIR (cm^{-1})** 3054, 2924, 2364, 1648, 1581, 1476, 1242, 1169.

2-Methyl-4-(phenylthio)-5-(thiophen-2-yl)oxazole (3m)



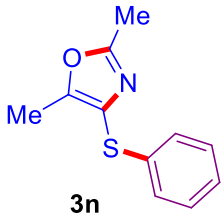
3m

Following the general procedure, treatment of 2-(trimethylsilyl)phenyl trifluoromethanesulfonate **2a** (0.112 g, 91 µL, 0.375 mmol) with 2-((2-oxo-2-(thiophen-2-yl)ethyl)thio)acetonitrile **1m** (0.049 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol)

in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 2-methyl-4-(phenylthio)-5-(thiophen-2-yl)oxazole **3m** as a light yellow oil (0.035 g, 52% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.36; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.57 (d, *J* = 3.7 Hz, 1H), 7.35 (d, *J* = 5.0 Hz, 1H), 7.32-7.30 (m, 2H), 7.27-7.23 (m, 2H), 7.18-7.15 (m, 1H), 7.08-7.06 (m, 1H), 2.52 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 160.3, 149.4, 135.0, 129.2, 128.9, 128.4, 127.6, 127.1, 126.6, 126.1, 124.6, 14.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{14}H_{12}NOS_2$ 274.0355; Found 274.0364. **FTIR (cm^{-1})** 2957, 1648, 1472, 1240, 1169, 1081, 1043, 928.

2,5-Dimethyl-4-(phenylthio)oxazole (3n)

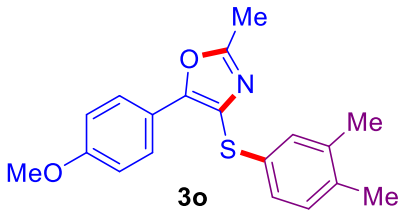


3n

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 μL, 0.375 mmol) with 2-((2-oxopropyl)thio)acetonitrile **1n** (0.032 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 2,5-dimethyl-4-(phenylthio)oxazole **3n** as a light yellow oil (0.028 g, 55% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.32; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.29-7.20 (m, 4H), 7.18-7.14 (m, 1H), 2.45 (s, 3H), 2.38 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 160.4, 153.0, 136.3, 129.0, 127.6, 126.0, 125.5, 14.1, 10.5. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{11}H_{12}NOS$ 206.0634; Found 206.0643. **FTIR (cm^{-1})** 2923, 1583, 1477, 1438, 1163, 1086, 741.

4-((3,4-Dimethylphenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3o)



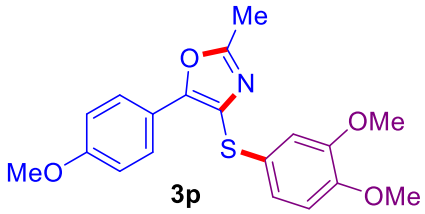
3o

Following the general procedure, treatment of 4,5-dimethyl-2-(trimethylsilyl)phenyl trifluoromethanesulfonate **2b** (0.122 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl)thio) acetonitrile **1a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 4-((3,4-dimethylphenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole **3o** as a light yellow solid (0.059 g, 73% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.35; Melting point: 56-58 °C. **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.94 (d, *J* = 8.8 Hz, 2H), 7.09 (s, 1H), 7.05-6.99 (m, 2H), 6.94 (d, *J* = 8.8 Hz, 2H), 3.84 (s, 3H), 2.50 (s, 3H), 2.18 (s, 6H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 160.04, 160.0, 152.2, 137.7, 135.2, 132.0, 130.5, 129.8, 127.6, 126.1, 124.5, 120.6, 114.2, 55.5, 19.9, 19.5, 14.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{19}H_{20}NO_2S$ 326.1209; Found 326.1214. **FTIR (cm^{-1})** 2922, 1585, 1499, 1251, 1175, 1031, 834.

4-((3,4-Dimethoxyphenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3p)

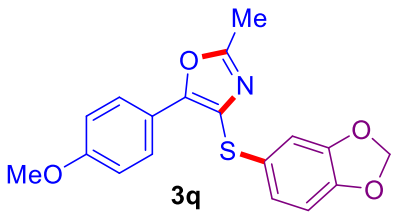
Following the general procedure, treatment of 4,5-dimethoxy-2-(trimethylsilyl)phenyl trifluoromethanesulfonate **2c** (0.134 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl) thio)acetonitrile **1a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 80/20) of the crude reaction mixture using silica gel afforded 4-((3,4-dimethoxyphenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole **3p** as a light yellow solid (0.061 g, 68% yield).



3p

***R*f** (Pet. ether /EtOAc = 90/10): 0.21; Melting point: 85-87 °C. **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.94 (d, *J* = 8.8 Hz, 2H), 6.95-6.89 (m, 4H), 6.74 (d, *J* = 8.1 Hz, 1H), 3.82 (s, 3H), 3.81 (s, 3H), 3.78 (s, 3H), 2.48 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 156.0, 159.8, 151.6, 149.3, 148.5, 127.5, 126.1, 125.2, 122.1, 120.5, 114.2, 113.1, 111.9, 56.0, 56.0, 55.4, 14.2. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{19}H_{20}NO_4S$ 358.1108; Found 358.1113. **FTIR (cm^{-1})** 2959, 2933, 1614, 1584, 1502, 1463, 1440, 1254.

4-(Benzo[*d*][1,3]dioxol-5-ylthio)-5-(4-methoxyphenyl)-2-methyloxazole (3q)



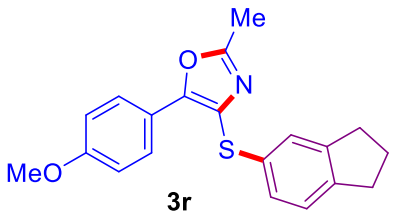
3q

Following the general procedure, treatment of 6-(trimethylsilyl)benzo[*d*][1,3]dioxol-5-yl trifluoromethane sulfonate **2d** (0.128 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl)thio)acetonitrile **1a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column

chromatography (Pet.ether/EtOAc = 85/15) of the crude reaction mixture using silica gel afforded 4-(benzo[*d*][1,3]dioxol-5-ylthio)-5-(4-methoxyphenyl)-2-methyloxazole **3q** as a light yellow solid (0.060 g, 71% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.21; Melting point: 88-90 °C. **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.93 (d, *J* = 8.8 Hz, 2H), 6.94 (d, *J* = 8.8 Hz, 2H), 6.88-6.86 (m, 1H), 6.81 (m, 1H), 6.70 (d, *J* = 8.1 Hz, 1H), 5.90 (s, 2H), 3.83 (s, 3H), 2.49 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 160.1, 160.0, 151.9, 148.3, 147.1, 127.5, 127.5, 124.9, 122.9, 120.4, 114.2, 110.1, 108.9, 101.4, 55.4, 14.2. **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{18}H_{15}NNaO_4S$ 364.0614; Found 364.0619. **FTIR (cm^{-1})** 2924, 1583, 1502, 1474, 1233, 1175, 1036.

4-((2,3-Dihydro-1*H*-inden-5-yl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3r)



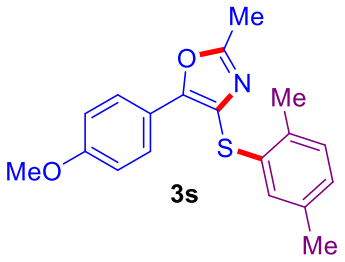
3r

Following the general procedure, treatment of 6-(trimethylsilyl)-2,3-dihydro-1*H*-inden-5-yl trifluoromethane sulfonate **2e** (0.107 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl)thio)acetonitrile **1a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 4-((2,3-dihydro-1H-inden-5-yl)thio)-5-(4-methoxyphenyl)-2-methyloxazole **3r** as a yellow oil (0.06 g, 71% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.30; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.96 (d, *J* = 8.8 Hz, 2H), 7.18 (s, 1H), 7.11 (s, 2H), 6.94 (d, *J* = 8.9 Hz, 2H), 3.83 (s, 3H), 2.83 (t, *J* = 7.4 Hz, 4H), 2.51 (s, 3H), 2.07-1.99 (m, 2H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 160.0, 159.9, 152.1, 145.5, 143.0, 132.4, 127.5, 126.6, 125.0, 124.7, 124.6, 120.6, 114.2, 55.4, 32.9, 32.5, 25.5, 14.2. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{20}H_{20}NO_2S$ 338.1209; Found 338.1213. **FTIR (cm^{-1})** 2924, 2365, 1648, 1584, 1435, 1251, 1174.

4-((2,5-Dimethylphenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3s)

Following the general procedure, treatment of 3,6-dimethyl-2-(trimethylsilyl)phenyl trifluoromethanesulfonate **2f** (0.122 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl)thio) acetonitrile **1a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column

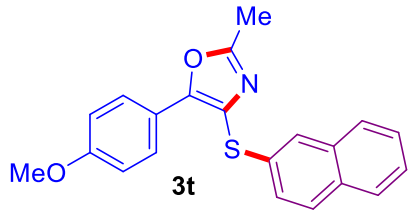


3s

chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 4-((2,5-dimethylphenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole **3s** as a light yellow oil (0.050 g, 62% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.35; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.91 (d, *J* = 8.8 Hz, 2H), 7.04 (d, *J* = 7.5 Hz, 1H), 6.94 (d, *J* = 8.8 Hz, 2H), 6.89-6.87 (m, 2H), 3.83 (s, 3H), 2.53 (s, 3H), 2.37 (m, 3H), 2.19 (m, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 160.2, 160.1, 152.8, 136.3, 134.2, 133.3, 130.3, 128.0, 127.6, 127.1, 123.3, 120.5, 114.2, 55.4, 21.2, 19.8, 14.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{19}H_{20}NO_2S$ 326.1209; Found 326.1212. **FTIR (cm^{-1})** 2922, 1612, 1584, 1499, 1252, 1175, 1032.

5-(4-Methoxyphenyl)-2-methyl-4-(naphthalen-2-ylthio)oxazole (3t)



3t

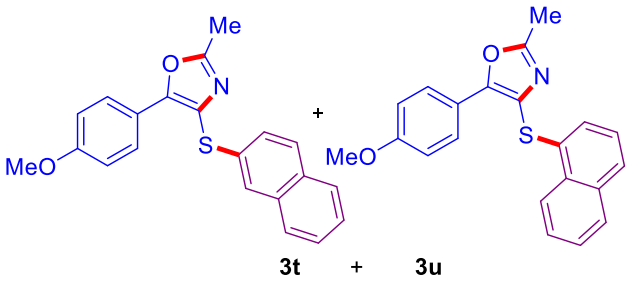
Following the general procedure, treatment of 3-(trimethylsilyl)naphthalen-2-yl trifluoromethanesulfonate **2g** (0.131 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl)thio)acetonitrile **1a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 5-(4-methoxyphenyl)-2-methyl-4-(naphthalen-2-ylthio)oxazole **3t** as a light yellow oil (0.053 g, 61% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.30; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.97-7.94 (m, 2H), 7.76-7.68 (m, 4H), 7.45-7.36 (m, 3H), 6.95-6.92 (m, 2H), 3.82 (s, 3H), 2.54 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 160.2, 160.2, 152.9, 133.9, 133.1, 132.0, 128.9, 127.8, 127.6, 127.3, 126.6, 126.1, 126.0, 125.8, 123.5, 120.4, 114.3, 55.4, 14.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{21}H_{18}NO_2S$ 348.1053; Found 348.1061. **FTIR (cm^{-1})** 3504, 2930, 1697, 1598, 1497, 1258, 1171, 852.

5-(4-Methoxyphenyl)-2-methyl-4-(naphthalen-2-ylthio)oxazole (3t) and

5-(4-Methoxyphenyl)-2-methyl-4-(naphthalen-1-ylthio)oxazole (3u)

Following the general procedure, treatment of 1-(trimethylsilyl)naphthalen-2-yl trifluoromethanesulfonate **2h** (0.131 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-

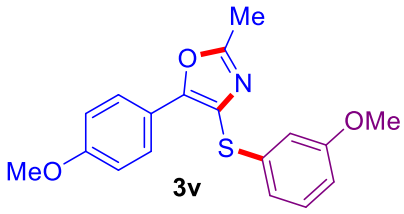


3t + **3u**

oxoethyl)thio) acetonitrile **1a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 5-(4-methoxyphenyl)-2-methyl-4-(naphthalen-2-ylthio)oxazole (**3t**) and 5-(4-methoxyphenyl)-2-methyl-4-(naphthalen-1-ylthio)oxazole (**3u**) as an inseparable mixture of regioisomers in 1.4:1 ratio as a light yellow oil (0.055 g, 64% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.36; **^{1}H NMR (400 MHz, $CDCl_3$) of Major Isomer:** δ 7.98-7.94 (m, 2H), 7.77-7.68 (m, 5H), 7.45-7.33 (m, 2H), 6.95-6.91 (m, 2H), 3.82 (s, 3H), 2.55 (m, 3H). **^{13}C NMR (100 MHz, $CDCl_3$) of Major Isomer:** δ 160.2, 160.15, 152.9, 133.9, 133.1, 132.0, 128.9, 127.6, 127.3, 126.6, 126.3, 126.0, 125.8, 124.5, 123.5, 120.4, 114.3, 55.4, 14.3. **^{1}H NMR (400 MHz, $CDCl_3$) of Minor Isomer:** δ 8.37-8.33 (m, 1H), 7.98-7.94 (m, 2H), 7.85-7.82 (m, 1H), 7.56-7.49 (m, 2H), 7.45-7.33 (m, 3H), 6.95-6.91 (m, 2H), 3.82 (s, 3H), 2.52 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$) of Minor Isomer:** δ 160.2, 160.17, 153.0, 134.1, 132.7, 131.7, 128.6, 127.8, 127.0, 126.6, 126.4, 126.0, 125.9, 124.5, 123.2, 120.39, 114.3, 55.4, 14.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{21}H_{18}NO_2S$ 348.1053; Found 348.1059. **FTIR (cm^{-1})** 3052, 1615, 1585, 1500, 1435, 1282, 1252, 1175.

5-(4-Methoxyphenyl)-4-((3-methoxyphenyl)thio)-2-methyloxazole (3v)



3v

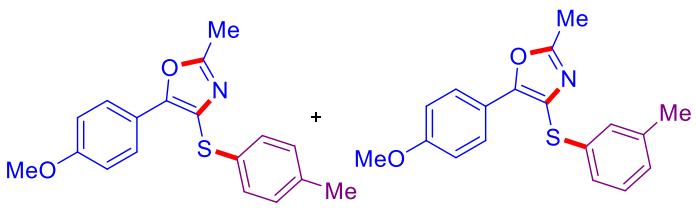
Following the general procedure, treatment of 3-methoxy-2-(trimethylsilyl)phenyl trifluoromethanesulfonate **2i** (0.123 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl)thio) acetonitrile **1a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 85/15) of the crude reaction mixture using silica gel afforded 5-(4-methoxyphenyl)-4-((3-methoxyphenyl)thio)-2-methyloxazole **3v** as a light yellow oil (0.055 g, 68% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.28; **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.92 (d, J = 8.8 Hz, 2H), 7.16 (t, J = 8.0 Hz, 1H), 6.93 (d, J = 8.9 Hz, 2H), 6.85-6.81 (m, 2H), 6.69 (dd, J_1 = 8.2 Hz, J_2 = 2.3 Hz,

1H), 3.82 (s, 3H), 3.73 (s, 3H), 2.52 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 160.2, 160.1, 160.07, 153.0, 137.2, 130.0, 127.6, 123.2, 120.3, 119.9, 114.2, 113.2, 111.8, 55.4, 55.3, 14.2. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{18}H_{18}NO_3S$ 328.1002; Found 328.1004. **FTIR (cm^{-1})** 2923, 2364, 1583, 1499, 1280, 1248, 1171, 1034.

5-(4-Methoxyphenyl)-2-methyl-4-(*p*-tolylthio)oxazole (3w) and
5-(4-Methoxyphenyl)-2-methyl-4-(*m*-tolylthio)oxazole (3w')

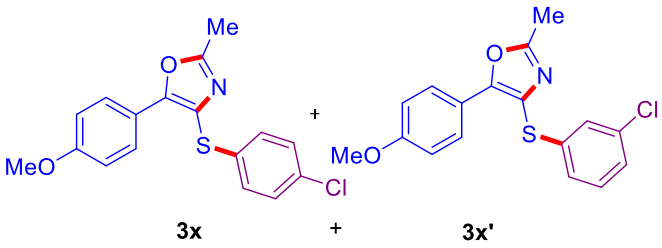
Following the general procedure, treatment of 4 methyl-2-(trimethylsilyl)phenyl trifluoromethanesulfonate **2j** (0.117 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl)thio)acetonitrile **1a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 5-(4-methoxyphenyl)-2-methyl-4-(p-tolylthio)oxazole **(3w)** and 5-(4-methoxyphenyl)-2-methyl-4-(m-tolylthio)oxazole **(3w')** as an inseparable mixture of regioisomers in 1.1:1 ratio as a light yellow oil (0.056 g, 72% yield).



3w + 3w'

***R*$_f$** (Pet. ether /EtOAc = 90/10): 0.36; **^{1}H NMR (400 MHz, $CDCl_3$) of Major Isomer:** δ 7.94 (d, *J* = 8.6 Hz, 2H), 7.15-7.05 (m, 3H), 6.97-6.92 (m, 3H), 3.83 (s, 3H), 2.52 (s, 3H), 2.28 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$) of Major Isomer:** δ 160.1, 160.0, 152.3, 139.0, 130.0, 128.4, 128.0, 127.21, 123.7, 120.45, 114.2, 55.4, 21.5, 14.2. **^{1}H NMR (400 MHz, $CDCl_3$) of Minor Isomer:** δ 7.94 (d, *J* = 8.6 Hz, 2H), 7.21-7.19 (m, 2H), 7.15-7.05 (m, 2H), 6.97-6.92 (m, 2H), 3.83 (s, 3H), 2.50 (s, 3H), 2.28 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$) of Minor Isomer:** δ 160.1, 159.9, 152.7, 136.4, 135.4, 131.9, 129.0, 128.38, 127.6, 124.9, 124.3, 120.5, 114.2, 55.4, 21.1, 14.22. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{18}H_{18}NO_2S$ 312.1053; Found 312.1055. **FTIR (cm^{-1})** 2924, 1585, 1252, 1175, 1031, 833.

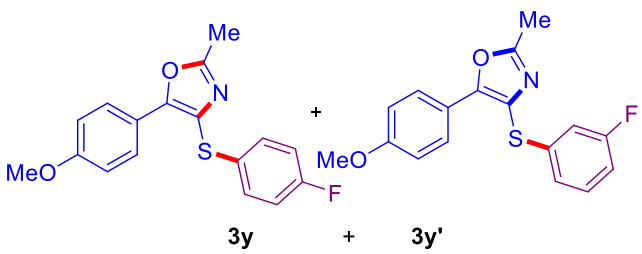
4-((4-Chlorophenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3x) and
4-((3-chlorophenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3x')



Following the general procedure, treatment of 4-chloro-2-(trimethylsilyl)phenyl trifluoromethane sulfonate **2k** (0.125 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl) -2-oxoethyl)thio) acetonitrile **1a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 4-((4-Chlorophenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (**3x**) and 4-((3-chlorophenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (**3x'**) as an inseparable mixture of regioisomers in 2.3:1 ratio as a light yellow oil (0.056 g, 68% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.35; **^{1}H NMR (400 MHz, $CDCl_3$) of Major Isomer:** δ 7.90 (d, *J* = 8.9 Hz, 2H), 7.22-7.17 (m, 4H), 6.94 (d, *J* = 8.9 Hz, 2H), 3.83 (s, 3H), 2.52 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$) of Major Isomer:** δ 160.2, 160.1, 152.9, 134.3, 132.2, 129.3, 127.6, 126.4, 123.1, 120.2, 114.3, 55.5, 14.2. **^{1}H NMR (400 MHz, $CDCl_3$) of Minor Isomer:** δ 7.90 (d, *J* = 8.9 Hz, 2H), 7.22-7.17 (m, 2H), 7.15-7.10 (m, 2H), 6.94 (d, *J* = 8.9 Hz, 2H), 3.83 (s, 3H), 2.53 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$) of Minor Isomer:** δ 160.3, 160.2, 153.3, 137.9, 135.0, 130.2, 129.1, 127.7, 127.1, 125.5, 122.4, 120.1, 114.3, 55.5, 14.3. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{15}ClNO_2S$ 332.0507; Found 332.0511. **FTIR (cm^{-1})** 2927, 1611, 1582, 1501, 1254, 1174, 1089, 1034.

4-((4-Fluorophenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3y) and 4-((3-Fluorophenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3y')

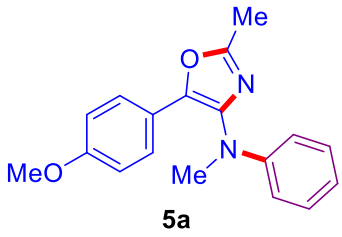


Following the general procedure, treatment of 5-fluoro-2-(trimethylsilyl)phenyl trifluoromethane sulfonate **2l** (0.119 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl) thio)acetonitrile **1a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 12 h followed by flash column chromatography (Pet.ether/EtOAc = 90/10) of the crude reaction mixture using silica gel afforded 4-((4-fluorophenyl)thio)-5-(4-

methoxyphenyl)-2-methyloxazole (**3y**) and 4-((3-fluorophenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (**3y'**) as an inseparable mixture of regioisomers in 2.9:1 ratio as a light yellow oil (0.062 g, 79% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.36; **^{1}H NMR (400 MHz, $CDCl_3$) of Major Isomer:** δ 7.93-7.88 (m, 2H), 7.30-7.23 (m, 2H), 6.98-6.91 (m, 4H), 3.83 (s, 3H), 2.50 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$) of Major Isomer:** δ 161.9 (d, *J* = 245.6 Hz), 160.3, 160.2, 152.2, 138.3, 130.3 (d, *J* = 8.0 Hz), 127.6, 124.1, 120.3, 116.4 (d, *J* = 21.5 Hz), 114.3, 55.4, 14.2. **^{1}H NMR (400 MHz, $CDCl_3$) of Minor Isomer;** δ 7.93-7.88 (m, 2H), 7.23-7.18 (m, 1H), 7.04-7.02 (m, 1H), 6.98-6.91 (m, 3H), 6.85-6.81 (m, 1H). 3.83 (s, 3H), 2.53 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$) of Minor Isomer;** δ 163.2 (d, *J* = 249.0 Hz), 160.3, 160.1, 153.4, 138.3, 130.5, 130.4, 127.7, 122.9 (d, *J* = 3.9 Hz), 120.1, 114.3, 114.1, 113.1 (d, *J* = 21.3 Hz), 55.4, 14.2. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{15}FNO_2S$ 316.0802; Found 316.0809. **FTIR (cm^{-1})** 2923, 2364, 1613, 1585, 1497, 1253, 1175, 1032.

5-(4-Methoxyphenyl)-*N*,2-dimethyl-*N*-phenyloxazol-4-amine (5a)

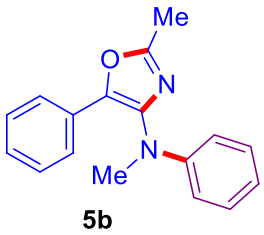


5a

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 μL, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl)(methyl)amino) acetonitrile **4a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 85/15) of the crude reaction mixture using silica gel afforded 5-(4-methoxyphenyl)-*N*,2-dimethyl-*N*-phenyloxazol-4-amine **5a** as a yellow oil (0.041 g, 55% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.22; **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.57 (d, *J* = 8.9 Hz, 2H), 7.23-7.19 (m, 2H), 6.87 (d, *J* = 8.9 Hz, 2H), 6.82-6.76 (m, 3H), 3.80 (s, 3H), 3.25 (s, 3H), 2.50 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 159.3, 158.5, 147.6, 142.2, 137.7, 129.2, 125.9, 120.9, 118.8, 114.3, 114.1, 55.4, 38.2, 14.5. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{18}H_{19}N_2O_2$ 295.1441; Found 295.1445. **FTIR (cm^{-1})** 2926, 1599, 1507, 1251, 1177, 1031, 835, 750.

***N*,2-Dimethyl-*N*,5-diphenyloxazol-4-amine (5b)**

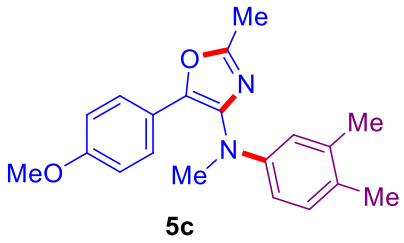


5b

Following the general procedure, treatment of 2-(trimethylsilyl) phenyltrifluoromethanesulfonate **2a** (0.112 g, 91 μL, 0.375 mmol) with 2-(methyl(2-oxo-2-phenylethyl)amino)acetonitrile **4b** (0.047 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 85/15) of the crude reaction mixture using silica gel afforded *N*,2-dimethyl-*N*,5-diphenyloxazol-4-amine **5b** as a yellow oil (0.033 g, 50% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.22; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.67-7.65 (m, 2H), 7.37-7.34 (m, 2H), 7.26-7.22 (m, 3H), 6.85-6.80 (m, 3H), 3.29 (s, 3H), 2.54 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 159.2, 147.3, 141.9, 139.3, 129.2, 128.8, 127.9, 127.8, 124.3, 118.9, 114.2, 38.2, 14.6. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{17}H_{17}N_2O$ 265.1335; Found 265.1343. **FTIR (cm^{-1})** 2911, 1598, 1484, 1276, 1110, 767, 661.

***N*-(3,4-Dimethylphenyl)-5-(4-methoxyphenyl)-*N*,2-dimethyloxazol-4-amine (5c)**

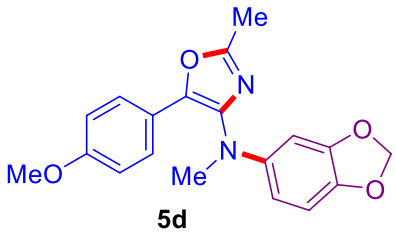


5c

Following the general procedure, treatment of 4,5-dimethyl-2-(trimethylsilyl)phenyl trifluoromethanesulfonate **2b** (0.122 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl)(methyl)amino)acetonitrile **4a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 85/15) of the crude reaction mixture using silica gel afforded *N*-(3,4-dimethylphenyl)-5-(4-methoxyphenyl)-*N*,2-dimethyloxazol-4-amine **5c** as a yellow oil (0.043 g, 53% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.22; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.61-7.58 (m, 2H), 6.97 (d, *J* = 8.2 Hz, 1H), 6.89-6.86 (m, 2H), 6.58-6.57 (m, 1H), 6.54-6.52 (m, 1H), 3.80 (s, 3H), 3.21 (s, 3H), 2.49 (s, 3H), 2.18 (s, 3H), 2.16 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 159.2, 158.4, 145.8, 141.9, 138.3, 137.2, 130.3, 126.9, 125.8, 121.1, 115.9, 114.3, 111.8, 55.7, 38.4, 20.4, 18.8, 14.6. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{20}H_{23}N_2O_4$ 323.1754; Found 323.1762. **FTIR (cm^{-1})** 2927, 1609, 1509, 1248, 1177, 1104, 835.

***N*-(Benzo[*d*][1,3]dioxol-5-yl)-5-(4-methoxyphenyl)-*N*,2-dimethyloxazol-4-amine (5d)**

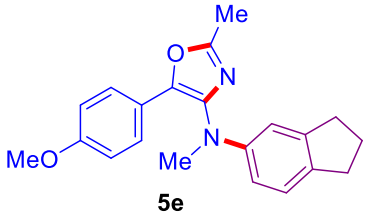


5d

Following the general procedure, treatment of 6-(trimethylsilyl)benzo[*d*][1,3]dioxol-5-yl trifluoromethane sulfonate **2d** (0.128 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl)(methyl)amino)acetonitrile **4a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 80/20) of the crude reaction mixture using silica gel afforded *N*-(benzo[*d*][1,3]dioxol-5-yl)-5-(4-methoxyphenyl)-*N*,2-dimethyloxazol-4-amine **5d** as a yellow oil (0.034 g, 40% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.20; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.60-7.57 (m, 2H), 6.90-6.87 (m, 2H), 6.68 (d, *J* = 8.5 Hz, 1H), 6.35 (d, *J* = 2.4 Hz, 1H), 6.22 (dd, J_1 = 8.5, J_2 = 2.4 Hz, 1H), 5.84 (s, 2H), 3.81 (s, 3H), 3.19 (s, 3H), 2.48 (s, 3H). **^{13}C NMR (100 MHz, CDCl$_3$)** δ 159.3, 158.5, 148.5, 143.6, 141.9, 140.7, 138.3, 125.9, 120.9, 114.3, 108.5, 106.3, 100.9, 97.5, 55.4, 38.9, 14.5. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{19}H_{19}N_2O_4$ 339.1339; Found 339.1343. **FTIR (cm^{-1})** 2928, 1510, 1488, 1250, 1036, 833.

***N*-(2,3-Dihydro-1*H*-inden-5-yl)-5-(4-methoxyphenyl)-*N*,2-dimethyloxazol-4-amine (5e)**



5e

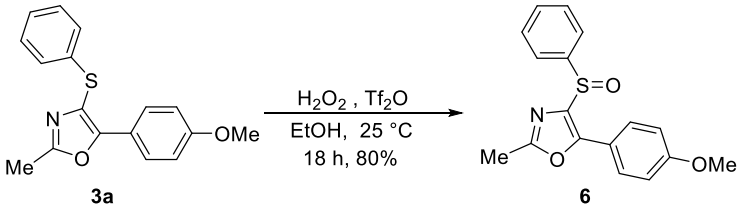
Following the general procedure, treatment of 6-(trimethylsilyl)-2,3-dihydro-1*H*-inden-5-yl trifluoromethanesulfonate **2e** (0.127 g, 0.375 mmol) with 2-((2-(4-methoxyphenyl)-2-oxoethyl)(methyl)amino)acetonitrile **4a** (0.055 g, 0.25 mmol) in the presence of KF (0.044 g, 0.75 mmol) and 18-crown-6 (0.198 g, 0.75 mmol) in PhCN (2.0 mL) at 25 °C for 1 h followed by flash column chromatography (Pet.ether/EtOAc = 85/15) of the crude reaction mixture using silica gel afforded *N*-(2,3-dihydro-1*H*-inden-5-yl)-5-(4-methoxyphenyl)-*N*,2-dimethyloxazol-4-amine **5e** as a yellow oil (0.042 g, 50% yield).

***R*f** (Pet. ether /EtOAc = 90/10): 0.22; **^{1}H NMR (400 MHz, CDCl$_3$)** δ 7.61 (d, *J* = 8.8 Hz, 2H), 7.06-7.04 (m, 1H), 6.88 (d, *J* = 8.7 Hz, 2H), 6.67 (s, 1H), 6.59-6.57 (m, 1H), 3.80 (s, 3H), 3.21 (s, 3H), 2.83-2.87 (m, 4H), 2.49 (s, 3H), 2.06-1.98 (m, 2H). **^{13}C NMR (100 MHz, CDCl$_3$)** 159.2, 158.4, 146.6, 145.4, 141.9, 138.5, 134.6, 125.9, 124.7, 121.1, 114.3, 112.7, 110.7, 55.4, 38.6, 33.4,

32.1, 25.9, 14.5. **HRMS (ESI)** m/z: $[M+H]^+$ Calcd for $C_{21}H_{23}N_2O_2$ 335.1754; Found 335.1761. **FTIR (cm^{-1})** 2935, 2838, 1602, 1485, 1269, 1012, 826.

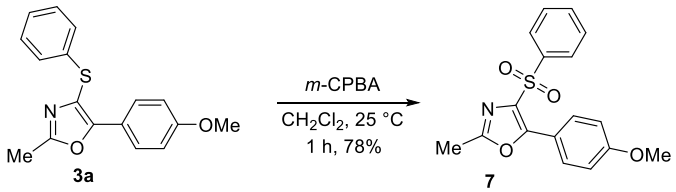
12. Product Functionalizations

a) Procedure for the synthesis of sulphoxide (6)



Oxazole derivative **6** was prepared by using the literature procedure.[9] In a flame-dried screw-capped test tube equipped with a magnetic stir bar, oxazole derivative **3a** (0.17 mmol, 0.050 g) was dissolved in EtOH (0.8 mL). To the above solution, H_2O_2 (30%, 0.34 mmol, 35 μL) and Tf_2O (0.085 mmol, 14 μL) were added, and the mixture was stirred at 25 °C for the 20 h. When the oxazole had completely disappeared, the reaction mixture was quenched by adding H_2O (10 mL). Then product was extracted with EtOAc (4 × 5 mL) and the combined extracts were dried using $MgSO_4$. The filtrate was evaporated, and the corresponding sulfoxide was purified by flash column chromatography on silica gel (using Pet. ether/EtOAc = 60/40 as the eluent) to afford the 5-(4-methoxyphenyl)-2-methyl-4-(phenylsulfinyl)oxazole **6** as a white solid (0.042 g, 80% yield) R_f (Pet. ether /EtOAc = 80/20): 0.28; Melting point: 168-170 °C. **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.83 (d, *J* = 8.7 Hz, 2H), 7.74-7.72 (m, 2H), 7.52-7.47 (m, 3H), 7.01 (d, *J* = 8.7 Hz, 2H), 3.88 (s, 3H), 2.45 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 161.2, 161.0, 153.0, 142.6, 135.8, 131.0, 129.3, 128.8, 125.1, 118.9, 114.7, 55.6, 14.2. **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{17}H_{16}NO_3S$ 314.0845; Found 314.0851. **FTIR (cm^{-1})** 2930, 1613, 1585, 1500, 1252, 1179, 1088, 1045.

b) Procedure for the synthesis of sulfone (7)



[9] Khodaei, M. M.; Bahrami, K.; Karimi, A. *Synthesis* **2008**, 1682.

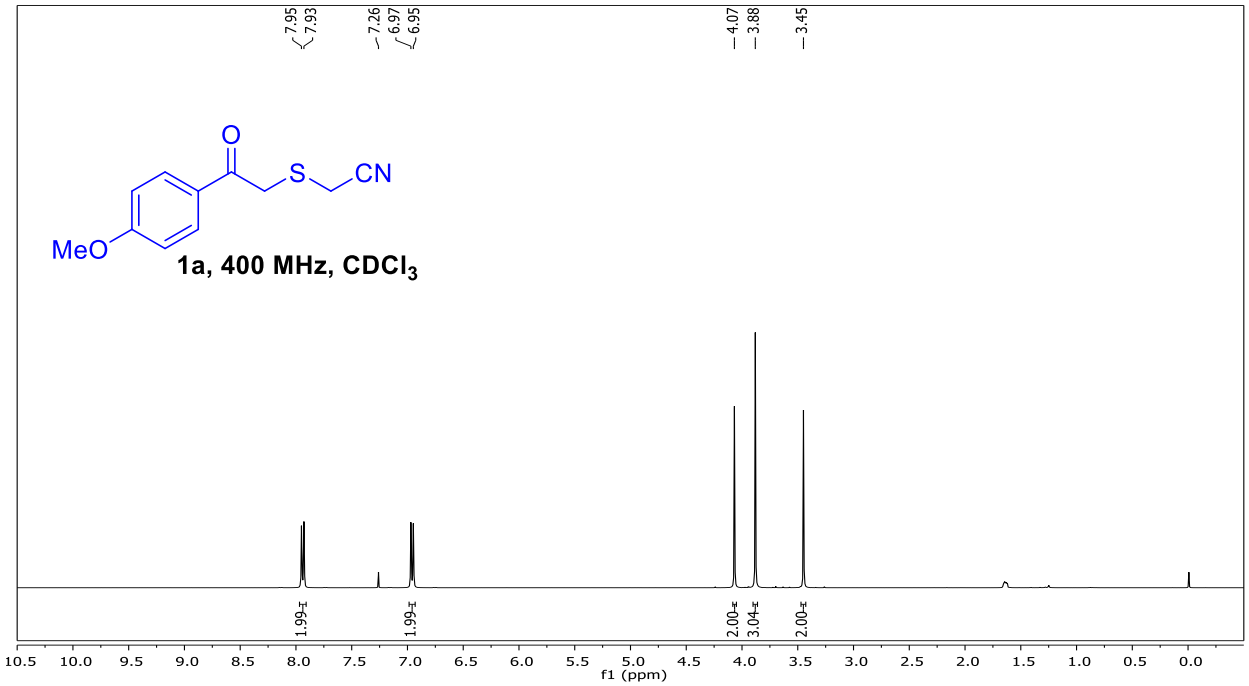
Oxazole derivative **7** was prepared by using the literature procedure.[10] To a 25 mL round bottom flask equipped with stir bar, oxazole **3a** (0.060 g, 0.2 mmol, 1 equiv) was dissolved in dry CH_2Cl_2 (10 mL). The reaction mixture was cooled to 0 °C with ice-bath followed by the addition of *m*-CBPA (0.6 mmol, 3 equiv) portion-wise and allowed to stir for 1h at room temperature. After the completion of the reaction, monitored by TLC, the reaction was neutralized with saturated aq. $NaHCO_3$ and extracted with CH_2Cl_2. The organic layer was evaporated under reduced pressure and the crude product thus obtained was purified by column chromatography using mixture of Pet. ether /ethyl acetate as an eluent to afford 5-(4-methoxyphenyl)-2-methyl-4-(phenylsulfonyl) oxazole **7** as a white solid (0.051 g, 78% yield).

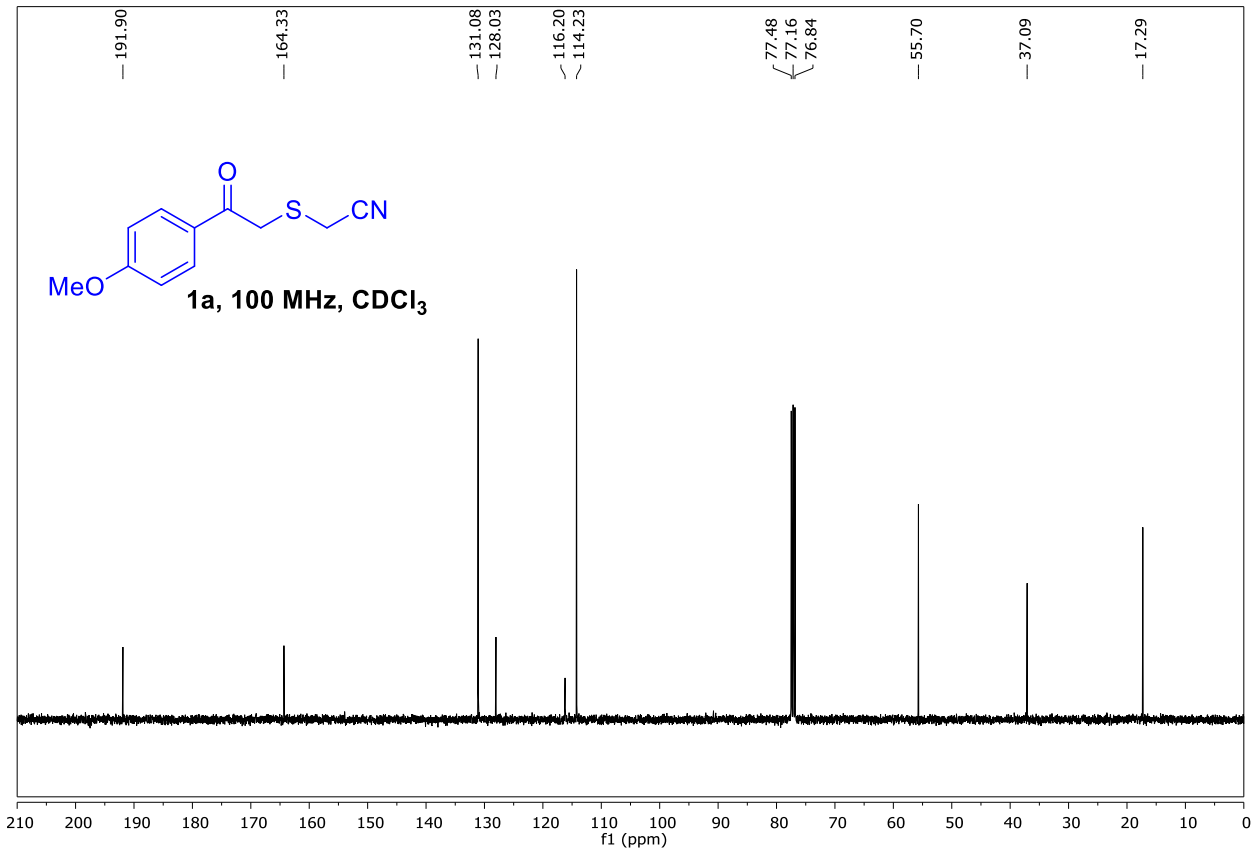
***R*f** (Pet. ether /EtOAc = 90/10): 0.28; Melting point: 131-133 °C. **^{1}H NMR (400 MHz, $CDCl_3$)** δ 7.98 (d, *J* = 7.6 Hz, 2H), 7.90 (d, *J* = 8.7 Hz, 2H), 7.60-7.48 (m, 3H), 6.99 (d, *J* = 8.6 Hz, 2H), 3.87 (s, 3H), 2.46 (s, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 161.5, 159.9, 153.2, 140.9, 133.9, 133.6, 130.7, 129.2, 128.0, 118.4, 114.1, 55.5, 14.0. **HRMS (ESI)** m/z: $[M+Na]^+$ Calcd for $C_{17}H_{16}NO_4S$ 330.0795; Found 330.0800. **FTIR (cm^{-1})** 2364, 1604, 1589, 1500, 1445, 1330, 1255, 1151.

[10] Reddy, A. C. S.; Anbarasan, P. *Org. Lett.* **2019**, *21*, 9965.

