# Supporting Information

## An electrolyte free electrochemical C-H trifluoromethylation of 2-pyridones under batch and flow conditions

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# Table of Contents

## I. Materials and methods

Reagents and dry solvents were bought from Sigma Aldrich, Fisher scientific and Fluorochem and are used as received. Substituted 2-pyridones were synthesized using procedure from the literature.[1] Sodium triflinate salts **2** was purchased from ABCR.

The electrodes used in this work were bought from IKA (https://www.ika.com/en/Products-Lab-Eq/Electrochemistry-Kit-csp-516/ElectraSyn-20-Package-Accessories-cpacc-20008980/). For experiments using an ElectraSyn vial (10 mL, for 0.1 - 0.2 mmol scale), the dimensions of the electrodes were approximately W8 × D2 × H40 mm (with the submerged exterior surface of the electrode approximately W8 × D2 × H35 mm), unless otherwise stated.

For experiments using an ElectraSyn flow cell (https://www.ikaprocess.com/en/Products/Electro-Organic-Synthesis-Systems-cph-45/) the dimensions of the electrodes were W20 × H60 mm.

Electrolysis in batch was conducted using a DC power supply (OrigaFlex OGFPWR-OGF01A) in constant current mode. For the ElectraSyn flow cell a power supply Keysight E36104A was applied.

Flow-rate was regulated as a function of internal volume and residence time in the reactor thanks to the formula $Q = V/t_r$ were Q is the flow rate ($\mu L.min^{-1}$), V the internal volume of the reactor and $t_r$ the residence time in the reactor. The different flow rates of the reactions were regulated using a Chemyx Inc Fusion 200-X syringe pump fitted with Disposable syringes (20 mL) from HENKE-JECT® luer-lock purchased from VWR Scientific. All capillary tubing and microfluidic fittings were purchased from IDEX Health & Science *via* CIL (Cluzeau Info Lab).

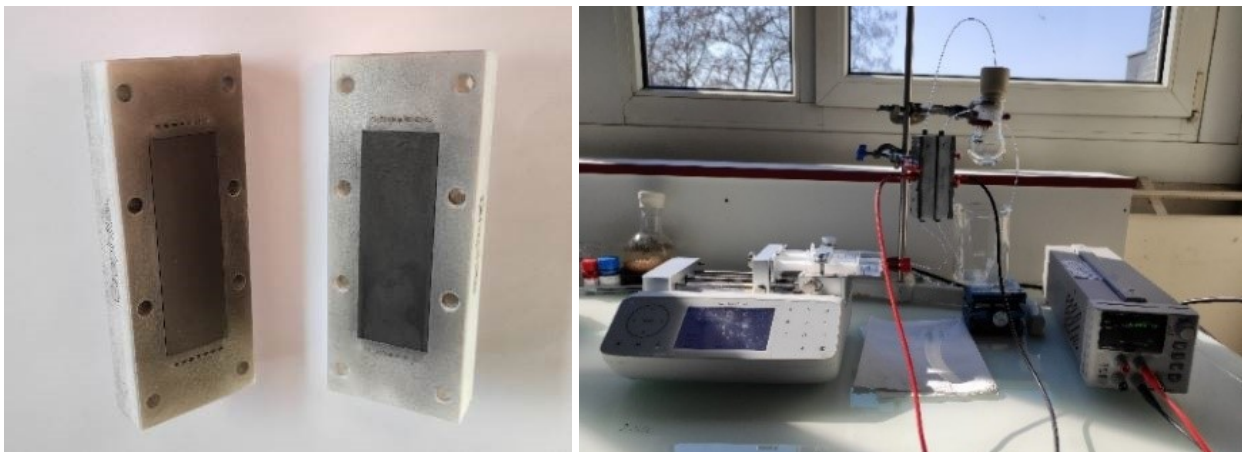


**Figure S1: left: Graphite Electrodes and right: experimental set-up for the electrochemical trifluoromethylation in flow**

Analytical thin-layer chromatography (TLC) were performed on 0.25 mm E. Merck silica plates (60F-254), using short-wave UV light as the visualizing agent, and KMnO4 and heat as developing agents. Column chromatography was performed using E. Merck silica gel (60, particle size 0.043–0.063 mm).

$^{1}H$, $^{19}F$ and $^{13}C$ NMR spectra were recorded on a Bruker AVANCEIIIHD 300 spectrometer at 300 MHz for $^{1}H$, 282 MHz for $^{19}F$ and 75 MHz for $^{13}C$ and calibrated using residual undeuterated solvent ($CDCl_3$ at 7.26 ppm $^{1}H$ NMR, 77.16 ppm $^{13}C$ NMR). Chemical shifts of $^{1}H$ NMR and $^{13}C$ NMR were recorded in parts per million (ppm, δ) relative to solvent signal. The following abbreviations are used for the proton spectra multiplicities: s=singlet; d=doublet; t=triplet; q=quartet; m=multiplet. Coupling constant are reported in hertz (Hz). NMR data was processed using the MestReNova 14.2.1 software packages. Known products were characterized by comparing to the corresponding $^{1}H$ NMR and $^{13}C$ NMR from literature. High-resolution mass spectra (HRMS) were recorded with a Maxis Bruker 4G instrument and were performed in positive mode with an ESI source on a Q-TOF mass spectrometer with an accuracy tolerance of 2 ppm. The names of all products were generated using the PerkinElmer ChemDraw Professional v.19.1.1.21 software package

## II. Process Green Metrics and Sustainability Qualitative Indicators

**Table S1: Qualitative sustainability indicators and green metrics for reported trifluoromethylation processes of 2-pyridones**

| Entry | Indicator | $CF_3CO_2H/XeF_2$[2] | $CF_3SO_2Na/Mn(OAc)_3$[3] | $TMSCF_3/KF/PIFA/Cu(OAc)_2$[1] | Togni reagent/$FeCl_2$[4] | TFFA/Pyridine N-Oxyde /$Ru(bpy)_3Cl_2$[5] |
|---|---|---|---|---|---|---|
| 1 | Type of Reaction | Stoichiometric Reagent[a] | Stoichiometric Reagent[b] | Stoichiometric Reagent[c] | Metal Catalysis[d] | Light (photoredox catalysis)[e] |
| 2 | T °[C] | 35 °C | 25 °C | r.t. | 35 °C | 35 °C |
| 5 | Ranking Solvent[f] (CHEM21) | $CH_2Cl_2$ | $CH_3CO_2H$ | $CH_3CN$ | $CH_2Cl_2$ | $CH_3CN$ |
| 6 | Health and safety Concerns[g] | $CF_3CO_2H$: H314, H332<br>$XeF_2$: H272, H301, H344, H330 | $CF_3SO_2Na$: H315, H319<br>$Mn(OAc)_3$: - | $TMSCF_3$: H225, H261<br>KF: H301, H311, H331, H318<br>PIFA: H315, H319, H335<br>$Cu(OAc)_2$: H302, H314, H410 | Togni reagent: H315, H319, H335, H373<br>$FeCl_2$: H302, H318 | TFFA: H314, H332, H412<br>Pyridine N-oxyde: -<br>$Ru(bpy)_3Cl_2$: - |
| 7 | Environmental implications | H412 | No | H402 | No | H412 |
| 8 | Flow process | NO | NO | NO | NO | Yes |
| 9 | Yield (%) | 40 | 55 | 50 | 32 | 54 |
| 10 | Atom Economy (%) | 51.8 | 48.0 | 31.0 | 53.3 | 49.8 |
| 11 | PMI reaction[g] | 36.3 | 124.4 | 134.7 | 97.9 | 32.7 |
| 12 | PMI (Sans Solvant)[g] | 3.8 | 8.5 | 9.9 | 9.5 | 6.4 |
| 13 | EcoScale[h] | 32 | 63.5 | 51 | 43 | 51 |
| 14 | E factor[g] | 44.8 | 7.2 | 7.2 | 3.6 | 3.2 |
| 15 | Reagents Cost (€ per mol of Product)[i] | 53 K€ | 6.7 K€ | 15 K€ | 69 K€ | 2.0 K€ |

[a]Process described in reference 2 (exemple 9A), [b]Process described in reference 3 (exemple **5a**), [c]Process described in reference 1 (exemple **2j**), [d]Process described in reference 4 (exemple **3j**), [e]Process described in reference 5 (exemple 18), [f]see *Green Chem.*, **2016**, *18*, 288–296, [g] see *Green Chem.*, **2015**, *17*, 3111–3121, [h]see *Beilstein J. Org. Chem.* **2006**, *2*, No. 3. doi:10.1186/1860-5397-2-3, [i]The calculations were performed based on the largest quantity available in the 2022 Aldrich website.

| Entry | | $CF_3CO_2H$/$(4\text{-}ClPh)_2SO$ /$Ru(bpy)_3Cl_2$[6] | $CF_3SO_2Na$/ AQN-2-$CO_2H$/ $CF_3CO_2H$[7] | $CF_3I$/ Bithiophene derivative/TMEDA[8] | **$CF_3SO_2Na$** |
|---|---|---|---|---|---|
| 1 | Type of Reaction | Light (photoredox catalysis)[a] | Light (photoredox catalysis)[b] | Light (photoredox catalysis)[c] | **Electricity[d]** |
| 2 | T °[C] | 35 °C | r.t. | r.t. | **r.t.** |
| 5 | Ranking Solvent[e] (CHEM21) | DCE | $CH_3CN$ | DMF | **$CH_3CN/H_2O$** |
| 6 | Health and safety Concerns[f] | $CF_3CO_2H$: H314, H332<br>$(4\text{-}ClPh)_2SO$: -<br>$Ru(bpy)_3Cl_2$: - | $CF_3SO_2Na$: H315, H319<br>AQN-2-$CO_2H$: -<br>$CF_3CO_2H$: H314, H332 | $CF_3I$: H280, H341, H420<br>Bithiophene derivative: home made<br>TMEDA: H225, H301, H331, H314 | **$CF_3SO_2Na$: H315, H319** |
| 7 | Environmental implications | No | No | H420 | **No** |
| 8 | Flow process | NO | NO | Yes | **Yes** |
| 9 | Yield (%) | 54 | 55 | 32 | **55** |
| 10 | Atom Economy (%) | 48.4 | 66.8 | 49.8 | **74.2** |
| 11 | PMI[f] | 163.6 | 223.3 | 108.7 | **302.8** |
| 12 | PMI[f] (sans solvent) | 6.3 | 7.7 | 11.4 | **4.7** |
| 13 | EcoScale[g] | 51 | 53.5 | 22 | **64.5** |
| 14 | E factor | 4.3 | 5.0 | 10.6 | **2.8** |
| 15 | Reagents Cost (€ per Kg of Product)[h] | 4.1 K€ | 1.2 K€ | - | **0.5 K€** |

[a]Process described in reference 6 (exemple 13), [b]Process described in reference 7 (exemple **5a**), [c]Process described in reference 8 (exemple **2j**), [d](exemple **3a**), [e]see *Green Chem.*, **2016**, *18*, 288–296, [f]see *Green Chem.*, **2015**, *17*, 3111–3121, [g]see *Beilstein J. Org. Chem.* **2006**, *2*, No. 3. doi:10.1186/1860-5397-2-3, [h] The calculations were performed based on the largest quantity available in the 2022 Aldrich website and ABCR for $CF_3SO_2Na$.

## III. Optimization of the Electrochemical trifluoromethylation of pyridones under Continuous Flow

For this study, we used the commercially available electrochemistry system from IKA (Electrasyn Flow cell). We started the optimization with N-benzyl-2-pyridinone (**1a**) and Langlois' reagent (**2**) in an undivided cell. We kept the same couple of electrode, solvent and concentrations as in batch. The reaction proceeded on 0.2 mmol of substrate (**1a**) in acetonitrile/water (8:2) with graphite plate as anode and cathode. Then, we studied the influence of the residence time, the current and the distance between electrodes. We can see on the Table S2, that when the reaction was performed with a reactor volume of 0.3 mL (spacer: 0.25 mm), no reactivity was observed. When the current was increased to 15 mA with a residence time of 10 min, the desired product was obtained with a better yield unfortunately, reproducibility issues appeared due to the formation of white solid on the surface of electrodes. By increasing the residence time in combination with a spacer of 5 mm the desired product was formed with 51% of yield. After 20 min of residence time the yield dropped dramatically, meaning that degradation was favored.

**Tableau S2: Optimization of trifluoromethylation of N-benzyl-2-pyridinone in electrochemical micro-flow cell.**

| entry | residence time (min) | current (mA) | solvent | spacer (mm) | yield |
|---|---|---|---|---|---|
| 1 | 20 | 8 | $CH_3CN/H_2O$ (8 :2) | 0,25 | - |
| 2 | 5 | 15 | $CH_3CN/H_2O$ (8 :2) | 0,25 | 35 |
| 3 | 10 | 15 | $CH_3CN/H_2O$ (8 :2) | 0,25 | 51 |
| 4 | 15 | 15 | $CH_3CN/H_2O$ (8 :2) | 0,25 | 16 |
| 5 | 2.5 | 20 | $CH_3CN/H_2O$ (8 :2) | 0.25 | 22 |
| 6 | 5 | 20 | $CH_3CN/H_2O$ (8 :2) | 0.25 | 32 |
| 7 | 10 | 8 | $CH_3CN/H_2O$ (8 :2) | 0.5 | 35 |
| 8 | 15 | 8 | $CH_3CN/H_2O$ (8 :2) | 0.5 | 34 |
| 9 | 20 | 8 | $CH_3CN/H_2O$ (8 :2) | 0.5 | 45 |
| **10** | **20** | **8** | **$CH_3CN/H_2O$ (8 :2)** | **0.5** | **51** |
| 11 | 22 | 8 | $CH_3CN/H_2O$ (8 :2) | 0.5 | 40 |

## IV. Cyclic voltammetry experiments

Cyclic voltammetry was measured under $N_2$ atmosphere with conventional three electrode system (Reference electrode: Ag/AgCl, working electrode: Glassy carbon, counter electrode: Pt wire, Supporting electrolyte: 0.1 M $NBu_4ClO_4$ in MeCN:$H_2O$ v/v 5:2) on a Metrohm PGSTAT128N potentiostat/galvanostat. Conventional concentrations of 1 mM electroactive species were used. Acquisitions were performed with 100 mV/s scan rates.

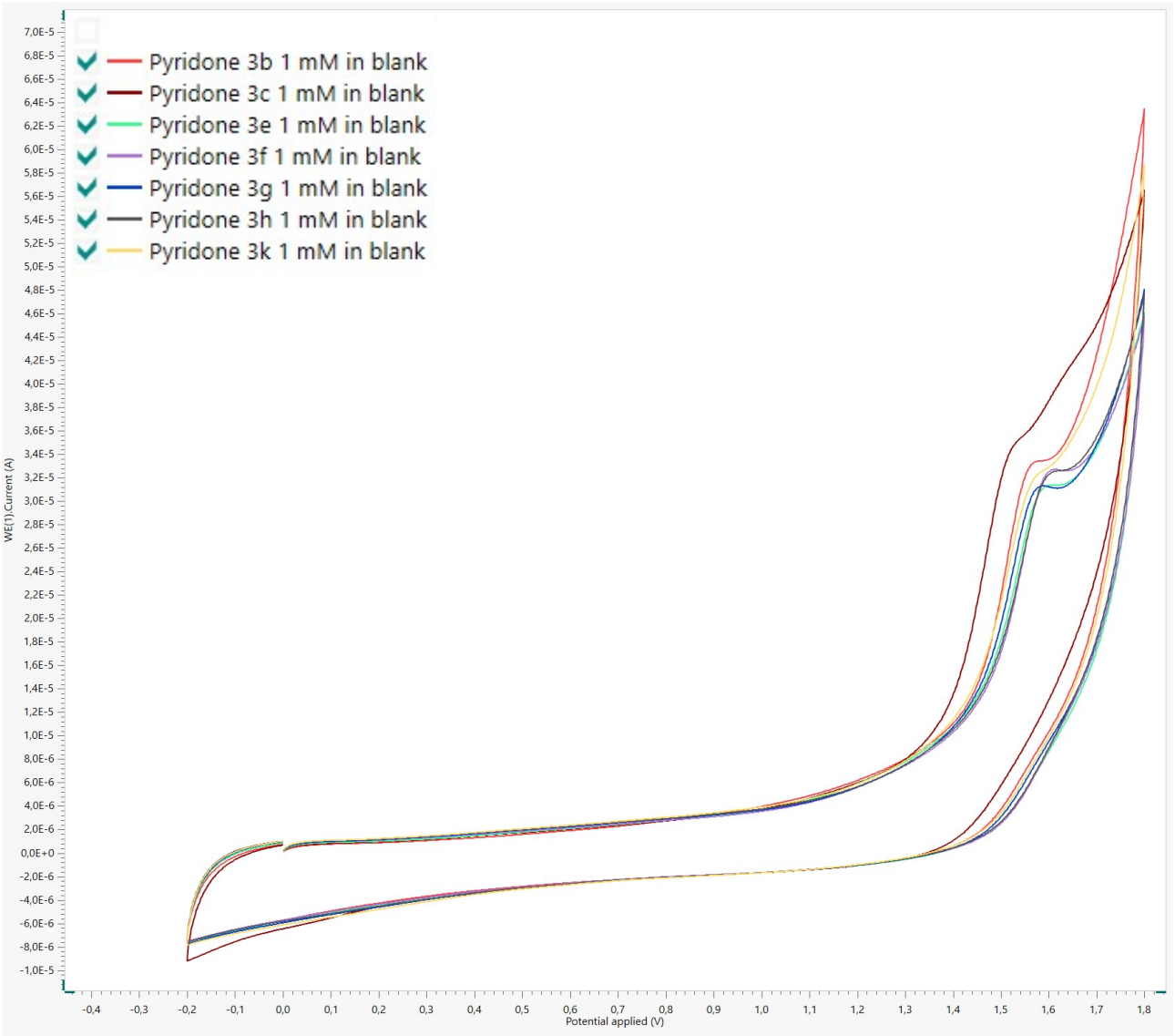



**Figure S2 : Cyclic voltammetry studies with different pyridones 1.**

## V. Experimental procedures and characterization data

### A. General Procedure A. Electrochemical sulfonylation under batch condition

Unless otherwise specified, the reaction was carried out on 0.2 mmol scale. To a 10 mL undivided IKA ElectraSyn 2.0 vials, equipped with a stirrer bar and IKA Graphite electrodes, was added pyridone **1** (0.2 mmol, 1 eq), Langlois reagent **2** (0.6 mmol, 3 eq) and then a mixture of MeCN:$H_2O$ (8:2, 10.0 mL). Note that before use, the electrodes were polished with sandpaper then wiped with a paper. The electrolysis was conducted at constant current conditions at room temperature with 8 mA (J = 2.5 mA.cm$^{-2}$) as current during 6 h (8.9 F, Q = 172.8 C). After electrolysis, the cap was removed, and the electrodes were taken out and rinsed with EtOAc into the reaction mixture. The electrodes were washed successively with acetone, water, acetone and methanol then dried with paper. The mixture was washed with a saturated solution of $NH_4Cl$. The combined organics were washed with brine, dried over anhydrous $Na_2SO_4$ and concentrated under reduced pressure [Note: Yield may be determined by analysis of $^1$H-NMR spectra of crude reaction product using an internal standard (1,3,5-trimethoxybenzene) at this point]. The crude material was purified by silica gel column chromatography to furnish the desired product.

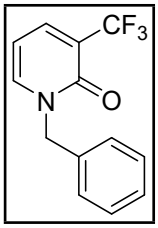
### B. General Procedure B. Electrochemical trifluoromethylation under flow condition

Unless otherwise specified, the reaction was carried out on 0.12 mmol scale. Note that before use, the electrodes were polished with sandpaper then wiped with a paper. A solution of pyridinones (0.12 mmol, 1 eq), Langlois reagent (0.36 mmol, 3 eq) in a mixture of MeCN:$H_2O$ (8:2, 6.0 mL) was pumped through the ElectraSyn flow cell (H = 500 µm, L = 60 cm, l = 20 cm, V = 0.6 mL) equipped with graphite electrodes and prefilled with the reaction mixture and electrolyzed for 20 min (Q = 0.03 mL.min$^{-1}$) at a constant current of 8 mA at room temperature. The reaction mixture was collected in a round-bottom flask as the reactor output after 3 dead volumes of the reactor. The collected reaction mixture was then diluted in EtOAc, washed with $NH_4Cl$ saturated, dried over anhydrous $MgSO_4$ and concentrated under reduced pressure [Note: Yield may be determined by analysis of $^1$H-NMR spectra of crude reaction product using an internal standard (1,3,5-trimethoxybenzene) at this point]. The crude material was purified by silica gel column chromatography to furnish the desired product. After collecting the product for specified time, the reactor was washed with $CH_3CN$ (15 mL) and disassembled. First, the gasket was cleaned with acetone on both the sides, then the electrodes were washed successively with acetone, water, acetone and methanol then dried with paper.

**N-benzyl-3-trifluoromethyl-2-pyridinone 3a**

Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 27.3 mg (55%) of the title compound **3a**.

Following General Procedure B on 0.12 mmol scale. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 15.53 mg (44%) of the title compound **3a**.

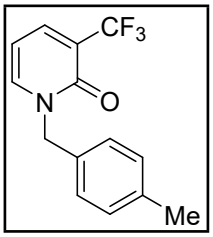



Spectral data are in agreement with the literature.[1]

**$^1$H NMR** (300 MHz, $CDCl_3$) δ 7.76 - 7.69 (m, 1H), 7.48 (dd, J = 6.8, 1.7 Hz, 1H), 7.41 - 7.29 (m, 5H), 6.21 (t, J = 7.0 Hz, 1H), 5.17 (s, 2H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -65.97. **$^{13}$C NMR** (75 MHz, $CDCl_3$) δ 158.62, 141.17, 138.86 (q, J = 5.0 Hz), 135.46, 129.24, 128.72, 128.64, 122.8 (q, J = 271.7 Hz), 121.0 (q, J = 30.9 Hz), 104.33, 52.30. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{13}H_{11}F_3NO$, 254.0787. found 254.0791.

**N-(4-methylbenzyl)-3-(trifluoromethyl)pyridin-2(1H)-one 3b**

Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (9:1 Dichloromethane/EtOAc) afforded 24.0 mg (45%) of the title compound **3b**.

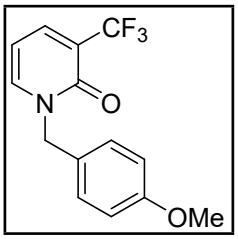



**$^{1}$H NMR** (300 MHz, $CDCl_3$): δ 7.75 (dd, J = 7.1, 1.0 Hz, 1H), 7.51 (dd, J = 6.8, 1.7 Hz, 1H), 7.32 – 7.18 (m, 4H), 6.23 (t, J = 6.9 Hz, 1H), 5.16 (s, 2H), 2.38 (s, 3H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -65.95.**$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 158.63, 141.10, 138.76 (q, J = 5.0 Hz), 138.55, 132.41, 129.90, 128.81, 122.9 (q, J = 270.2 Hz), 120.45 (q, J = 30.6 Hz), 104.24, 52.04, 21.26. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{14}H_{13}F_3NO$, 268.0943 found 268.0943.

**N-(4-methoxybenzyl)-3-(trifluoromethyl)pyridin-2(1H)-one 3c**

Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 17.8 mg (31%) of the title compound **3c**.

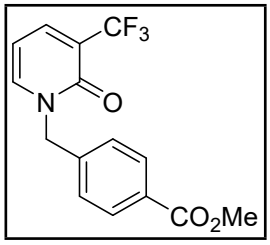
Spectral data are in agreement with the literature.[1]




**$^{1}$H NMR** (300 MHz, $CDCl_3$): δ 7.75 - 7.67 (m, 1H), 7.47 (dd, J = 6.8, 1.7 Hz, 1H), 7.31 - 7.24 (m, 2H), 6.88 (d, J = 8.7 Hz, 2H), 6.19 (t, J = 7.0 Hz, 1H), 5.09 (s, 2H), 3.79 (s, 3H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -65.94. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 159.91, 158.65, 140.99, 138.74 (q, J = 5.0 Hz), 134.23, 130.36, 127.42, 122.87 (q, J = 271 Hz), 120.06 (q, J = 30.5 Hz), 114.60, 112.83, 104.23, 55.44, 51.86. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{14}H_{13}F_3NO_2$, 284.0892 found 284.0896.

**methyl 4-((2-oxo-3-(trifluoromethyl)pyridin-1(2H)-yl)methyl)benzoate 3e**

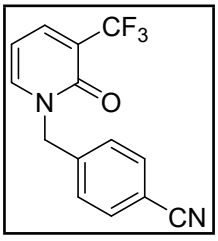
Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (9:1 Dichloromethane/EtOAc) afforded 32.0 mg (51%) of the title compound **3e**.




**$^{1}$H NMR** (300 MHz, $CDCl_3$): δ 7.99 (d, J = 8.3 Hz, 2H), 7.73 (dd, J = 7.0, 1.0 Hz, 1H), 7.52 (dd, J = 6.8, 1.7 Hz, 1H), 7.35 (d, J = 8.3 Hz, 2H), 6.24 (t, J = 6.9 Hz, 1H), 5.19 (s, 2H), 3.88 (s, 3H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -66.04. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 167.07, 158.93, 141.57, 140.84, 139.53 (q, J = 5.1 Hz)., 130.91, 128.83, 128.52, 124.9 (q, J = 270.0 Hz), 122.6 (q, J = 31.9Hz), 121.34, 105.01, 52.81, 52.59. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{15}H_{13}F_3NO_3$, 312.0842 found 312.0838.

**4-((2-oxo-3-(trifluoromethyl)pyridin-1(2H)-yl)methyl)benzonitrile 3f**

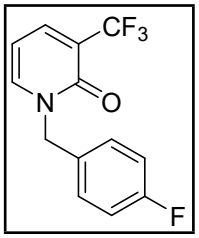
Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (9:1 Dichloromethane/EtOAc) afforded 27.55 mg (50%) of the title compound **3f**.




**$^{1}$H NMR** (300 MHz, $CDCl_3$): δ 7.76 (dd, J = 7.1, 1.0 Hz, 1H), 7.66 – 7.59 (m, 2H), 7.56 (dd, J = 6.8, 1.7 Hz, 1H), 7.41 (d, J = 8.4 Hz, 2H), 6.28 (t, J = 6.8 Hz, 1H), 5.19 (s, 2H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -65.05. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 158.36, 141.38, 140.73, 139.40 (q, J = 5.0 Hz), 132.82 (2), 128.86 (2), 122.60 (q, J = 270.0 Hz), 122.60 (q, J = 30.8 Hz), 118.39, 112.35, 104.84, 52.35. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{14}H_{10}F_3N_2O$, 279.0739 found 279.0743.

**1-(4-fluorobenzyl)-3-(trifluoromethyl)pyridin-2(1H)-one 3g**

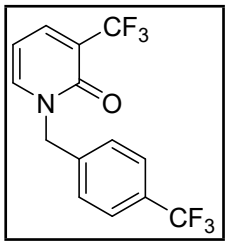
Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (9:1 Dichloromethane/EtOAc) afforded 27.14 mg (50%) of the title compound **3g**.




**$^{1}$H NMR** (300 MHz, $CDCl_3$): δ 7.72 (dd, J = 7.1, 1.0 Hz, 1H), 7.51 (dd, J = 6.8, 1.7 Hz, 1H), 7.38 - 7.28 (m, 2H), 7.08 - 6.98 (m, 2H), 6.23 (t, J = 7.0 Hz, 1H), 5.12 (s, 2H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -65.95, -113.07. **$^{13}$C NMR** (75 MHz, $CDCl_3$) δ 164.88, 161.60, 158.96, 141.55, 139.43 (q, J = 5.0 Hz), 131.7 (d, J = 3.2 Hz), 130.9 (d, J = 8.3 Hz), 130.88, 123.2 (q, J= 270.0 Hz), 121.4 (q, J = 30.6 Hz), 116.5 (d, J = 21.5 Hz), 104.93, 52.23. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{13}H_{10}F_4NO$, 272.0693 found 272.0696.

**3-(trifluoromethyl)-1-(4-(trifluoromethyl)benzyl)pyridin-2(1H)-one 3h**

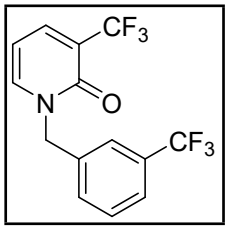
Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (9:1 Dichloromethane/EtOAc) afforded 40.2 mg (63%) of the title compound **3h**.




**$^{1}$H NMR** (300 MHz, $CDCl_3$): δ 7.76 (ddd, J = 7.1, 1.9, 0.8 Hz, 1H), 7.61 (d, J = 8.1 Hz, 2H), 7.53 (dd, J = 6.8, 1.7 Hz, 1H), 7.43 (d, J = 8.1 Hz, 2H), 6.28 (dd, J = 10.3, 3.6 Hz, 1H), 5.20 (s, 2H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -62.78, -66.01.**$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 158.49, 141.25, 139.46, 139.24 (q, J = 5.0 Hz), 130.8 (q, J = 32. Hz), 128.70, 126.14 (q, J = 5 Hz), 123.6 (q, J = 270 Hz), 122.70 (q, J = 270.1 Hz), 122.18, 121.3 (q, J = 30.8 Hz), 105.0, 104.72, 52.17. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{14}H_{10}F_6NO$, 322.0661 found 322.0661.

**3-(trifluoromethyl)-1-(3-(trifluoromethyl)benzyl)pyridin-2(1H)-one 3i**

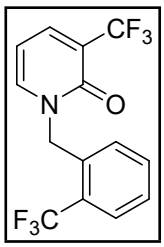
Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (9:1 Dichloromethane/EtOAc) afforded 38.1 mg (60%) of the title compound **3i**.




**$^{1}$H NMR** (300 MHz, $CDCl_3$): δ 7.75 (dd, J = 7.1, 1.0 Hz, 1H), 7.61 - 7.40 (m, 5H), 6.26 (t, J = 6.9 Hz, 1H), 5.20 (s, 2H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -62.71, -66.00. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 158.49, 141.28, 139.25 (q, J = 5.0 Hz), 136.55, 131.92,131.5 (q, J = 32.2 Hz), 129.78, 125.41 (q, J = 5 Hz), 125.01 (q, J = 5 Hz), 123.9 (q, J= 270.2Hz), 122.7 (q, J = 270.2 Hz), 121.1 (q, J = 30.9 Hz), 104.73, 52.15. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{14}H_{10}F_6NO$, 322.0661 found 322.0663.

**3-(trifluoromethyl)-1-(2-(trifluoromethyl)benzyl)pyridin-2(1H)-one 3j**

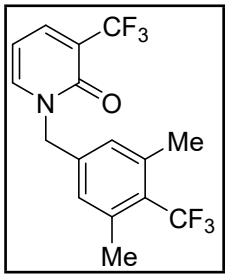
Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (9:1 Dichloromethane/EtOAc) afforded 36.7 mg (57%) of the title compound **3j**.




**$^{1}$H NMR** (300 MHz, $CDCl_3$): δ 7.77 (ddd, J = 19.2, 10.1, 4.3 Hz, 2H), 7.54 (t, J = 7.3 Hz, 1H), 7.47 - 7.35 (m, 2H), 7.24 (d, J = 9.9 Hz, 1H), 6.25 (t, J = 6.7 Hz, 1H), 5.41 (s, 2H).**$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -59.35, -66.03.**$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 158.76, 141.44, 139.20 (q, J = 5.0 Hz), 134.0, 133.8 (q, J = 35.7 Hz), 132.91, 129.61, 128.47, 126.46 (q, J = 5.6 Hz), 124.6 (q, J = 27 Hz), 122.9 (q, J = 270.2 Hz), 121.3 (q, J = 28.3 Hz), 104.66, 48.36. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{14}H_{10}F_6NO$, 322.0661 found 322.0664.

**1-(3,5-dimethyl-4-(trifluoromethyl)benzyl)-3-(trifluoromethyl)pyridin-2(1H)-one 3k**

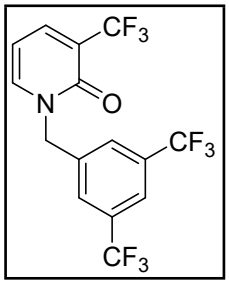
Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 26.5 mg (38%) of the title compound **3k**.




**$^{1}$H NMR** (300 MHz, $CDCl_3$): δ 7.76 (dd, J = 7.1, 1.1 Hz, 1H), 7.47 (dd, J = 6.7, 1.8 Hz, 1H), 7.02 (s, 2H), 6.25 (t, J = 7.0 Hz, 1H), 5.10 (s, 2H), 2.46 (q, J = 3.3 Hz, 6H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -54.31, -66.01. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 158.50, 141.15, 139.08 (q, J = 5.0 Hz), 138.68 (d, J = 1.9 Hz), 138.13, 130.01 (2), 128.1 (q, J = 28.6 Hz), 125.9 (q, J = 274.6 Hz), 122.7 (q, J = 270.2 Hz), 120.9 (q, J = 30.9 Hz), 117.35, 104.53, 51.66, 21.63 (q, J = 4.1 Hz, 2). **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{16}H_{14}F_6NO$, 350.0974 found 350.0972.

**1-(3,5-bis(trifluoromethyl)benzyl)-3-(trifluoromethyl)pyridin-2(1H)-one 3l**

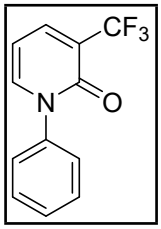
Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 43.23 mg (56%) of the title compound **3l**.




**$^{1}$H NMR** (300 MHz, $CDCl_3$): 7.84 - 7.73 (m, 4H), 7.62 (dd, J = 6.8, 1.6 Hz, 1H), 6.33 (t, J = 6.9 Hz, 1H), 5.25 (s, 2H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -62.98, -66.09. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 158.42, 141.16, 139.60 (q, J = 5.0 Hz), 138.07, 132.55 (q, J = 33.6 Hz, 2), 128.52, 123.0 (q, J = 271.5 Hz), 122.7 (q, J = 270.2 Hz), 122.63 (q, J = 5.0 Hz), 121.5 (q, J = 31.5), 121.29, 105.12 (2), 52.20. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{15}H_9F_9NO$, 390.0535 found 390.0538.

**1-phenyl-3-trifluoromethyl-2-pyridinone 3m**

Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 28.3 mg (59%) of the title compound **3m**.

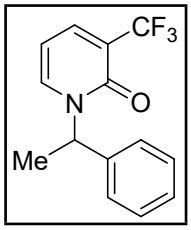



Spectral data are in agreement with the literature.[1]

**$^{1}$H NMR** (300 MHz, $CDCl_3$): δ 7.87 - 7.77 (m, 1H), 7.60 - 7.43 (m, 4H), 7.42 - 7.34 (m, 2H), 6.32 (t, J = 7.0 Hz, 1H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -66.01. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 158.29, 141.99, 139.90,139.45 (q, J = 5.0 Hz), 129.56 (2), 129.2, 127.28, 126.62 (2), 121.4 (q, J= 31.05 Hz), 120.9 (q, J= 270.2 Hz), 104.13. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{12}H_9F_3NO$, 240.0630 found 240.0633.

**1-(1-phenylethyl)-3-(trifluoromethyl)pyridin-2(1H)-one 3n**

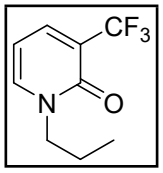
Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 35.9 mg (67%) of the title compound **3n**.




**$^{1}$H NMR** (300 MHz, $CDCl_3$): 7.68 (ddd, J = 7.0, 1.9, 0.8 Hz, 1H), 7.44 - 7.27 (m, 6H), 6.47 (q, J = 7.1 Hz, 1H), 6.17 (t, J = 7.0 Hz, 1H), 1.74 (d, J = 7.1 Hz, 3H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -65.92. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 158.41, 139.41, 138.60, 138.28 (q, J = 5.1 Hz), 129.17 (2), 128.55, 127.69 (2), 122.9 (q, J = 270.0 Hz), 120.4 (q, J = 30.1 Hz), 104.43, 53.21, 19.13. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{14}H_{13}F_3NO$, 268.0944 found 268.0947.

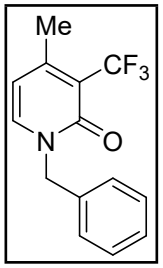
**1-butyl-3-(trifluoromethyl)pyridin-2(1H)-one 3p**

Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 16.6 mg (40%) of the title compound **3p**.



**$^1$H NMR** (300 MHz, $CDCl_3$): δ 7.78 - 7.65 (m, 1H), 7.48 (dd, J = 6.7, 1.7 Hz, 1H), 6.21 (t, J = 6.9 Hz, 1H), 3.96 – 3.89 (t, 2H), 1.78 (dd, J = 14.8, 7.4 Hz, 2H), 0.94 (t, J = 7.4 Hz, 3H). **$^{19}$F NMR** (282 MHz, CDCl3) δ -65.95. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 158.48, 141.72, 138.74 (q, J = 5.0 Hz), 122.9 (q, J = 270.0 Hz), 120.6 (q, J = 30.6 Hz), 103.91, 51.83, 22.45, 11.09. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_9H_{11}F_3NO$, 206.0787 found 206.0791.

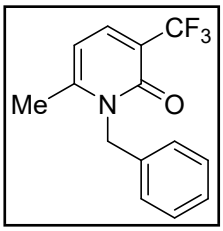
**N-benzyl-4-methyl-3-trifluoromethyl-2-pyridinone 3q**



Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 28.9 mg (54%) of the title compound **3q**. **$^1$H NMR** (300 MHz, $CDCl_3$): δ 7.39 - 7.22 (m, 6H), 6.00 (d, J = 7.0 Hz, 1H), 5.10 (s, 2H), 2.36 (d, J = 3.3 Hz, 3H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -58.18. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 159.11, 152.56, 138.71, 135.67, 129.12 (2), 128.57, 128.44 (2), 124.3 (q, J = 272.7 Hz), 118.04 (q, J = 28.5 Hz), 109.86, 52.13, 21.15 (q, J = 3.8 Hz). **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{14}H_{13}F_3NO$, 268.0943 found 268.0947.

**1-benzyl-6-methyl-3-trifluoromethyl-2-pyridinone 3r**

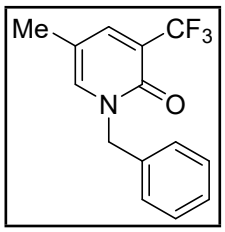
Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 15.7 mg (30%) of the title compound **3r**.



**$^1$H NMR** (300 MHz, $CDCl_3$): δ 7.66 (d, J = 7.4 Hz, 1H), 7.38 - 7.27 (m, 3H), 7.20 - 7.14 (m, 2H), 6.09 (d, J = 7.4 Hz, 1H), 5.37 (s, 2H), 2.35 (s, 3H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -65.82. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 159.79, 151.78, 138.32 (q, J = 4.9 Hz), 135.65, 129.09 (2), 127.86, 126.86 (2), 123.2 (q, J = 269.4 Hz), 117.7 (q, J = 30.7 Hz), 105.23, 47.57, 21.21. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{14}H_{13}F_3NO$, 268.0943 found 268.0945.

**1-benzyl-5-methyl-3-trifluoromethyl-2-pyridinone 3s**

Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 10.7 mg (20%) of the title compound **3s**.

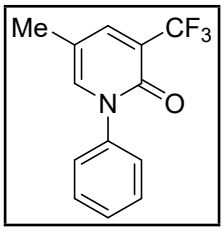


**$^1$H NMR** (300 MHz, $CDCl_3$): δ 7.59 (d, J = 2.2 Hz, 1H), 7.43 - 7.29 (m, 5H), 7.25 (s, 1H), 5.14 (s, 2H), 2.08 (s, 3H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -65.87. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 157.95, 141.22 (q, J = 4.9 Hz), 138.70, 135.86, 129.19 (2), 128.62 (2), 128.52, 122.5 (q, J = 270.0 Hz), 120.1 (q, J = 30.4 Hz), 113.49, 52.11, 17.21. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{14}H_{13}F_3NO$, 268.0943 found 268.0947.

**5-methyl-1-phenyl-3-(trifluoromethyl)pyridin-2(1H)-one 3t** (Pirfenidone analog)

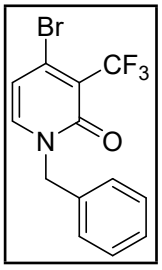
Following General Procedure A on 0.2 mmol scale. Yield determined by analysis of $^1$H-NMR spectra of crude reaction product: 83% yield. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 6.05 mg (12%) of the title compound **3t**. Spectral data are in agreement with the literature.[4]

**$^1$H NMR** (300 MHz, $CDCl_3$): δ 7.70 (d, J = 2.2 Hz, 1H), 7.52 - 7.41 (m, 3H), 7.36 (dd, J = 8.2, 1.5 Hz, 3H), 2.17 (s,




3H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -65.87.**$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 157.68, 141.90 (q, J = 4.9 Hz), 140.07, 139.50, 129.48 (2), 129.02, 126.65 (2), 122.8 (q, J = 270.2 Hz), 121.1 (q, J = 30.5 Hz), 113.29, 17.08. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{13}H_{11}F_3NO$, 254.0787 found 254.0789.

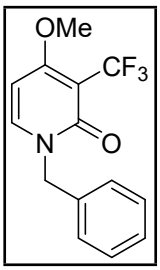
**4-bromo-3-trifluoromethyl-2-pyridinone 3u**




Following General Procedure A on 0.2 mmol scale. Yield determined by analysis of $^1$H-NMR spectra of crude reaction product: 19% yield. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 9.6 mg (14%) of the title compound **3u**.

**$^1$H NMR** (300 MHz, $CDCl_3$): 7.40 - 7.29 (m, 5H), 7.21 (d, J = 7.0 Hz, 1H), 6.43 (d, J = 7.3 Hz, 1H), 5.10 (s, 2H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -59.60. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 158.06, 141.13, 138.75, 137.11, 136.11, 134.88, 129.36 (2), 128.87, 128.80 (2), 112.02, 52.52. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{13}H_{10}BrF_3NO$, 331.9892 found 331.9895.

**1-benzyl-4-methoxy-3-(trifluoromethyl)pyridin-2(1H)-one 3w**

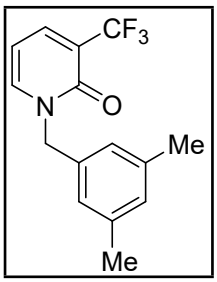



Following General Procedure A on 0.2 mmol scale. Yield determined by analysis of $^1$H-NMR spectra of crude reaction product: 48% yield. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) followed by recrystallization (cyclohexane/dicholoromethane) afforded 9.6 mg (17%) of the title compound **3w**.

**$^1$H NMR** (300 MHz, $CDCl_3$): δ 7.41 (d, J = 7.9 Hz, 1H), 7.33 (dd, J = 5.1, 2.7 Hz, 5H), 6.04 (d, J = 8.1 Hz, 1H), 5.10 (s, 2H), 3.90 (s, 3H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -57.56. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 167.54, 159.74, 141.15, 135.84, 129.19, 128.61, 128.48,125.9 (q, J = 32.8 Hz), 121.9 (q, J = 272.0 Hz), 94.00, 56.77, 51.78. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{14}H_{13}F_3NO$, 284.0893 found 284.0895.

**1-(3,5-dimethylbenzyl)-3-(trifluoromethyl)pyridin-2(1H)-one 3y**

Following General Procedure B on 0.12 mmol scale. Purification by silica gel column chromatography (7:3 cyclohexane/EtOAc) afforded 12.7 mg (38%) of the title compound **3y**.

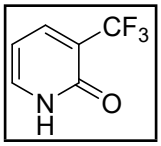



**$^1$H NMR** (300 MHz, $CDCl_3$): δ 7.72 (ddd, J = 7.1, 2.0, 0.9 Hz, 1H), 7.46 (dd, J = 6.8, 1.6 Hz, 1H), 6.95 (d, J = 10.9 Hz, 3H), 6.19 (t, J = 7.0 Hz, 1H), 5.09 (s, 2H), 2.30 (d, J = 0.5 Hz, 6H).**$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -65.96. **$^{13}$C NMR** (75 MHz, $CDCl_3$) δ 141.15, 138.97, 138.75 (q, J = 5.1 Hz), 135.30, 130.32, 128.31, 126.60 (2), 121.10, 121.0 (q, J = 270.0 Hz), 120.7 (q, J = 30.7 Hz), 104.20, 52.06, 21.37 (2). **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_{15}H_{15}F_3NO$, 282.1100 found 282.1106.

**3-(trifluoromethyl)pyridin-2(1H)-one 4a**

Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (7:3 Cyclohexane/EtOAc) afforded 6.26 mg (19%) of the title compound **4a**.

Following General Procedure B on 0.12 mmol scale. Yield determined by analysis of $^1$H-NMR spectra of crude reaction product: 40% yield.



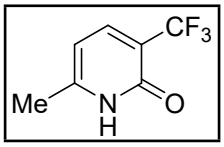

**$^1$H NMR** (300 MHz, $CDCl_3$): δ 7.87 (d, J = 7.0 Hz, 1H), 7.65 (d, J = 6.4 Hz, 1H), 6.39 (t, J = 6.8 Hz, 1H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -65.74. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 161.54, 140.85 (q, J = 4.9

Hz), 139.28, 122.8 (q, J = 269.7 Hz), 120.5 (q, J = 31.1 Hz), 105.72. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_6H_5F_3NO$, 164.0318 found 164.0319.

**6-methyl-3-(trifluoromethyl)pyridin-2(1H)-one 4b**

Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (9:1 Dichloromethane/EtOAc) afforded 8.2 mg (23%) of the title compound **4b**.

Following General Procedure B on 0.12 mmol scale. The title Compound **4b** was obtained in a pure form without further purification (14.5 mg, 68%).

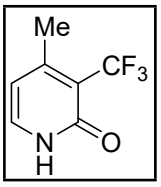



**$^1$H NMR** (300 MHz, $CDCl_3$): δ 13.34 (s, 1H), 7.73 (d, J = 7.3 Hz, 1H), 6.14 (d, J = 7.3 Hz, 1H), 2.42 (s, 3H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -65.14. **$^{13}$C NMR** (75 MHz, $CDCl_3$) δ 162.01, 151.33, 140.82 (q, J = 4.6 Hz)., 123.1 (q, J = 269.2 Hz), 116.8 (q, J = 30.8 Hz), 105.03, 19.37. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_7H_7F_3NO$, 178.0474 found 178.0473.

**4-methyl-3-(trifluoromethyl)pyridin-2(1H)-one 4d**

Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (9:1 Dichloromethane/EtOAc) afforded 10.5 mg (29%) of the title compound **4d**.

Following General Procedure B on 0.12 mmol scale. Yield determined by analysis of $^1$H-NMR spectra of crude reaction product: 40% yield.

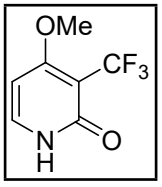



**$^1$H NMR** (300 MHz, $CDCl_3$): δ 7.43 (d, J = 6.7 Hz, 1H), 6.16 (d, J = 6.7 Hz, 1H), 2.43 (q, J = 3.2 Hz, 3H).**$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -57.83. **$^{13}$C NMR** (75 MHz, $CDCl_3$): δ 162.04, 154.89, 136.74,124.2 (q, J = 272.7 Hz),117.9 (q, J = 36.0 Hz), 111.10, 21.47 (q, J = 3.8 Hz). **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_7H_7F_3NO$, 178.0474 found 178.0474.

**4-methoxy-3-(trifluoromethyl)pyridin-2(1H)-one 4e**

Following General Procedure A on 0.2 mmol scale. Purification by silica gel column chromatography (9:1 Dichloromethane/EtOAc) afforded 10.1 mg (26%) of the title compound **4e**.

Following General Procedure B on 0.12 mmol scale. Yield determined by analysis of $^1$H-NMR spectra of crude reaction product: 40% yield.

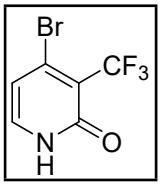



**$^1$H NMR** (300 MHz, $CDCl_3$): δ 13.11 (s, 1H), 7.59 (d, J = 7.5 Hz, 1H), 6.16 (d, J = 7.4 Hz, 1H), 3.95 (s, 3H).**$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -57.29. **$^{13}$C NMR** (75 MHz, $CDCl_3$) δ 169.28, 163.09, 139.66,123.7 (q, J = 271.4 Hz), 103.1 (q, J = 33.8 Hz), 94.71, 57.00. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_7H_7F_3NO_2$ , 194.0423 found 194.0421.

