# Supporting Information

## Visible-light-initiated Catalyst-free Oxidative Cleavage of Triaryl-Substituted Alkenes C=C Bonds under Ambient Conditions

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## 1. General Remarks

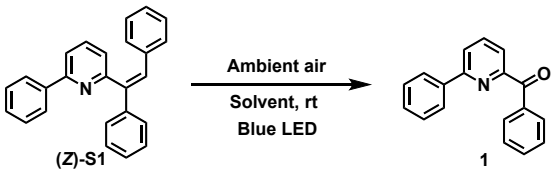
All reagents and starting materials were purchased from commercial sources and used as supplied, unless otherwise illustrated. All solvents were purified according to the established procedures. Column chromatography was performed with silica gel (Merck, 300-400 mesh). $^{1}$H NMR spectra were recorded on Bruker Avance 400 MHz spectrometers. Chemical shifts were reported in ppm referenced to 7.26 ppm of chloroform-*d* (2.5 ppm of DMSO-$d_6$). $^{13}$C NMR spectra were recorded on Bruker Avance 101 MHz spectrometers, and were fully decoupled by broad band proton decoupling. Chemical shifts were reported in ppm referenced to the center line of a triplet at 77.16 ppm of chloroform-*d* (39.5 ppm of DMSO-$d_6$). HRMS was recorded on a commercial apparatus (ESI Source, TOF). The UV-Vis Spectra has been recorded on a Shimadazu UV 3600 UV-Vis spectrometer. Cyclic voltammetry and square wave voltammetry were performed on an ALS/CHI 660C/680C electrochemical analyzer. Electron paramagnetic resonance (EPR) spectra were recorded on a Bruker A300 spectrometer.

## 2. The Preparation of (*Z*)-Triary-substituted Alkenes[1]

An oven-dried 25 mL Schlenk tube equipped with magnetic stirring bar were charged with diphenylacetylene/1,2-bis(3,5-dimethylphenyl)ethyne (0.6 mmol, 108.6 /140.1 mg), appropriate *N*-methylpyridinium salts (0.3 mmol) and $Pd(OAc)_2$ (0.003 mmol, 6.8 mg), $(Cy)_3P{\cdot}HBF_4$ (0.09 mmol, 33.1 mg), PivOK (0.3 mmol, 45 mg), CuBr (0.15 mmol, 20.3 mg), $Et_3N$ (0.09 mmol, 12.5 uL), then $H_2O$ (50 uL), Fluorobenzene (0.25 mL) and DMAc (0.1 mL) was added to the sealed reaction vessel by syringe. The resulting solution was stirred at 120 °C (heated by heating plate magnetic stirrer) for 20 h. After cooling to room temperature, the mixture was diluted with dichloromethane and filtered through a short pad of celite, the volatiles were removed under vacuum and the residue was purified by preparative thin layer chromatography (silica gel, petroleum ether/ethyl acetate 50:1) to give pure product.

## 3. Optimization Results of the Reaction Conditions

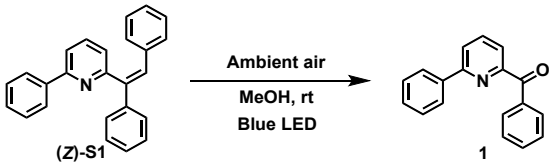
Table S1. Optimization of Reaction Conditions[a,b]



| Entry | Solvent | Time | Yield (%) |
|---|---|---|---|
| 1 | Toluene | 12 h | Trace |
| 2 | Fluorobenzene | 12 h | NR |
| 3 | Benzo-trifluoride | 12 h | 24 |
| 4 | $CHCl_3$ | 12 h | NR |
| 5 | DCE | 12 h | Trace |
| 6 | $CH_3CN$ | 12 h | Trace |
| 7 | THF | 12 h | Trace |
| 8 | 1,4-Dioxane | 12 h | Trace |
| 9 | 2-Methoxyethanol | 12 h | 69 |
| 10 | MeOH | 12 h | 83 |
| 11 | EtOH | 12 h | 81 |
| 12 | TBA | 12 h | 10 |
| 13 | IPA | 12 h | 70 |
| 14 | HFIP | 12 h | 60 |
| 15 | $H_2O$ | 12 h | NR |
| 16 | Sulfolane | 12 h | 51 |
| 17 | NMP | 12 h | 51 |
| 18 | DMSO | 12 h | 60 |
| 19 | DMAc | 12 h | 67 |
| 20 | DMF | 12 h | 52 |
| 21 | MeOH | 8 h | 80 |
| 22 | MeOH | 10 h | 81 |
| 23 | MeOH | 24 h | 82 |
| 24 | MeOH (0.5 mL) | 12 h | 79 |
| 25 | MeOH (2 mL) | 12 h | 78 |

[a]Reaction conditions: (*Z*)-**S1** (0.1 mmol), Solvent (1 mL), Ambient Air, Blue LED, RT, Time. [b]Isolated yields. TBA=*tert*-Butanol; IPA=Isopropanol; HFIP = Hexafluoroisopropanol.

Table S2. Distribution of (*Z*)-**S1**, (*E*)-**S1** and products **1** over the time in (*Z*)-**S1**




| Time | (*Z*)-**S1** | (*E*)-**S1** | Product **1** |
|---|---|---|---|
| 2 | 76% | 13% | 11% |
| 4 | 62% | 15% | 23% |
| 6 | 39% | 19% | 42% |
| 8 | 23% | 10% | 67% |
| 10 | 16% | 5% | 79% |

| | | | |
|---|---|---|---|
| 12 | 12% | 2% | 86% |

[a] Reaction conditions: (*Z*)-**S1** (0.10 mmol), MeOH (1 mL), ambient air, 30 W blue LED, room temperature, 12 h. [b]GC yields. $CH_2Br_2$ as the internal standard.

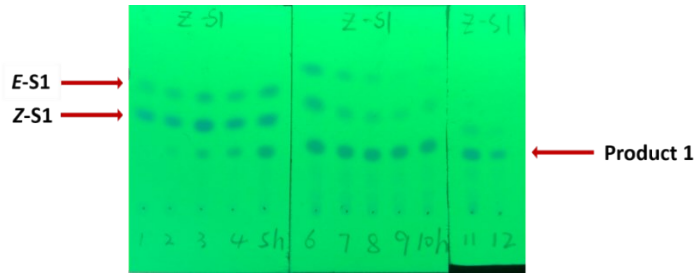
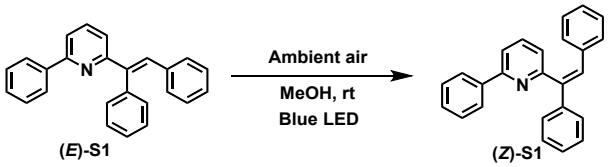



Table S3. Distribution of (*Z*)-**S1**, (*E*)-**S1** and products **1** over the time in (*E*)-**S1**




| Time | (*E*)-**S1** | (*Z*)-**S1** | Product **1** |
|---|---|---|---|
| 2 | 92% | 8% | 0% |
| 4 | 91% | 9% | 0% |
| 6 | 86% | 14% | 0% |
| 8 | 82% | 18% | 0% |
| 10 | 85% | 15% | 0% |
| 12 | 86% | 14% | 0% |

[a] Reaction conditions: (*E*)-**S1** (0.10 mmol), MeOH (1 mL), ambient air, 30 W blue LED, room temperature, 12 h. [b]GC yields. $CH_2Br_2$ as the internal standard.

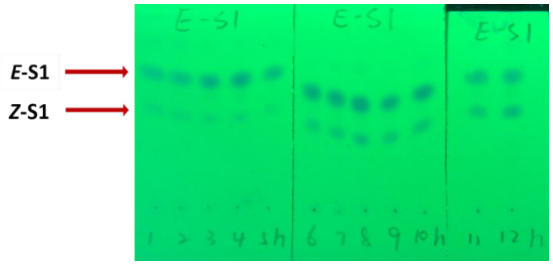
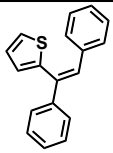
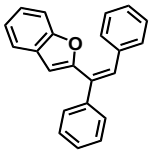
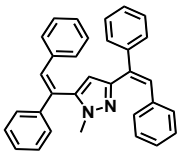



Table S4. Other type of heteroaryl substituted alkenes

| Entry | Substrate | Time | Yield (%) |
|---|---|---|---|
| 1 |  | 36 h | NR |

| | | | |
|---|---|---|---|
| 2 |  | 36 h | NR |
| 3 |  | 36 h | NR |

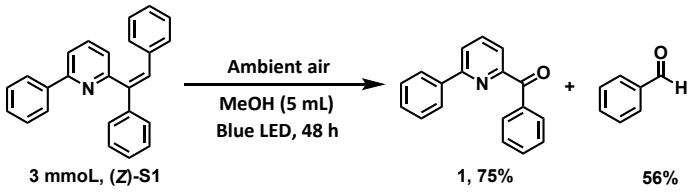
[a] Reaction conditions: Substrates (0.10 mmol), MeOH (1 mL), ambient air, 30 W blue LED, room temperature, time. [b]GC yields.

# 4. Experimental Procedures

## 4.1 General Procedures for the Cleavage of Alkene using Blue LED

An oven-dried 25 mL Quartz tubes equipped with magnetic stirring bar were charged with (*Z*)-triaryl-substituted Alkenes (0.1 mmol) in MeOH (1–3 mL) with an ambient air at room temperature. The resulting mixture was stirred for 10–40 h under 30 W blue LED irradiation (the progress can be monitored *via* TLC). After cooling to room temperature, the mixture was diluted with dichloromethane, the volatiles were removed under vacuum and the residue was purified by preparative thin layer chromatography (petroleum ether/ethyl acetate 20:1) to give pure product.

## 4.2 General Procedure for Gram Scale Experiment




An oven-dried 25 mL Quartz tubes equipped with magnetic stirring bar were charged with (*Z*)-2-(1,2-diphenylvinyl)-6-phenylpyridine (*Z*)-**S1** (3 mmol, 1.0 g) in MeOH (5 mL) with an ambient air at room temperature. The resulting mixture was stirred for 48 h under 30 W blue LED irradiation (the progress can be monitored TLC). After cooling to room temperature, the mixture was diluted with dichloromethane, then the volatiles were removed under vacuum and the crude mixture was purified by column chromatography (silica gel, petroleum ether/ethyl acetate 20:1) to afford the pure product.

## 4.3 X-Ray Crystallographic Data

Single crystals of phenyl(6-phenylpyridin-2-yl)methanone **1** were obtained by slow layer diffusion of n-hexane (2 mL) floated on a concentrated solution of **1** (~20 mg) in dichloromethane (0.3 mL) in tube over the course of 15 days.

The full numbering scheme of compound 2055782 can be found in the full details of the X-ray structure determination (CIF), which is included in Supporting Information. CCDC number 2055782 contains the supplementary crystallographic data for this paper. These data can be obtained free of charge from The Cambridge Crystallographic Data Center via www.ccdc.cam.ac.uk/data_request/cif.

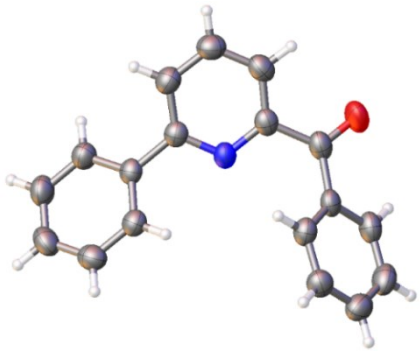


Figure S1. X-ray crystal structure of **1**. Ellipsoids are drawn at the 50% probability level.

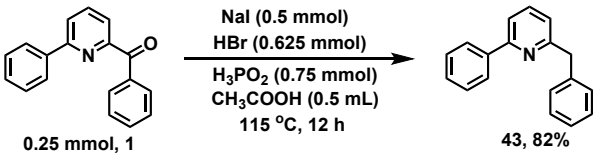
Table S5. Crystal data and structure refinement for 2055782.

| | |
|---|---|
| Empirical formula | $C_{18}H_{13}NO$ |
| Formula weight | 259.29 |
| Temperature/K | 293.15 |
| Crystal system | triclinic |
| Space group | P-1 |
| a/Å | 7.1154 (7) |
| b/Å | 9.6387 (8) |
| c/Å | 10.8333 (9) |
| α/° | 93.473 (7) |
| β/° | 98.583 (7) |
| γ/° | 109.416 (8) |
| Volume/Å3 | 688.03 (11) |
| Z | 2 |
| ρcalcg/cm3 | 1.252 |

| | |
|---|---|
| μ/mm-1 | 0.078 |
| F(000) | 272.0 |
| Crystal size/mm$^3$ | 0.35 × 0.3 × 0.25 |
| Radiation | MoKα (λ = 0.71073) |
| 2Θ range for data collection/° to 52.744 | 6.172 |
| Index ranges | -7 ≤ h ≤ 8, -12 ≤ k ≤ 12, -12 ≤ l ≤ 13 |
| Reflections collected | 5657 |
| Independent reflections | 2806 [Rint = 0.0182, Rsigma = 0.0364] |
| Data/restraints/parameters | 2806/0/181 |
| Goodness-of-fit on F2 | 1.033 |
| Final R indexes [I>=2σ (I)] | R1 = 0.0502, wR2 = 0.1137 |
| Final R indexes [all data] | R1 = 0.0737, wR2 = 0.1315 |
| Largest diff. peak/hole / e Å-3 | 0.15/-0.23 |

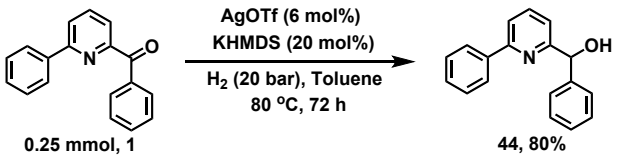
### 4.4 The Product Derivatization

a)



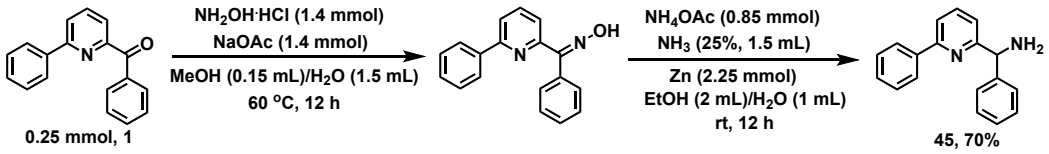

An oven-dried 25 mL Schlenk tube equipped with magnetic stirring bar were charged with phenyl(6-phenylpyridin-2-yl)methanone **1** (0.25 mmol, 65 mg), sodium iodide (0.5 mmol, 92.5 mg) in hydrobromic acid (0.625 mmol, 32.8 uL) and acetic acid (0.5 mL) was heated to a gentle reflux at 115 °C. Hypophosphorous acid (0.75 mmol, 34.4 uL) was slowly added to the reaction through syringe pump in 30 minutes. The reaction was heated for a total of 12 hours. After cooling to room temperature, the mixture was diluted with dichloromethane and filtered through a short pad of celite, the volatiles were removed under vacuum and the residue was purified by preparative thin layer chromatography (petroleum ether/ethyl acetate 1:1) to give pure product 2-benzyl-6-phenylpyridine **43** (50.0 mg, 82%).[2]

b)



A high pressure reactor was charged sequentially with phenyl (6-phenylpyridin-2-yl)methanone **1** (0.25 mmol, 65 mg), silver salt (6 mol%, 3.85 mg) and 1 mL of dry toluene, follow by add to the potassium bis(trimethylsilyl)amide (KHMDS) (20 mol%). The reactor was then charged with Hydrogen gas (20 bar) and stirred at the 80 $^{o}$C for 72 h. After cooling to room temperature, the mixture was diluted with dichloromethane and filtered through a short pad of celite, the volatiles were removed under vacuum and the residue was purified by preparative thin layer chromatography (petroleum ether/ethyl acetate 20:1) to give pure product phenyl(6-phenylpyridin-2-yl)methanol **44** (52.2 mg, 80%).[3]

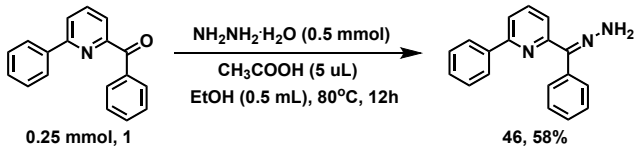
c)




Hydroxylamine hydrochloride (1.4 mmol, 97.3 mg) and sodium acetate (1.4 mmol, 115 mg) were heated at 60 °C in $H_2O$ (1.5 mL) for 1 hour. To the above, Phenyl(6-phenylpyridin-2-yl)methanone **1** (0.7 mmol, 180 mg) in 0.15 mL MeOH was then added. The resulting mixture was stirred at 60 °C overnight. The oxime solidified upon cooling the reaction mixture to room temperature. The product oxime was washed with MeOH and the solvent was dried under vacuum. The crude oxime, was used in the next step without further purification.