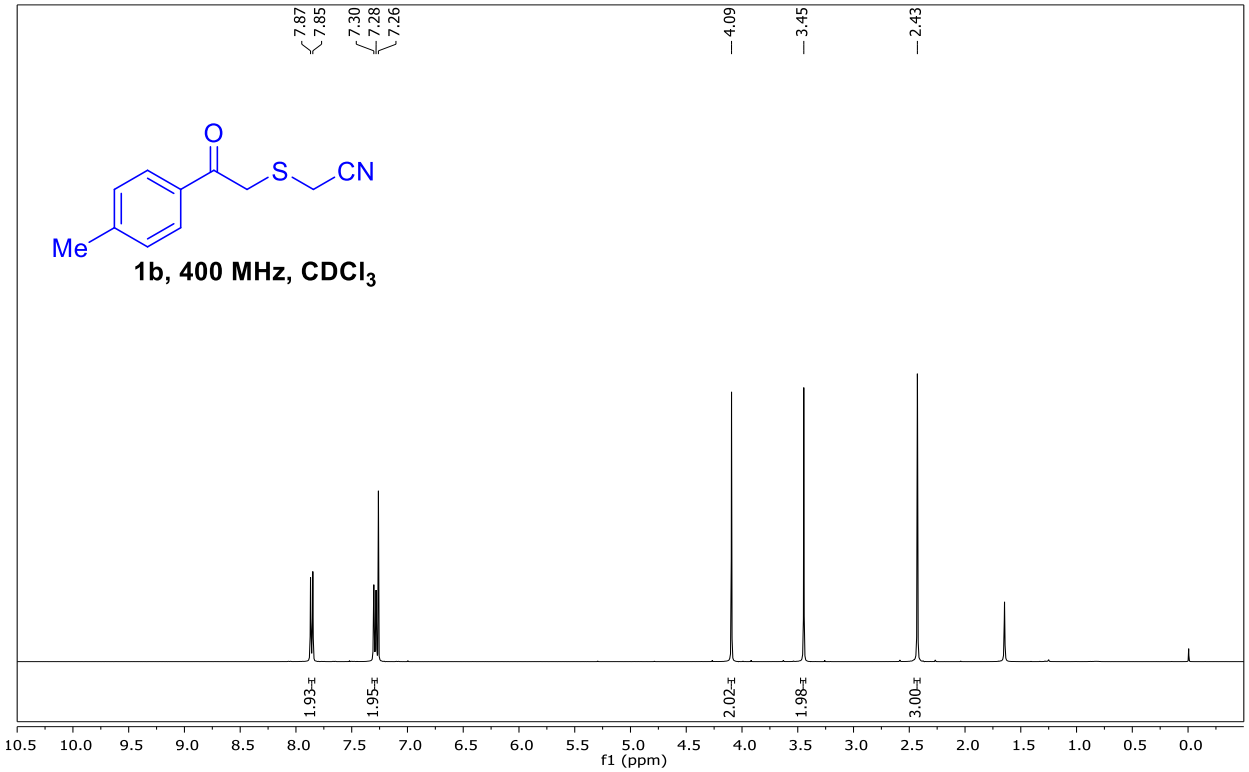
13. ^{1}H and ^{13}C NMR Spectra of 2-Substituted Thio-acetonitriles and β-Keto Amines

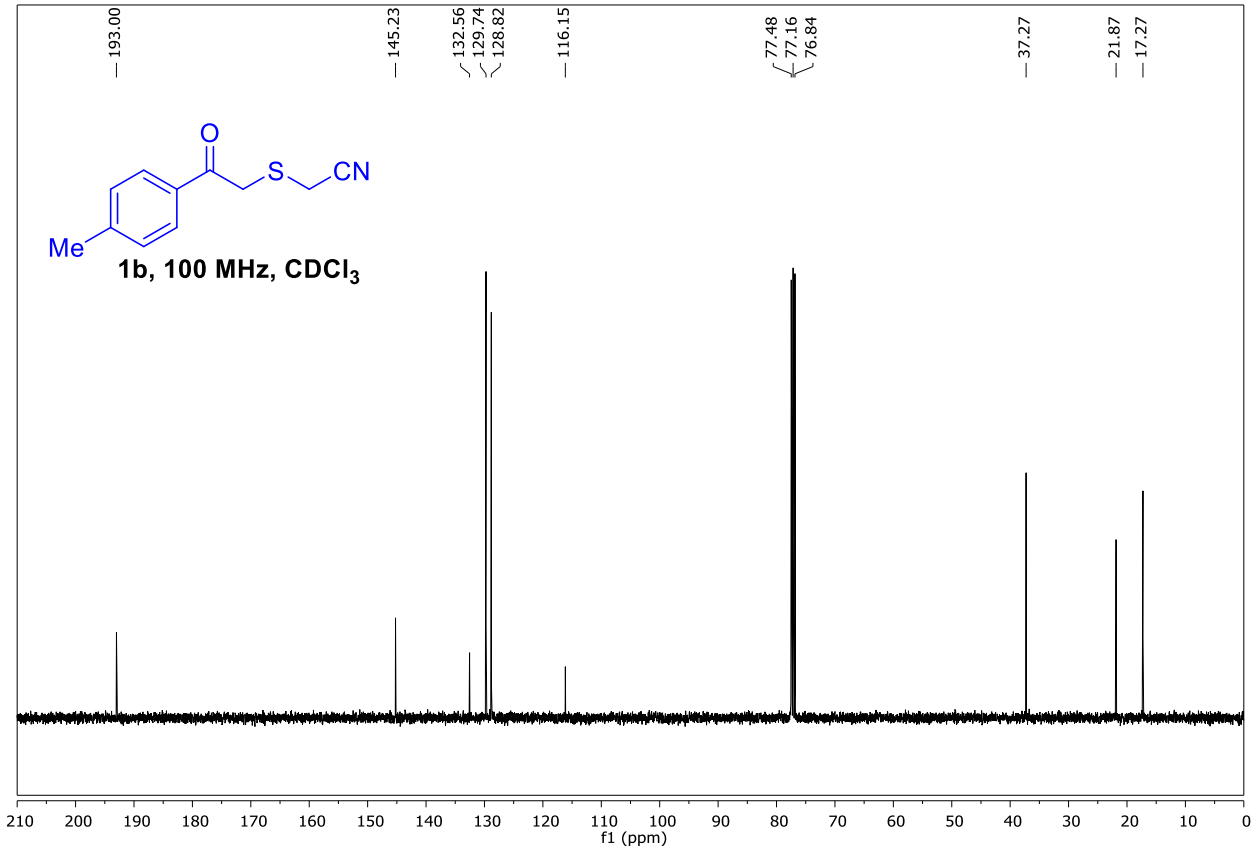
2-((2-(4-Methoxyphenyl)-2-oxoethyl)thio)acetonitrile (1a)



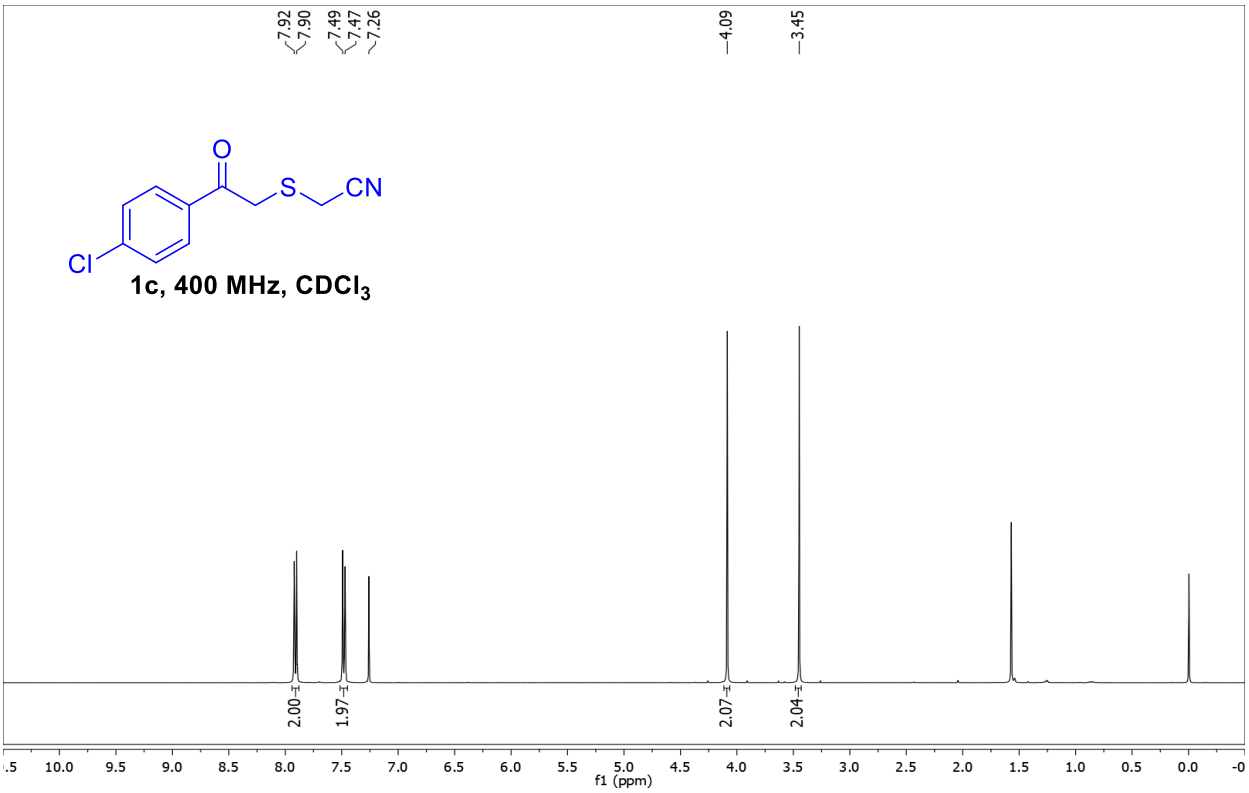


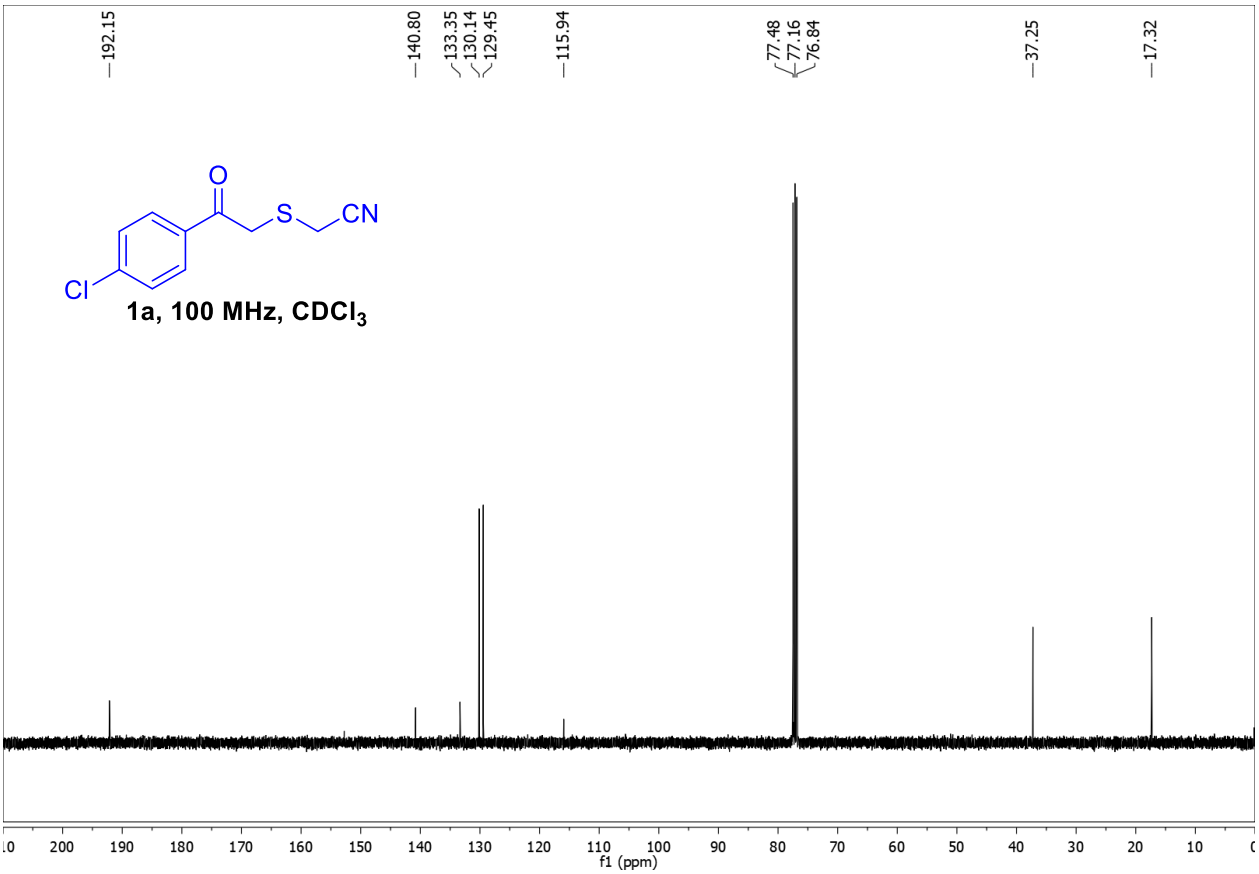
2-((2-Oxo-2-(*p*-tolyl)ethyl)thio)acetonitrile (1b)



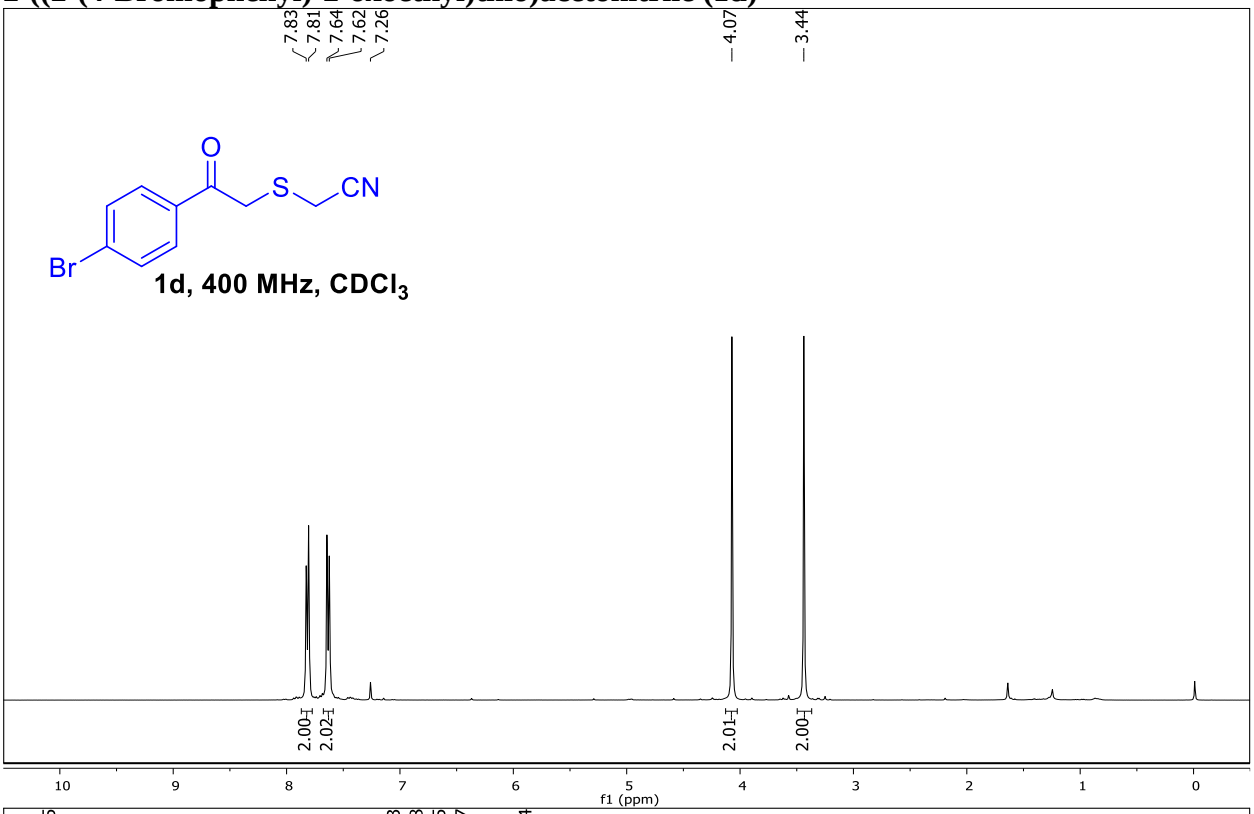


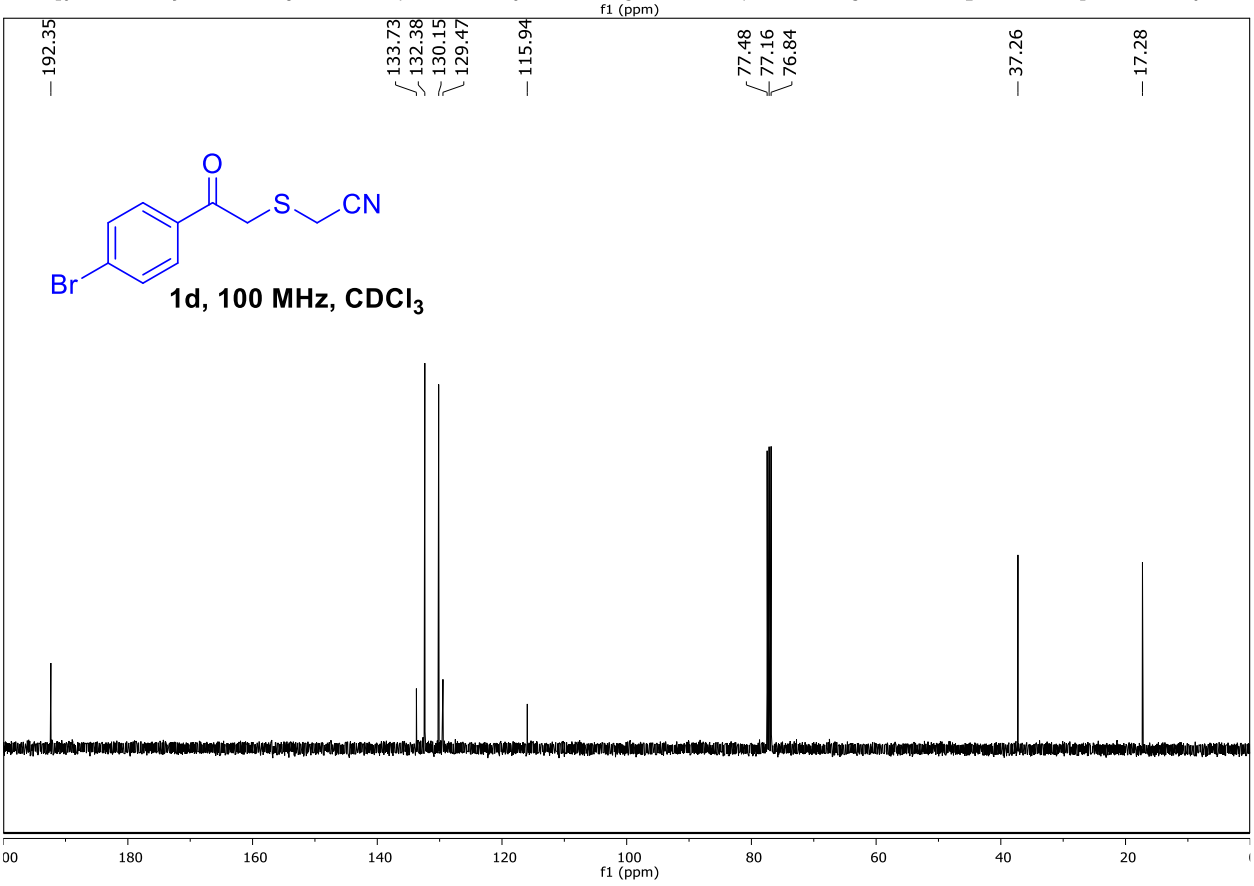
2-((2-(4-Chlorophenyl)-2-oxoethyl)thio)acetonitrile (1c)



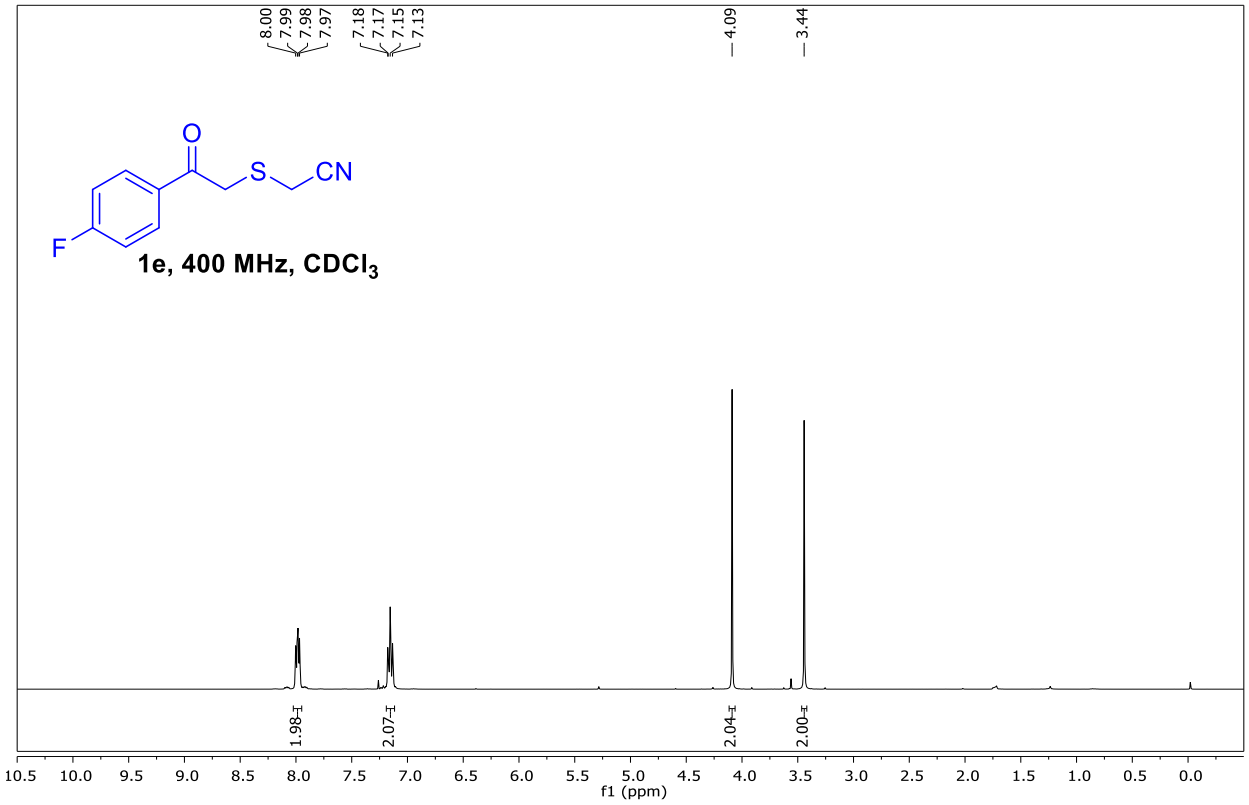


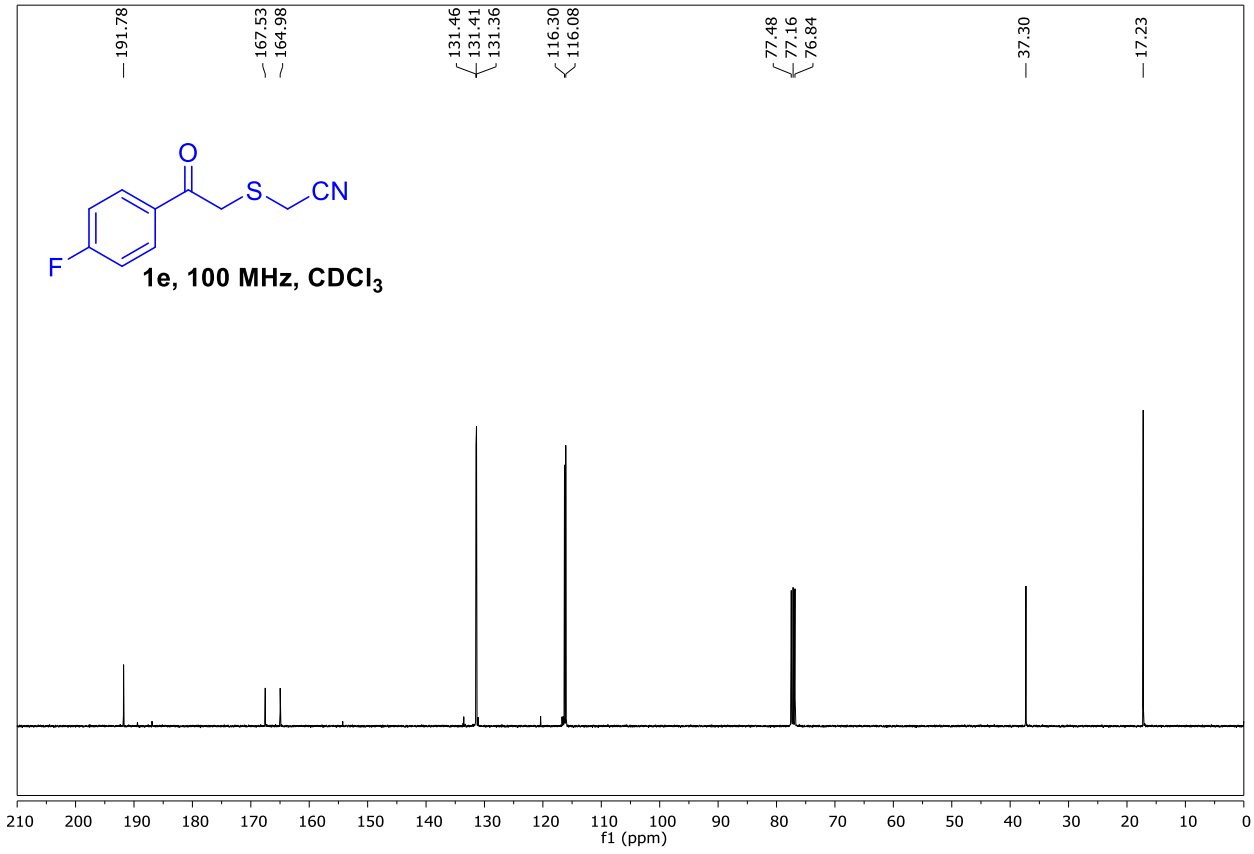
2-((2-(4-Bromophenyl)-2-oxoethyl)thio)acetonitrile (1d)



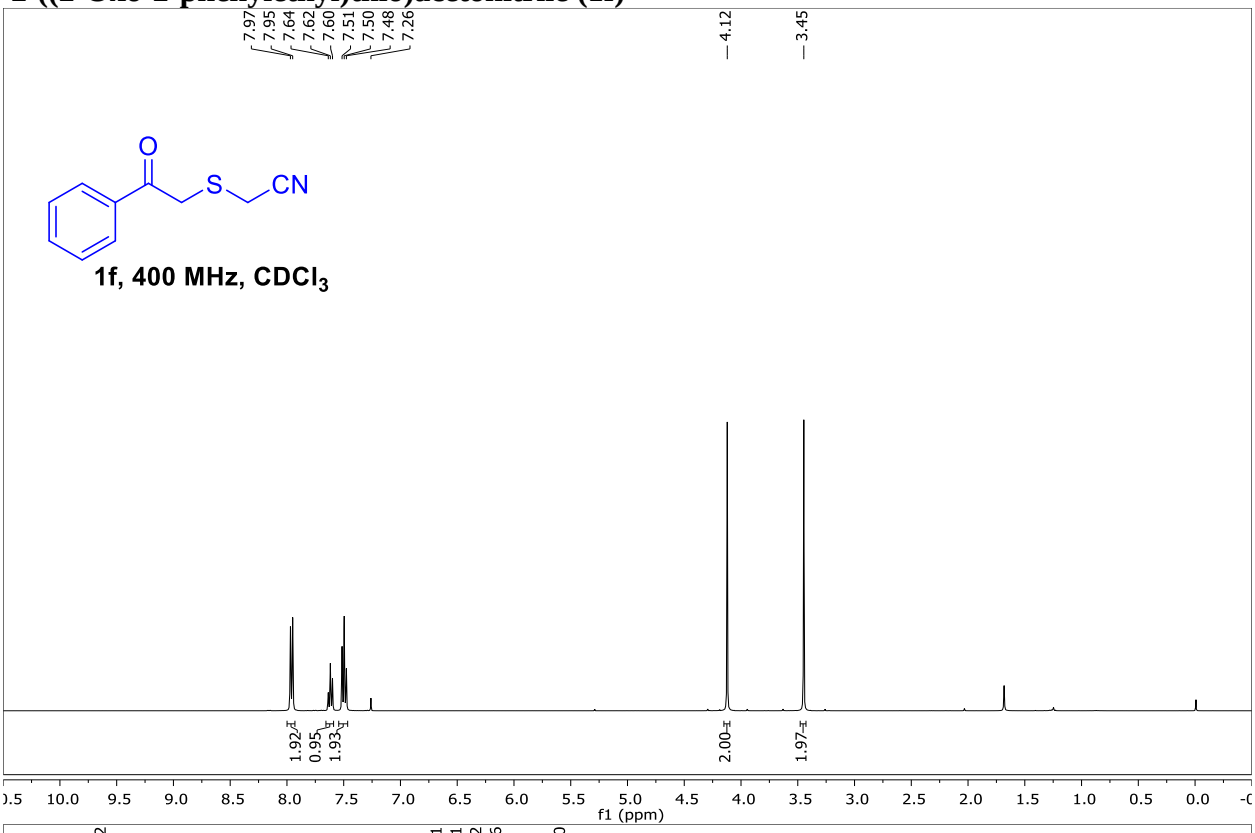


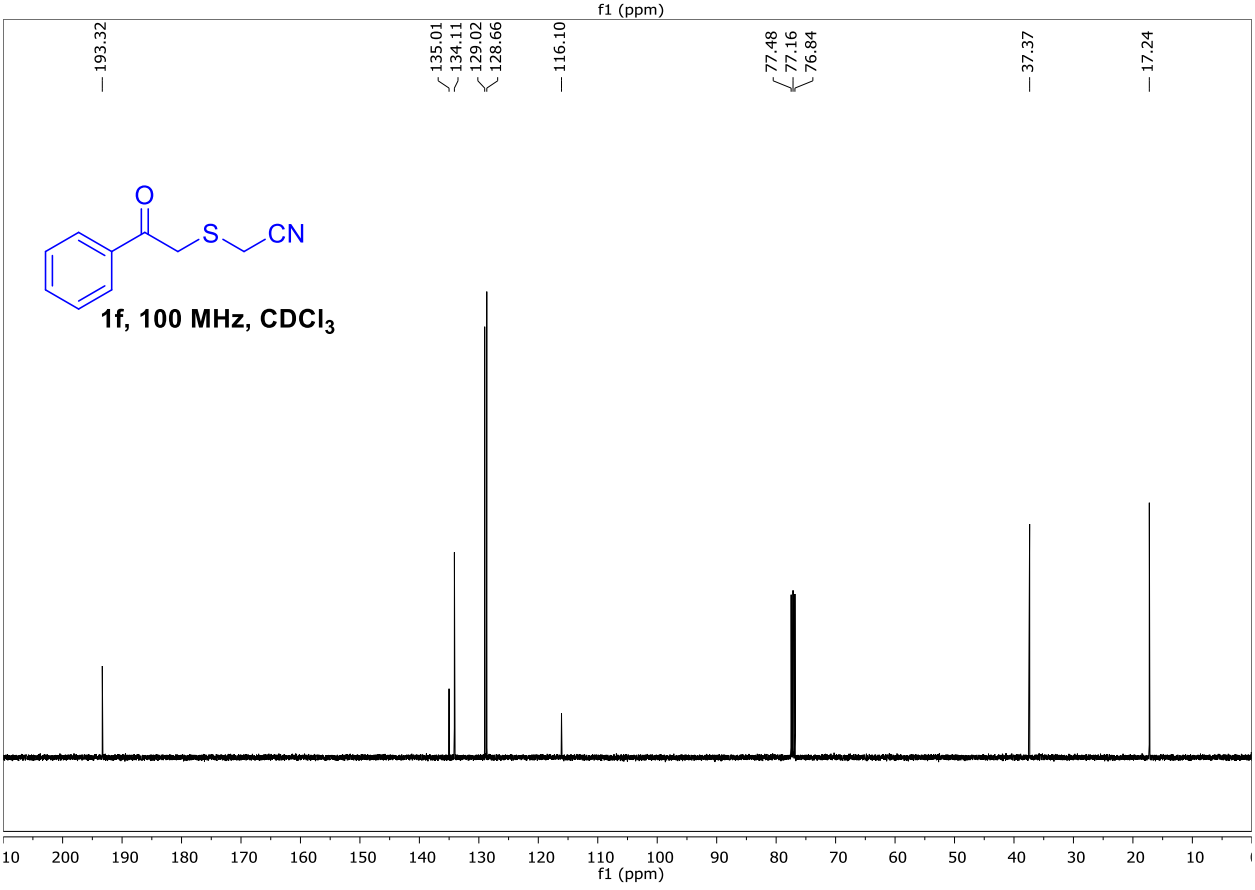
2-((2-(4-Fluorophenyl)-2-oxoethyl)thio)acetonitrile (1e)



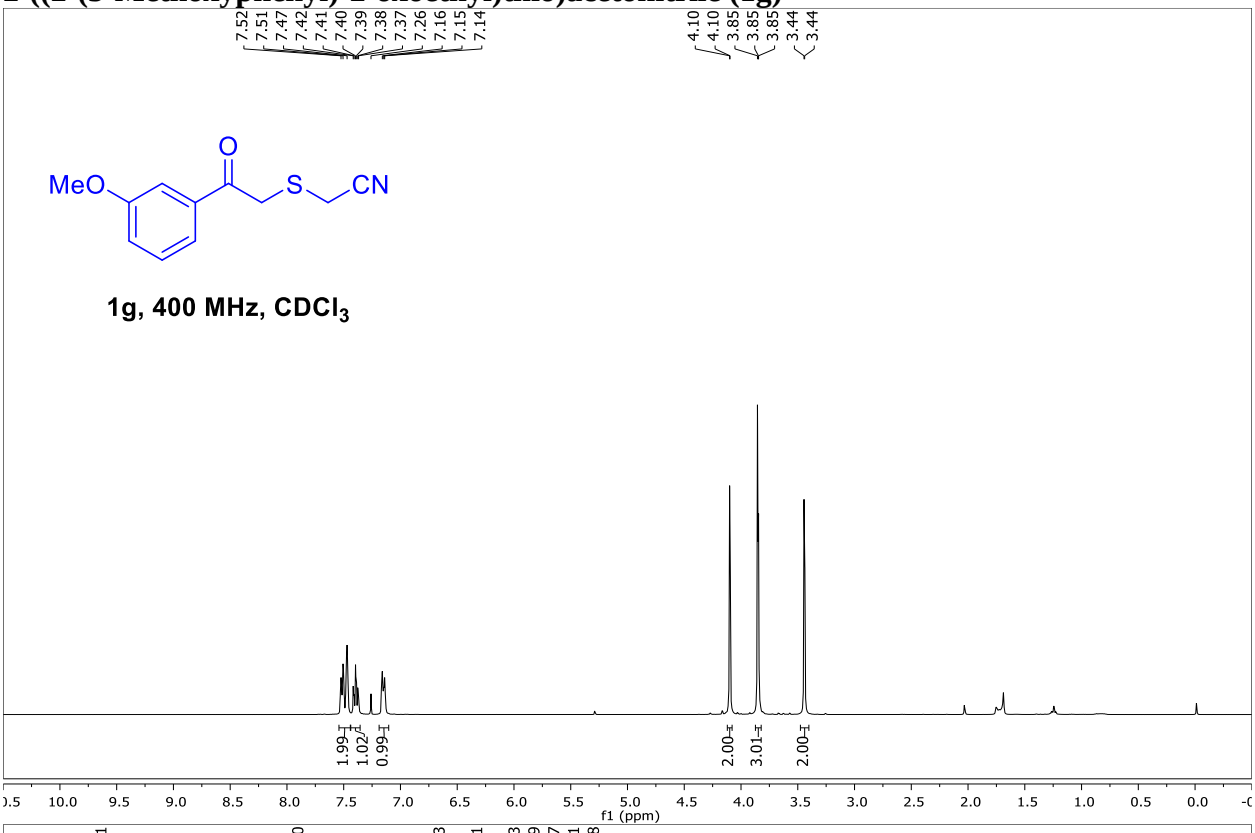


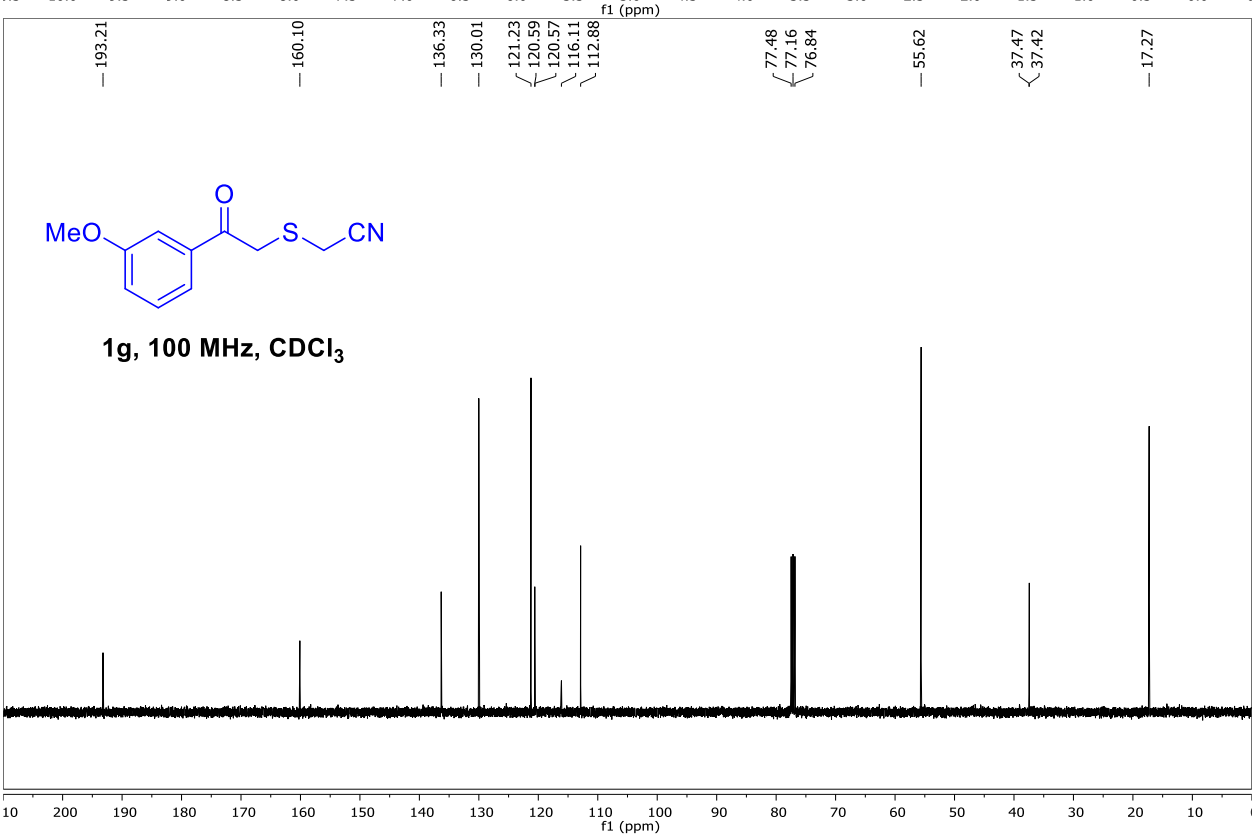
2-((2-Oxo-2-phenylethyl)thio)acetonitrile (1f)



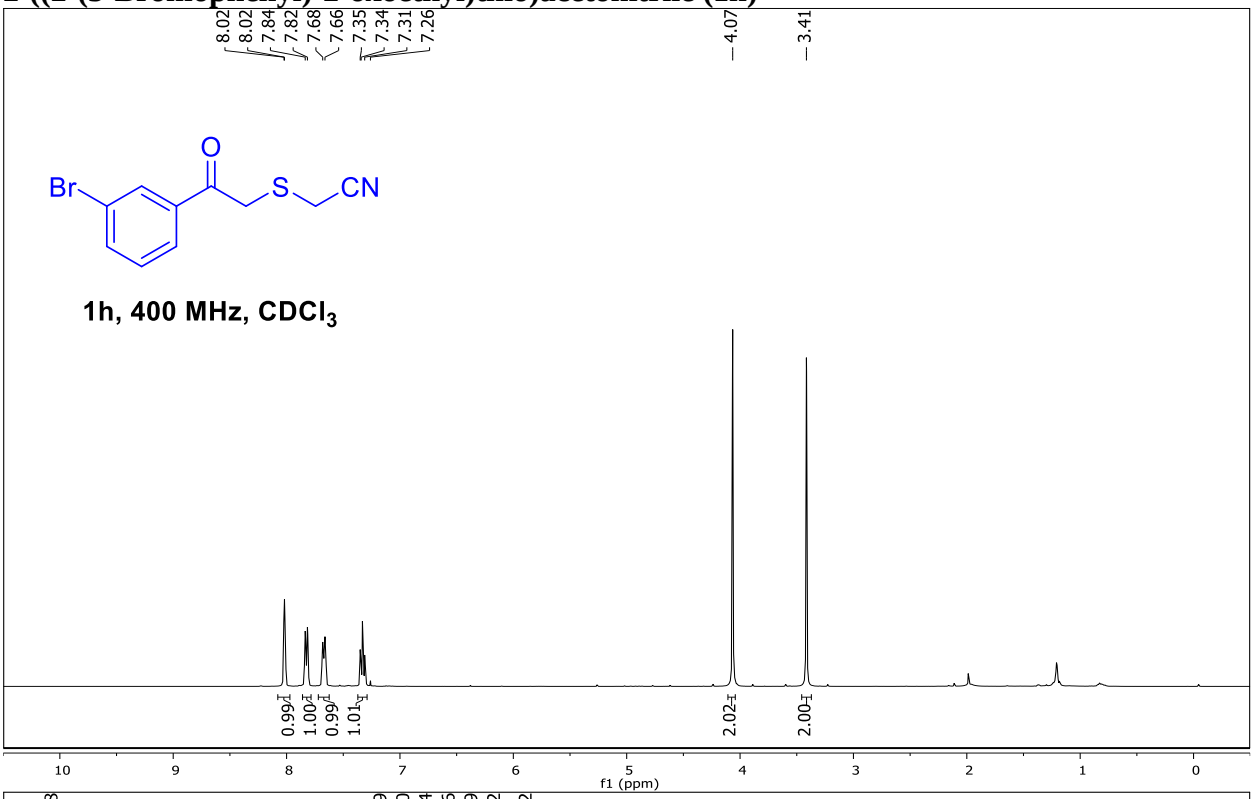


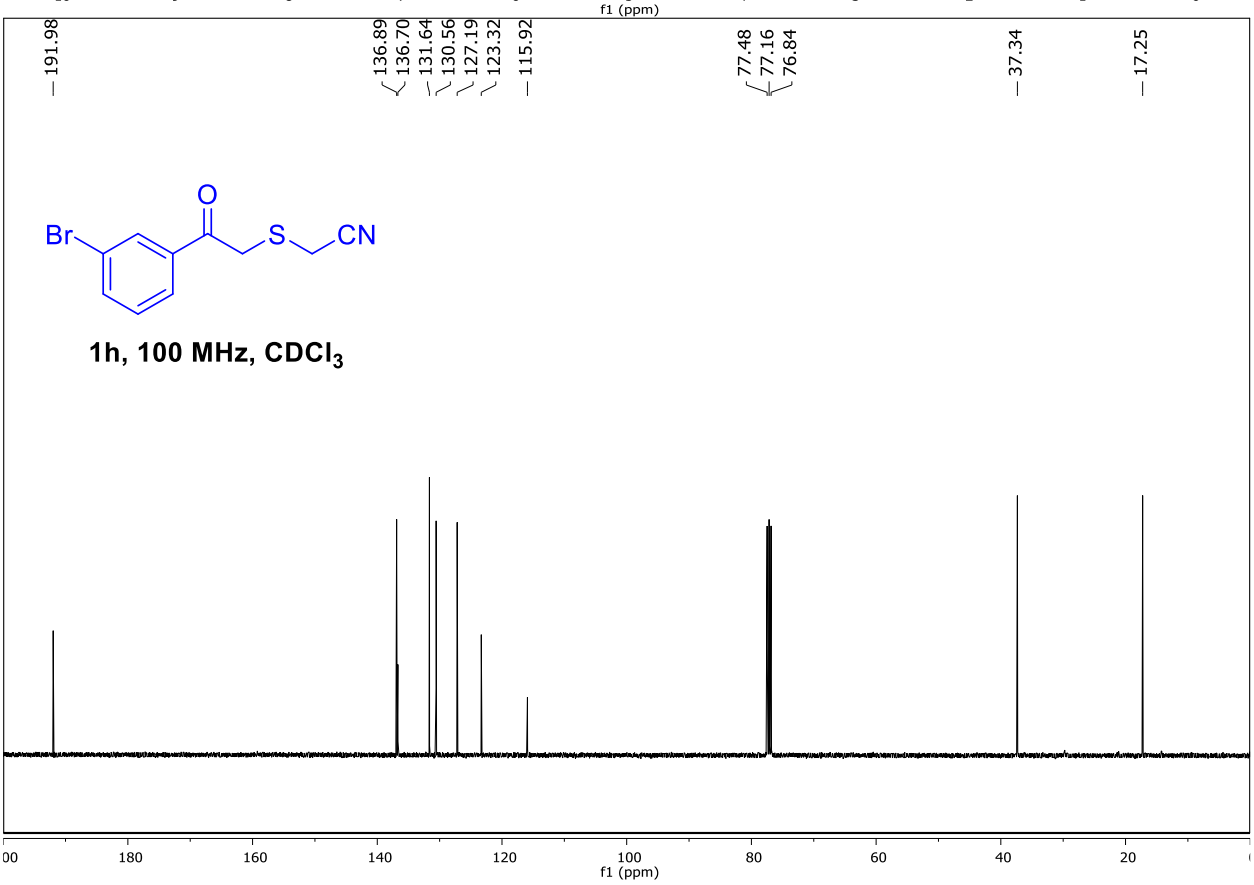
2-((2-(3-Methoxyphenyl)-2-oxoethyl)thio)acetonitrile (1g)