**4-bromo-3-(trifluoromethyl)pyridin-2(1H)-one 4f**

Following General Procedure A on 0.2 mmol scale. Yield determined by analysis of $^1$H-NMR spectra of crude reaction product: 17% yield.

Following General Procedure B on 0.2 mmol scale. Yield determined by analysis of $^1$H-NMR spectra of crude reaction product: 38% yield.



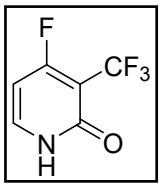

**$^1$H NMR** (300 MHz, $CDCl_3$): δ 12.90 (s, 1H), 7.37 (d, J = 6.8 Hz, 1H), 6.62 (d, J = 6.9 Hz, 1H). **$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -59.23.**$^{13}$C NMR** (75 MHz, $CDCl_3$) δ 161.04, 138.62, 136.93, 122.4 (q, J = 273.2 Hz),120.3 (q, J = 29.7 Hz), 113.65. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_6H_4BrF_3NO$,

241.9423 found 241.9420.

**4-fluoro-3-(trifluoromethyl)pyridin-2(1H)-one 4g**

Following General Procedure A on 0.2 mmol scale. Yield determined by analysis of $^{1}$H-NMR spectra of crude reaction product: 30% yield.

Following General Procedure B on 0.12 mmol scale. Yield determined by analysis of $^{1}$H-NMR spectra of crude reaction product: 34% yield.

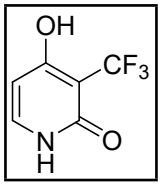



**$^{1}$H NMR** (300 MHz, $CDCl_3$): δ 12.84 (s, 1H), 7.62 (t, J = 7.1 Hz, 1H), 6.24 (t, J = 8.0 Hz, 1H).**$^{19}$F NMR** (282 MHz, $CDCl_3$) δ -59.24, -59.34. **$^{13}$C NMR** (75 MHz, $CDCl_3$) δ 171.96, 168.24, 162.97 (d, J = 10.0 Hz), 139.95, 120.2 (q, J = 271.8 Hz), 99.24 (d, J = 27.3 Hz). **HRMS** (ESI): *m/z* $[M+H]^+$ calc. 182.0221 for $C_6H_4F_4NO$ found 182.0223.

**4-hydroxy-3-(trifluoromethyl)pyridin-2(1H)-one 4h**

Following General Procedure A on 0.2 mmol scale. Yield determined by analysis of $^{1}$H-NMR spectra of crude reaction product: 26% yield. Purification by recrystallization in dichloromethane.

Following General Procedure B on 0.12 mmol scale. Yield determined by analysis of $^{1}$H-NMR spectra of crude reaction product: 60% yield.




**$^{1}$H NMR** (300 MHz, DMSO) δ 11.65 (s, 1H), 11.38 (s, 1H), 7.40 (d, J = 7.3 Hz, 1H), 5.94 (d, J = 7.3 Hz, 1H). **$^{19}$F NMR** (282 MHz, DMSO) δ -55.62. **$^{13}$C NMR** (75 MHz, DMSO) δ 167.53, 160.41, 138.81, 126.10, 122.49, 98.33. **HRMS** (ESI): *m/z* $[M+H]^+$ calc. for $C_6H_5F_3NO_2$, 180.0267 found 180.0266

## VI. Pseudo-Hammett Plot

| Substituents | Substituent constant σ radicalaire | Yield of **3** (%) | log (rdtx/rdth) |
|---|---|---|---|
| H | 0 | 55 | 0 |
| *p*-$CF_3$ | 0.08 | 63 | 0.05897786 |
| *p*-$CO_2Me$ | 0.39 | 51 | -0.03279251 |
| *p*-*F* | -0.08 | 50 | -0.04139269 |
| *p*-*CN* | 0.46 | 50 | -0.04139269 |
| *m*-$CF_3$ | -0.14 | 47 | -0.06826483 |
| *m*-$CF_3$ *1* | -0.07 | 61 | 0.04496715 |
| *p*-$NO_2$ | 0.57 | 1 | -1.74036269 |

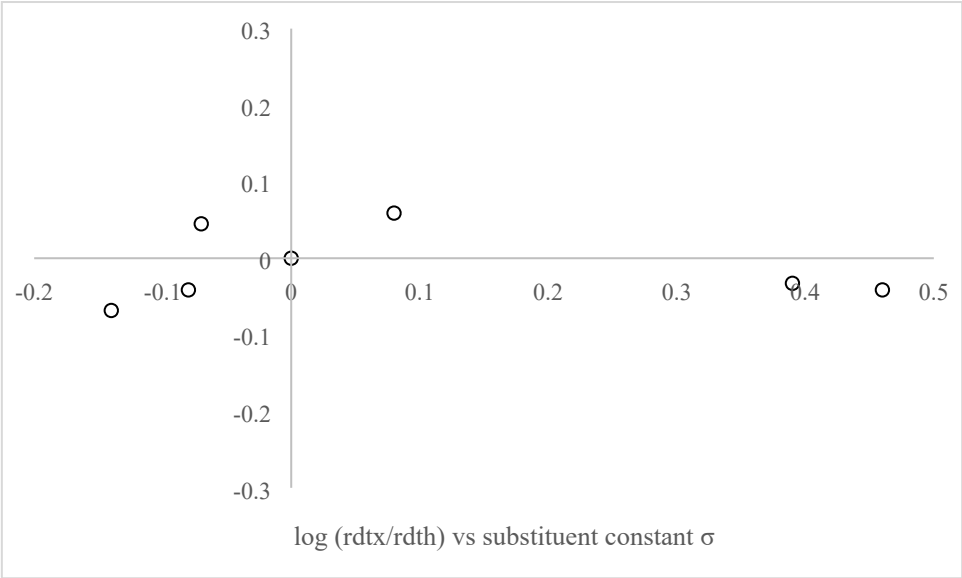



**Figure S3 : Pseudo-Hammett plot of withdrawing substituents log (rdtx/rdth) vs substituent constant σ.**

## VII. DFT Calculations

All the quantum chemistry computations were carried out using the Gaussian 16 software.[9] The energies were computed using a DFT-based method, namely the PBE0 global hybrid functional.[10,11] The atoms were described by the 6-311+G(d,p) basis set.[12] The solvent (acetonitrile) was represented by an implicit model (PCM method as implemented in Gaussian).[13] All the geometries have been fully optimized and the nature of the stationary point was checked by vibrational analyses (no imaginary frequency for the minima, one imaginary frequency for the transition states).

The localization of the transition state between **II'** and **III** was a tough task due to the crossing of two potential energy surfaces (triplet for **II'** + $CF_3^\bullet$ and singlet for **III**). Therefore, the Gibbs free energy of this transition state was estimated using a two-step procedure: (i) a relaxed scan of the departure of $CF_3^\bullet$ from **III** was processed in both spin states; the crossing energy was extrapolated from the obtained data and considered as the transition energy; then (ii) the entropy correction obtained from the transition state located between **1a** and **II** was added to this value to yield the transition Gibbs free energy. This scheme is justified by the similarities in structure between **1a** and **II'**: no significant geometrical constraint could explain a large difference between the entropy corrections.

The atomic charges were computed using the internal facilities of Gaussian 16 for Mulliken and APT[14] ones, and the AIMAll software[15] for QT-AIM ones.[16]

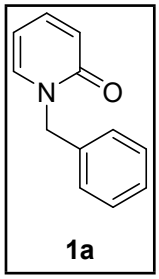
## Atomic charges and spin densities

**Table S3: Mulliken and QT-AIM charges and spin densities and APT charges computed for all the non-hydrogen atoms in II' and $3a^+$.**

| | Mulliken | | | | APT | | QT-AIM | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **II'** | | **$3a^+$** | | **II'** | **$3a^+$** | **II'** | | **$3a^+$** | |
| | charges | spin | charges | spin | charges | charges | charges | spin | charges | spin |
| N | **0.56** | 0.13 | **0.63** | 0.15 | **−0.37** | −0.26 | **−1.17** | 0.10 | **−1.16** | 0.12 |
| $C_{amide}$ | −0.12 | −0.11 | **−0.78** | −0.11 | **0.57** | **0.60** | **1.30** | −0.03 | **1.34** | −0.04 |
| O | −0.20 | **0.35** | −0.16 | **0.33** | **−0.55** | **−0.52** | **−1.02** | **0.31** | **−1.01** | 0.28 |
| $C_3$ | **0.30** | **0.45** | **0.49** | **0.42** | 0.09 | −0.06 | 0.02 | **0.34** | 0.03 | **0.32** |
| $CF_3$ | – | – | **0.31** | −0.02 | – | **2.22** | – | – | **1.77** | 0.00 |
| $C_4$ | **−0.42** | −0.23 | −0.14 | −0.26 | −0.12 | −0.17 | 0.05 | −0.12 | 0.07 | −0.13 |
| $C_5$ | −0.07 | **0.41** | −0.07 | **0.47** | 0.09 | 0.21 | 0.04 | **0.31** | 0.06 | **0.35** |
| $C_6$ | −0.17 | 0.04 | −0.02 | 0.01 | 0.29 | 0.19 | **0.59** | 0.08 | **0.60** | 0.05 |
| $C_{benz}$ | **−0.99** | −0.01 | **−1.06** | −0.02 | **0.48** | **0.44** | 0.28 | 0.00 | 0.28 | 0.00 |
| $C_{ipso}$ | **1.11** | −0.01 | **1.21** | 0.00 | −0.06 | −0.08 | −0.02 | 0.00 | −0.02 | 0.00 |
| $C_{ortho}$* | −0.26 | 0.01 | −0.20 | 0.00 | −0.09 | −0.11 | −0.03 | 0.00 | −0.03 | 0.00 |
| $C_{meta}$* | **−0.31** | 0.00 | **−0.41** | 0.00 | −0.06 | −0.04 | −0.03 | 0.00 | −0.03 | 0.00 |
| $C_{para}$ | −0.14 | 0.00 | −0.11 | 0.00 | −0.02 | −0.02 | −0.03 | 0.00 | −0.03 | 0.00 |

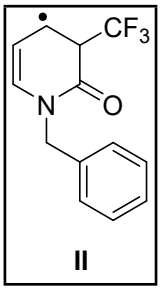
* the values were averaged on the two corresponding atoms

**Figure S4 : Cartesian coordinates for the optimized structures**



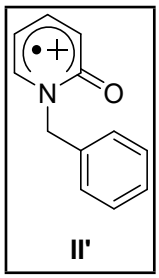

**1a**

| | | | |
|---|---|---|---|
| C | -0.033635 | 0.477083 | 0.004206 |
| C | 0.020561 | 0.540542 | 1.438554 |
| C | 1.134425 | 0.174560 | 2.134289 |
| C | 2.288668 | -0.279021 | 1.455139 |
| C | 2.249950 | -0.339247 | 0.096551 |
| N | 1.141728 | 0.018603 | -0.607659 |
| H | 3.186638 | -0.570093 | 1.983012 |
| H | 3.093222 | -0.672750 | -0.496606 |
| C | 1.147041 | -0.075579 | -2.061962 |
| O | -1.006045 | 0.791613 | -0.687644 |
| C | 1.480334 | -1.318899 | -2.604741 |
| H | 0.645203 | 0.809806 | -2.455081 |
| H | 2.190351 | -0.038989 | -2.386155 |
| C | 0.051078 | -1.322672 | -3.932756 |
| C | -0.522183 | -2.459800 | -4.488918 |
| C | -0.680353 | -3.609861 | -3.720349 |
| C | -0.259381 | -3.611253 | -2.395484 |
| C | 0.319989 | -2.472879 | -1.841266 |
| H | 0.163919 | -0.425868 | -4.535792 |
| H | -0.852621 | -2.445584 | -5.522573 |
| H | -1.132794 | -4.497001 | -4.151185 |
| H | -0.381622 | -4.501249 | -1.786502 |
| H | 0.640907 | -2.489711 | -0.804410 |
| H | -0.873324 | 0.895274 | 1.937631 |
| H | 1.137522 | 0.234299 | 3.218245 |



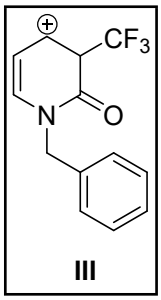

**II**

| | | | |
|---|---|---|---|
| C | -0.231875 | 0.422300 | 0.173570 |
| C | 0.244239 | 0.553569 | 1.620782 |
| C | 1.570301 | -0.075607 | 1.905799 |
| C | 2.404449 | -0.415956 | 0.874364 |
| C | 1.998125 | -0.289928 | -0.445729 |
| N | 0.709372 | 0.099786 | -0.766977 |
| C | 0.259621 | 2.033200 | 2.012290 |
| H | 1.859581 | -0.209715 | 2.940710 |
| H | 3.395796 | -0.808188 | 1.069351 |
| H | 2.634103 | -0.533427 | -1.285430 |
| C | 0.314943 | 0.061711 | -2.179109 |
| O | -1.403082 | 0.617204 | -0.110211 |
| F | 0.691345 | 2.185605 | 3.274851 |
| F | 1.078026 | 2.752093 | 1.225124 |
| F | -0.950285 | 2.601707 | 1.943760 |
| C | 0.165842 | -1.338955 | -2.717444 |
| H | -0.626417 | 0.606424 | -2.255310 |
| H | 1.070641 | 0.607747 | -2.748464 |
| C | 0.896448 | -1.744368 | -3.832565 |
| C | 0.747306 | -3.028952 | -4.349119 |
| C | -0.132145 | -3.922203 | -3.748929 |
| C | -0.864107 | -3.525050 | -2.632092 |
| C | -0.717874 | -2.241557 | -2.121135 |
| H | 1.588199 | -1.050584 | -4.302062 |
| H | 1.323308 | -3.330948 | -5.217837 |
| H | -0.248106 | -4.924711 | -4.147697 |
| H | -1.554349 | -4.217272 | -2.160703 |
| H | -1.296664 | -1.935077 | -1.254925 |
| H | -0.545575 | 0.113804 | 2.241556 |



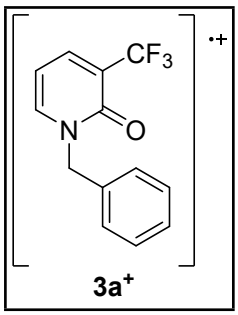

**II'**

| | | | |
|---|---|---|---|
| C | 0.108267 | 0.699158 | -0.292810 |
| C | -0.161320 | 0.872405 | 1.113809 |
| C | 0.684770 | 0.365069 | 2.075392 |
| C | 1.817975 | -0.328932 | 1.671236 |
| C | 2.078694 | -0.511833 | 0.298117 |
| N | 1.278784 | -0.043293 | -0.635848 |
| H | 2.520796 | -0.740844 | 2.383589 |
| H | 2.960521 | -1.049457 | -0.030800 |
| C | 1.548115 | -0.287382 | -2.073553 |
| O | -0.586836 | 1.153551 | -1.182534 |
| C | 0.732029 | -1.435296 | -2.612801 |
| H | 1.321720 | 0.639683 | -2.597739 |
| H | 2.617164 | -0.482542 | -2.154605 |
| C | -0.430722 | -1.193005 | -3.342829 |
| C | -1.173057 | -2.254230 | -3.849120 |
| C | -0.759834 | -3.563573 | -3.626549 |
| C | 0.402527 | -3.810622 | -2.902486 |
| C | 1.147154 | -2.750393 | -2.399694 |
| H | -0.754752 | -0.172017 | -3.514203 |
| H | -2.074322 | -2.056630 | -4.419692 |
| H | -1.339575 | -4.391230 | -4.021600 |
| H | 0.734964 | -4.829548 | -2.735145 |
| H | 2.061331 | -2.953902 | -1.849510 |
| H | -1.056914 | 1.429382 | 1.359943 |
| H | 0.472098 | 0.506803 | 3.127977 |




**III**

| | | | |
|---|---|---|---|
| C | 0.408497 | 0.561016 | -0.361476 |
| C | 0.086839 | 0.612190 | 1.115929 |
| C | 1.228843 | 0.339957 | 2.028133 |
| C | 2.351013 | -0.236397 | 1.568352 |
| C | 2.470525 | -0.533386 | 0.183692 |
| N | 1.568488 | -0.218314 | -0.712295 |
| C | -0.693556 | 1.877070 | 1.488148 |
| H | 1.101445 | 0.564276 | 3.081491 |
| H | 3.175907 | -0.496435 | 2.217391 |
| H | 3.357907 | -1.038611 | -0.185541 |
| C | 1.756383 | -0.521785 | -2.152257 |
| O | -0.234363 | 1.073258 | -1.222898 |
| F | -0.910425 | 1.903706 | 2.807083 |
| F | -0.015256 | 2.981118 | 1.163470 |
| F | -1.876754 | 1.922547 | 0.882894 |
| C | 0.760996 | -1.539550 | -2.644603 |
| H | 1.658744 | 0.419265 | -2.692643 |
| H | 2.782582 | -0.874966 | -2.256510 |
| C | -0.226316 | -1.167885 | -3.555183 |
| C | -1.128707 | -2.111288 | -4.034322 |
| C | -1.053540 | -3.430237 | -3.600273 |
| C | -0.069360 | -3.806724 | -2.690671 |
| C | 0.836777 | -2.866125 | -2.217143 |
| H | -0.289506 | -0.137201 | -3.888871 |
| H | -1.892003 | -1.813827 | -4.745438 |
| H | -1.758938 | -4.166003 | -3.972055 |
| H | -0.002331 | -4.836011 | -2.354807 |
| H | 1.608348 | -3.174125 | -1.517476 |
| H | -0.621070 | -0.222881 | 1.274294 |



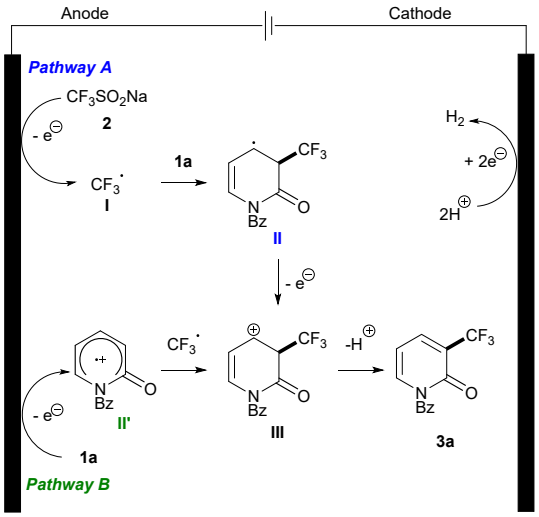

**3a$^+$**

| | | | |
|---|---|---|---|
| C | -0.010215 | 0.250568 | -0.042680 |
| C | -0.110705 | 0.236711 | 1.406685 |
| C | 0.962331 | -0.096410 | 2.196038 |
| C | 2.166767 | -0.436092 | 1.584591 |
| C | 2.267004 | -0.449133 | 0.177955 |
| N | 1.248655 | -0.144476 | -0.593989 |
| C | -1.443720 | 0.628448 | 2.004110 |
| H | 3.042136 | -0.696981 | 2.164881 |
| H | 3.198767 | -0.714890 | -0.307991 |
| C | 1.350991 | -0.207039 | -2.071380 |
| O | -0.903902 | 0.582029 | -0.789824 |
| F | -1.407724 | 0.553305 | 3.334619 |
| F | -1.765888 | 1.880879 | 1.673138 |
| F | -2.415794 | -0.178676 | 1.574657 |
| C | 0.648324 | -1.418965 | -2.629587 |
| H | 0.916228 | 0.713192 | -2.459173 |
| H | 2.416421 | -0.213039 | -2.301789 |
| C | -0.495918 | -1.262529 | -3.408759 |
| C | -1.126306 | -2.374727 | -3.955909 |
| C | -0.621892 | -3.649108 | -3.718773 |
| C | 0.518705 | -3.809960 | -2.938116 |
| C | 1.153683 | -2.698549 | -2.397105 |
| H | -0.893413 | -0.269190 | -3.589457 |
| H | -2.012557 | -2.244114 | -4.567626 |
| H | -1.115535 | -4.516779 | -4.143577 |
| H | 0.919132 | -4.801097 | -2.754210 |
| H | 2.049339 | -2.837701 | -1.798429 |
| H | 0.877419 | -0.093741 | 3.275837 |

## 1aTSII

| | | | |
|---|---|---|---|
| C | -0.253407 | 0.115712 | 0.322030 |
| C | 0.247348 | 0.101400 | 1.683327 |
| C | 1.548945 | -0.268002 | 1.961566 |
| C | 2.465306 | -0.463608 | 0.915706 |
| C | 2.018578 | -0.350363 | -0.369991 |
| N | 0.720004 | -0.069719 | -0.662412 |
| C | 0.258517 | 2.479199 | 1.912511 |
| H | 1.867661 | -0.376526 | 2.992888 |
| H | 3.502166 | -0.708923 | 1.102604 |
| H | 2.668637 | -0.490816 | -1.225335 |
| C | 0.311328 | -0.007851 | -2.072403 |
| O | -1.432687 | 0.295245 | 0.019012 |
| F | 1.134448 | 2.761814 | 2.866075 |
| F | 0.629044 | 3.063631 | 0.780164 |
| F | -0.943430 | 2.913358 | 2.266750 |
| C | 0.150743 | -1.369106 | -2.699845 |
| H | -0.630085 | 0.541573 | -2.093347 |
| H | 1.062663 | 0.573625 | -2.609586 |
| C | 0.965313 | -1.754668 | -3.762943 |
| C | 0.815294 | -3.007600 | -4.352087 |
| C | -0.150014 | -3.887972 | -3.878168 |
| C | -0.967560 | -3.509774 | -2.815357 |
| C | -0.820122 | -2.258059 | -2.231191 |
| H | 1.721640 | -1.070139 | -4.136557 |
| H | 1.455751 | -3.294298 | -5.179888 |
| H | -0.267807 | -4.865277 | -4.334805 |
| H | -1.726071 | -4.191588 | -2.444335 |
| H | -1.463591 | -1.961162 | -1.408578 |
| H | -0.507449 | 0.122546 | 2.460614 |

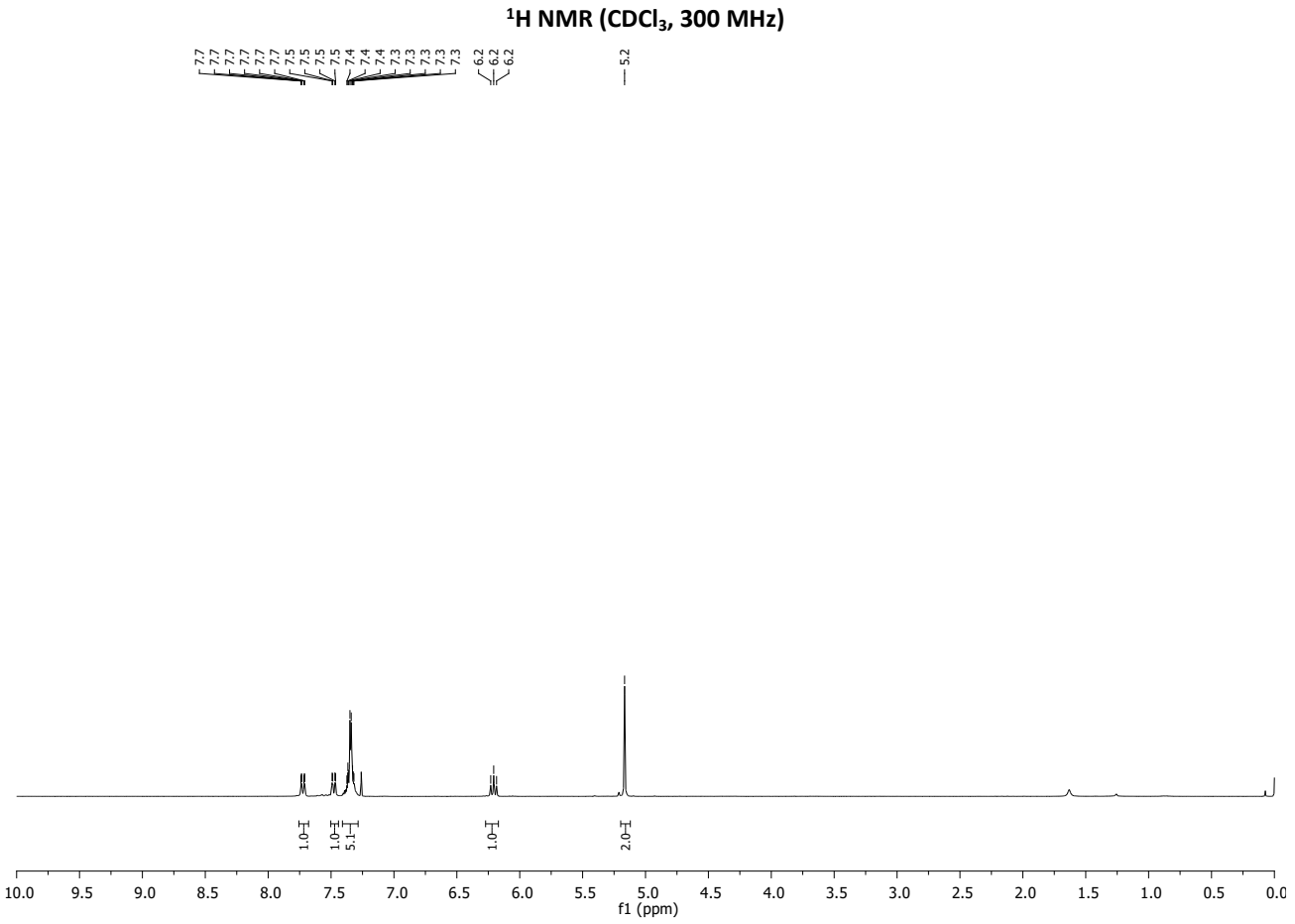
**Scheme S1 : Proposed mechanism**



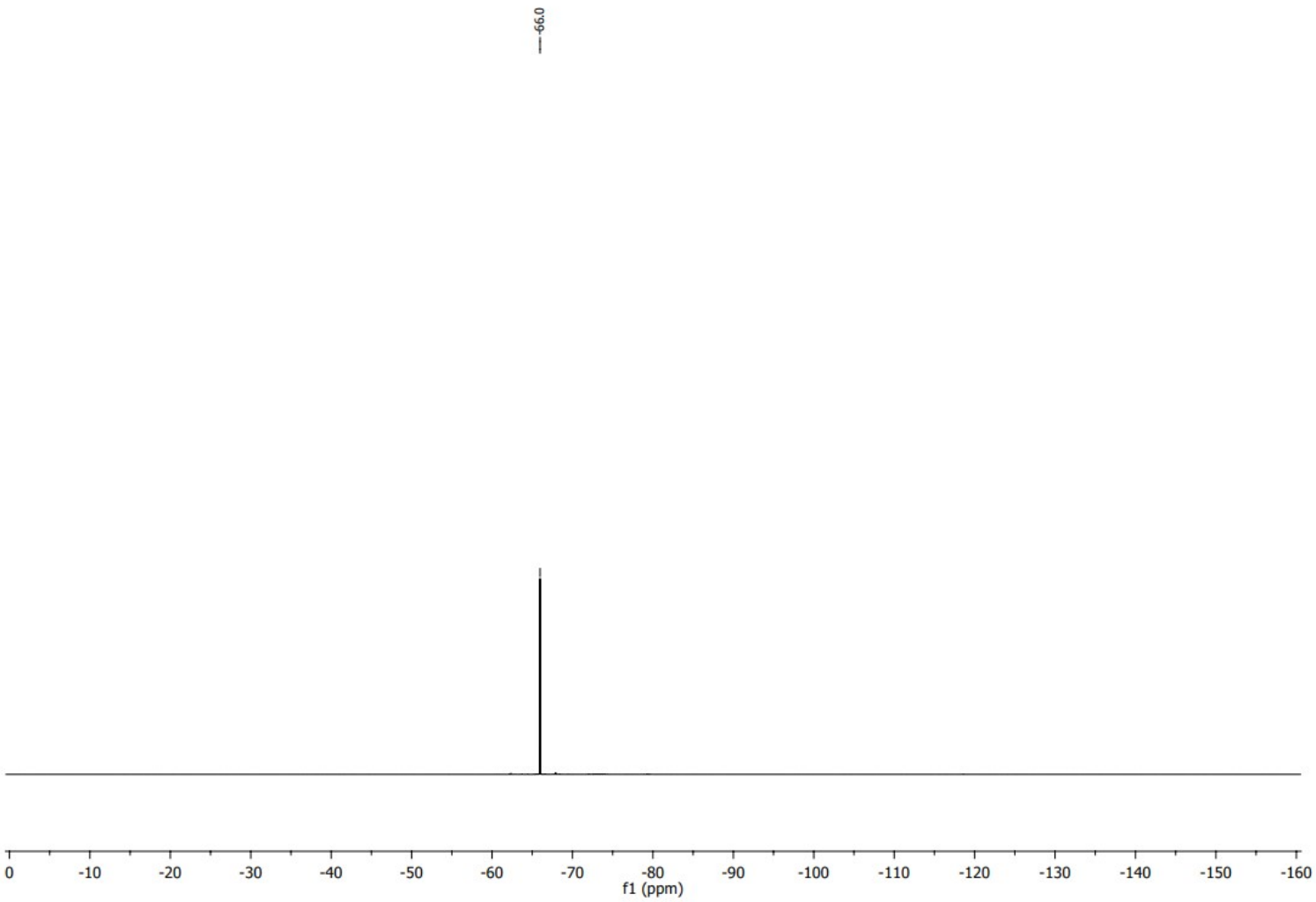
## VIII. Copies of NMR spectra

1-benzyl-3-trifluoromethyl-2-pyridinone **3a**

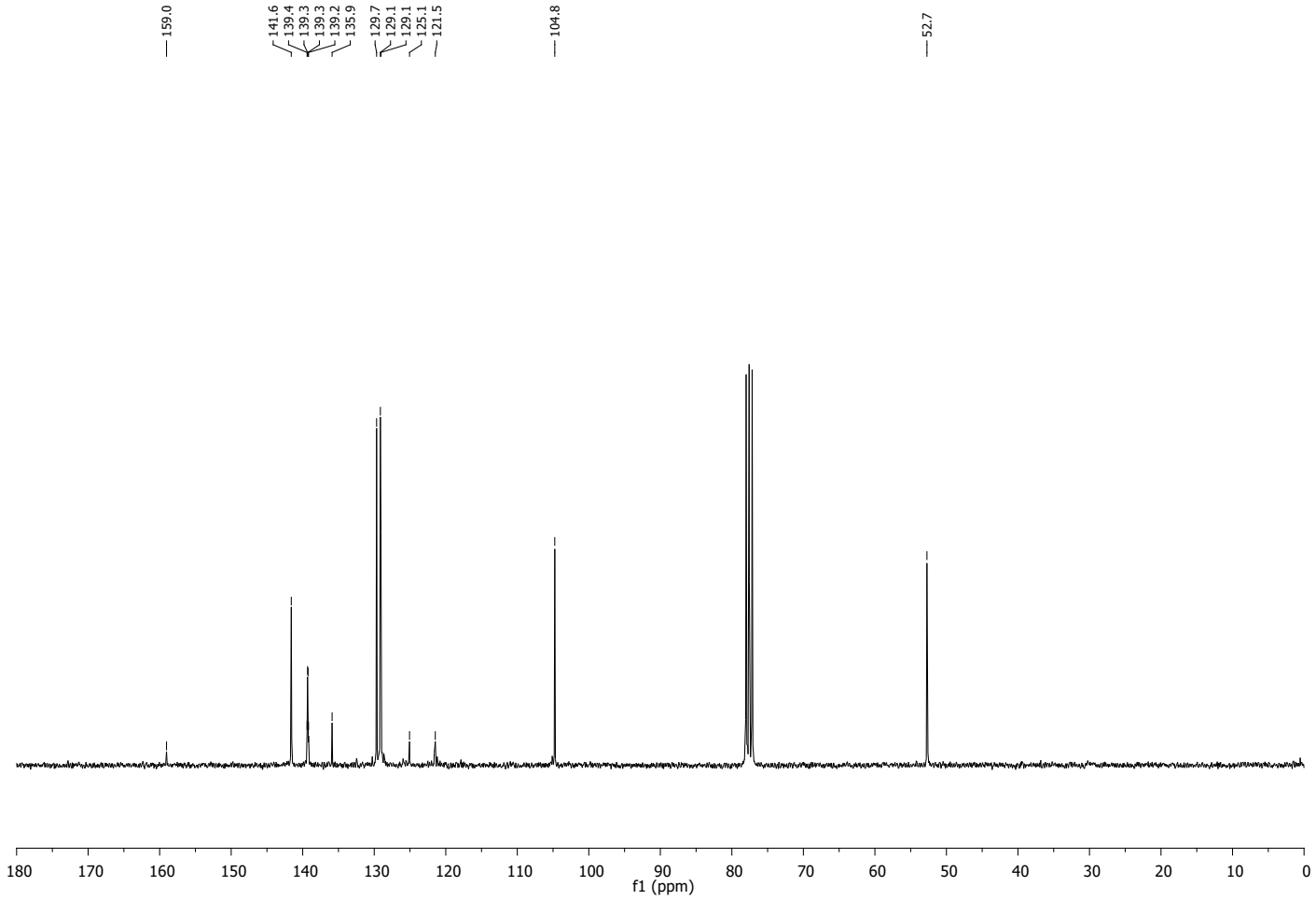
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

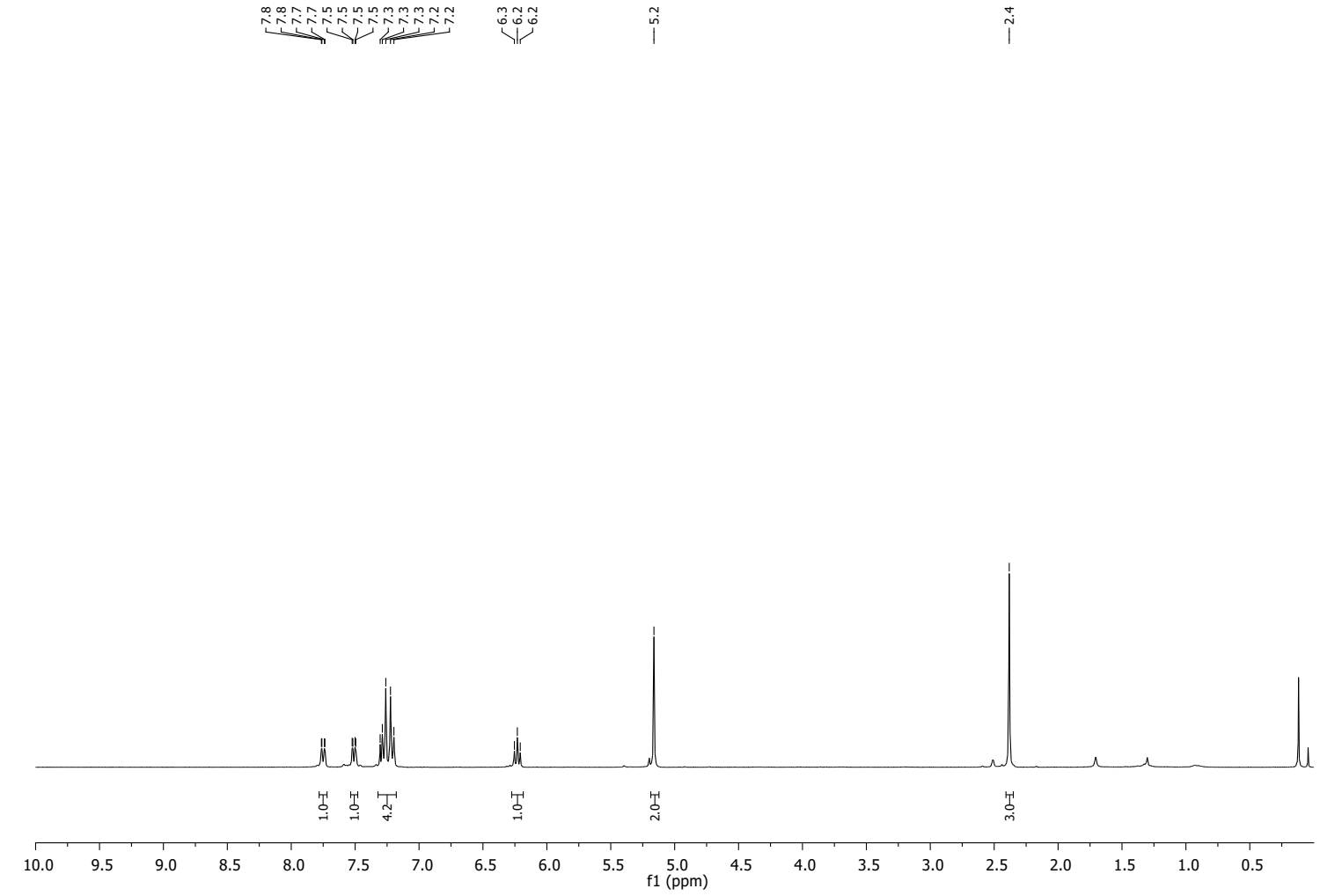


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

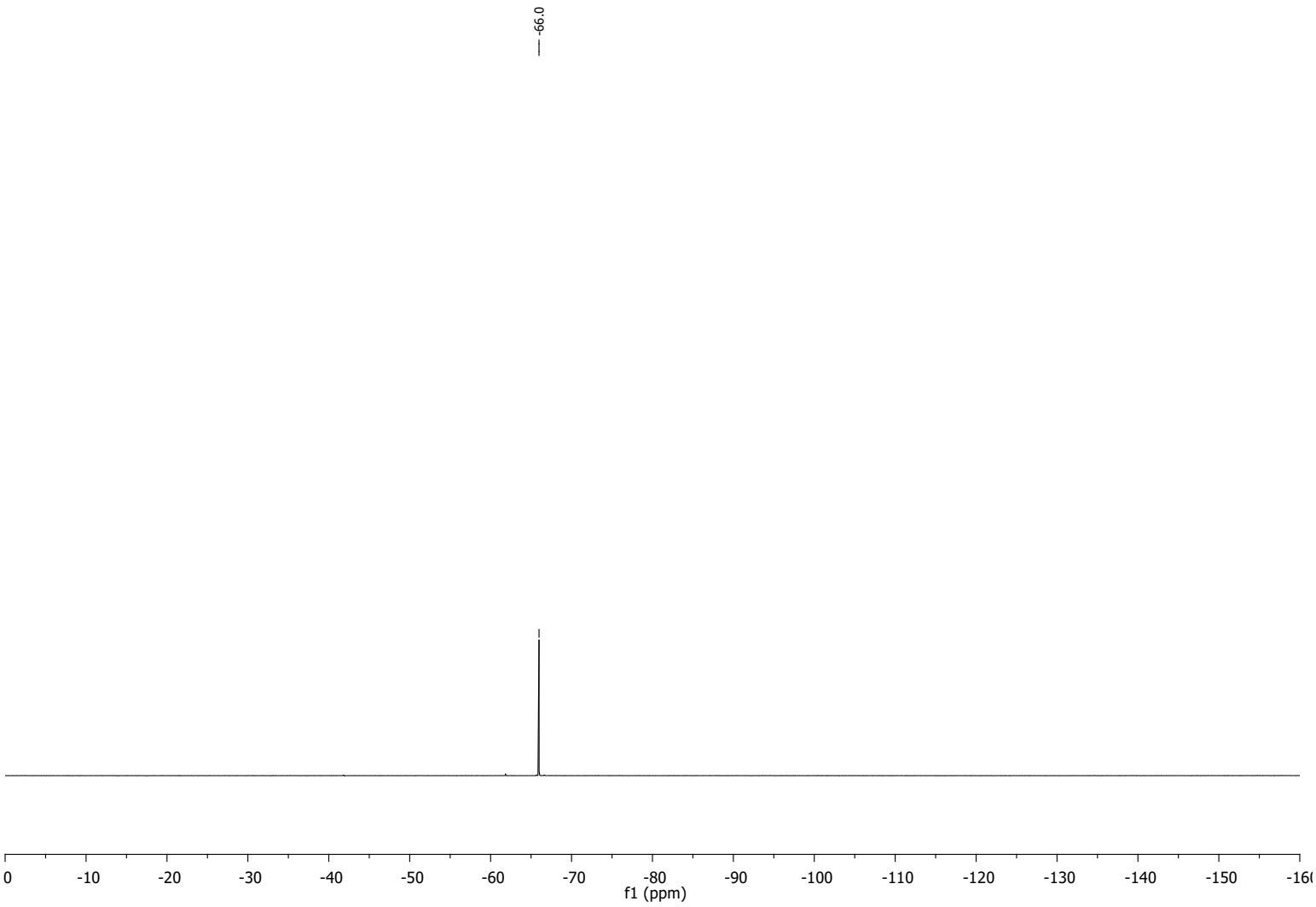


N-(4-methylbenzyl)-3-(trifluoromethyl)pyridin-2(1H)-one **3b**

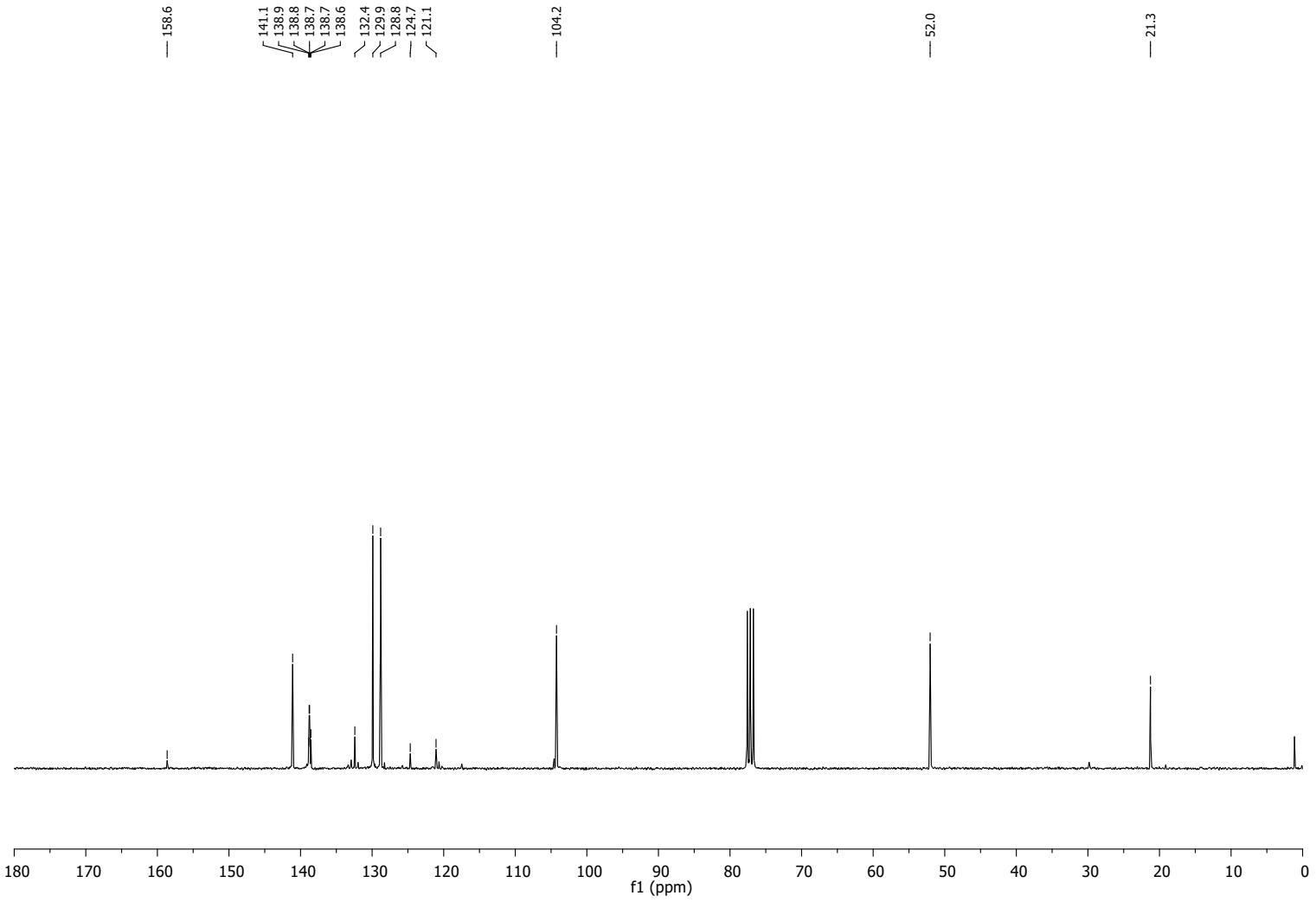
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