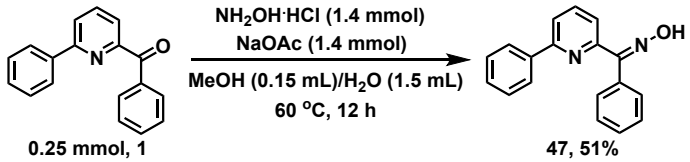
The above prepared oxime (0.5 mmol), $NH_4OAc$ (0.85 mmol, 65.5 mg), $NH_3$ (25% aqueous, 1.5 mL), EtOH (2 mL) and $H_2O$ (1 mL) were mixed and heated at 80 °C. Activated Zn dust (2.25 mmol, 0.147 g) was then added to the reaction mixture in small amounts for over 30 mins. The resulting mixture was refluxed for 3 hour and then stirred at 25 °C overnight. The mixture was filtered and the residue was washed with MeOH and water. The filtrate was concentrated the and resulting aqueous solution was made strongly alkaline with 10 (M) NaOH solution. The amine was then extracted with ethyl acetate and the organic phase was then washed with brine, dried over $Na_2SO_4$ and concentrated under vacuum to afford product. The residue was purified by preparative thin layer chromatography (dichloromethane) to give pure product phenyl(6-phenylpyridin-2-yl)methanamine **45** (45.5 mg, 70%).[4]

d)



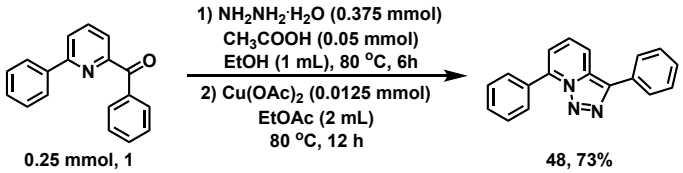

An oven-dried 25 mL Schlenk tube equipped with magnetic stirring bar were charged with phenyl(6-phenylpyridin-2-yl)methanone **1** (0.25 mmol, 65 mg), Hydrazine monohydrate (1.25 mmol, 60 uL) in ethanol (0.5 mL). Then HOAc (5 uL) was added and the mixture was heated at reflux for 12 h. After cooling to room temperature, the mixture was diluted with dichloromethane and filtered through a short pad of celite, the volatiles were removed under vacuum and the residue was purified by preparative thin layer chromatography (petroleum ether/dichloromethane 1:3) to give pure product 2-(hydrazono(phenyl) methyl)-6-phenylpyridine **46** (40.0 mg, 58%).[5]

e)




Hydroxylamine hydrochloride (1.4 mmol, 97.3 mg) and sodium acetate (1.4 mmol, 115 mg) were heated at 60 °C in $H_2O$ (1.5 mL) for 1 hour. To the above, Phenyl(6-phenylpyridin-2-yl)methanone **1** (0.7 mmol, 180 mg) in 0.15 mL MeOH was then added. The resulting mixture was stirred at 60 °C overnight. The oxime solidified upon cooling the reaction mixture to room temperature. The product oxime was washed with MeOH and the solvent was dried under vacuum. The volatiles were removed under vacuum and the residue was purified by preparative thin layer chromatography (dichloromethane) to give pure product phenyl(6-phenylpyridin-2-yl)methanone oxime **47** (34.9 mg, 51%).[4]

f)




An oven-dried 25 mL Schlenk tube equipped with magnetic stirring bar were charged with phenyl(6-phenylpyridin-2-yl)methanone **1** (0.25 mmol, 65 mg), Hydrazine monohydrate (0.375 mmol, 18 uL) and acetic acid (0.05 mmol, 3 uL) in ethanol (0.5 mL). The reaction mixture was heated at reflux for 6 h, and then EtOAc (2 mL) and

$Cu(OAc)_2$ (0.0125 mmol) were added. After stirring at the indicated temperature for the indicated time, the resulting mixture was cooled to room temperature, the mixture was diluted with dichloromethane and filtered through a short pad of celite, the volatiles were removed under vacuum and the residue was purified by preparative thin layer chromatography (petroleum ether/ethyl acetate 5:1) to give pure product phenyl(6-phenylpyridin-2-yl)methanone oxime **48** (49.5 mg, 73%).[6]

## 5. Mechanism Research

### 5.1 Radical trapped experiments

A mixture of (*Z*)-2-(1,2-diphenylvinyl)-6-phenylpyridine (*Z*)-**S1** (0.1 mmol, 33.3 mg), MeOH (1 mL) and 2,2,6,6-tetramethyl-1-piperidyloxy (TEMPO, 0.2 mmol)/ butyleret hydroxy-toluen (BHT, 0.2 mmol) was added to a 25 mL Quartz tubes with an ambient air at room temperature, then the contents were stirred at 30 W blue LED irradiation for 12 hours. The reaction was cooled down to room temperature and analyzed by GC-MS showed trace product formation.

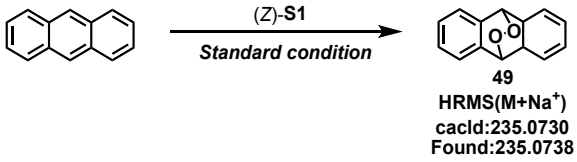
A mixture of (*Z*)-2-(1,2-diphenylvinyl)-6-phenylpyridine (*Z*)-**S1** (0.1 mmol, 33.3 mg), MeOH (1 mL) and 1,4-diazabicyclo[2.2.2]octane (DABCO, 0.2 mmol)/ Sodium azide ($NaN_3$, 0.2 mmol) was added to a 25 mL Quartz tubes with an ambient air at room temperature, then the contents were stirred at 30 W blue LED irradiation for 12 hours. The reaction was cooled down to room temperature and analyzed by GC-MS showed trace product formation.

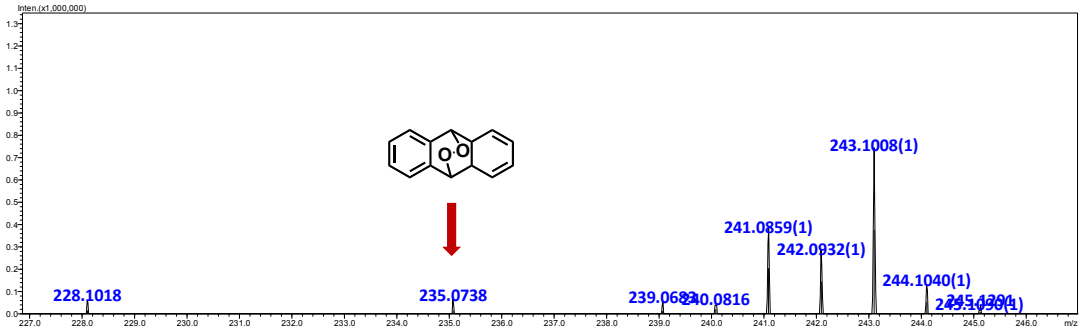
A mixture of (*Z*)-2-(1,2-diphenylvinyl)-6-phenylpyridine (*Z*)-**S1** (0.1 mmol, 33.3 mg), MeOH (1 mL) and 2,2-diphenyl-1-picrylhydrazyl (DPPH, 0.2 mmol) and benzoquinone (0.2 mmol) was added to a 25 mL Quartz tubes with an ambient air at room temperature, then the contents were stirred at 30 W blue LED irradiation for 12 hours. The reaction was cooled down to room temperature and analyzed by GC-MS showed trace product formation.

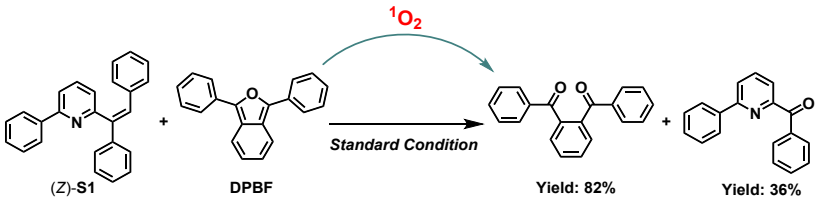
### 5.2 $^1O_2$ trapping

A mixture of (*Z*)-2-(1,2-diphenylvinyl)-6-phenylpyridine (*Z*)-**S1** (0.1 mmol, 33.3 mg), MeOH (1 mL) and anthracene (0.2 mmol, 35.6 mg) was added to a 25 mL Quartz tubes with an ambient air at room temperature, then the contents were stirred at 30 W

blue LED irradiation for 12 hours. The reaction was cooled down to room temperature and analyzed by HRMS.




A mixture of (*Z*)-2-(1,2-diphenylvinyl)-6-phenylpyridine (*Z*)-**S1** (0.1 mmol, 33.3 mg) and 1,3-Diphenylbenzo[c]furan (DPBF, 0.1 mmol) was added to MeOH (1 mL), then the contents were stirred at 30 W blue LED irradiation for 0, 1, 2, 3 hours, respectively. The reaction was cooled down to room temperature and was diluted using the MeOH. The mixture ($5\times10^{-5}$ $M^{-1}$) was analyzed by Shimadazu 3600 UV-Vis spectrometer.

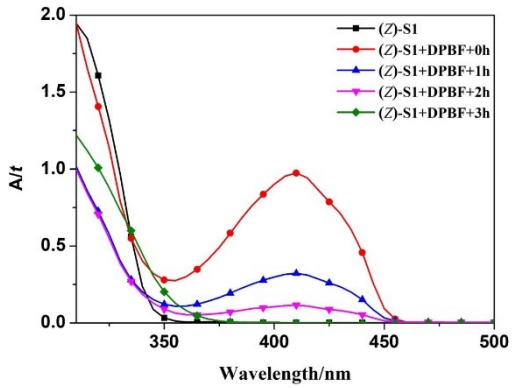



Fig. S2 Absorption spectra of (*Z*)-**S1** ($5\times10^{-5}$ $M^{-1}$) and DPBF ($5\times10^{-5}$ $M^{-1}$) in MeOH under blue LED irradiation.

### 5.3 General procedure for on/o□ light experiment

An oven-dried 25 mL Quartz tubes equipped with magnetic stirring bar were charged with (*Z*)-2-(1,2-diphenylvinyl)-6-phenylpyridine (*Z*)-**S1** (0.1 mmol, 33.3 mg), MeOH (2 mL) was added to the sealed reaction vessel by syringe. The resulting mixture was stirred for 2 h under 30 W blue LED irradiation. Then, the resulting mixture was stirred for 2 h without 30 W blue LED irradiation. The reaction mixture was cooled down to room temperature and analyzed by GC-MS.

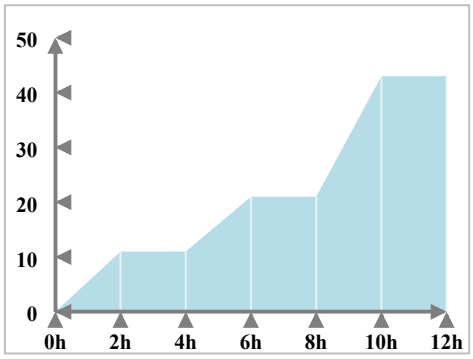



Fig. S3 On/off experiments.

## 5.4 UV-Vis absorption and phosphorescence spectra

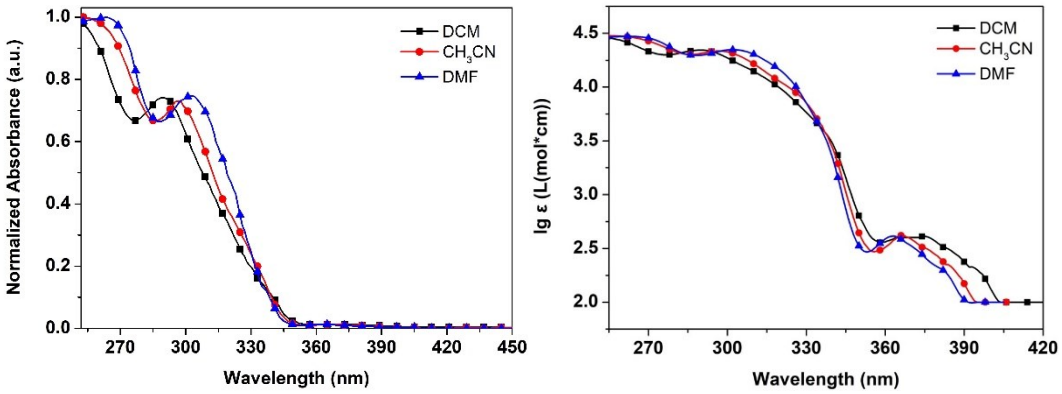



Fig. S4 UV-vis absorption spectra of (*Z*)-**S1** ($1\times10^{-5}$ $M^{-1}$) in DCM (black line), $CH_3CN$ (red line) and DMF (blue line).

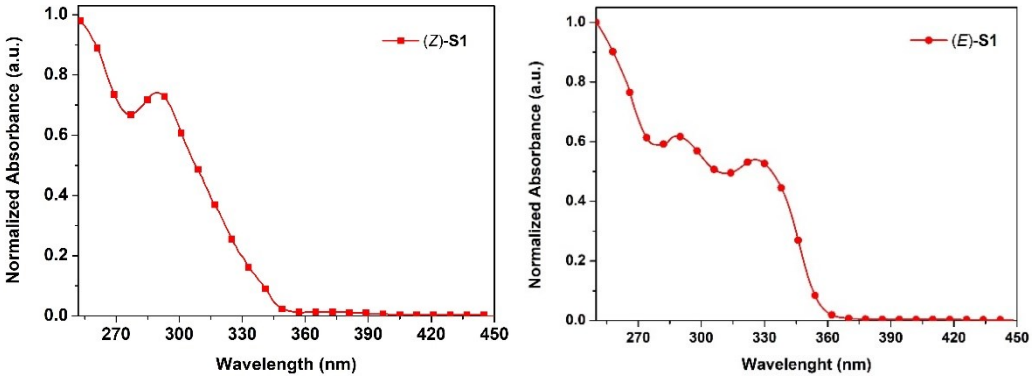



Fig. S5 UV-vis absorption spectra of (*Z*)-**S1** and (*E*)-**S1** ($1\times10^{-5}$ $M^{-1}$) in DCM.

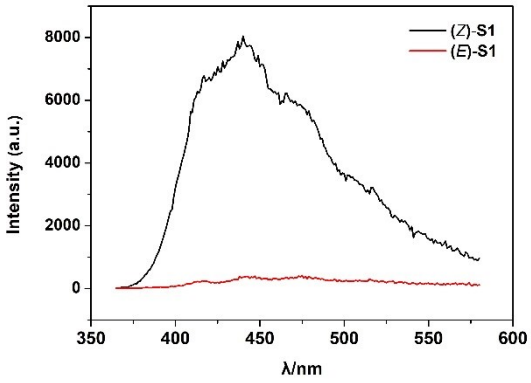



Fig. S6 Phosphorescence spectra of (*Z*)-**S1** (black line) and (*E*)-**S1** (red line) ($1\times10^{-5}$ $M^{-1}$) in 2-MeTHF, 77 K.