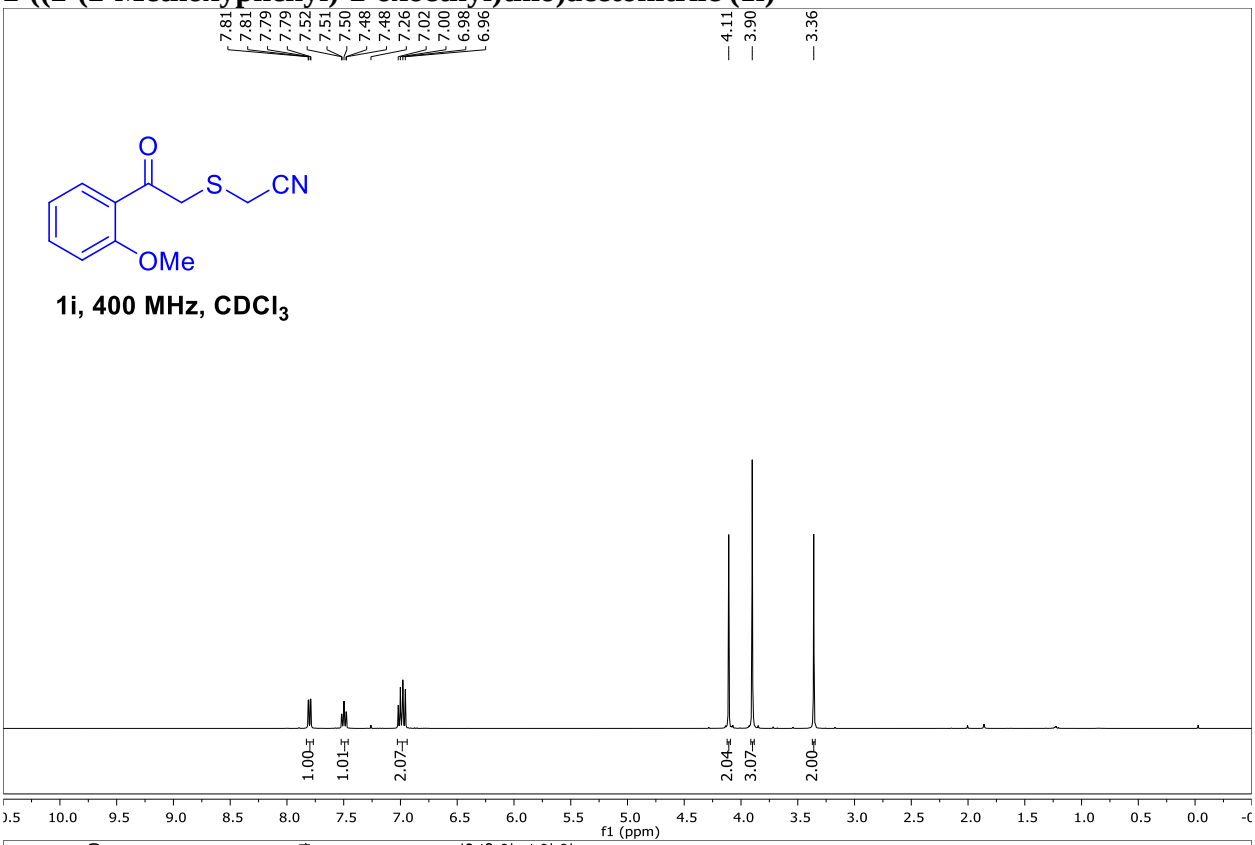


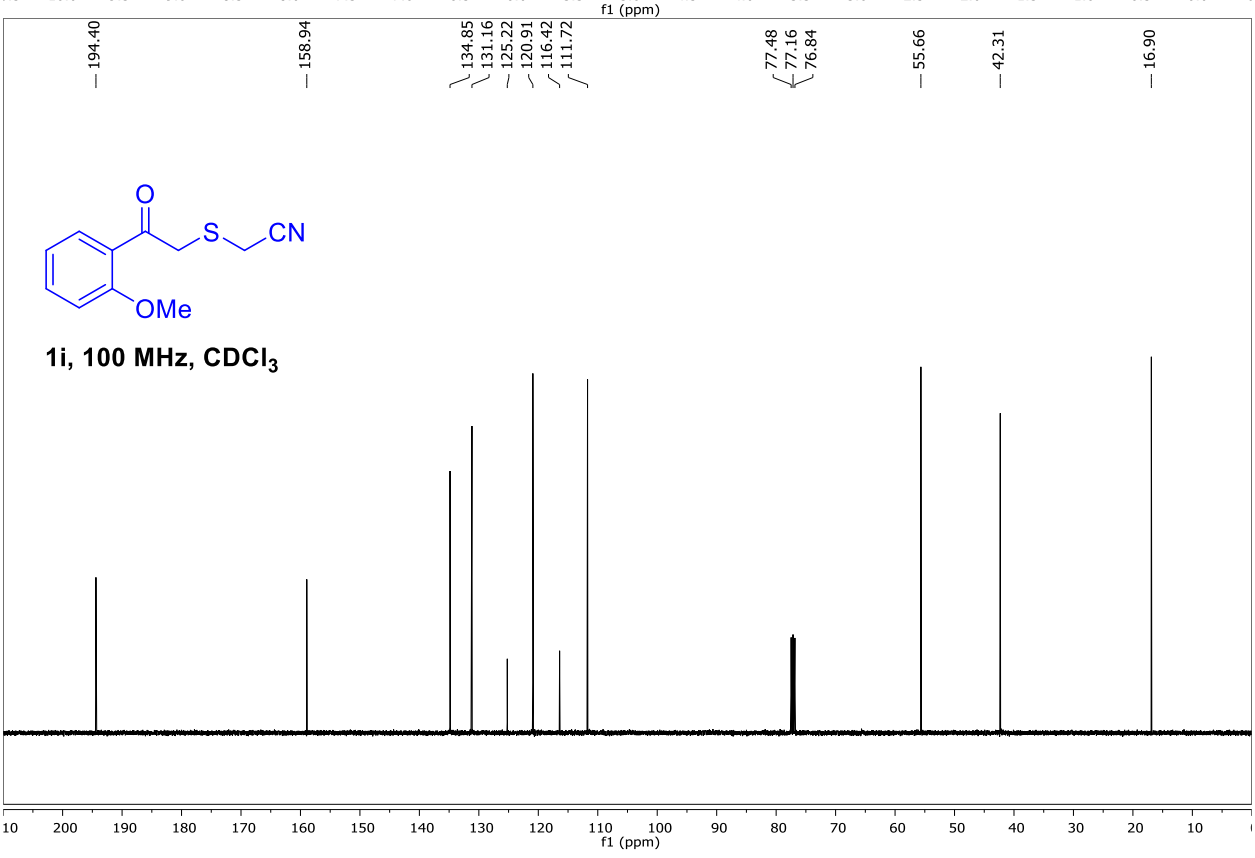
2-((2-(3-Bromophenyl)-2-oxoethyl)thio)acetonitrile (1h)



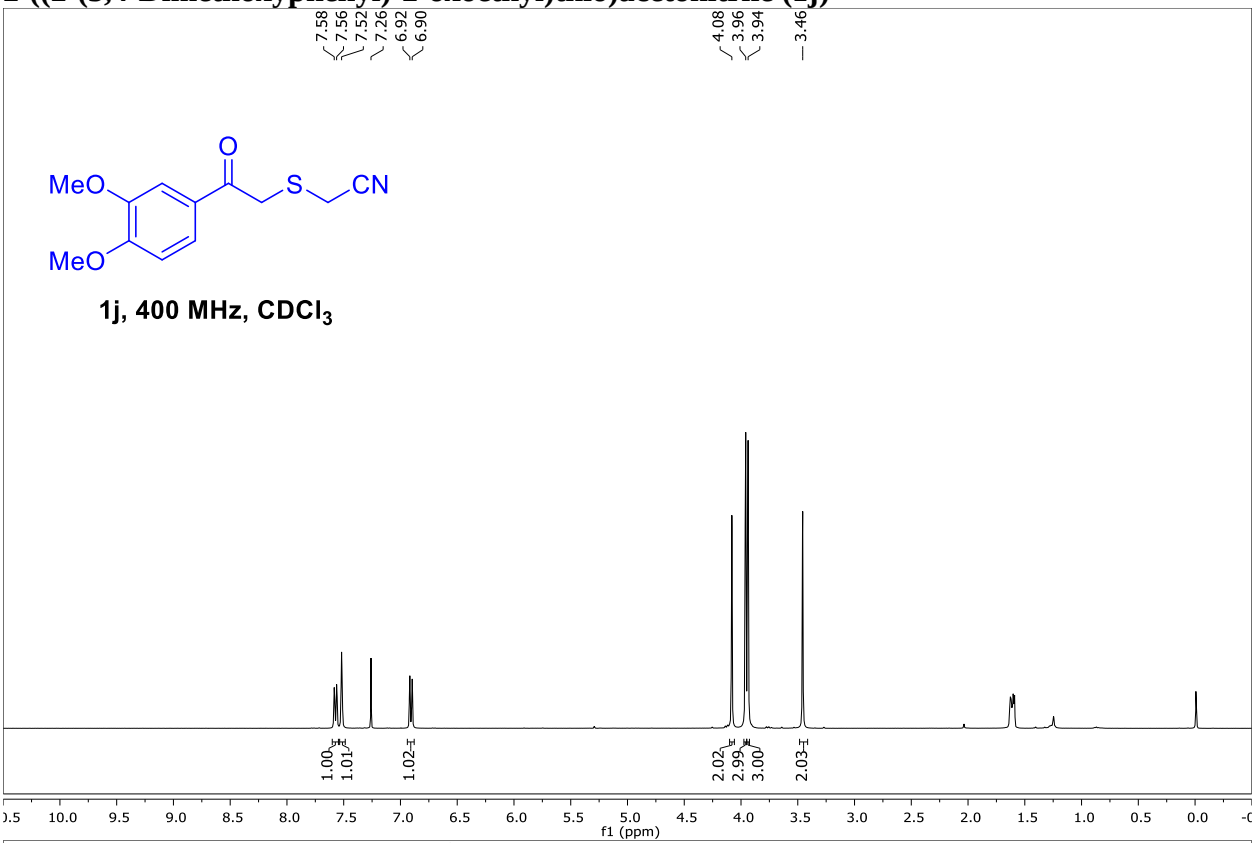


2-((2-(2-Methoxyphenyl)-2-oxoethyl)thio)acetonitrile (1i)

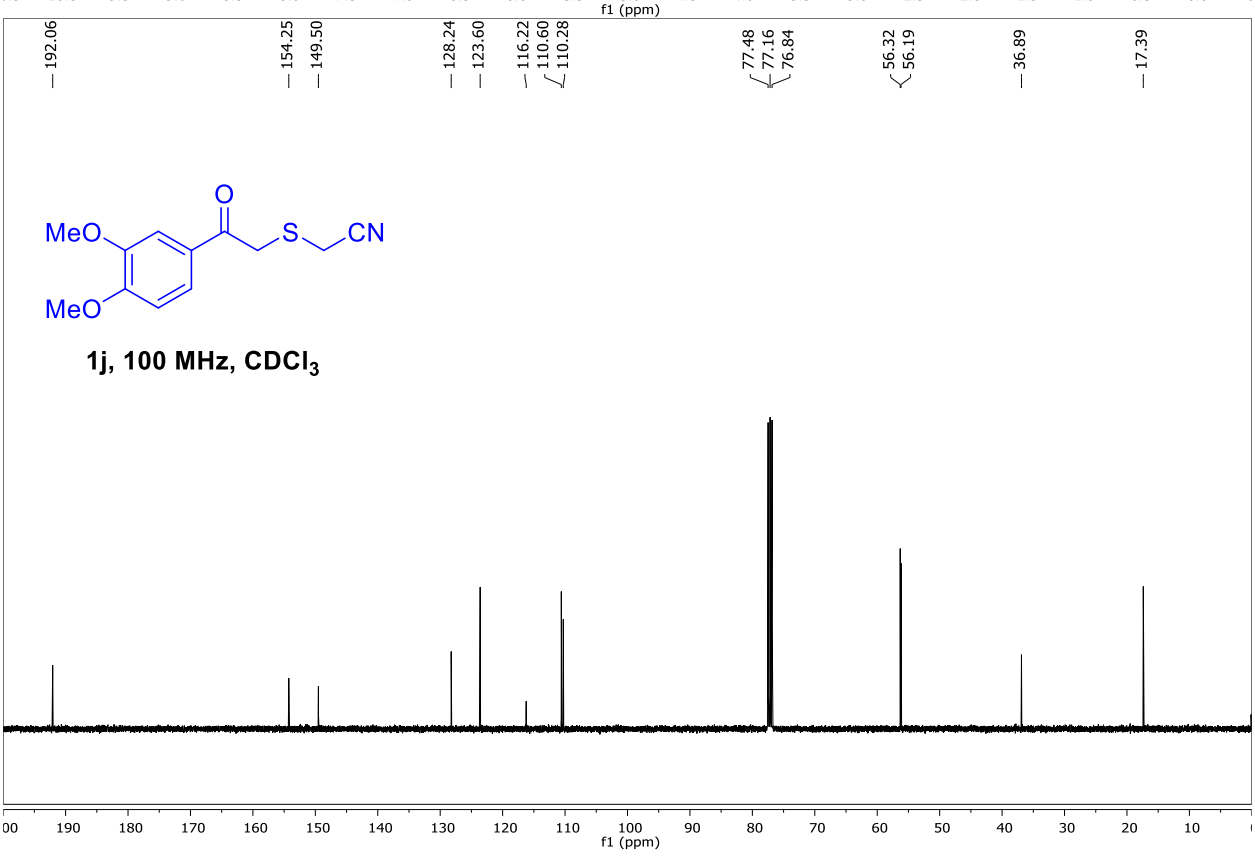




2-((2-(3,4-Dimethoxyphenyl)-2-oxoethyl)thio)acetonitrile (1j)

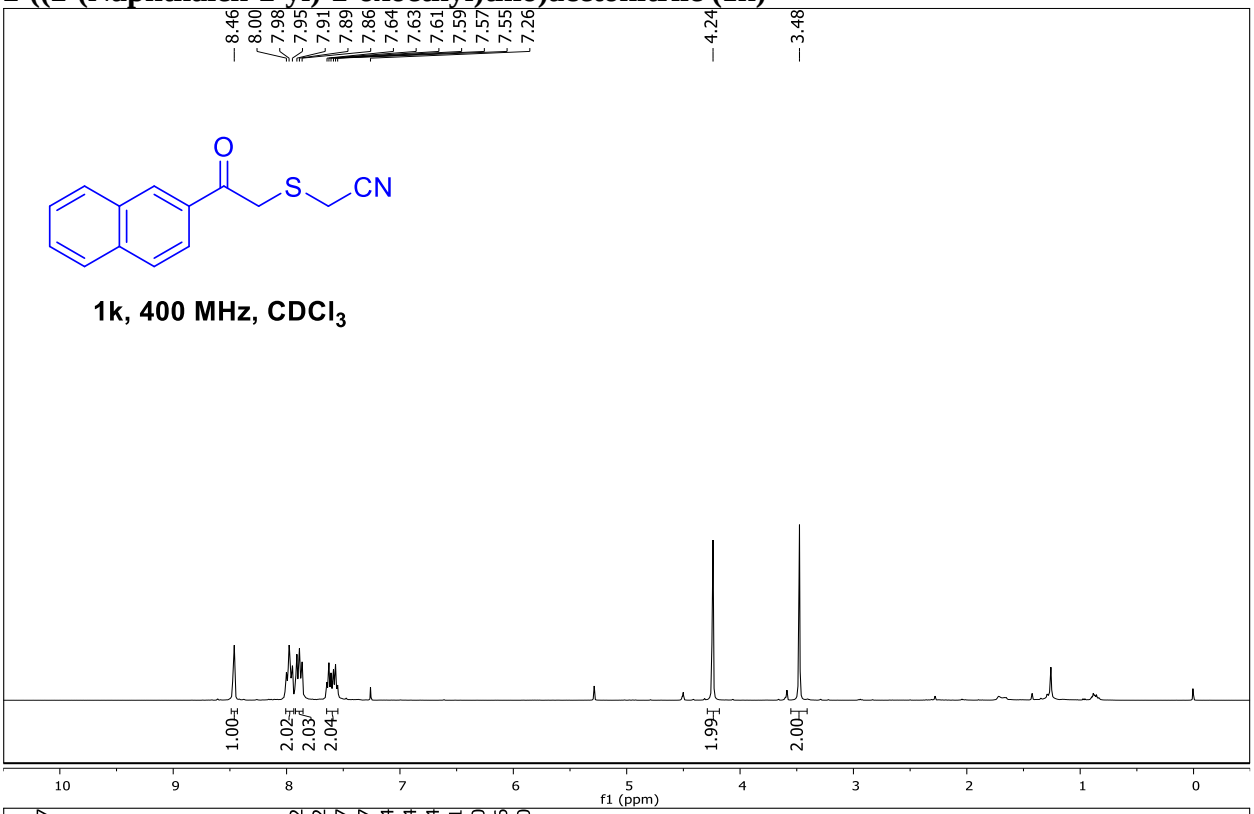


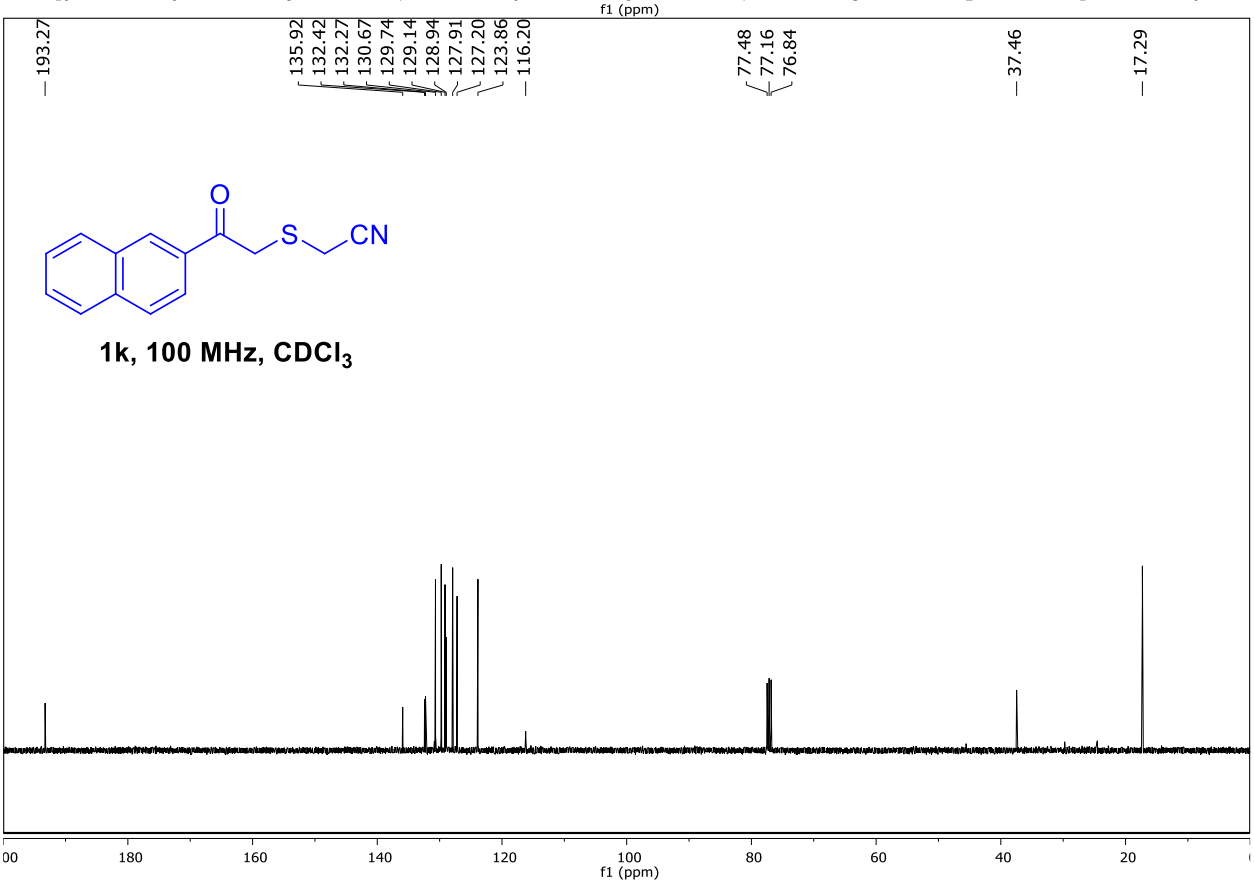
1j, 400 MHz, $CDCl_3$



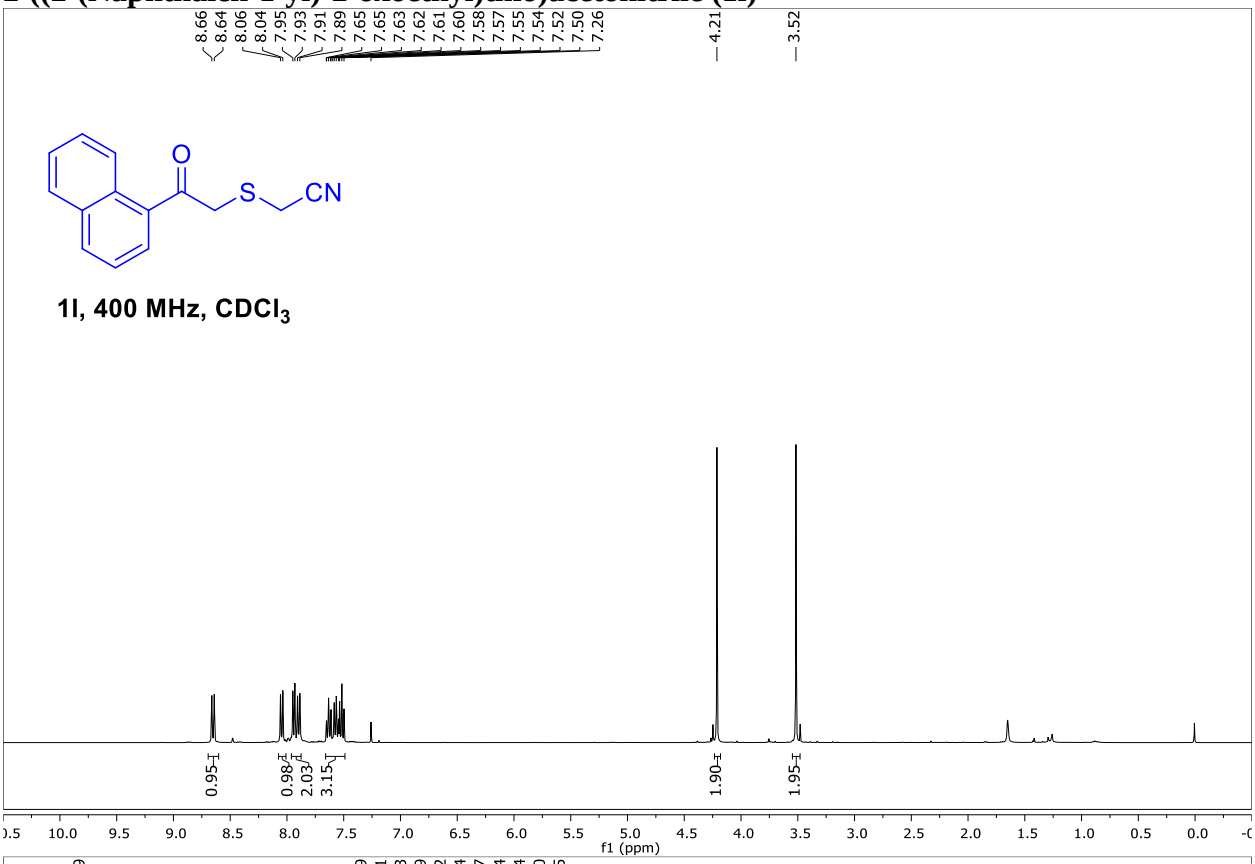
1j, 100 MHz, $CDCl_3$

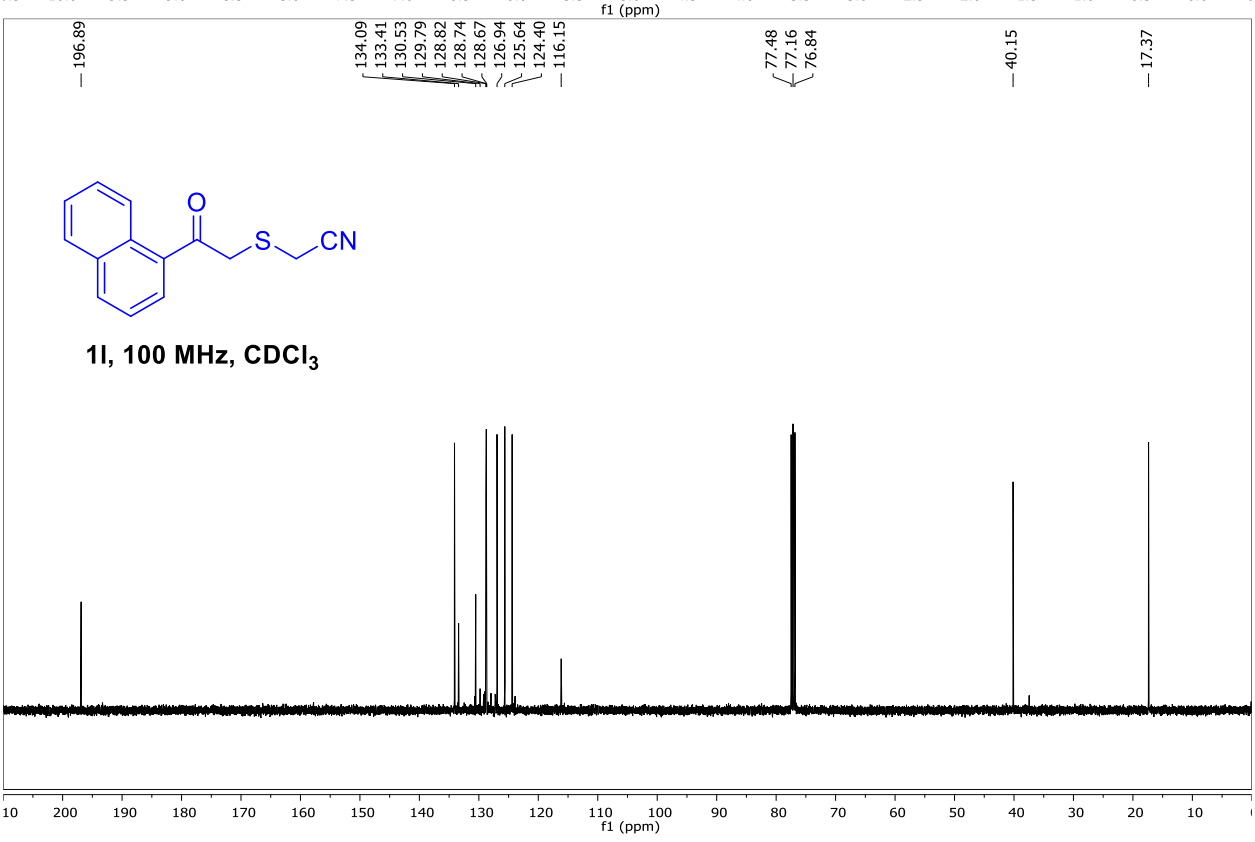
2-((2-(Naphthalen-2-yl)-2-oxoethyl)thio)acetonitrile (1k)



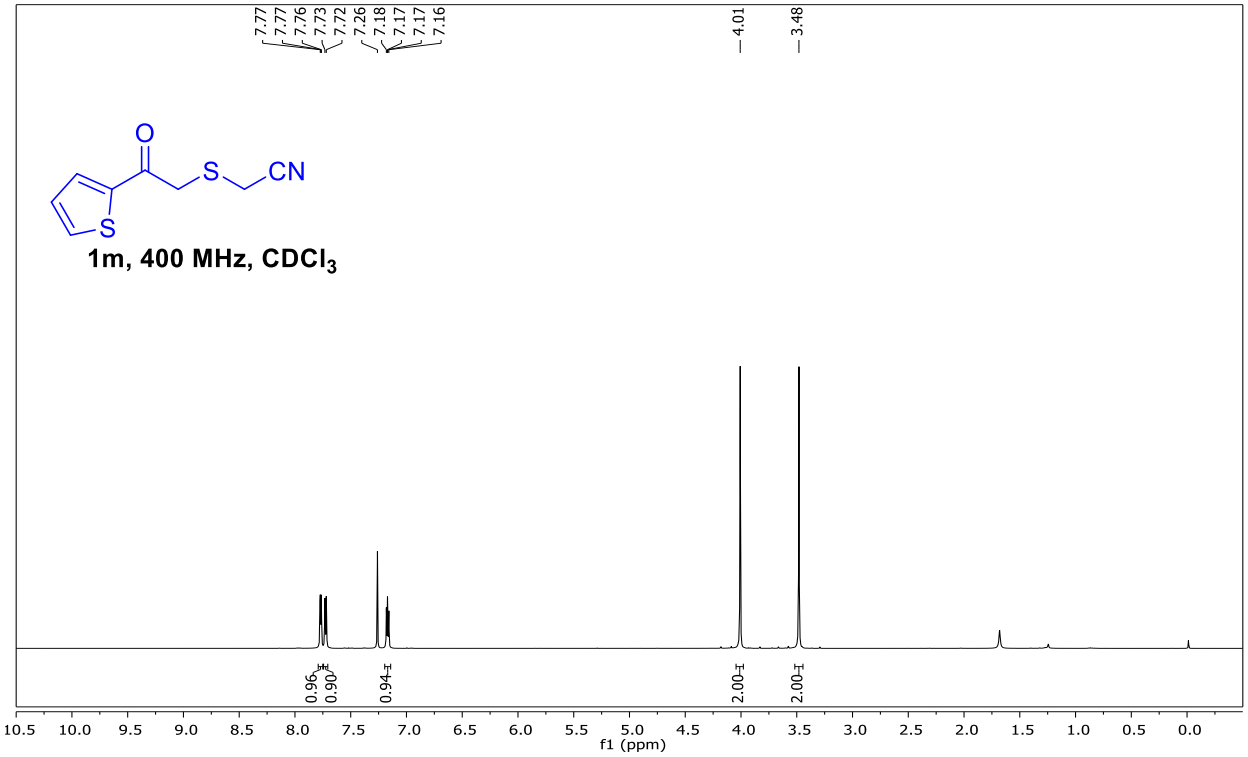


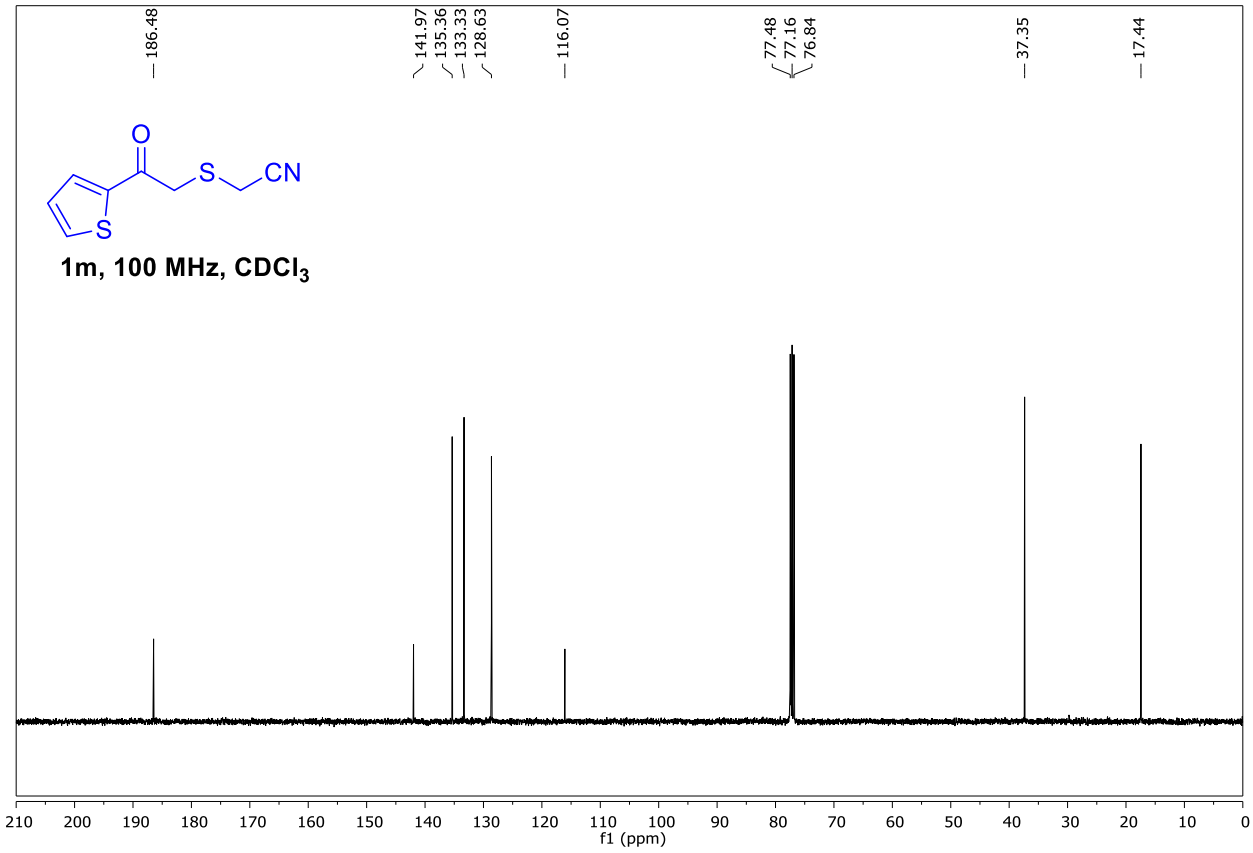
2-((2-(Naphthalen-1-yl)-2-oxoethyl)thio)acetonitrile (1l)



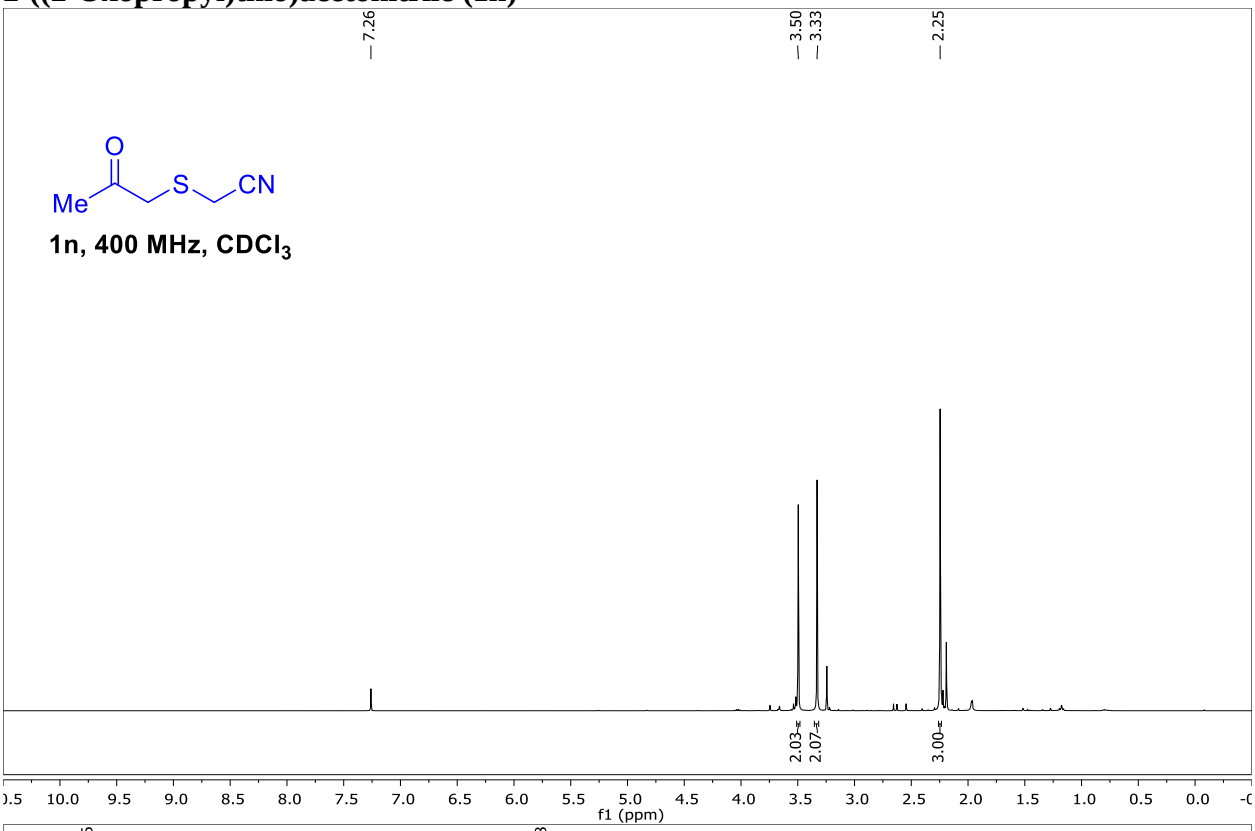


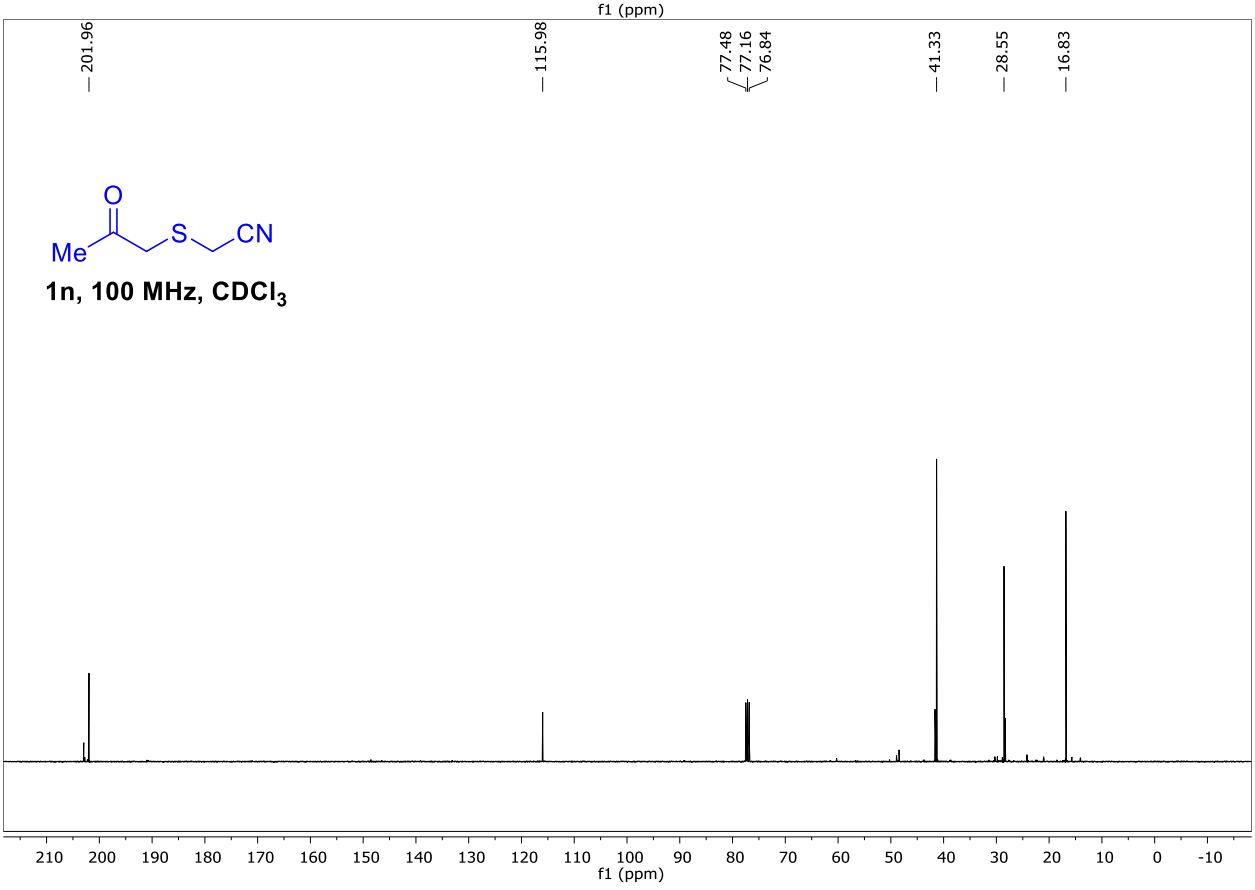
2-((2-Oxo-2-(thiophen-2-yl)ethyl)thio)acetonitrile (1m)