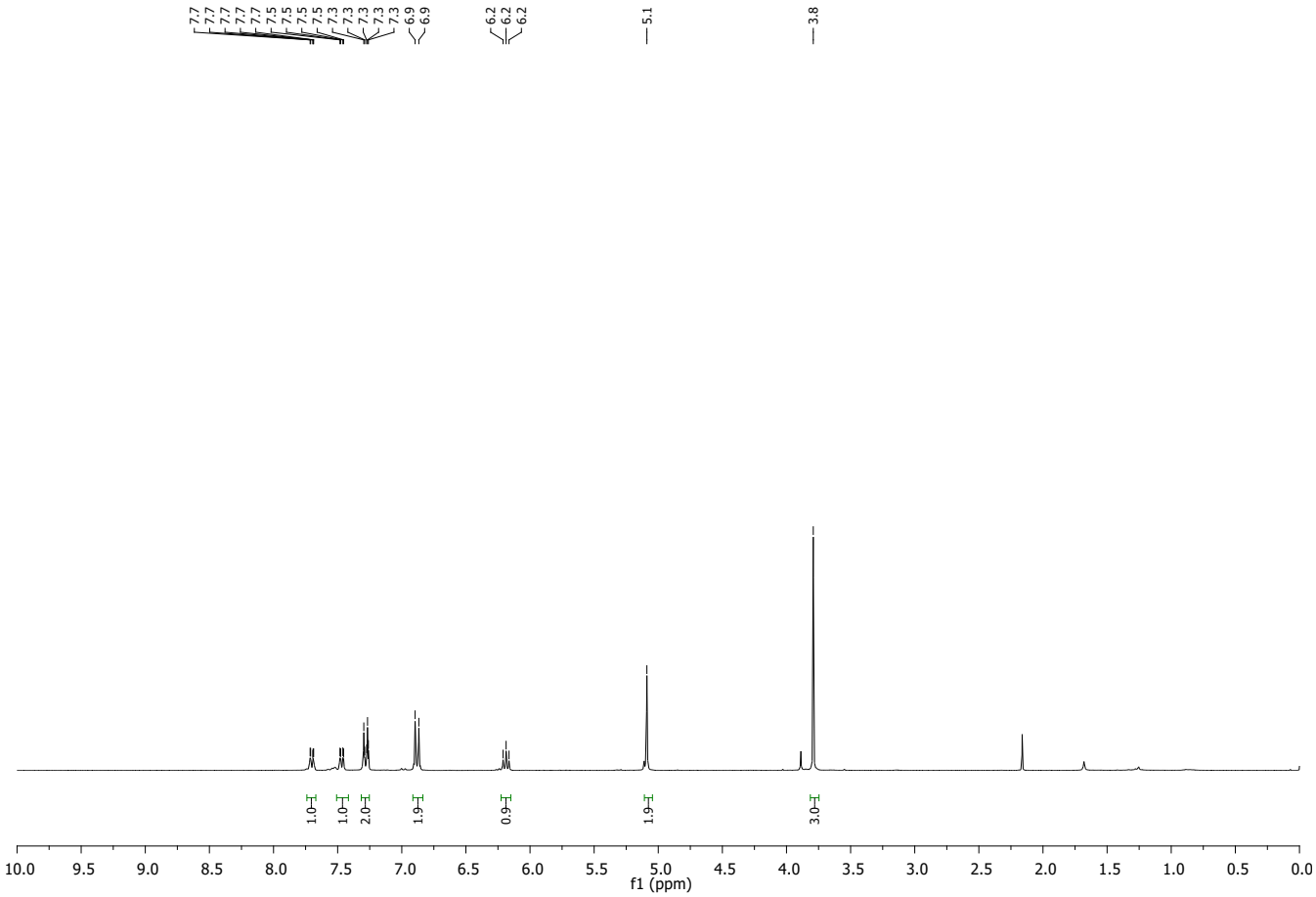


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

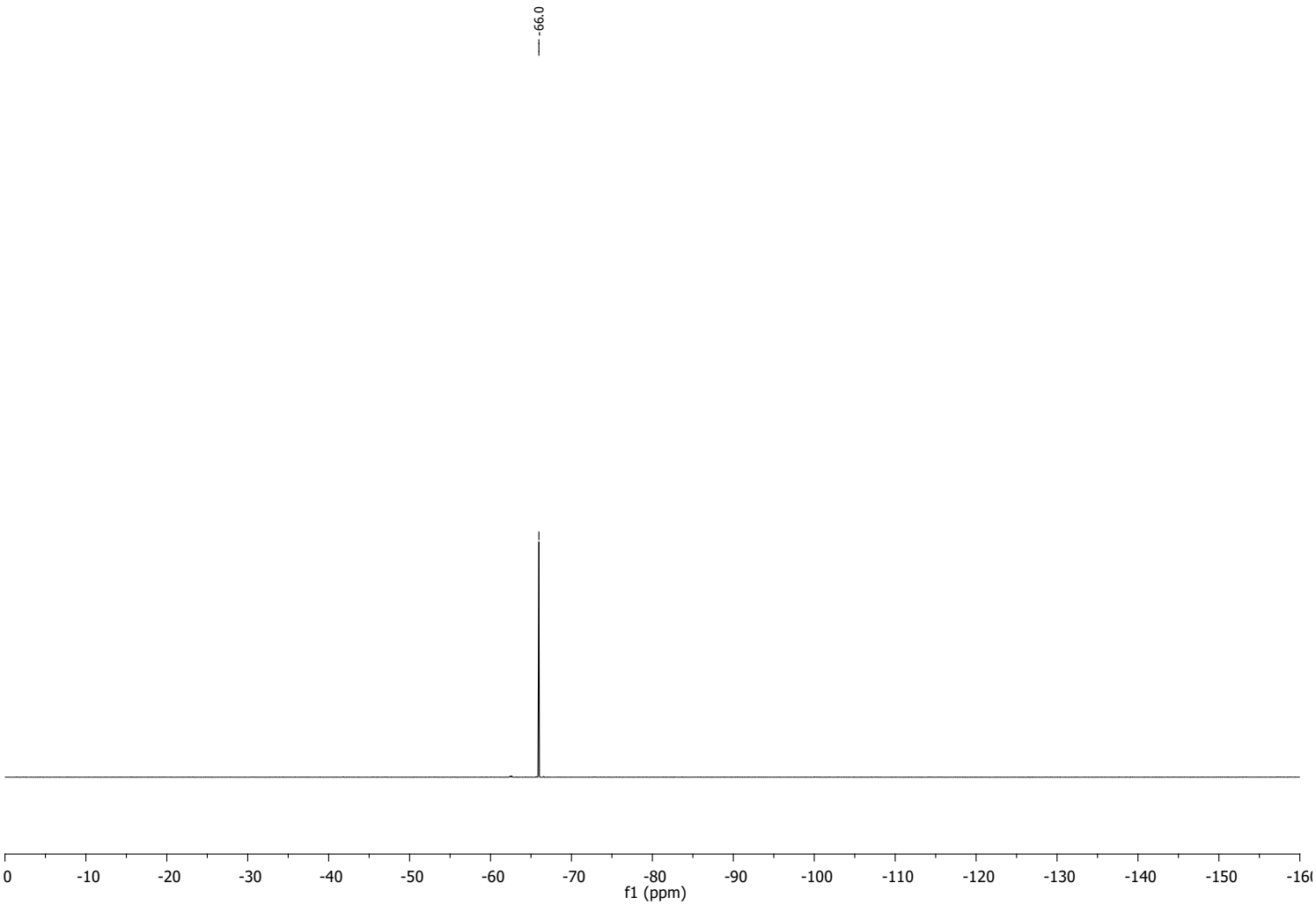


N-(4-methoxybenzyl)-3-(trifluoromethyl)pyridin-2(1H)-one **3c**

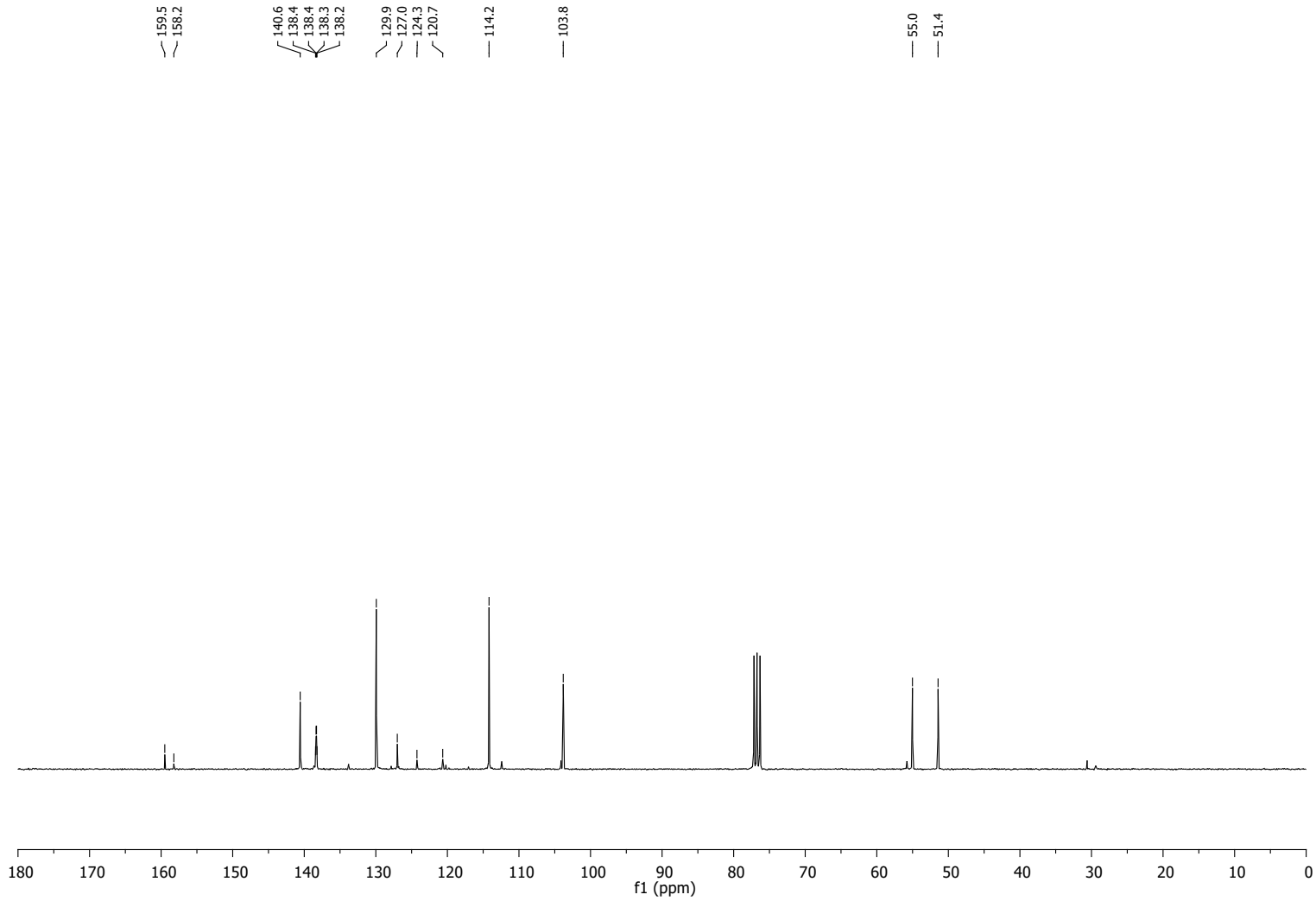
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

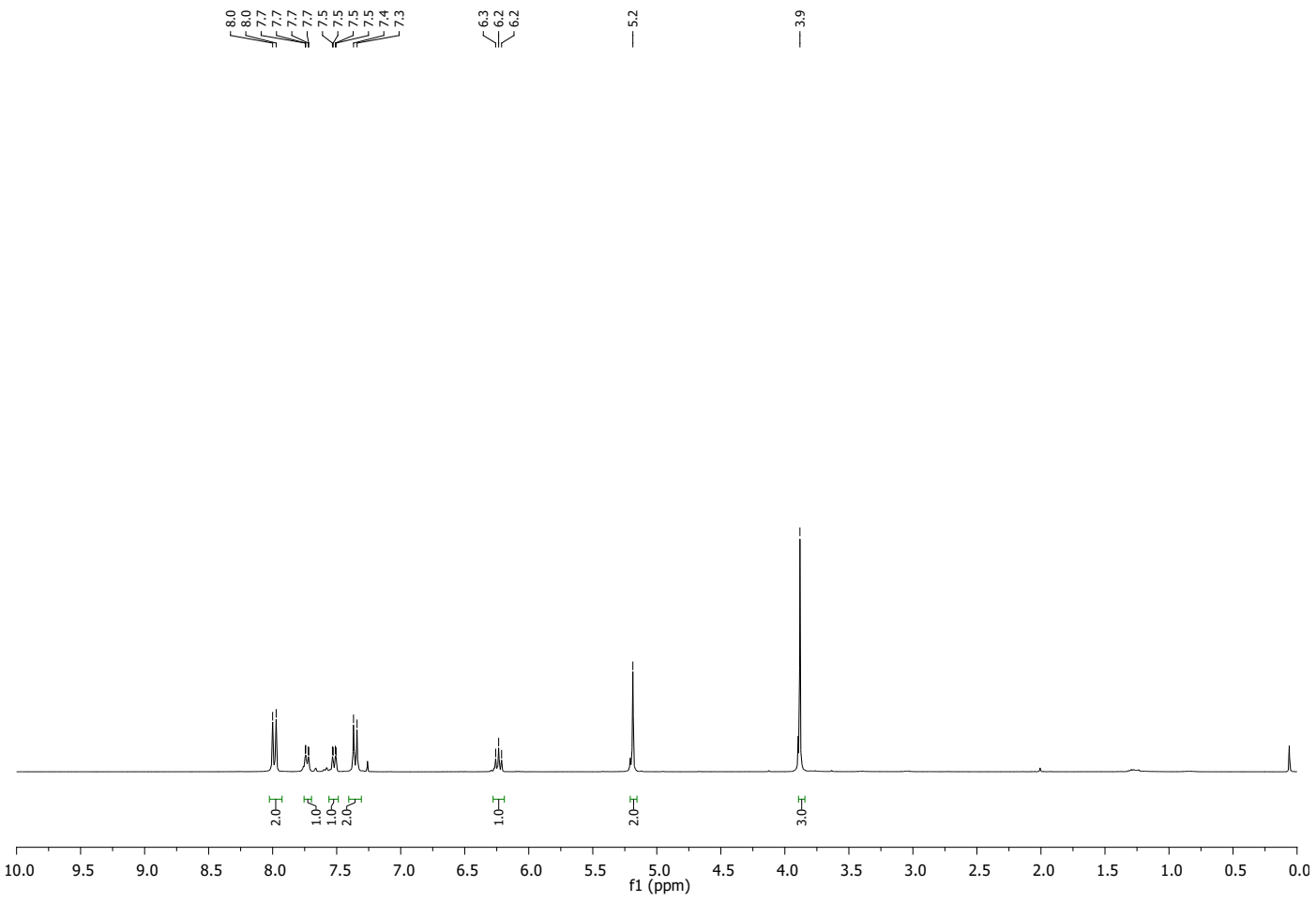


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

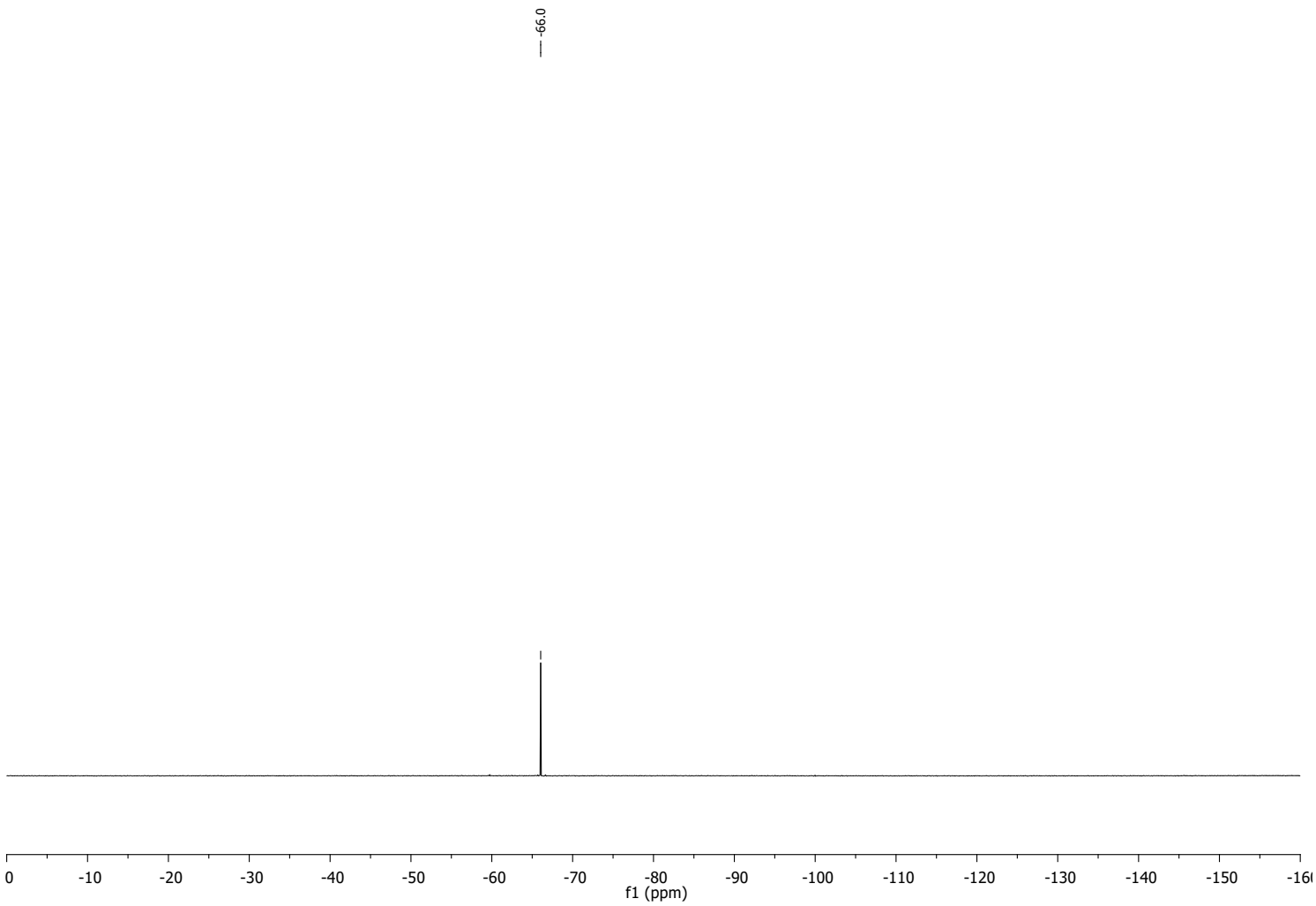


1-(3,5-dimethyl-4-(trifluoromethyl)benzyl)-3-(trifluoromethyl)pyridin-2(1H)-one **3e**

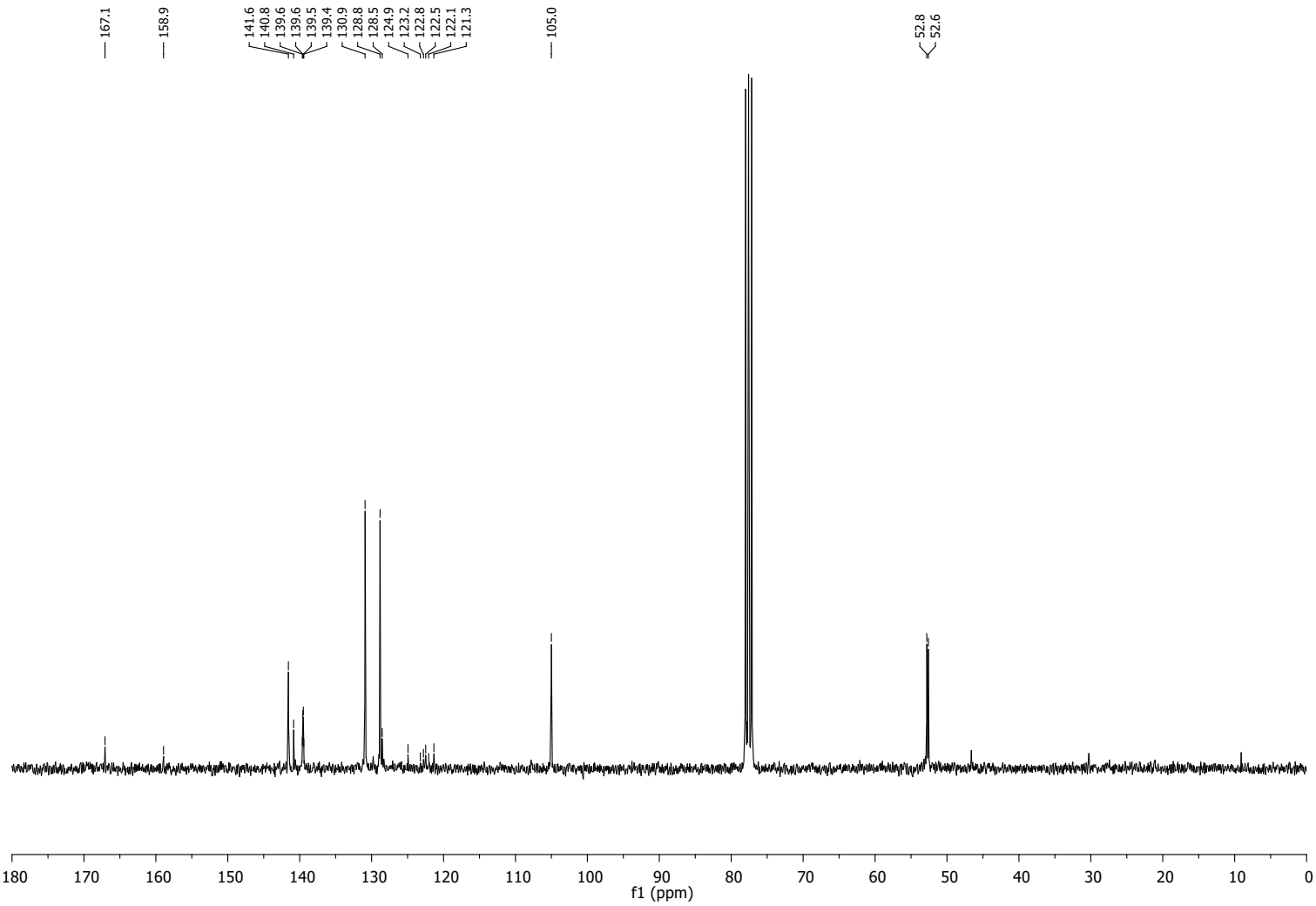
**$^{1}$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

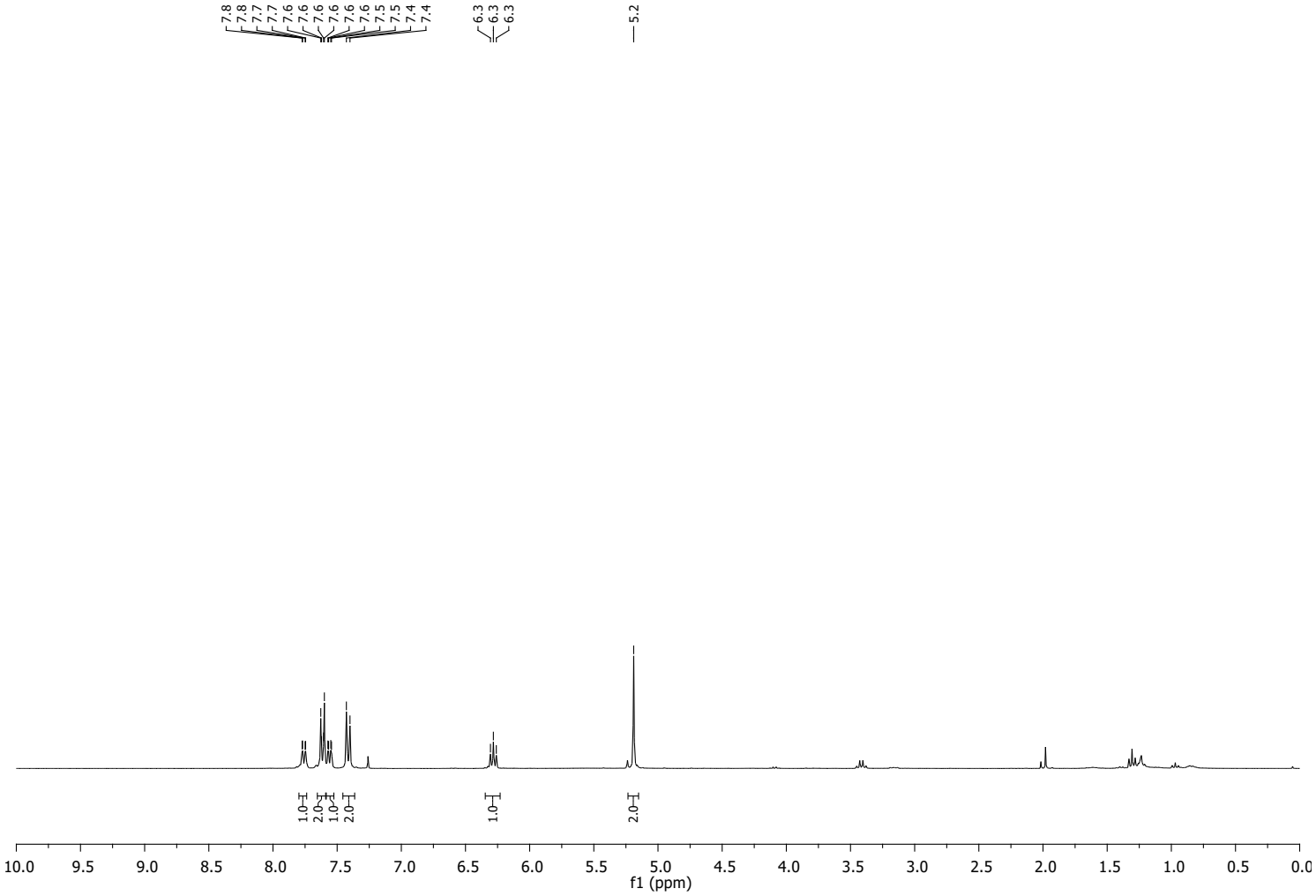


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

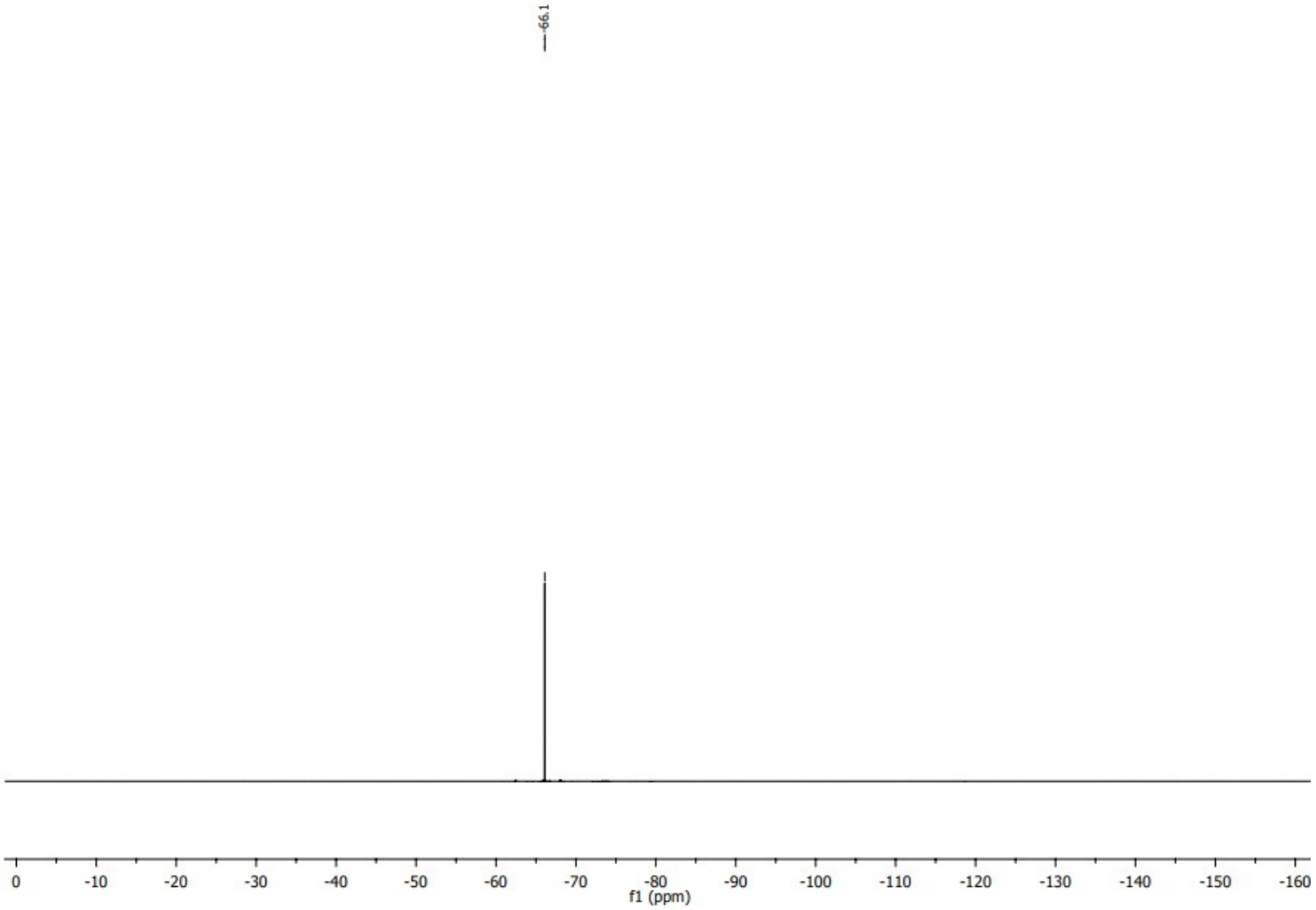


4-((2-oxo-3-(trifluoromethyl)pyridin-1(2H)-yl)methyl)benzonitrile **3f**

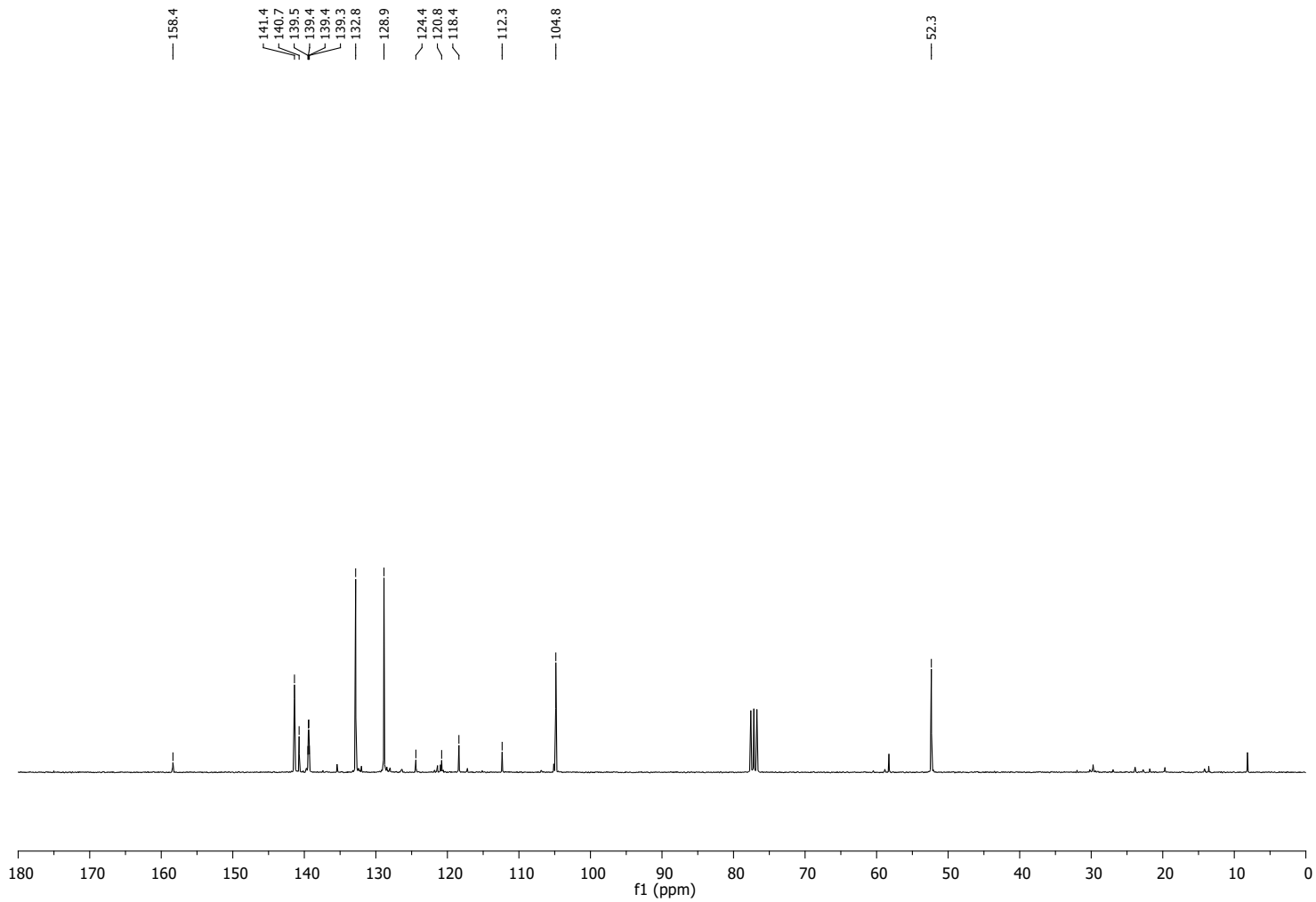
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

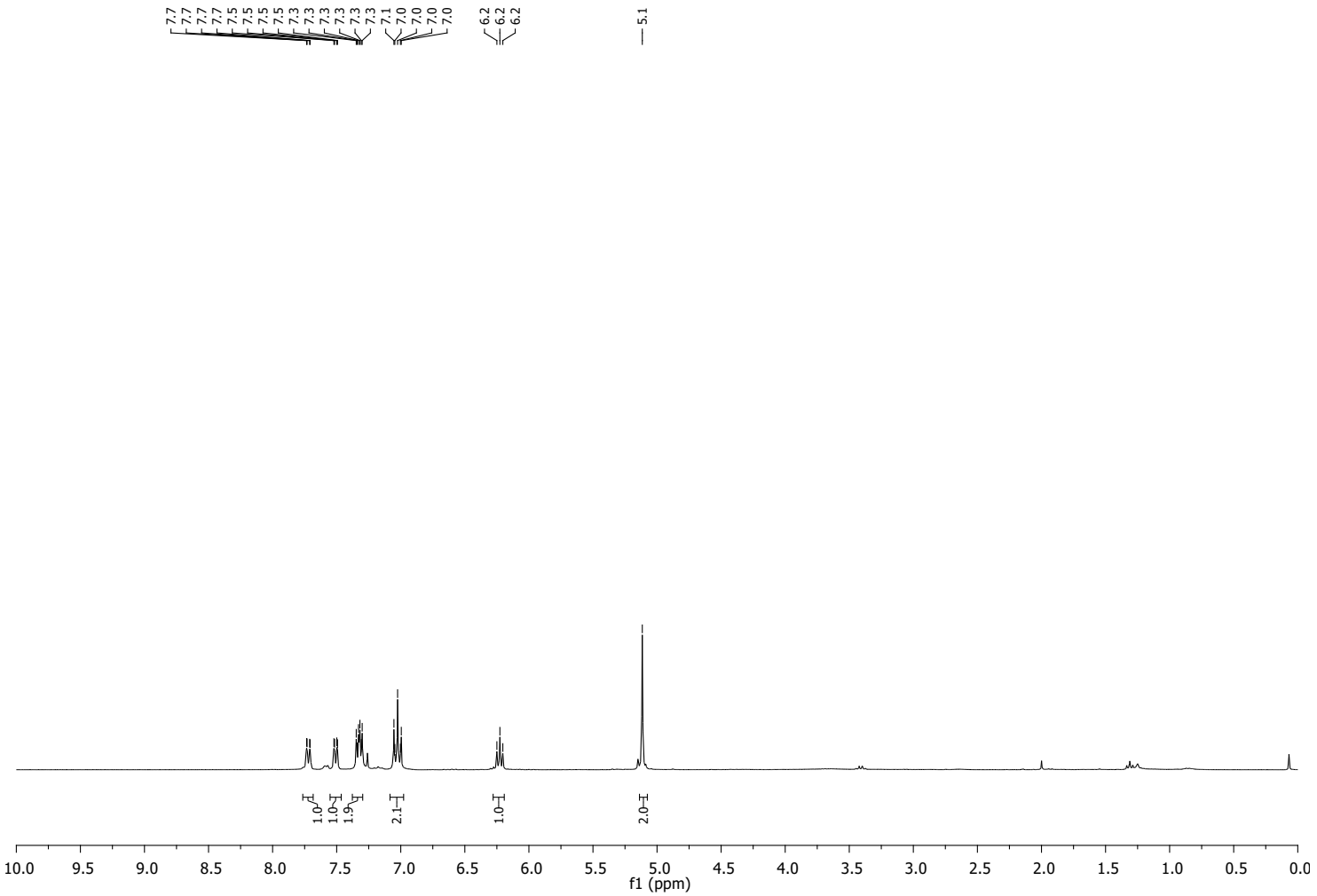


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

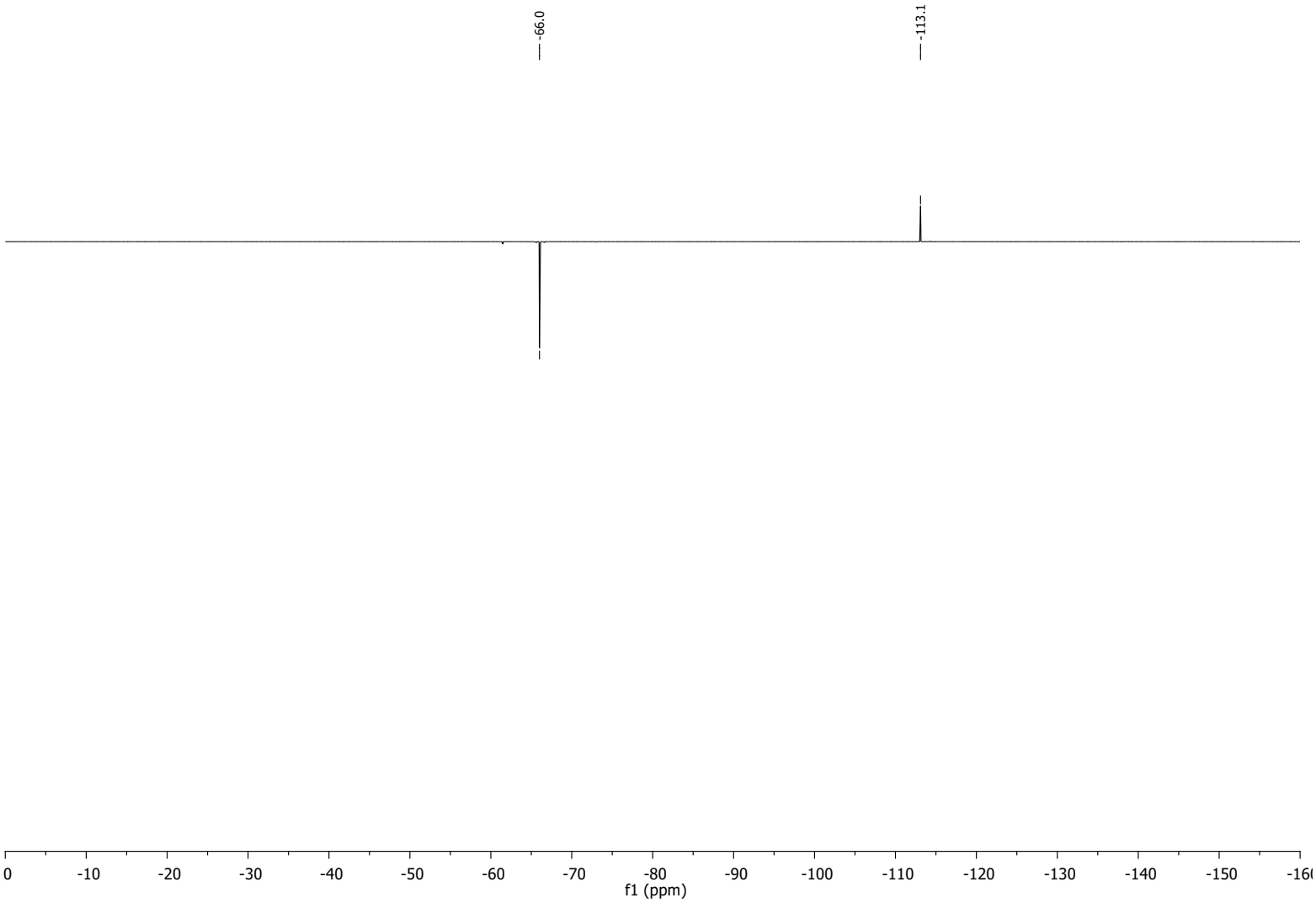


1-(3,5-dimethyl-4-(trifluoromethyl)benzyl)-3-(trifluoromethyl)pyridin-2(1H)-one **3g**

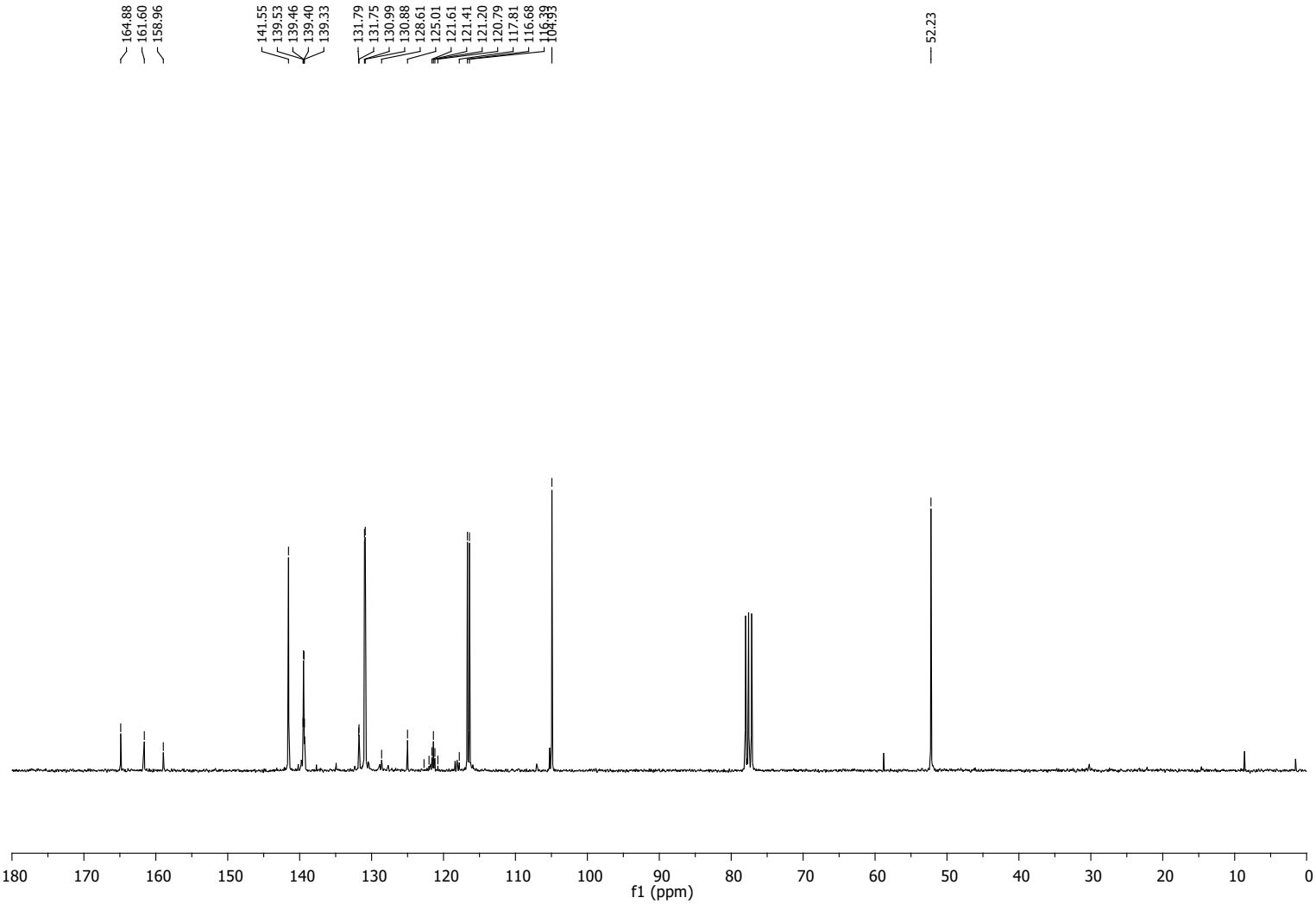
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

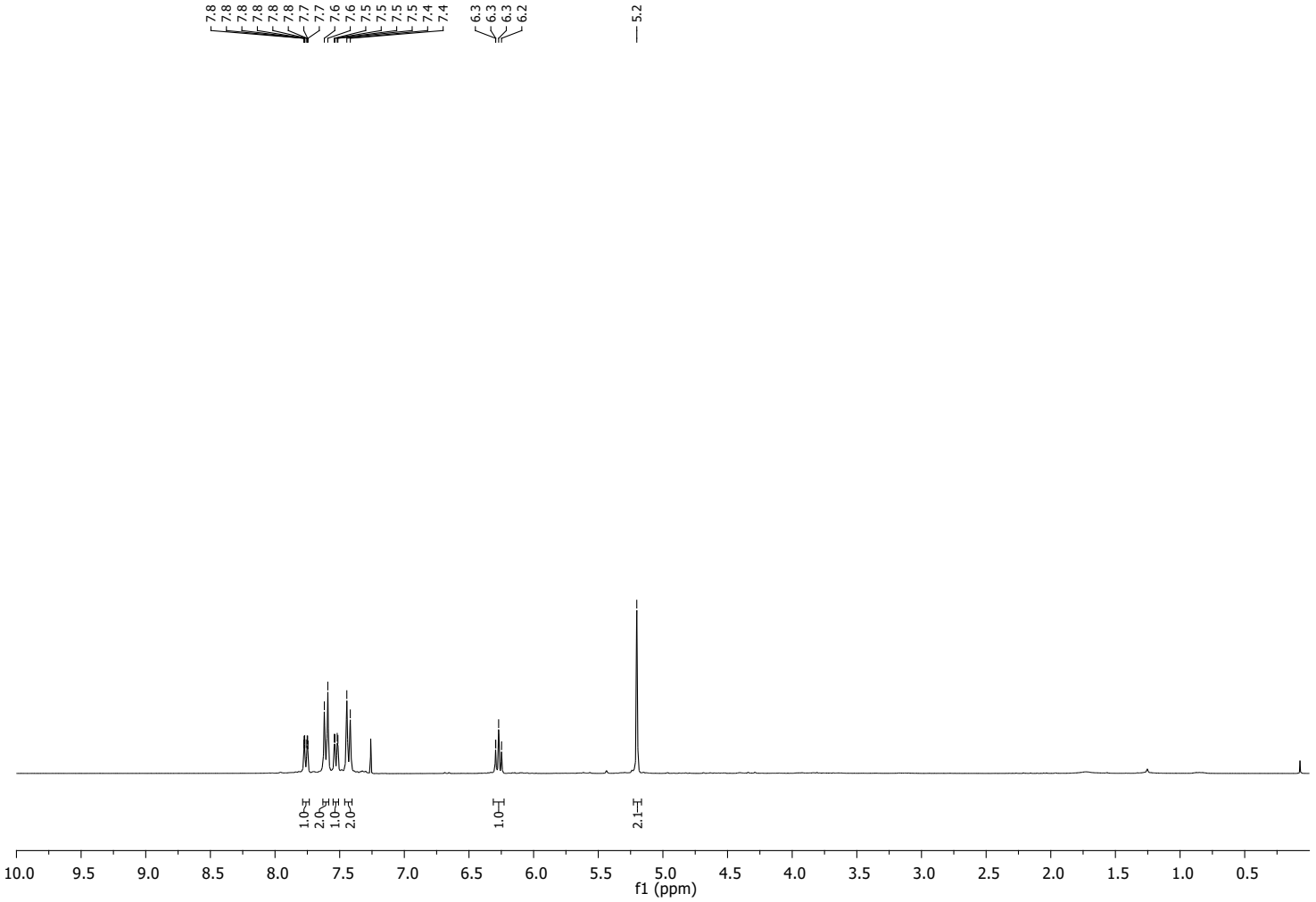


**$^{13}C$ NMR ($CDCl_3$, 75 MHz)**

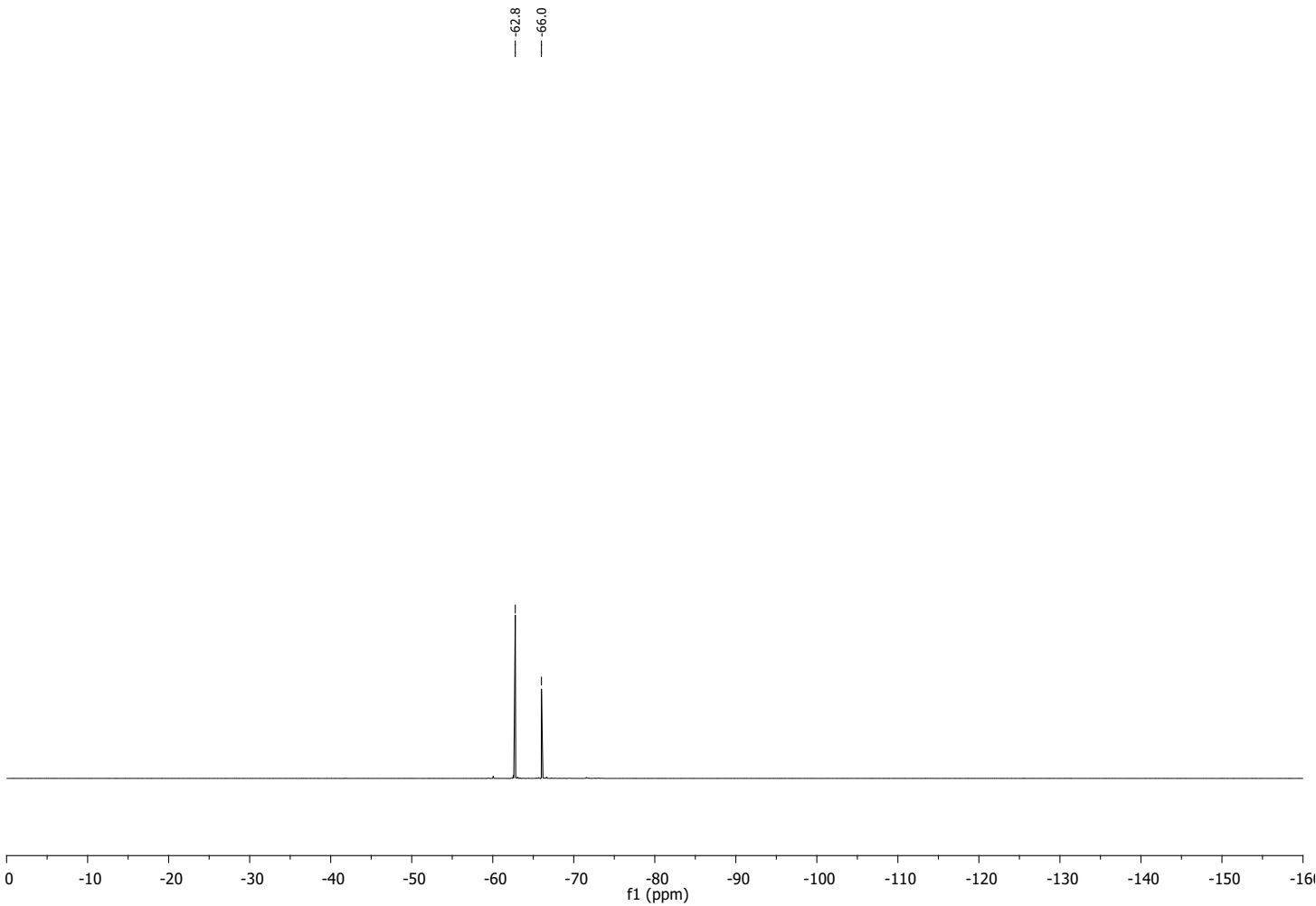


3-(trifluoromethyl)-1-(4-(trifluoromethyl)benzyl)pyridin-2(1H)-one **3h**

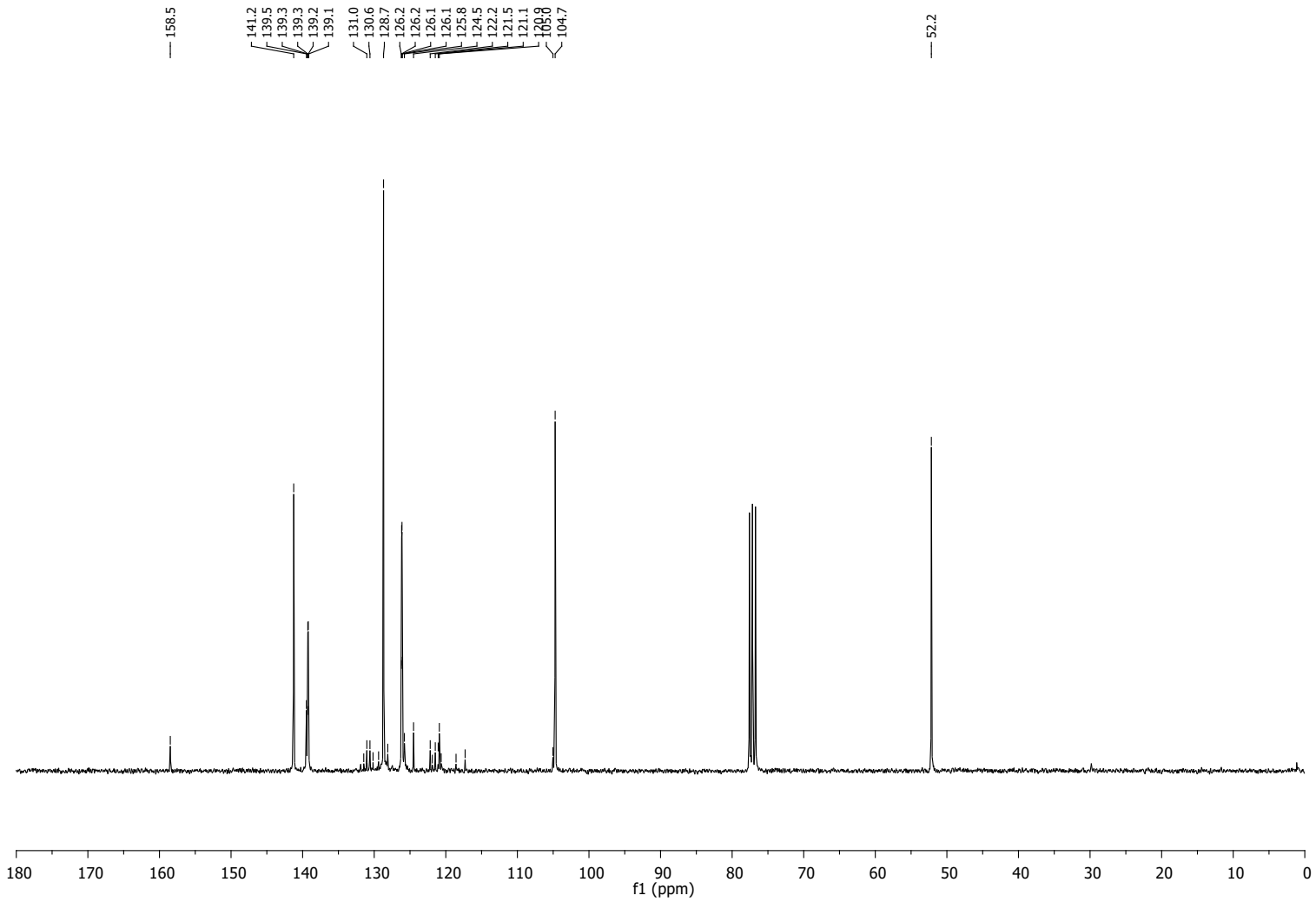
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