### 5.5 Single-crystal structures of (*Z*)-S1 and (*E*)-S1

Additionally, the single-crystal structures of *Z*-**S1** and *E*-**S1** show their different planarity (Fig. S7). The dihedral angles θ between the pyridine plane (purple) and the benzene plane (red) at both ends of C=C bonds were 68.19° for *Z*-**S1** and 38.80° for *E*-**S1**, which clearly indicated that the *Z*-**S1** had highly distorted geometries than the *E*-**S1**. It is anticipated that these highly distorted geometries will lead to a small $\Delta E_{ST}$ to promote intersystem crossing (ISC) process.[12]

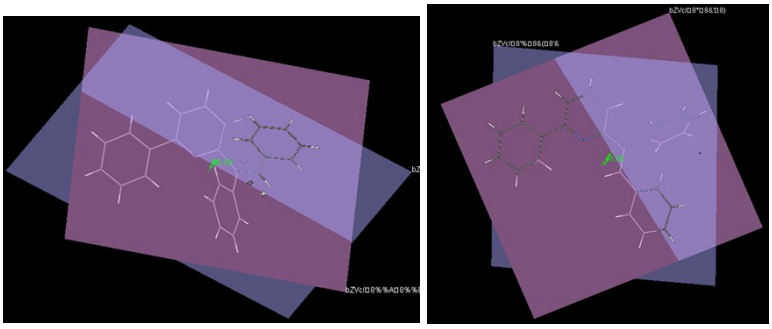


Fig. S7 The dihedral angles θ for the (*Z*)-**S1** (left) and (*E*)-**S1** (right).

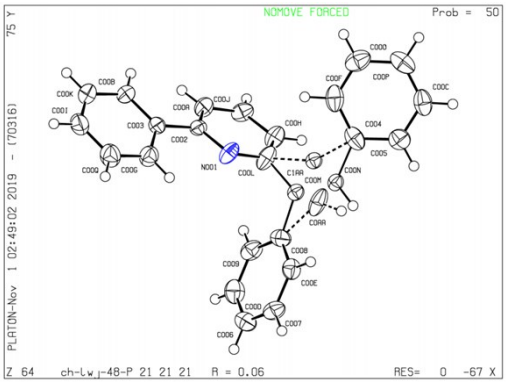


Fig. S8 X-ray crystal structure of (*Z*)-**S1**. Ellipsoids are drawn at the 50% probability level.

Table S6. (*Z*)-**S1** Crystal data and structure refinement for 1984439.

| | |
|---|---|
| Empirical formula | $C_{25}H_{19}N$ |
| Formula weight | 333.41 |
| Temperature/K | 165(20) |
| Crystal system | orthorhombic |
| Space group | P212121 |
| a/Å | 5.96385(16) |
| b/Å | 8.7418(4) |
| c/Å | 35.2530(15) |
| α /° | 90 |
| β /° | 90 |
| γ /° | 90 |
| Volume/Å3 | 1837.92(12) |
| Z | 4 |
| ρ calcg/cm3 | 1.205 |
| μ /mm‑1 | 0.530 |
| F(000) | 704.0 |
| Crystal size/mm3 | 0.4 × 0.2 × 0.2 |
| Radiation | CuKα (λ = 1.54184) |
| 2Θ range for data collection/° | 10.036 to 143.486 |
| Index ranges | -7 ⩽ h ⩽ 4, -8 ⩽ k ⩽ 10, -30 ⩽ l ⩽ 43 |
| Reflections collected | 5280 |
| Independent reflections | 3168 [Rint = 0.0430, Rsigma = 0.0576] |
| Data/restraints/parameters | 3168/12/255 |
| Goodness-of-fit on F2 | 1.028 |
| Final R indexes [I>=2σ (I)] | R1 = 0.0639, wR2 = 0.1666 |
| Final R indexes [all data] | R1 = 0.0680, wR2 = 0.1728 |
| Largest diff. peak/hole / e Å-3 | 0.37/-0.28 |

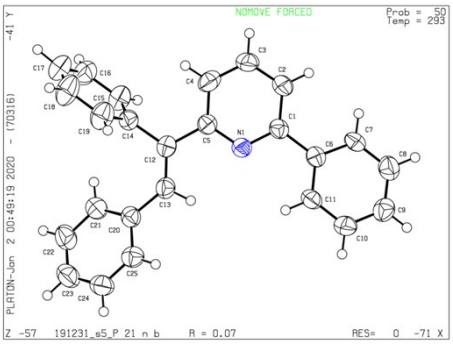



Fig. S9 X-ray crystal structure of (*E*)-**S1**. Ellipsoids are drawn at the 50% probability level.

Table S7. (*E*)-**S1** Crystal data and structure refinement for 1984437.

| | |
|---|---|
| Empirical formula | $C_{25}H_{19}N$ |
| Formula weight | 333.41 |
| Temperature/K | 293.15 |
| Crystal system | orthorhombic |
| Space group | P21nb |
| a/Å | 5.6920(6) |
| b/Å | 8.3359(10) |
| c/Å | 38.600(3) |
| α /° | 90 |
| β /° | 90 |
| γ /° | 90 |
| Volume/Å3 | 1831.5(3) |
| Z | 4 |
| ρ calcg/cm3 | 1.209 |
| μ /mm‐1 | 0.070 |
| F(000) | 704.0 |
| Crystal size/mm3 | 0.35 × 0.3 × 0.25 |
| Radiation | MoKα (λ = 0.71073) |
| 2Θ range for data collection/° | 6.334 to 52.734 |
| Index ranges | -7 ⩽ h ⩽ 6, -5 ⩽ k ⩽ 10, -33 ⩽ l ⩽ 48 |
| Reflections collected | 5654 |
| Independent reflections | 3300 [Rint = 0.0327, Rsigma = 0.0565] |
| Data/restraints/parameters | 3300/1/235 |

| | |
|---|---|
| Goodness-of-fit on F2 | 1.052 |
| Final R indexes [I>=2σ (I)] | R1 = 0.0720, wR2 = 0.1790 |
| Final R indexes [all data] | R1 = 0.0897, wR2 = 0.1978 |
| Largest diff. peak/hole / e Å-3 | 0.18/-0.25 |

### 5.6 Electron paramagnetic resonance (EPR) study

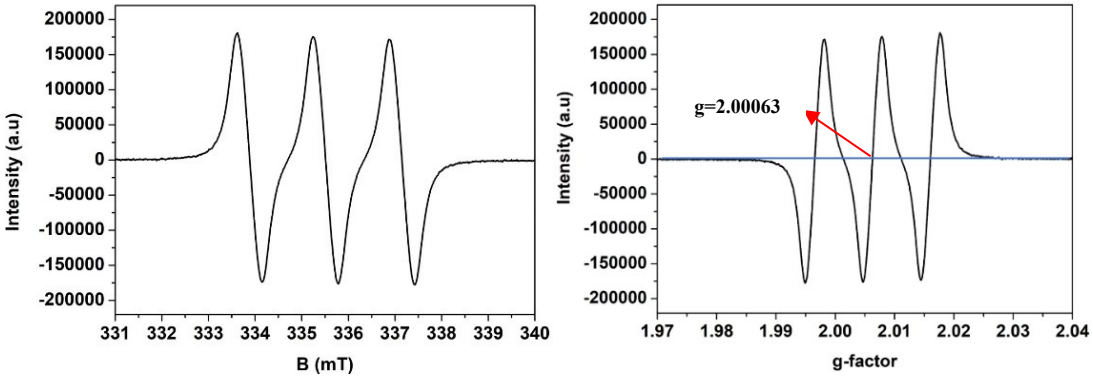



Fig. S10 (*Z*)-**S1** (0.10 mol/L) with TEMP (0.20 mol/L) in MeOH under blue LED irradiation for 10 min: (a) magnetic induction intensity B (mT); (b) g-factor.

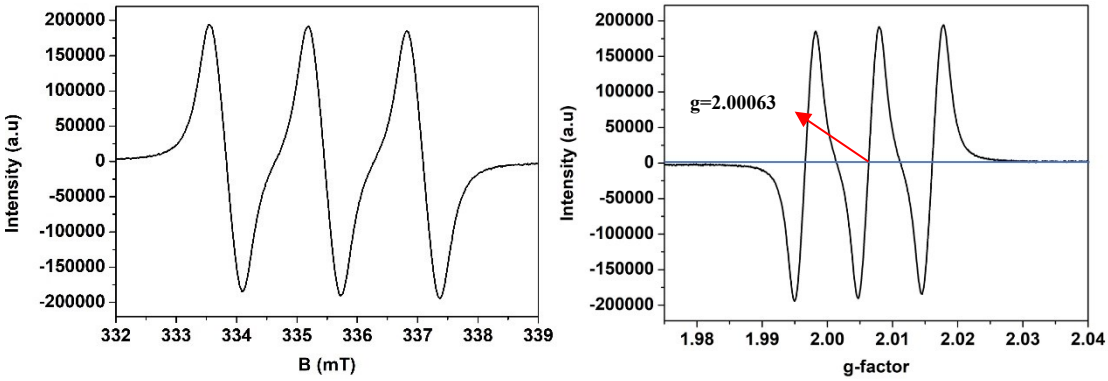



Fig. S11 (*E*)-**S1** (0.10 mol/L) with TEMP (0.20 mol/L) in MeOH under blue LED irradiation for 30 min: (a) magnetic induction intensity B (mT); (b) g-factor.

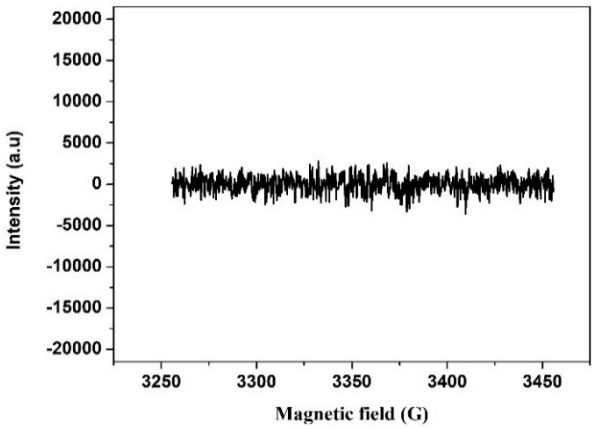


Fig. S12 Triphenylethylene (0.10 mol/L) with TEMP (0.20 mol/L) in air-saturated MeOH under blue LED irradiation for 30 min.

### 5.7 General procedure for Cyclic Voltammetry (CV) Experiments

Cyclic voltammetry and square wave voltammetry were performed on an ALS/CHI 660C/680C electrochemical analyzer. The voltammetric cell consisted of a glassy carbon electrode, a platinum wire, and an Ag/AgCl reference electrode. The measurements were carried out using a sample solution of a concentration of 1.0 mM in acetonitrile (10 mL) containing tetrabutylammonium tetrafluoroborate ($^{n}Bu_4NBF_4$) as a supporting electrolyte ($1\times10^{-5}$ M). The scan rate is 0.05 V/s, ranging from 0 V to 2.0 V. An obvious oxidation peak of (*Z*)-**S1** was observed at 1.00 V, 1.38 V. The oxidation peak of (*E*)-**S1** could also be observed at 1.56 V. At the same time, the triphenylethylene was also tested, with the oxidation peaks at 1.52 V.

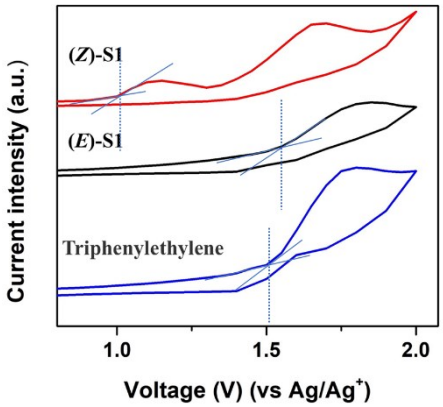
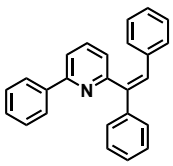



Fig. S13 Cyclic Voltammogram.

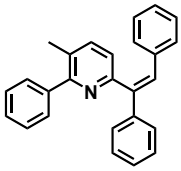
## 6. Characterization Data of Material

**(*Z*)-2-(1,2-Diphenylvinyl)-6-phenylpyridine (S1)**[1]



Colourless oil (68.3 mg, 68%). $^1$H NMR (400 MHz, DMSO) δ 7.97 (dd, *J* = 7.9, 1.4 Hz, 2H), 7.93 (d, *J* = 7.6 Hz, 1H), 7.85 (t, *J* = 7.7 Hz, 1H), 7.45 – 7.39 (m, 3H), 7.38 – 7.33 (m, 4H), 7.32 – 7.29 (m, 1H), 7.26 (s, 1H), 7.16 – 7.11 (m, 4H), 7.03 – 6.98 (m, 2H).

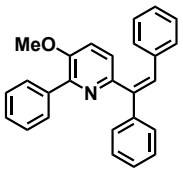
**(*Z*)-6-(1,2-Diphenylvinyl)-3-methyl-2-phenylpyridine (S2)**



Colourless oil (72.9 mg, 70%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.55 (d, *J* = 7.8 Hz, 1H), 7.45 – 7.41 (m, 2H), 7.40 – 7.30 (m, 8H), 7.23 – 7.16 (m, 3H), 7.16 (s, 1H), 7.13 – 7.06 (m, 3H), 2.43 (s, 3H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 158.5, 156.3, 142.1, 142.0, 140.4, 139.2, 137.5, 130.1,

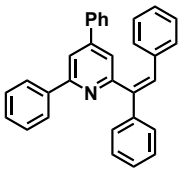
129.6, 129.4, 129.3, 128.3, 128.1, 127.9, 127.7, 127.6, 126.9, 124.1, 20.1. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{26}H_{22}N$ 348.1747; Found 348.1747.

**(*Z*)-6-(1,2-Diphenylvinyl)-3-methoxy-2-phenylpyridine (S3)**



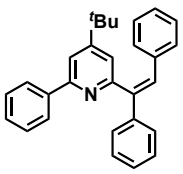

Colourless oil (50.1 mg, 46%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.13 – 8.07 (m, 2H), 7.94 (s, 1H), 7.52 – 7.45 (m, 2H), 7.45 – 7.40 (m, 4H), 7.34 – 7.29 (m, 2H), 7.15 – 7.10 (m, 4H), 7.09 – 7.04 (m, 2H), 6.85 (d, $J$ = 8.6 Hz, 1H), 3.86 (s, 3H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 152.8, 150.4, 147.0, 140.0, 139.7, 138.0, 137.3, 130.4, 130.0, 129.8, 129.3, 129.1, 128.5, 128.1, 127.6, 126.9, 121.9, 118.6, 55.7. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{26}H_{22}NO$ 364.1696; Found 364.1695.

**(*Z*)-2-(1,2-Diphenylvinyl)-4,6-diphenylpyridine (S4)**



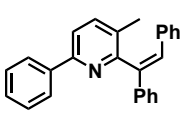

Colourless oil (77.4 mg, 63%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.86 – 7.80 (m, 3H), 7.50 – 7.42 (m, 4H), 7.41 – 7.35 (m, 6H), 7.33 – 7.26 (m, 4H), 7.17 – 7.42 (m, 1H), 7.15 – 7.06 (m, 5H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 159.6, 158.2, 149.8, 142.3, 142.0, 139.6, 138.6, 137.5, 130.6, 129.6, 129.1, 129.08, 129.06, 128.7, 128.4, 128.2, 127.8, 127.7, 127.3, 127.2, 122.5, 117.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{31}H_{24}N$ 410.1903; Found 410.1902.

**(*Z*)-4-(*Tert*-butyl)-2-(1,2-diphenylvinyl)-6-phenylpyridine (S5)**




Colourless oil (82.6 mg, 71%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.94 – 7.88 (m, 2H), 7.68 (d, $J$ = 1.5 Hz, 1H), 7.53 – 7.49 (m, 2H), 7.48 – 7.30 (m, 6H), 7.24 (s, 1H), 7.20 – 7.13 (m, 4H), 7.10 – 7.05 (m, 2H), 1.26 (s, 9H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 161.0, 158.7, 157.6, 142.9, 142.0, 140.1, 137.6, 130.1, 129.5, 128.74, 128.65, 128.3, 128.0, 127.7, 127.6, 127.3, 127.0, 122.2, 116.2, 34.8, 30.5. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{29}H_{28}N$ 390.2216; Found 390.2212.