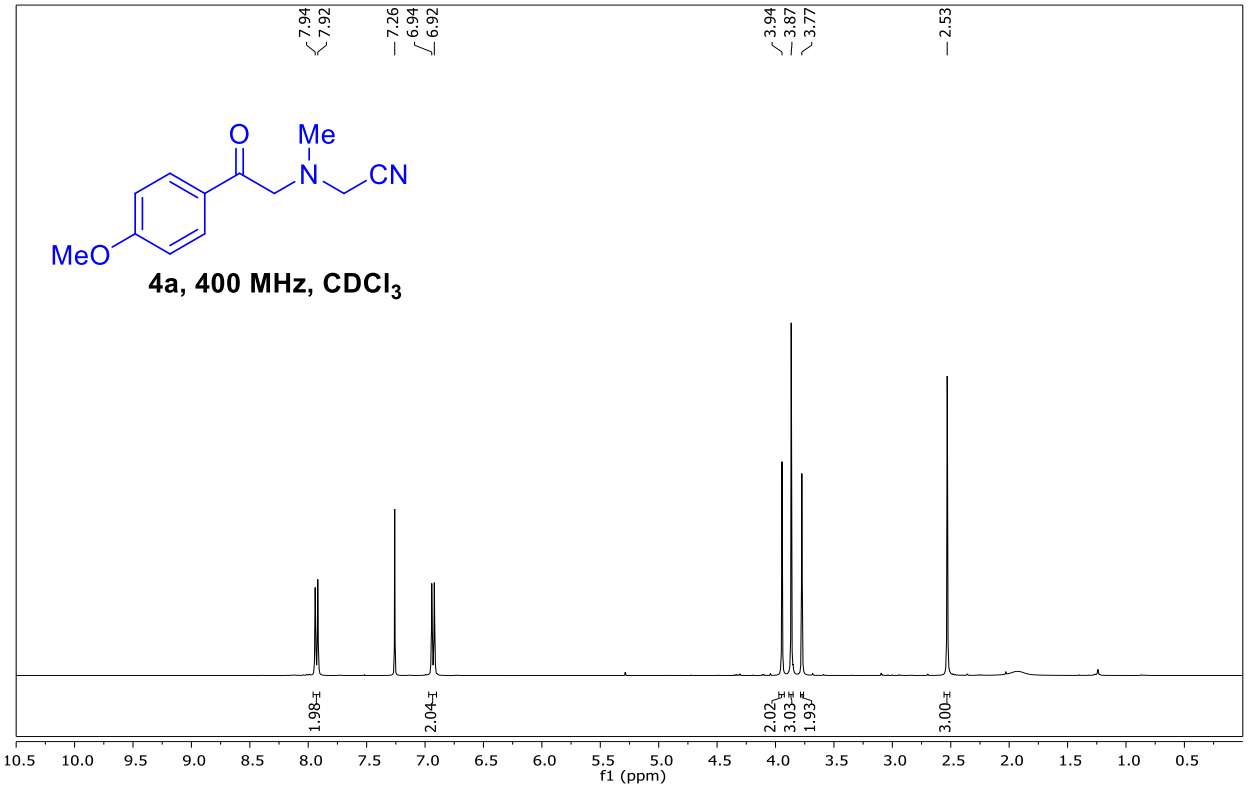


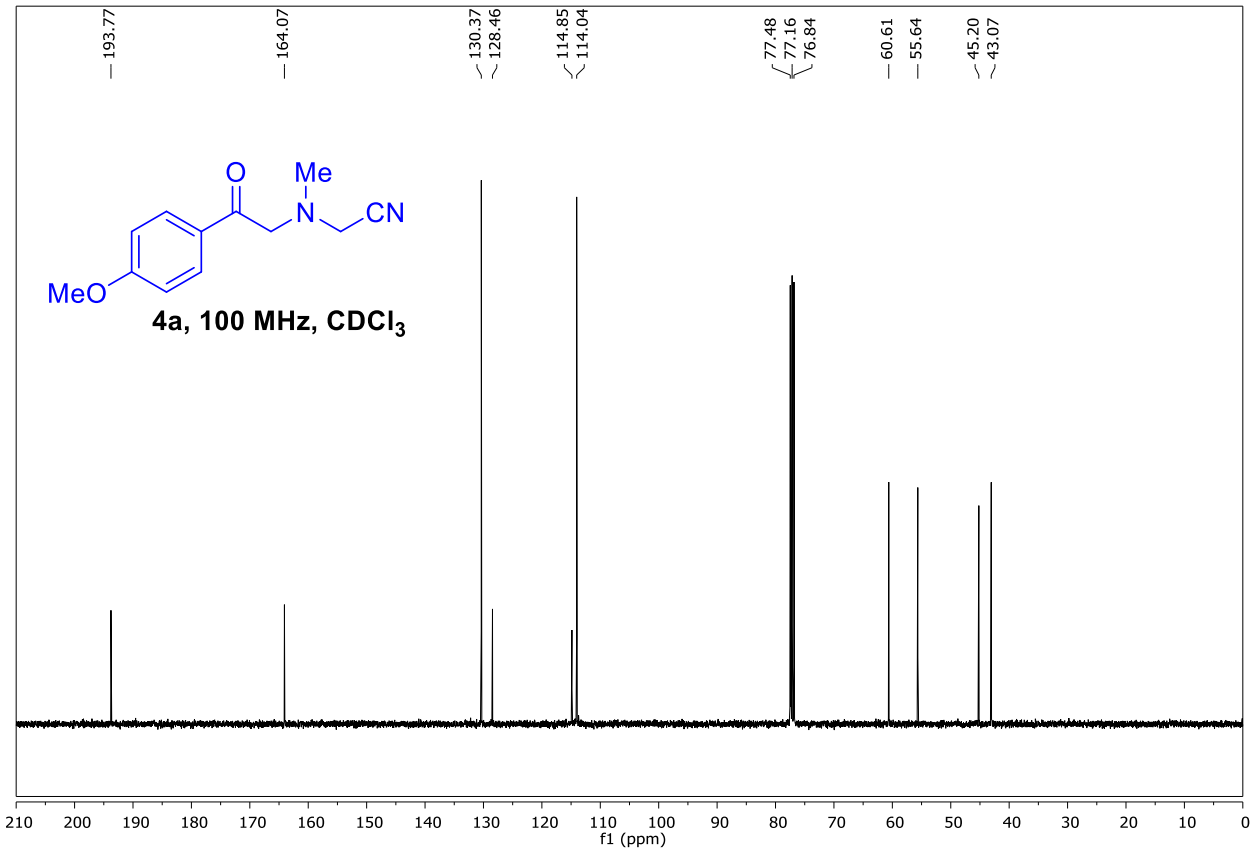
2-((2-Oxopropyl)thio)acetonitrile (1n)



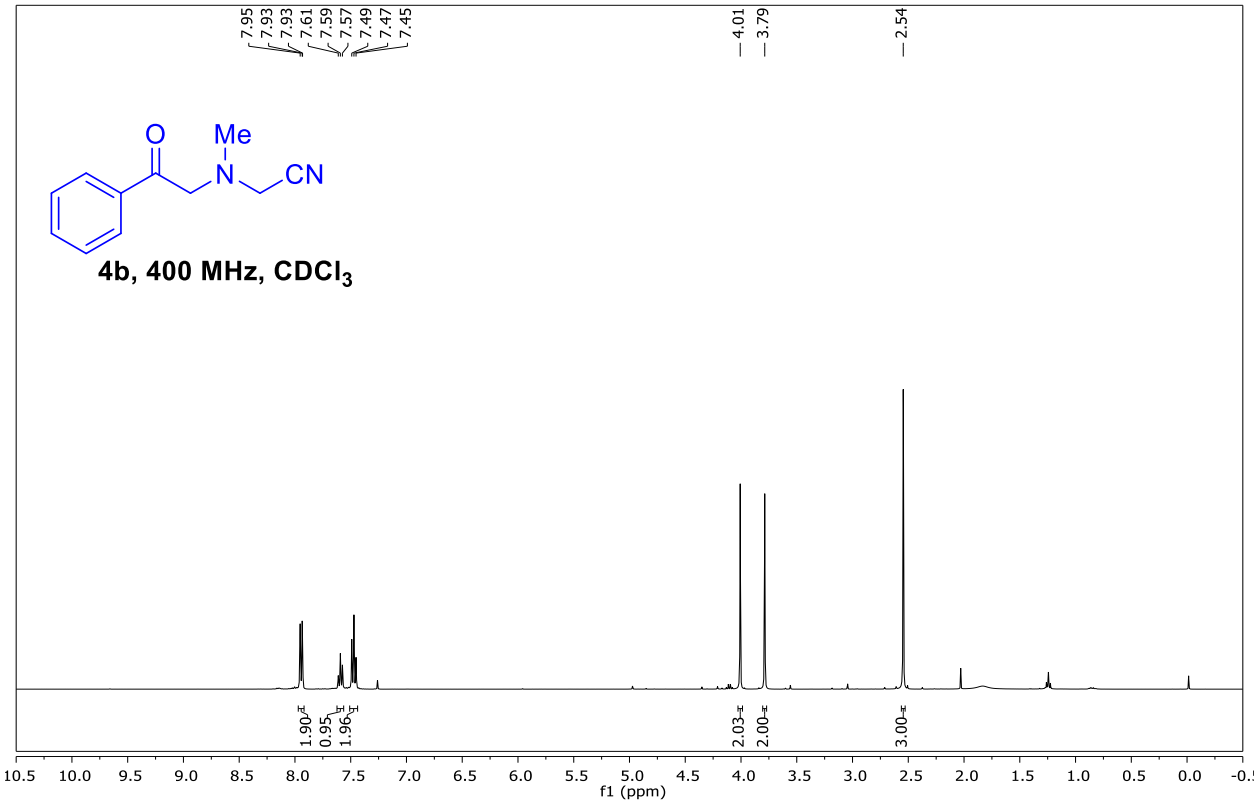


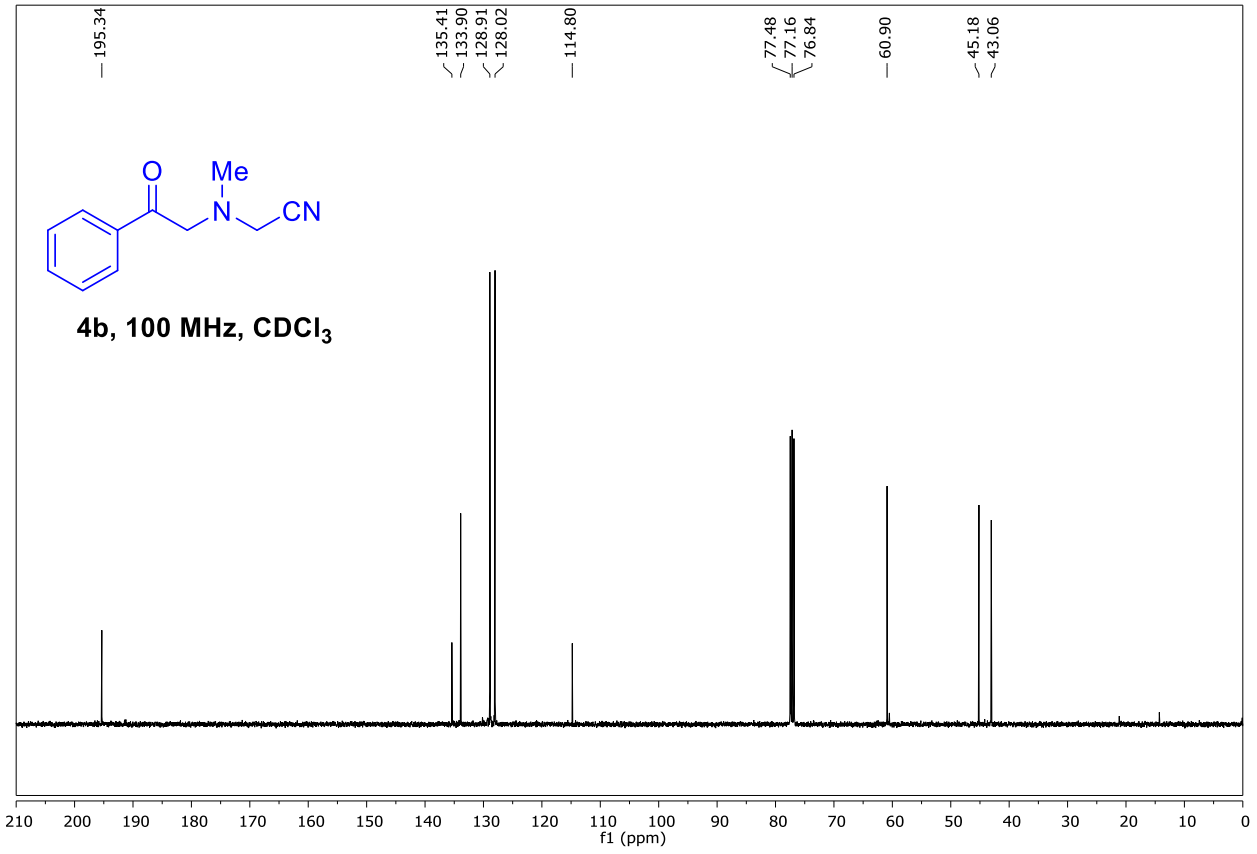
2-((2-(4-Methoxyphenyl)-2-oxoethyl)(methyl)amino)acetonitrile (4a)





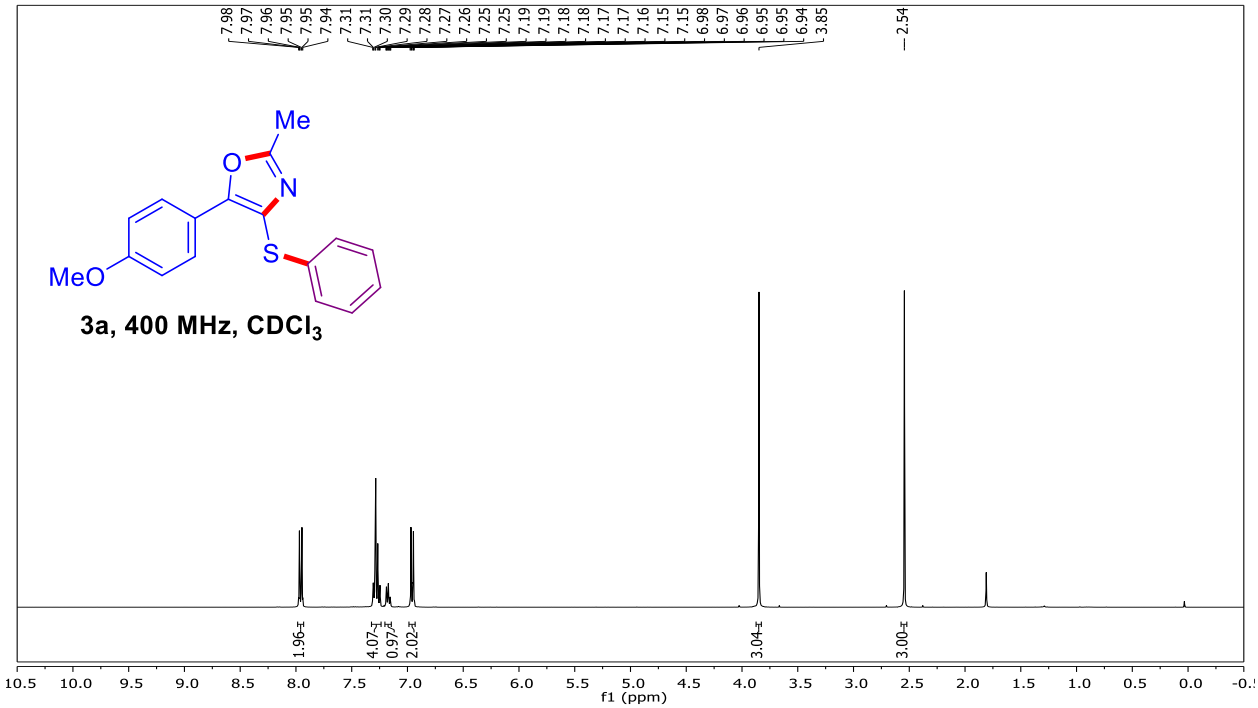
2-(Methyl(2-oxo-2-phenylethyl)amino)acetonitrile (4b)

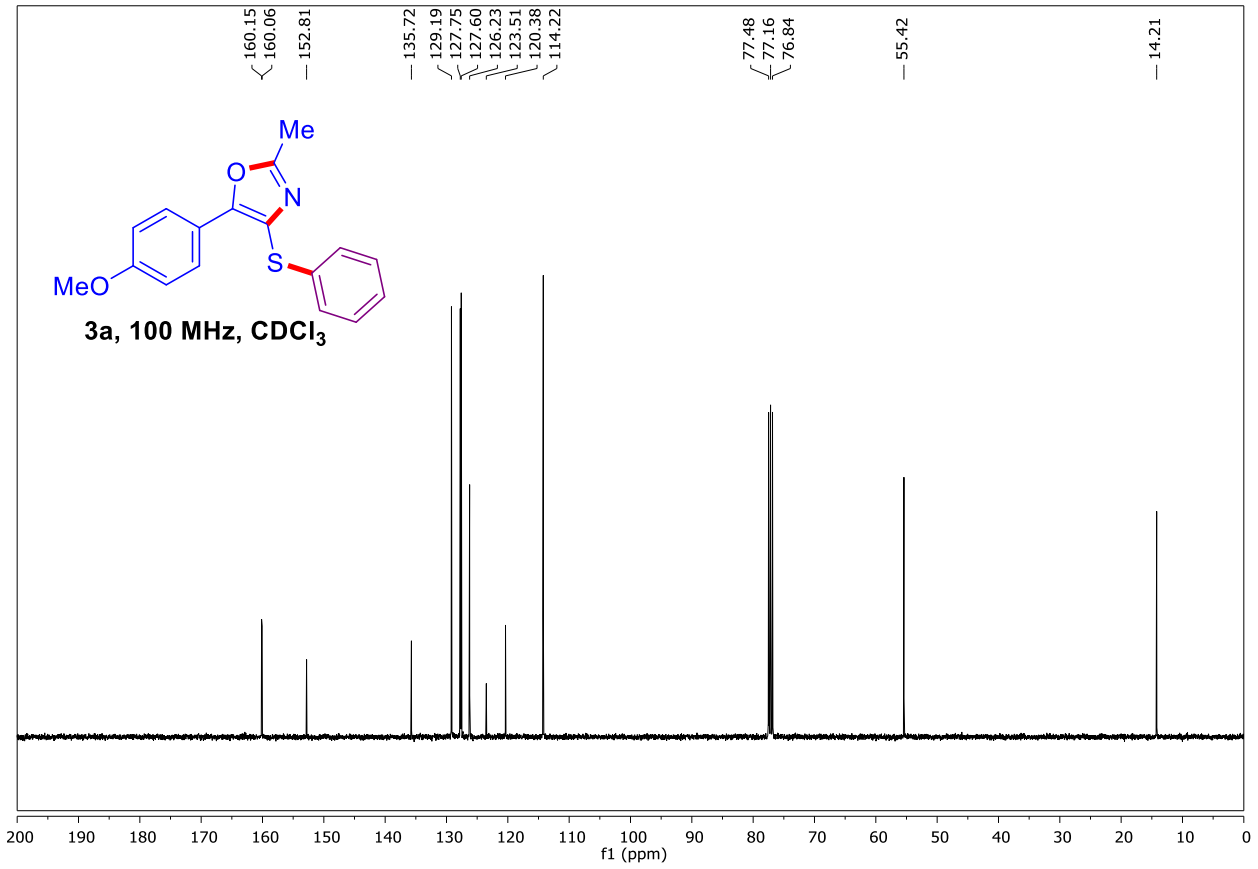




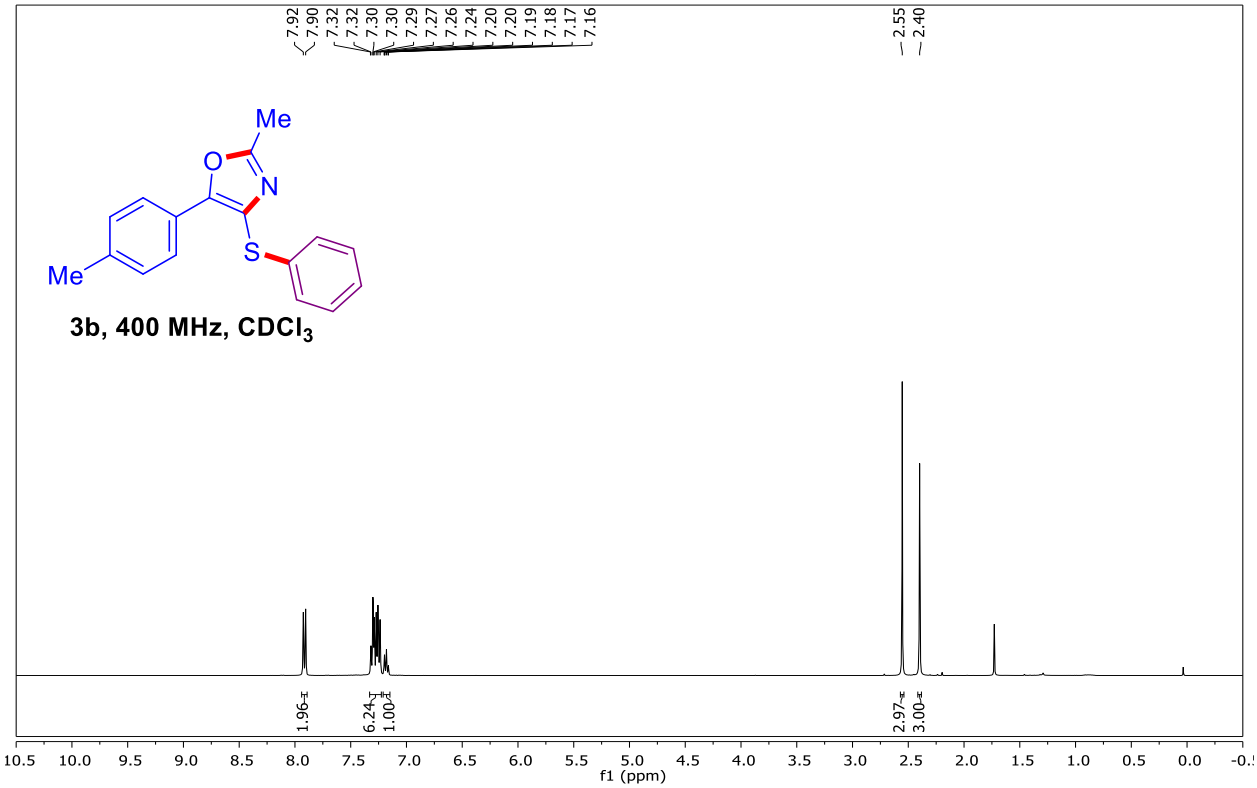
14. ^{1}H and ^{13}C NMR Spectra of Functionalized Oxazole Derivatives

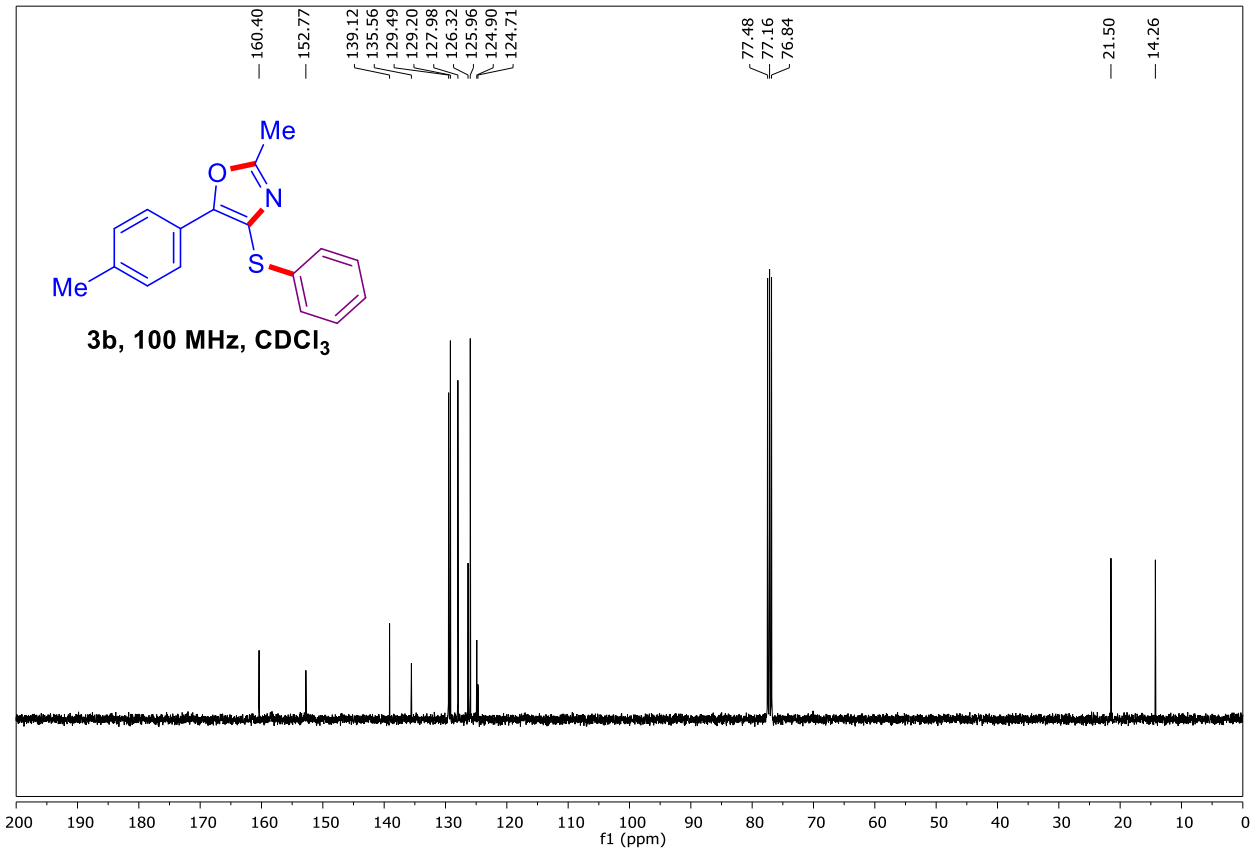
5-(4-Methoxyphenyl)-2-methyl-4-(phenylthio)oxazole (3a)



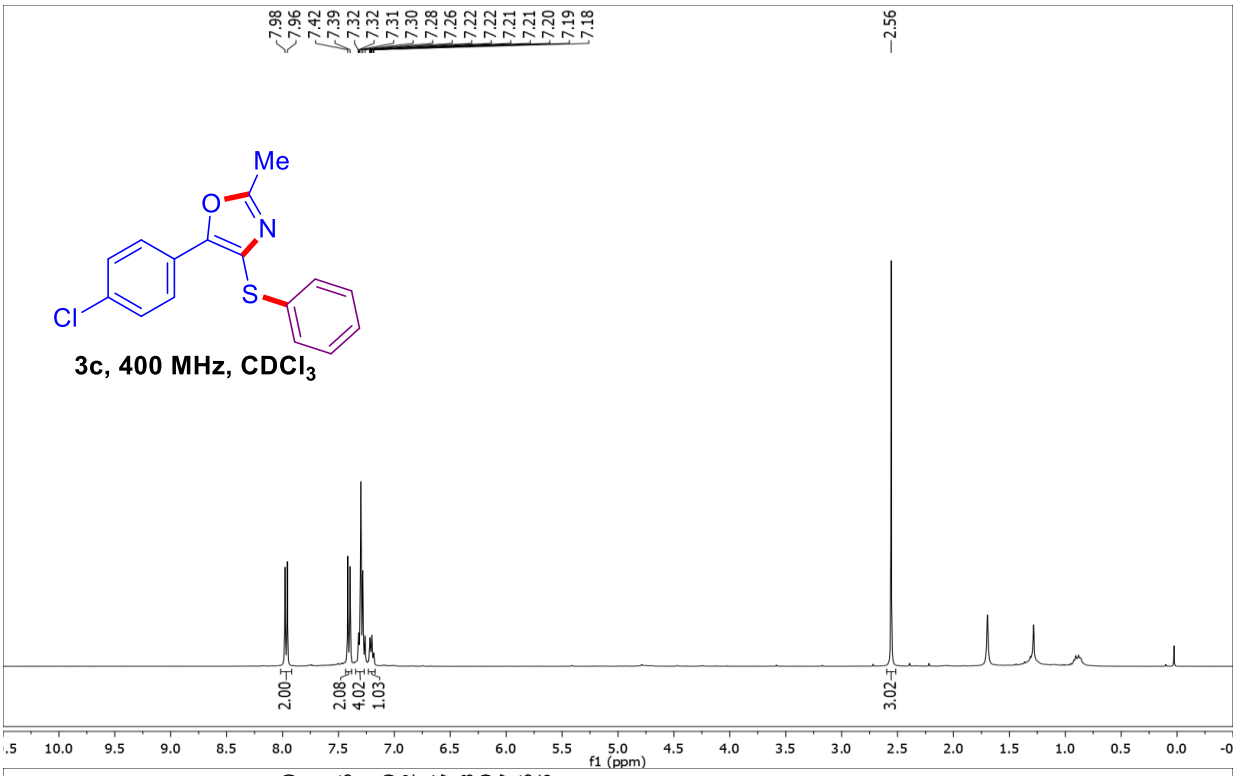


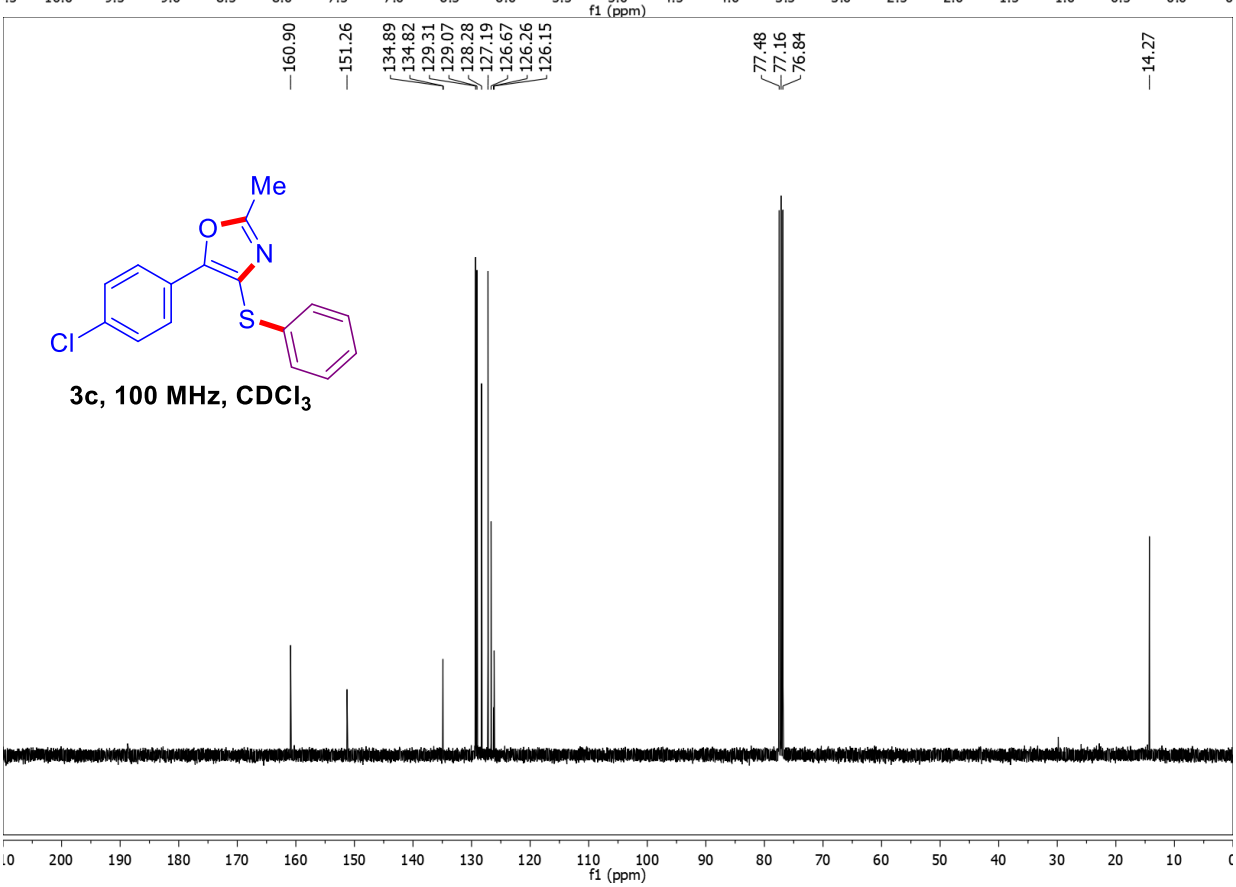
2-Methyl-4-(phenylthio)-5-(*p*-tolyl)oxazole (3b)



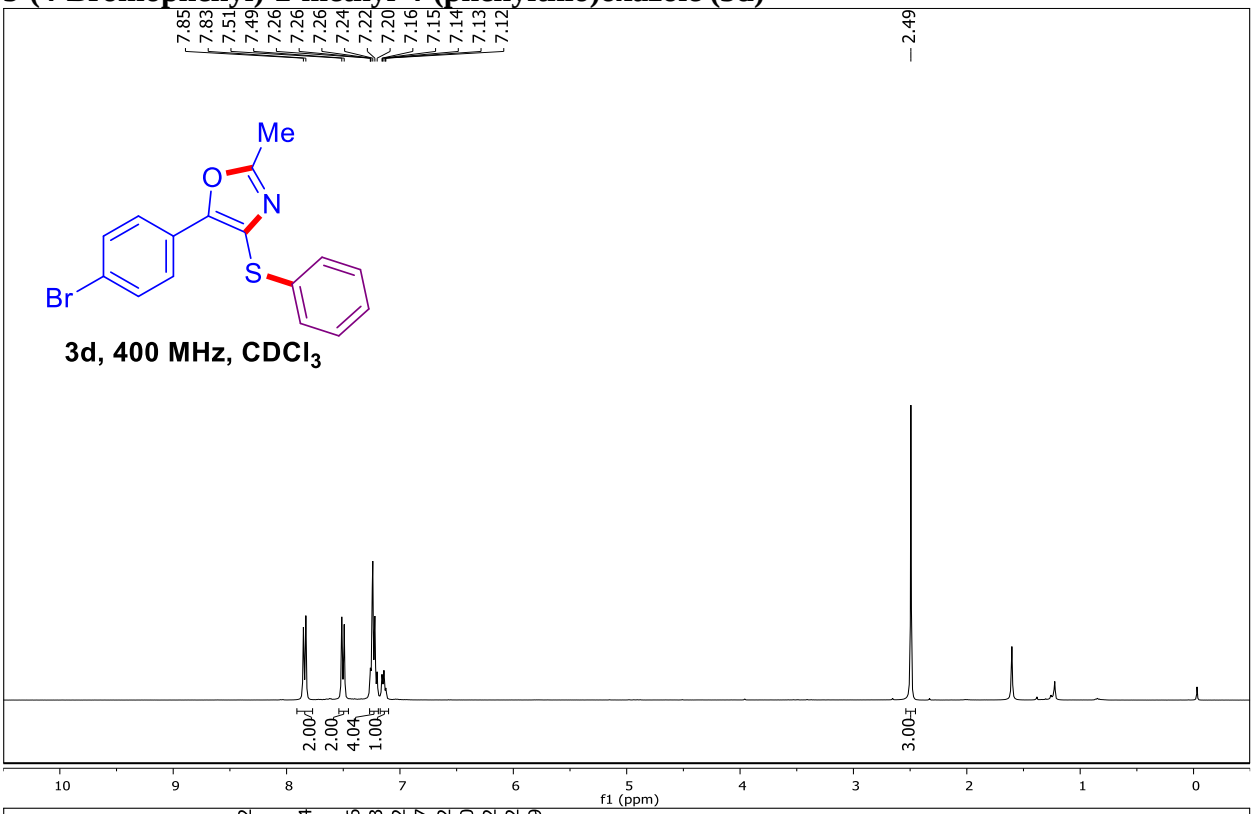


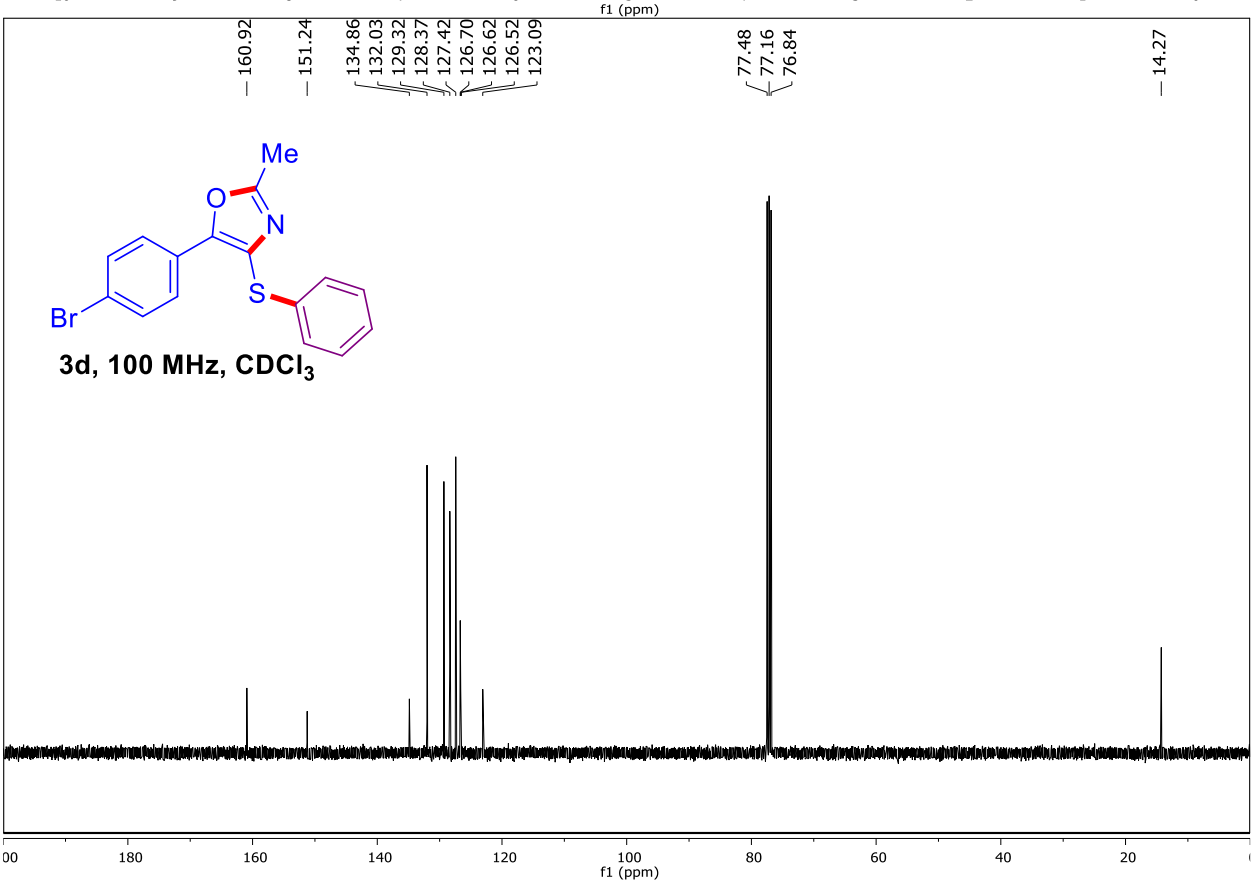
5-(4-Chlorophenyl)-2-methyl-4-(phenylthio)oxazole (3c)



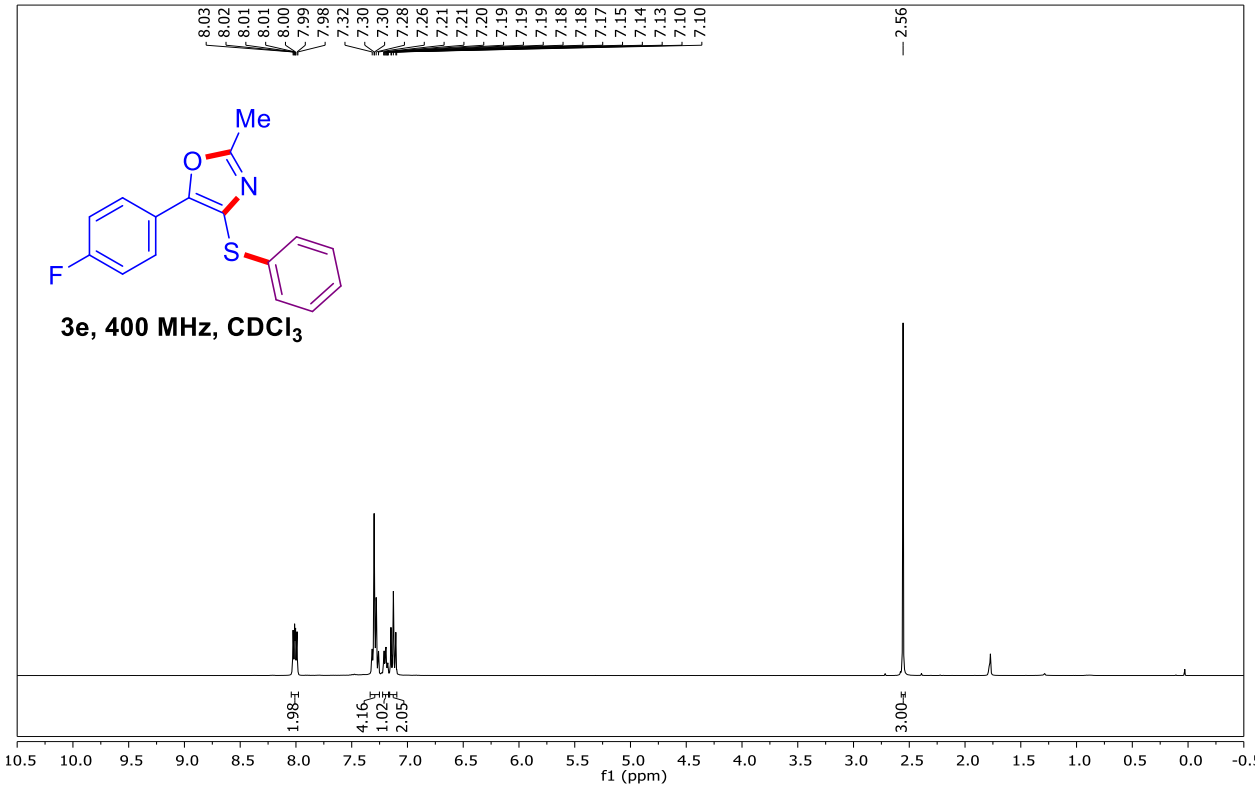


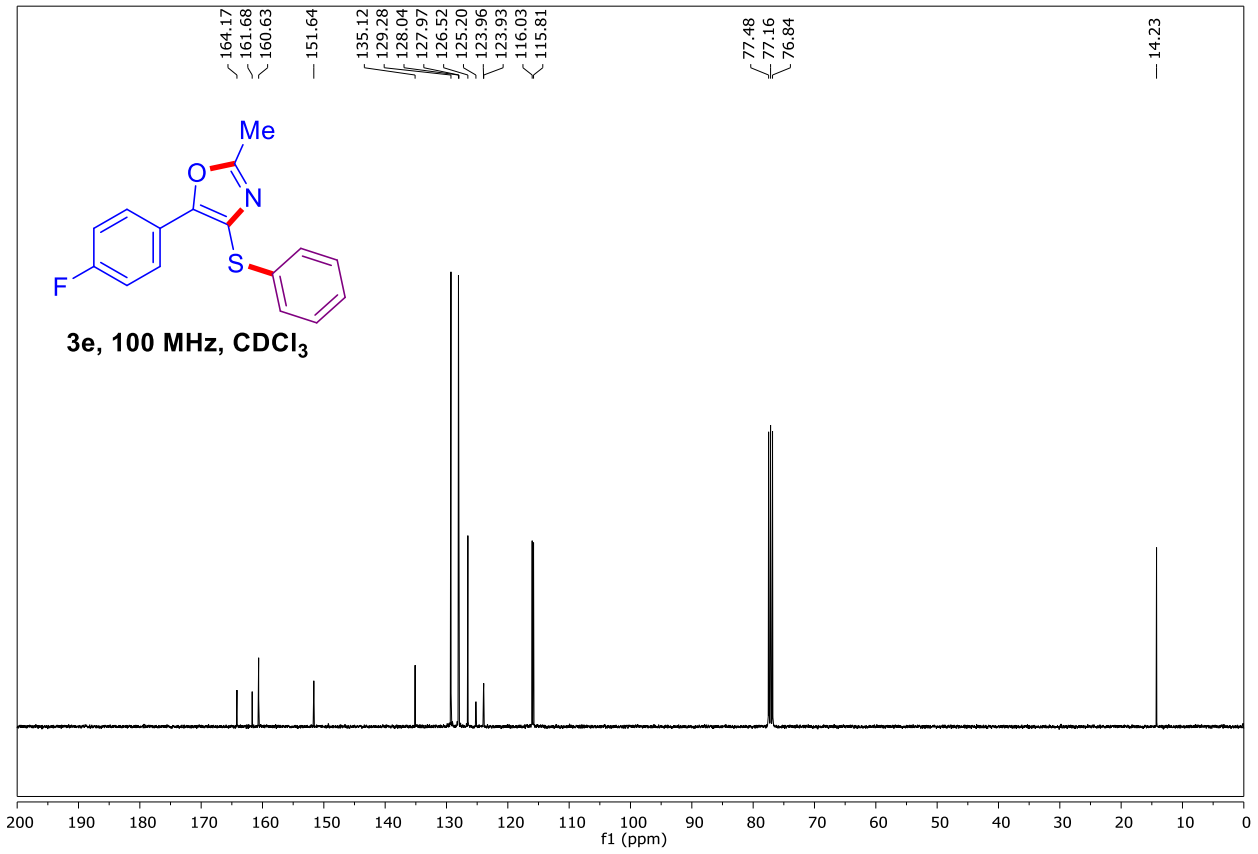
5-(4-Bromophenyl)-2-methyl-4-(phenylthio)oxazole (3d)