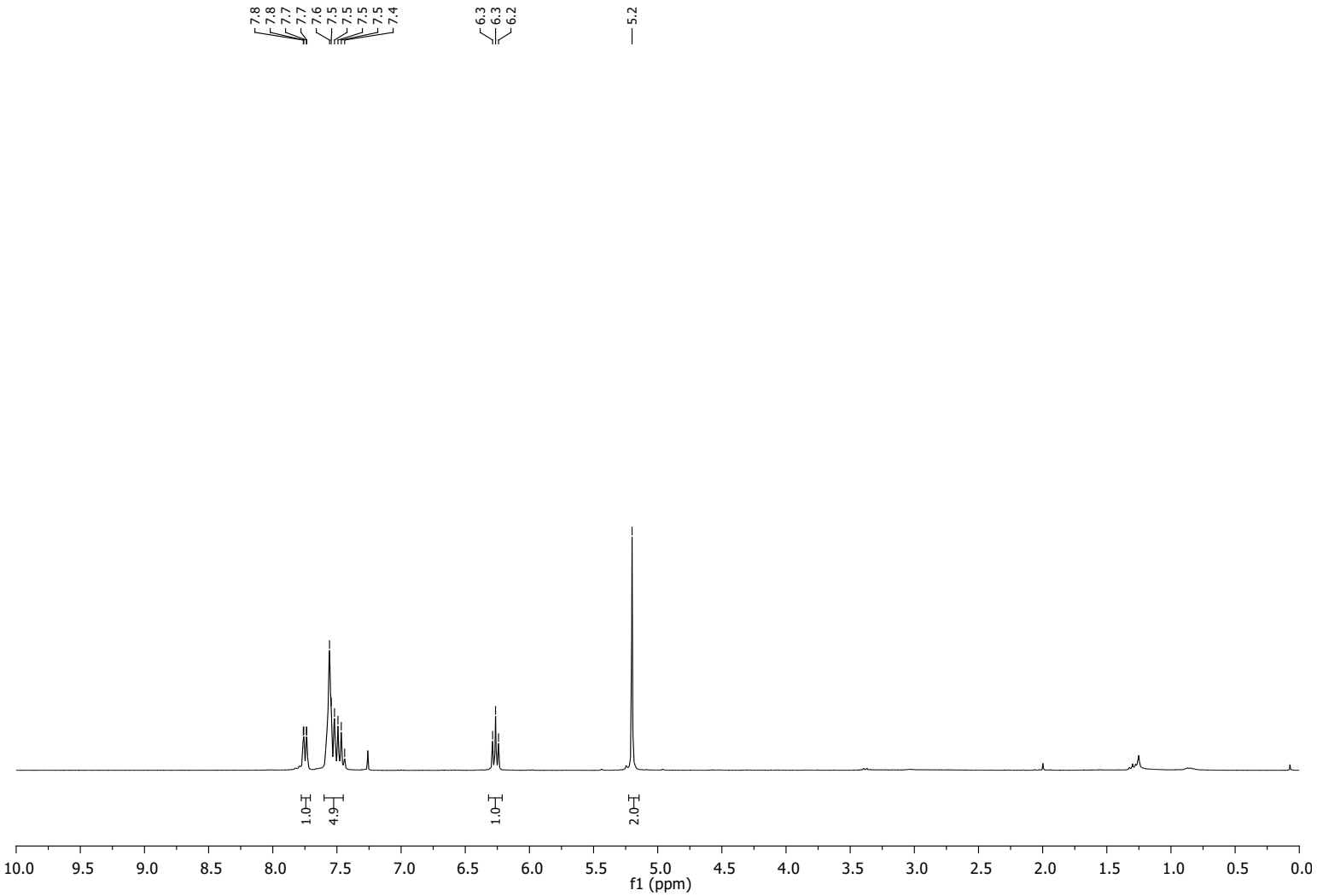


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

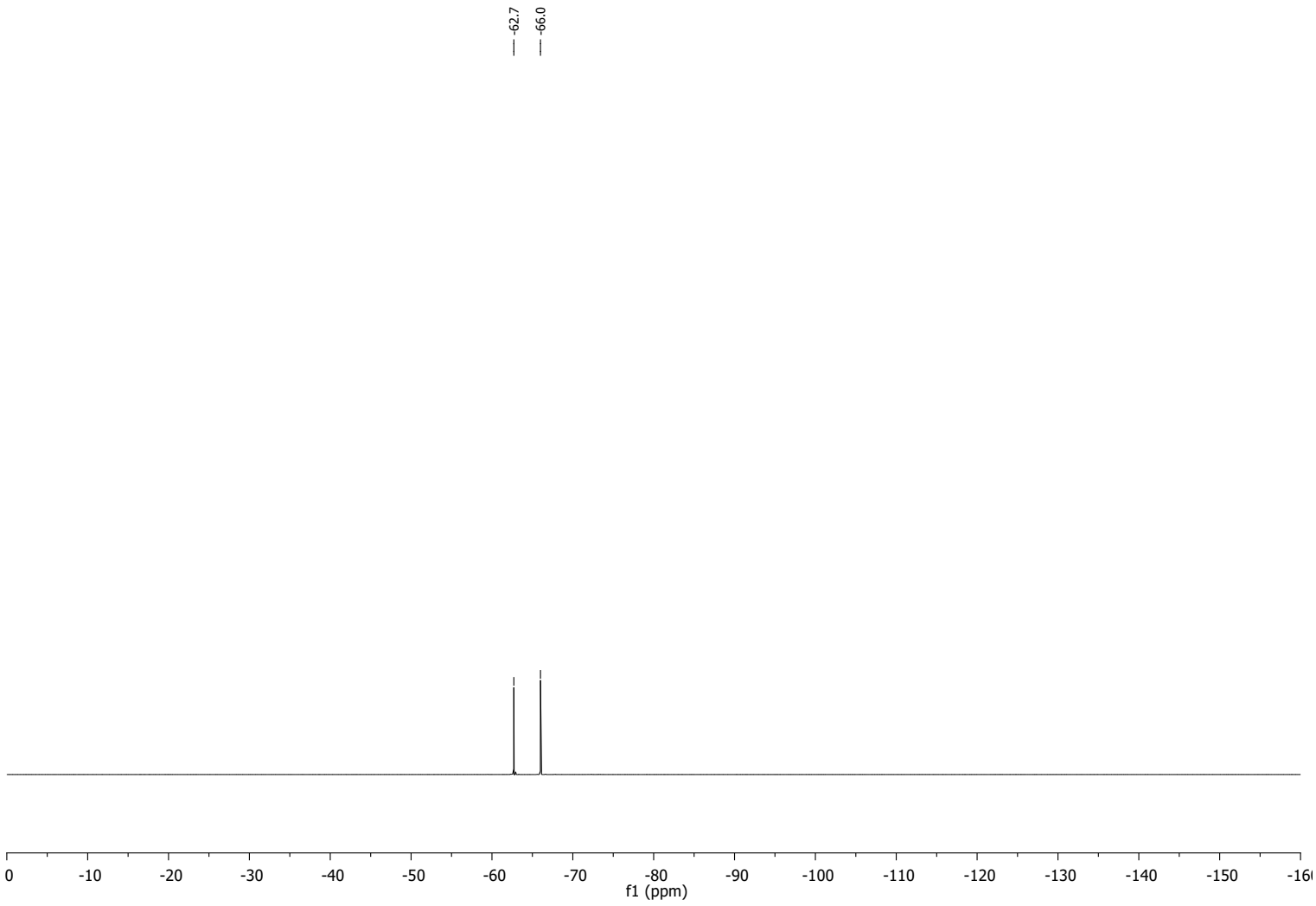


3-(trifluoromethyl)-1-(3-(trifluoromethyl)benzyl)pyridin-2(1H)-one **3i**

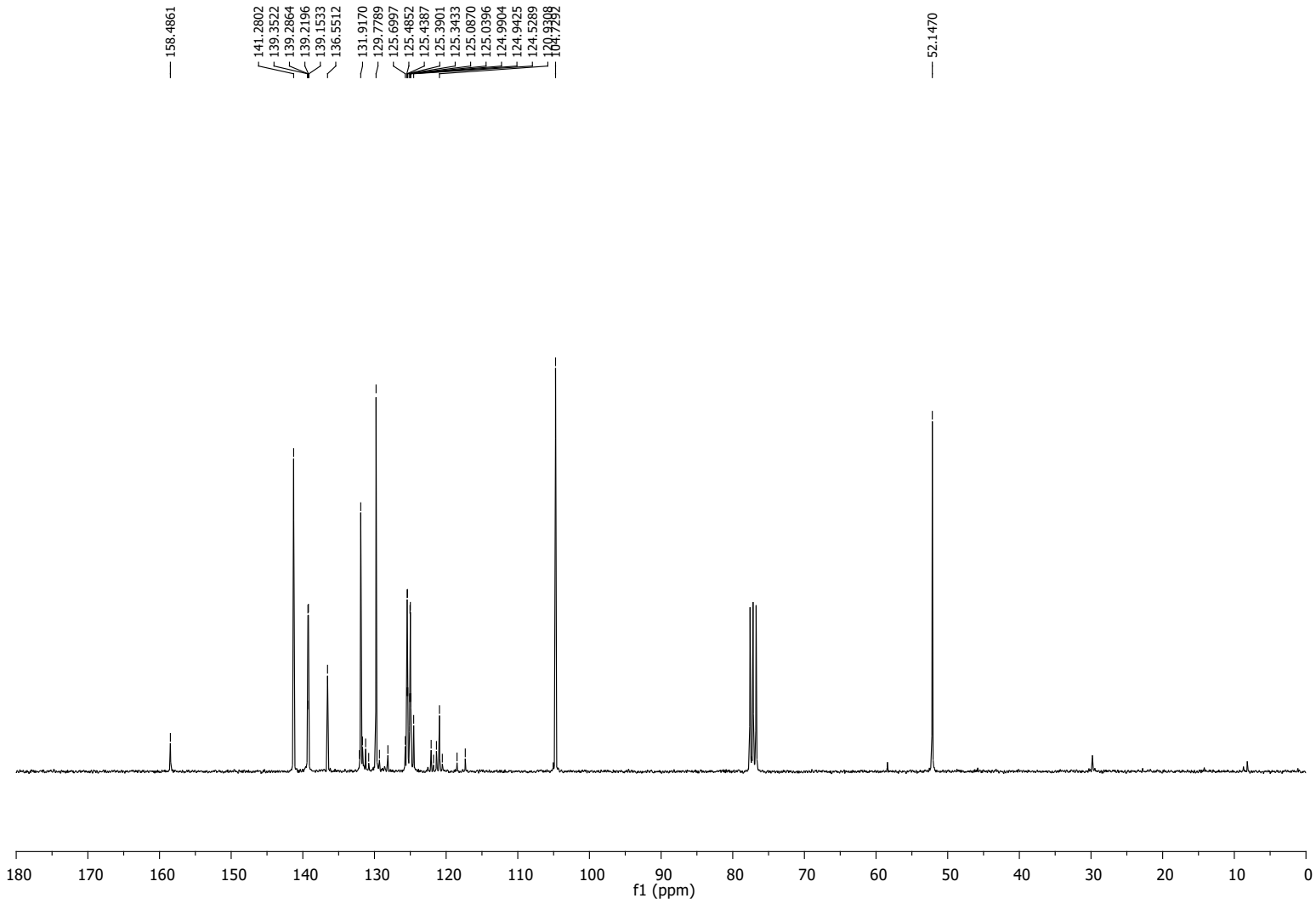
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

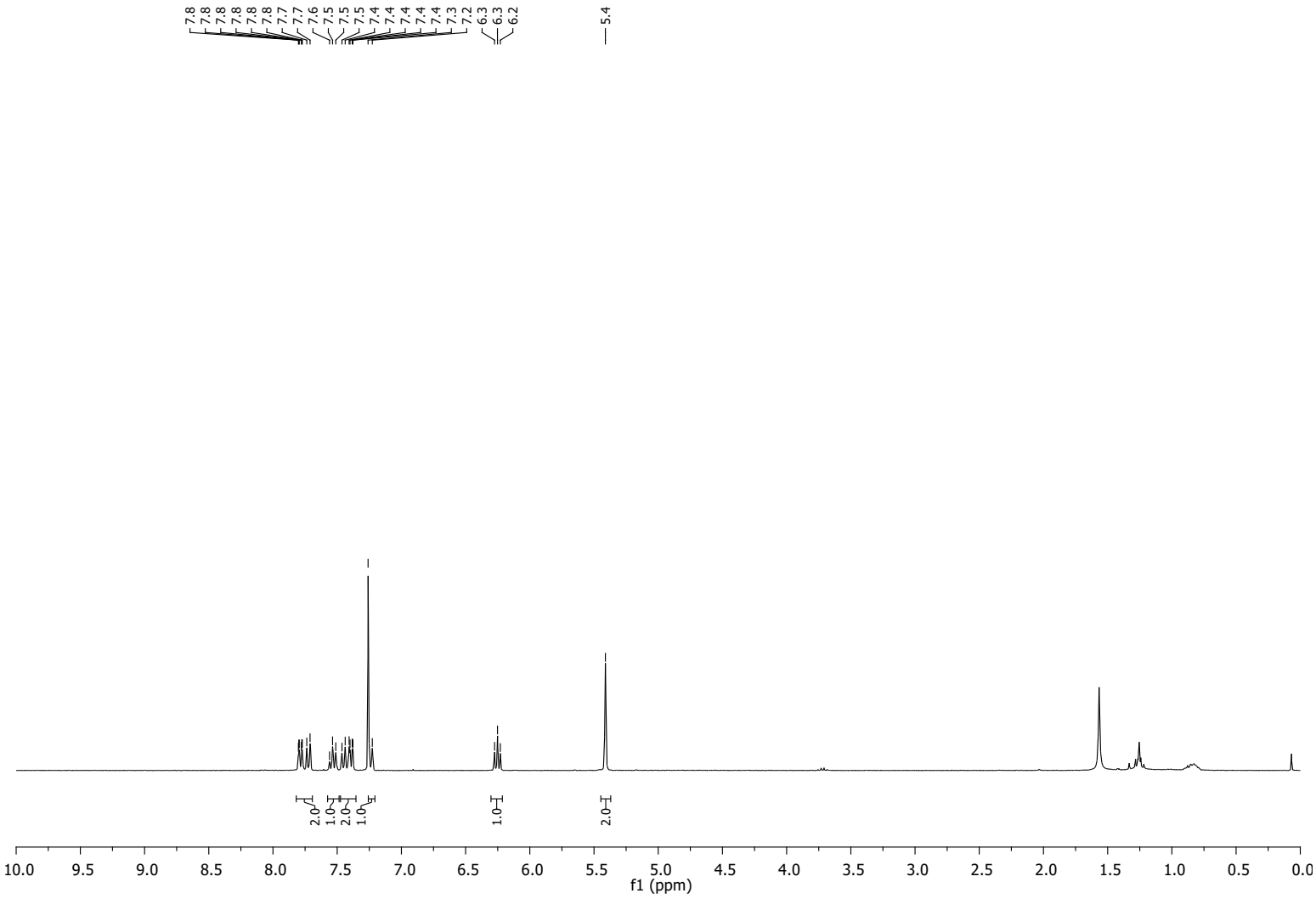


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

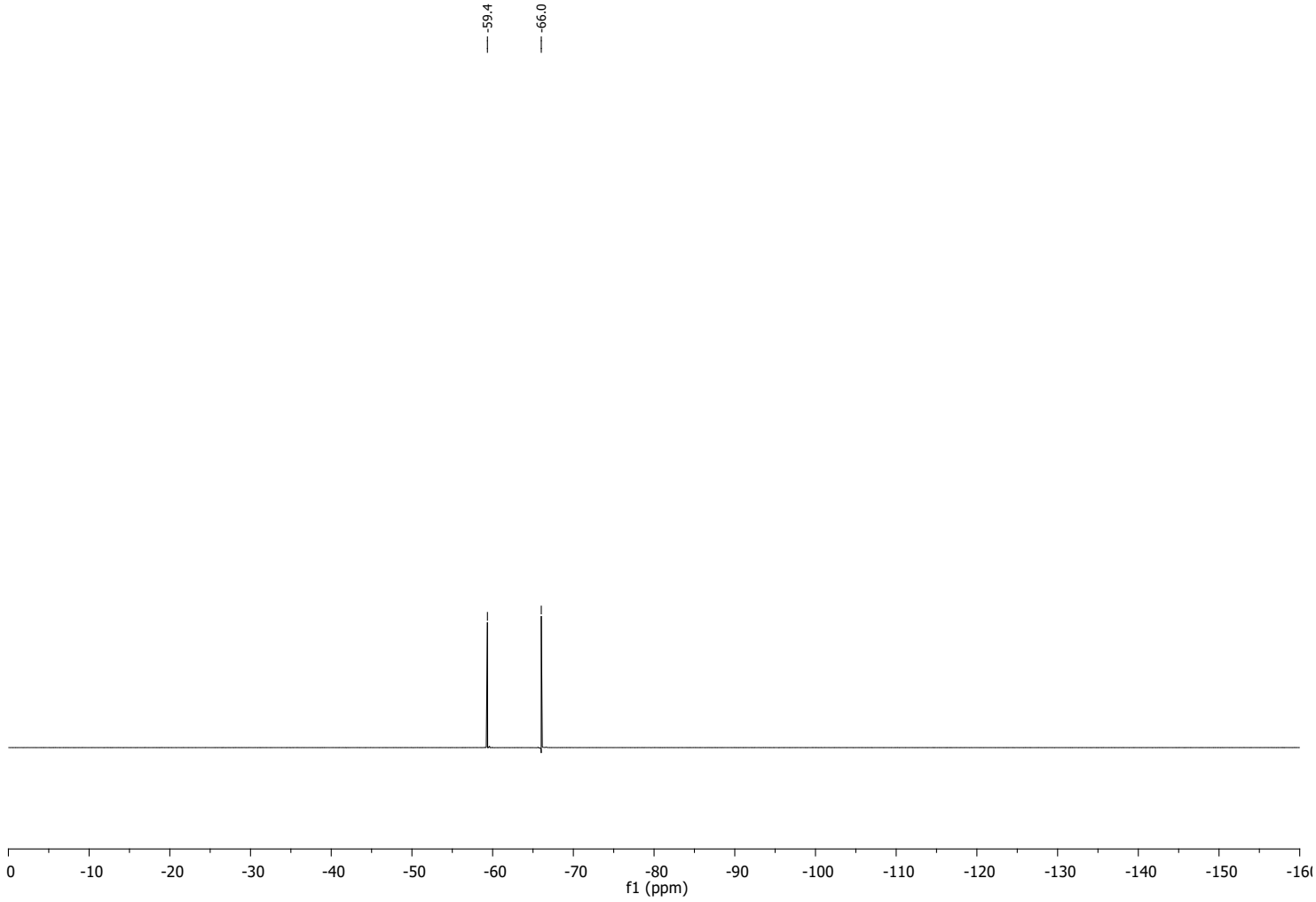


3-(trifluoromethyl)-1-(2-(trifluoromethyl)benzyl)pyridin-2(1H)-one **3j**

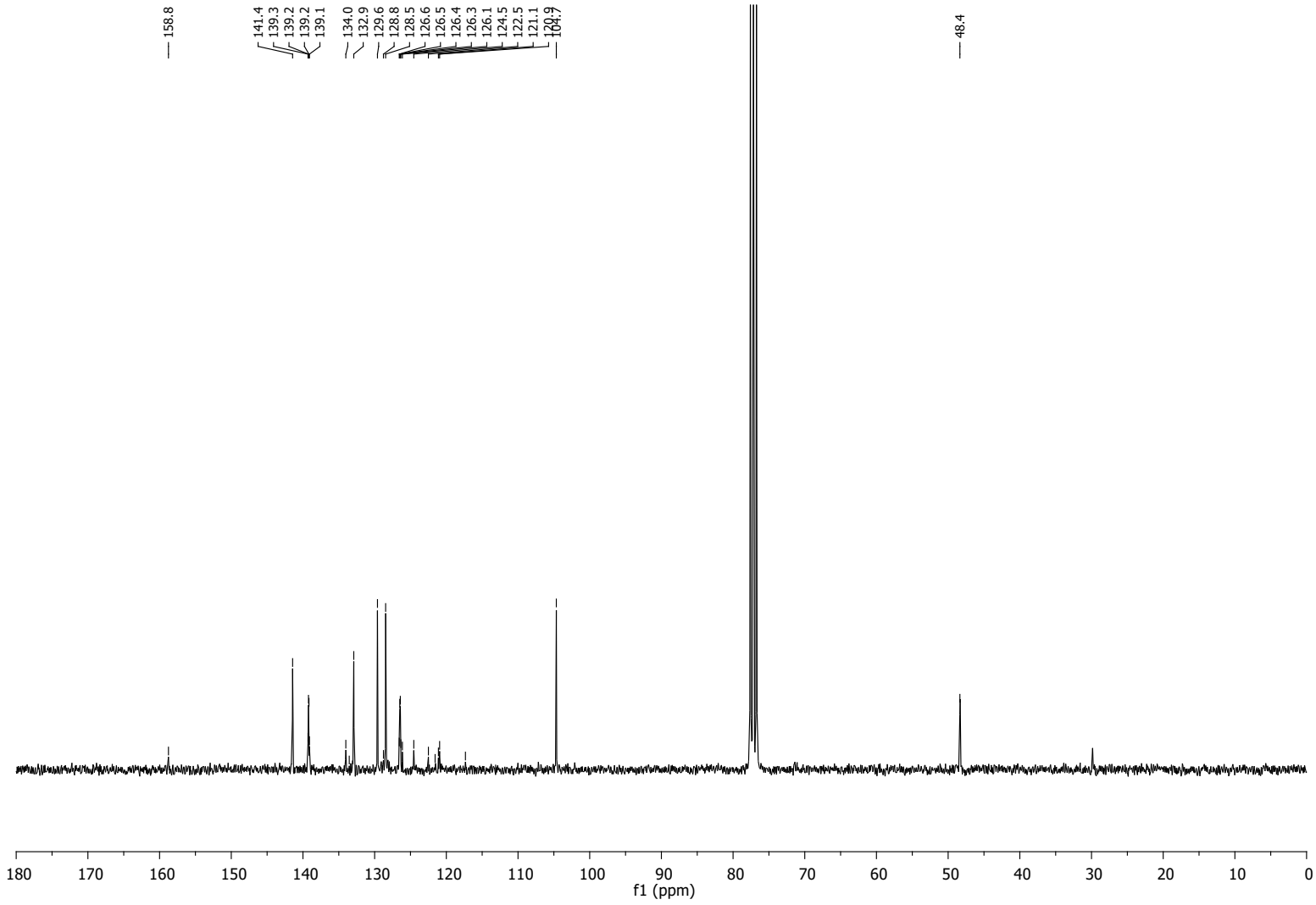
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

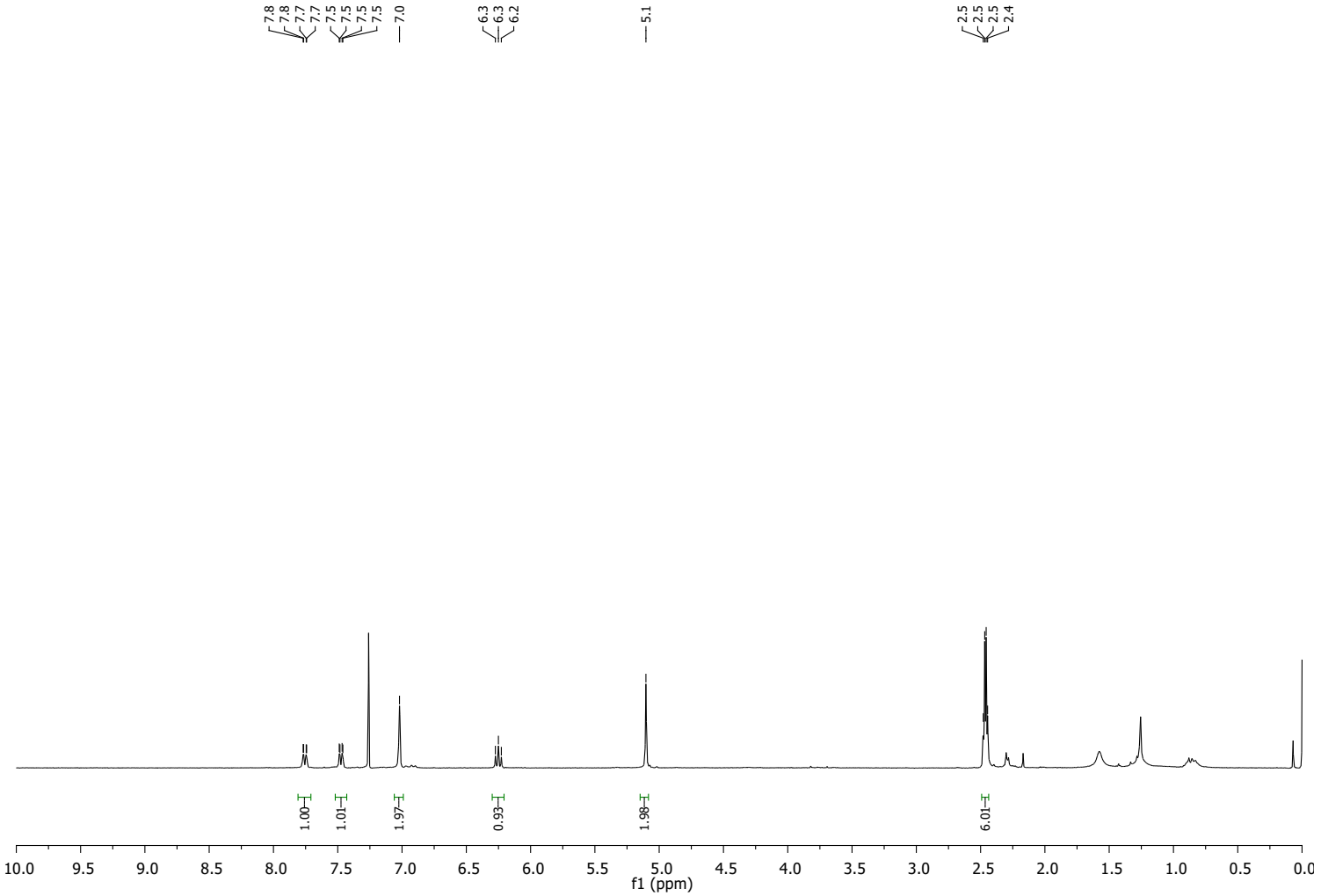


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

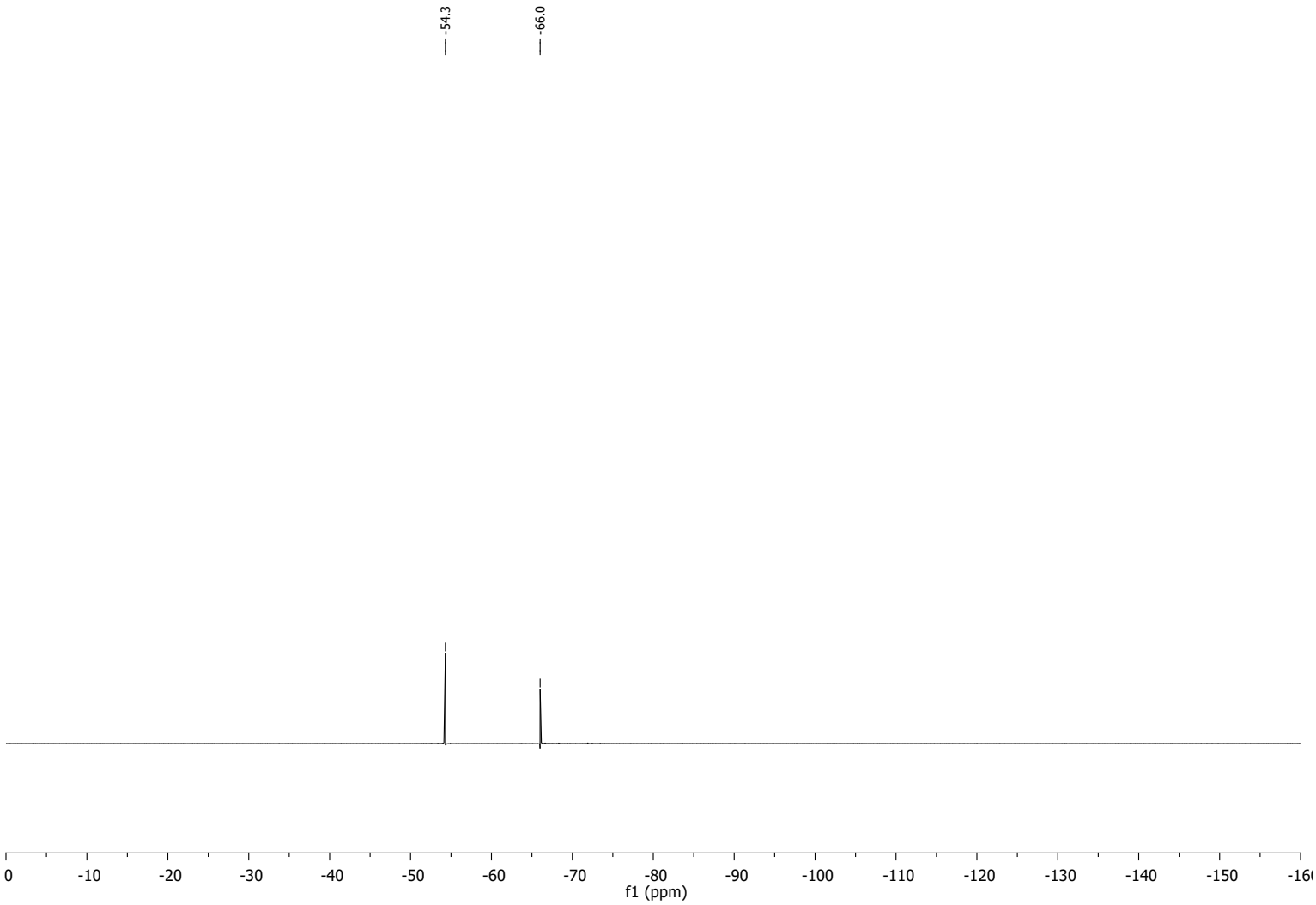


1-(3,5-dimethyl-4-(trifluoromethyl)benzyl)-3-(trifluoromethyl)pyridin-2(1H)-one **3k**

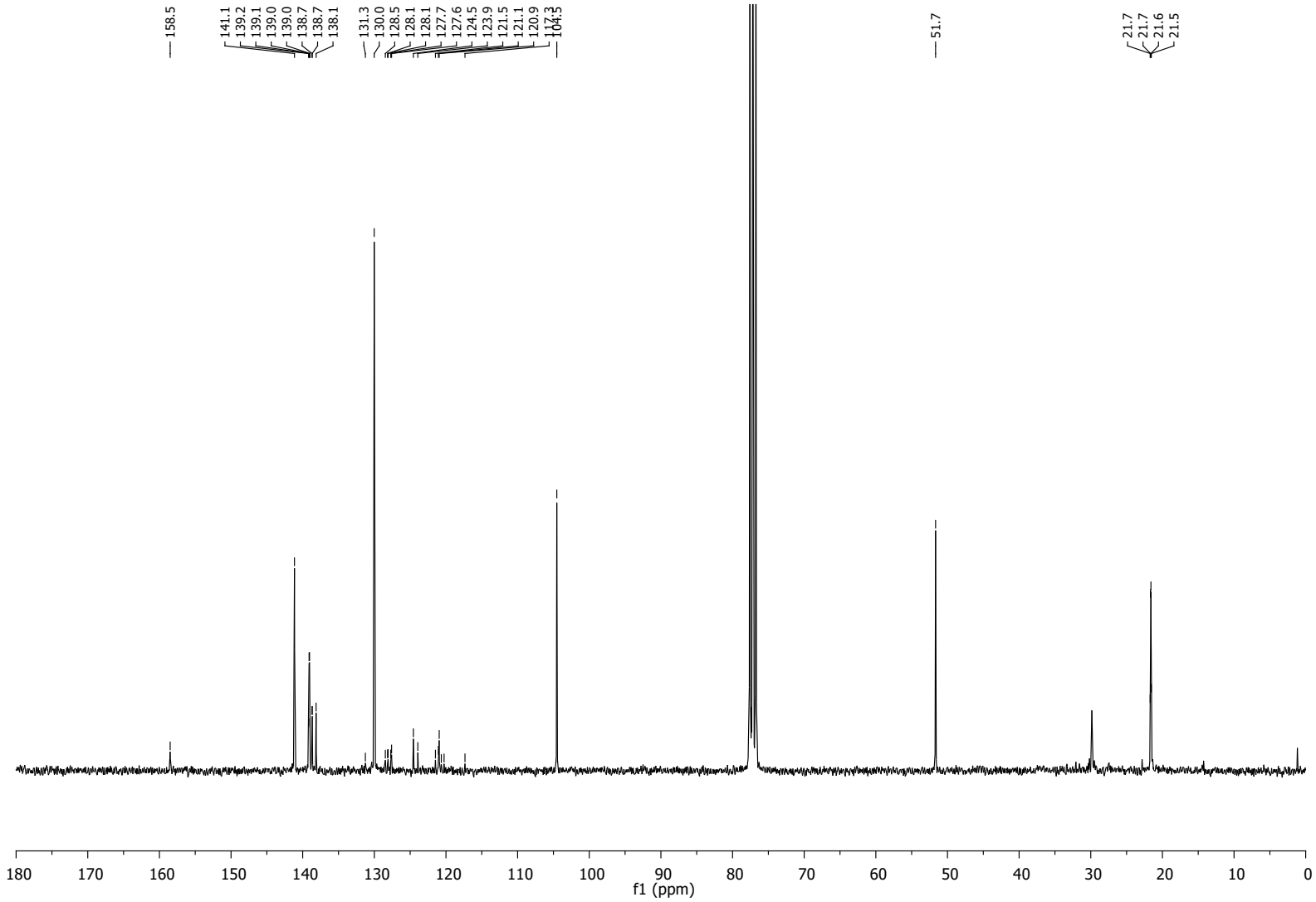
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

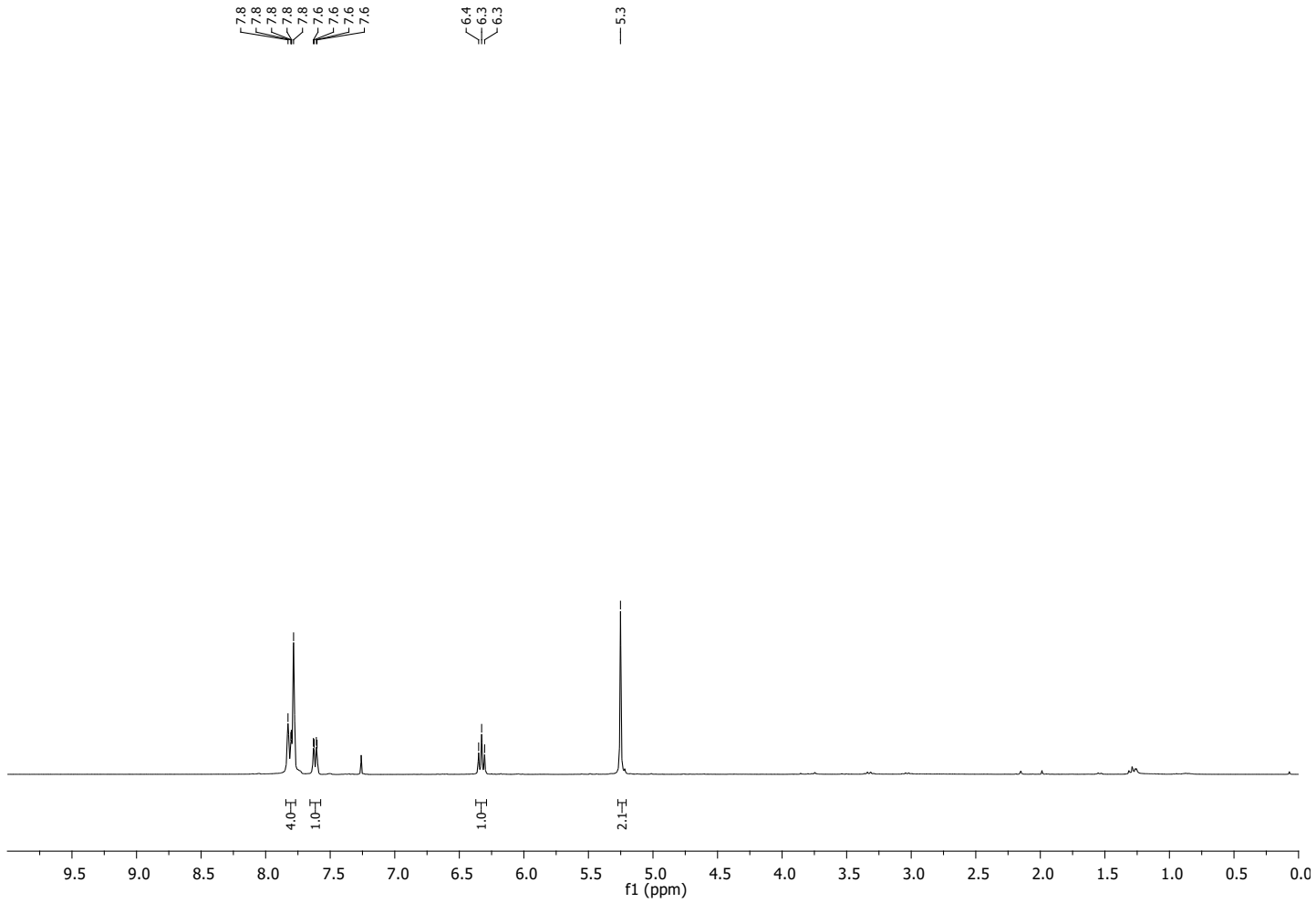


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

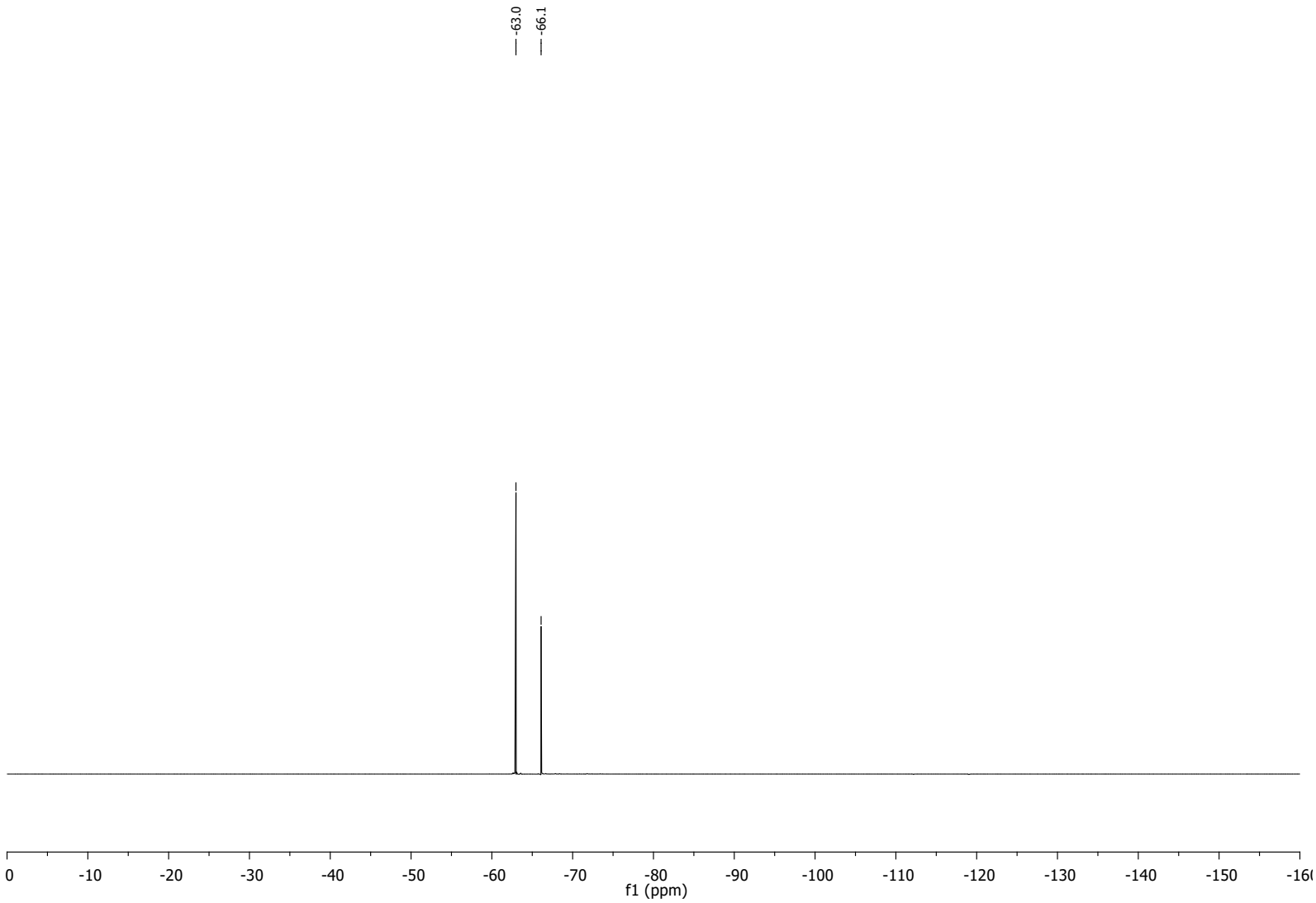


1-phenyl-3-(trifluoromethyl)pyridin-2(1H)-one **3l**

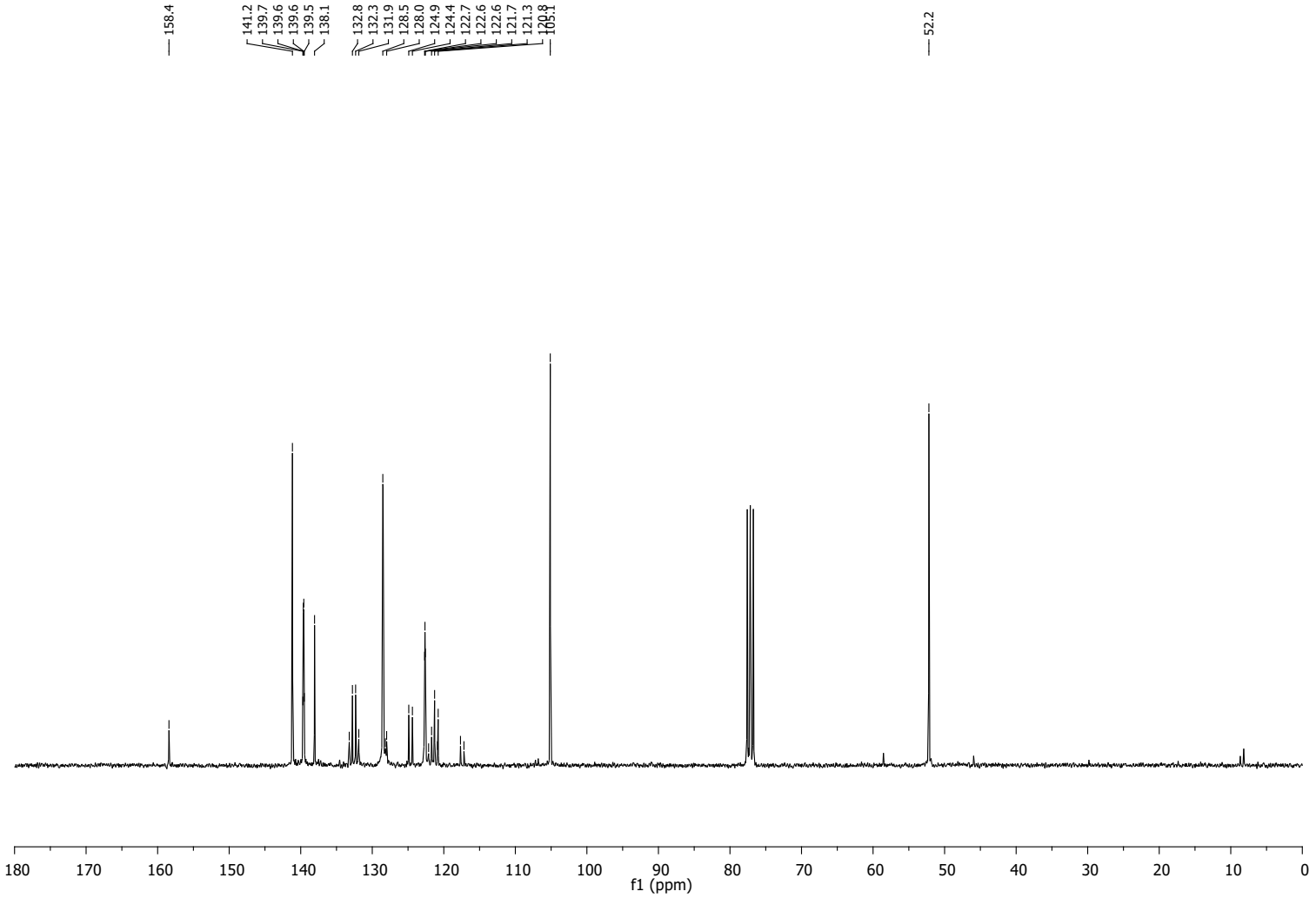
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