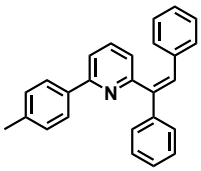
**(*Z*)-2-(1,2-Diphenylvinyl)-3-methyl-6-phenylpyridine (S6)**




Colourless oil (42.5 mg, 41%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.99 – 7.94 (m, 2H), 7.67 (d, $J$ = 8.0 Hz, 1H), 7.58 (d, $J$ = 8.0 Hz, 1H), 7.46 – 7.37 (m, 5H), 7.36 – 7.27 (m, 3H), 7.24 (s, 1H), 7.15 – 7.10 (m, 3H), 6.99 – 6.93 (m, 2H), 2.03 (s, 3H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 158.1, 155.3, 140.9,

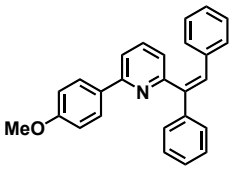
140.4, 139.3, 137.2, 131.0, 129.5, 129.0, 128.77, 128.74, 128.6, 128.3, 127.7, 127.3, 127.1, 126.8, 119.6, 18.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{26}H_{22}N$ 348.1747; Found 348.1743.

**(*Z*)-2-(1,2-Diphenylvinyl)-6-(*p*-tolyl)pyridine (S7)**



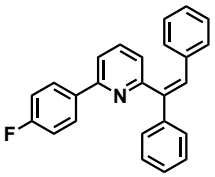
Colourless oil (59.3 mg, 57%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.74 (d, $J$ = 8.2 Hz, 2H), 7.70 – 7.62 (m, 2H), 7.47 – 7.39 (m, 2H), 7.38 – 7.30 (m, 3H), 7.24 – 7.13 (m, 6H), 7.12 – 7.04 (m, 3H), 2.39 (s, 3H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 159.5, 157.5, 141.3, 139.5, 139.3, 137.3, 137.2, 136.7, 134.6, 129.5, 129.3, 129.1, 128.9, 128.8, 128.7, 127.5, 127.2, 124.2, 119.0, 21.3. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{26}H_{22}N$ 348.1747; Found 348.1743.

**(*Z*)-2-(1,2-Diphenylvinyl)-6-(4-methoxyphenyl)pyridine (S8)**



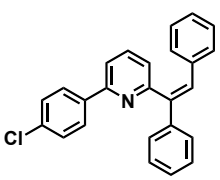
Colourless oil (66.5 mg, 61%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.81 (d, $J$ = 8.8 Hz, 2H), 7.69 – 7.59 (m, 2H), 7.49 – 7.42 (m, 2H), 7.41 – 7.30 (m, 3H), 7.21 – 7.17 (m, 4H), 7.12 – 7.06 (m, 3H), 6.94 (d, $J$ = 8.8 Hz, 2H), 3.84 (s, 3H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 160.5, 158.9, 157.1, 142.3, 142.1, 137.4, 137.2, 132.1, 130.1, 129.6, 128.5, 128.3, 128.1, 127.71, 127.65, 127.0, 123.4, 118.4, 114.1, 55.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{26}H_{22}NO$ 364.1696; Found 364.1695.

**(*Z*)-2-(1,2-Diphenylvinyl)-6-(4-fluorophenyl)pyridine (S9)**



Colourless oil (53.6 mg, 51%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.82 – 7.75 (m, 2H), 7.74 – 7.65 (m, 1H), 7.63 – 7.58 (m, 1H), 7.45 – 7.40 (m, 2H), 7.39 – 7.31 (m, 3H), 7.20 – 7.15 (m, 4H), 7.15 – 7.11 (m, 1H), 7.10 – 7.04 (m, 4H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 163.6 (d, $J$ = 248.2 Hz), 159.1, 156.5, 142.2, 142.0, 137.42, 137.38, 135.6 (d, $J$ = 3.0 Hz), 130.5, 129.6, 129.0 (d, $J$ = 8.3 Hz), 128.4, 128.2, 127.8, 127.1, 124.2, 118.9, 115.6 (d, $J$ = 21.6 Hz). HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{25}H_{19}FN$ 352.1496; Found 352.1497.

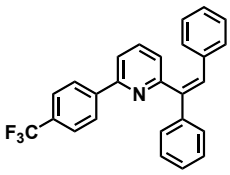
**(*Z*)-2-(4-Chlorophenyl)-6-(1,2-diphenylvinyl)pyridine (S10)**



Yellowish oil (67.8 mg, 62%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.79 – 7.74 (m, 2H), 7.73 – 7.65 (m, 1H), 7.64 – 7.60 (m, 1H), 7.46 – 7.42

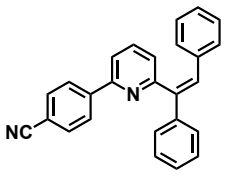
(m, 2H), 7.40 – 7.33 (m, 5H), 7.21 – 7.14 (m, 5H), 7.10 – 7.06 (m, 2H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 159.2, 156.2, 142.1, 141.9, 137.8, 137.4, 135.1, 130.5, 129.5, 128.8, 128.43, 128.39, 128.1, 127.8, 127.7, 127.1, 124.4, 118.9. HRMS (ESI-TOF) m/z: [M + H]+ Calcd for $C_{25}H_{19}ClN$ 368.1201; Found 368.1201.

**(*Z*)-2-(1,2-Diphenylvinyl)-6-(4-(trifluoromethyl)phenyl)pyridine (S11)**



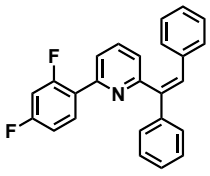
Yellowish oil (72.4 mg, 60%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.79 – 7.74 (m, 2H), 7.73 – 7.65 (m, 1H), 7.64 – 7.60 (m, 1H), 7.46 – 7.42 (m, 2H), 7.40 – 7.33 (m, 5H), 7.21 – 7.14 (m, 5H), 7.10 – 7.06 (m, 2H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 159.5, 155.9, 142.8, 142.1, 137.5, 137.4, 130.8 (q, $J$ = 32.4 Hz), 130.7, 129.6, 128.5, 128.2, 127.9, 127.8, 127.5, 127.2, 126.3 (q, $J$ = 261.1 Hz), 125.7 (q, $J$ = 3.8 Hz), 125.1, 119.5. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{26}H_{19}F_3N$ 402.1464; Found 402.1465.

**(*Z*)-4-(6-(1,2-Diphenylvinyl)pyridin-2-yl)benzonitrile (S12)**



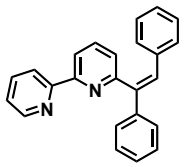
Yellowish oil (73.0 mg, 68%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.89 (d, $J$ = 8.5 Hz, 2H), 7.74 (t, $J$ = 7.7 Hz, 1H), 7.70 – 7.64 (m, 3H), 7.41 – 7.32 (m, 5H), 7.25 – 7.11 (m, 5H), 7.04 (dd, $J$ = 6.6, 2.7 Hz, 2H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 159.6, 155.2, 143.5, 141.9, 141.8, 137.6, 137.3, 132.5, 130.8, 129.5, 128.5, 128.2, 127.9, 127.8, 127.7, 127.2, 125.5, 119.6, 119.0, 112.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{26}H_{19}N_2$ 359.1542; Found 359.1543.

**(*Z*)-2-(2,4-Difluorophenyl)-6-(1,2-diphenylvinyl)pyridine (S13)**



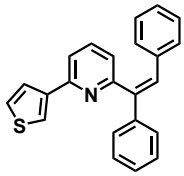
Yellowish oil (77.6 mg, 70%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.74 – 7.67 (m, 2H), 7.55 (dt, $J$ = 15.6, 7.9 Hz, 1H), 7.45 – 7.40 (m, 2H), 7.40 – 7.28 (m, 3H), 7.22 – 7.15 (m, 5H), 7.09 – 7.02 (m, 2H), 6.95 – 6.79 (m, 2H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 163.2 (dd, $J$ = 260.0, 9.2 Hz), 160.7 (dd, $J$ = 261.4, 9.2 Hz), 159.3, 152.4 (d, $J$ = 2.4 Hz), 142.1, 141.9, 137.5, 137.0, 132.8 (dd, $J$ = 9.6, 4.5 Hz), 130.6, 129.6, 128.4, 128.2, 127.8 (d, $J$ = 4.3 Hz), 127.1, 124.6, 123.8 (dd, $J$ = 11.8, 3.7 Hz), 122.8 (d, $J$ = 9.8 Hz), 111.9 (dd, $J$ = 21.0, 3.6 Hz), 104.2 (dd, $J$ = 26.9, 25.5 Hz). HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{25}H_{18}F_2N$ 370.1402; Found 370.1403.

**(*Z*)-6-(1,2-Diphenylvinyl)-2,2'-bipyridine (S14)**[1]



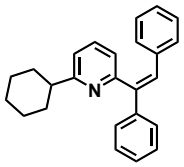
Yellowish oil (18.1 mg, 18%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.71 (d, *J* = 4.1 Hz, 1H), 8.62 (d, *J* = 8.0 Hz, 1H), 8.33 (d, *J* = 7.7 Hz, 1H), 8.10 (s, 1H), 7.90 – 7.83 (m, 1H), 7.69 (t, *J* = 7.8 Hz, 1H), 7.46 – 7.38 (m, 3H), 7.37 – 7.30 (m, 3H), 7.20 – 7.09 (m, 5H), 6.99 (d, *J* = 7.7 Hz, 1H).

**(*Z*)-2-(1,2-Diphenylvinyl)-6-(thiophen-3-yl)pyridine (S15)**



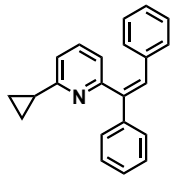
Yellowish oil (43.6 mg, 43%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.07 (s, 1H), 8.03 (d, *J* = 2.2 Hz, 1H), 7.81 – 7.77 (m, 1H), 7.57 (t, *J* = 7.7 Hz, 1H), 7.50 (d, *J* = 7.6 Hz, 1H), 7.46 – 7.37 (m, 4H), 7.30 (dd, *J* = 7.6, 1.6 Hz, 2H), 7.17 – 7.12 (m, 3H), 7.12 – 7.07 (m, 2H), 6.83 (d, *J* = 7.6 Hz, 1H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 159.0, 153.6, 142.3, 142.1, 142.0, 137.3, 137.2, 130.2, 129.6, 128.4, 128.1, 127.71, 127.68, 127.1, 126.5, 126.2, 124.0, 123.9, 118.9. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{23}H_{18}NS$ 340.1154; Found 340.1153.

**(*Z*)-2-Cyclohexyl-6-(1,2-diphenylvinyl)pyridine (S16)**[1]



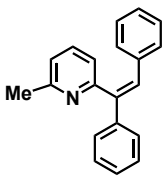
Yellowish oil (85.3 mg, 72%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.56 (t, *J* = 7.7 Hz, 1H), 7.40 – 7.36 (m, 2H), 7.35 – 7.27 (m, 3H), 7.17 – 7.09 (m, 5H), 7.02 – 6.92 (m, 3H), 2.81 – 2.70 (m, 1H), 1.94 (d, *J* = 12.0 Hz, 2H), 1.85 – 1.79 (m, 2H), 1.77 – 1.69 (m, 1H), 1.55 – 1.35 (m, 4H), 1.28 – 1.22 (m, 1H).

**(*Z*)-2-Cyclopropyl-6-(1,2-diphenylvinyl)pyridine (S17)**[1]



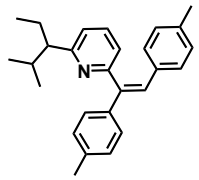
Yellowish oil (43.8 mg, 49%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.46 (t, *J* = 7.7 Hz, 1H), 7.36 – 7.27 (m, 5H), 7.17 – 7.11 (m, 3H), 7.09 (s, 1H), 7.03 (dd, *J* = 7.8, 0.9 Hz, 1H), 6.98 – 6.93 (m, 2H), 6.91 (dd, *J* = 7.6, 0.6 Hz, 1H), 2.08 – 2.01 (m, 1H), 0.95 – 0.82 (m, 4H).

**(*Z*)-2-(1,2-Diphenylvinyl)-6-methylpyridine (S18)**[1]



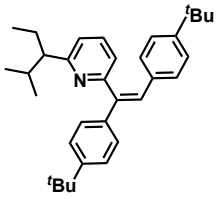
Yellowish oil (13.0 mg, 16%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.52 (t, *J* = 7.7 Hz, 1H), 7.36 – 7.27 (m, 5H), 7.15 – 7.09 (m, 5H), 7.02 – 6.94 (m, 3H), 2.57 (s, 3H).

**(*Z*)-2-(1,2-Di-*p*-tolylvinyl)-6-(2-methylpentan-3-yl)pyridine (S19)**[1]



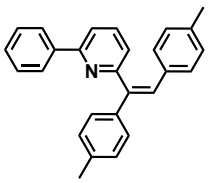
Yellowish oil (68.5 mg, 62%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.57 (t, *J* = 7.7 Hz, 1H), 7.30 – 7.24 (m, 2H), 7.17 – 7.12 (m, 3H), 7.07 (d, *J* = 7.7 Hz, 1H), 7.00 (d, *J* = 7.6 Hz, 1H), 6.97 – 6.91 (m, 2H), 6.90 – 6.87 (m, 2H), 2.50 – 2.43 (m, 1H), 2.38 (s, 3H), 2.28 (s, 3H), 2.01 – 1.95 (m, 1H), 1.93 – 1.84 (m, 1H), 1.78 – 1.69 (m, 1H), 1.01 (d, *J* = 6.7 Hz, 3H), 0.81 – 0.75 (m, 6H).

**(*Z*)-2-(1,2-Bis(4-(*tert*-butyl)phenyl)vinyl)-6-(2-methylpentan-3-yl)pyridine (S20)**[1]



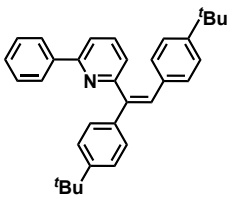
A Yellow oil (Yield: 81.7 mg, 60%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.58 (t, *J* = 7.7 Hz, 1H), 7.36 – 7.27 (m, 4H), 7.17 – 7.09 (m, 3H), 7.08 – 7.01 (m, 2H), 6.92 – 7.87 (m, 2H), 2.48 – 2.40 (m, 1H), 1.99 – 1.93 (m, 1H), 1.89 – 1.80 (m, 1H), 1.76– 1.67 (m, 1H), 1.34 (s, 9H), 1.26 (s, 9H), 0.98 (d, *J* = 6.7 Hz, 3H), 0.79 – 0.72 (m, 6H).

**(*Z*)-2-(1,2-Di-p-tolylvinyl)-6-phenylpyridine (S21)**



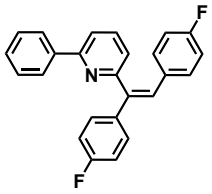
Yellowish oil (73.6 mg, 68%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.90 (dd, *J* = 7.8, 1.4 Hz, 2H), 7.74 – 7.66 (m, 2H), 7.47 – 7.37 (m, 3H), 7.35 (d, *J* = 8.1 Hz, 2H), 7.16 (dd, *J* = 12.1, 6.2 Hz, 4H), 7.03 – 6.95 (m, 4H), 2.40 (s, 3H), 2.31 (s, 3H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 159.5, 157.5, 141.3, 139.5, 139.3, 137.3, 137.2, 136.7, 134.6, 129.5, 129.3, 129.1, 128.9, 128.8, 128.7, 127.5, 127.2, 124.2, 119.0, 21.3. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{27}H_{24}N$ 362.1903; Found 362.1902.

**(*Z*)-2-(1,2-Bis(4-(*tert*-butyl)phenyl)vinyl)-6-phenylpyridine (S22)**



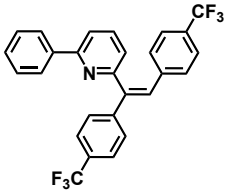
Yellowish oil (66.3 mg, 50%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.83 (dd, *J* = 7.7, 1.7 Hz, 2H), 7.76 – 7.65 (m, 2H), 7.43 – 7.35 (m, 7H), 7.21 – 7.14 (m, 4H), 6.99 (d, *J* = 8.4 Hz, 2H), 1.35 (s, 9H), 1.28 (s, 9H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 159.4, 157.5, 150.6, 150.0, 141.1, 139.6, 139.2, 137.4, 134.6, 129.5, 129.3, 128.9, 128.7, 127.3, 127.2, 125.1, 124.2, 119.2, 34.5, 31.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{33}H_{36}N$ 446.2842; Found 446.2841.