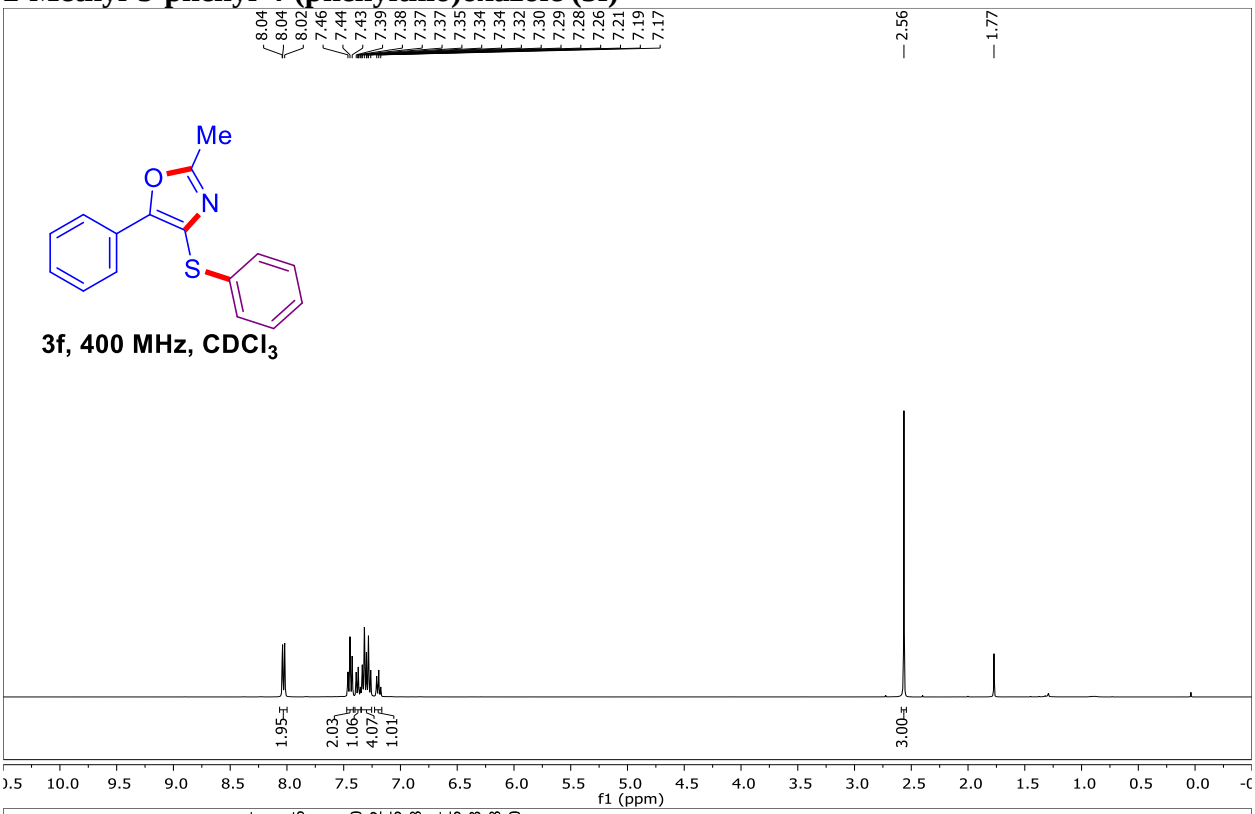


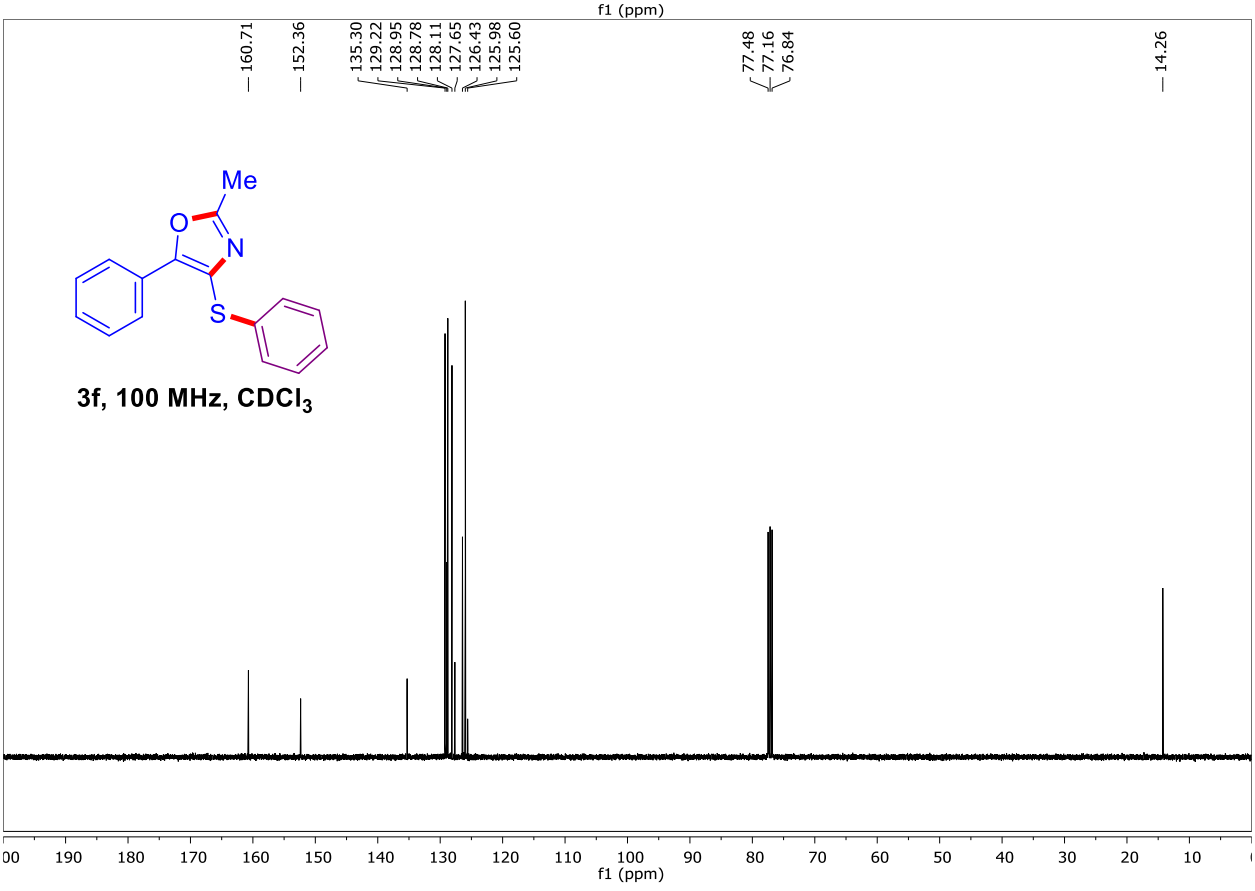
5-(4-Fluorophenyl)-2-methyl-4-(phenylthio)oxazole (3e)



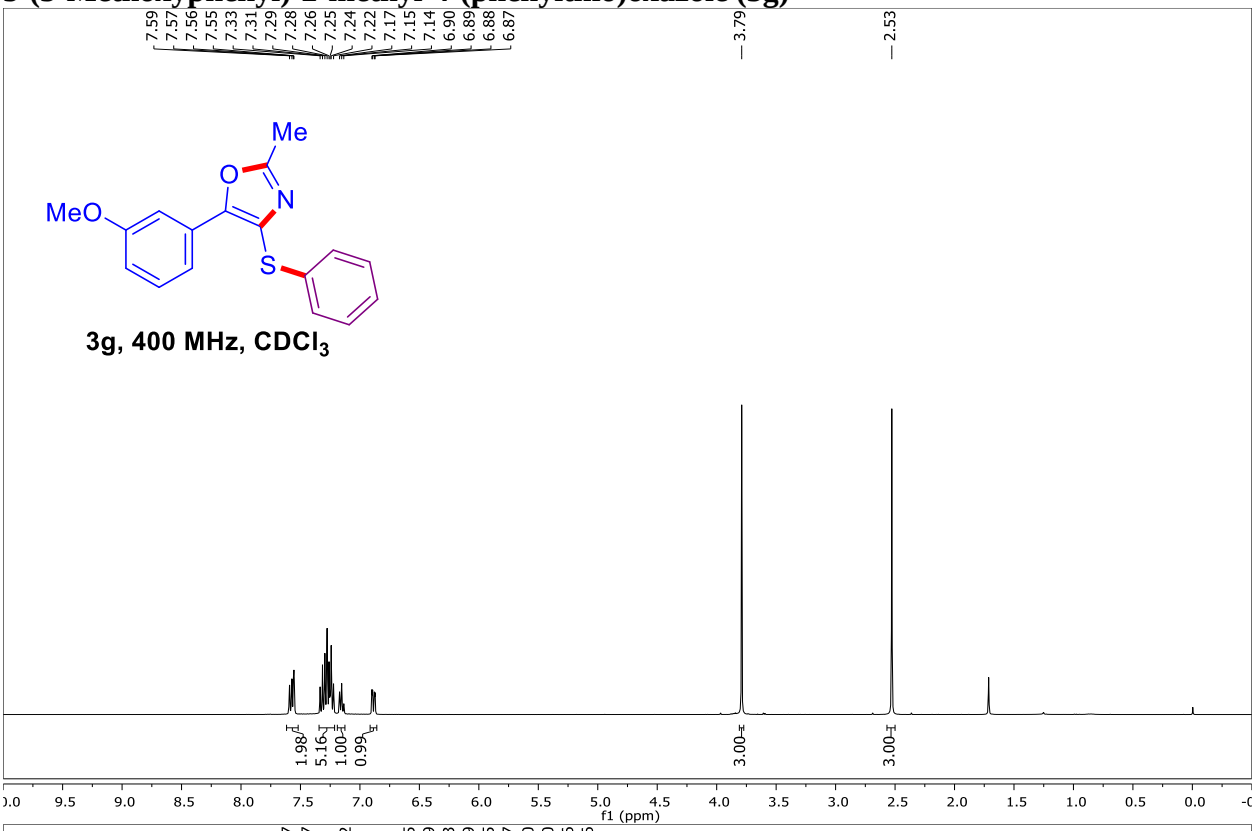


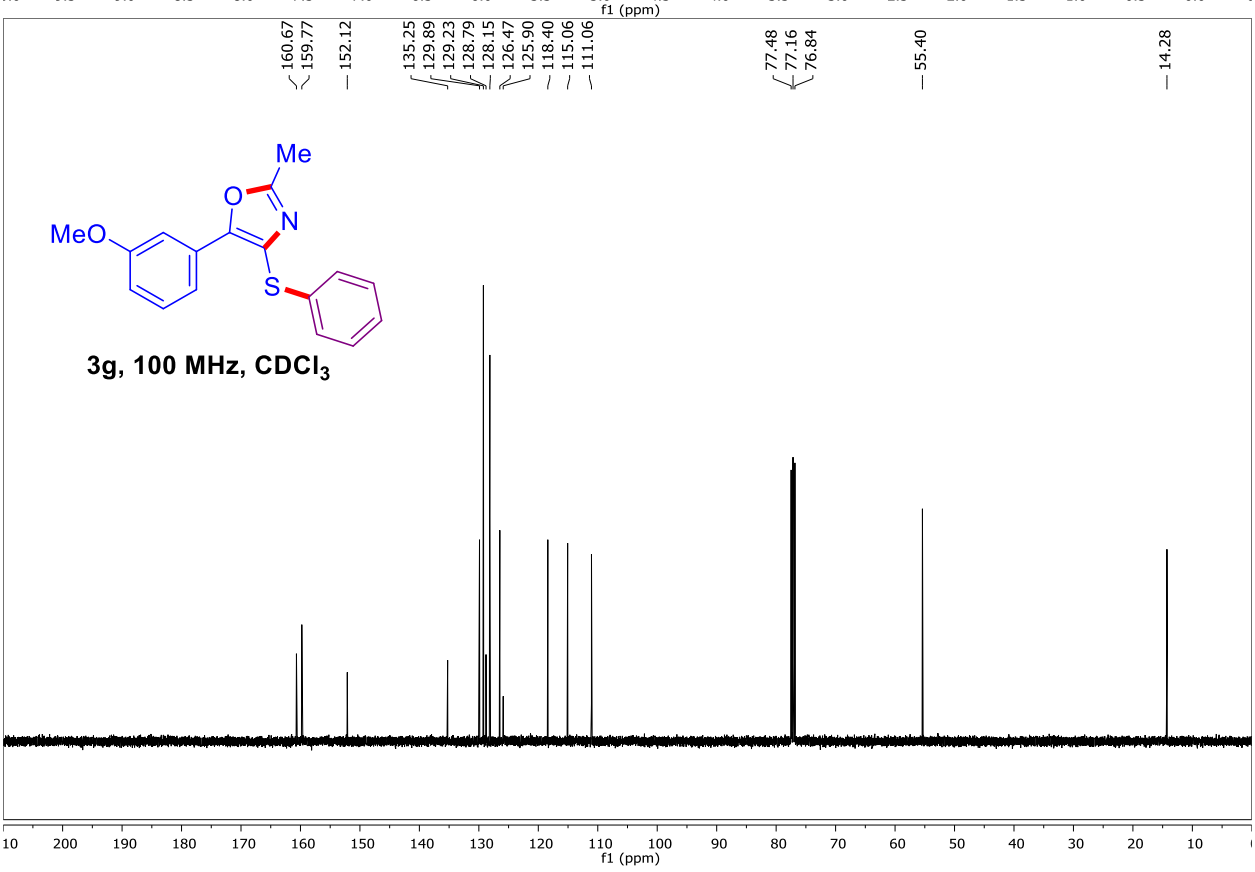
2-Methyl-5-phenyl-4-(phenylthio)oxazole (3f)



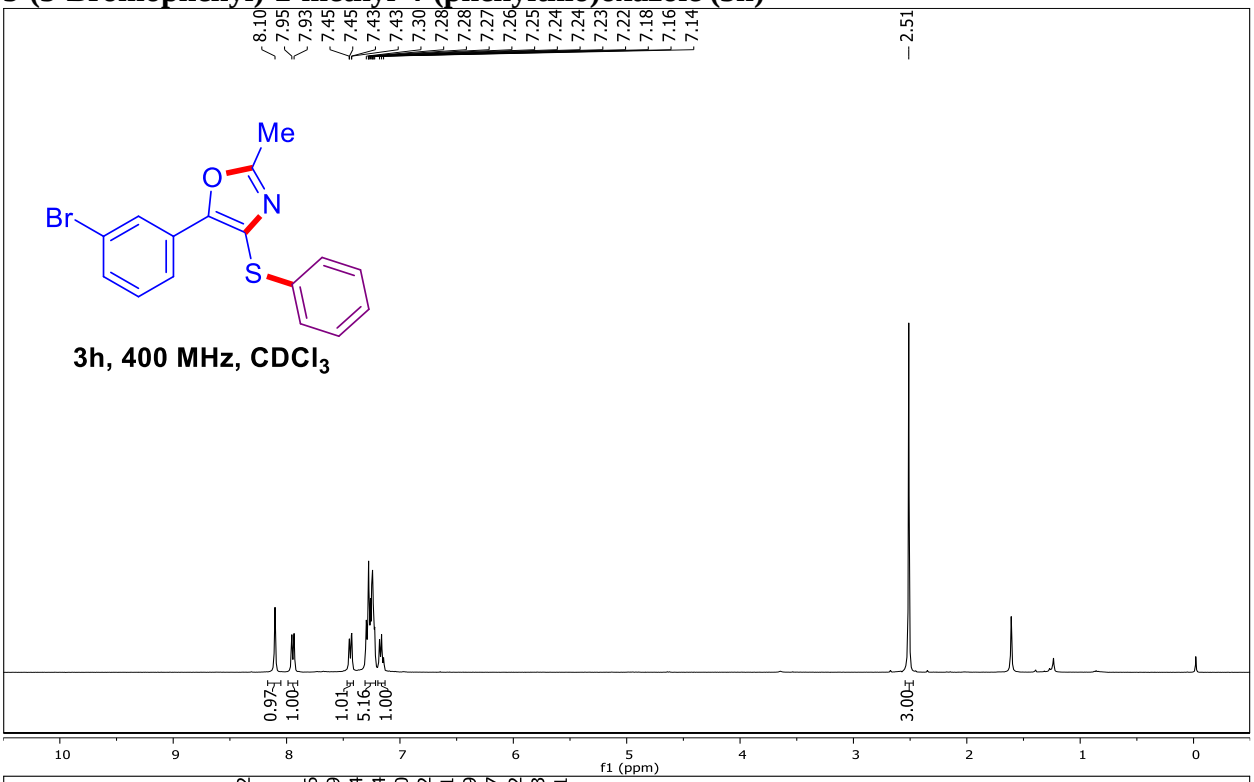


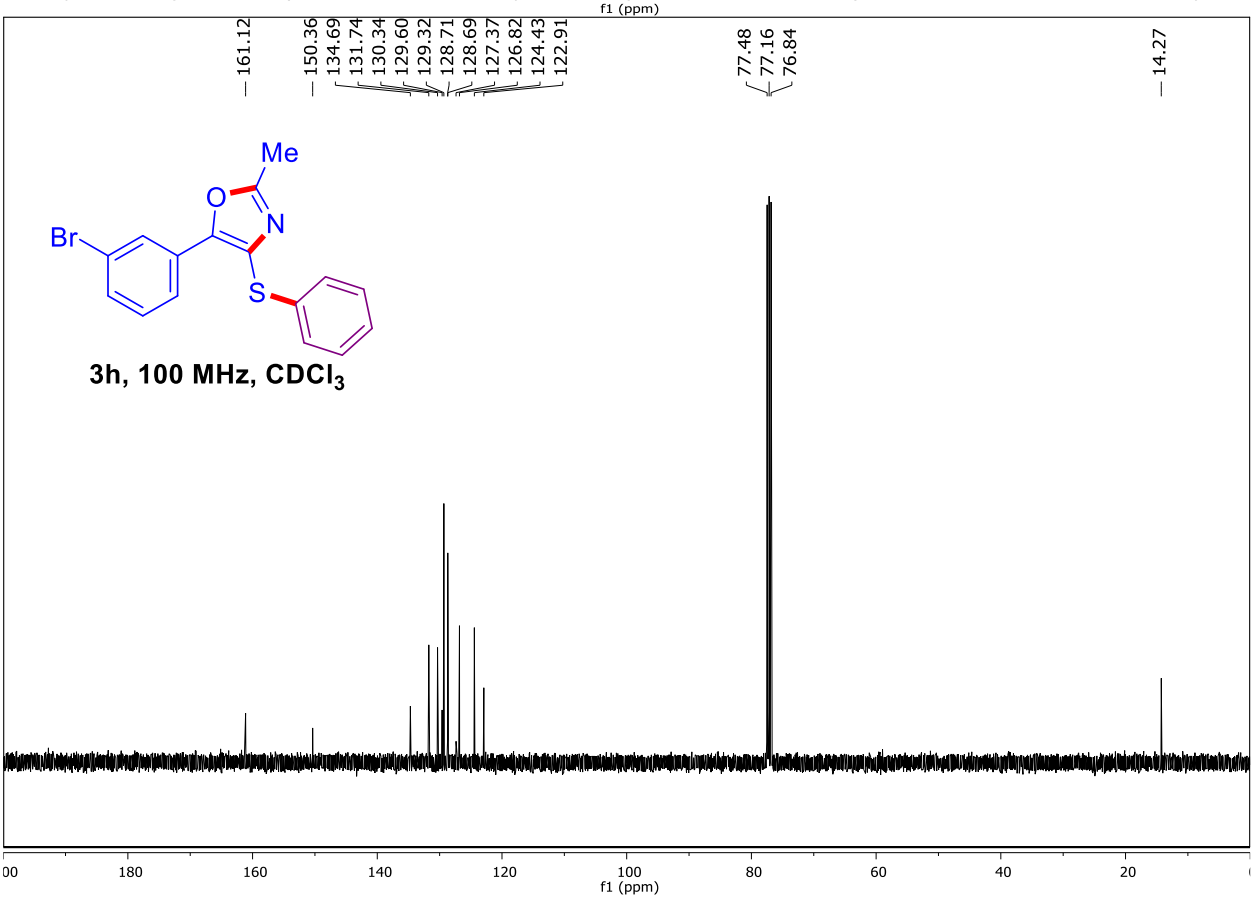
5-(3-Methoxyphenyl)-2-methyl-4-(phenylthio)oxazole (3g)



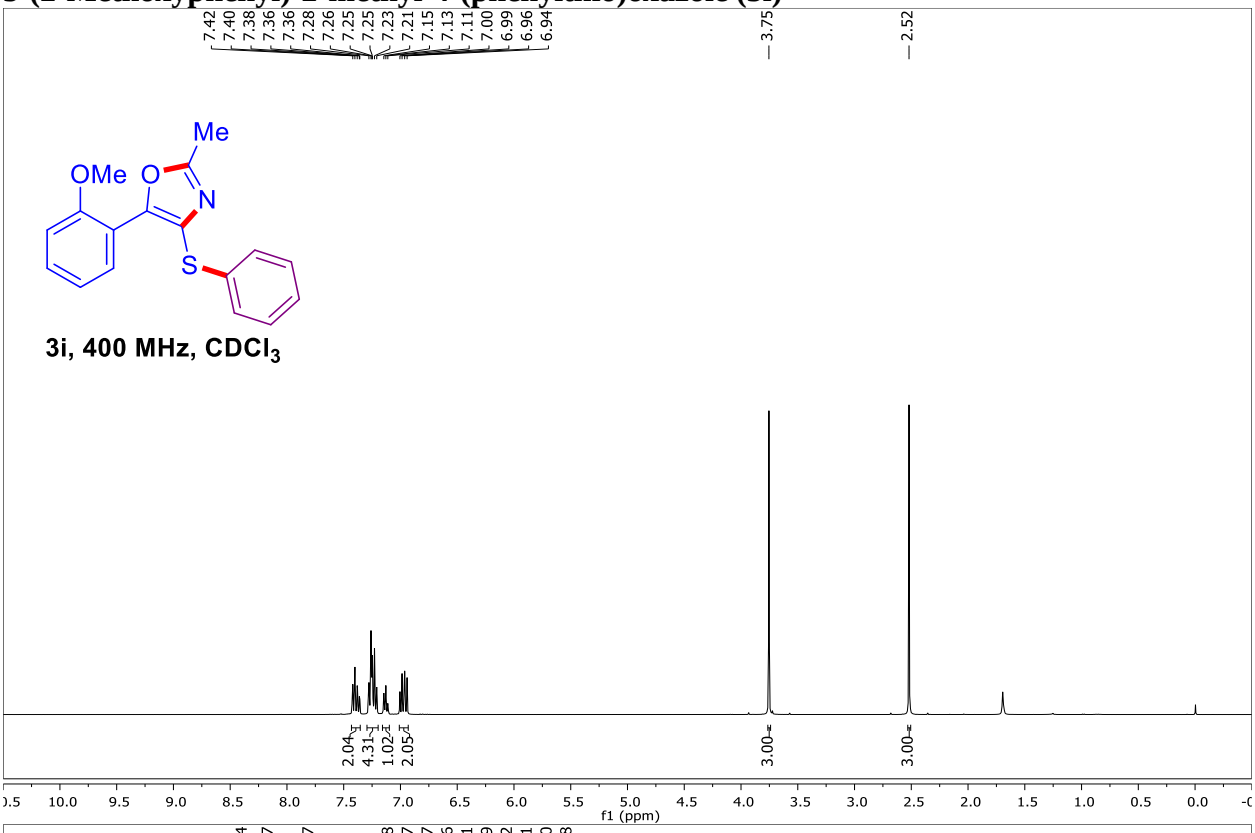


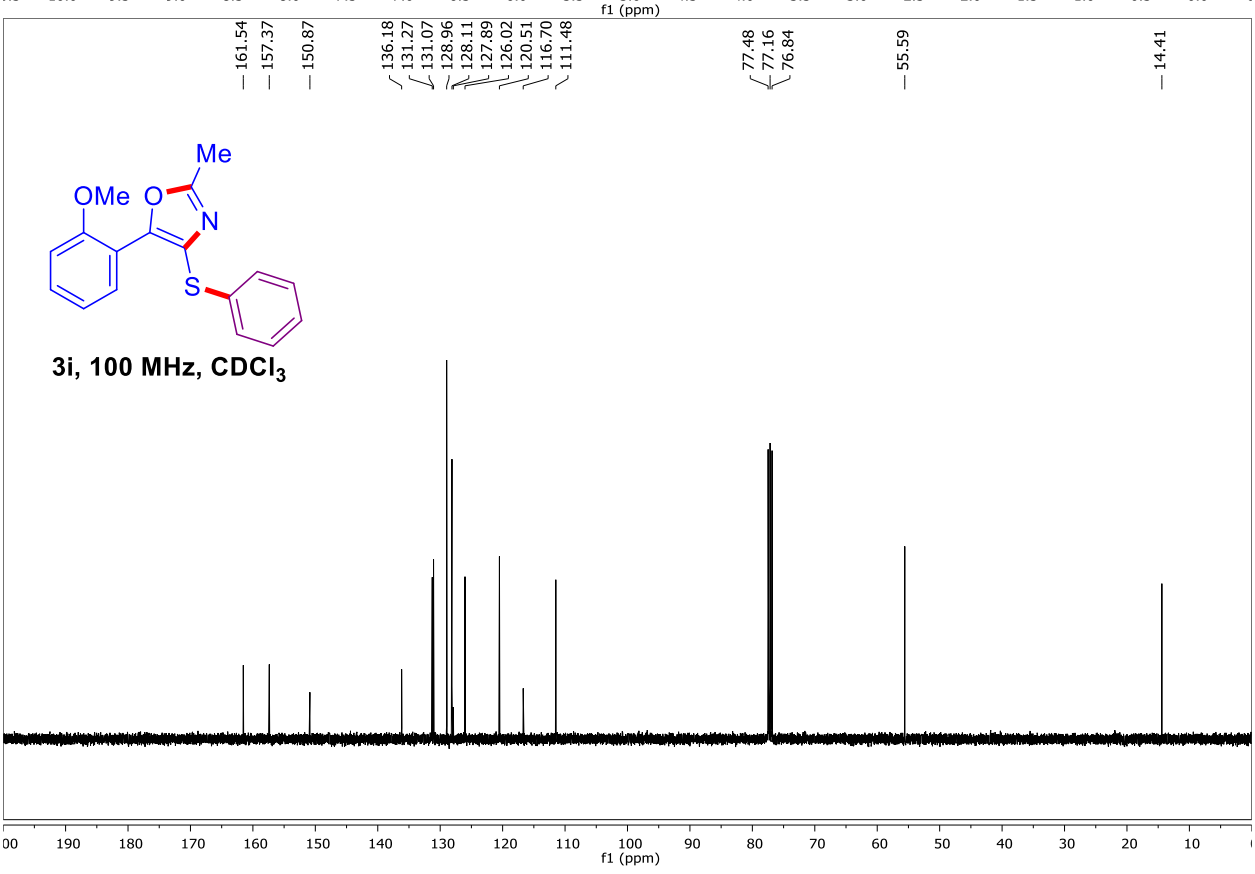
5-(3-Bromophenyl)-2-methyl-4-(phenylthio)oxazole (3h)



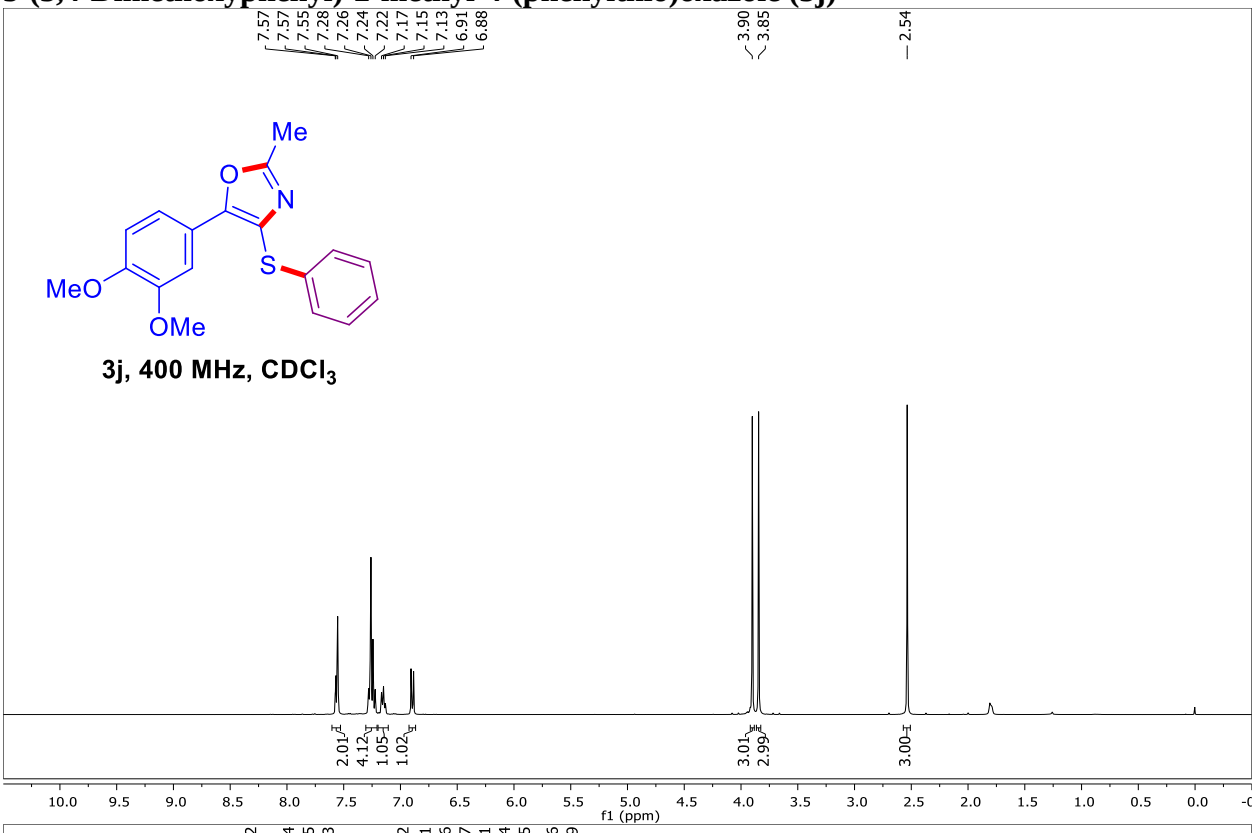


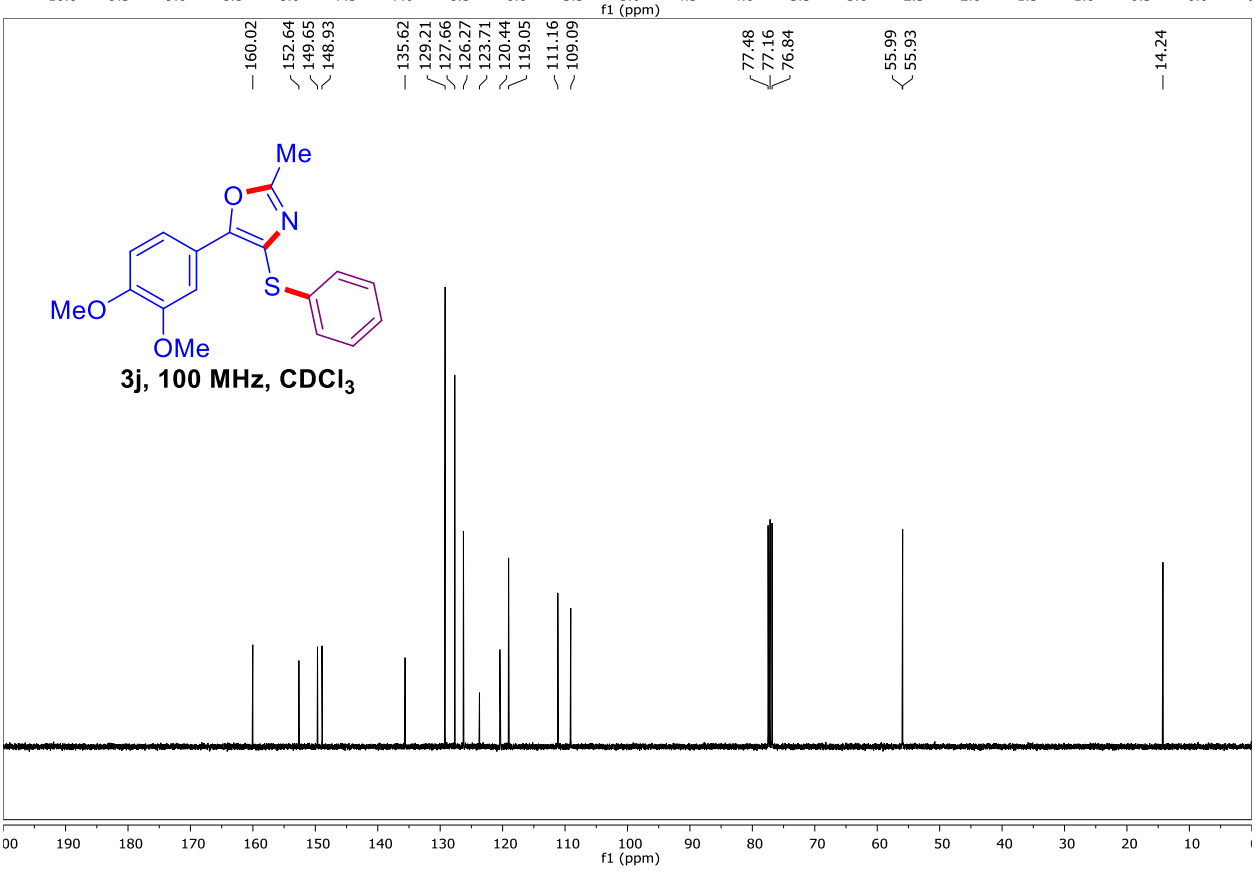
5-(2-Methoxyphenyl)-2-methyl-4-(phenylthio)oxazole (3i)



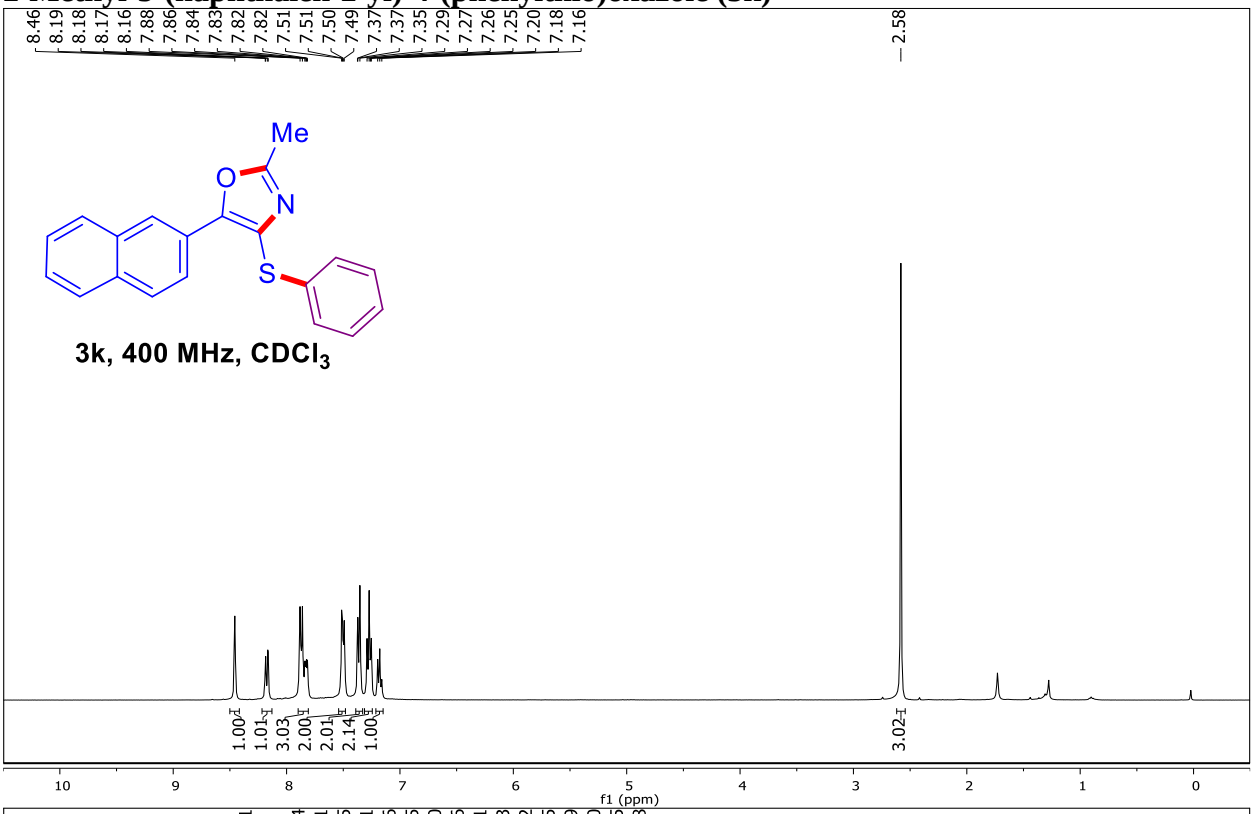


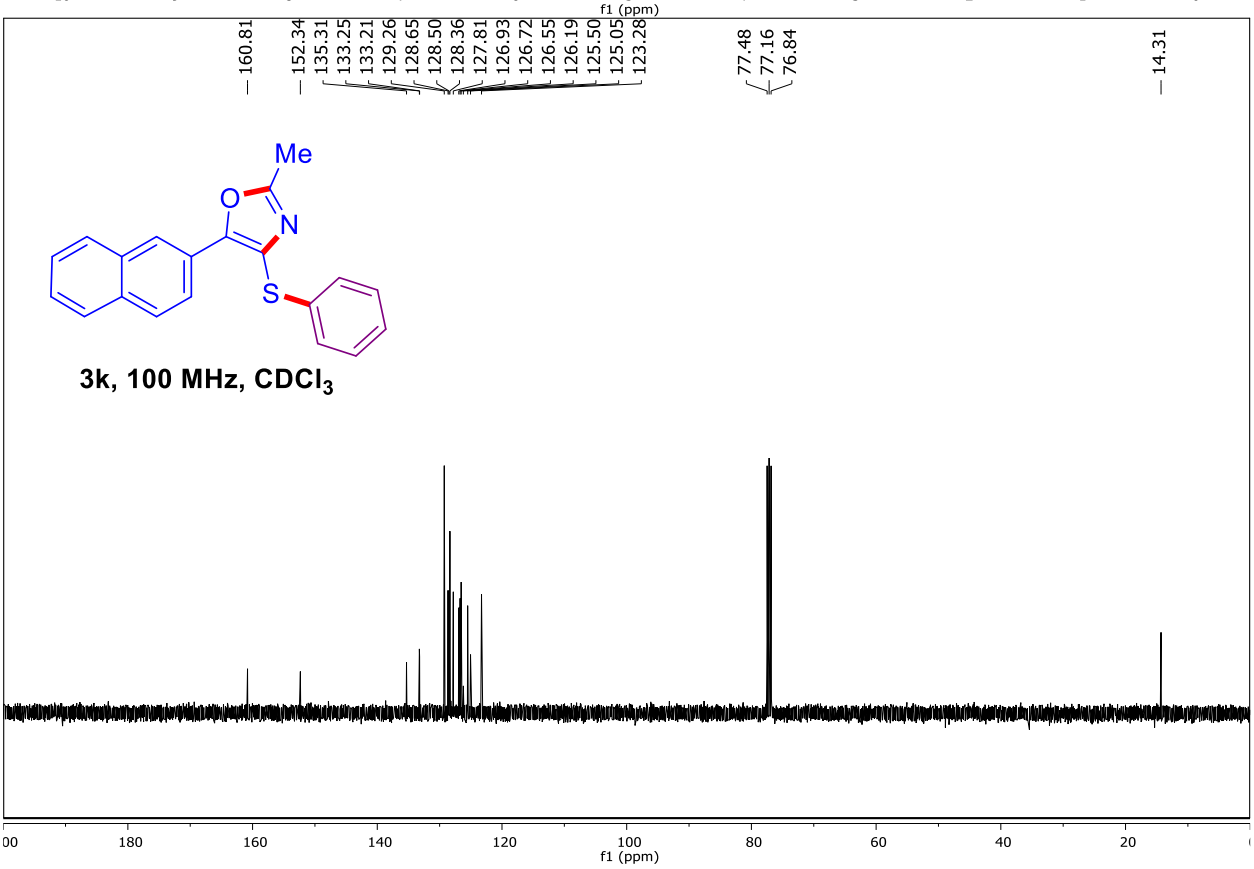
5-(3,4-Dimethoxyphenyl)-2-methyl-4-(phenylthio)oxazole (3j)