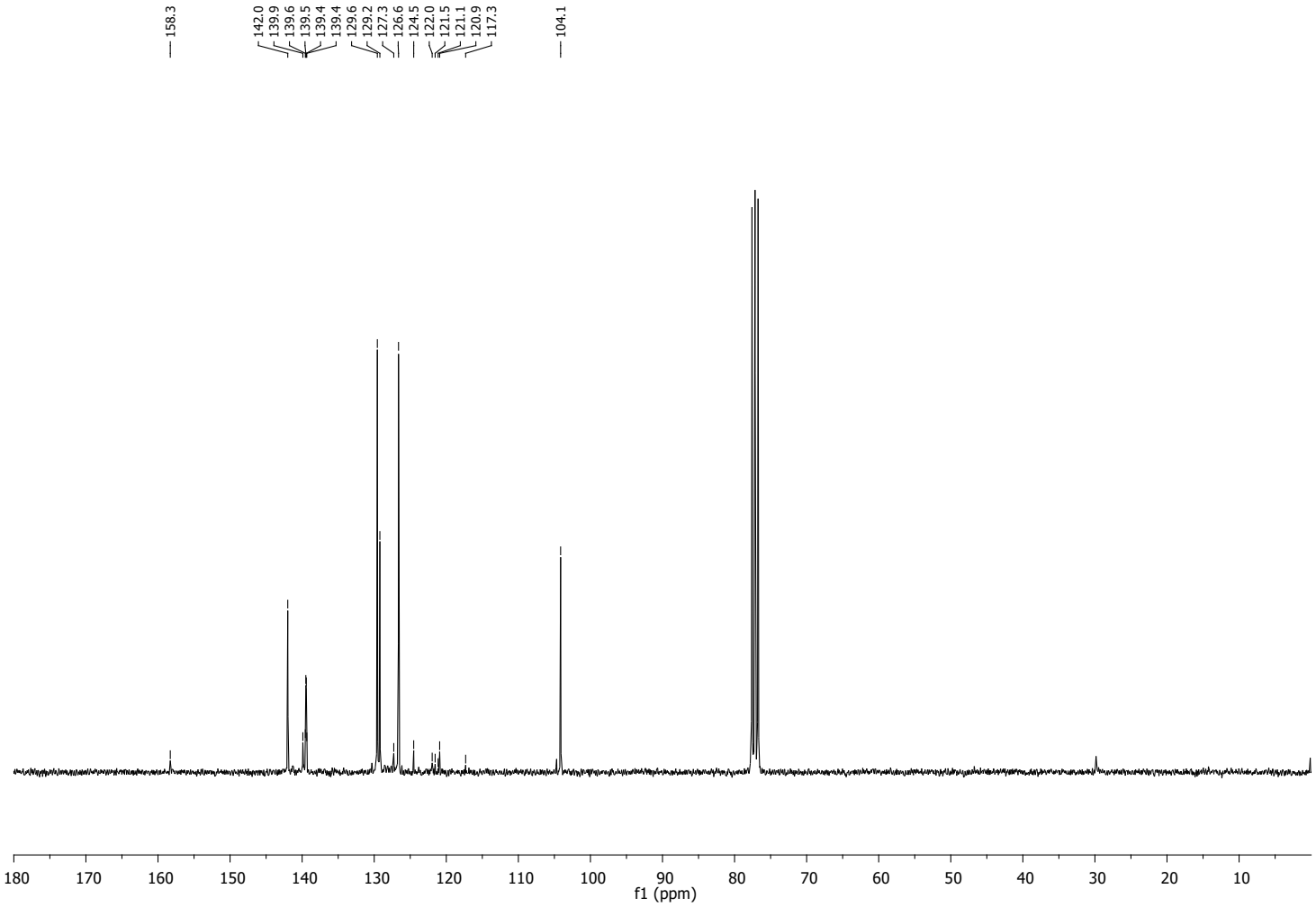


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

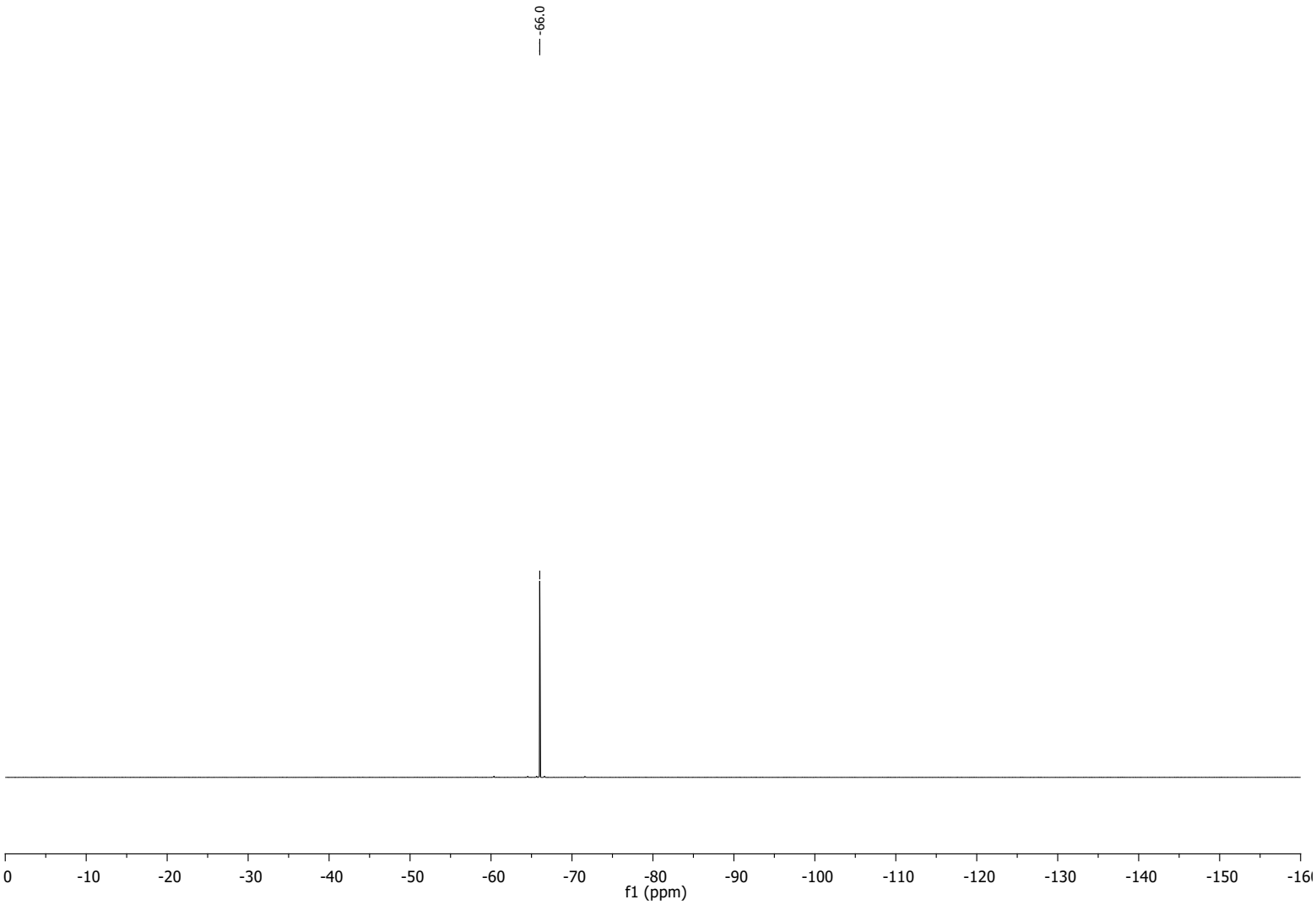


1-phenyl-3-(trifluoromethyl)pyridin-2(1H)-one **3m**

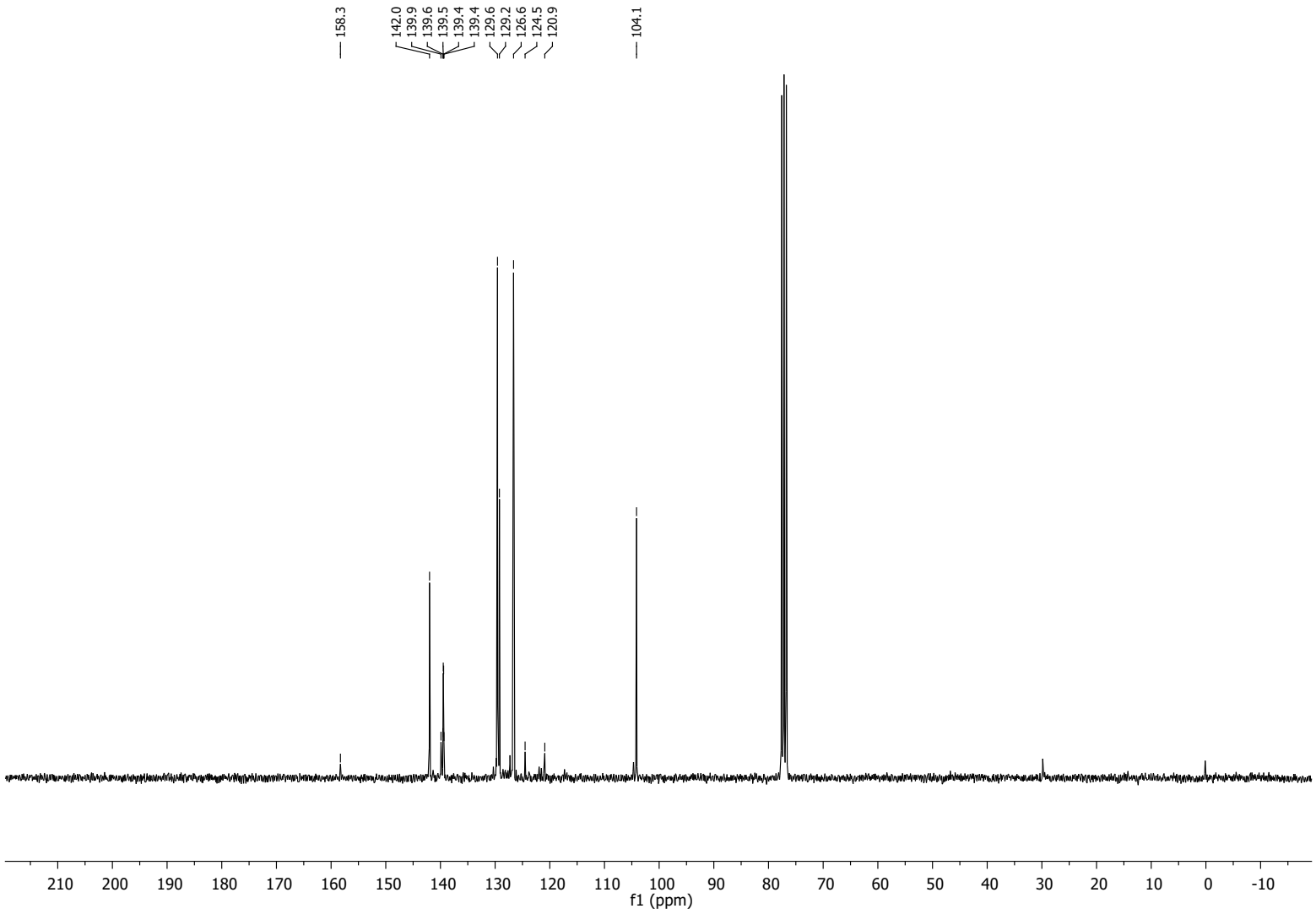
**$^{1}$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

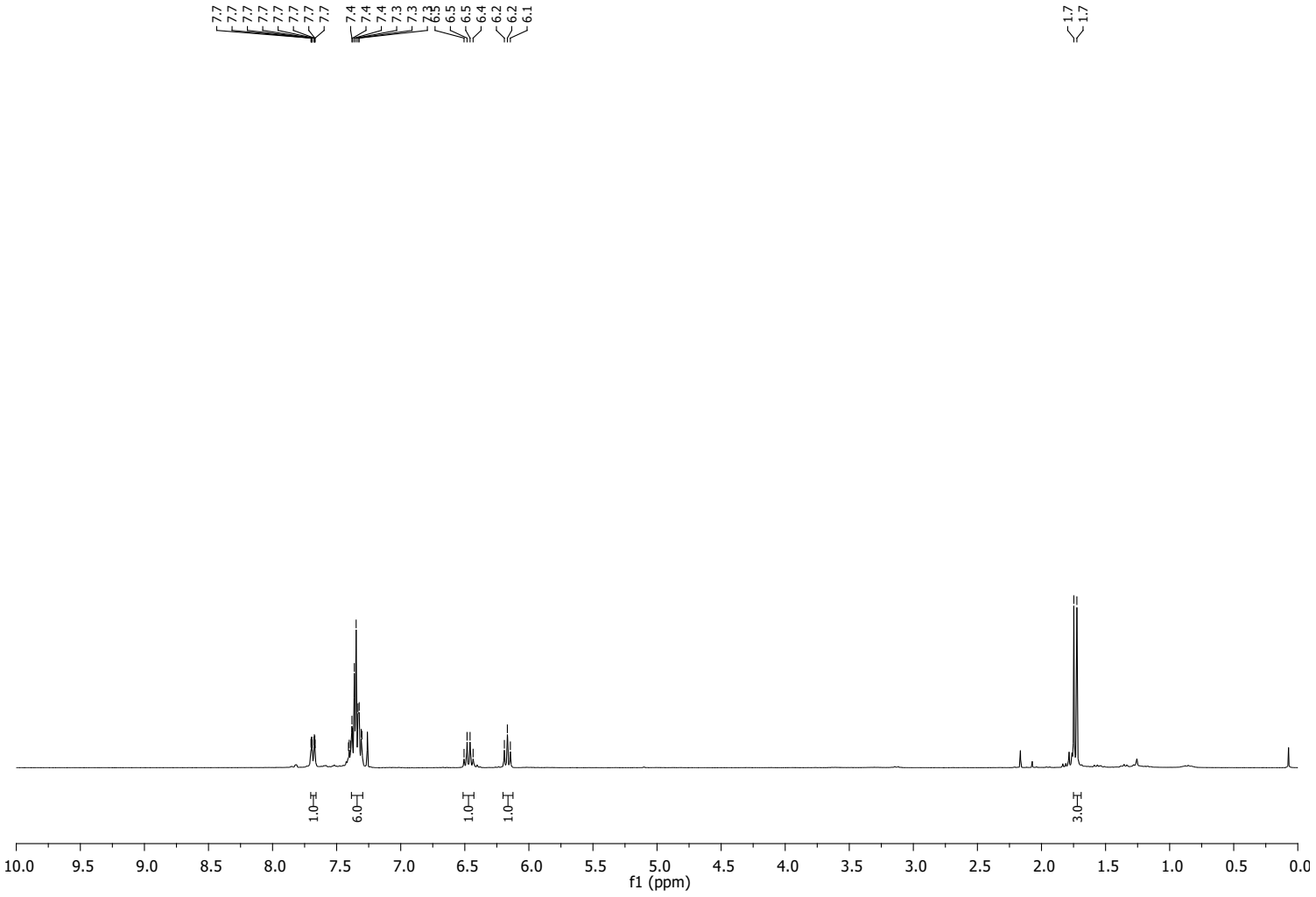


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

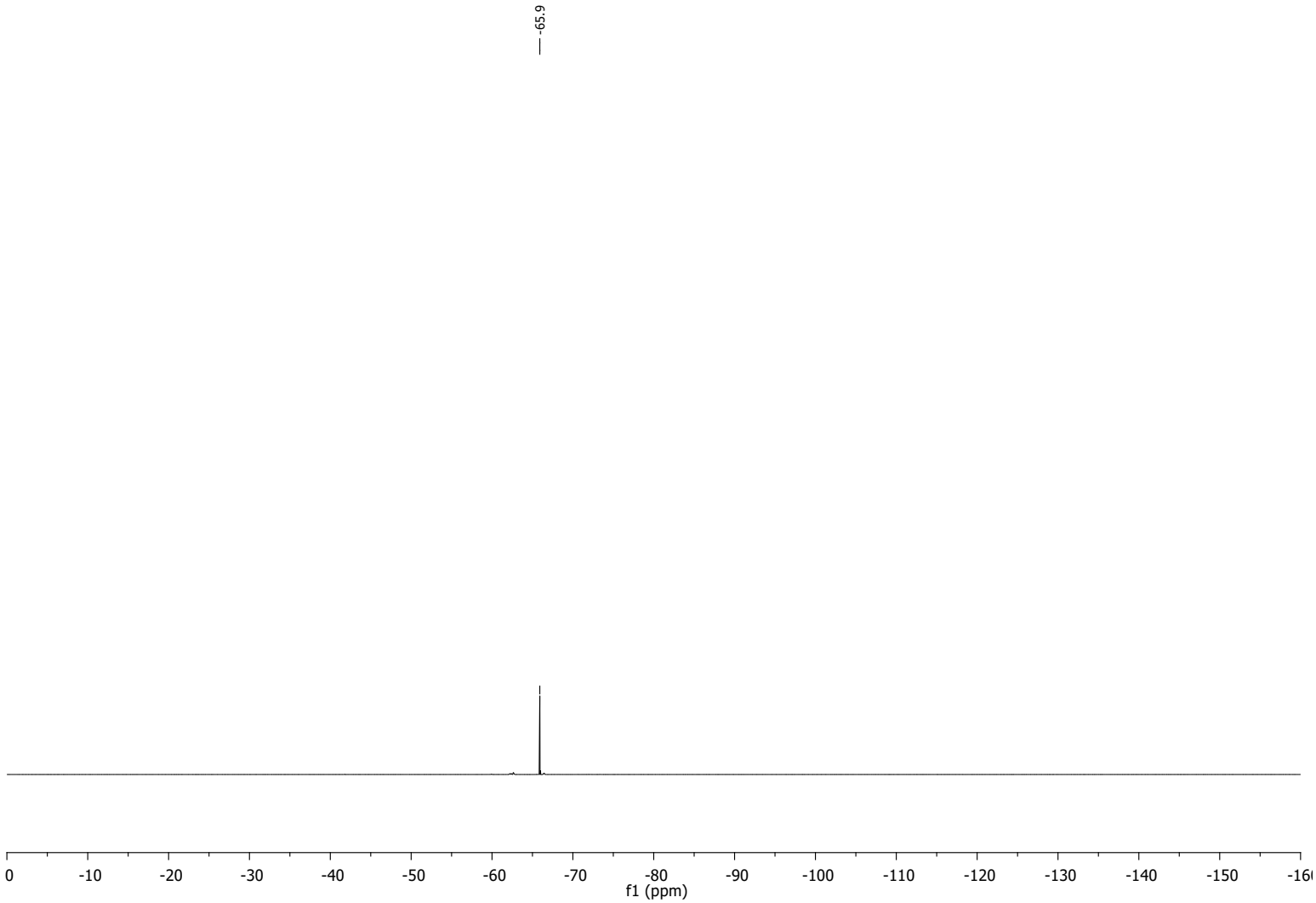


**1-(1-phenylethyl)-3-(trifluoromethyl)pyridin-2(1H)-one 3n**

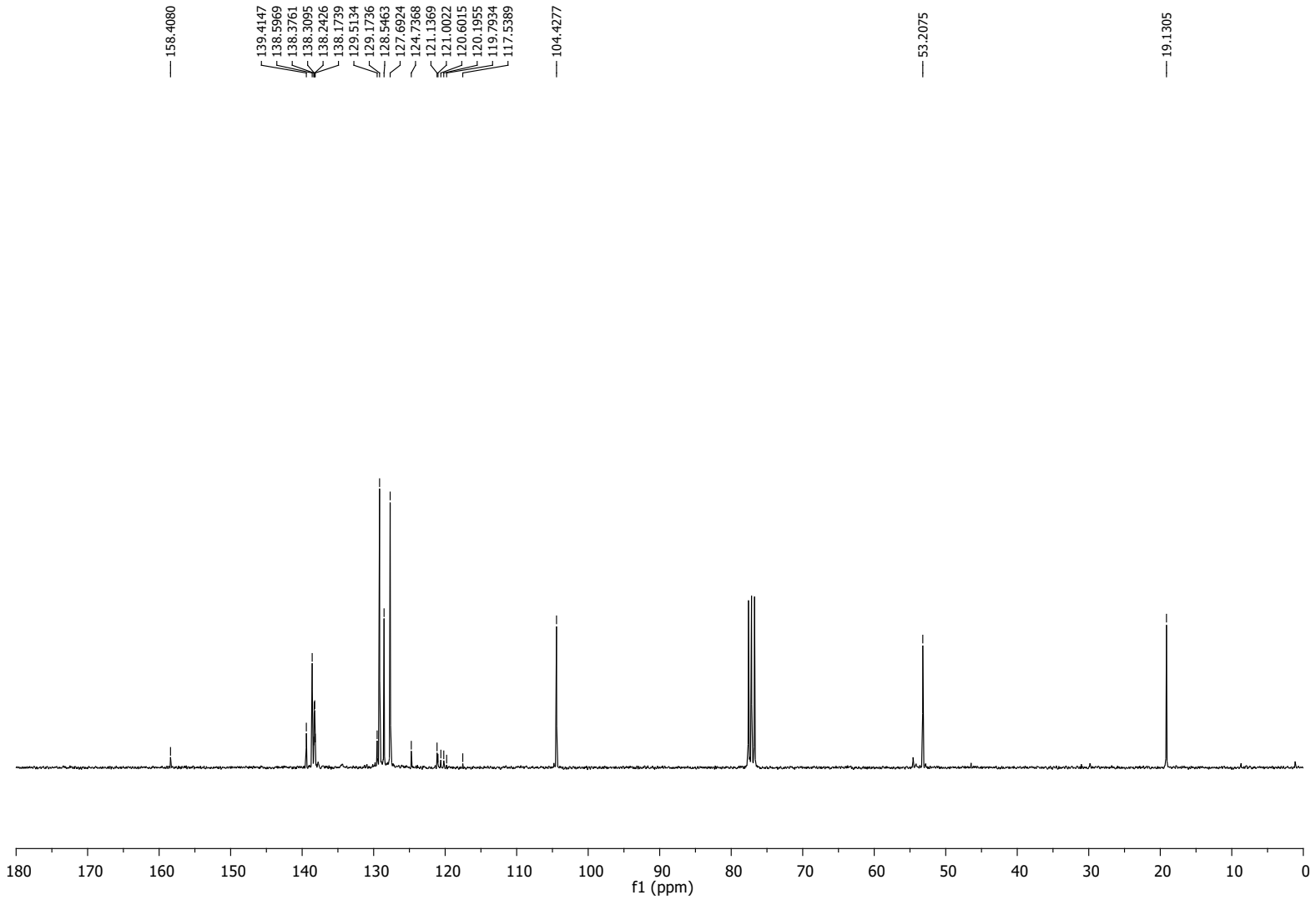
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

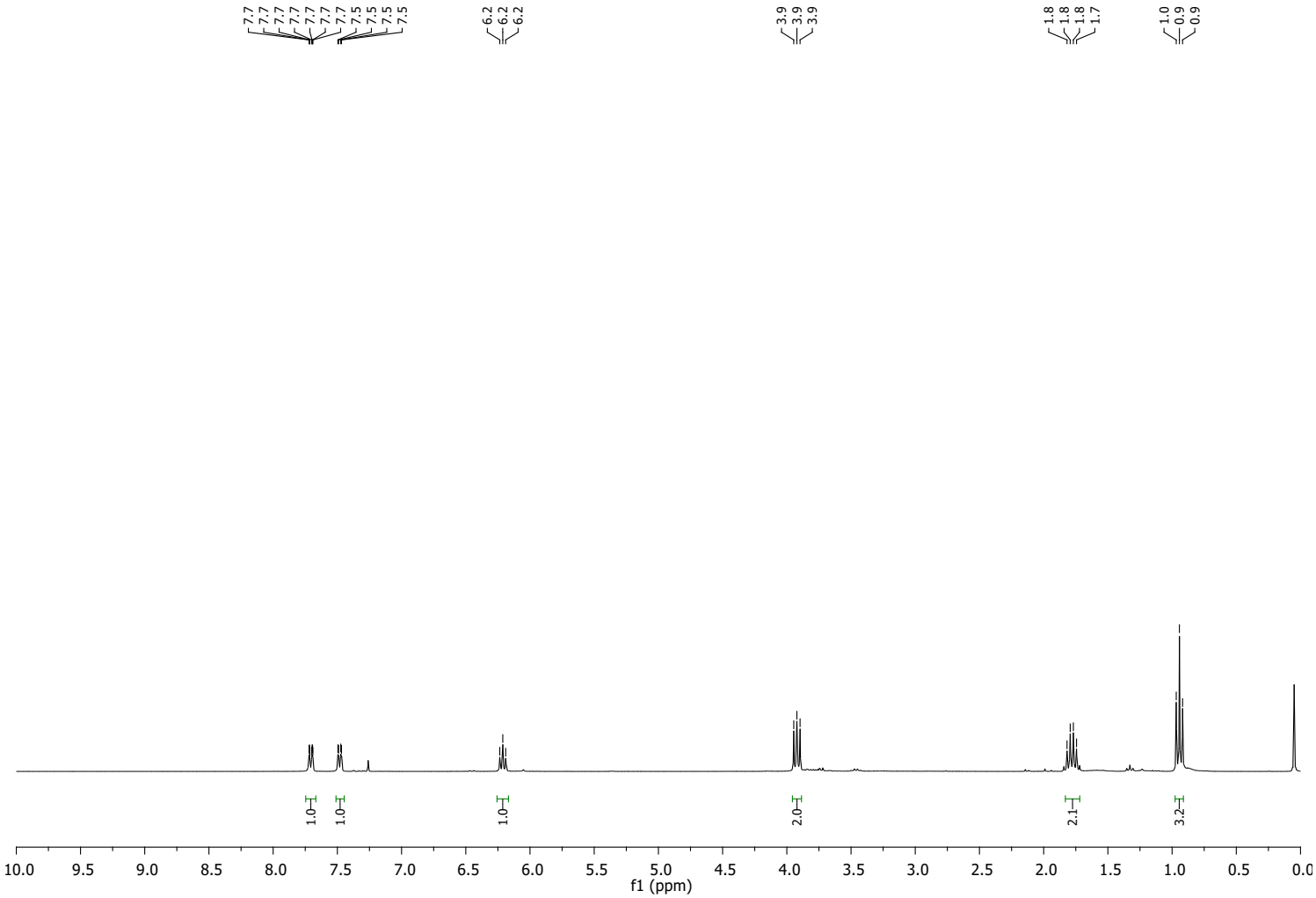


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

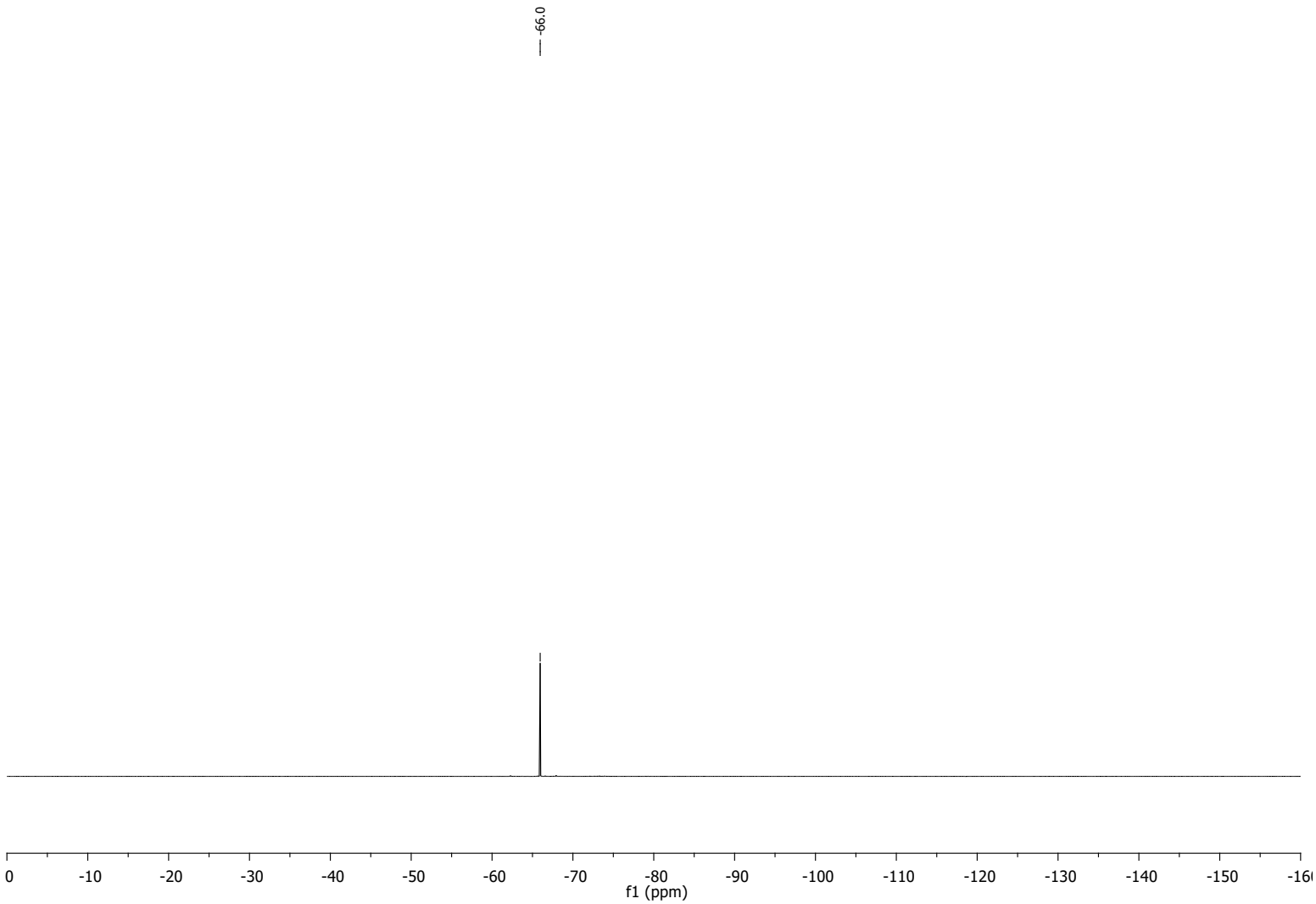


**1-propyl-3-(trifluoromethyl)pyridin-2(1H)-one 3p**

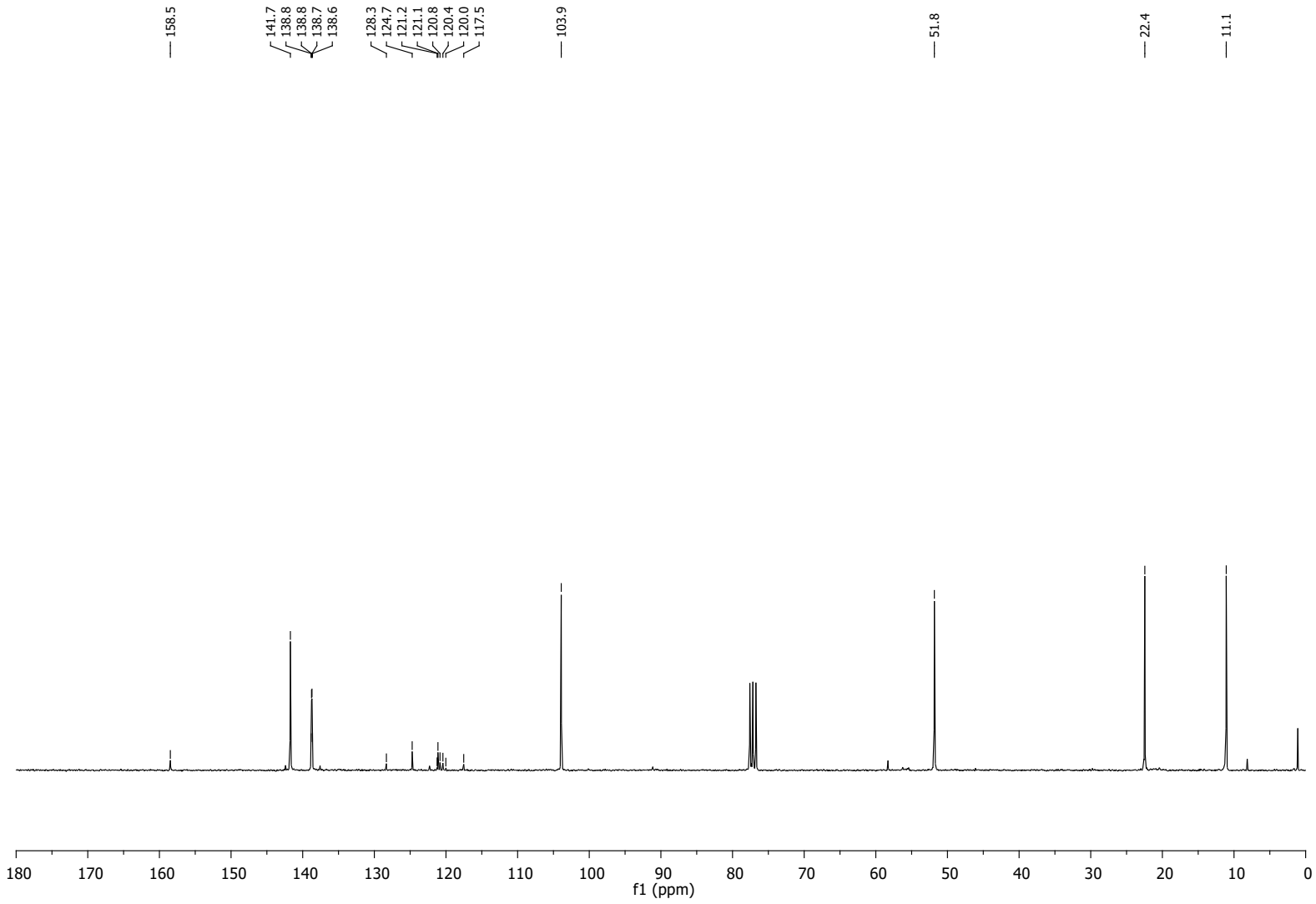
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

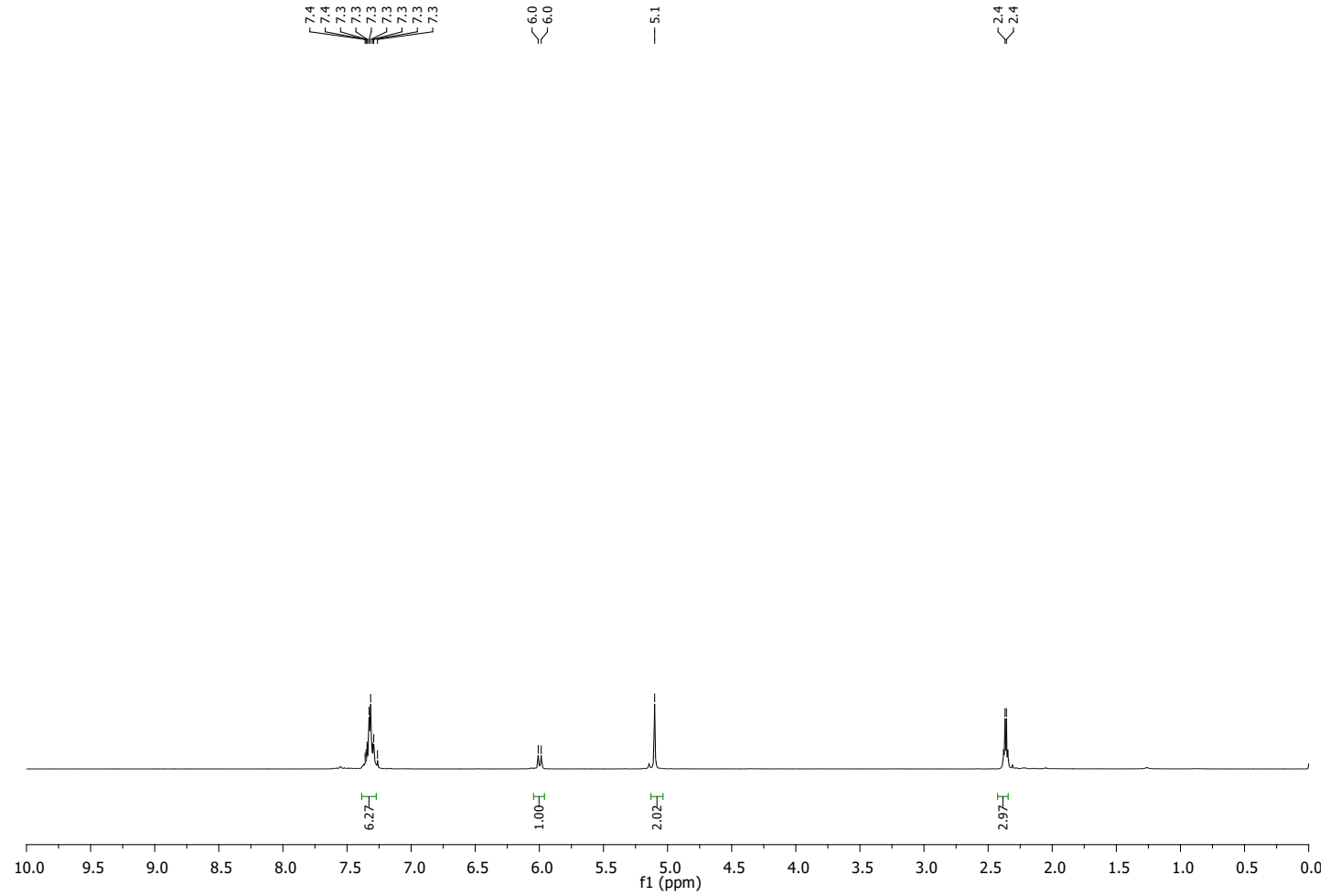


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

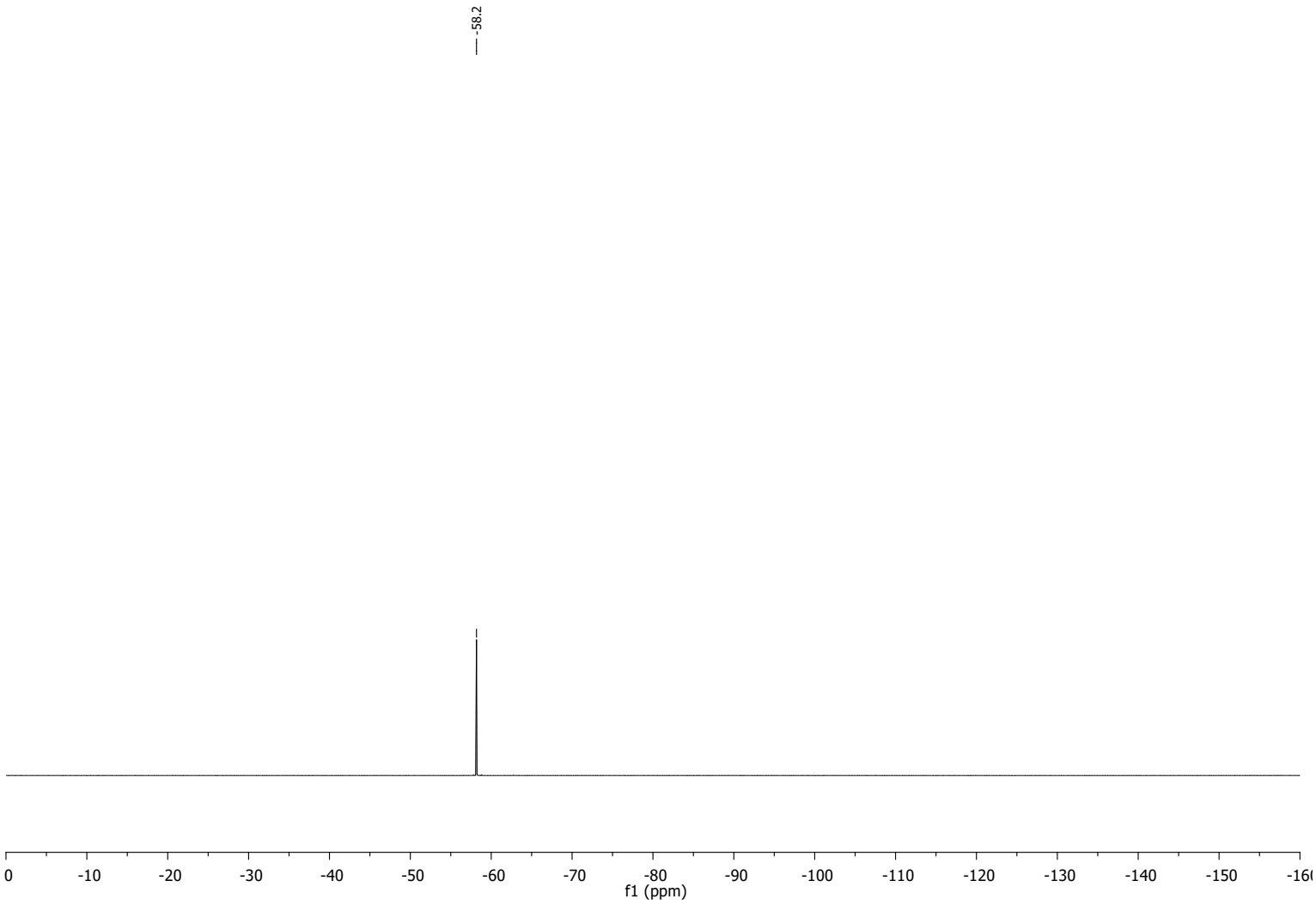


**1-benzyl-4-methyl-3-trifluoromethyl-2-pyridinone 3q**

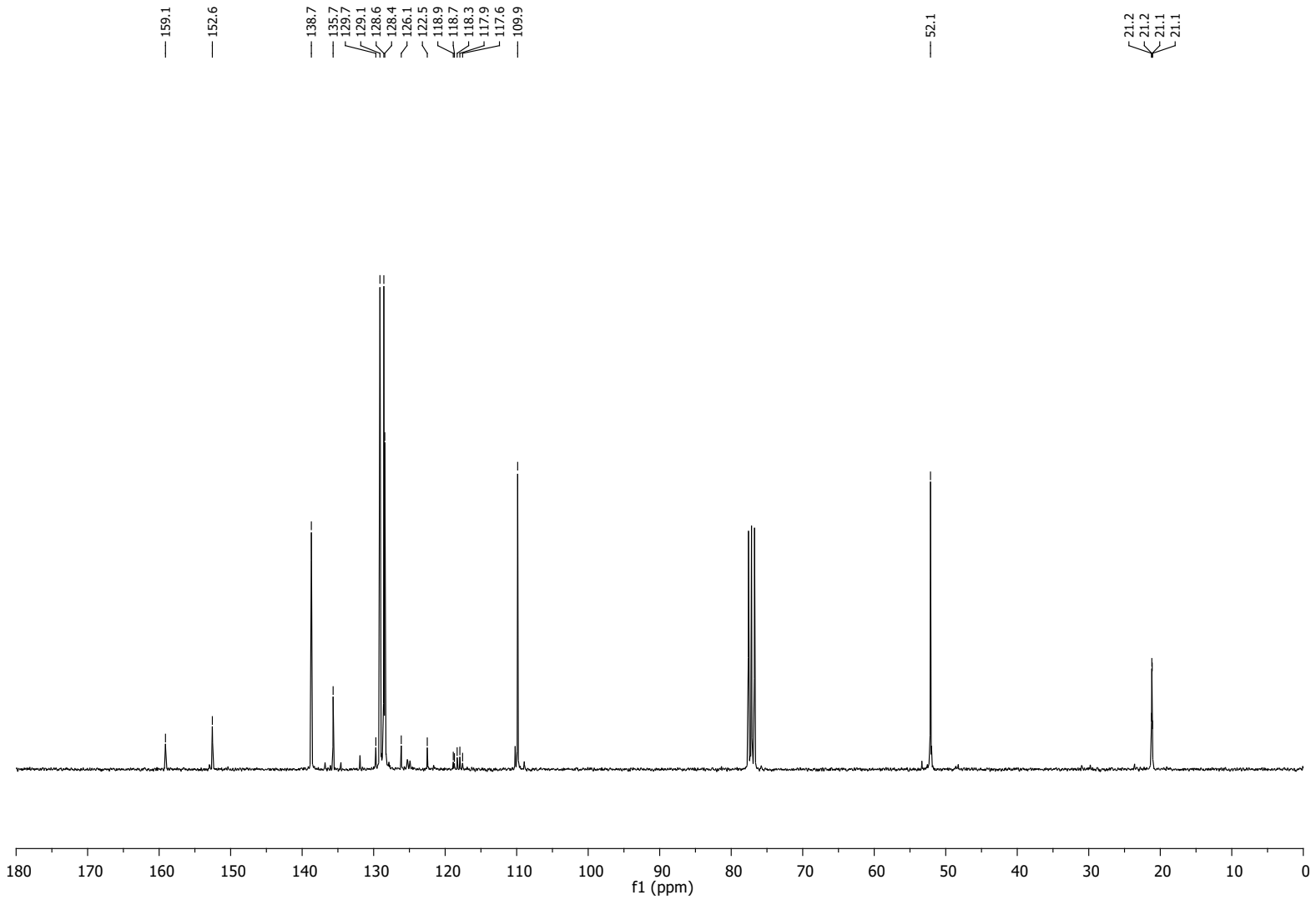
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