**(*Z*)-2-(1,2-Bis(4-fluorophenyl)vinyl)-6-phenylpyridine (S23)**



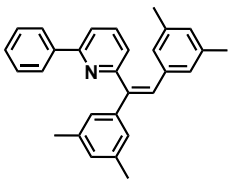
Yellowish oil (59.8 mg, 54%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.88 – 7.82 (m, 2H), 7.74 – 7.66 (m, 2H), 7.47 – 7.35 (m, 5H), 7.12 – 7.00 (m, 6H), 6.90 – 6.82 (m, 2H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 162.6 (d, *J* = 247.2 Hz), 161.8 (d, *J* = 247.5 Hz), 158.6, 157.7, 141.1, 139.2, 138.0 (d, *J* = 3.3 Hz), 137.5, 133.3 (d, *J* = 3.4 Hz), 131.1 (d, *J* = 7.9 Hz), 129.3 (d, *J* = 8.0 Hz), 129.2, 128.8, 127.1, 124.1, 119.3, 115.3 (d, *J* = 21.5 Hz), 115.1 (d, *J* = 21.5 Hz). HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{25}H_{18}F_2N$ 370.1402; Found 370.1403.

**(*Z*)-2-(1,2-Bis(4-(trifluoromethyl)phenyl)vinyl)-6-phenylpyridine (S24)**



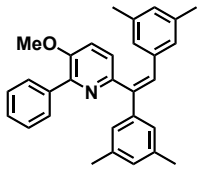
Colourless oil (73.2 mg, 52%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.79 – 7.66 (m, 4H), 7.62 (d, *J* = 8.3 Hz, 2H), 7.54 (d, *J* = 8.3 Hz, 2H), 7.48 – 7.38 (m, 5H), 7.24 – 7.15 (m, 3H), 7.09 (dd, *J* = 6.8, 1.7 Hz, 1H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 157.9, 157.5, 145.0, 143.2, 140.6, 138.9, 137.8, 130.6, 130.0 (q, *J* = 32.5 Hz), 129.8, 129.4, 129.3 (q, *J* = 32.4 Hz), 128.9, 128.2, 127.1, 125.5 (q, *J* = 3.8 Hz), 125.2 (q, *J* = 3.8 Hz), 124.3 (q, *J* = 272.0 Hz), 121.5 (q, *J* = 271.9 Hz), 124.0, 120.0. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{27}H_{18}F_6N$ 470.1338; Found 470.1337.

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-phenylpyridine (S25)**[1]



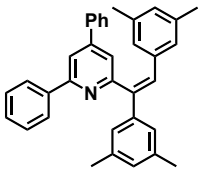
Yellowish oil (98.9 mg, 85%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.87 (dd, *J* = 7.8, 1.5 Hz, 2H), 7.74 – 7.65 (m, 2H), 7.47 – 7.37 (m, 3H), 7.17 – 7.10 (m, 2H), 7.06 (s, 2H), 6.97 (s, 1H), 6.81 (s, 1H), 6.68 (s, 2H), 2.33 (s, 6H), 2.16 (s, 6H).

**(*Z*)-6-(1,2-Bis(3,5-dimethylphenyl)vinyl)-3-methoxy-2-phenylpyridine (S26)**[1]



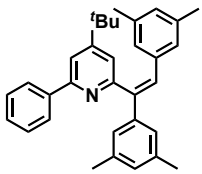
Yellow oil (56.2 mg, 45%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.74 – 7.69 (m, 2H), 7.39 – 7.33 (m, 3H), 7.24 (d, *J* = 8.5 Hz, 1H), 7.12 (d, *J* = 8.4 Hz, 1H), 7.04 (s, 3H), 6.96 (s, 1H), 6.83 (s, 1H), 6.70 (s, 2H), 3.90 (s, 3H), 2.33 (s, 6H), 2.19 (s, 6H).

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-4,6-diphenylpyridine (S27)**[1]



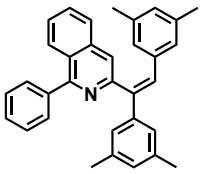
Colourless oil (91.9 mg, 66%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.01 – 7.97 (m, 2H), 7.96 – 7.92 (m, 1H), 7.68 – 7.60 (m, 2H), 7.53 – 7.44 (m, 7H), 7.19 (d, *J* = 10.0 Hz, 3H), 7.03 (s, 1H), 6.86 (s, 1H), 6.80 (s, 2H), 2.39 (s, 6H), 2.21 (s, 6H).

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-4-(*tert*-butyl)-6-phenylpyridine (S28)**[1]



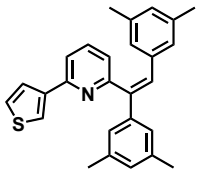
Yellowish oil (85.3 mg, 72%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.95 – 7.89 (m, 2H), 7.68 (d, *J* = 1.7 Hz, 1H), 7.48 – 7.38 (m, 3H), 7.18 (d, *J* = 1.7 Hz, 1H), 7.13 (d, *J* = 2.5 Hz, 3H), 6.98 (s, 1H), 6.79 (s, 1H), 6.64 (s, 2H), 2.35 (s, 6H), 2.16 (s, 6H), 1.29 (s, 9H).

**(*Z*)-3-(1,2-Bis(3,5-dimethylphenyl)vinyl)-1-phenylisoquinoline (S29)**[1]



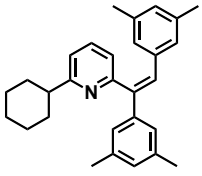
Colourless oil (73.5 mg, 64%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.20 (s, 1H), 8.13 (dd, *J* = 8.4, 0.5 Hz, 1H), 7.92 – 7.87 (m, 2H), 7.71 (d, *J* = 8.2 Hz, 1H), 7.64 – 7.55 (m, 4H), 7.49 – 7.42 (m, 1H), 7.26 (s, 1H), 7.14 (s, 1H), 7.03 (s, 2H), 6.80 (s, 1H), 6.74 (s, 2H), 2.40 (s, 6H), 2.18 (s, 6H).

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(thiophen-2-yl)pyridine (S30)**[1]



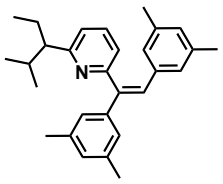
Yellowish oil (61.2 mg, 52%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.80 – 7.75 (m, 1H), 7.68 – 7.60 (m, 1H), 7.59 – 7.53 (m, 2H), 7.38 – 7.32 (m, 1H), 7.11 – 7.05 (m, 4H), 6.97 (s, 1H), 6.80 (s, 1H), 6.69 (s, 2H), 2.33 (d, *J* = 0.7 Hz, 6H), 2.16 (d, *J* = 0.7 Hz, 6H).

**(*Z*)-2-Cyclohexyl-6-(2-(2,4-dimethylphenyl)-1-(3,5-dimethylphenyl)vinyl)pyridine (S31)**[1]



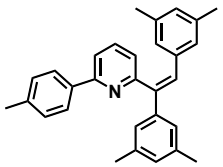
Yellowish oil (85.3 mg, 72%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.57 (t, *J* = 7.7 Hz, 1H), 7.15 – 7.10 (m, 1H), 7.07 (s, 1H), 7.02 – 6.96 (m, 3H), 6.93 (s, 1H), 6.76 (s, 1H), 6.53 (s, 2H), 2.84 – 2.75 (m, 1H), 2.31 (s, 6H), 2.14 (s, 6H), 1.97 (dd, *J* = 9.9, 3.3 Hz, 2H), 1.80 – 1.72 (m, 2H), 1.79 – 1.73 (m, 1H), 1.57 – 1.38 (m, 4H), 1.36 – 1.24 (m, 1H).

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(2-methylpentan-3-yl)pyridine (S32)**[1]



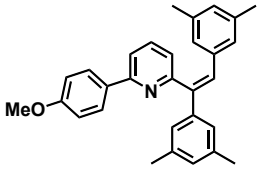
Yellow oil (71.1 mg, 60%). $^1$H NMR (400 MHz, CDCl3) δ 7.54 (t, *J* = 7.7 Hz, 1H), 7.16 (s, 1H), 7.06 (dd, *J* = 7.7, 0.7 Hz, 1H), 7.03 – 6.97 (m, 3H), 6.93 (s, 1H), 6.77 (s, 1H), 6.63 (s, 2H), 2.53 – 2.44 (m, 1H), 2.29 (s, 6H), 2.15 (s, 6H), 2.03 – 1.97 (m, 1H), 1.92 – 1.85 (m, 1H), 1.80 – 1.72 (m, 1H), 1.03 (d, *J* = 6.7 Hz, 3H), 0.83 – 0.77 (m, 6H).

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(*p*-tolyl)pyridine (S33)**[1]



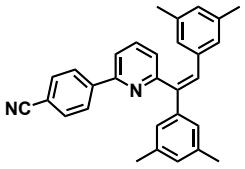
Yellow oil (93.3 mg, 77%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.81 (d, *J* = 8.2 Hz, 2H), 7.72 – 7.65 (m, 2H), 7.28 – 7.24 (m, 2H), 7.15 – 7.09 (m, 4H), 6.99 (s, 1H), 6.82 (s, 1H), 6.71 (s, 2H), 2.43 (s, 3H), 2.35 (s, 6H), 2.18 (s, 6H).

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(4-methoxyphenyl)pyridine (S34)**[1]



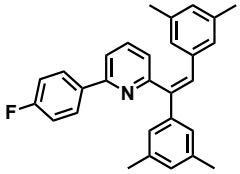
Yellow oil (85.2 mg, 68%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.87 – 7.81 (m, 2H), 7.69 – 7.59 (m, 2H), 7.12 – 7.06 (m, 4H), 6.99 – 6.92 (m, 3H), 6.81 (s, 1H), 6.69 (s, 2H), 3.86 (s, 3H), 2.33 (s, 6H), 2.16 (s, 6H).

**(*Z*)-4-(6-(1,2-Bis(3,5-dimethylphenyl)vinyl)pyridin-2-yl)benzonitrile (S35)**[1]



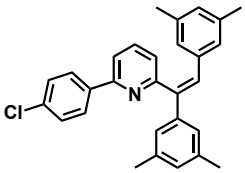
Yellow oil (85.2 mg, 68%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.91 (d, *J* = 8.4 Hz, 2H), 7.75 (t, *J* = 7.7 Hz, 1H), 7.71 – 7.65 (m, 3H), 7.21 (d, *J* = 7.4 Hz, 1H), 7.11 (s, 1H), 6.99 (d, *J* = 15.2 Hz, 3H), 6.81 (s, 1H), 6.64 (s, 2H), 2.32 (s, 6H), 2.14 (s, 6H).

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(4-fluorophenyl)pyridine (S36)**[1]



Yellowish oil (78.9 mg, 65%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.85 – 7.78 (m, 2H), 7.73 – 7.64 (m, 1H), 7.65– 7.59 (m, 1H), 7.16 – 7.04 (m, 6H), 6.97 (s, 1H), 6.81 (s, 1H), 6.67 (s, 2H), 2.33 (s, 6H), 2.15 (s, 6H).

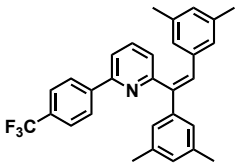
**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(4-chlorophenyl)pyridine (S37)**[1]



Yellowish oil (85.8 mg, 68%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.81 – 7.75 (m, 2H), 7.75– 7.75 (m, 1H), 7.67 – 7.60 (m, 1H), 7.42 – 7.36 (m, 2H), 7.16 (dd, *J* = 7.5, 0.9 Hz, 1H), 7.12 (s, 1H), 7.06 (s,

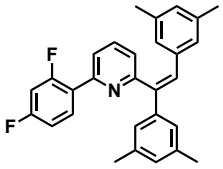
2H), 6.98 (s, 1H), 6.82 (s, 1H), 6.67 (s, 2H), 2.34 (s, 6H), 2.16 (s, 6H).

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(4-(trifluoromethyl)phenyl)pyridine (S38)**[1]



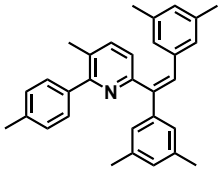
Colourless oil (59.0 mg, 43%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.93 (d, *J* = 8.1 Hz, 2H), 7.76 – 7.64 (m, 4H), 7.19 (dd, *J* = 7.4, 1.2 Hz, 1H), 7.11 (s, 1H), 7.03 (s, 2H), 6.97 (s, 1H), 6.81 (s, 1H), 6.65 (s, 2H), 2.32 (s, 6H), 2.14 (s, 6H).

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(2,4-difluorophenyl)pyridine (S39)**[1]



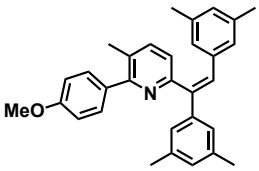
Yellow oil (Yield: 53.2 mg, 48%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.74 – 7.67 (m, 2H), 7.60 – 7.50 (m, 1H), 7.17 – 7.14 (m, 1H), 7.09 (s, 1H), 7.03 (s, 2H), 6.97 (s, 1H), 6.92 – 6.88 (m, 1H), 6.87 – 6.83 (m, 1H), 6.81 (s, 1H), 2.32 (s, 6H), 2.15 (s, 6H).

**(*Z*)-6-(1,2-Bis(3,5-dimethylphenyl)vinyl)-3-methyl-2-(p-tolyl)pyridine (S40)**[1]



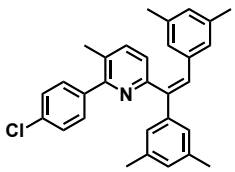
Yellow oil (95.1 mg, 76%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.55 (d, *J* = 7.9 Hz, 1H), 7.33 (d, *J* = 8.1 Hz, 2H), 7.23 (d, *J* = 7.9 Hz, 2H), 7.10 (d, *J* = 5.3 Hz, 4H), 6.98 (s, 1H), 6.85 (s, 1H), 6.69 (s, 2H), 2.46 (s, 3H), 2.42 (s, 3H), 2.36 (s, 6H), 2.22 (s, 6H).

**(*Z*)-6-(1,2-Bis(3,5-dimethylphenyl)vinyl)-2-(4-methoxyphenyl)-3-methylpyridine (S41)**[1]



Yellow oil (95.7 mg, 74%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.53 (d, *J* = 7.7, 1H), 7.38 – 7.25 (m, 2H), 7.10 – 7.03 (m, 4H), 6.99 – 6.89 (m, 3H), 6.84 (s, 1H), 6.67 (s, 2H), 3.85 (s, 3H), 2.46 (s, 3H), 2.34 (s, 6H), 2.20 (s, 6H).

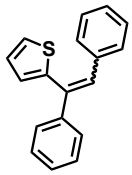
**(*Z*)-6-(1,2-Bis(3,5-dimethylphenyl)vinyl)-2-(4-chlorophenyl)-3-methylpyridine (S42)**[1]



Yellow oil (91.2 mg, 70%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.55 (d, *J* = 8.0 Hz, 1H), 7.37 – 7.32 (m, 2H), 7.30 – 7.26 (m, 2H), 7.10 (d,

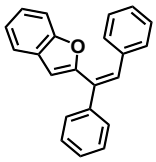
*J* = 7.8 Hz, 1H), 7.04 (d, *J* = 11.7 Hz, 3H), 6.96 (s, 1H), 6.83 (s, 1H), 6.63 (s, 2H), 2.42 (s, 3H), 2.32 (s, 6H), 2.18 (s, 6H).

**(*Z*)/(*E*) -2-(1,2-diphenylvinyl)thiophene**[8]



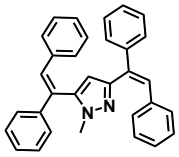
Colorless oil (69.2 mg, 88%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.46 – 7.38 (m, 4H), 7.37 – 7.31 (m, 4H), 7.21 (dd, *J* = 13.9, 6.3 Hz, 3H), 7.11 (dd, *J* = 12.2, 6.7 Hz, 4H), 7.04 – 6.94 (m, 4H), 6.92 (dd, *J* = 3.3, 1.2 Hz, 1H), 6.77 – 6.72 (m, 1H). GC-MS: 262 (*Z:E*=2:1).