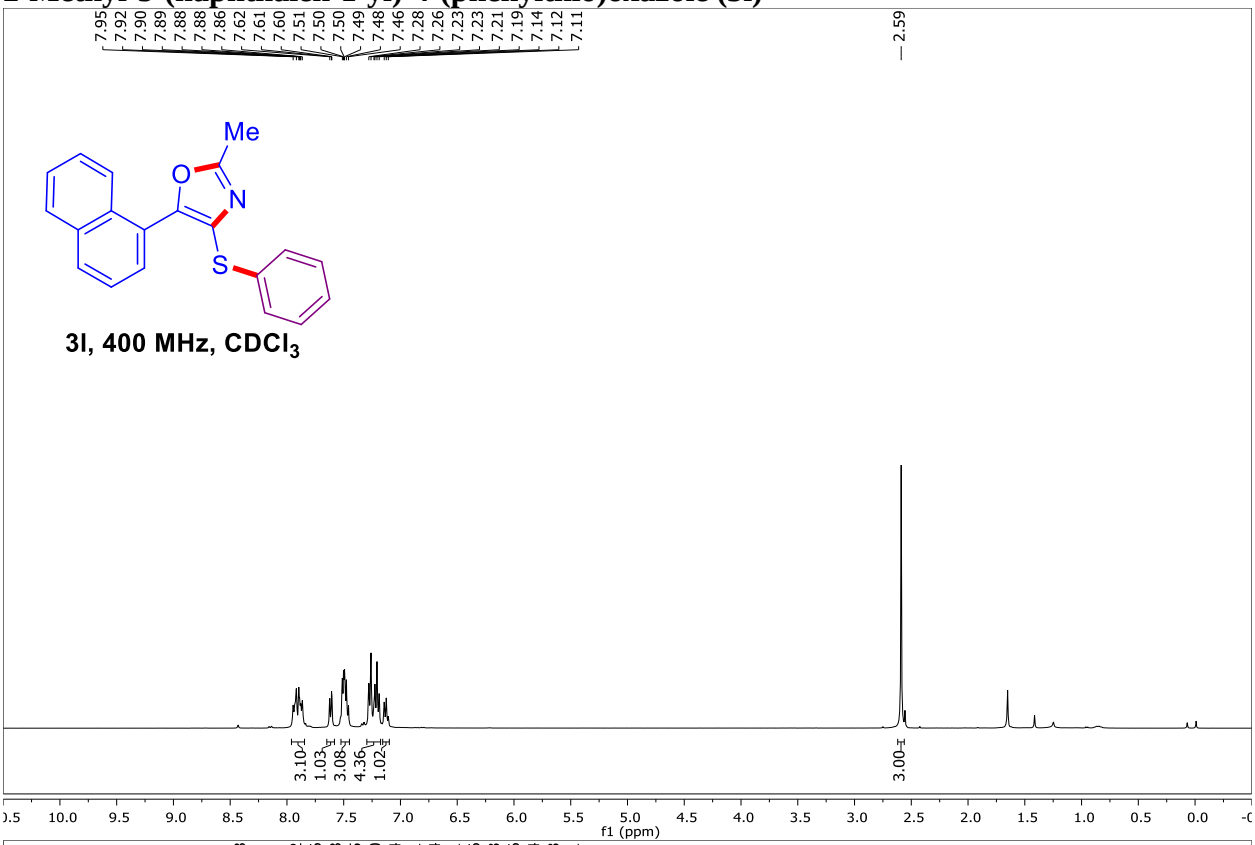


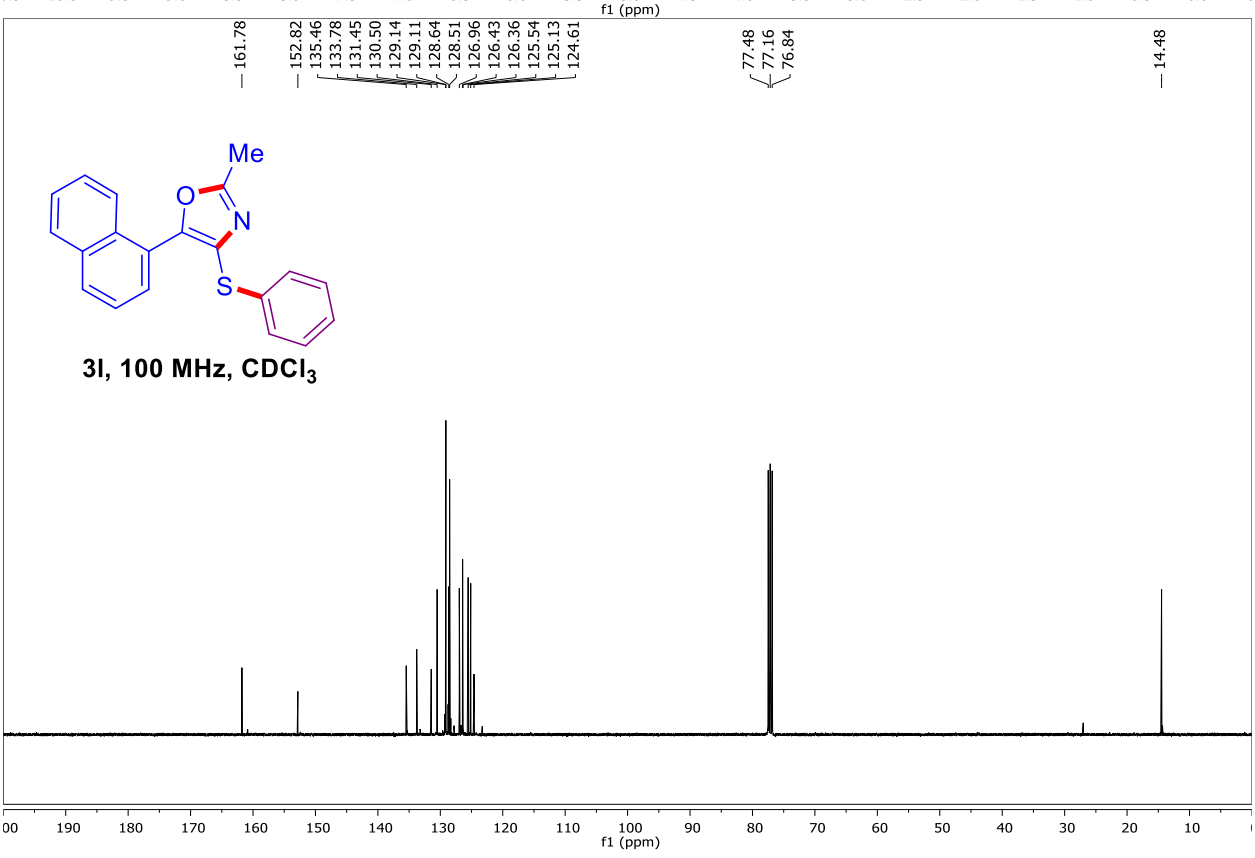
2-Methyl-5-(naphthalen-2-yl)-4-(phenylthio)oxazole (3k)



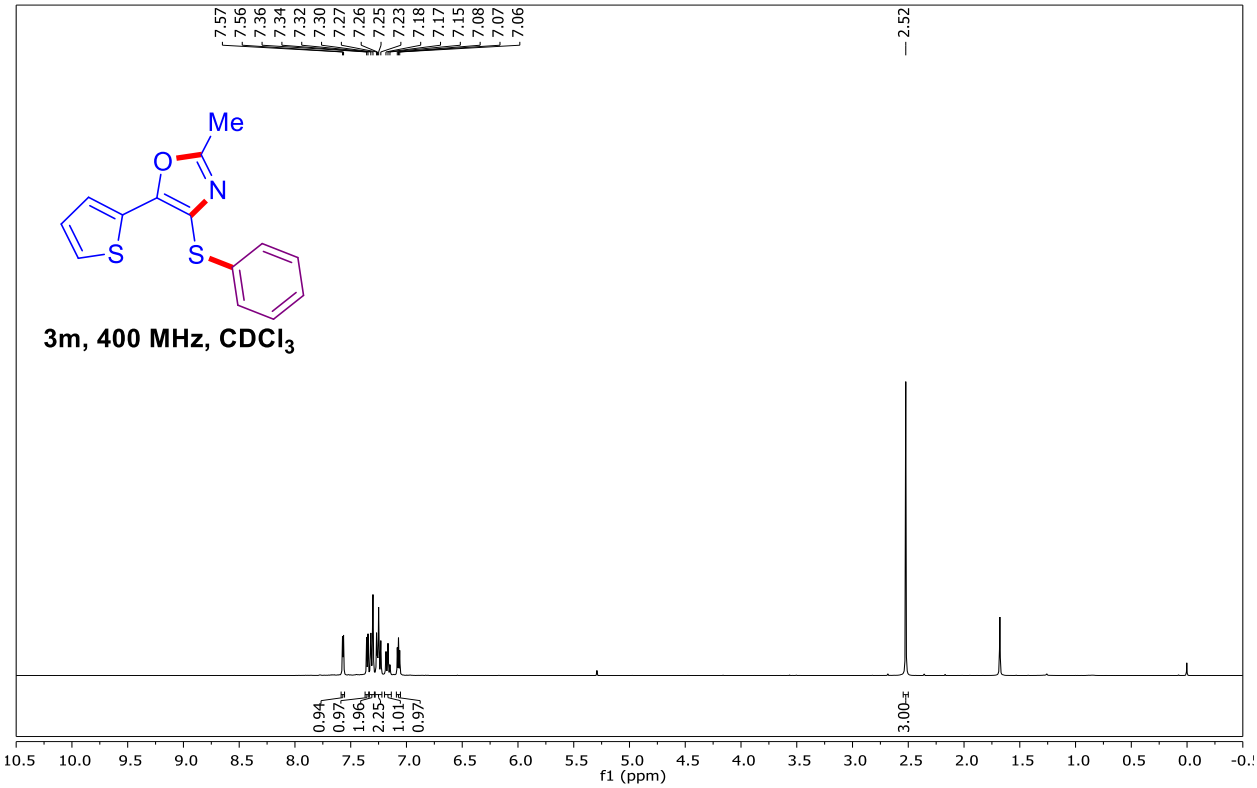


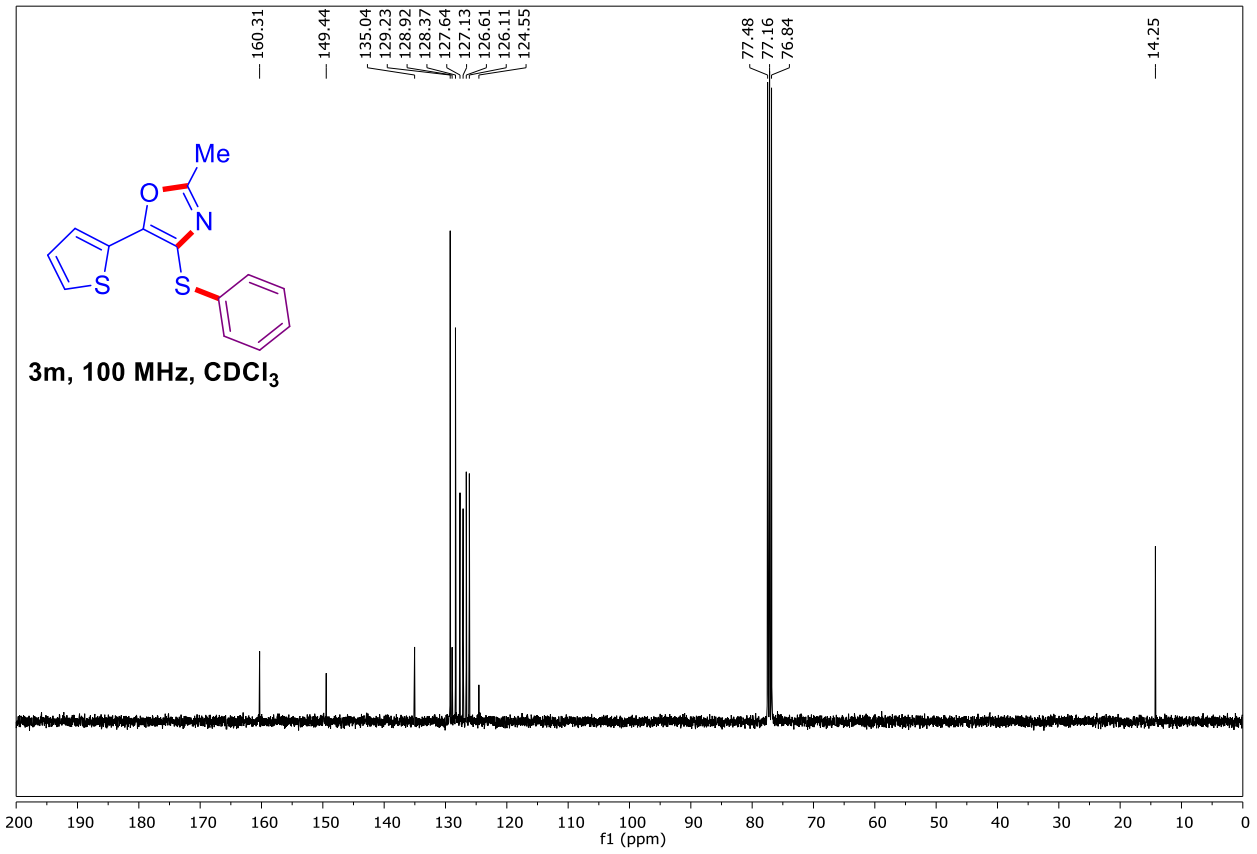
2-Methyl-5-(naphthalen-1-yl)-4-(phenylthio)oxazole (3l)



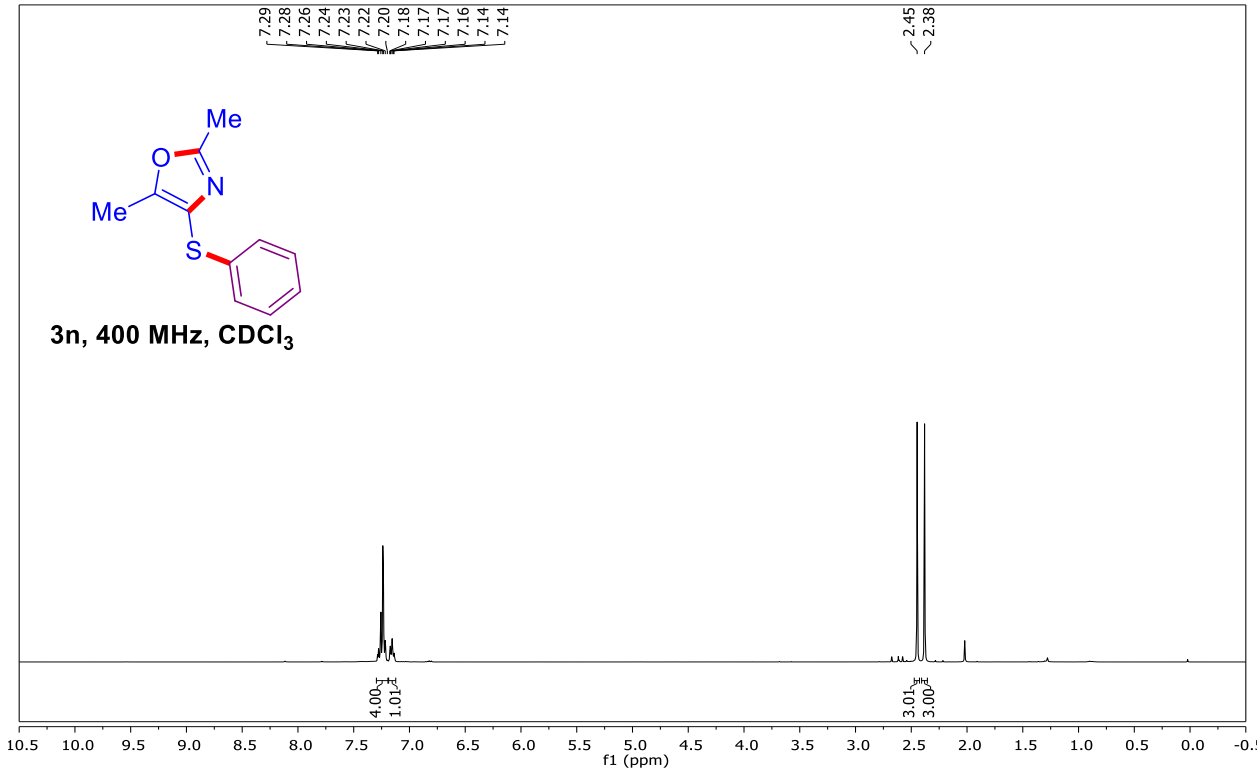


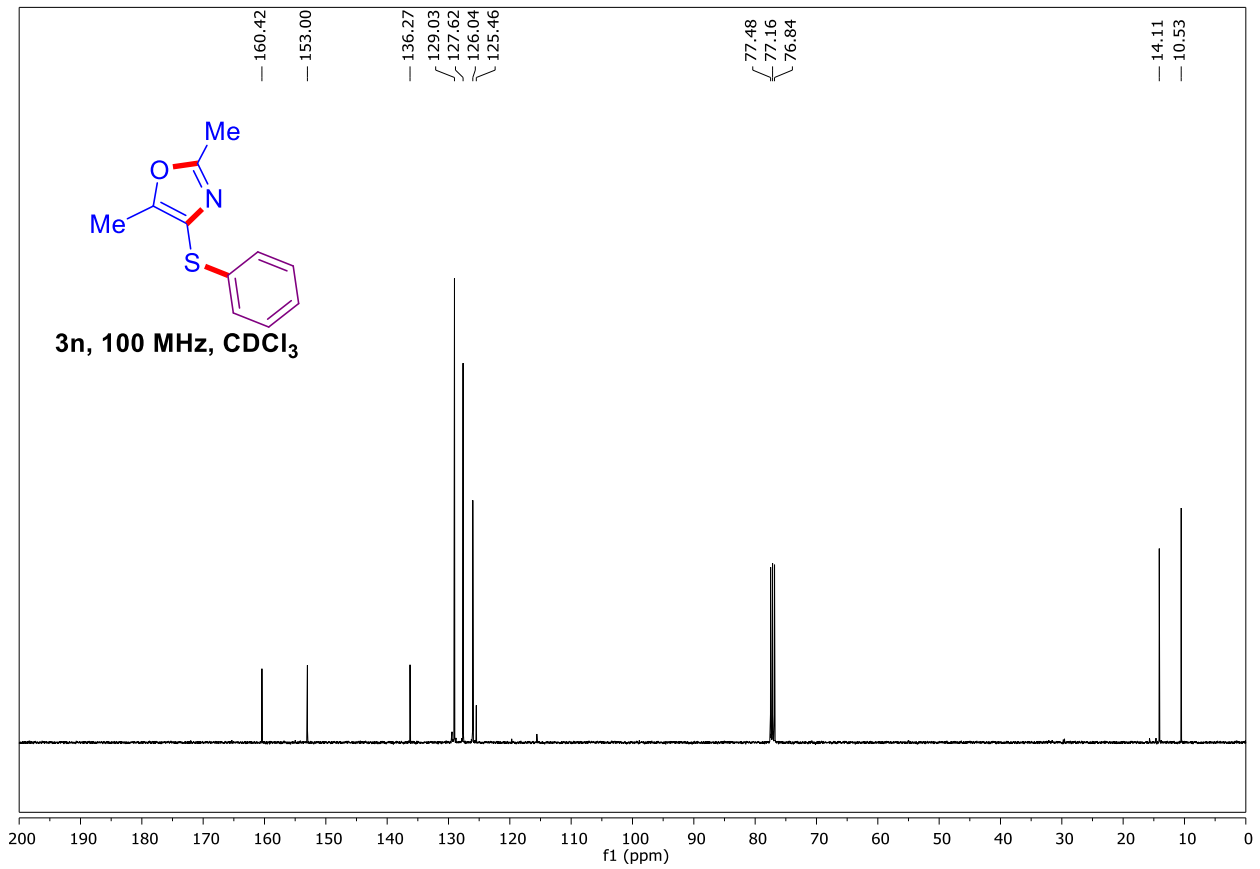
2-Methyl-4-(phenylthio)-5-(thiophen-2-yl)oxazole (3m)



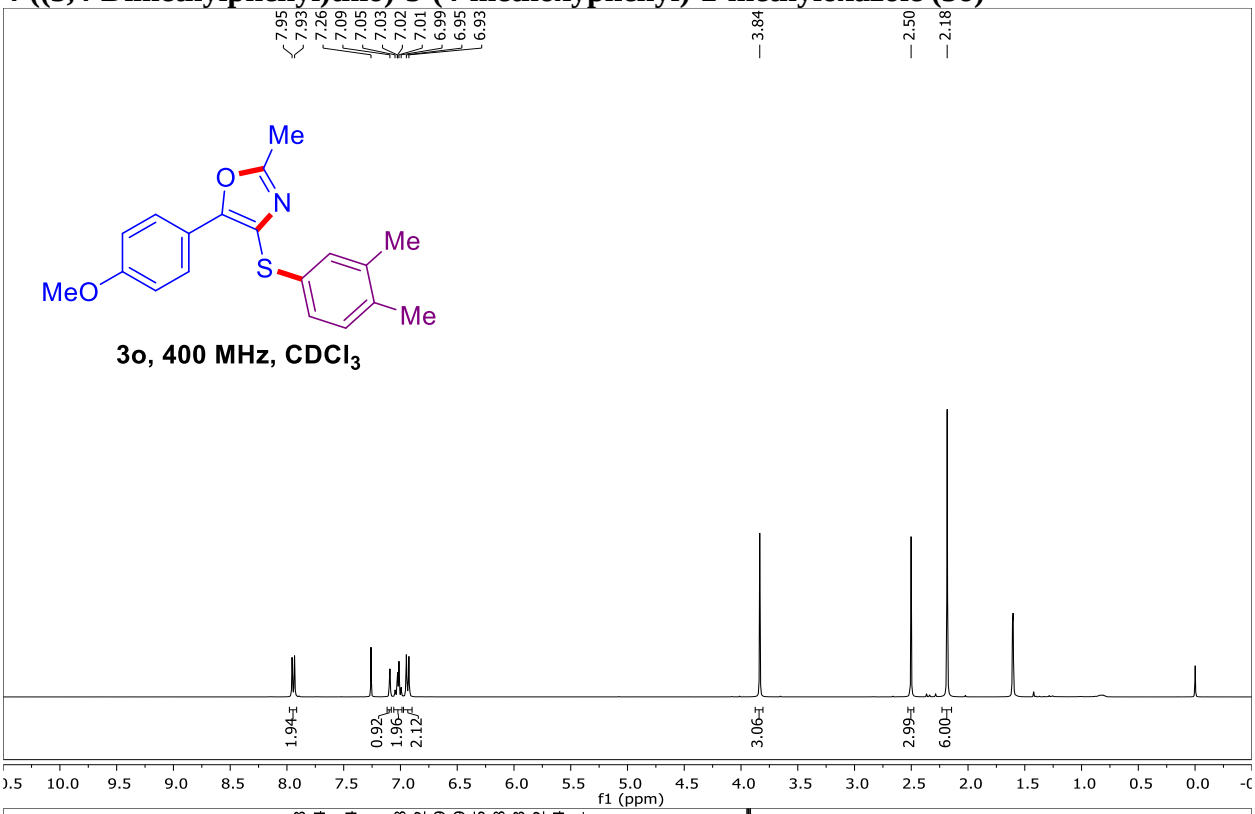


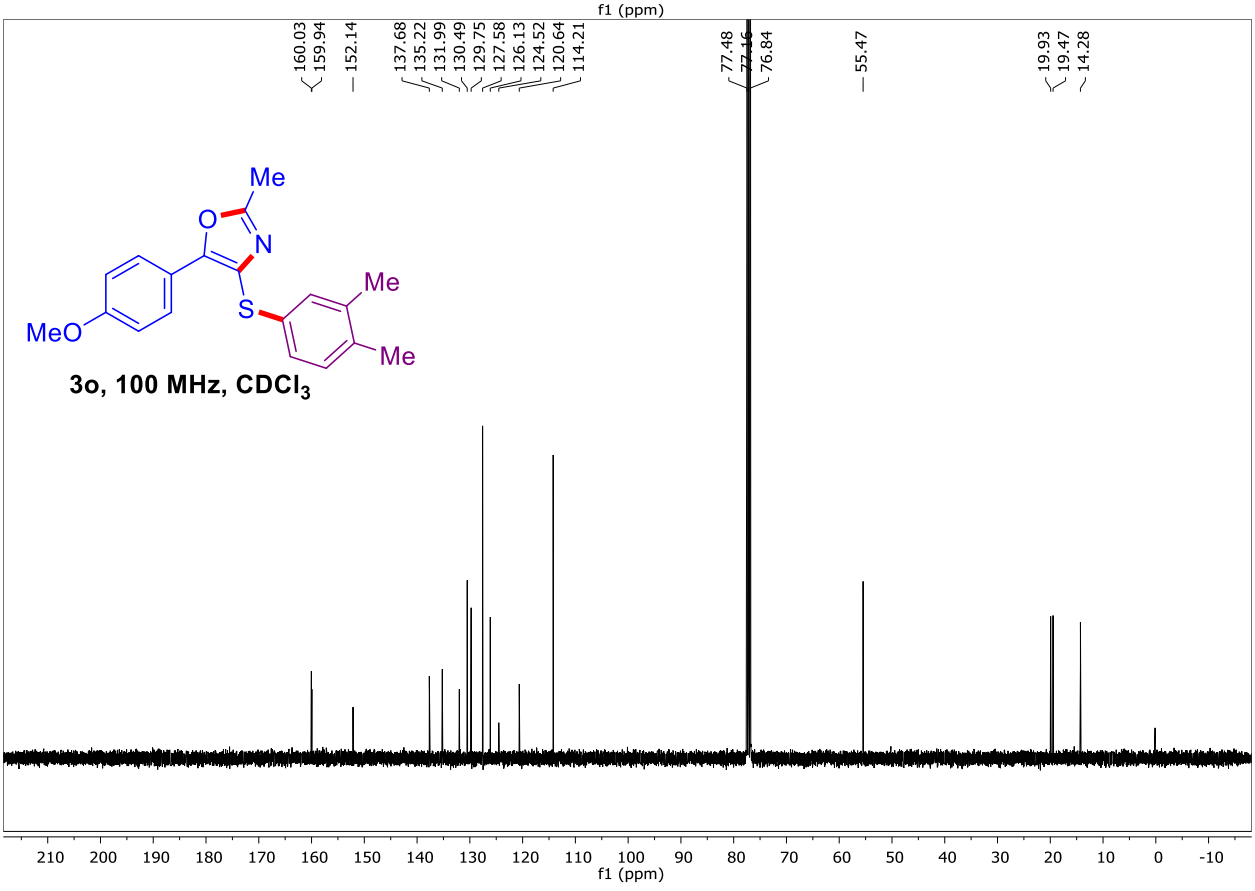
2,5-Dimethyl-4-(phenylthio)oxazole (3n)



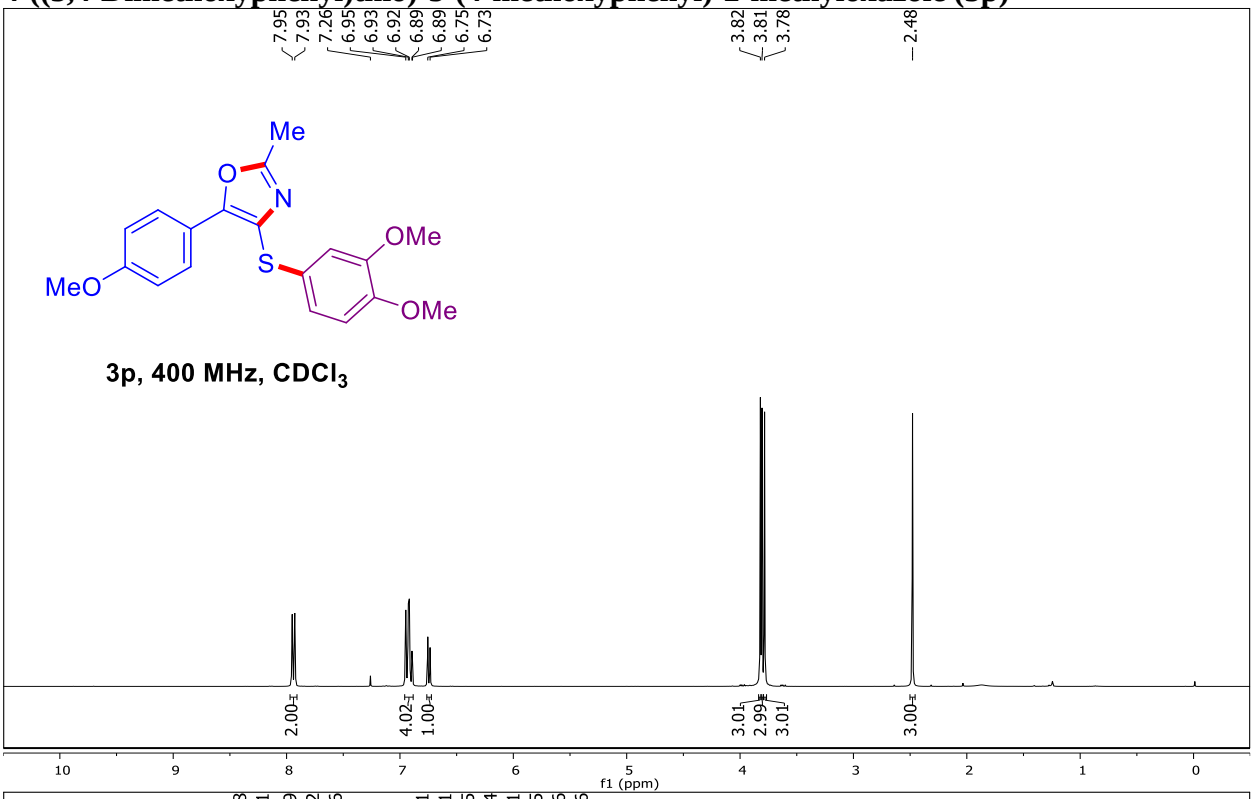


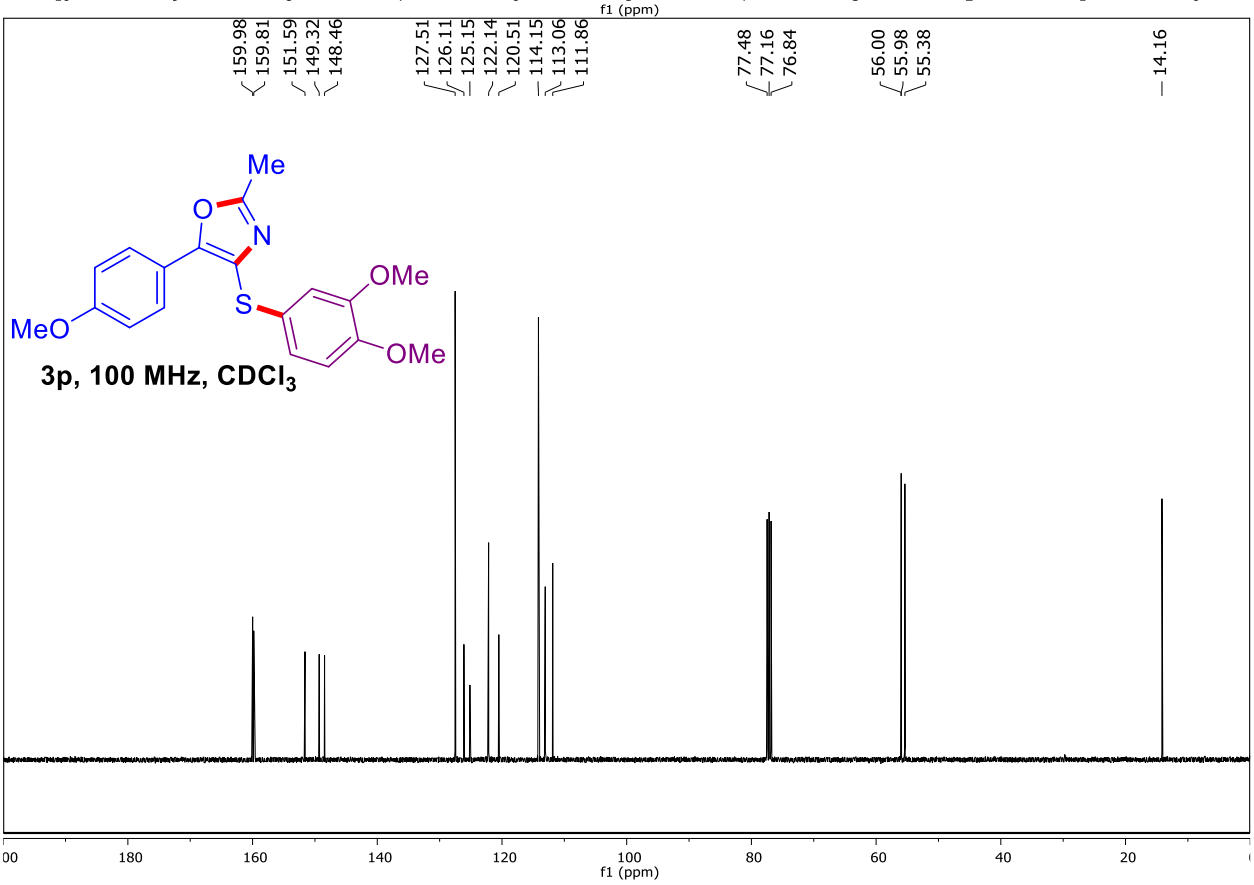
4-((3,4-Dimethylphenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3o)



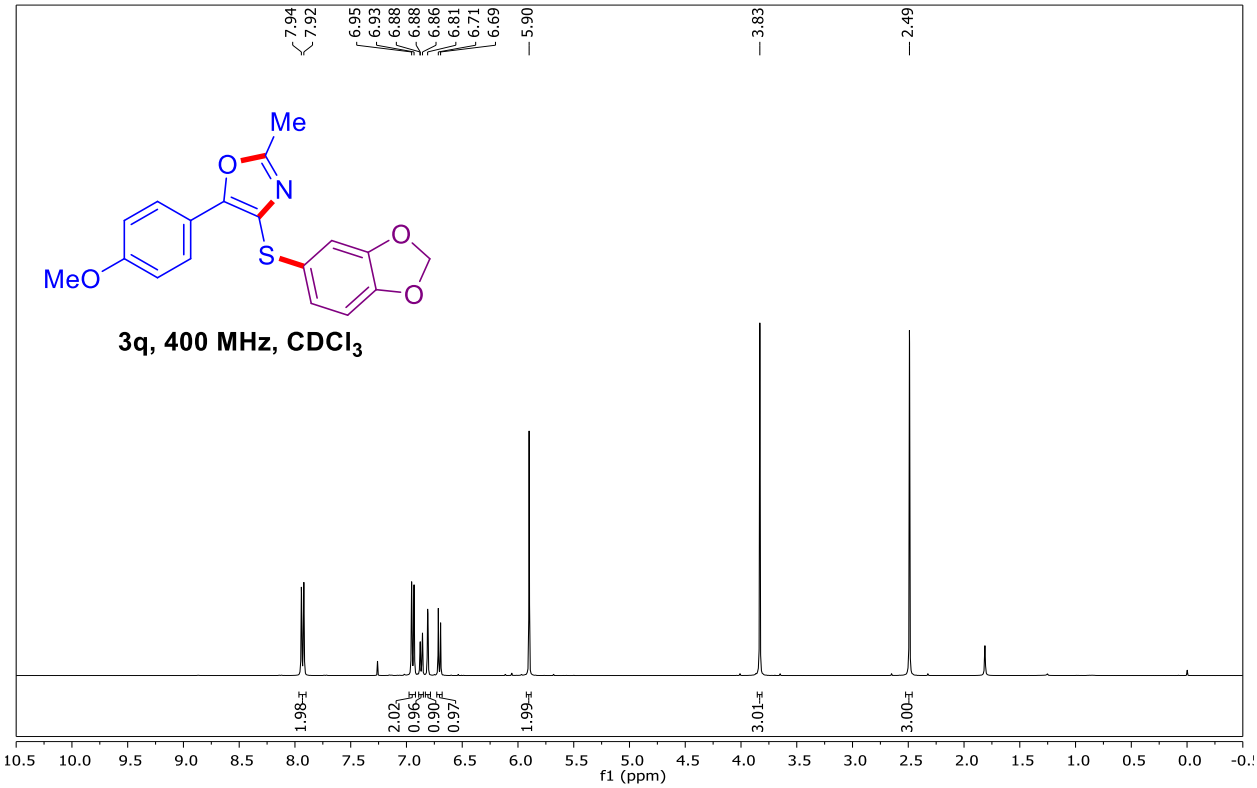


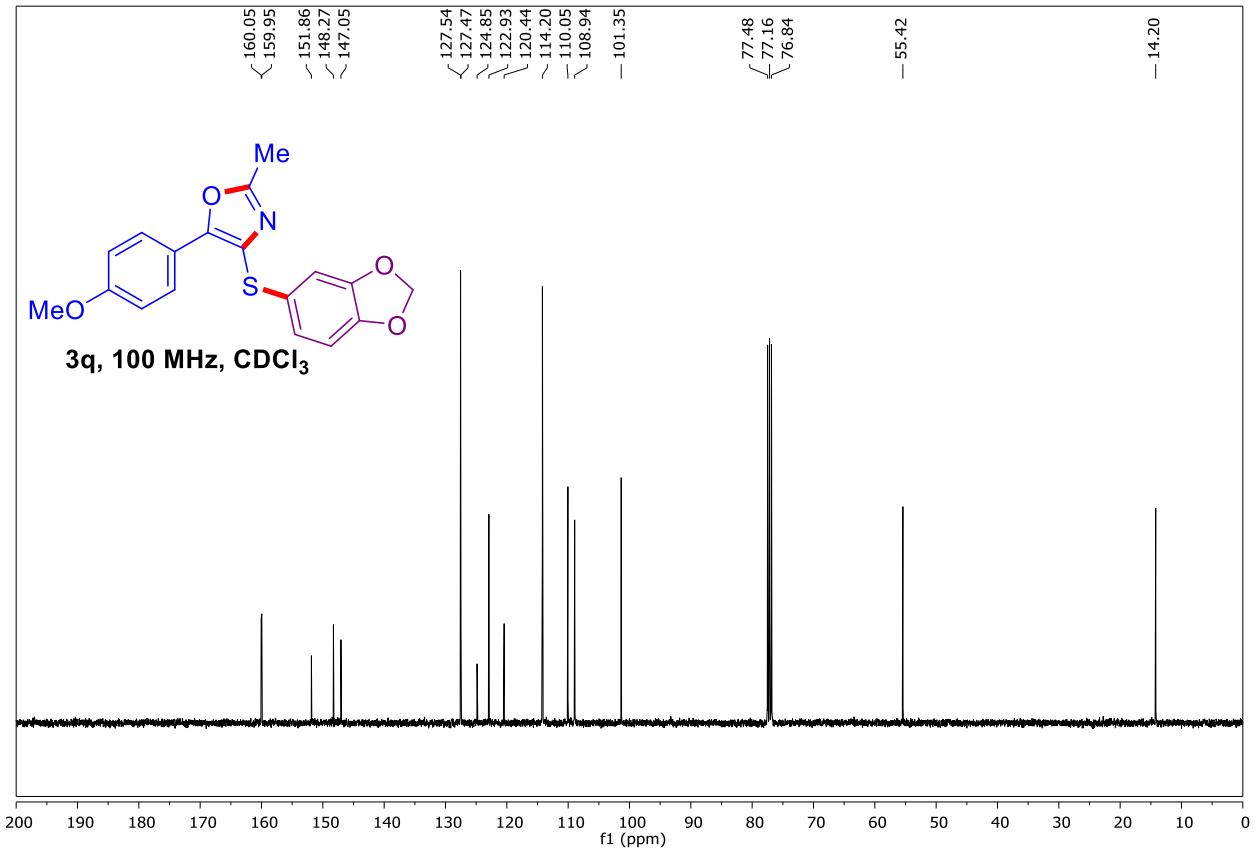
4-((3,4-Dimethoxyphenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3p)



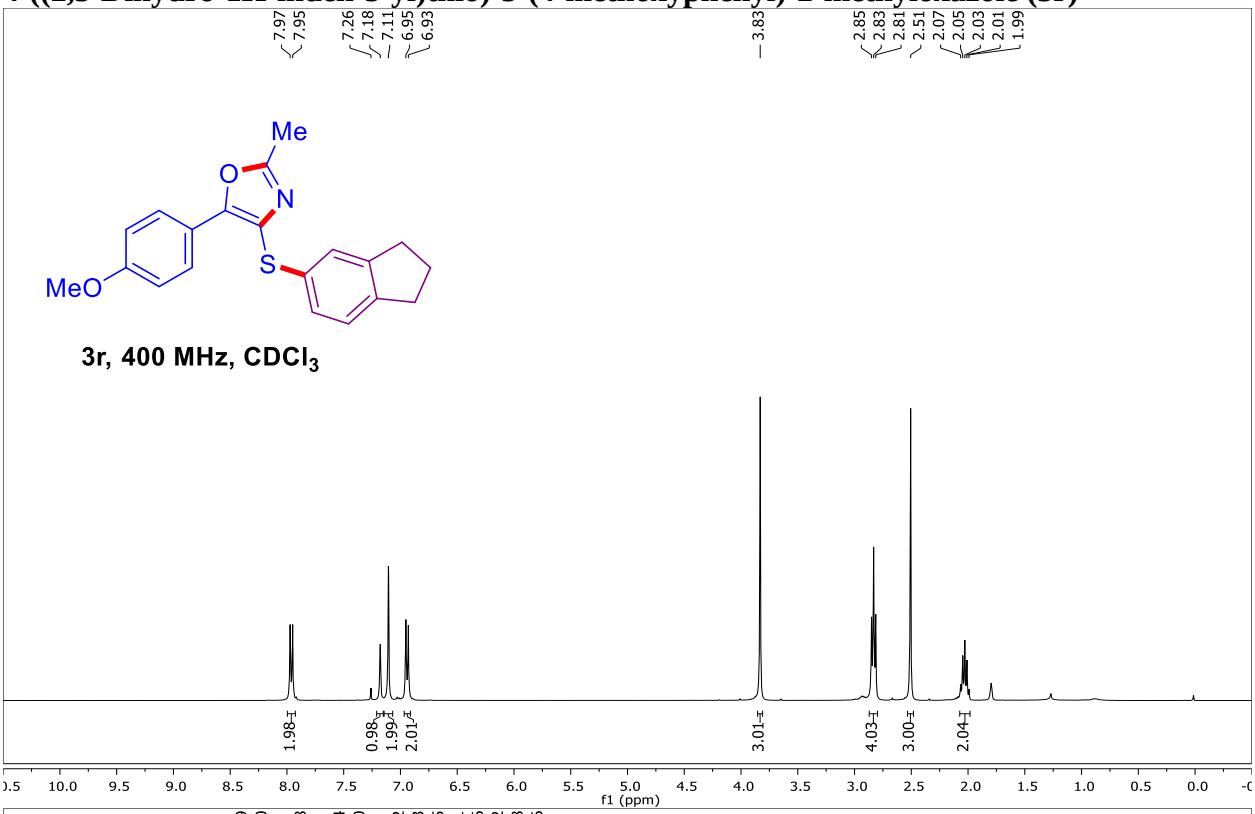


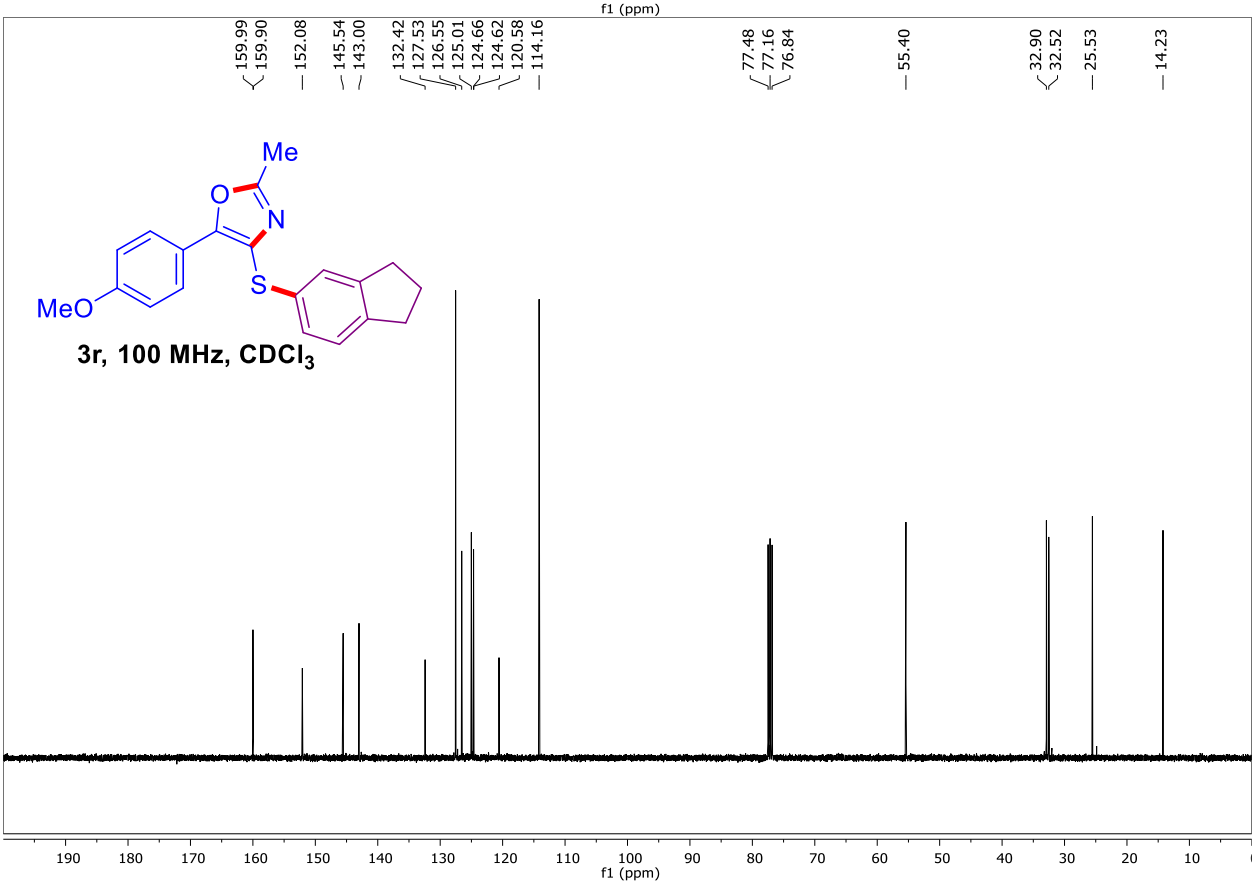
4-(Benzo[*d*][1,3]dioxol-5-ylthio)-5-(4-methoxyphenyl)-2-methyloxazole (3q)