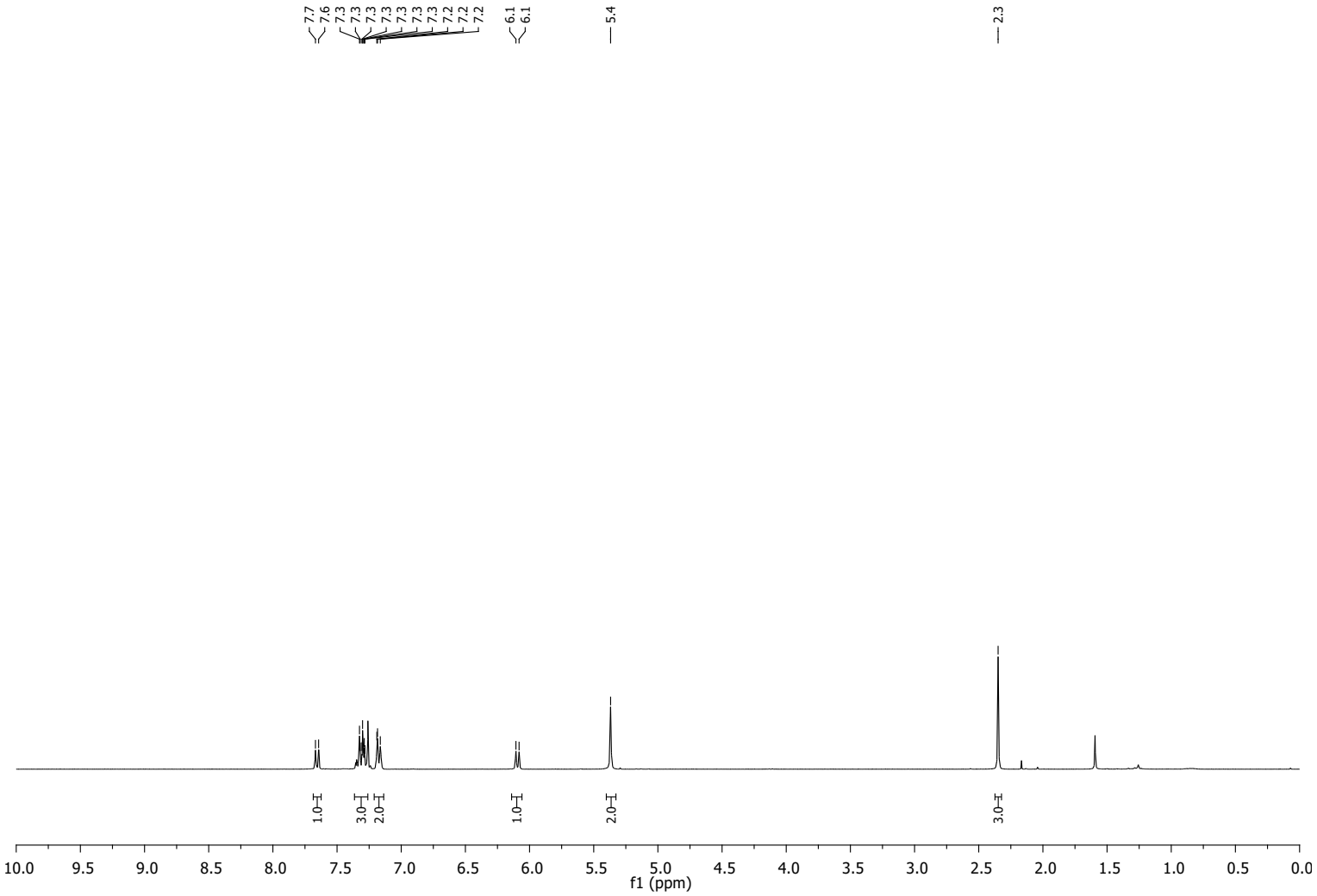


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

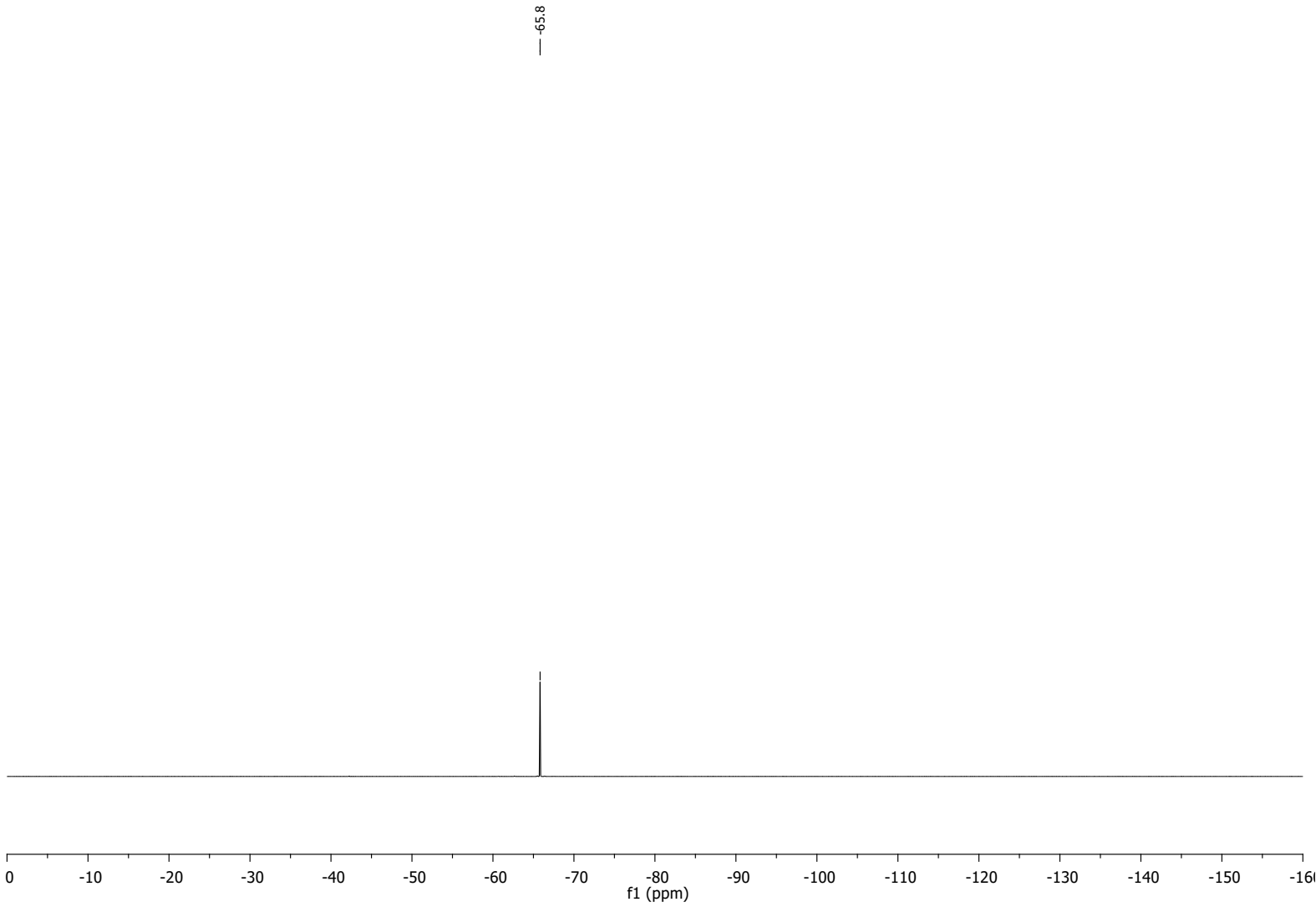


**1-benzyl-6-methyl-3-trifluoromethyl-2-pyridinone 3r**

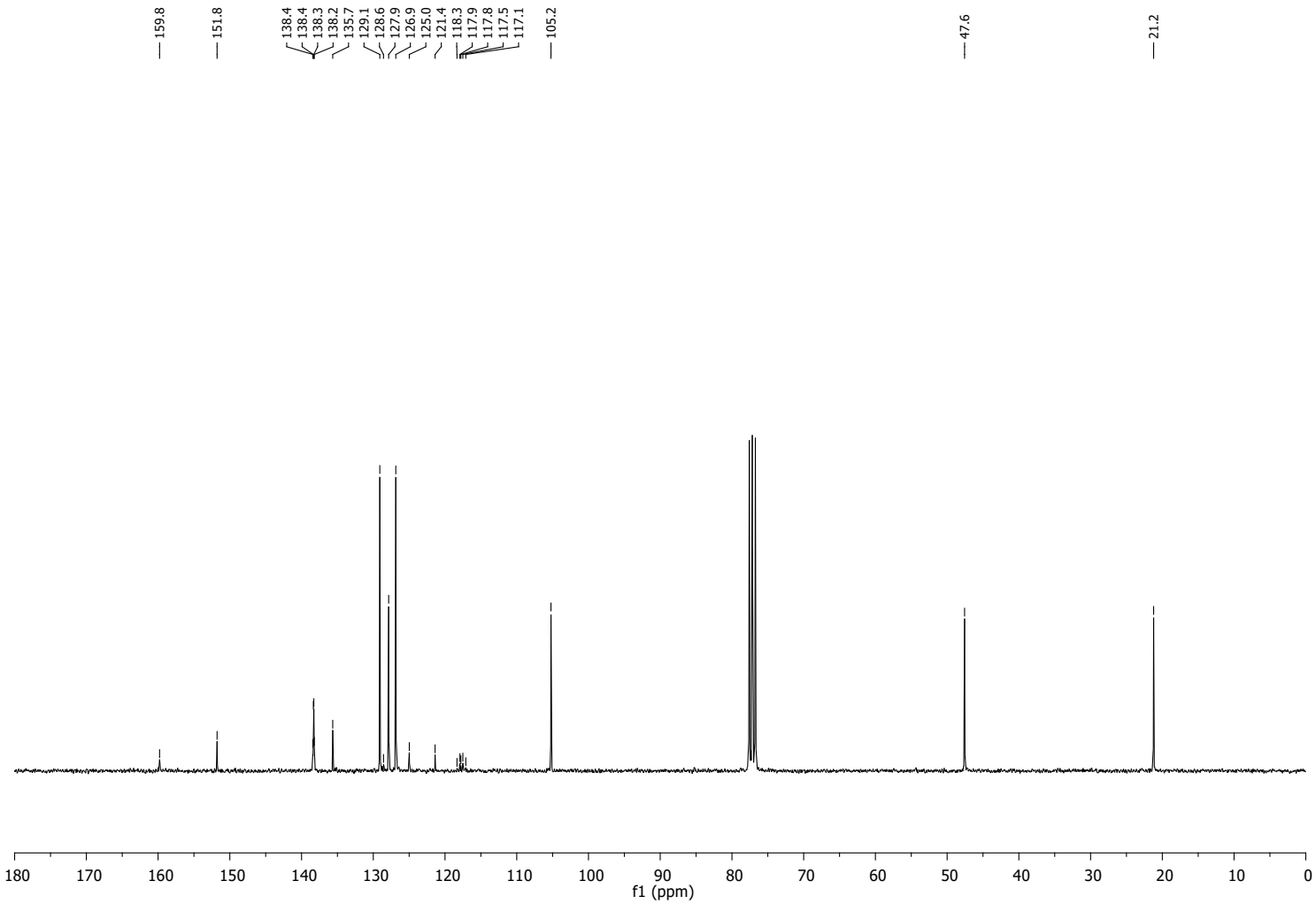
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

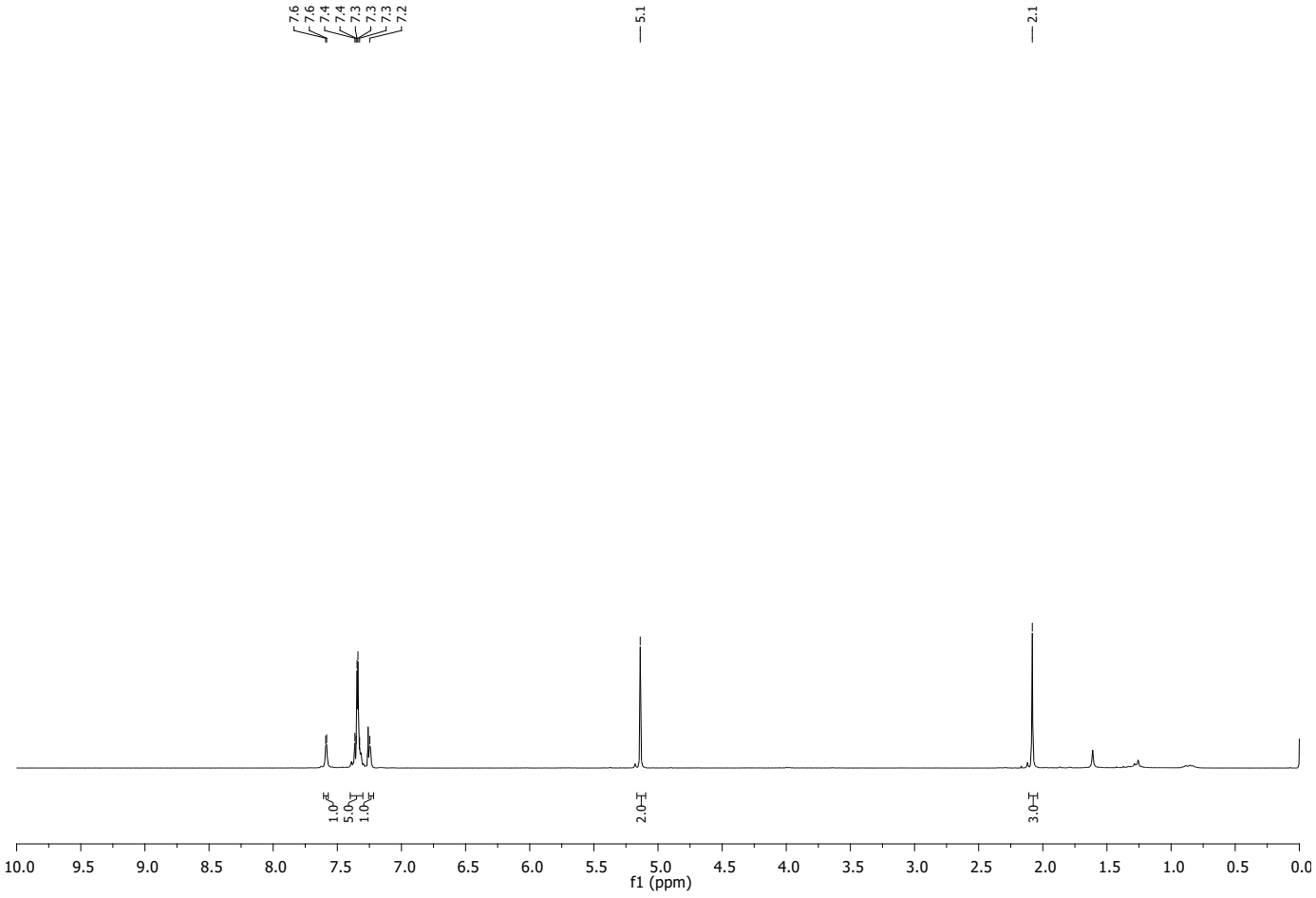


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

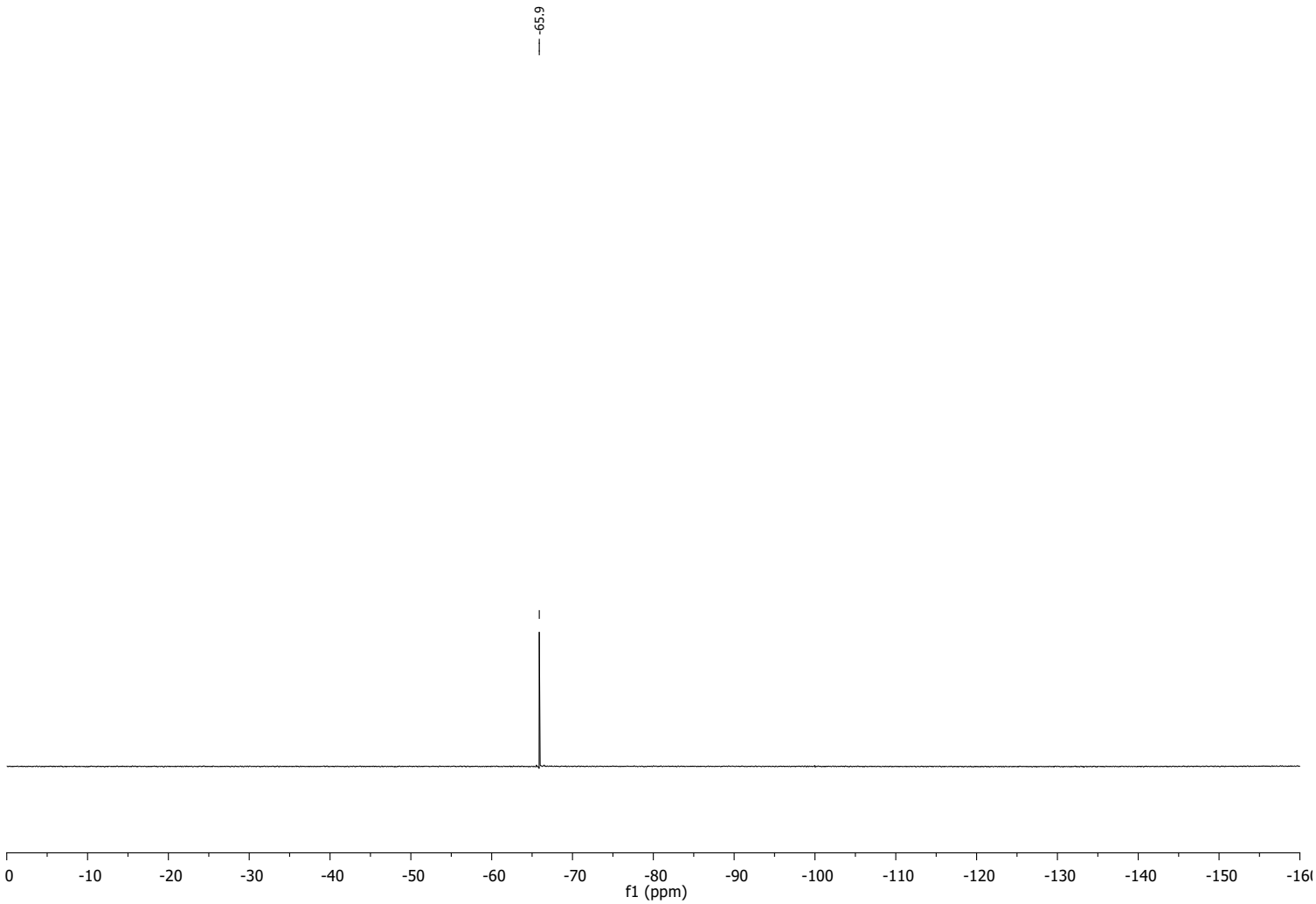


**1-benzyl-5-methyl-3-trifluoromethyl-2-pyridinone 3s**

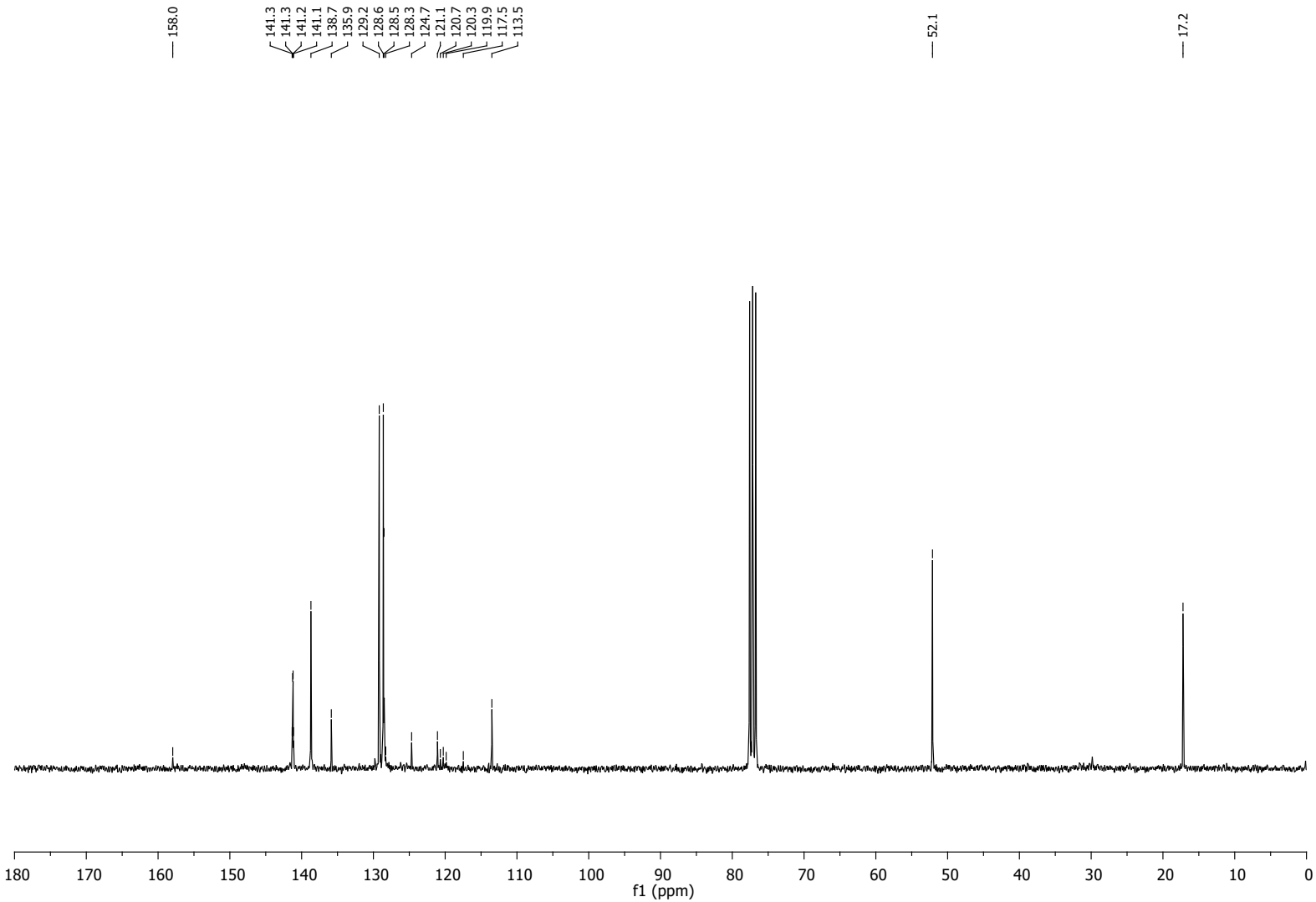
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

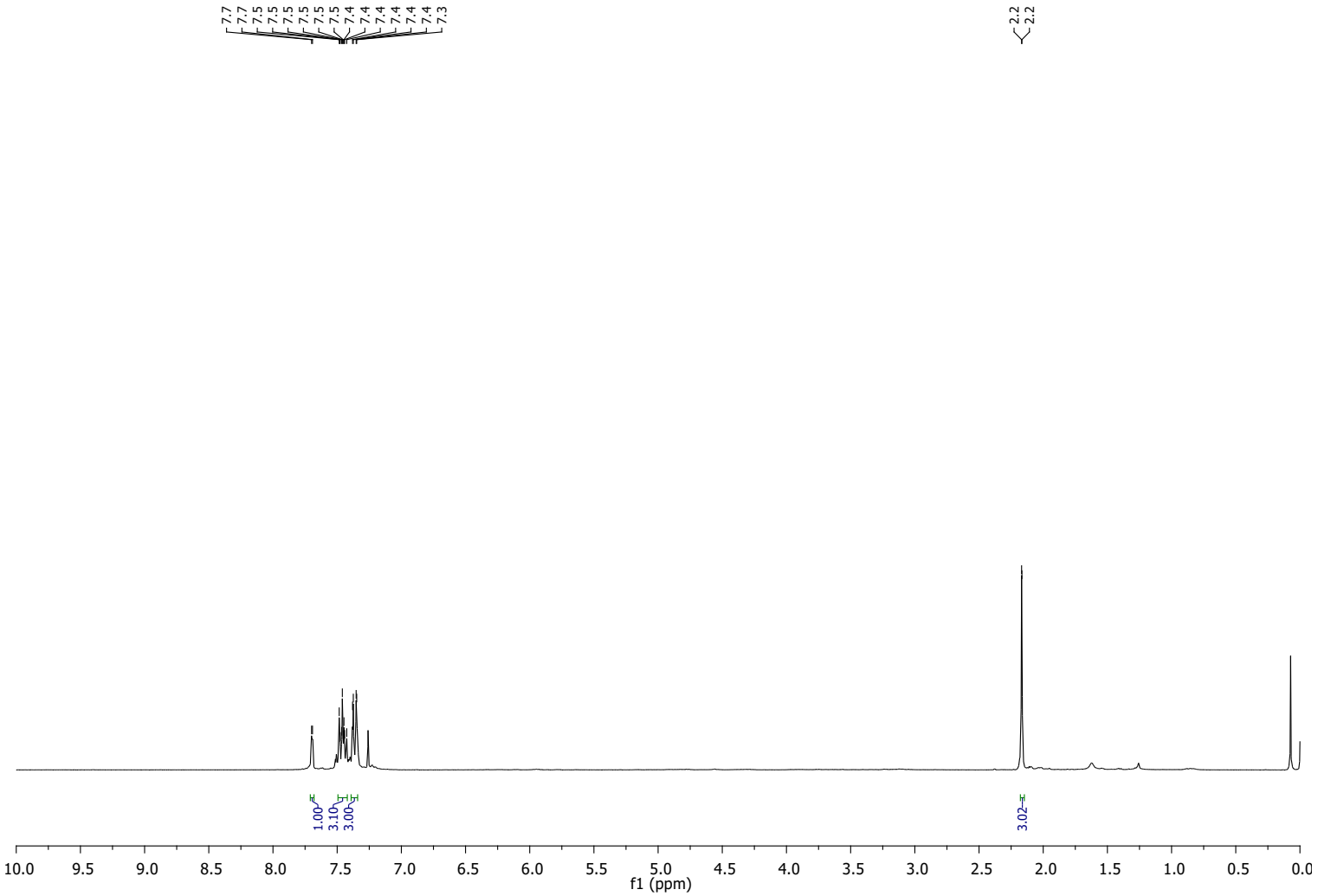


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

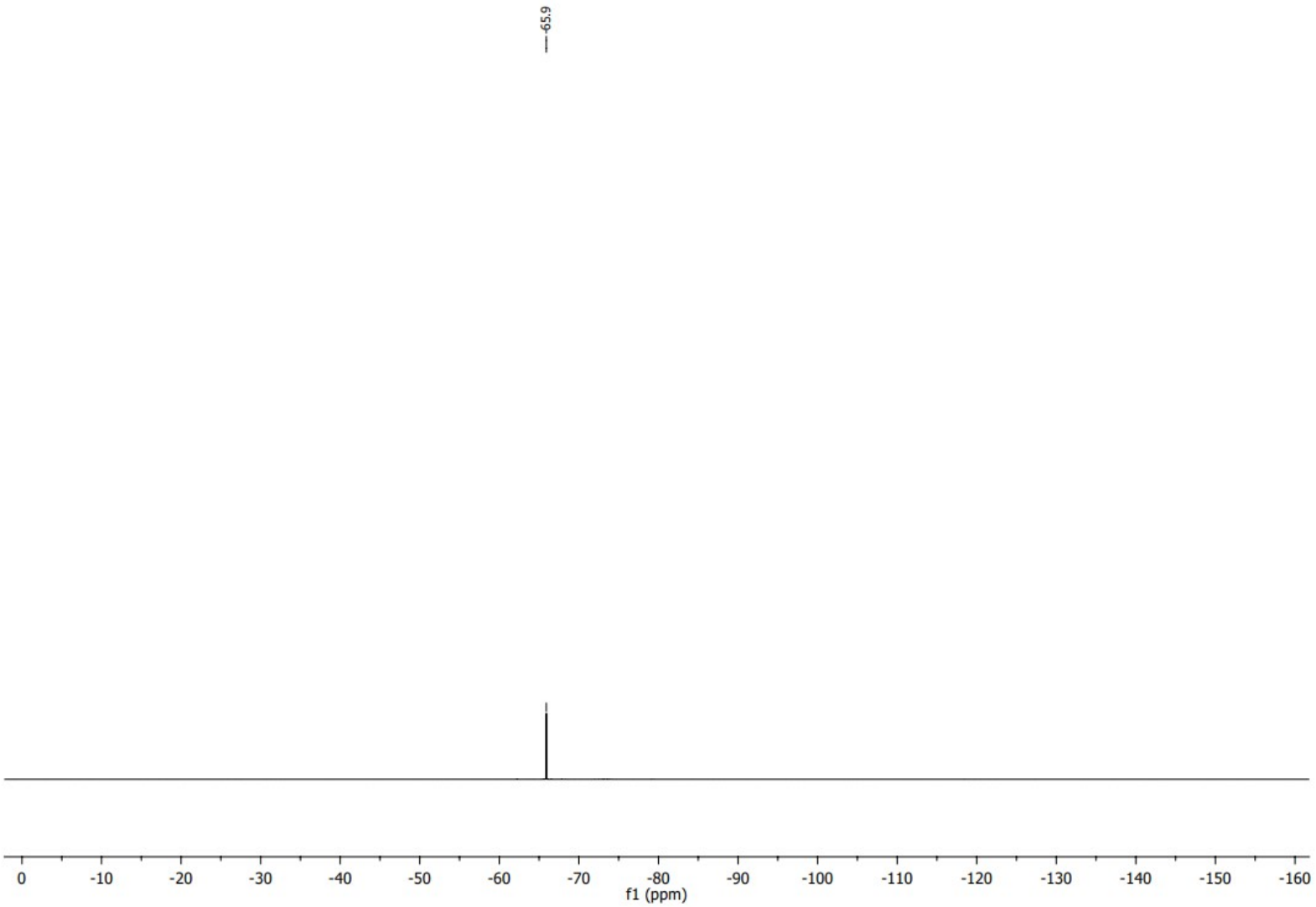


**4-(3-tosylimidazo[1,2-*a*]pyridin-2-yl)benzonitrile 3t**

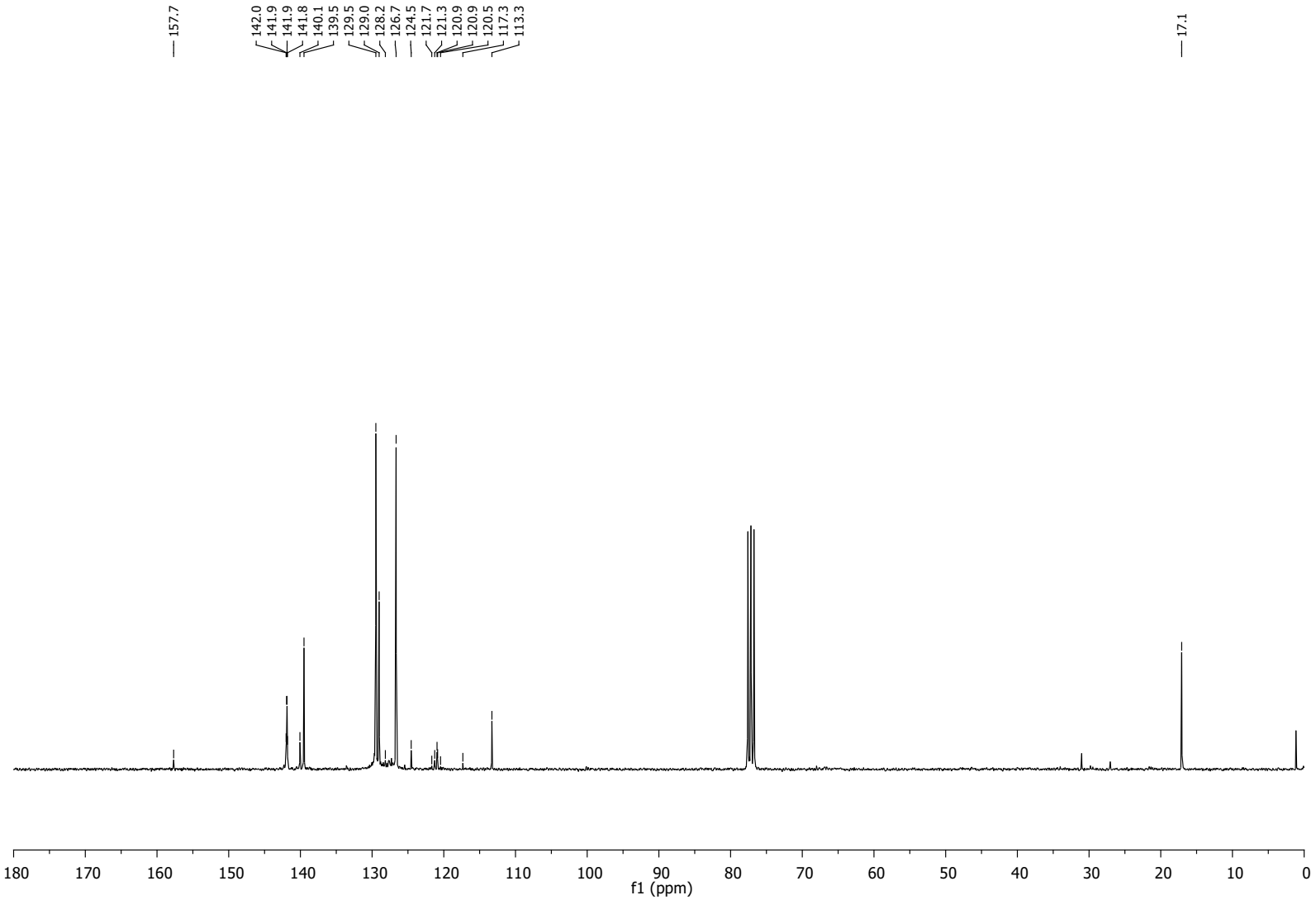
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

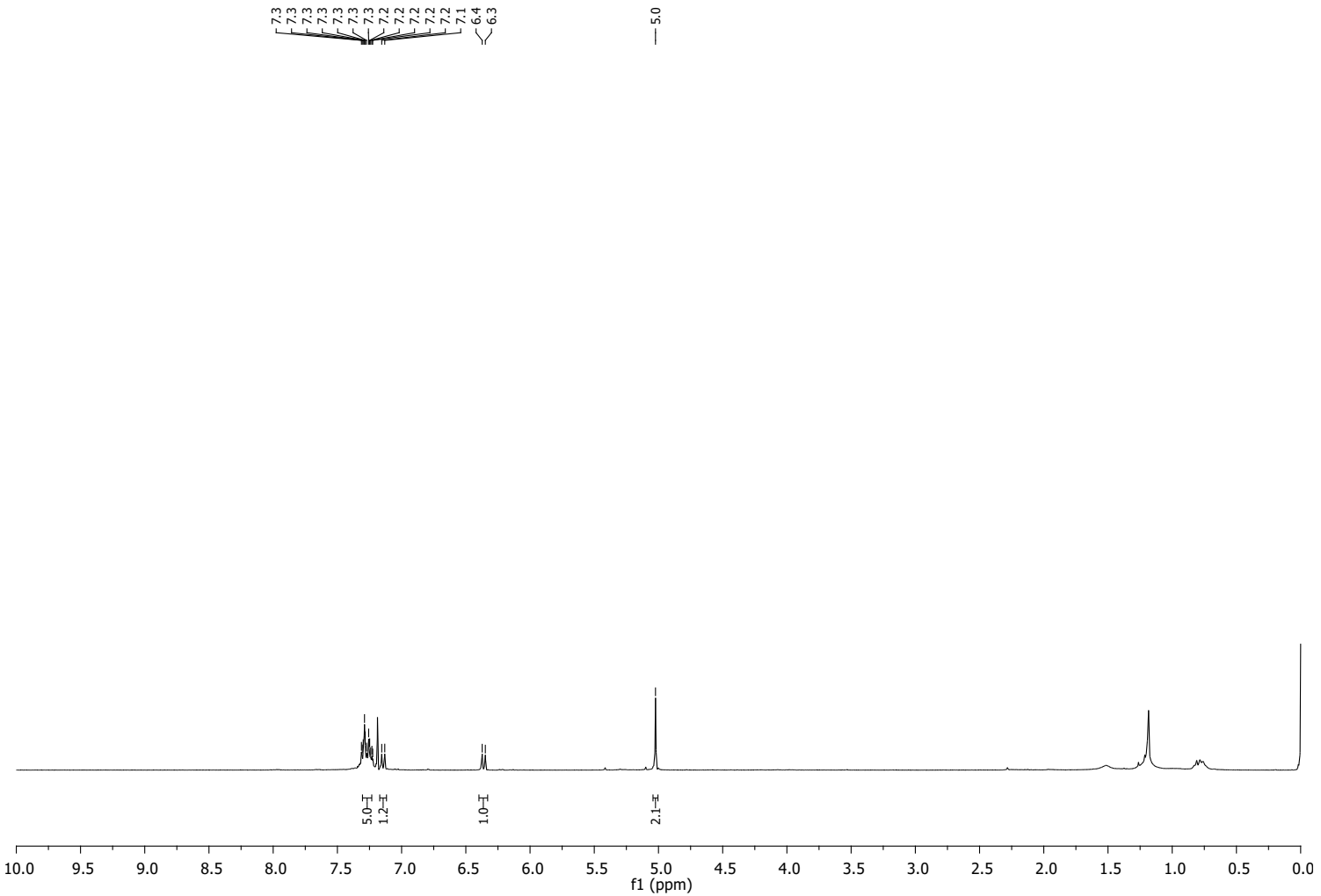


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

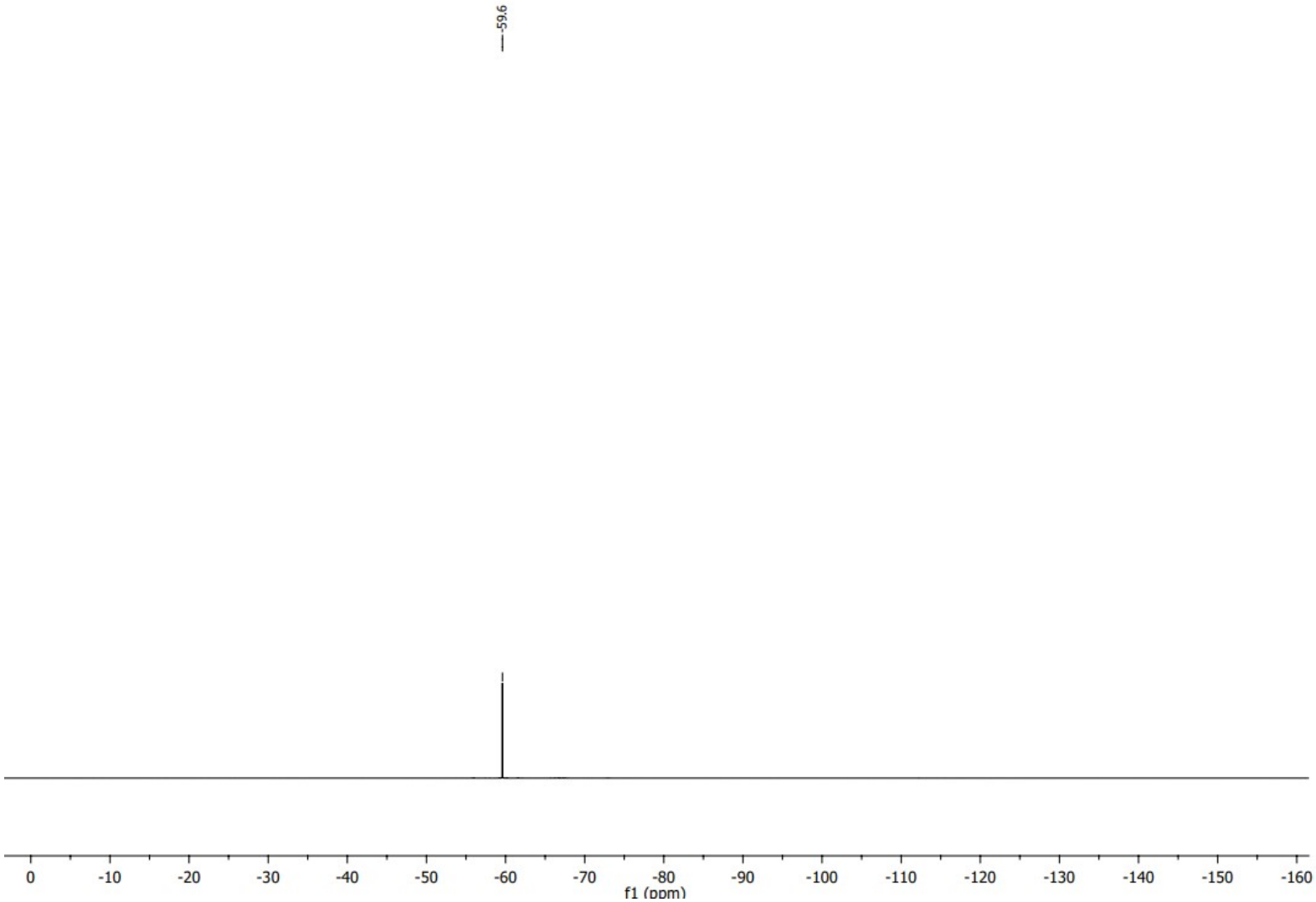


4-(3-tosylimidazo[1,2-*a*]pyridin-2-yl)benzonitrile **3u**

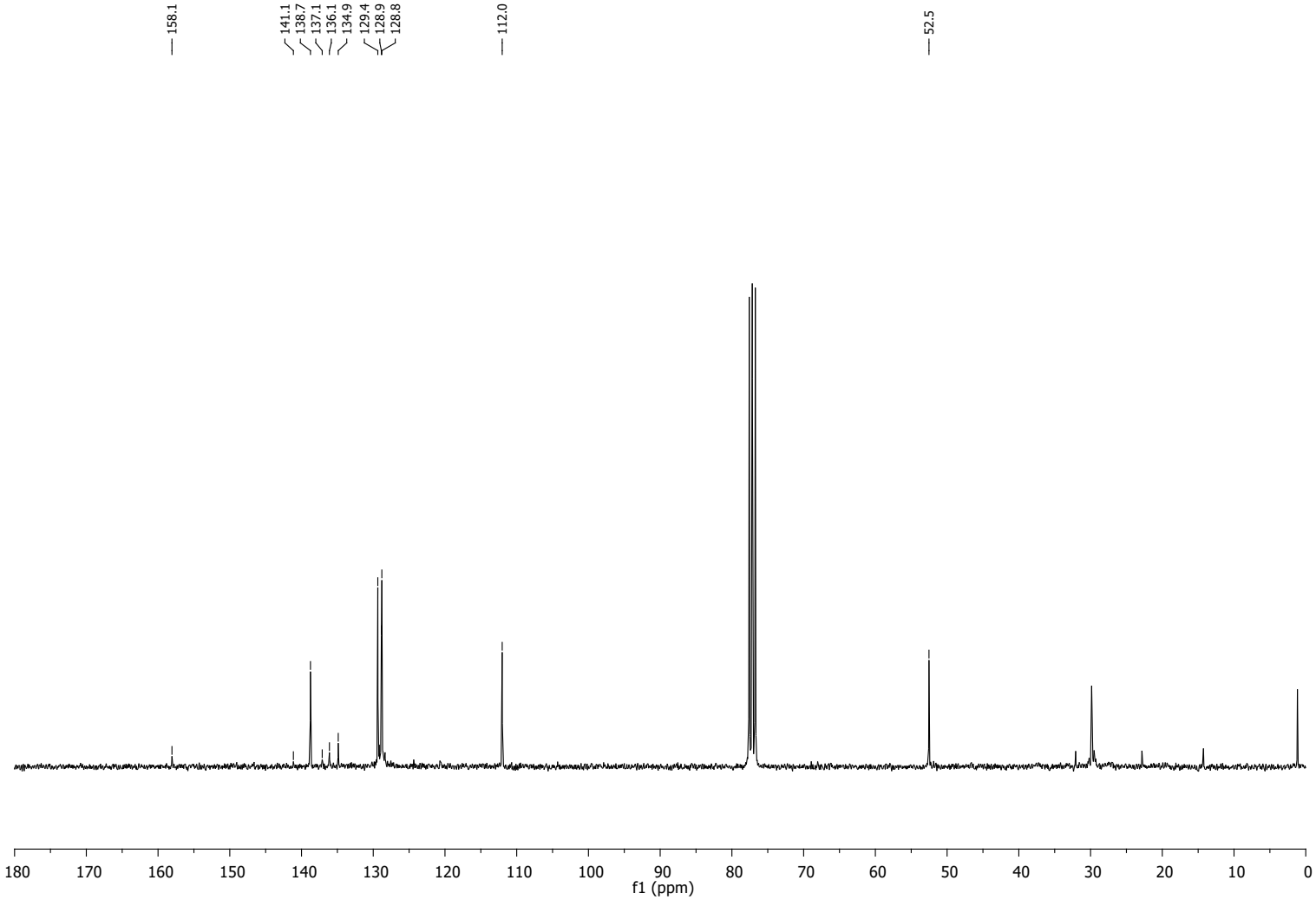
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