**(*Z*)-2-(1,2-diphenylvinyl)benzofuran**[8a]



Colorless oil (80 mg, 90%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.55 – 7.50 (m, 2H), 7.47 – 7.42 (m, 4H), 7.40 – 7.36 (m, 2H), 7.29 (t, *J* = 7.7 Hz, 1H), 7.21 – 7.13 (m, 4H), 7.08 – 7.04 (m, 2H), 6.23 (s, 1H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 158.0, 155.1, 137.6, 136.4, 131.6, 130.1, 129.9, 129.3, 129.1, 128.21, 128.18, 127.4, 124.8, 123.0, 121.0, 111.1, 106.3. GC-MS: 296.

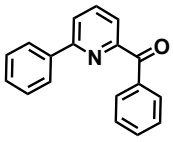
**3,5-Bis((*Z*)-1,2-diphenylvinyl)-1-methyl-1*H*-pyrazole**[1]



Yellowish oil (59.7 mg, 45%, 1:2 *Z:E*). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.43 (s, 1H), 7.39 – 7.32 (m, 5H), 7.31 – 7.27 (m, 3H), 7.21 – 7.14 (m, 5H), 7.14 – 7.06 (m, 5H), 7.05 – 7.02 (m, 2H), 6.82 (s, 1H), 6.07 (s, 1H), 3.51 (s, 3H).

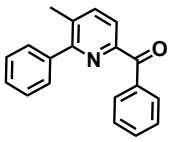
## 7. Characterization Data of Products

**Phenyl(6-phenylpyridin-2-yl)methanone (1)**



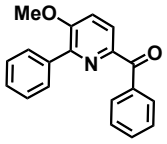
Colourless oil (32.0 mg, 83%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.25 – 8.21 (m, 2H), 8.07 – 8.03 (m, 2H), 8.02 – 7.97 (m, 1H), 7.95 (dd, *J* = 6.5, 2.9 Hz, 2H), 7.65 – 7.60 (m, 1H), 7.54 – 7.42 (m, 5H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 193.8, 156.0, 154.9, 138.5, 138.0, 136.5, 132.9, 131.5, 129.6, 129.0, 128.1, 127.1, 124.0, 122.6. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{18}H_{14}NO$ 260.1070; Found 260.1071.

**(5-Methyl-6-phenylpyridin-2-yl)(phenyl)methanone (2)**



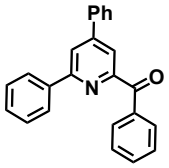
Colourless oil (24.6 mg, 90%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.22 – 8.17 (m, 2H), 7.95 (d, *J* = 7.9 Hz, 1H), 7.79 (dd, *J* = 7.9, 0.5 Hz, 1H), 7.61 – 7.54 (m, 3H), 7.49 – 7.38 (m, 5H), 2.48 (s, 3H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 193.6, 157.4, 152.7, 140.0, 139.7, 136.6, 134.3, 132.8, 131.4, 129.3, 128.4, 128.3 128.1, 123.0, 20.6. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{19}H_{16}NO$ 274.1226; Found 274.1224.

**(5-Methoxy-6-phenylpyridin-2-yl)(phenyl)methanone (3)**



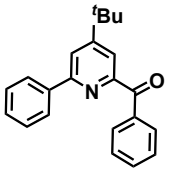
Colourless oil (24.6 mg, 90%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.22 (dd, *J* = 5.2, 3.4 Hz, 2H), 8.14 (d, *J* = 8.6 Hz, 1H), 8.04 – 8.00 (m, 2H), 7.61 – 7.56 (m, 1H), 7.52 – 7.39 (m, 6H), 3.95 (s, 3H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 192.7, 155.8, 146.7, 146.2, 137.07, 137.05, 132.4, 131.3, 129.6, 128.8, 128.1, 127.9, 125.3, 118.7, 55.8. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{19}H_{16}NO$ 290.1176; Found 290.1176.

**(4,6-Diphenylpyridin-2-yl)(phenyl)methanone (4)**[9]



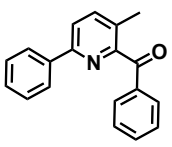
Colourless oil (26.8 mg, 80%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.29 – 8.23 (m, 3H), 8.16 (d, *J* = 1.6 Hz, 1H), 8.13 – 8.07 (m, 2H), 7.81 – 7.76 (m, 2H), 7.66 – 7.61 (m, 1H), 7.57 – 7.43 (m, 8H).

**(4-(*Tert*-butyl)-6-phenylpyridin-2-yl)(phenyl)methanone (5)**



Colourless oil (26.7 mg, 85%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.26 – 8.20 (m, 2H), 8.08 – 8.01 (m, 3H), 7.94 (d, *J* = 1.7 Hz, 1H), 7.64 – 7.58 (m, 1H), 7.54 – 7.41 (m, 5H), 1.45 (s, 9H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.3, 162.2, 156.2, 155.0, 139.2, 136.8, 132.8, 131.5, 129.3, 128.9, 128.1, 127.2, 120.2, 119.9, 35.4, 30.8. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{22}H_{22}N$ 316.1696; Found 316.1698.

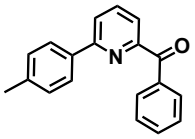
**(3-Methyl-6-phenylpyridin-2-yl)(phenyl)methanone (6)**



Colourless oil (19.0 mg, 70%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.98 (dd, *J* = 9.5, 1.5 Hz, 4H), 7.79 (d, *J* = 8.1 Hz, 1H), 7.71 (d, *J* = 8.1 Hz, 1H), 7.62 – 7.58 (m, 1H), 7.50 – 7.36 (m, 5H), 2.44 (s, 3H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 195.4, 154.7, 153.7, 140.0, 138.6, 136.7, 133.4, 131.3, 130.9, 129.1,

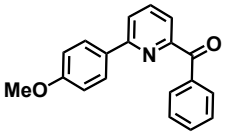
128.9, 128.4, 126.9, 121.2, 18.3. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{19}H_{16}N$ 274.1226; Found 274.1225.

**Phenyl(6-(*p*-tolyl)pyridin-2-yl)methanone (7)**[10]



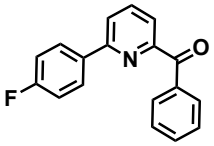
Colourless oil (21.5 mg, 79%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.26 – 8.20 (m, 2H), 7.98 – 7.92 (m, 5H), 7.65 – 7.57 (m, 1H), 7.53 – 7.48 (m, 2H), 7.28 (d, *J* = 8.0 Hz, 2H), 2.41 (s, 3H).

**(6-(4-Methoxyphenyl)pyridin-2-yl)(phenyl)methanone (8)**[10]



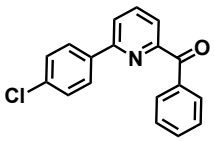
White solid (20.3 mg, 70%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.23 – 8.18 (m, 2H), 8.02 – 7.98 (m, 2H), 7.95 – 7.86 (m, 3H), 7.61 (t, *J* = 7.4 Hz, 1H), 7.51 (t, *J* = 7.7 Hz, 2H), 7.01 – 6.97 (m, 2H), 3.86 (s, 3H).

**(6-(4-Fluorophenyl)pyridin-2-yl)(phenyl)methanone (9)**[10]



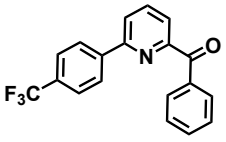
Colourless oil (21.8 mg, 79%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.21 – 8.16 (m, 2H), 8.05 – 7.94 (m, 4H), 7.90 (dd, *J* = 7.3, 1.4 Hz, 1H), 7.64 – 7.60 (m, 1H), 7.54 – 7.49 (m, 2H), 7.18 – 7.12 (m, 2H). $^{19}$F NMR (376 MHz, $CDCl_3$) δ -112.17 (s).

**(6-(4-Chlorophenyl)pyridin-2-yl)(phenyl)methanone (10)**



Colourless oil (21.8 mg, 74%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.20 – 8.16 (m, 2H), 8.03 – 7.89 (m, 5H), 7.65 – 7.60 (m, 1H), 7.54 – 7.49 (m, 2H), 7.45 – 7.41 (m, 2H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 193.6, 155.0, 154.8 138.1, 136.9, 136.4, 135.7, 133.0, 131.4, 129.2, 128.3, 128.2, 123.2, 122.3. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{18}H_{13}ClNO$ 294.0680; Found 294.0677.

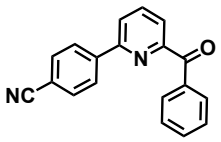
**Phenyl(6-(4-(trifluoromethyl)phenyl)pyridin-2-yl)methanone (11)**



Colourless oil (24.5 mg, 75%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.21 – 8.12 (m, 4H), 8.07 – 7.97 (m, 3H), 7.72 (d, *J* = 8.2 Hz, 2H), 7.65 – 7.60 (m, 1H), 7.55 – 7.49 (m, 2H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 193.5, 155.2, 154.4, 141.8, 138.3, 136.4, 133.1, 131.4, 131.3 (q, *J* = 32.5 Hz), 128.2, 127.4, 125.9 (q, *J* = 3.8 Hz), 124.2 (q, *J* = 272.1 Hz), 123.8, 122.9. $^{19}$F NMR (376 MHz,

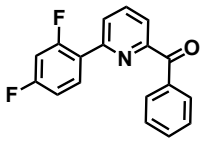
$CDCl_3$) δ -62.56 (d, *J* = 1.3 Hz). HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{19}H_{13}F_3NO$ 328.0944; Found 328.0945.

**4-(6-Benzoylpyridin-2-yl)benzonitrile (12)**



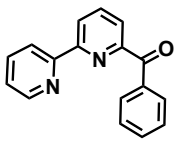
Colourless oil (20.3 mg, 71%). $^1H$ NMR (400 MHz, $CDCl_3$) δ 8.18 – 8.12 (m, 4H), 8.08 – 7.97 (m, 3H), 7.75 (d, *J* = 8.4 Hz, 2H), 7.64 (t, *J* = 7.4 Hz, 1H), 7.52 (t, *J* = 7.7 Hz, 2H). $^{13}C$ NMR (101 MHz, $CDCl_3$) δ 193.4, 155.3, 153.8, 142.5, 138.4, 136.2, 133.2, 132.8, 131.3, 128.2, 127.6, 124.1, 123.0, 113.0. HRMS (ESI-TOF) m/z: $[M + Na]^+$ Calcd for $C_{19}H_{12}N_2ONa$ 307.0842; Found 307.0813.

**(6-(2,4-Difluorophenyl)pyridin-2-yl)(phenyl)methanone (13)**



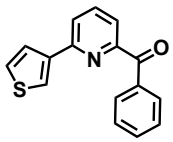
Colourless oil (18.3 mg, 63%). $^1H$ NMR (400 MHz, $CDCl_3$) δ 8.19 – 8.13 (m, 2H), 8.07 – 7.94 (m, 4H), 7.64 – 7.58 (m, 1H), 7.54 – 7.45 (m, 2H), 7.01 – 6.89 (m, 2H). $^{13}C$ NMR (101 MHz, $CDCl_3$) δ 193.4, 163.6 (dd, *J* = 250.6, 12.1 Hz), 161.1 (dd, *J* = 253.0, 11.9 Hz), 155.0, 151.3, 137.8, 136.4, 133.0, 132.4 (dd, *J* = 9.7, 4.4 Hz), 131.3, 128.2, 126.5 (d, *J* = 10.6 Hz), 123.2, 112.2 (dd, *J* = 21.1, 3.6 Hz), 104.6 (dd, *J* = 27.0, 25.5 Hz). $^{19}F$ NMR (376 MHz, $CDCl_3$) δ -108.41 (d, *J* = 8.9 Hz), -112.10 (d, *J* = 8.9 Hz). HRMS (ESI-TOF) m/z: $[M + Na]^+$ Calcd for $C_{18}H_{11}F_2NONa$ 318.0701; Found 318.0667.

**[2,2'-Bipyridin]-6-yl(phenyl)methanone (14)**[10]



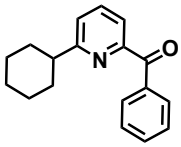
Colourless oil (19.3 mg, 86%). $^1H$ NMR (400 MHz, $CDCl_3$) δ 8.71 – 8.63 (m, 2H), 8.34 (d, *J* = 8.0 Hz, 1H), 8.23 – 8.16 (m, 2H), 8.08 (dd, *J* = 7.7, 1.2 Hz, 1H), 8.02 (t, *J* = 7.7 Hz, 1H), 7.80 – 7.73 (m, 1H), 7.65 – 7.58 (m, 1H), 7.54 – 7.48 (m, 2H), 7.34 – 7.28 (m, 1H).

**Phenyl(6-(thiophen-3-yl)pyridin-2-yl)methanone (15)**



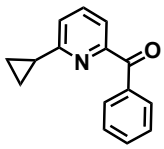
Colourless oil (23.3 mg, 88%). $^1H$ NMR (400 MHz, $CDCl_3$) δ 8.23 – 8.18 (m, 2H), 7.96 – 7.89 (m, 3H), 7.80 (dd, *J* = 7.4, 1.4 Hz, 1H), 7.67 (dd, *J* = 5.1, 1.2 Hz, 1H), 7.64 – 7.59 (m, 1H), 7.54 – 7.48 (m, 2H), 7.39 (dd, *J* = 5.1, 3.0 Hz, 1H). $^{13}C$ NMR (101 MHz, $CDCl_3$) δ 193.7, 154.8, 152.2, 141.7, 137.9, 136.5, 132.9, 131.5, 128.1, 126.7, 126.3, 124.4, 122.6 122.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{16}H_{12}NOS$ 266.0634; Found 266.0633.

**(6-Cyclohexylpyridin-2-yl)(phenyl)methanone (16)**



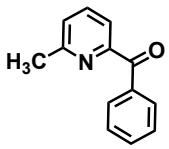
Colourless oil (19.5 mg, 73%). $^{1}$H NMR (400 MHz, $CDCl_3$) δ 8.19 – 8.13 (m, 2H), 7.85 – 7.75 (m, 2H), 7.61 – 7.56 (m, 1H), 7.50 – 7.45 (m, 2H), 7.33 (dd, *J* = 7.4, 1.4 Hz, 1H), 2.82 – 2.72 (m, 1H), 1.99 (dd, *J* = 13.2, 1.9 Hz, 2H), 1.88 – 1.82 (m, 2H), 1.77 – 1.72 (m, 1H), 1.60 – 1.47 (m, 2H), 1.46 – 1.36 (m, 2H), 1.31 – 1.26 (m, 1H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.0, 165.7, 154.6, 137.3, 136.6, 132.8, 131.5, 128.1, 123.6, 122.0, 46.4, 32.9, 26.6, 26.1. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{18}H_{20}NO$ 266.1539; Found 266.1546.

**(6-Cyclopropylpyridin-2-yl)(phenyl)methanone (17)**



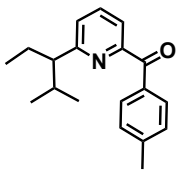
Colourless oil (15.4 mg, 69%). $^{1}$H NMR (400 MHz, $CDCl_3$) δ 8.12 – 8.07 (m, 2H), 7.78 (d, *J* = 7.5 Hz, 1H), 7.72 (t, *J* = 7.7 Hz, 1H), 7.60 – 7.55 (m, 1H), 7.49 – 7.44 (m, 2H), 7.32 (d, *J* = 7.5 Hz, 1H), 2.16 – 2.06 (m, 1H), 1.05 – 0.96 (m, 4H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 193.9, 162.2, 154.6, 136.8, 136.6, 132.8, 131.3, 128.0, 124.0, 121.3, 17.3, 10.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{15}H_{14}NO$ 224.1070; Found 224.1071.

**(6-Methylpyridin-2-yl)(phenyl)methanone (18)**



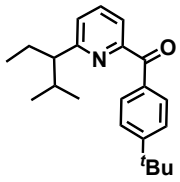
Colourless oil (15.2 mg, 77%). $^{1}$H NMR (400 MHz, $CDCl_3$) δ 8.05 – 8.00 (m, 2H), 7.70 (d, *J* = 5.8 Hz, 2H), 7.54 – 7.49 (m, 1H), 7.40 (t, *J* = 7.6 Hz, 2H), 7.27 (d, *J* = 5.0 Hz, 1H), 2.56 (s, 3H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.1, 157.8, 154.9, 137.2, 136.4, 133.0, 131.3, 128.2, 125.9, 121.8, 24.7. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{13}H_{12}NO$ 198.0913; Found 198.0912.