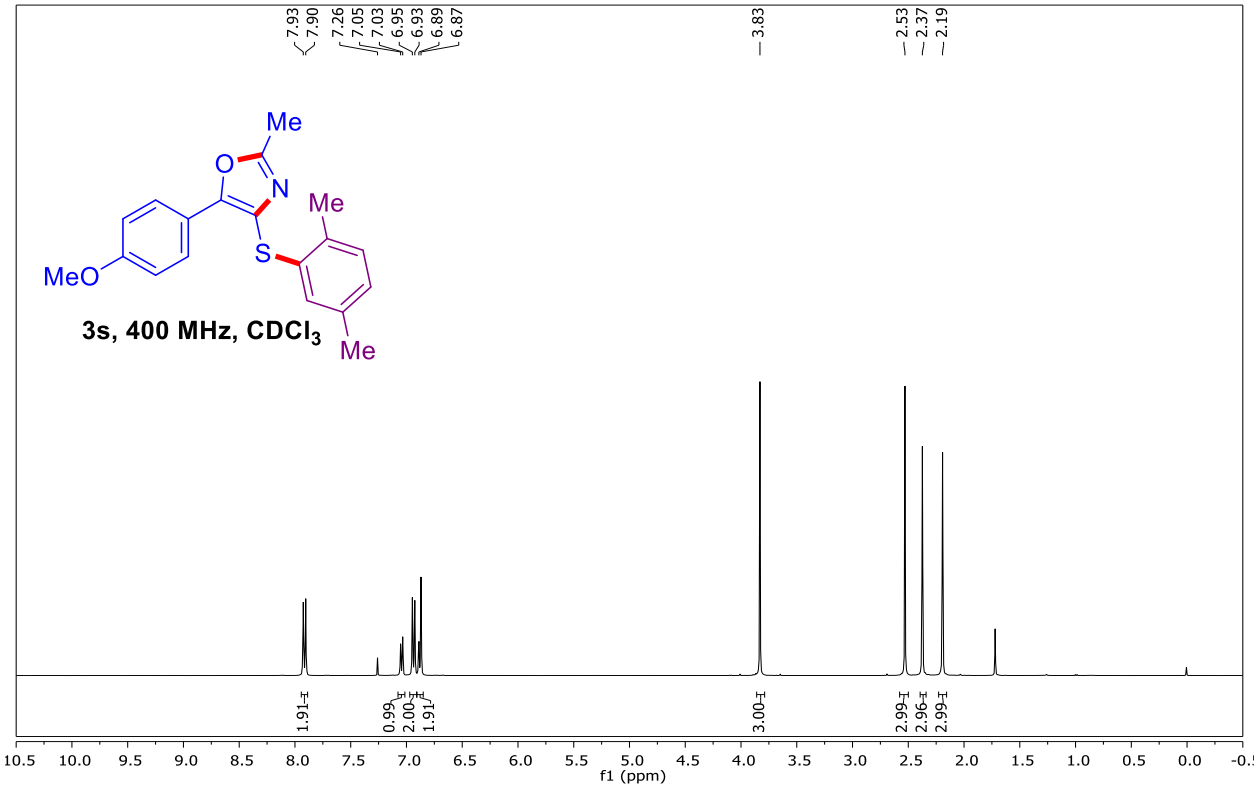


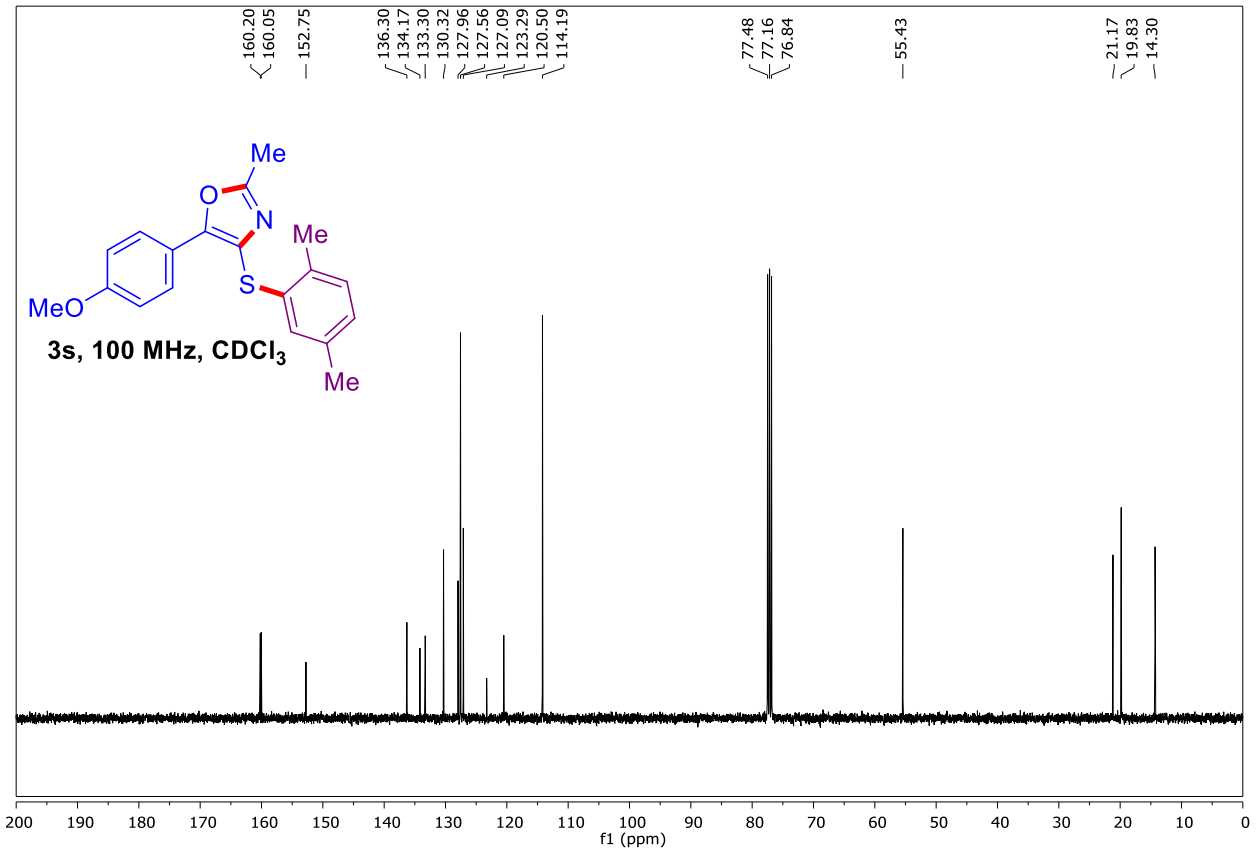
4-((2,3-Dihydro-1H-inden-5-yl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3r)



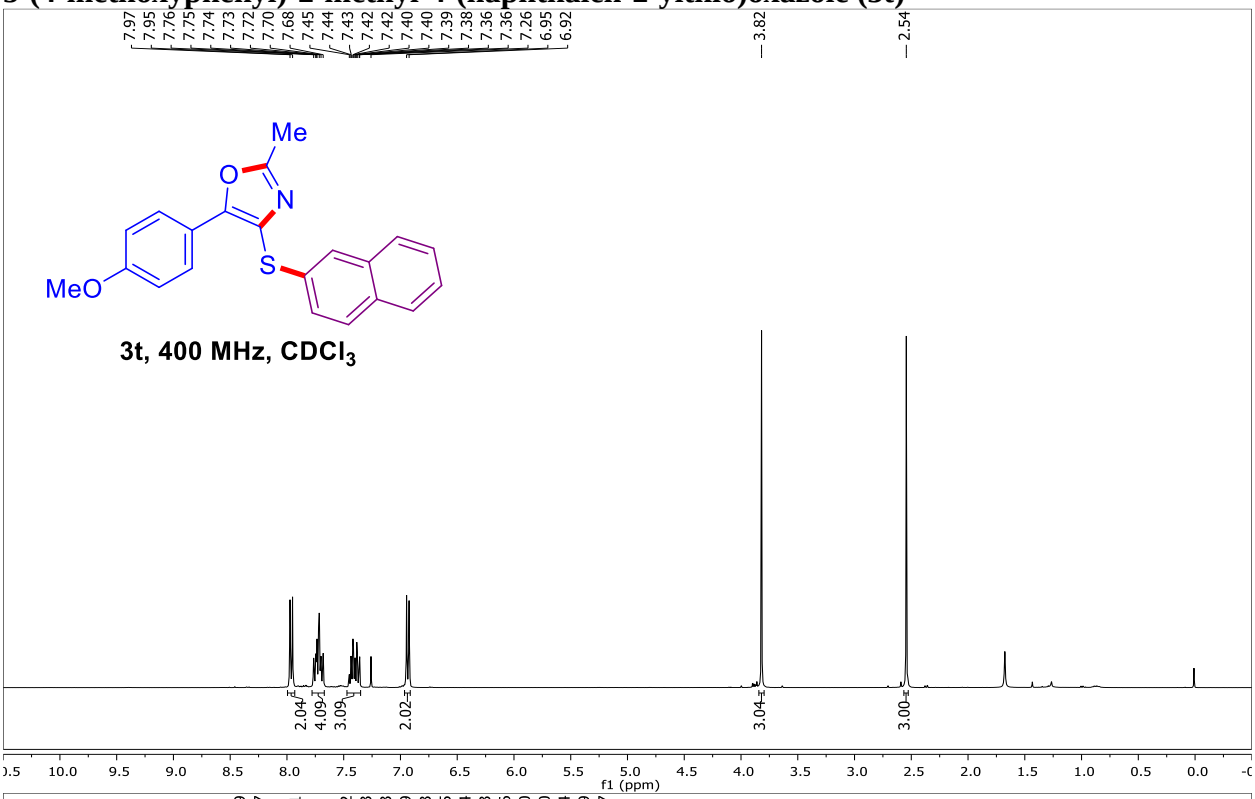


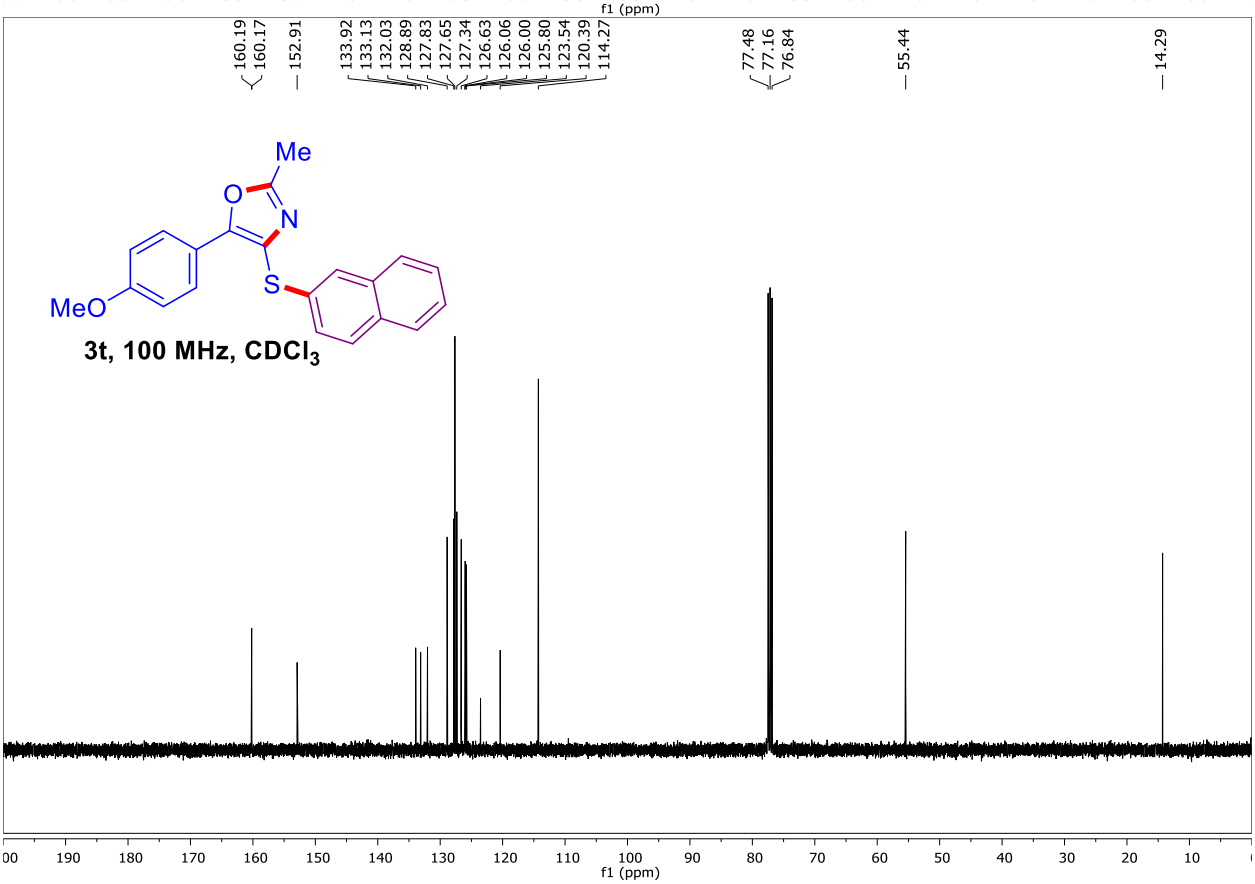
4-((2,5-Dimethylphenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3s)



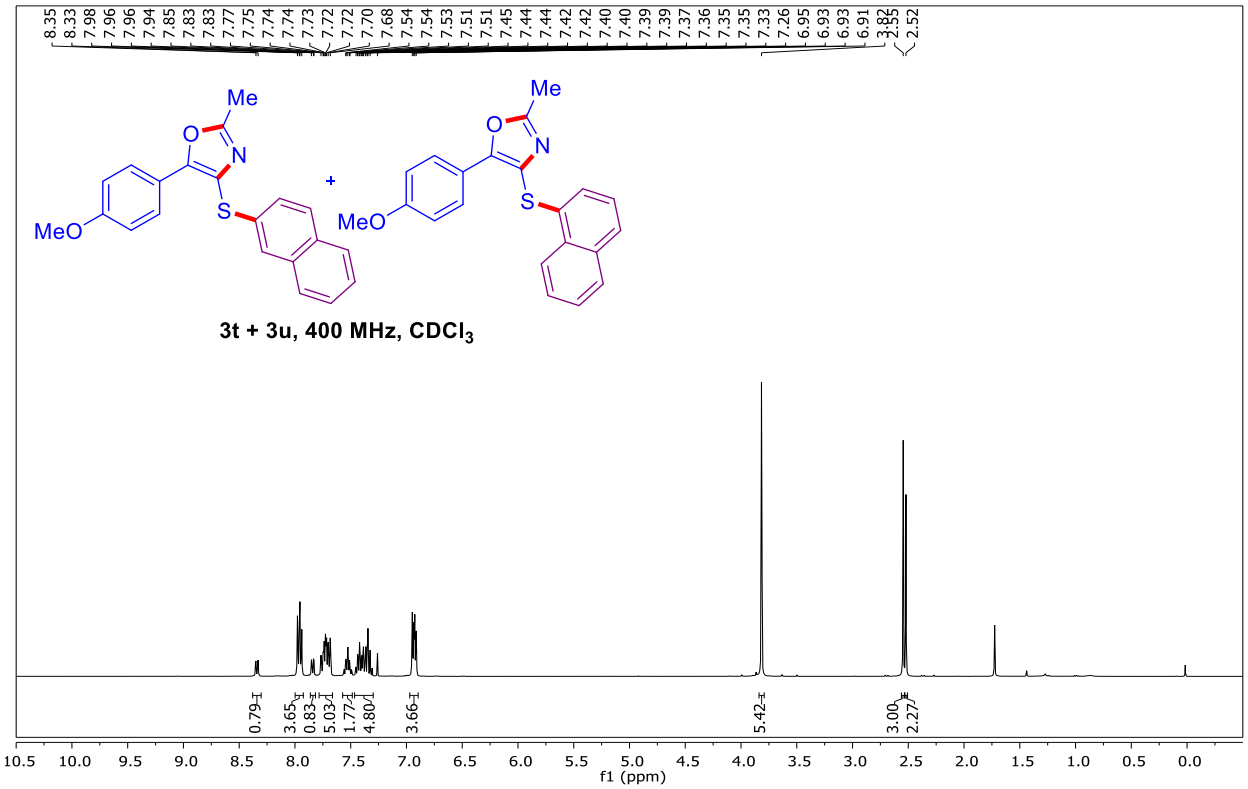


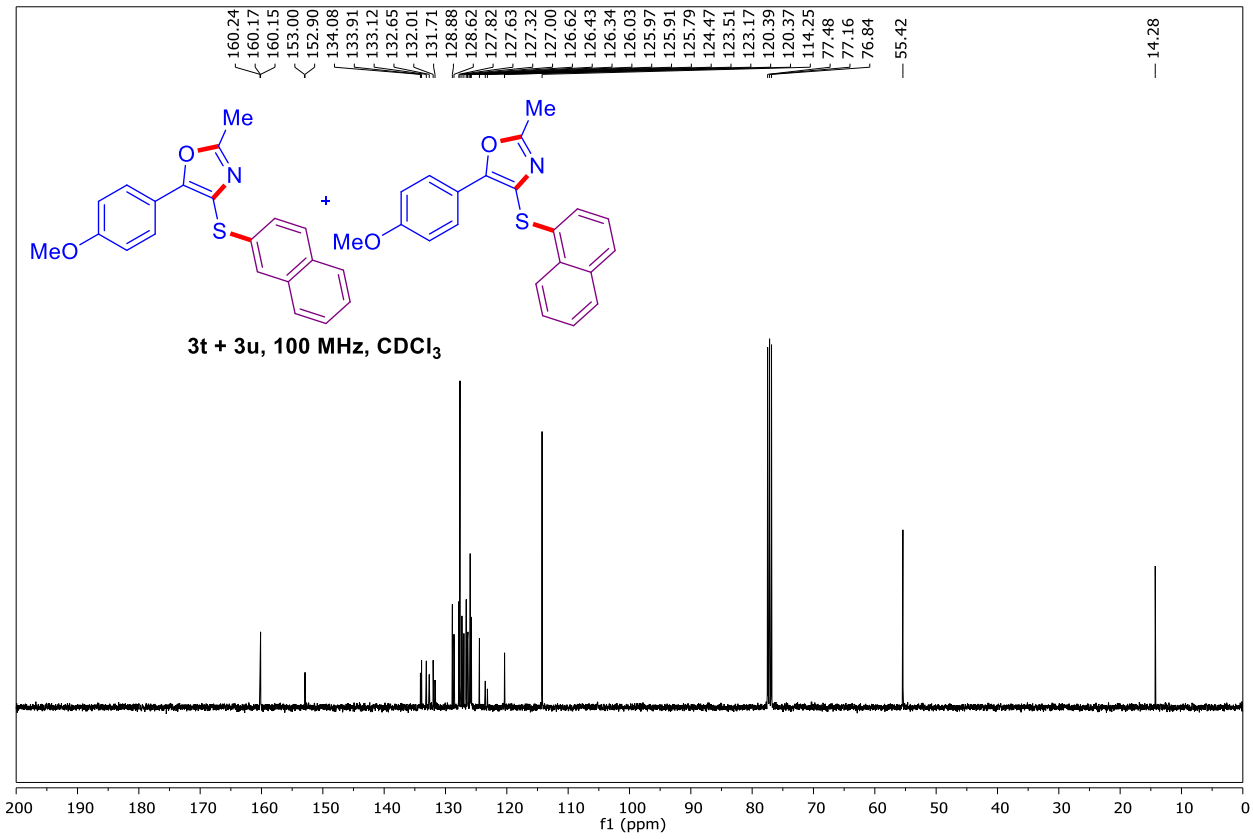
5-(4-methoxyphenyl)-2-methyl-4-(naphthalen-2-ylthio)oxazole (3t)



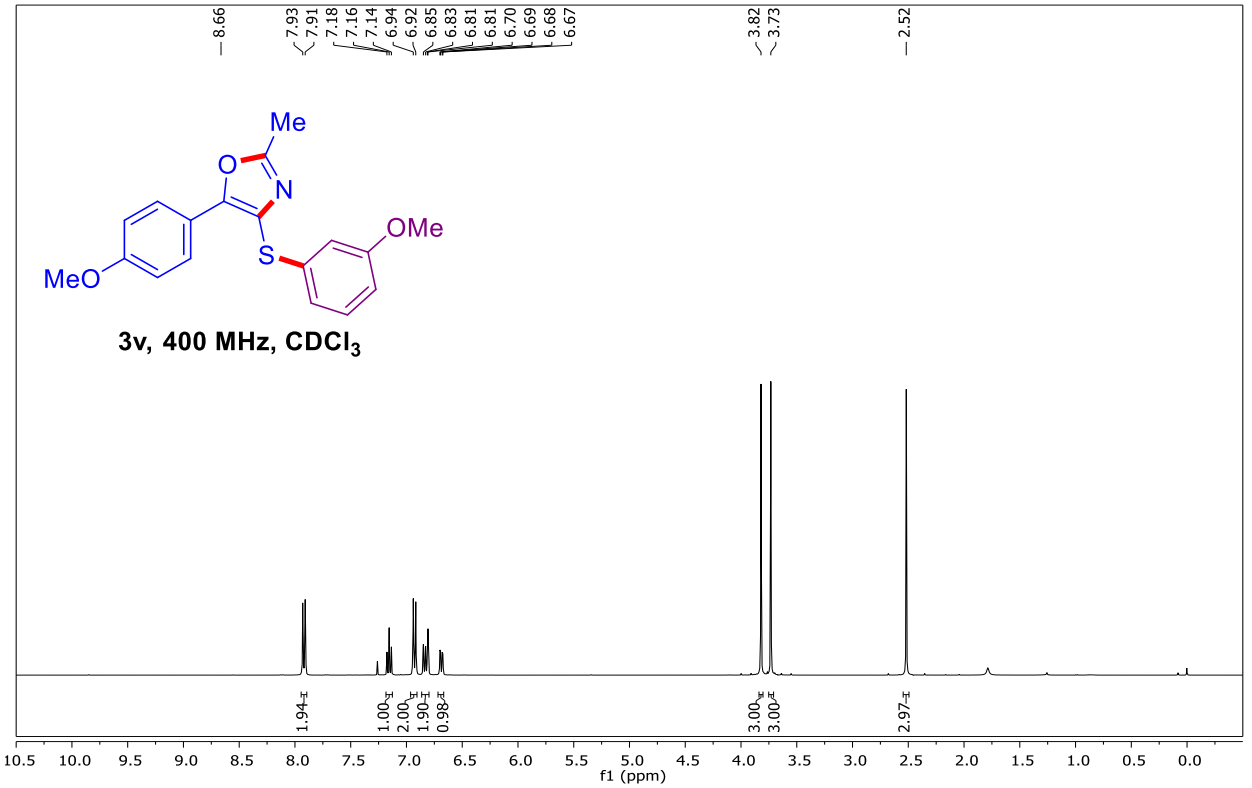


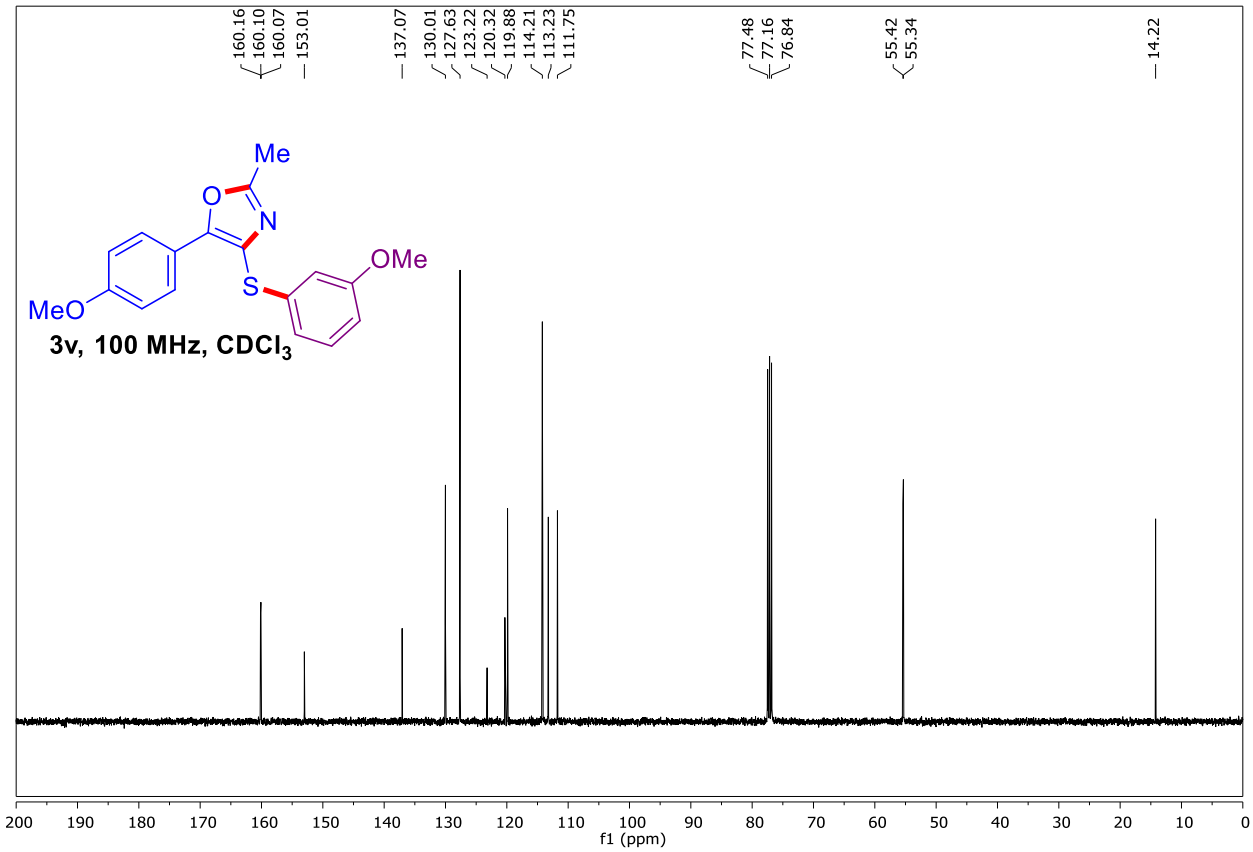
5-(4-Methoxyphenyl)-2-methyl-4-(naphthalen-2-ylthio)oxazole (3t) and
5-(4-methoxyphenyl)-2-methyl-4-(naphthalen-1-ylthio)oxazole (3u)



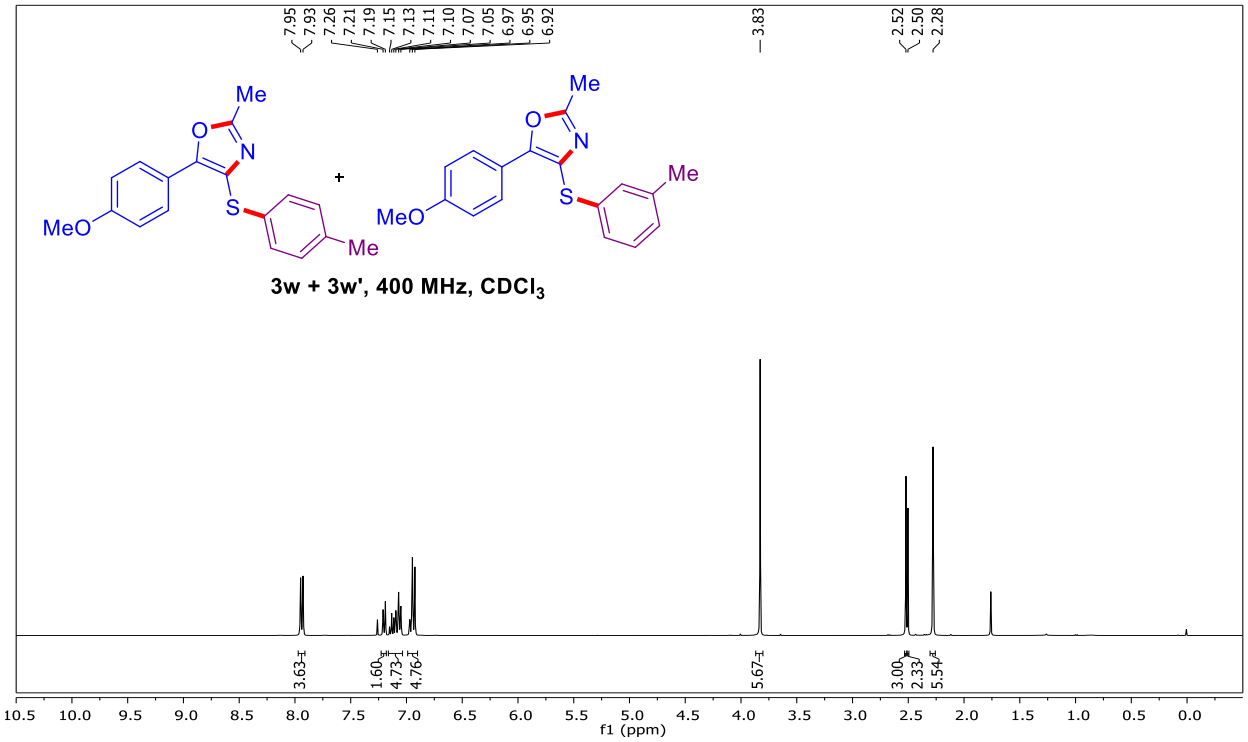


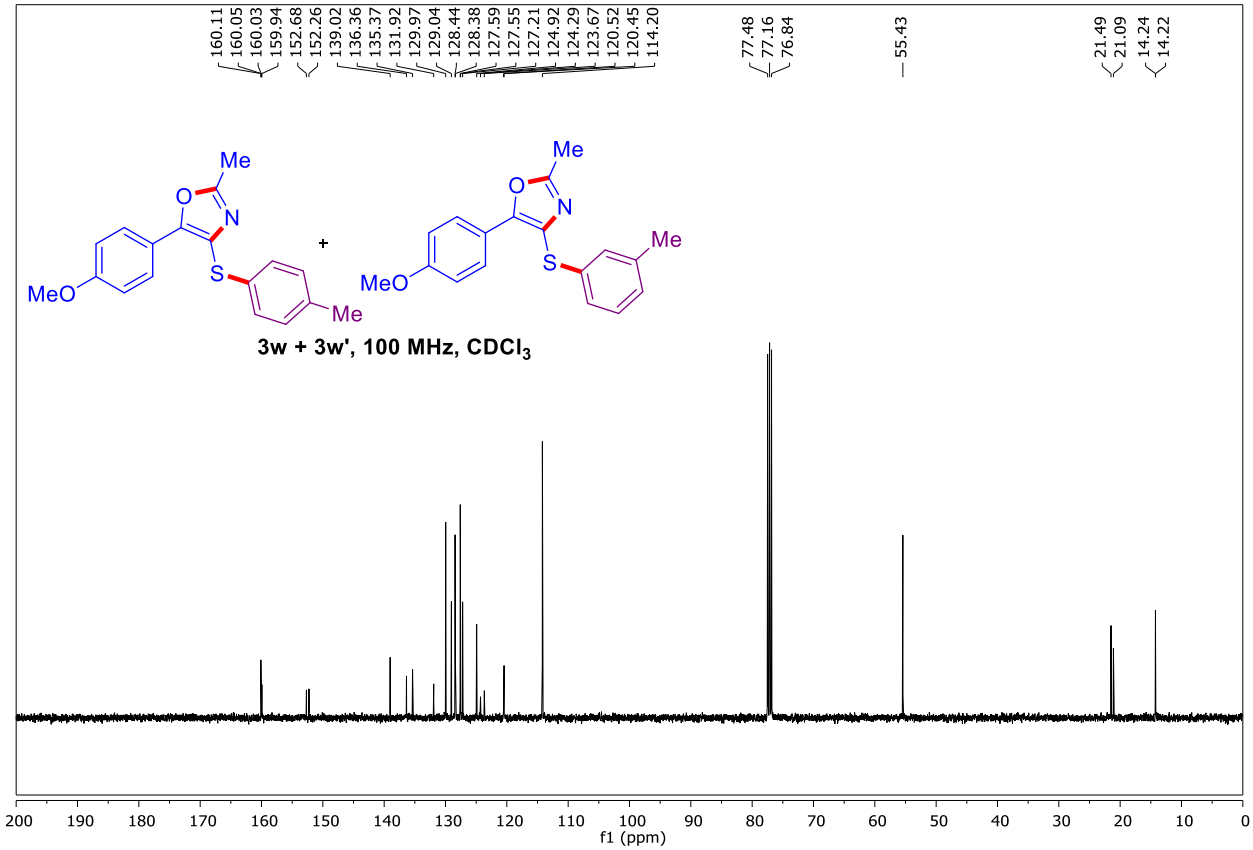
5-(4-Methoxyphenyl)-4-((3-methoxyphenyl)thio)-2-methyloxazole (3v)



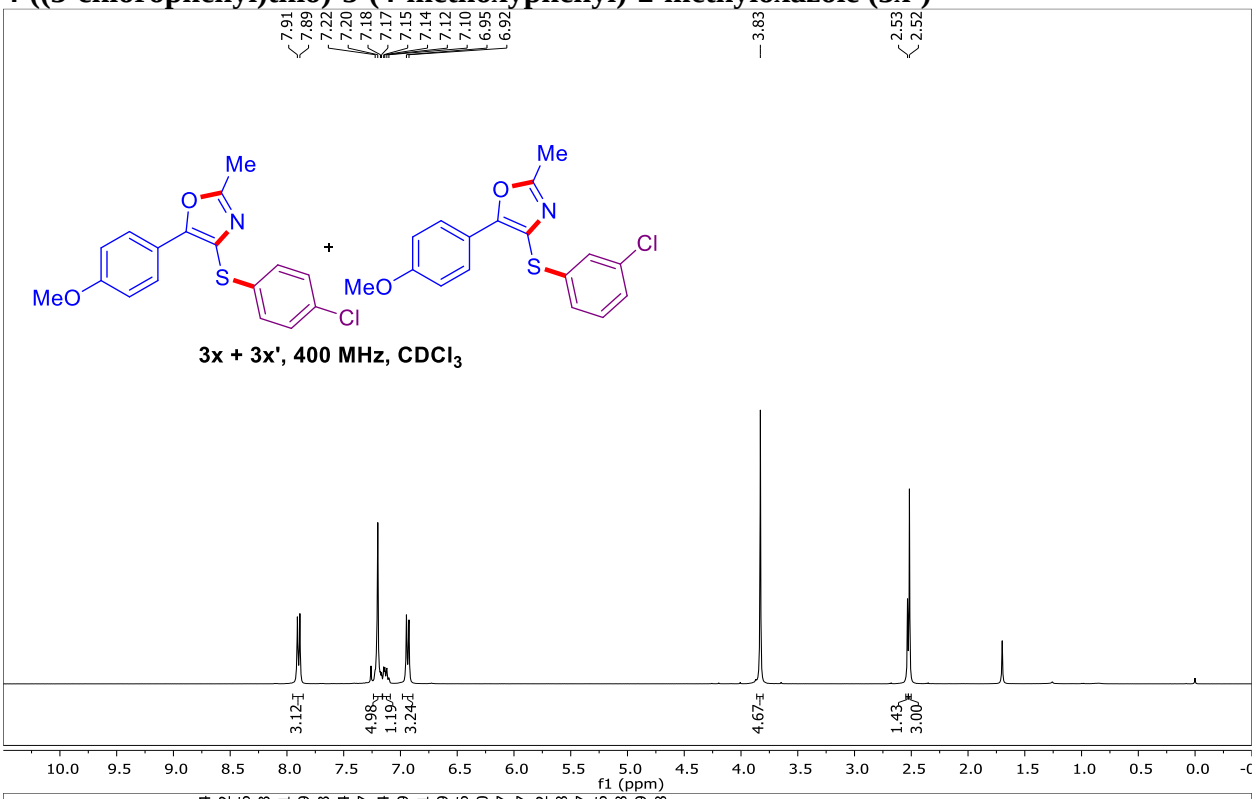


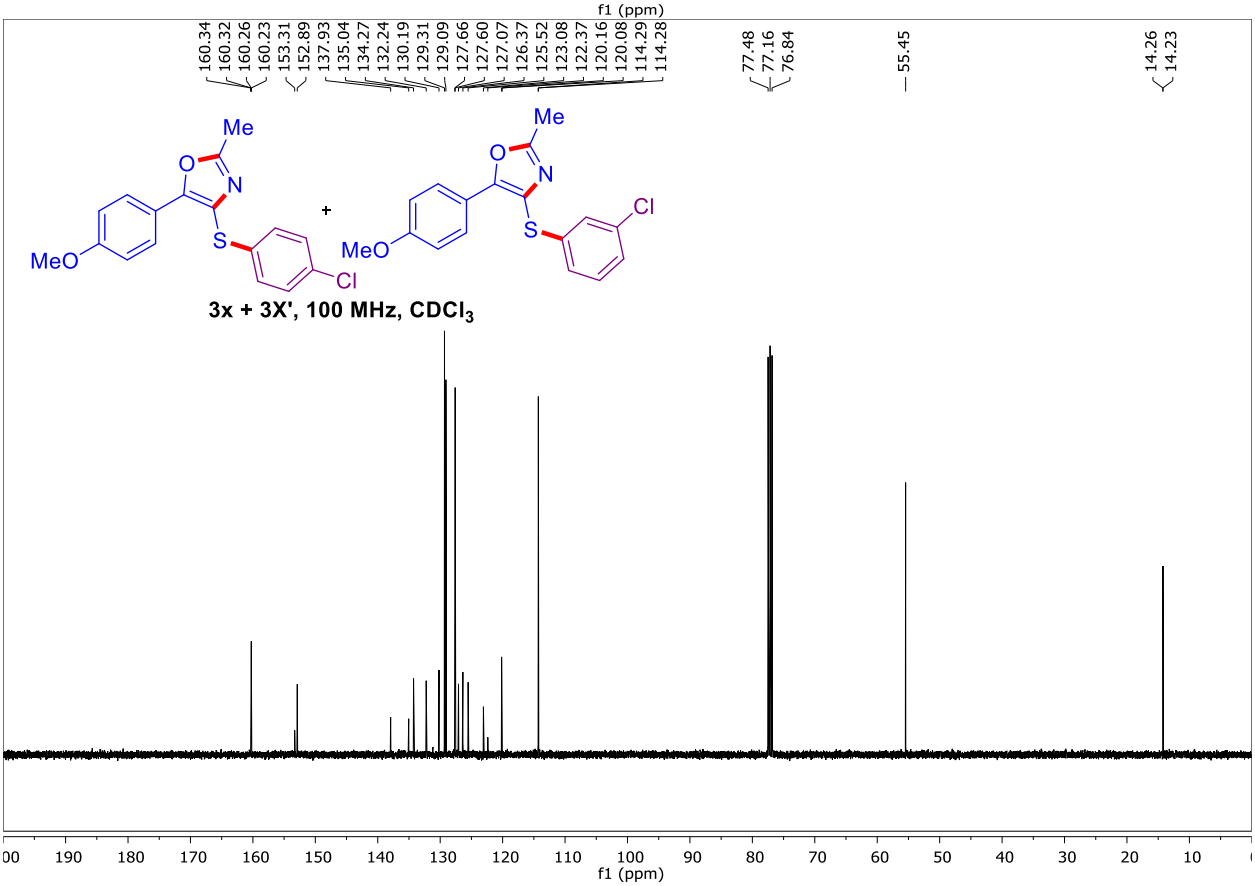
5-(4-Methoxyphenyl)-2-methyl-4-(*p*-tolylthio)oxazole (3w) and
5-(4-methoxyphenyl)-2-methyl-4-(*m*-tolylthio)oxazole (3w')