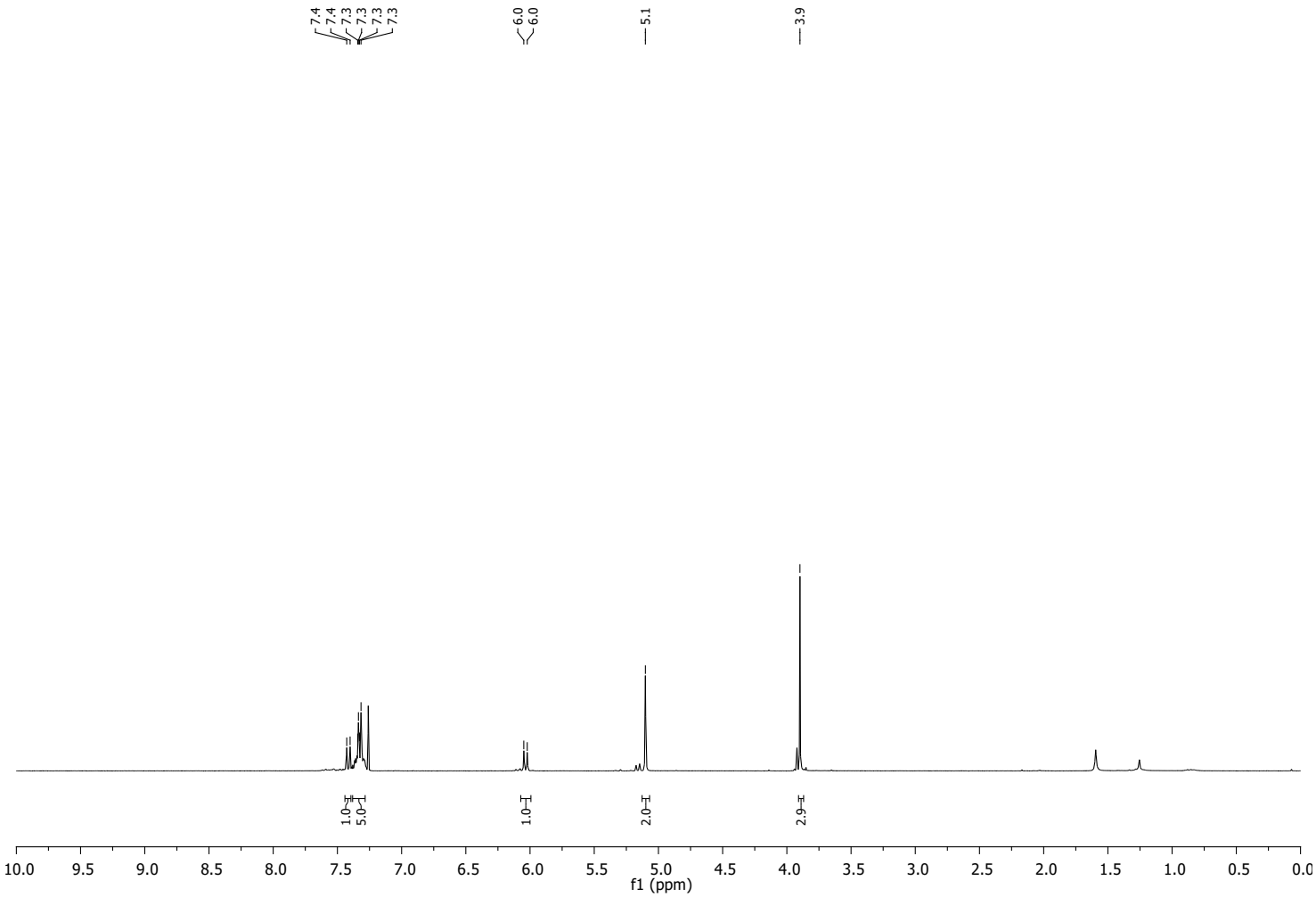


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

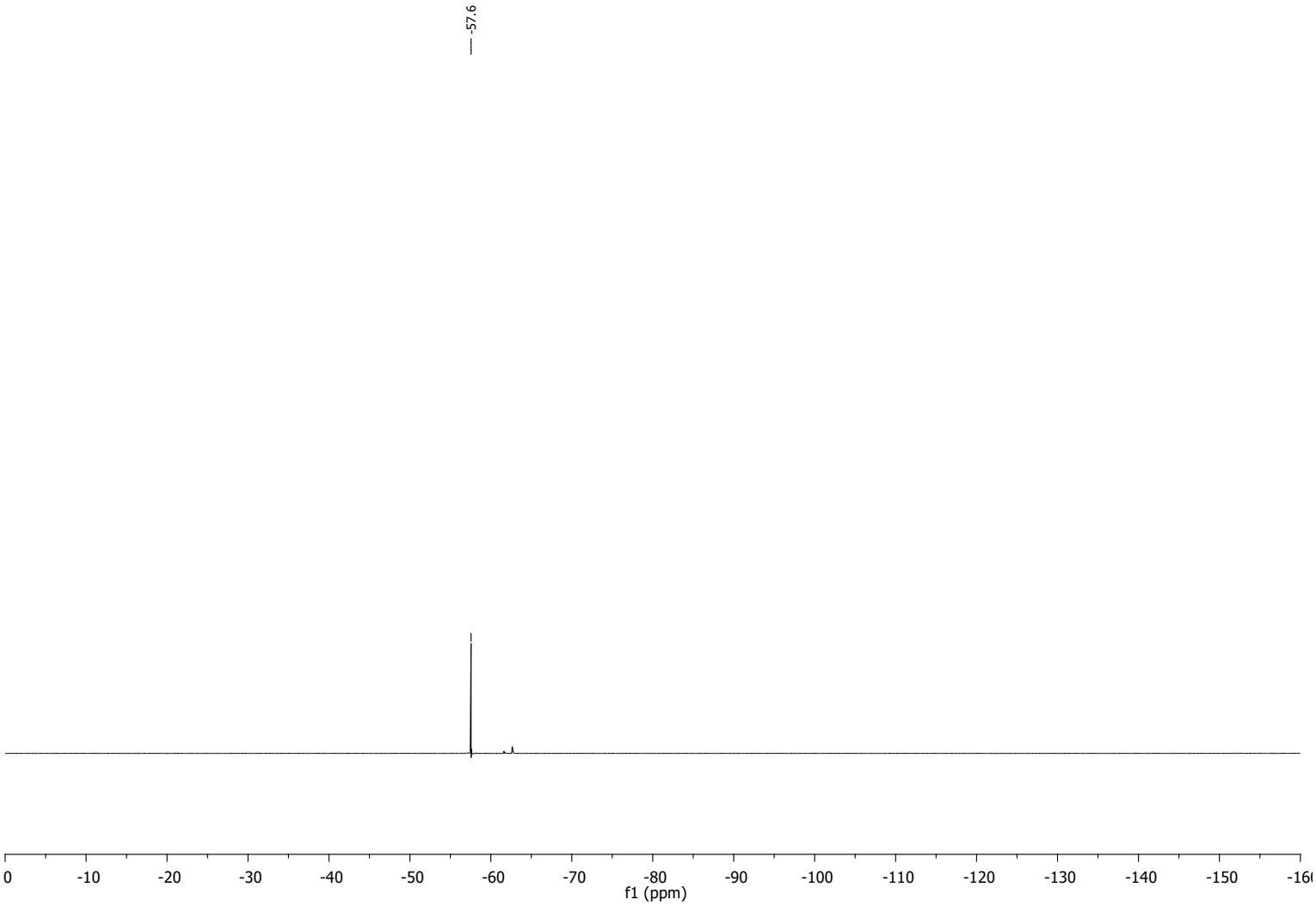


4-(3-tosylimidazo[1,2-*a*]pyridin-2-yl)benzonitrile **3w**

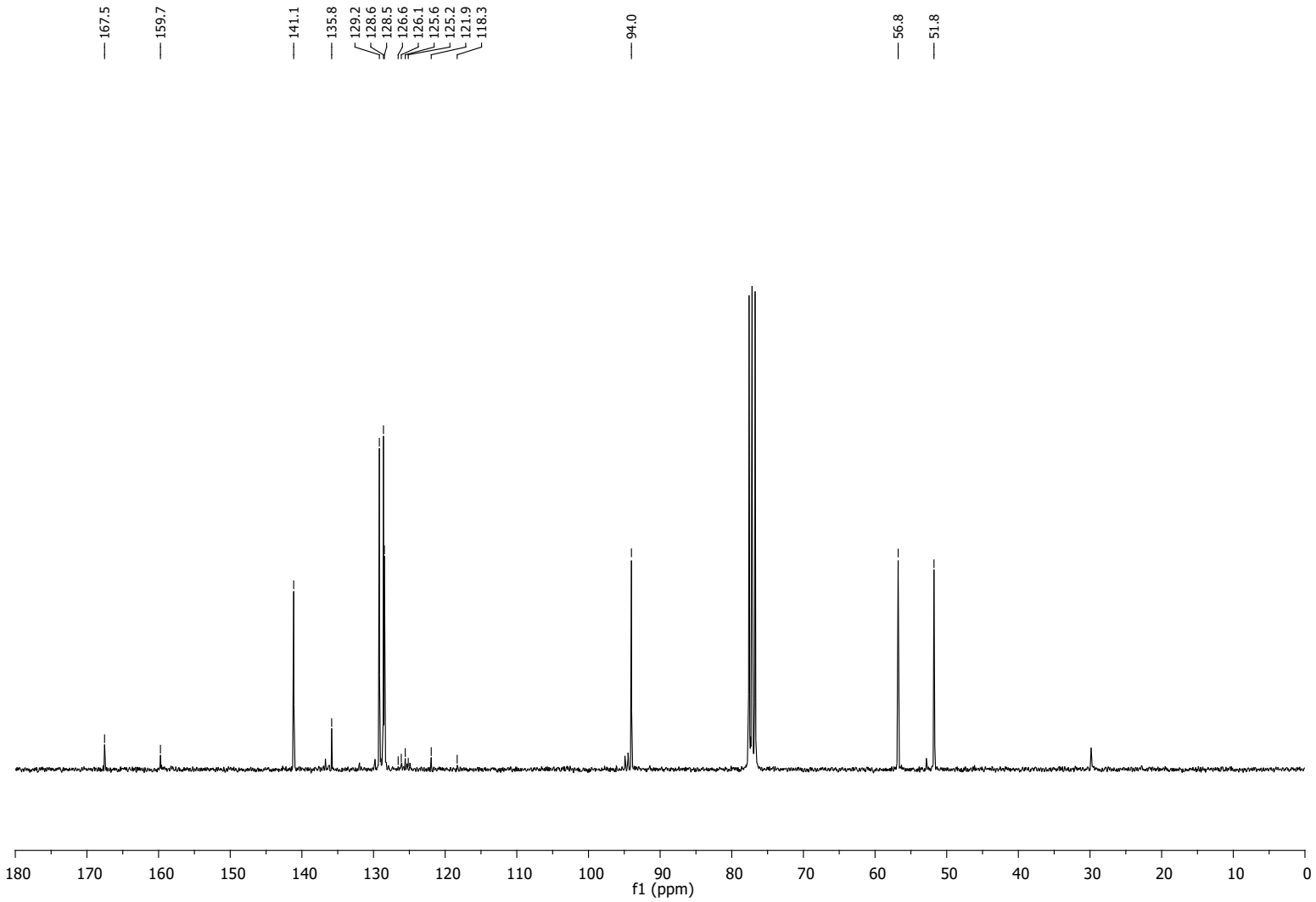
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

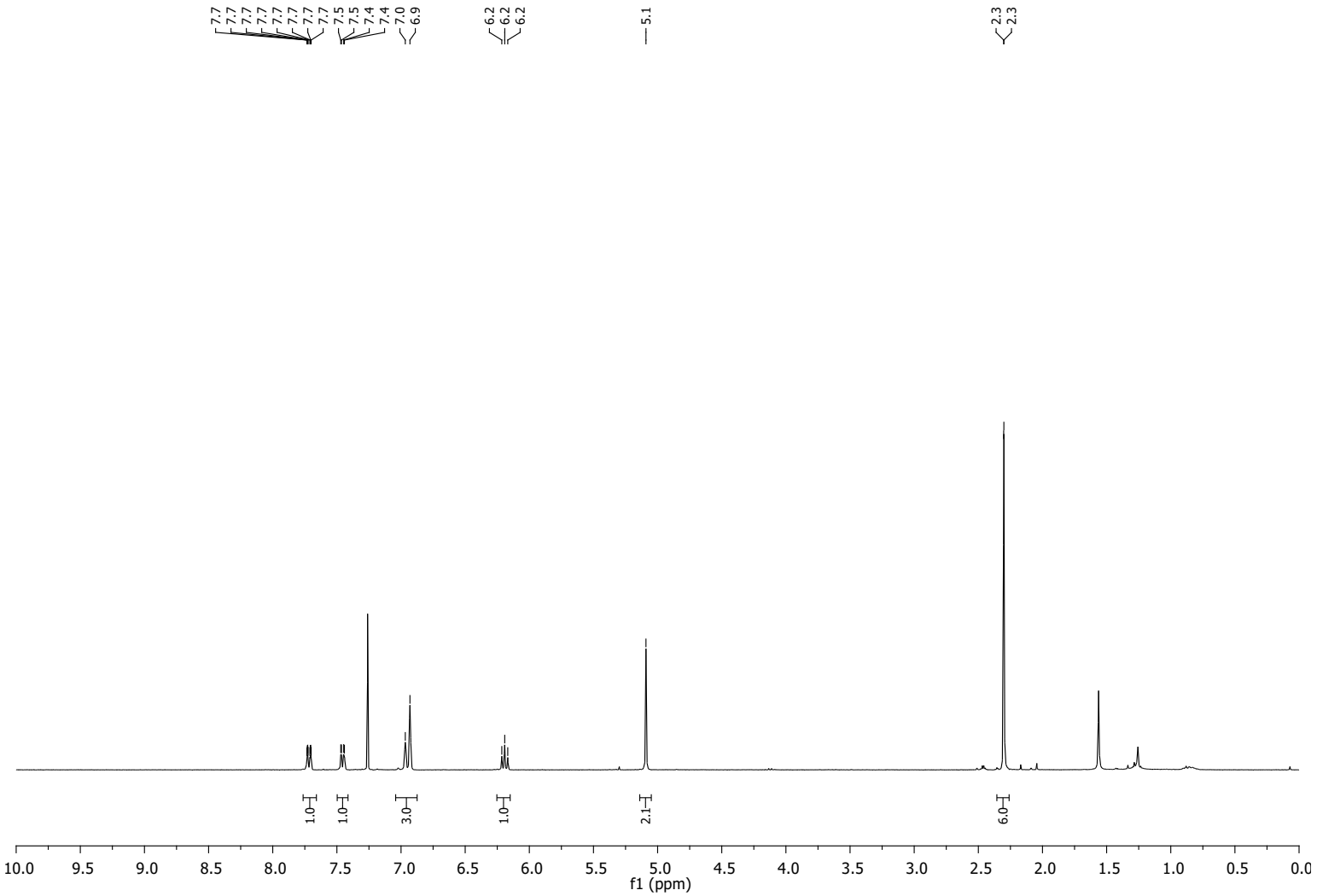


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

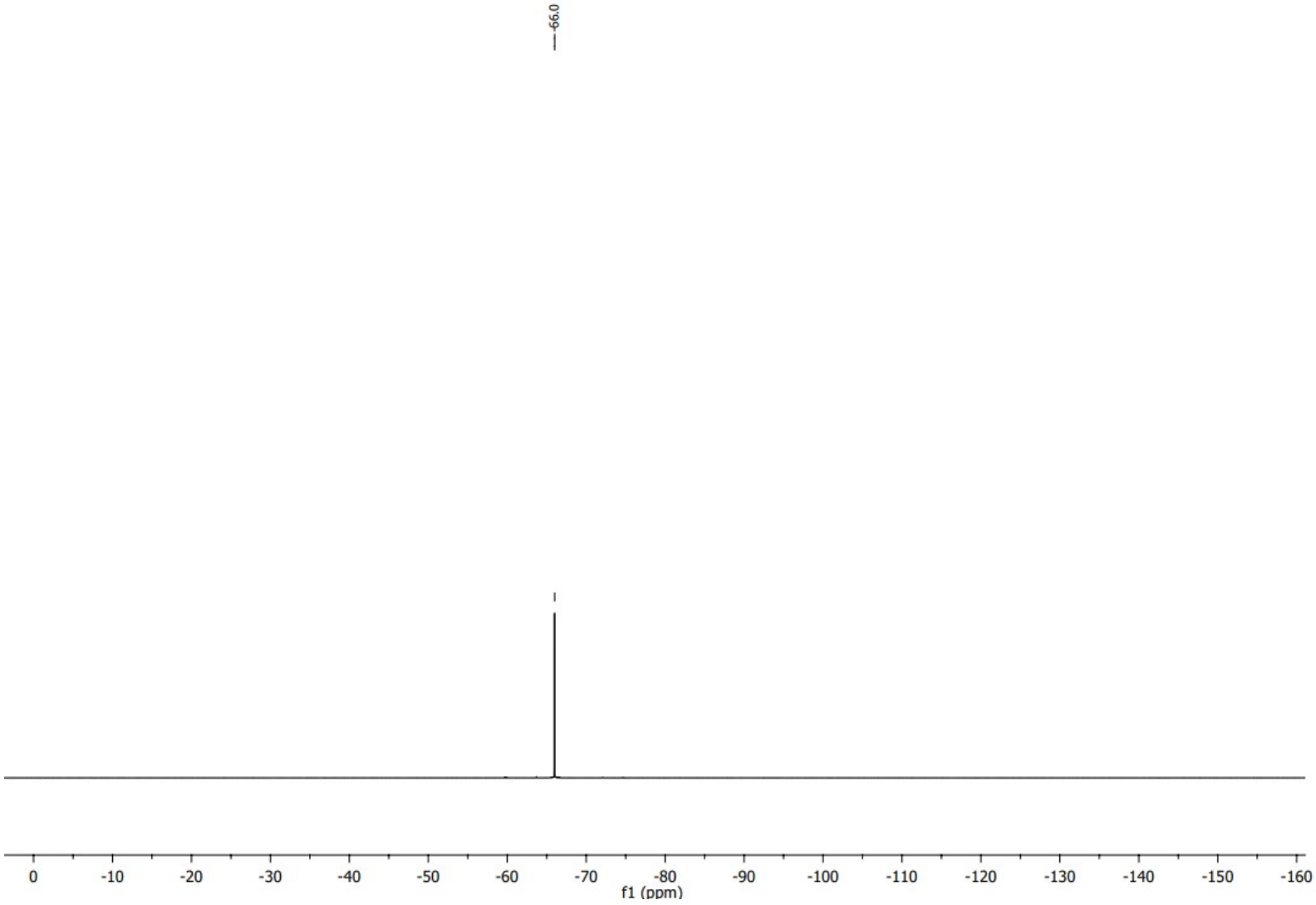


1-(3,5-dimethylbenzyl)-3-(trifluoromethyl)pyridin-2(1H)-one **3y**

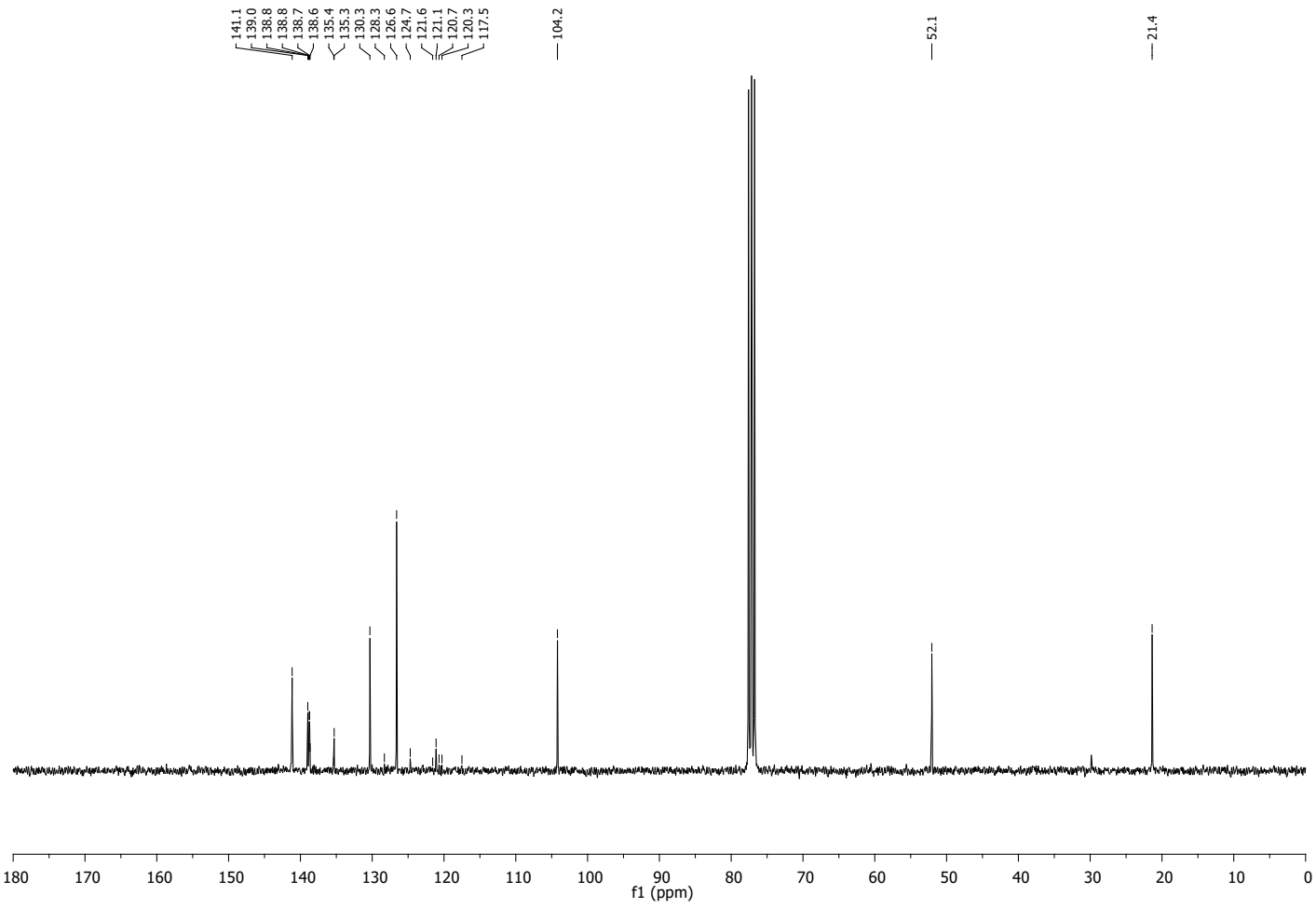
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

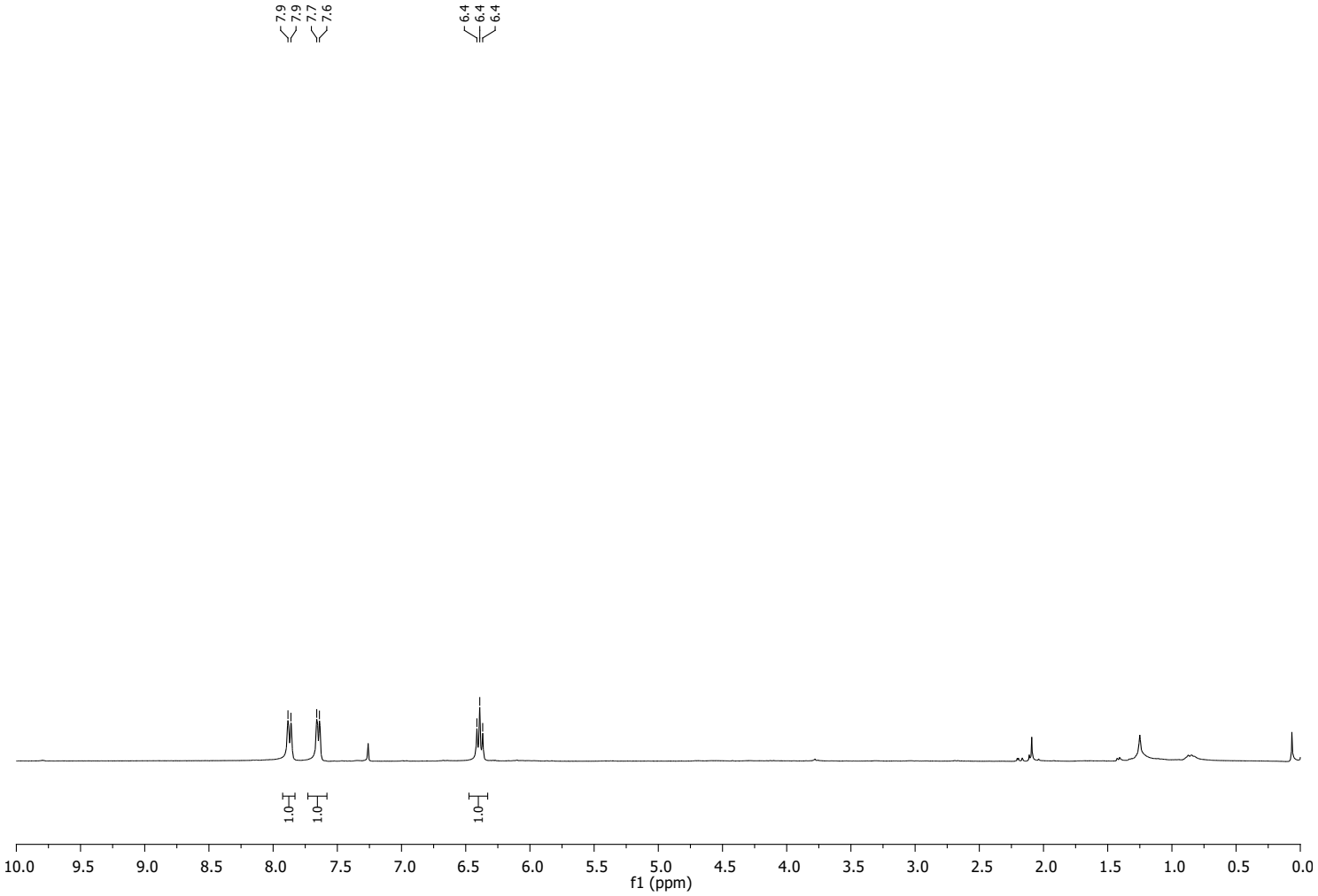


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

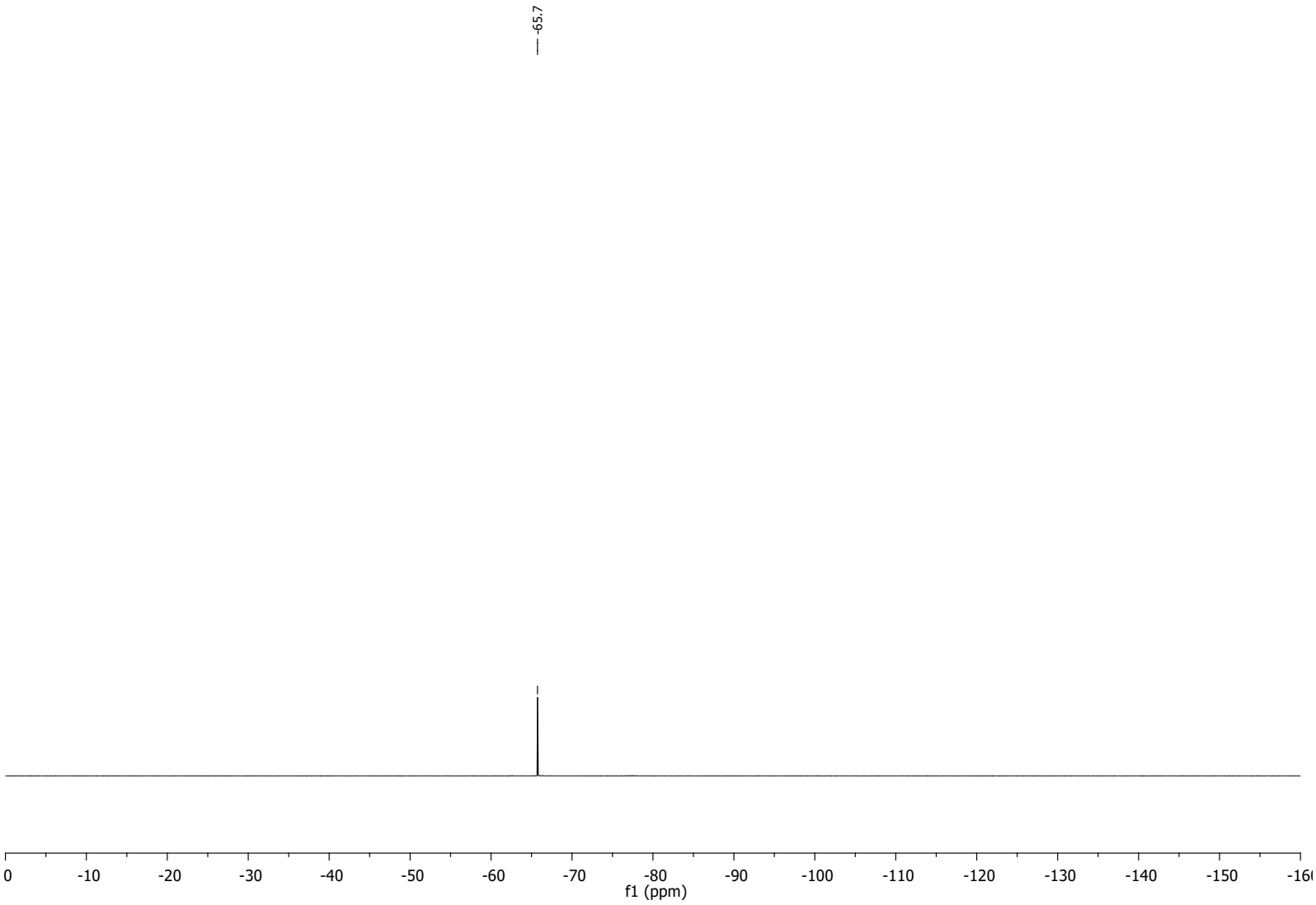


3-(trifluoromethyl)pyridin-2(1H)-one **4a**

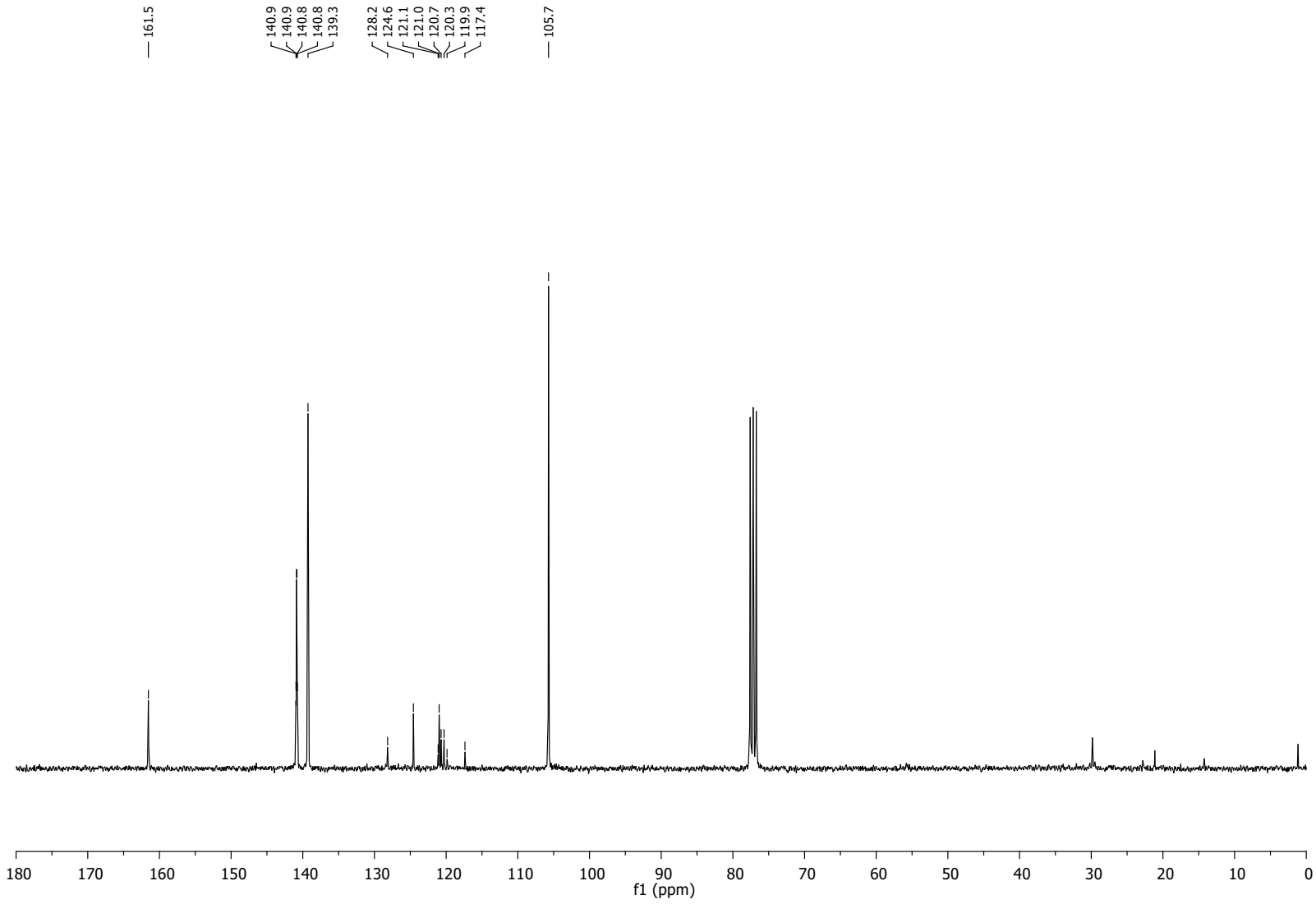
**$^{1}$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

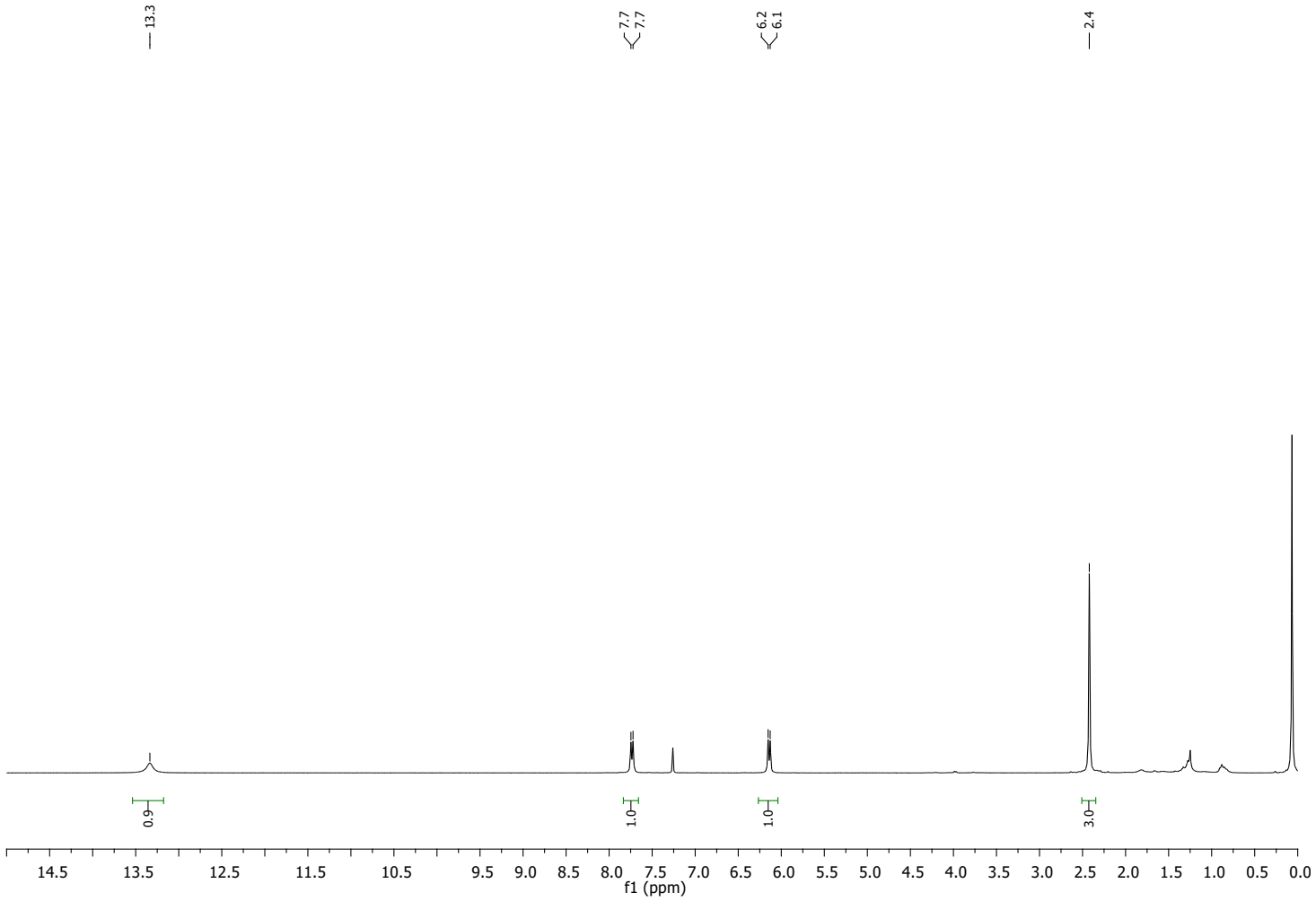


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

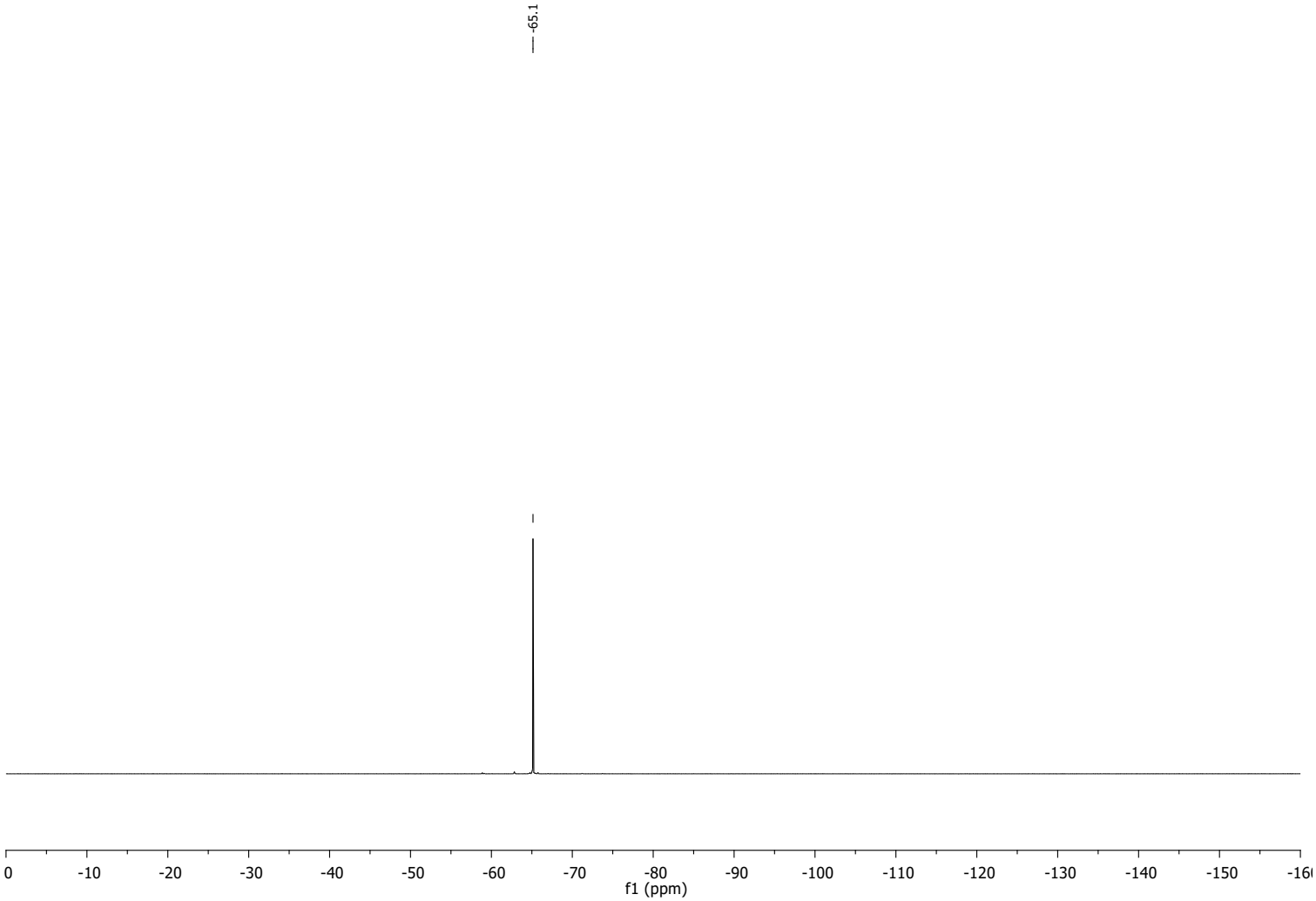


6-methyl-3-(trifluoromethyl)pyridin-2(1H)-one **4b**

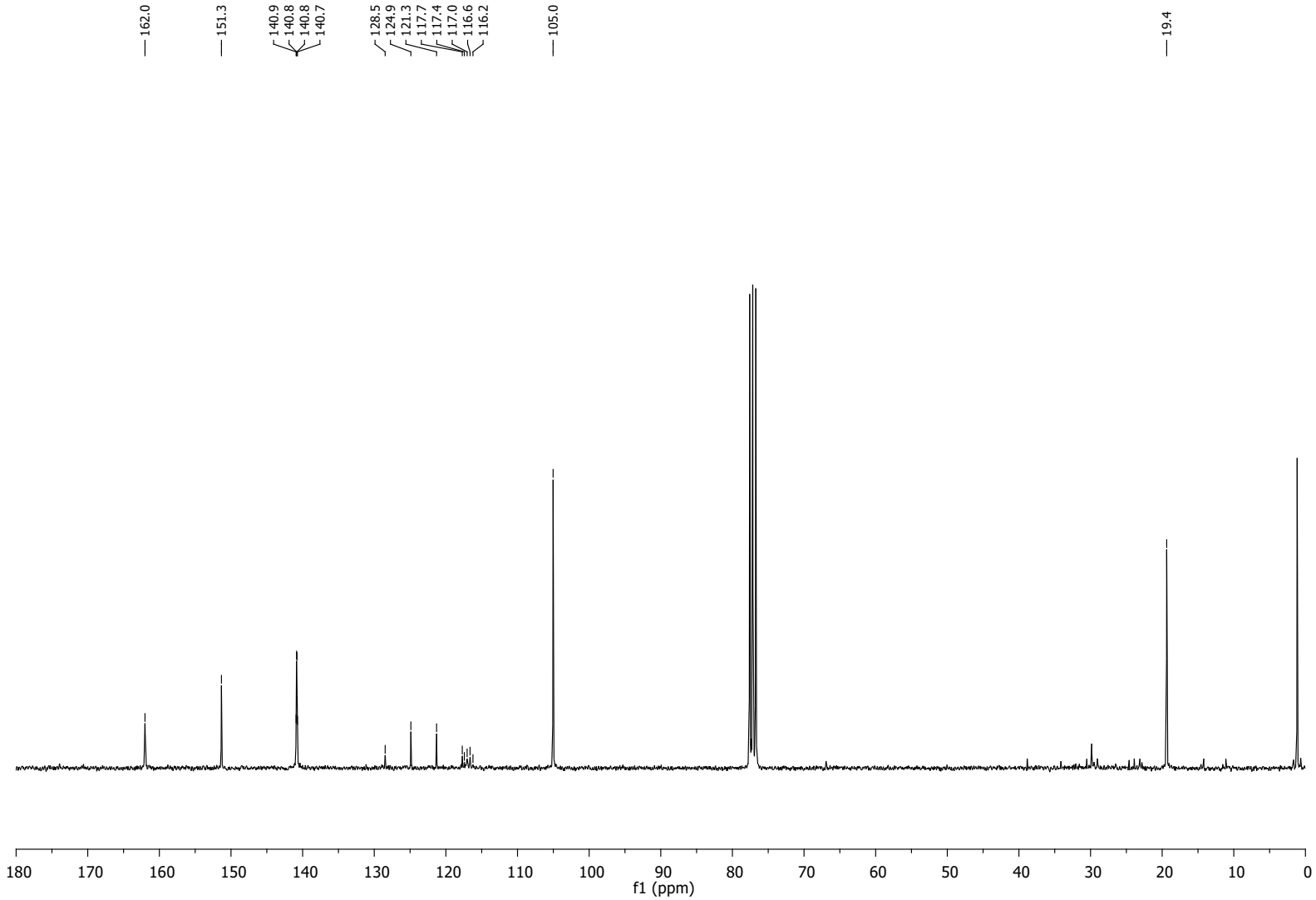
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

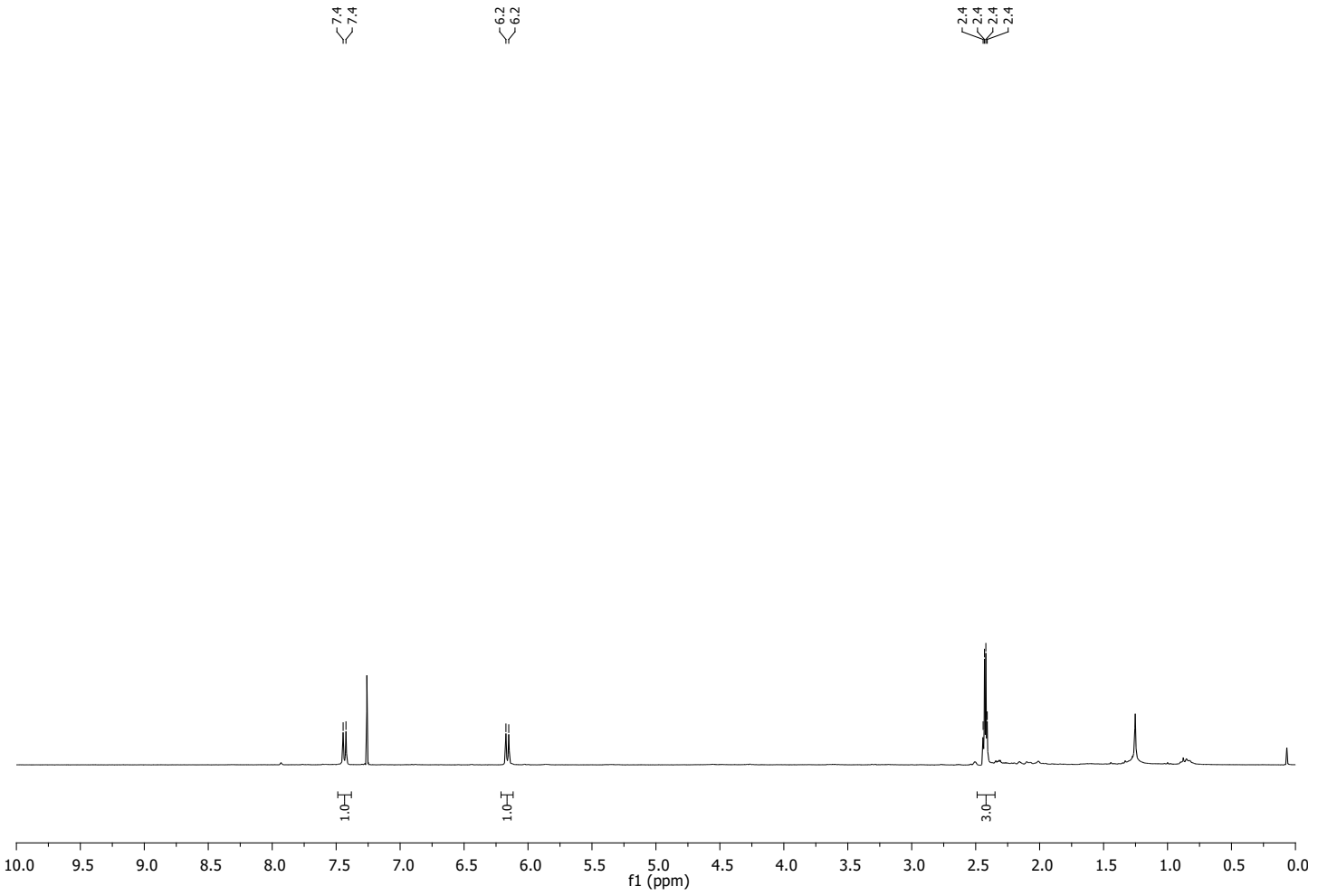


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

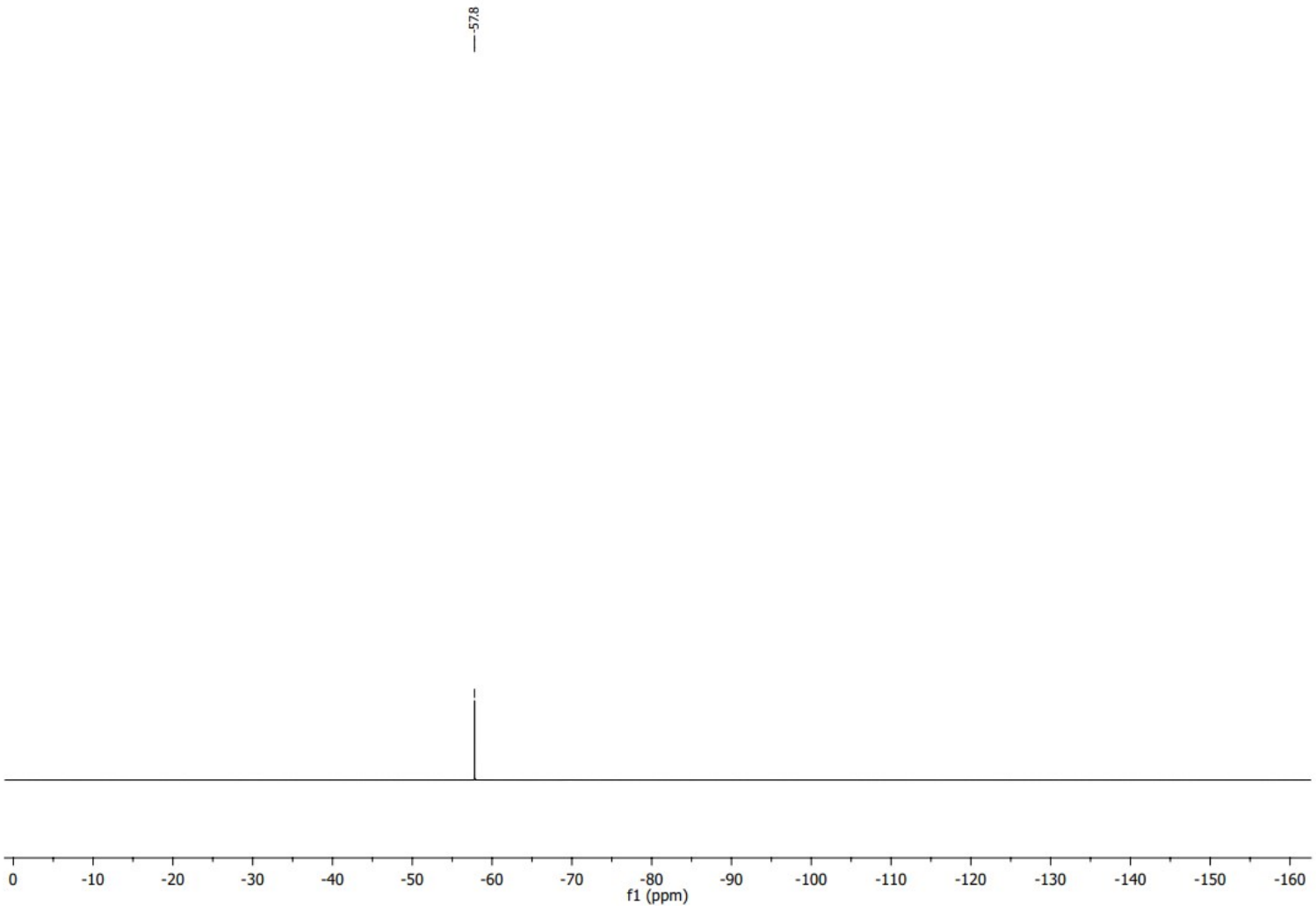


4-methyl-3-(trifluoromethyl)pyridin-2(1H)-one **4d**

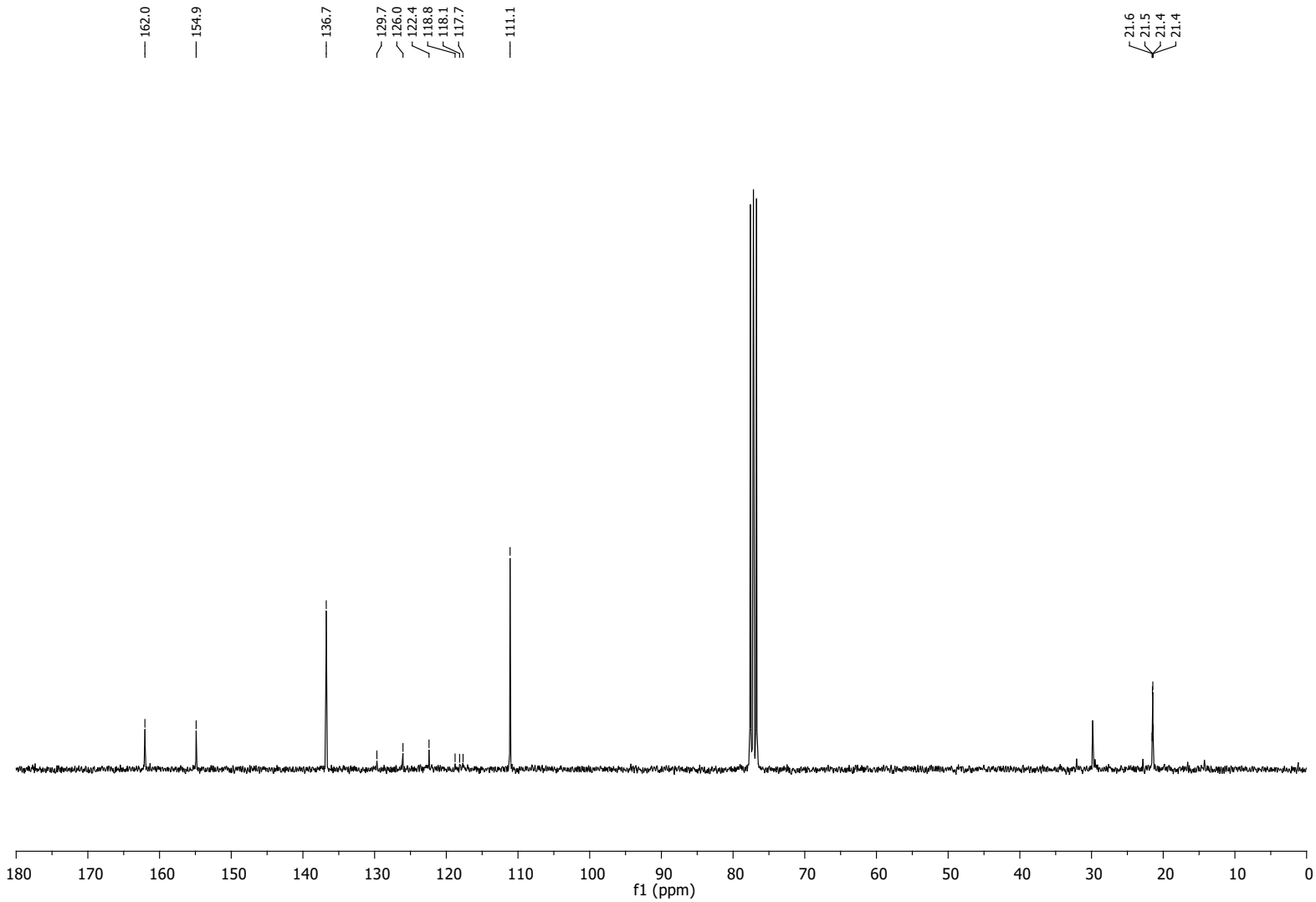
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