**(6-(2-Methylpentan-3-yl)pyridin-2-yl)(*p*-tolyl)methanone (19)**



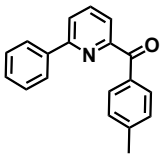
Colourless oil (21.8 mg, 78%). $^{1}$H NMR (400 MHz, $CDCl_3$) δ 8.09 – 8.05 (m, 2H), 7.81 (dd, *J* = 7.7, 1.2 Hz, 1H), 7.76 (t, *J* = 7.6 Hz, 1H), 7.27 (s, 1H), 7.26 – 7.22 (m, 2H), 2.49 – 2.44 (m, 1H), 2.43 (s, 3H), 2.02 – 1.94 (m, 1H), 1.86 – 1.72 (m, 2H), 0.98 (d, *J* = 6.7 Hz, 3H), 0.75 – 0.70 (m, 6H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 193.8, 163.6, 155.2, 143.6, 136.6, 134.0, 131.7, 128.8, 126.0, 121.9, 56.8, 32.7, 25.1, 21.9, 21.2, 20.9, 12.5. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{19}H_{24}NO$ 282.1852; Found 282.1853.

**(6-(2-Methylpentan-3-yl)pyridin-2-yl)(*p*-tolyl)methanone (20)**



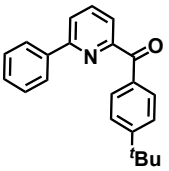
Colourless oil (24.3 mg, 76%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.18 – 8.12 (m, 2H), 7.83 – 7.74 (m, 2H), 7.50 – 7.45 (m, 2H), 7.24 (dd, *J* = 7.5, 1.2 Hz, 1H), 2.50 – 2.41 (m, 1H), 2.06 – 1.93 (m, 1H), 1.89 – 1.73 (m, 2H), 1.37 (s, 9H), 1.00 (d, *J* = 6.7 Hz, 3H), 0.77 – 0.71 (m, 6H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 193.5, 163.7, 156.6, 155.3, 136.6, 133.8, 131.5, 125.9, 125.1, 121.9, 56.8, 35.3, 32.8, 31.3, 25.1, 21.2, 20.9, 12.5. HRMS (ESI-TOF) m/z: [M + H]$^+$ Calcd for $C_{22}H_{30}NO$ 324.2322; Found 324.2321.

**(6-Phenylpyridin-2-yl)(p-tolyl)methanone (21)**[11]



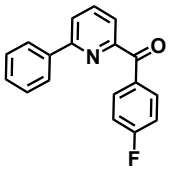
Colourless oil (23.1 mg, 85%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.16 – 8.12 (m, 2H), 8.07 – 8.03 (m, 2H), 7.98 – 7.93 (m, 3H), 7.52 – 7.40 (m, 3H), 7.31 (d, *J* = 8.0 Hz, 2H), 2.46 (s, 3H).

**(4-(*Tert*-butyl)phenyl)(6-phenylpyridin-2-yl)methanone (22)**[11]



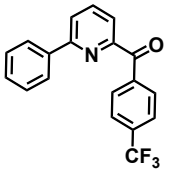
Colourless oil (26.0 mg, 83%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.21 (d, *J* = 8.5 Hz, 2H), 8.08 – 8.04 (m, 2H), 7.98 – 7.92 (m, 3H), 7.55 – 7.42 (m, 5H), 1.39 (s, 9H).

**(4-Fluorophenyl)(6-phenylpyridin-2-yl)methanone (23)**[11]



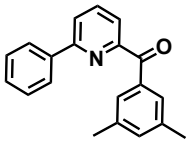
Colourless oil (17.9 mg, 65%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.34 – 8.28 (m, 2H), 8.05 – 7.99 (m, 3H), 7.98 – 7.93 (m, 2H), 7.51 – 7.42 (m, 3H), 7.22 – 7.15 (m, 2H). $^{19}$F NMR (376 MHz, $CDCl_3$) δ -105.50 (s).

**(6-Phenylpyridin-2-yl)(4-(trifluoromethyl)phenyl)methanone (24)**



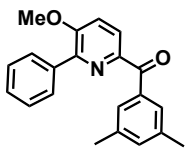
Colourless oil (21.5 mg, 66%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.33 (d, *J* = 8.2 Hz, 2H), 8.12 – 8.05 (m, 1H), 8.03 – 7.98 (m, 4H), 7.78 (d, *J* = 8.3 Hz, 2H), 7.51 – 7.43 (m, 3H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 192.6, 156.3, 154.0, 139.6, 138.3, 138.2, 134.0 (q, *J* = 32.6 Hz), 131.7, 129.8, 129.1, 128.3 (q, *J* = 245.4 Hz), 127.0, 125.1 (q, *J* = 3.8 Hz), 123.2, 123.1. $^{19}$F NMR (376 MHz, $CDCl_3$) δ -62.99 (s). HRMS (ESI-TOF) m/z: [M + H]$^+$ Calcd for $C_{19}H_{13}F_3NO$ 328.0944; Found 328.0946.

**(3,5-Dimethylphenyl)(6-phenylpyridin-2-yl)methanone (25)**



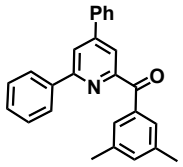
Colourless oil (22.3 mg, 78%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.08 – 8.04 (m, 2H), 7.98 – 7.93 (m, 3H), 7.83 (s, 2H), 7.50 – 7.40 (m, 3H), 7.26 (s, 1H), 2.41 (s, 6H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.2, 156.0, 155.2, 138.6, 137.9, 137.7, 136.5, 134.7, 129.5, 129.3, 129.0, 127.1, 122.9, 122.4, 21.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{20}H_{18}NO$ 288.1383; Found 288.1383.

**(3,5-Dimethylphenyl)(5-methoxy-6-phenylpyridin-2-yl)methanone (26)**



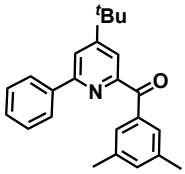
Colourless oil (25.0 mg, 79%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.11 (d, $J$ = 8.6 Hz, 1H), 8.04 – 8.00 (m, 2H), 7.82 (s, 2H), 7.46 – 7.36 (m, 4H), 7.22 (s, 1H), 3.98 (s, 3H), 2.40 (s, 6H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 193.2, 155.8, 147.0, 146.2, 137.5, 137.2, 137.1, 134.2, 129.6, 129.2, 128.8, 128.1, 125.2, 118.6, 55.9, 21.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{21}H_{20}NO_2$ 318.1489; Found 318.1488.

**(3,5-Dimethylphenyl)(4,6-diphenylpyridin-2-yl)methanone (27)**



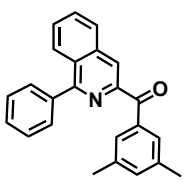
Colourless oil (36.6 mg, 79%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.21 (d, $J$ = 1.4 Hz, 1H), 8.17 – 8.11 (m, 3H), 7.88 (s, 2H), 7.81 – 7.77 (m, 2H), 7.58 – 7.43 (m, 6H), 7.28 (s, 1H), 2.43 (s, 6H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.3, 156.7, 155.8, 150.6, 138.8, 138.1, 137.7, 136.6, 134.7, 129.53, 129.50, 129.34, 129.29, 129.0, 127.3, 127.2, 121.0, 120.4, 21.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{26}H_{22}NO$ 364.1696; Found 364.1692.

**(4-(Tert-butyl)-6-phenylpyridin-2-yl)(3,5-dimethylphenyl)methanone (28)**



Colourless oil (27.4 mg, 80%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.07 – 8.03 (m, 2H), 8.00 (d, $J$ = 1.7 Hz, 1H), 7.93 (d, $J$ = 1.7 Hz, 1H), 7.83 (s, 2H), 7.49 – 7.40 (m, 3H), 7.25 (s, 1H), 2.41 (s, 6H), 1.44 (s, 9H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.7, 162.1, 156.2, 155.2, 139.3, 137.6, 136.8, 134.5, 129.32, 129.26, 128.9, 127.2, 120.2, 119.7, 35.4, 30.8, 21.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{24}H_{26}NO$ 344.2009; Found 344.2007.

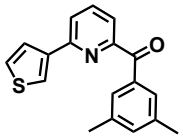
**(3,5-Dimethylphenyl)(1-phenylisoquinolin-3-yl)methanone (29)**



Colourless oil (21.2 mg, 63%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.40 (s, 1H), 8.23 (dd, $J$ = 8.4, 0.6 Hz, 1H), 8.05 (d, $J$ = 8.2 Hz, 1H), 7.81 –

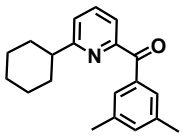
7.75 (m, 5H), 7.72 – 7.65 (m, 1H), 7.56 – 7.48 (m, 3H), 7.23 (s, 1H), 2.40 (s, 6H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.6, 159.9, 148.5, 139.2, 137.7, 137.04, 136.98, 134.5, 130.7, 130.3, 129.3, 129.1, 129.0, 128.8, 128.5, 127.8, 127.7, 122.4, 21.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{24}H_{20}NO$ 338.1539; Found 338.1522.

**(3,5-Dimethylphenyl)(6-(thiophen-3-yl)pyridin-2-yl)methanone (30)**



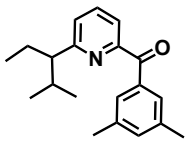
Colourless oil (23.8 mg, 81%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.95 – 7.90 (m, 1H), 7.91 – 7.88 (m, 2H), 7.82 – 7.78 (m, 3H), 7.68 (dd, *J* = 5.1, 1.2 Hz, 1H), 7.39 (dd, *J* = 5.1, 3.0 Hz, 1H), 7.25 (s, 1H), 2.40 (s, 6H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.1, 155.1, 152.2, 141.8, 137.8, 137.6, 136.5, 134.6, 129.2, 126.6, 126.3, 124.3, 122.5, 122.3, 21.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{18}H_{16}NOS$ 294.0947; Found 294.0949.

**(6-Cyclohexylpyridin-2-yl)(3,5-dimethylphenyl)methanone (31)**



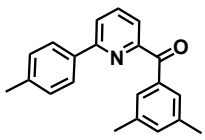
Colourless oil (18.8 mg, 64%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.80 – 7.74 (m, 4H), 7.35 – 7.30 (m, 1H), 7.22 (s, 1H), 2.85 – 2.73 (m, 1H), 2.38 (s, 6H), 2.02 – 1.96 (m, 2H), 1.88 – 1.82 (m, 2H), 1.78 – 1.72 (m, 1H), 1.63 – 1.57 (m, 1H), 1.56 – 1.50 (m, 1H), 1.47 – 1.36 (m, 2H), 1.30 – 1.24 (m, 1H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.4, 165.6, 154.9, 137.6, 137.2, 136.5, 134.6, 129.4, 123.5, 121.9, 46.2, 32.9, 26.6, 26.2, 21.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{18}H_{20}NO$ 266.1539; Found 266.1538.

**(3,5-Dimethylphenyl)(6-(2-methylpentan-3-yl)pyridin-2-yl)methanone (32)**



Colourless oil (22.7 mg, 77%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.80 (dd, *J* = 7.6, 1.3 Hz, 1H), 7.77 (d, *J* = 7.4 Hz, 1H), 7.73 (s, 2H), 7.24 (dd, *J* = 7.4, 1.3 Hz, 1H), 7.21 (s, 1H), 2.47 – 2.41 (m, 1H), 2.36 (s, 6H), 2.05 – 1.92 (m, 1H), 1.85 – 1.73 (m, 2H), 0.98 (d, *J* = 6.7 Hz, 3H), 0.76 – 0.71 (m, 6H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.7, 163.6, 155.2, 137.5, 136.6, 136.5, 134.5, 129.4, 126.0, 121.8, 56.7, 32.8, 25.1, 21.3, 21.2, 20.9, 12.6. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{20}H_{26}NO$ 296.2009; Found 296.2008.

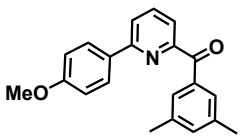
**(3,5-Dimethylphenyl)(6-(*p*-tolyl)pyridin-2-yl)methanone (33)**



Colourless oil (23.8 mg, 79%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.97 – 7.94 (m, 2H), 7.93 – 7.87 (m, 3H), 7.83 (s, 2H), 7.28 (s, 1H), 7.27

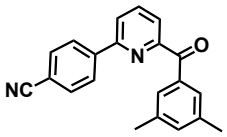
– 7.24 (m, 2H), 2.40 (s, 9H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.2, 156.0, 155.1, 139.6, 137.8, 137.6, 136.6, 135.8, 134.6, 129.7, 129.3, 126.9, 122.5, 122.1, 21.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{21}H_{20}NO$ 302.1539; Found 302.1540.

**(3,5-Dimethylphenyl)(6-(4-methoxyphenyl)pyridin-2-yl)methanone (34)**



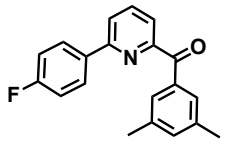

Colourless oil (27.5 mg, 78%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.02 (d, *J* = 8.8 Hz, 2H), 7.93 – 7.84 (m, 3H), 7.82 (s, 2H), 7.26 (s, 1H), 6.98 (d, *J* = 8.9 Hz, 2H), 3.86 (s, 3H), 2.41 (s, 6H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.3, 160.9, 155.7, 155.0, 137.7, 137.6, 136.6, 134.6, 131.3, 129.3, 128.4, 122.1, 121.6, 114.3, 55.5, 21.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{21}H_{20}NO_2$ 318.1489; Found 318.1488.

**4-(6-(3,5-Dimethylbenzoyl)pyridin-2-yl)benzonitrile (35)**



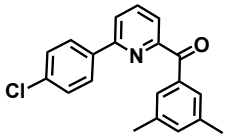

Colourless oil (21.3 mg, 75%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.18 – 8.15 (m, 2H), 8.03 – 7.97 (m, 3H), 7.77 – 7.74 (m, 4H), 7.28 (s, 1H), 2.40 (s, 6H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 193.8, 155.5, 153.8, 142.6, 138.3, 137.9, 136.3, 134.9, 132.8, 129.1, 127.6, 124.0, 122.8, 118.8, 113.0, 21.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{21}H_{17}N_2O$ 313.1335; Found 313.1327.

**(3,5-Dimethylphenyl)(6-(4-fluorophenyl)pyridin-2-yl)methanone (36)**




Colourless oil (21.4 mg, 70%). $^1$H NMR (400 MHz, DMSO) δ 8.26 – 8.22 (m, 1H), 8.16 – 8.10 (m, 3H), 7.92 – 7.88 (m, 1H), 7.65 (s, 2H), 7.38 – 7.31 (m, 3H), 2.35 (s, 6H). $^{13}$C NMR (400 MHz, DMSO) δ 193.9, 163.6 (d, *J* = 246.9 Hz), 154.8, 154.4, 139.3, 137.9, 136.5, 135.0, 134.8 (d, *J* = 2.9 Hz), 129.3 (d, *J* = 8.6 Hz), 128.9, 123.1, 123.0, 116.3 (d, *J* = 21.7 Hz), 21.3. $^{19}$F NMR (376 MHz, $CDCl_3$) δ -107.52 (s). HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{20}H_{17}FNO$ 306.1289; Found 306.1286.

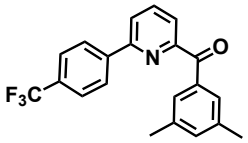
**(6-(4-Chlorophenyl)pyridin-2-yl)(3,5-dimethylphenyl)methanone (37)**




Colourless oil (24.0 mg, 75%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.01 – 7.98 (m, 2H), 7.97 – 7.93 (m, 2H), 7.92 – 7.87 (m, 1H), 7.79 (s, 2H), 7.45 – 7.41 (m, 2H), 7.26 (s, 1H), 2.40 (s, 6H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.0, 155.2, 154.7, 138.0, 137.7, 137.0, 136.4, 135.7, 134.7, 129.2,

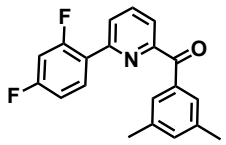
129.1, 128.3, 123.1, 122.2, 21.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{20}H_{17}ClNO$ 322.0993; Found 322.0991.