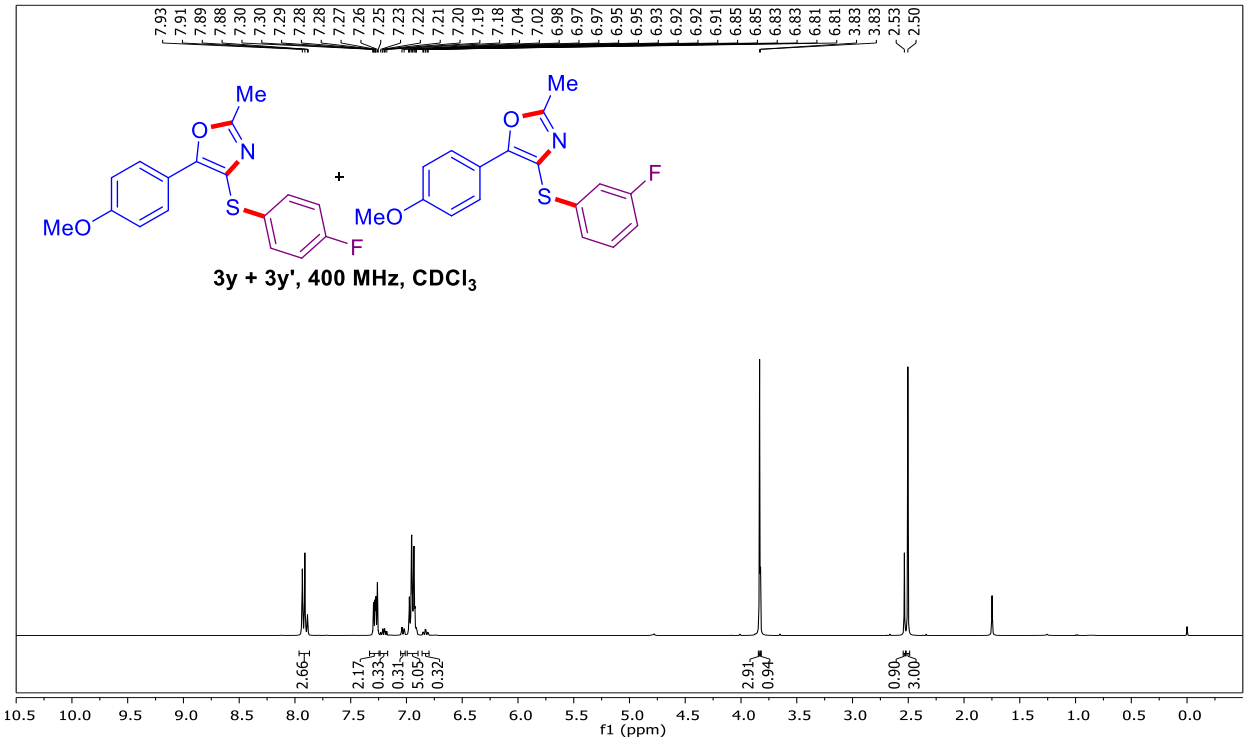


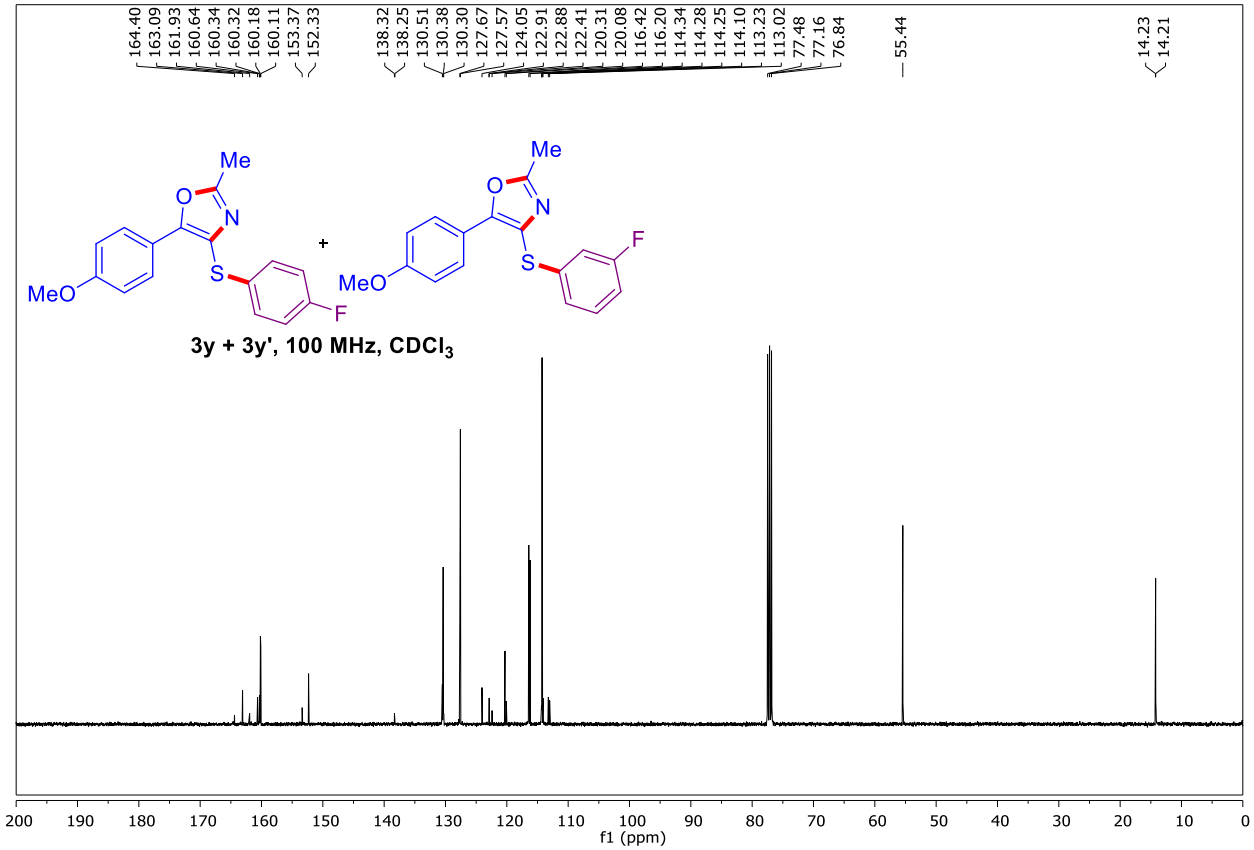
4-((4-Chlorophenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3x) and
4-((3-chlorophenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3x')



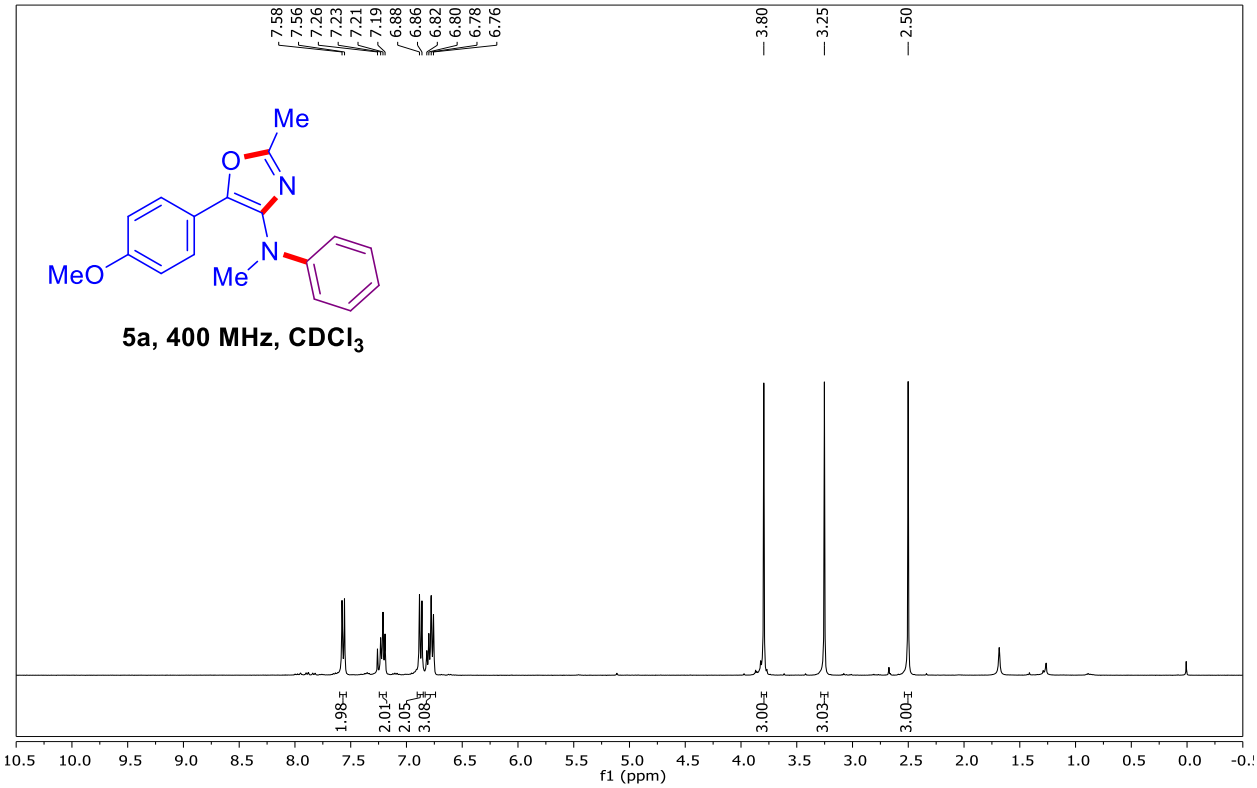


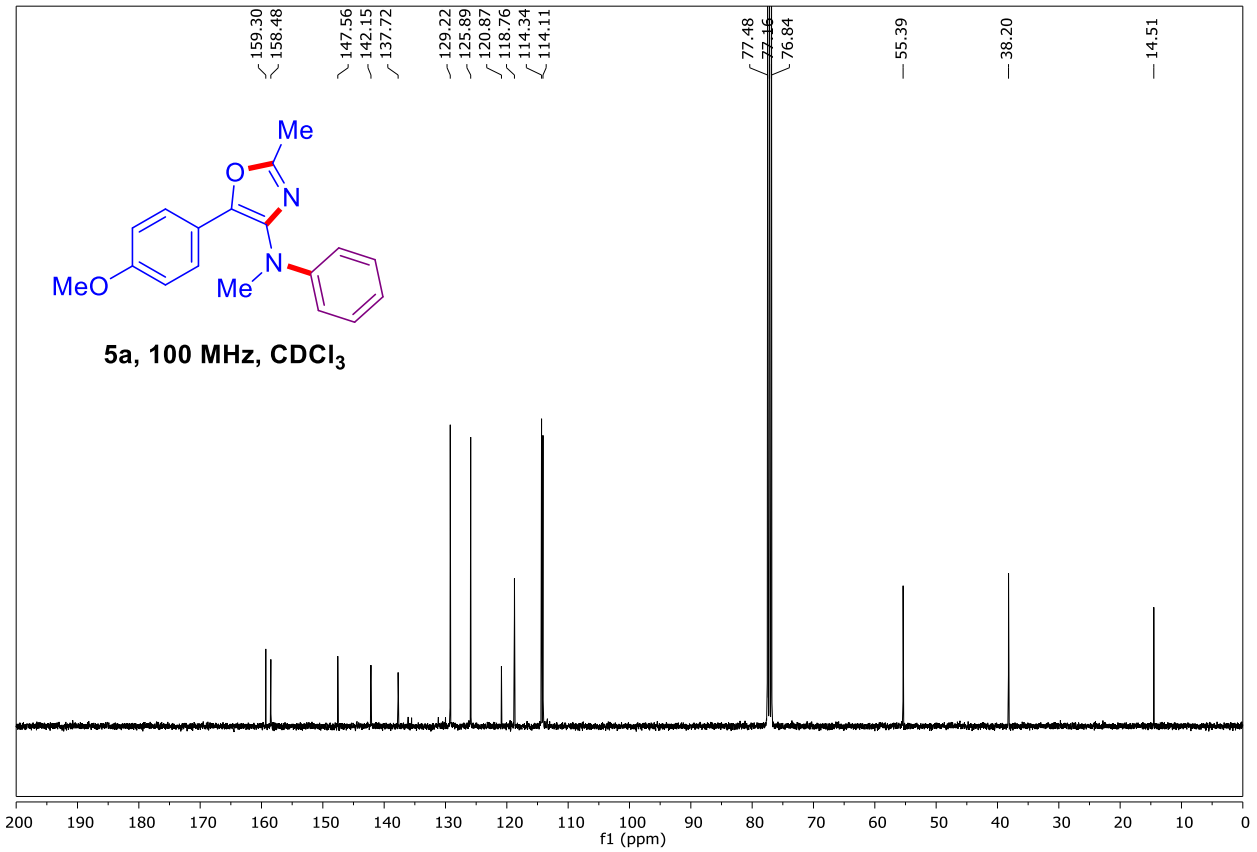
4-((4-Fluorophenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3y) and 4-((3-fluorophenyl)thio)-5-(4-methoxyphenyl)-2-methyloxazole (3y')



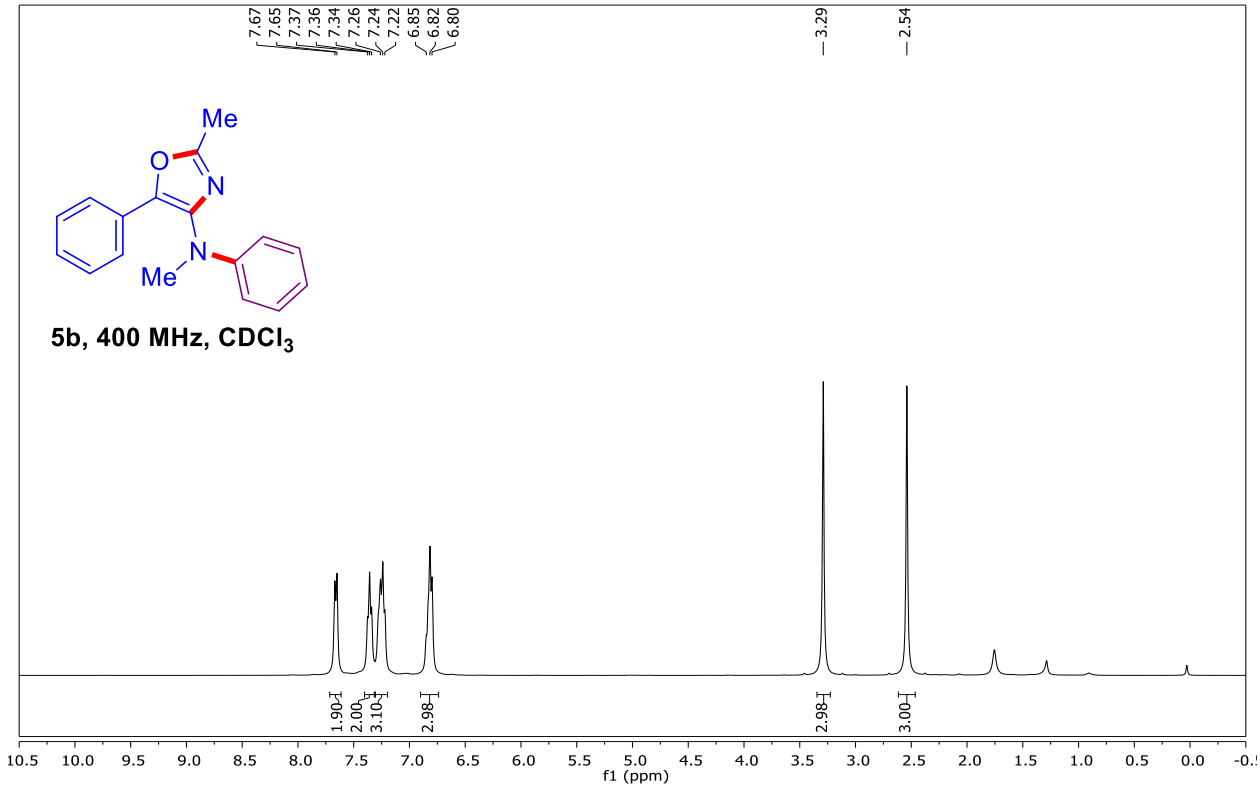


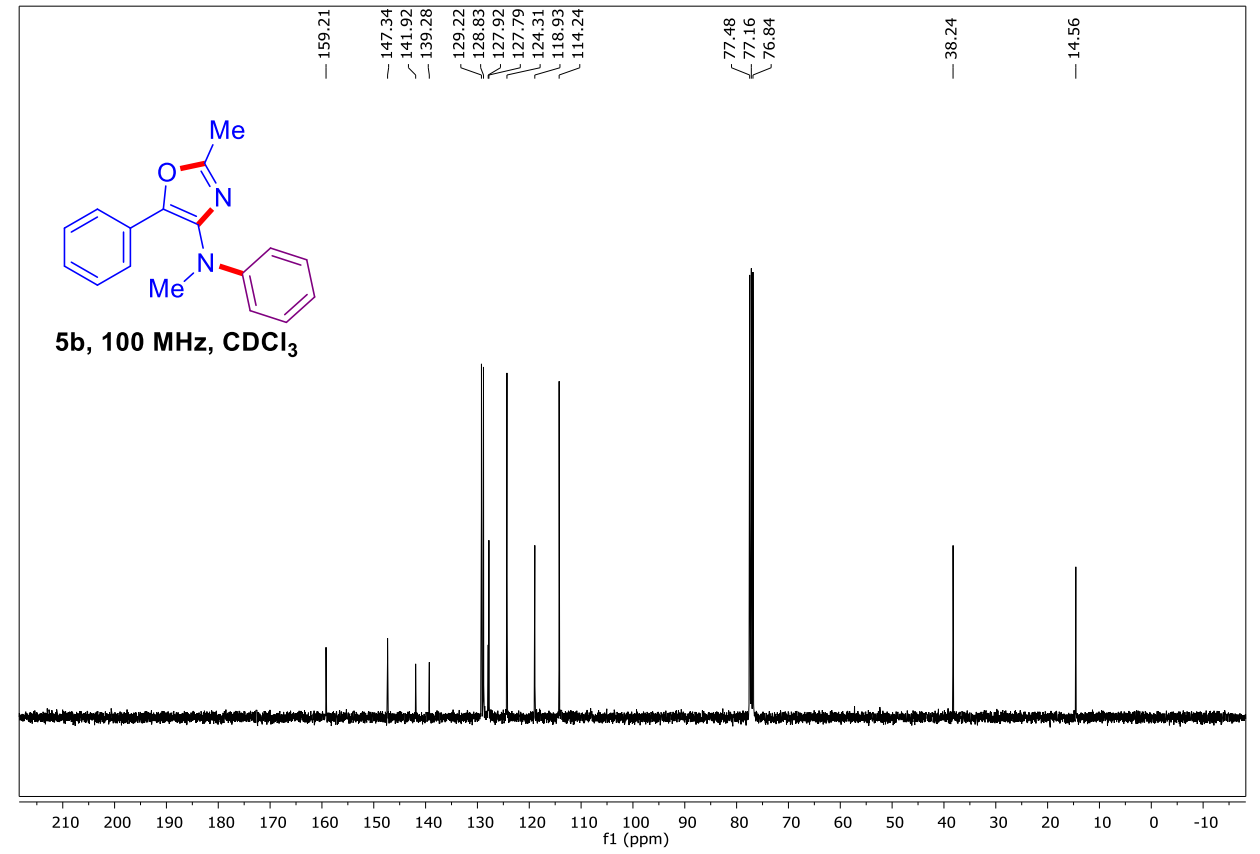
5-(4-Methoxyphenyl)-*N*,2-dimethyl-*N*-phenyloxazol-4-amine (5a)



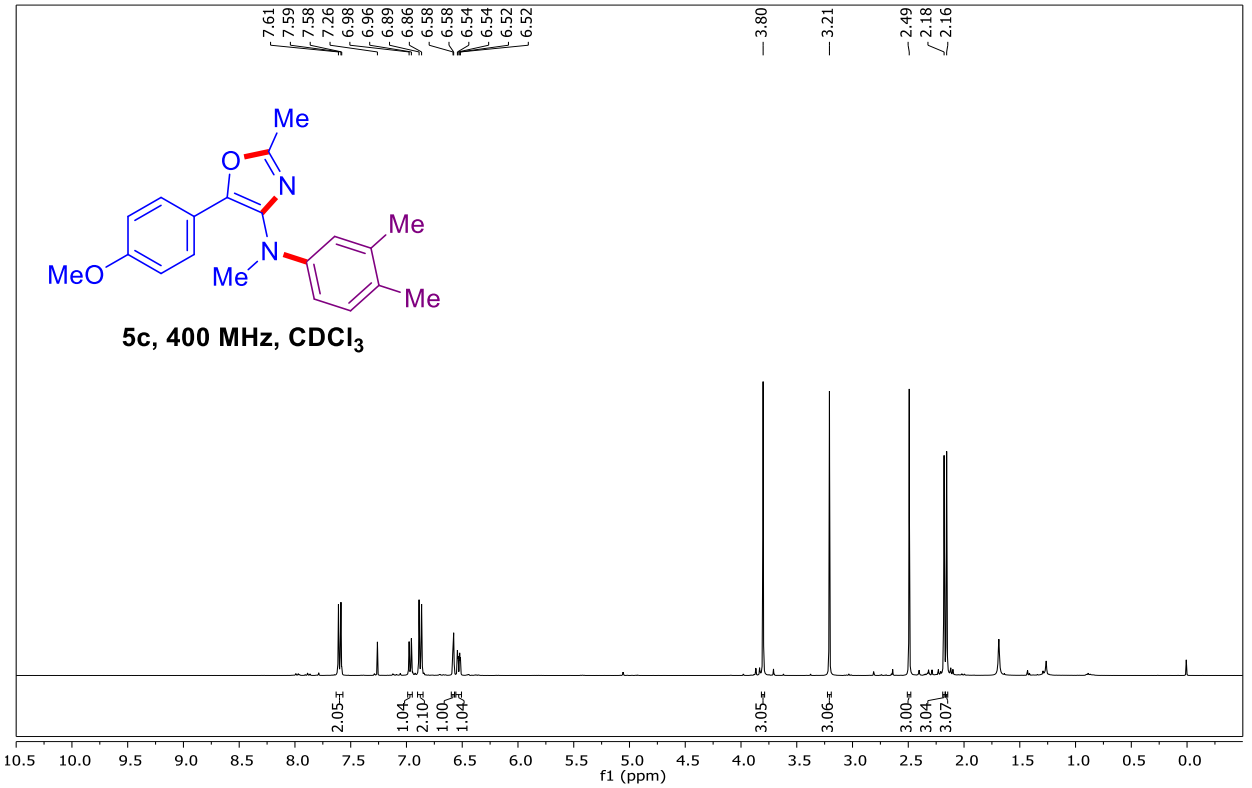


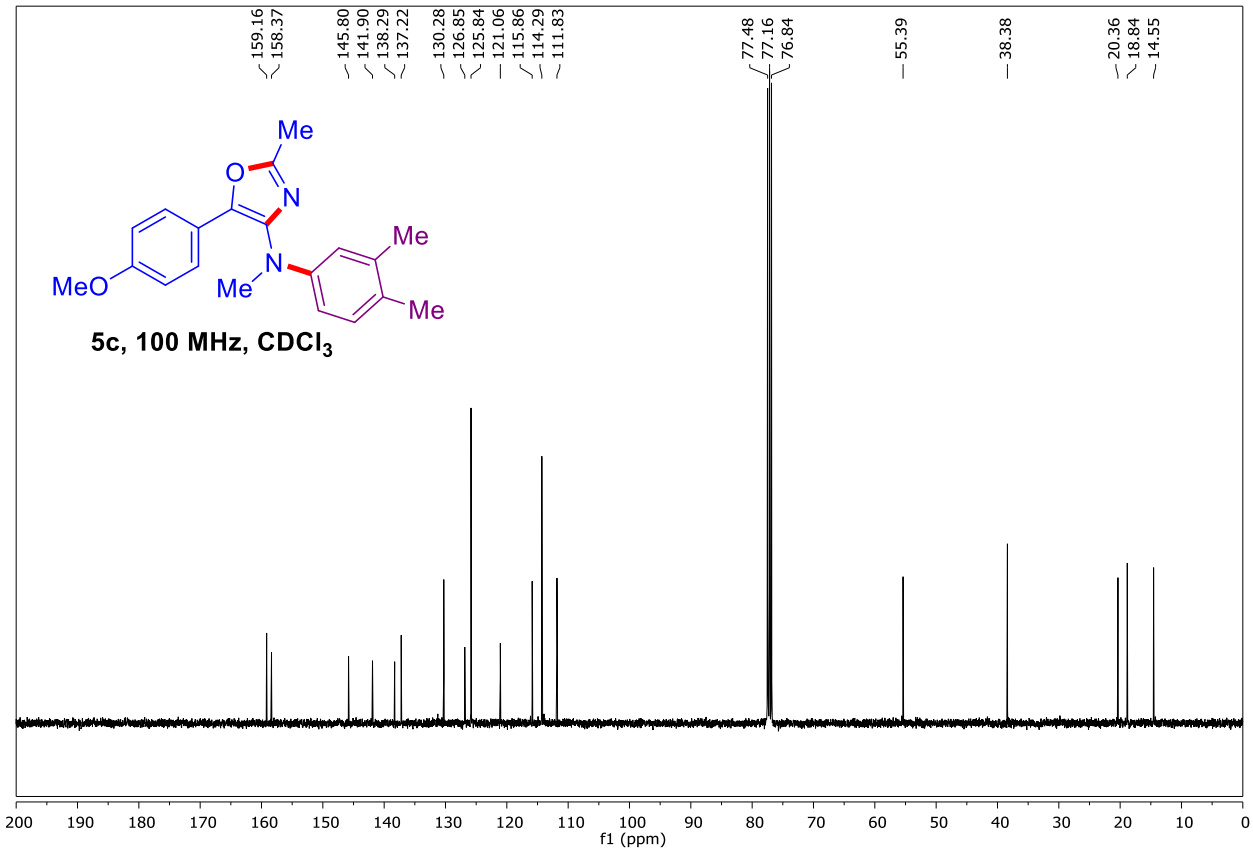
N,2-Dimethyl-*N*,5-diphenyloxazol-4-amine (5b)



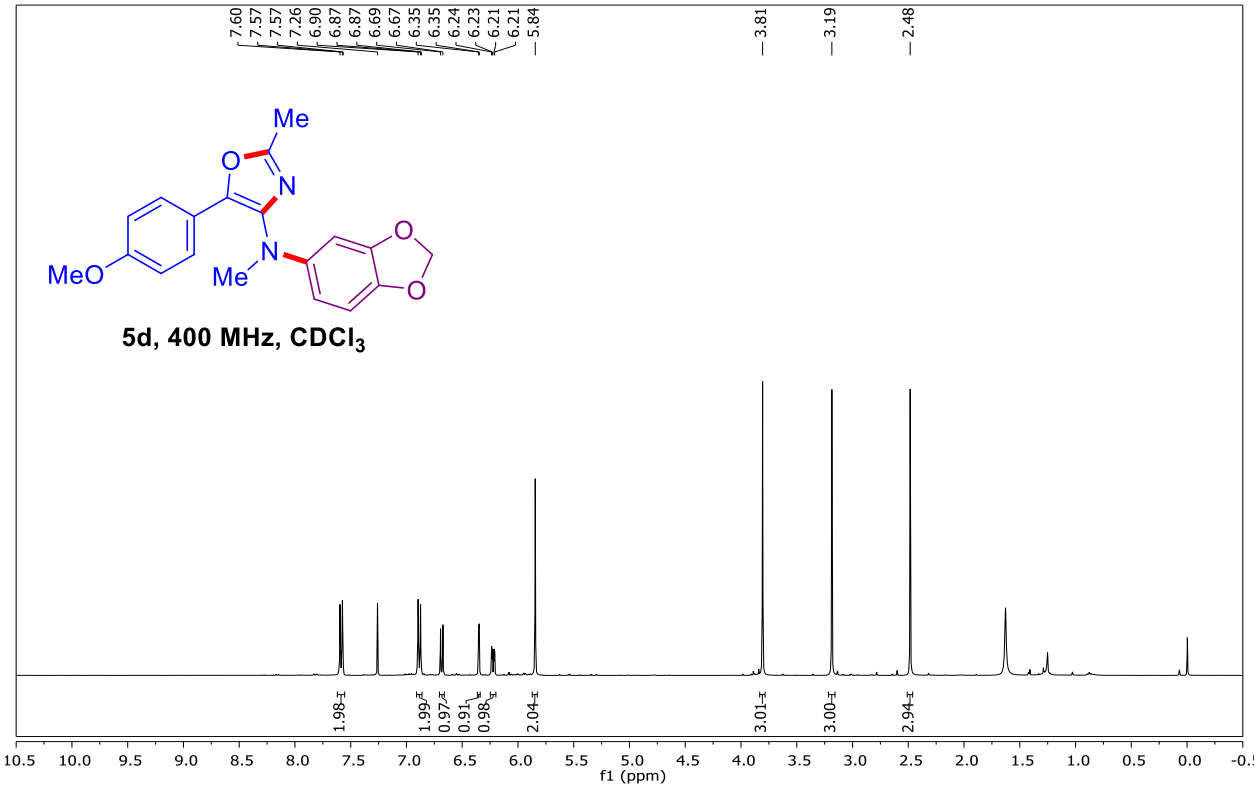


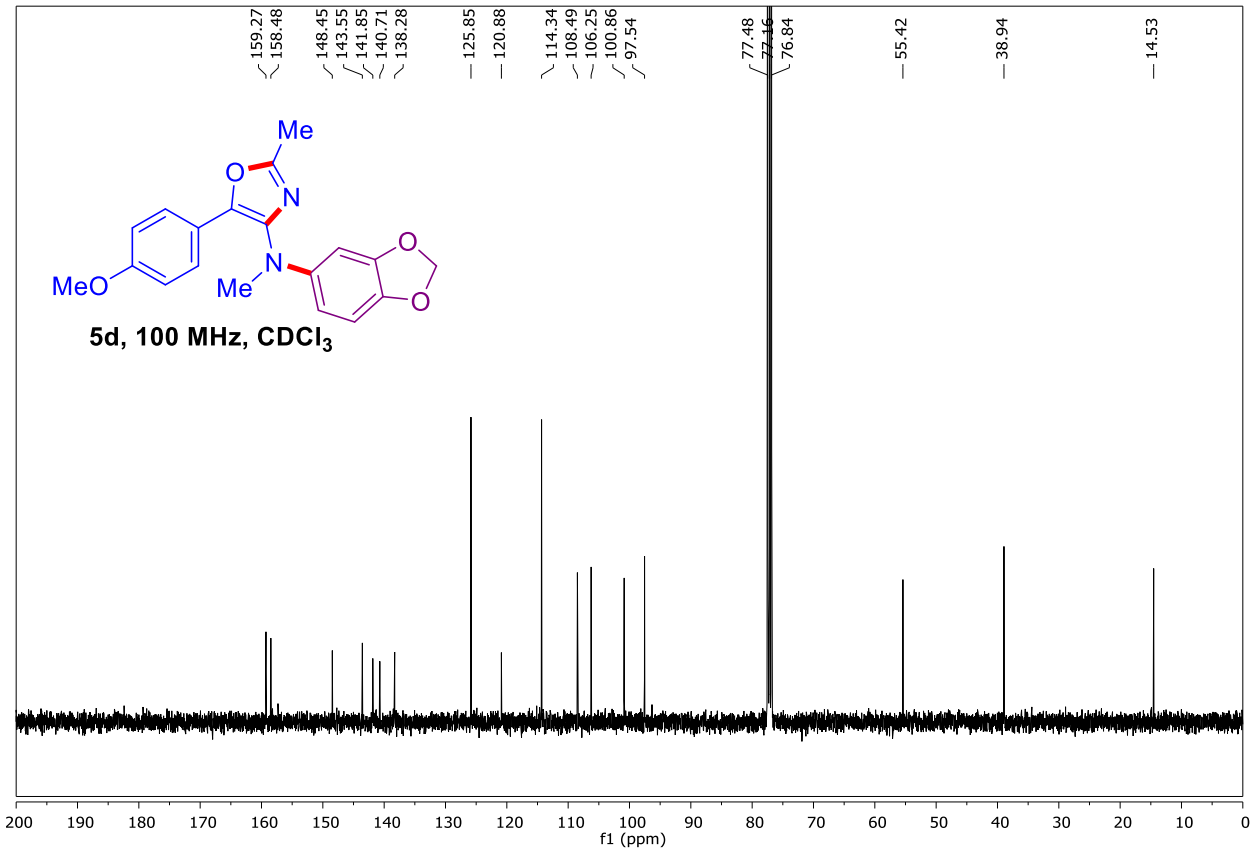
_N_-(3,4-Dimethylphenyl)-5-(4-methoxyphenyl)-_N_,2-dimethyloxazol-4-amine (5c)



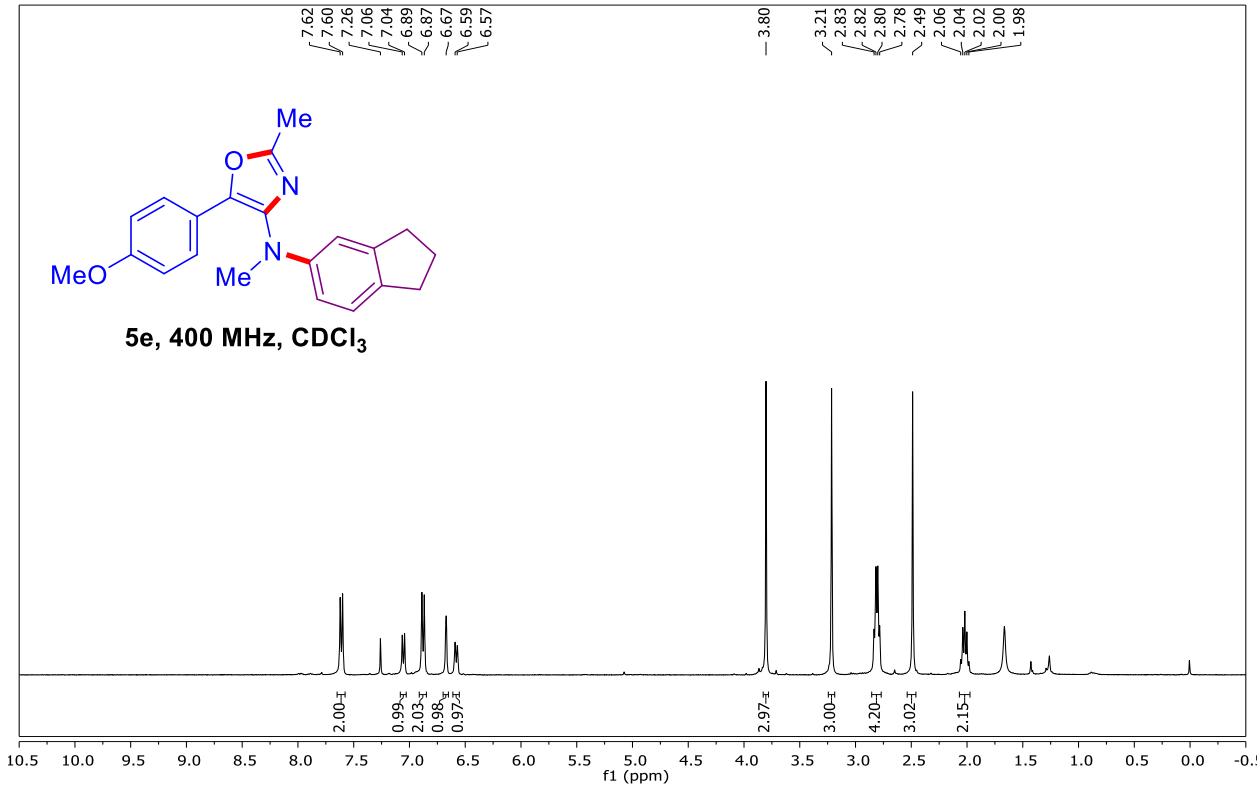


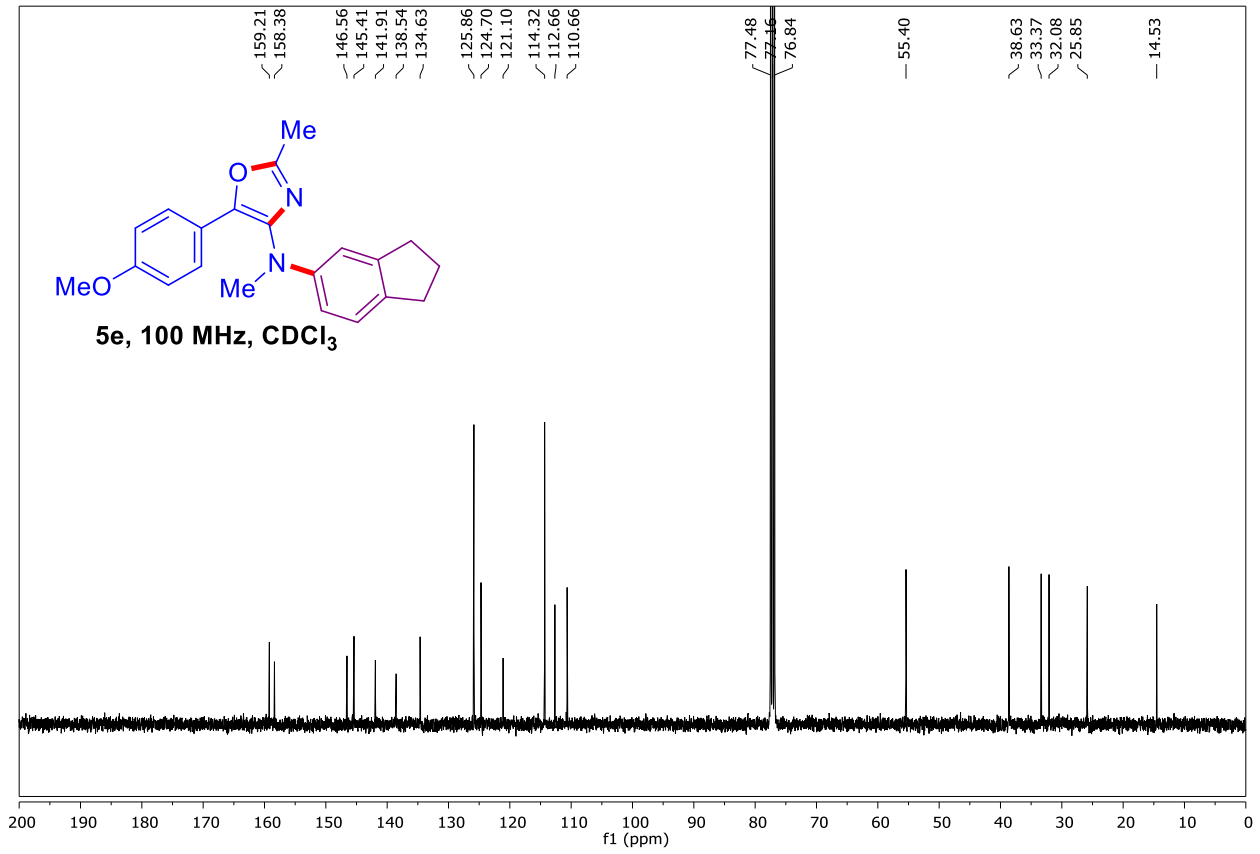
***N*-(Benzo[*d*][1,3]dioxol-5-yl)-5-(4-methoxyphenyl)-*N*,2-dimethyloxazol-4-amine (5d)**



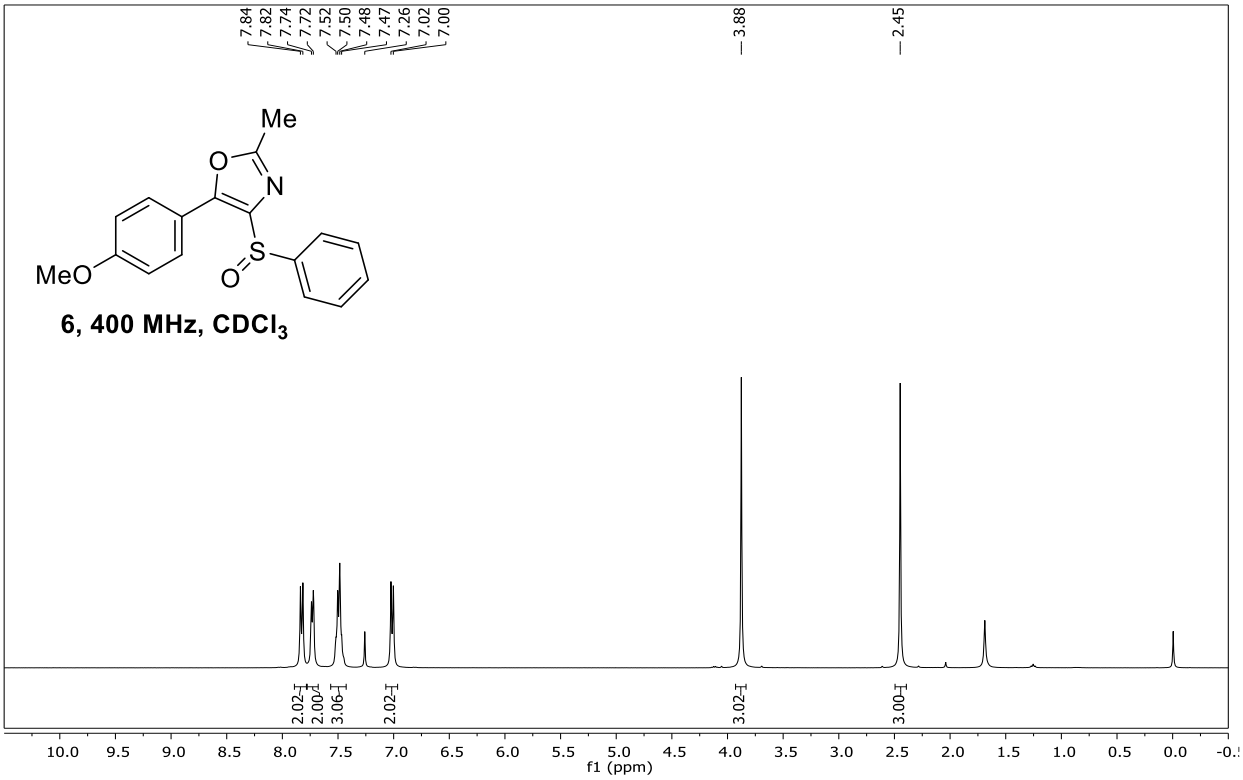


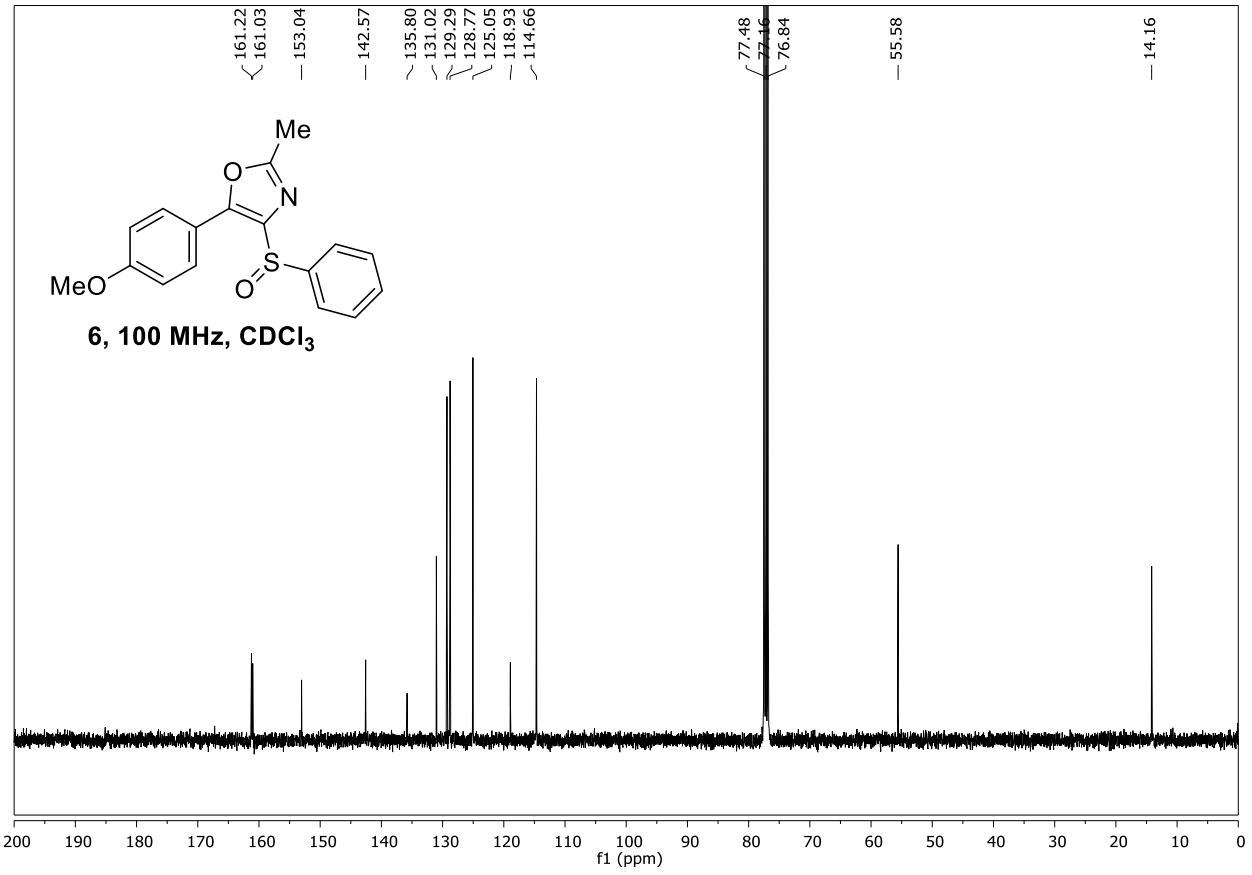
_N_-(2,3-Dihydro-1_H_-inden-5-yl)-5-(4-methoxyphenyl)-_N_,2-dimethyloxazol-4-amine (5e)





5-(4-Methoxyphenyl)-2-methyl-4-(phenylsulfinyl)oxazole (6)





5-(4-Methoxyphenyl)-2-methyl-4-(phenylsulfonyl)oxazole (7)