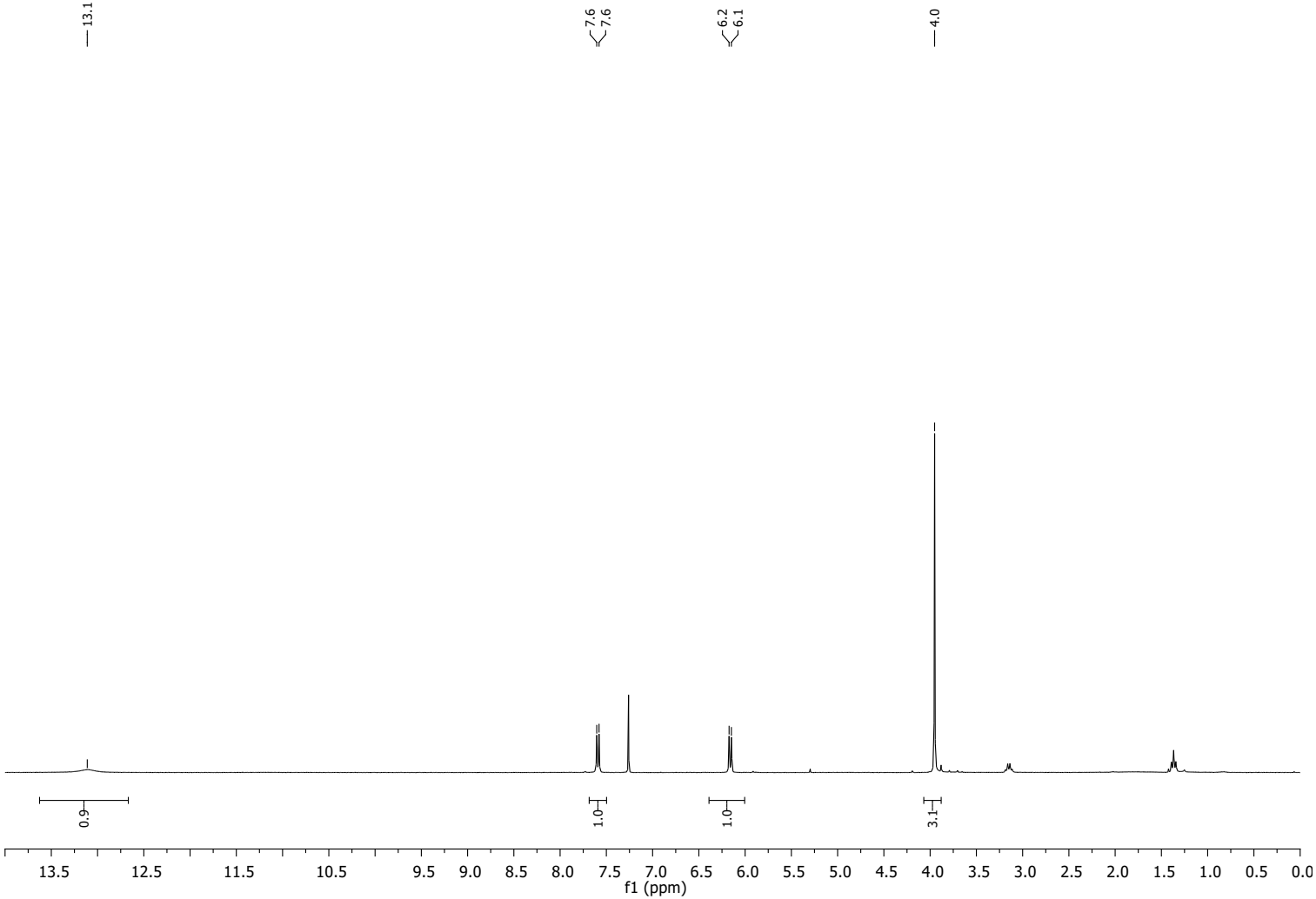


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

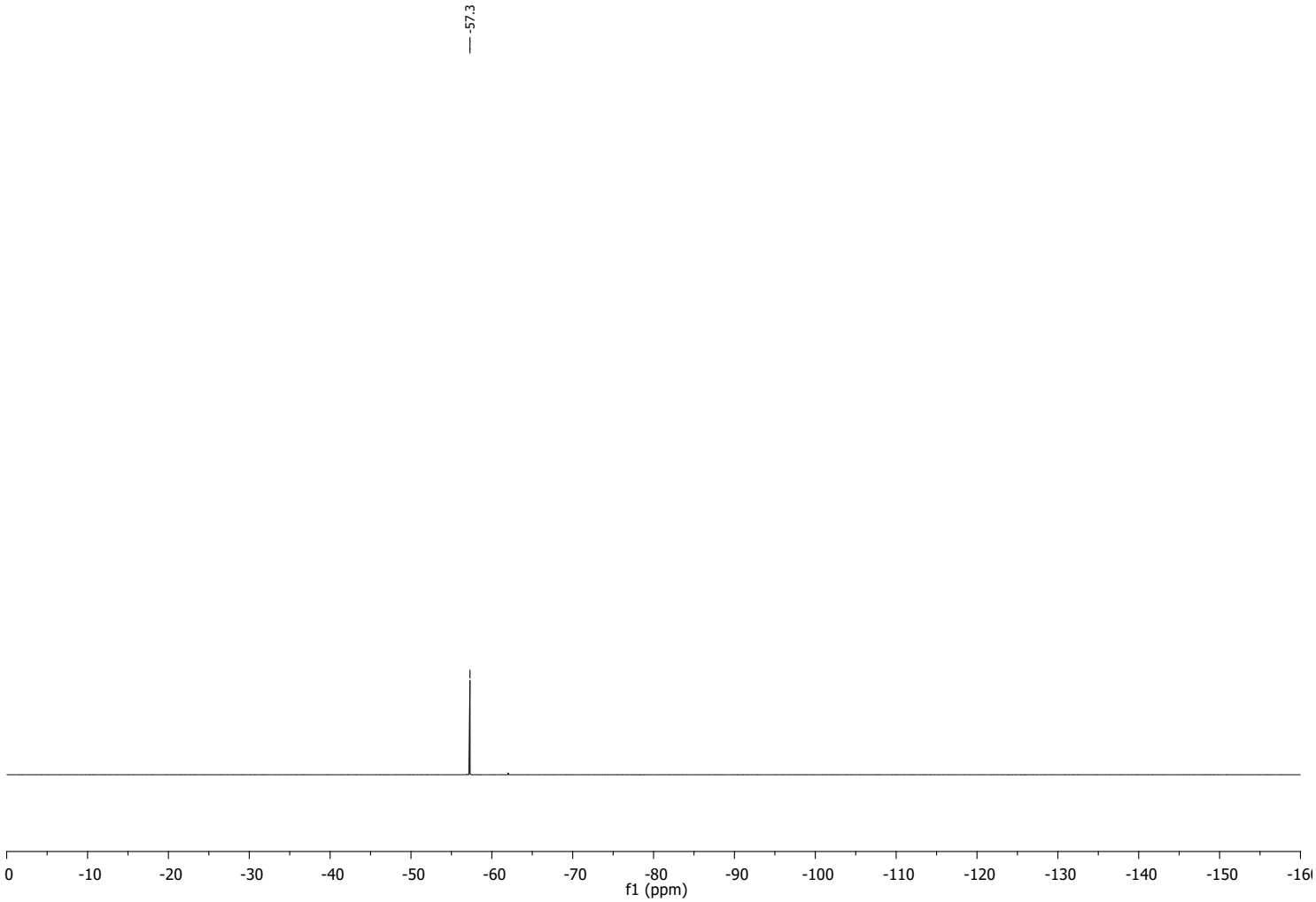


4-methoxy-3-(trifluoromethyl)pyridin-2(1H)-one **4e**

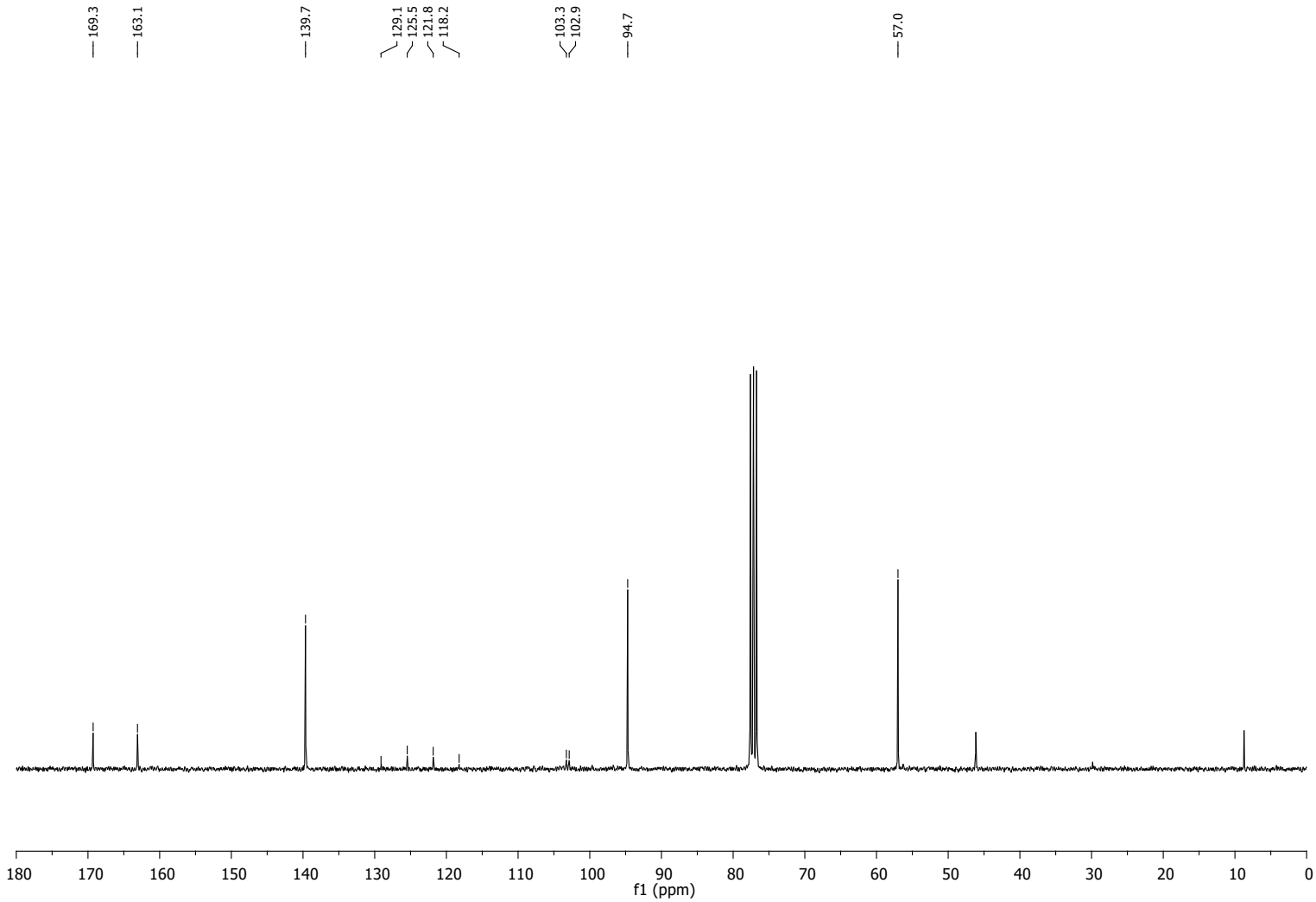
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

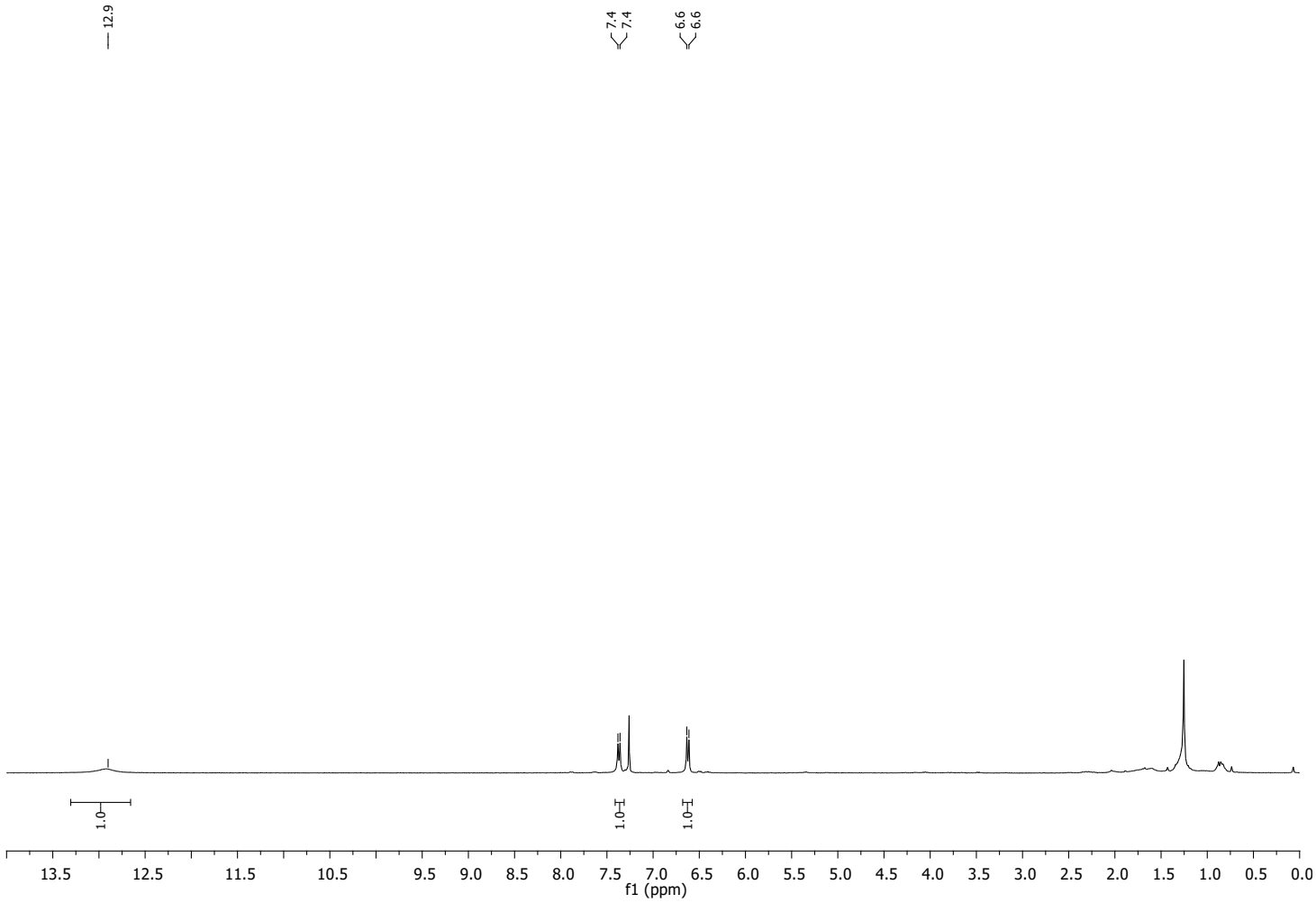


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

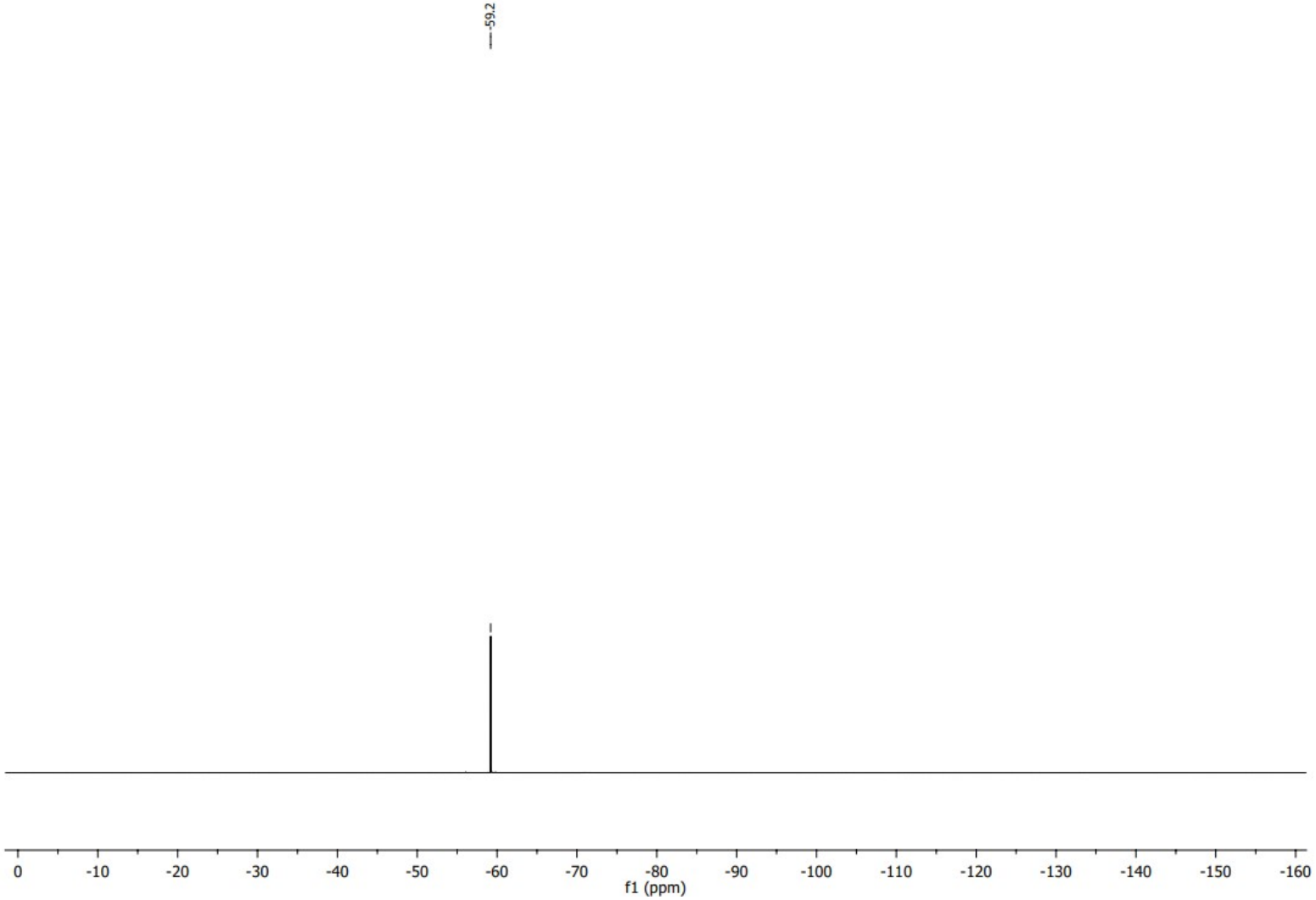


4-bromo-2-pyridinone **4f**

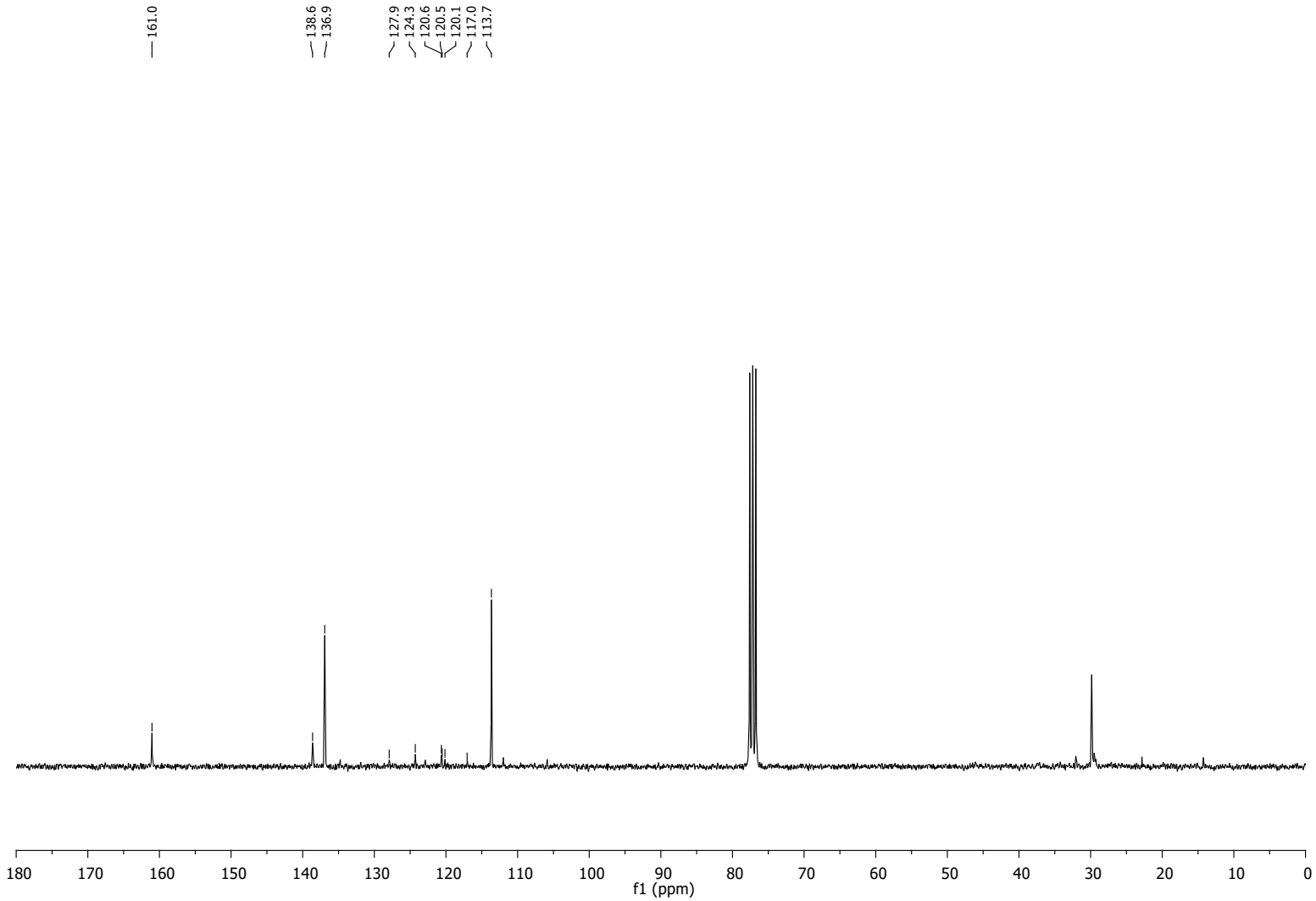
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

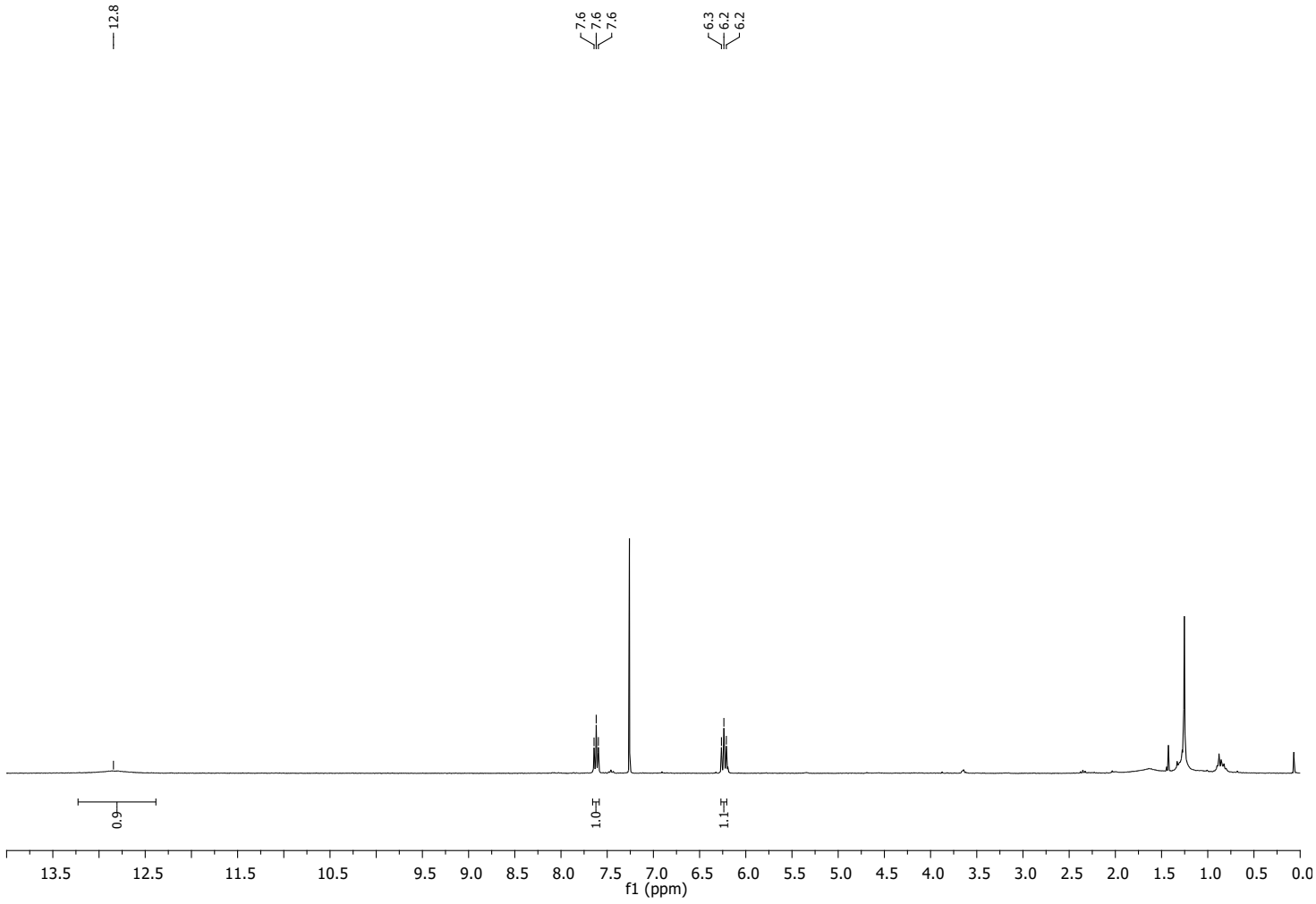


**$^{13}C$ NMR ($CDCl_3$, 75 MHz)**

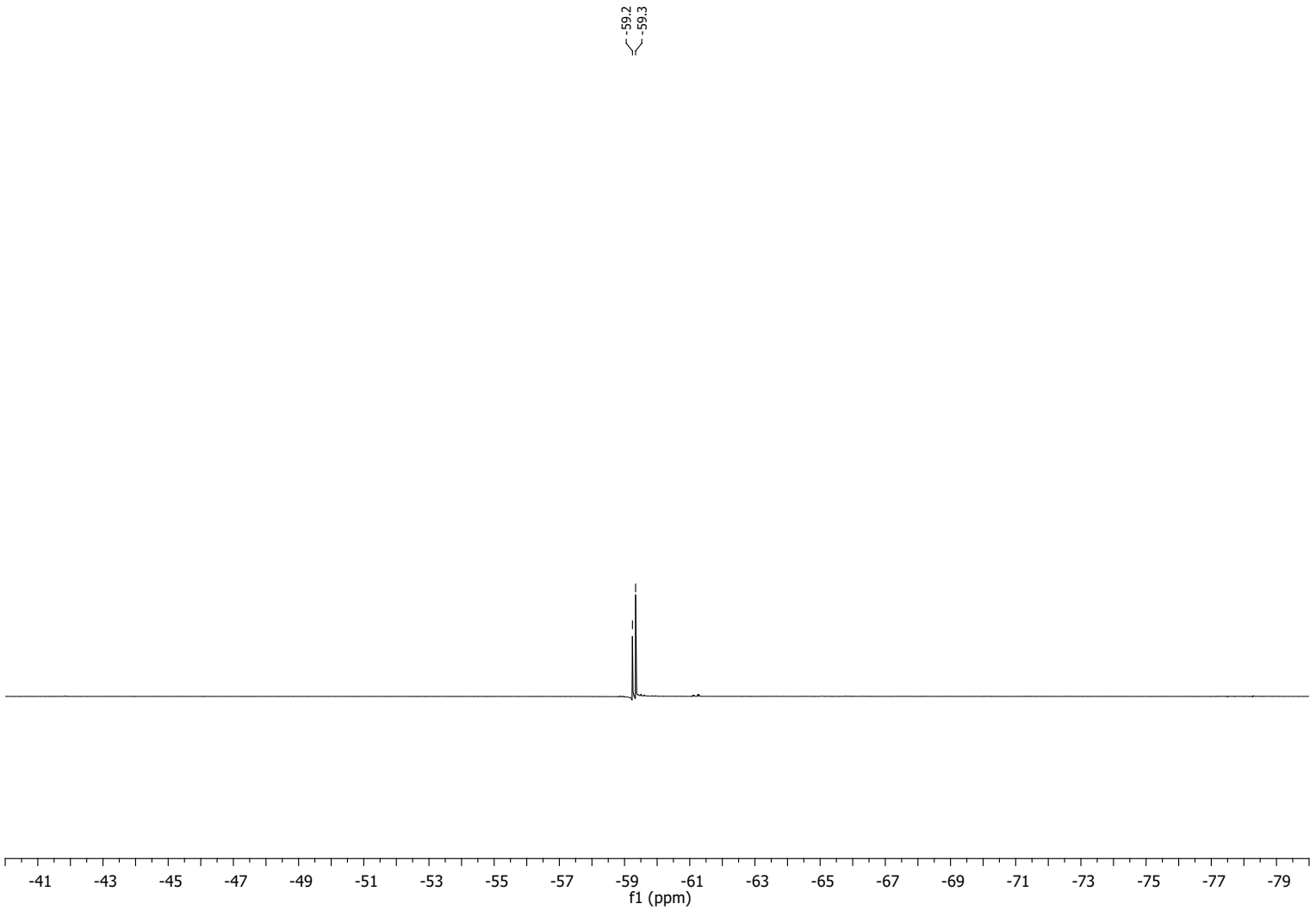


4-fluoro-3-(trifluoromethyl)pyridin-2(1H)-one **4g**

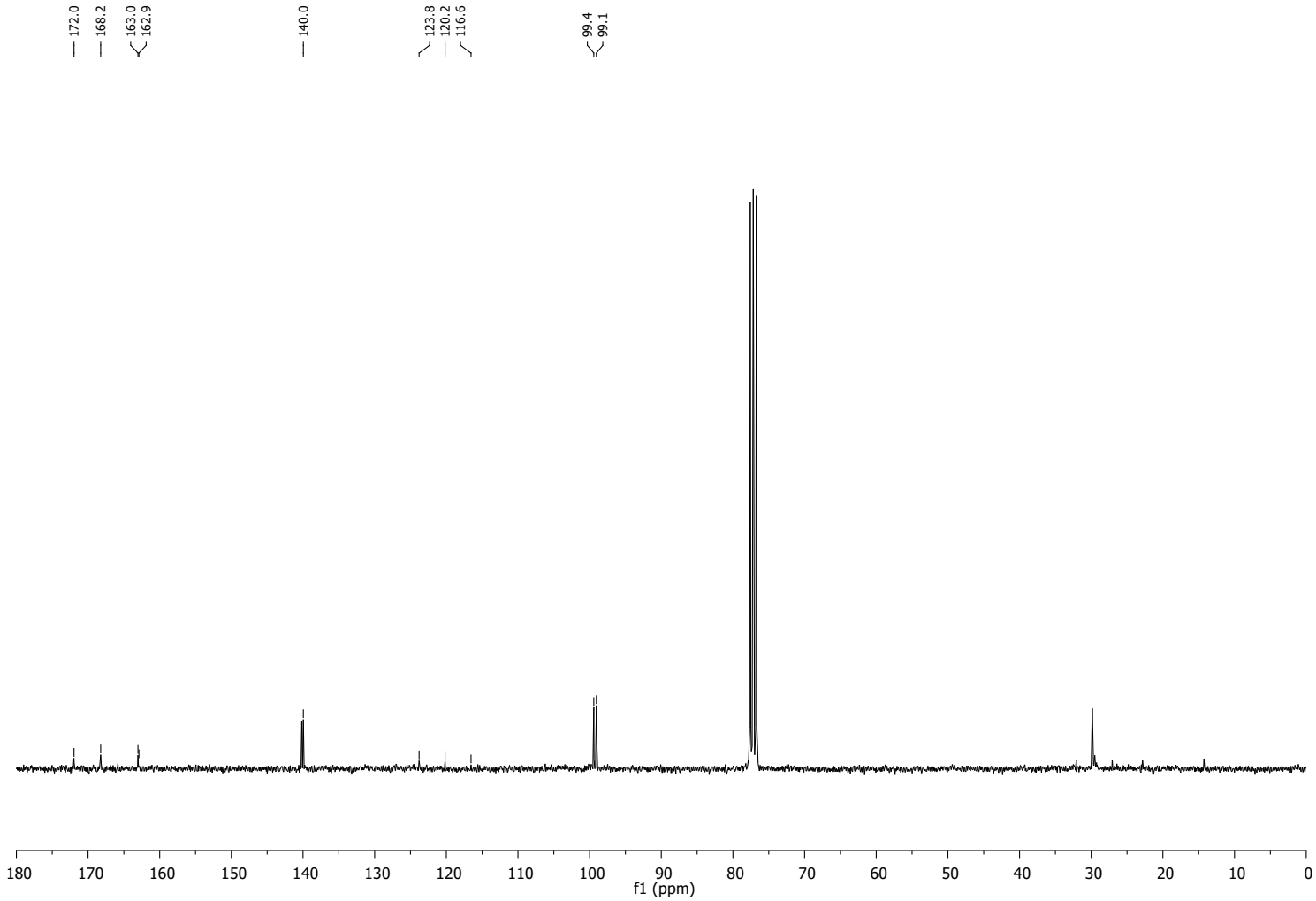
**$^1$H NMR ($CDCl_3$, 300 MHz)**



**$^{19}$F NMR ($CDCl_3$, 282 MHz)**

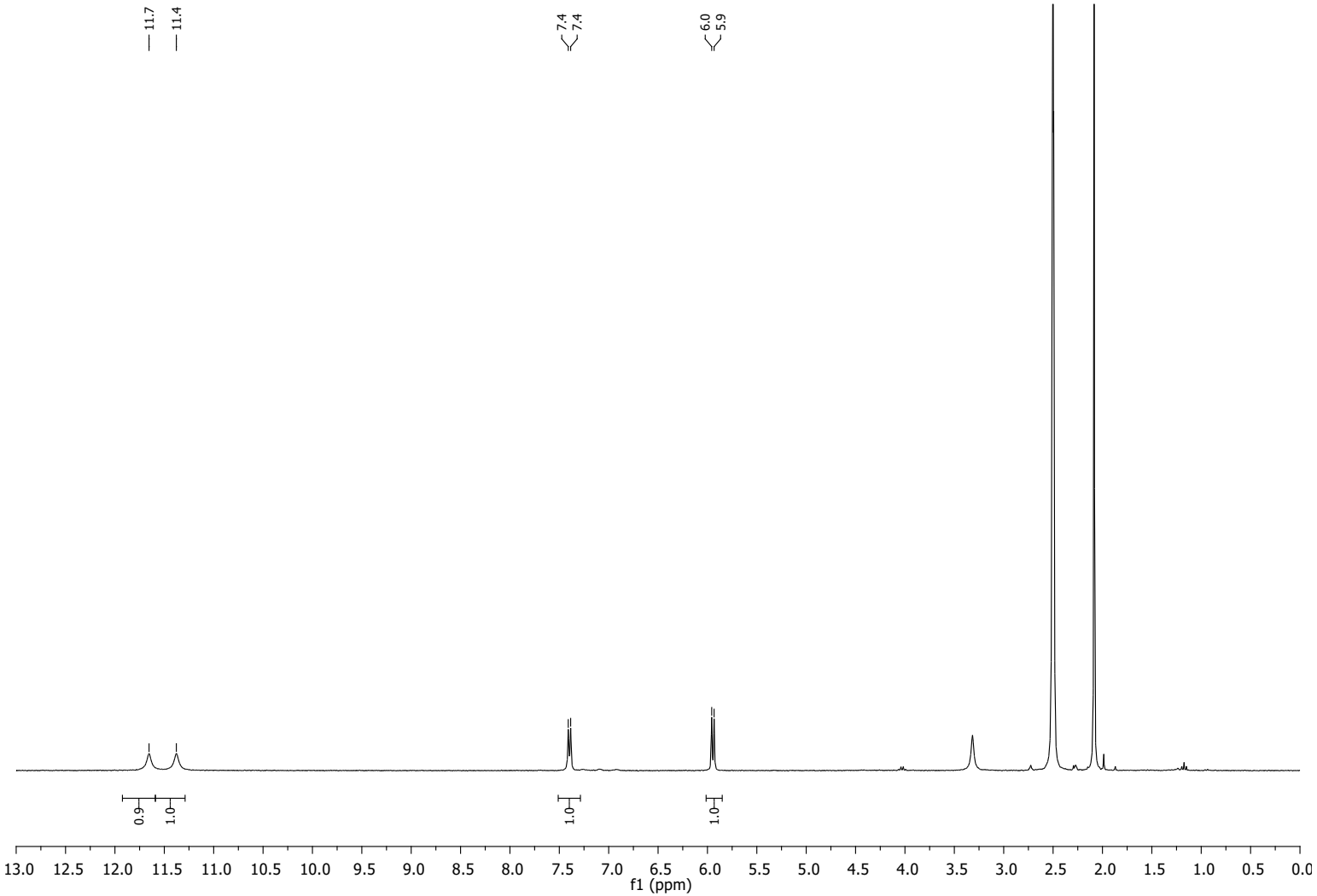


**$^{13}$C NMR ($CDCl_3$, 75 MHz)**

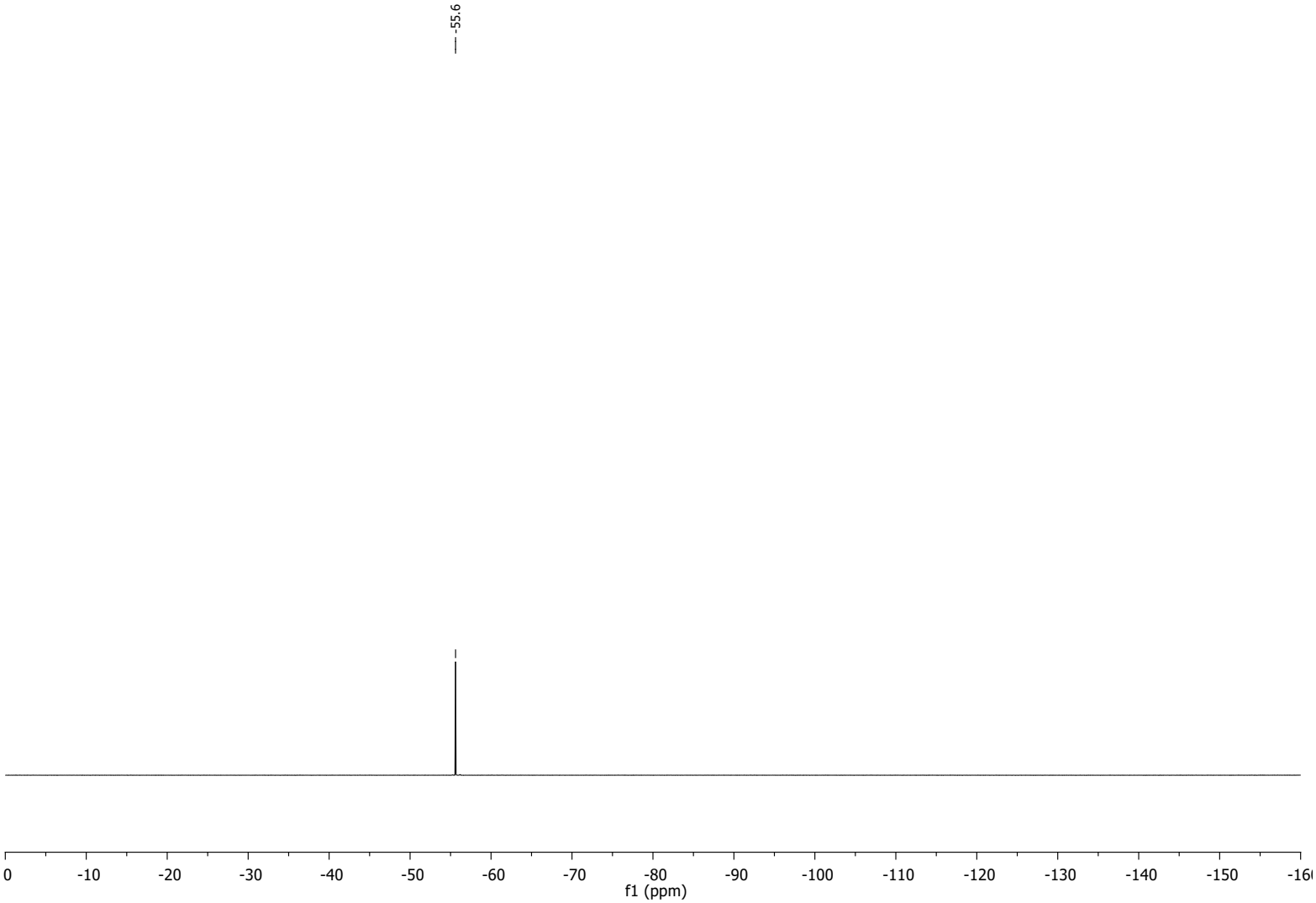


4-hydroxy-3-(trifluoromethyl)pyridin-2(1H)-one **4h**

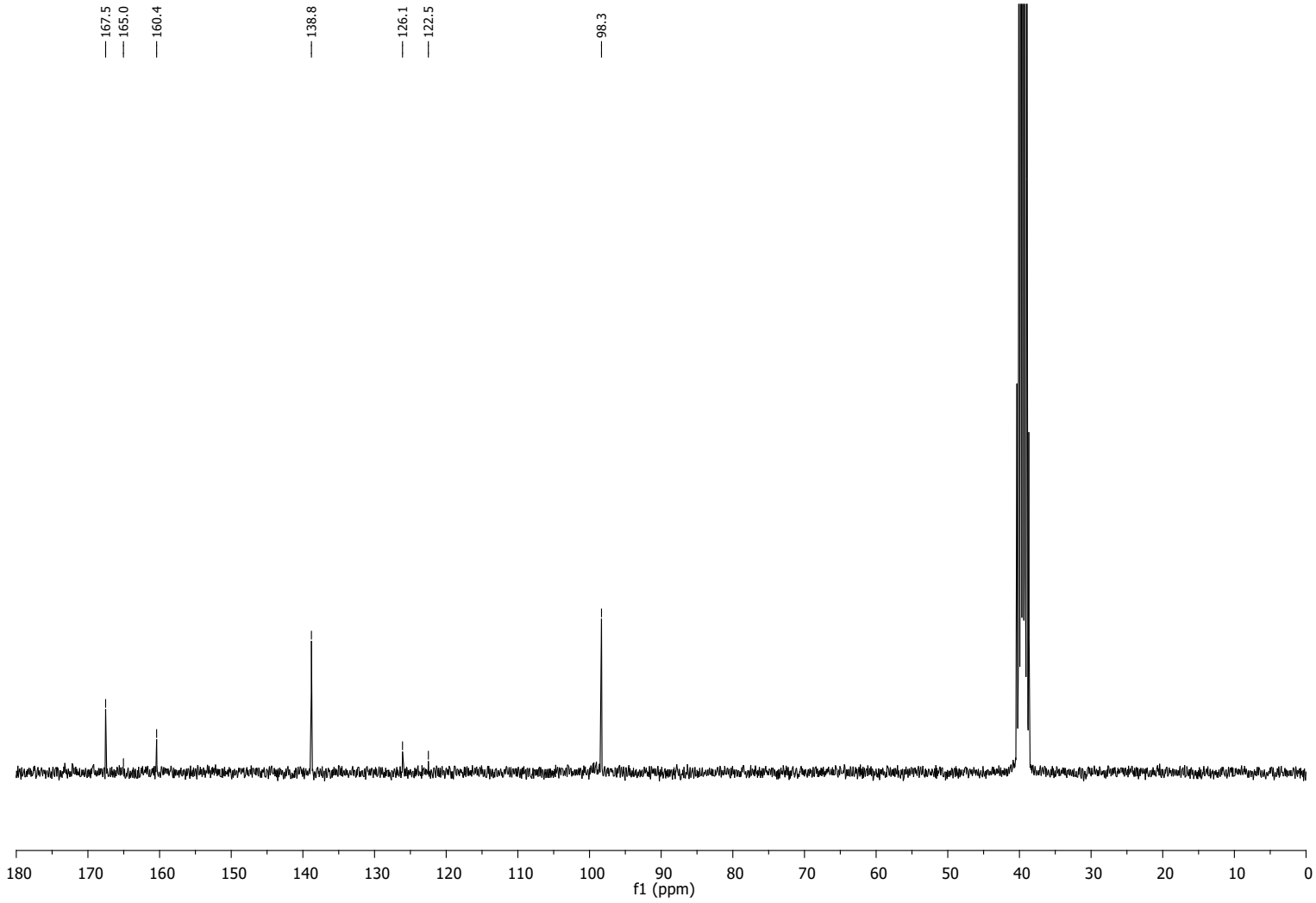
**$^{1}$H NMR (DMSO, 300 MHz)**



**$^{19}$F NMR (DMSO, 282 MHz)**



**$^{13}$C NMR (DMSO, 75 MHz)**



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