**(3,5-Dimethylphenyl)(6-(4-(trifluoromethyl)phenyl)pyridin-2-yl)methanone (38)**



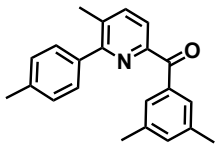
Colourless oil (22.8 mg, 64%). $^1H$ NMR (400 MHz, $CDCl_3$) δ 8.17 (d, $J$ = 8.2 Hz, 2H), 8.04 – 7.97 (m, 3H), 7.79 (s, 2H), 7.72 (d, $J$ = 8.3 Hz, 2H), 7.27 (s, 1H), 2.41 (s, 6H). $^{13}C$ NMR (101 MHz, $CDCl_3$) δ 193.9, 155.5, 154.4, 141.9, 138.2, 137.8, 136.4, 134.8, 131.3 (q, $J$ = 32.5 Hz), 129.2, 127.2, 125.9 (q, $J$ = 3.8 Hz), 124.2 (q, $J$ = 272.2 Hz), 123.7, 122.8, 21.4. $^{19}F$ NMR (376 MHz, $CDCl_3$) δ -62.65 (s). HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{21}H_{17}F_3NO$ 356.1257; Found 356.1259.

**(6-(2,4-Difluorophenyl)pyridin-2-yl)(3,5-dimethylphenyl)methanone (39)**



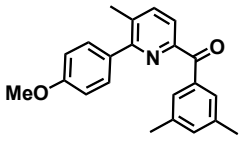
Colourless oil (22.9 mg, 71%). $^1H$ NMR (400 MHz, $CDCl_3$) δ 8.07 – 8.01 (m, 1H), 7.99 – 7.94 (m, 3H), 7.76 (s, 2H), 7.25 (s, 1H), 6.99 – 6.90 (m, 2H), 2.41 – 2.38 (m, 6H). $^{13}C$ NMR (101 MHz, $CDCl_3$) δ 194.0, 163.6 (dd, $J$ = 243.9, 8.0 Hz), 161.1 (dd, $J$ = 245.2, 8.0 Hz), 155.3, 151.4, 137.8, 136.4, 134.8, 132.4 (dd, $J$ = 9.7, 4.4 Hz), 129.2, 126.3 (d, $J$ = 10.6 Hz), 123.1, 112.1 (dd, $J$ = 21.2, 3.6 Hz), 104.7 (dd, $J$ = 27.0, 25.4 Hz), 21.4. $^{19}F$ NMR (376 MHz, $CDCl_3$) δ -108.52 (d, $J$ = 8.9 Hz), -112.07 (d, $J$ = 8.9 Hz). HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{20}H_{16}F_2NO$ 324.1194; Found 324.1195.

**(3,5-Dimethylphenyl)(5-methyl-6-(p-tolyl)pyridin-2-yl)methanone (40)**



Colourless oil (24.9 mg, 75%). $^1H$ NMR (400 MHz, $CDCl_3$) δ 7.89 (d, $J$ = 7.8 Hz, 1H), 7.80 (d, $J$ = 0.6 Hz, 2H), 7.75 (dd, $J$ = 7.9, 0.5 Hz, 1H), 7.53 – 7.49 (m, 2H), 7.27 (s, 1H), 7.25 (s, 1H), 7.21 (s, 1H), 2.48 (s, 3H), 2.41 (s, 3H), 2.38 (d, $J$ = 0.5 Hz, 6H). $^{13}C$ NMR (101 MHz, $CDCl_3$) δ 194.1, 157.3, 152.9, 139.5, 138.2, 137.5, 137.2, 136.6, 134.4, 134.0, 129.22, 129.20, 129.0, 122.7, 21.4, 20.7. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{22}H_{22}NO$ 316.1696; Found 316.1694.

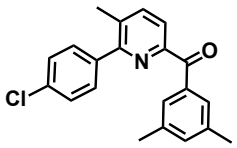
**(3,5-Dimethylphenyl)(6-(4-methoxyphenyl)-5-methylpyridin-2-yl)methanone (41)**



Colourless oil (23.1 mg, 74%). $^1H$ NMR (400 MHz, $CDCl_3$) δ 7.86 (d, $J$ = 7.8 Hz, 1H), 7.77 (s, 2H), 7.74 (d, $J$ = 7.9 Hz, 1H), 7.59 –

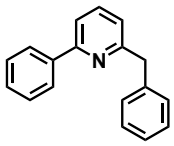
7.54 (m, 2H), 7.20 (s, 1H), 7.00 – 6.95 (m, 2H), 3.85 (s, 3H), 2.49 (s, 3H), 2.38 (s, 6H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 194.2, 159.8, 157.1, 152.9, 139.6, 137.6, 136.7, 134.5, 133.9, 132.6, 130.7, 129.2, 122.5, 113.7, 55.5, 21.4, 20.8. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{22}H_{22}NO_2$ 332.1645; Found 332.1643.

**(6-(4-Chlorophenyl)-5-methylpyridin-2-yl)(3,5-dimethylphenyl)methanone (42)**



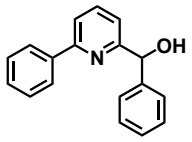
Colourless oil (20.6 mg, 72%). $^1$H NMR (400 MHz, $CDCl_3$) δ 7.90 (d, *J* = 7.7 Hz, 1H), 7.80 – 7.73 (m, 3H), 7.54 (d, *J* = 8.4 Hz, 2H), 7.42 (d, *J* = 8.4 Hz, 2H), 7.21 (s, 1H), 2.47 (s, 3H), 2.37 (s, 6H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 193.9, 156.2, 153.1, 139.8, 138.5, 137.7, 136.5, 134.6, 134.5, 134.1, 130.7, 129.1, 128.5, 123.2, 21.4, 20.6. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{21}H_{19}ClNO$ 336.1150; Found 336.1149.

**2-Benzyl-6-phenylpyridine (43)**[2]



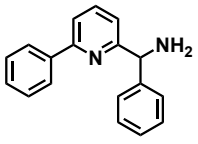
Colourless oil (50.0 mg, 82%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.05 – 8.01 (m, 2H), 7.64 (t, *J* = 7.7 Hz, 1H), 7.56 (d, *J* = 7.8 Hz, 1H), 7.48 (t, *J* = 7.4 Hz, 2H), 7.44 – 7.39 (m, 1H), 7.38 – 7.29 (m, 4H), 7.26 – 7.21 (m, 1H), 7.03 (d, *J* = 7.6 Hz, 1H), 4.26 (s, 2H).

**Phenyl(6-phenylpyridin-2-yl)methanol (44)**



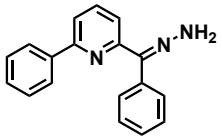
Colourless oil (52.2 mg, 80%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.10 (d, *J* = 5.8 Hz, 2H), 7.69 (t, *J* = 7.2 Hz, 2H), 7.57 – 7.40 (m, 6H), 7.36 (t, *J* = 7.4 Hz, 2H), 7.29 (t, *J* = 7.2 Hz, 1H), 7.11 (s, 1H), 5.84 (s, 1H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 160.6, 155.4, 143.4, 138.7, 137.9, 129.4, 128.9, 128.7, 128.0, 127.4, 127.1, 120.0, 119.2, 75.0. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{18}H_{16}NO$: 262.1226; Found: 262.1221.

**Phenyl(6-phenylpyridin-2-yl)methanamine (45)**



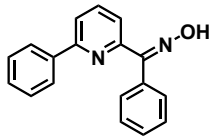
Colourless oil (45.5 mg, 70%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.07 (d, *J* = 7.2 Hz, 2H), 7.76 – 7.62 (m, 2H), 7.52 (t, *J* = 7.2 Hz, 2H), 7.49 – 7.40 (m, 3H), 7.36 (t, *J* = 7.3 Hz, 2H), 7.29 (t, *J* = 7.2 Hz, 1H), 7.05 (d, *J* = 7.4 Hz, 1H), 5.84 (s, 1H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 160.5, 155.4, 143.4, 138.6, 137.9, 129.5, 129.0, 128.7, 128.0, 127.4, 127.1, 120.0, 119.2, 74.9. HRMS (ESI-TOF) m/z: $[M + K]^+$ Calcd for $C_{18}H_{15}N_2K$: 299.0945; Found: 299.0955.

**2-(Hydrazono(phenyl)methyl)-6-phenylpyridine (46)**



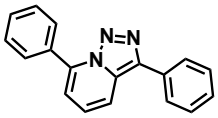
Colourless oil (40.0 mg, 58%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.11 – 8.05 (m, 2H), 7.71 – 7.63 (m, 2H), 7.53 (dd, *J* = 9.9, 4.6 Hz, 2H), 7.49 – 7.42 (m, 3H), 7.36 (t, *J* = 7.3 Hz, 2H), 7.33 – 7.28 (m, 1H), 7.05 (d, *J* = 7.4 Hz, 1H), 5.82 (s, 2H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 160.5, 155.4, 143.4, 138.6, 137.9, 129.5, 129.0, 128.7, 128.0, 127.4, 127.1, 120.0, 119.2, 74.9. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{18}H_{15}N_3$: 274.1339; Found: 274.1328.

**Phenyl(6-phenylpyridin-2-yl)methanone oxime (47)**



Colourless oil (34.9 mg, 51%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.00 – 7.94 (m, 2H), 7.92 – 7.82 (m, 2H), 7.58 – 7.49 (m, 5H), 7.45 – 7.42 (m, 3H), 7.21 (d, *J* = 7.6 Hz, 1H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 155.5, 152.3, 152.1, 138.9, 137.3, 135.7, 130.2, 129.31, 129.28, 129.2, 128.7, 127.1, 123.1, 121.9. HRMS (ESI-TOF) m/z: $[M + H]^+$ $C_{18}H_{15}N_2O$: 275.1179; Found: 275.1176.

**3,7-Diphenyl-[1,2,3]triazolo[1,5-a]pyridine (48)**



White solid (49.5 mg, 73%). $^1$H NMR (400 MHz, $CDCl_3$) δ 8.06 – 7.98 (m, 5H), 7.59 – 7.51 (m, 5H), 7.43 – 7.37 (m, 2H), 7.08 (dd, *J* = 6.9, 1.1 Hz, 1H). $^{13}$C NMR (101 MHz, $CDCl_3$) δ 139.0, 138.3, 132.2, 131.8, 131.6, 130.3, 129.4, 129.1, 128.8, 128.0, 127.0, 126.1, 117.1, 115.4. HRMS (ESI-TOF) m/z: $[M + H]^+$ Calcd for $C_{18}H_{14}N_3$: 272.1182; Found: 272.1181.

## 8. References


(1) W. Li, J. Tang, S. Li, X. Zheng, M. Yuan, B. Xu, W. Jiang, H. Fu, R. Li and Hua Chen, *Org. Lett.,* 2020, **22**, 7814−7819.

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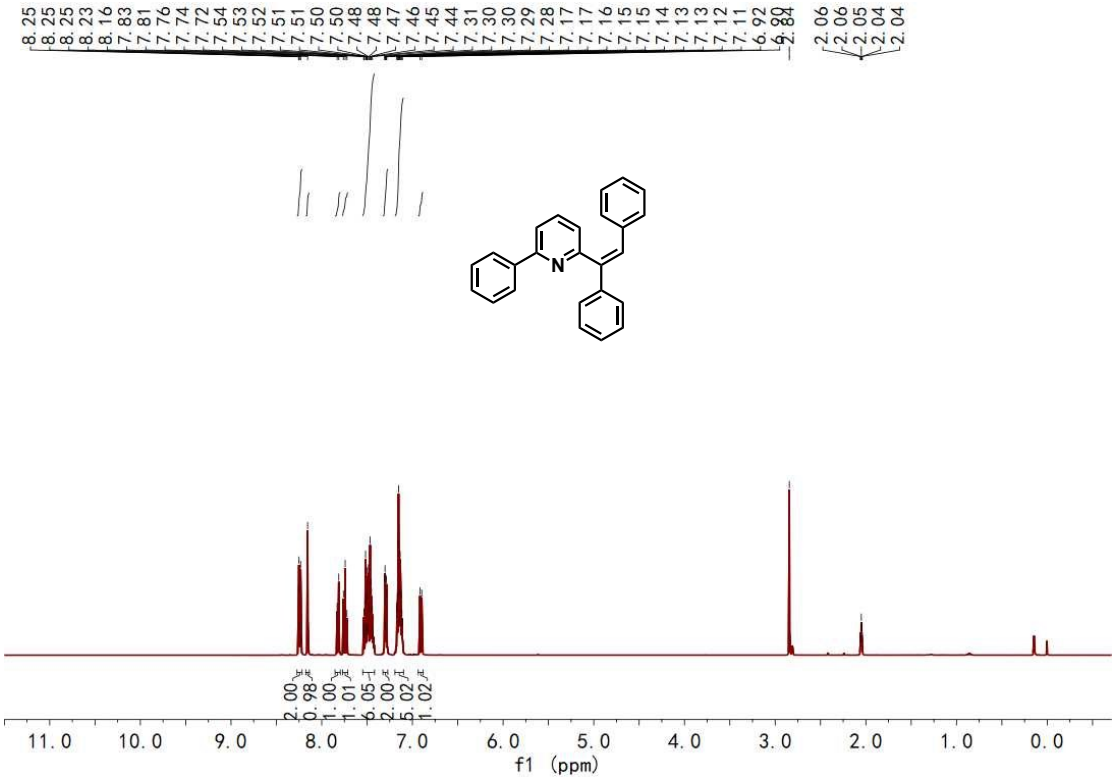
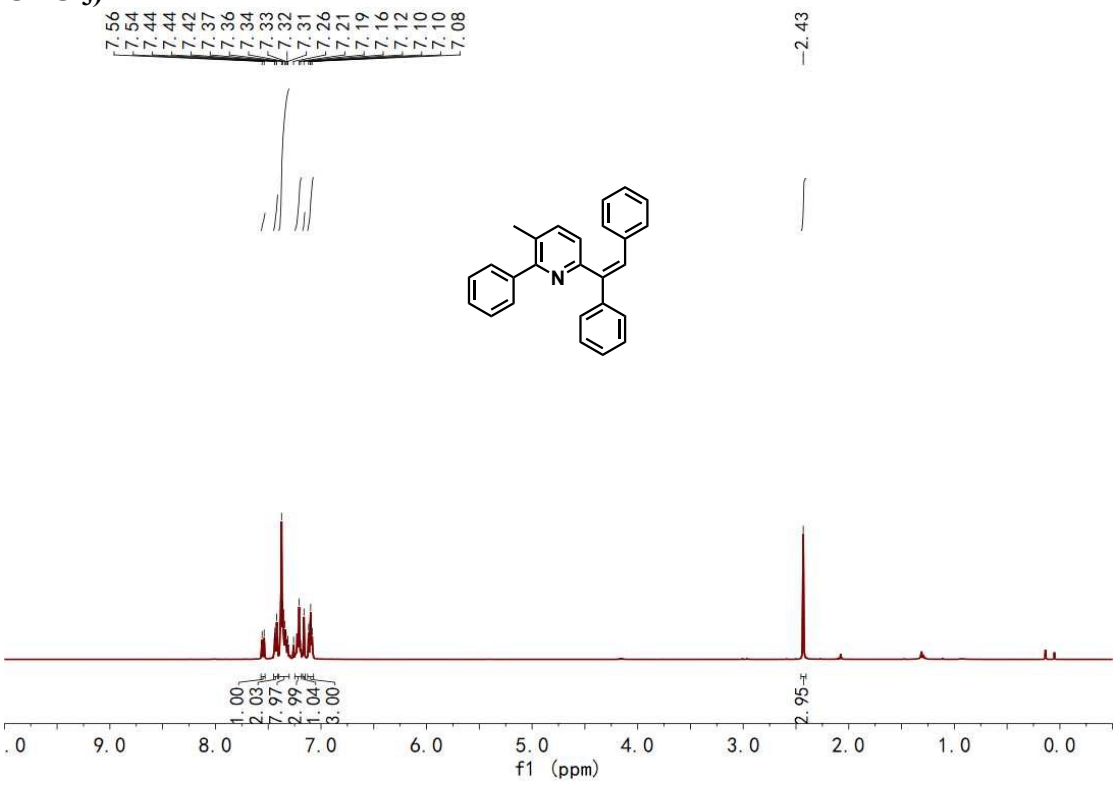
## 9. NMR spectra

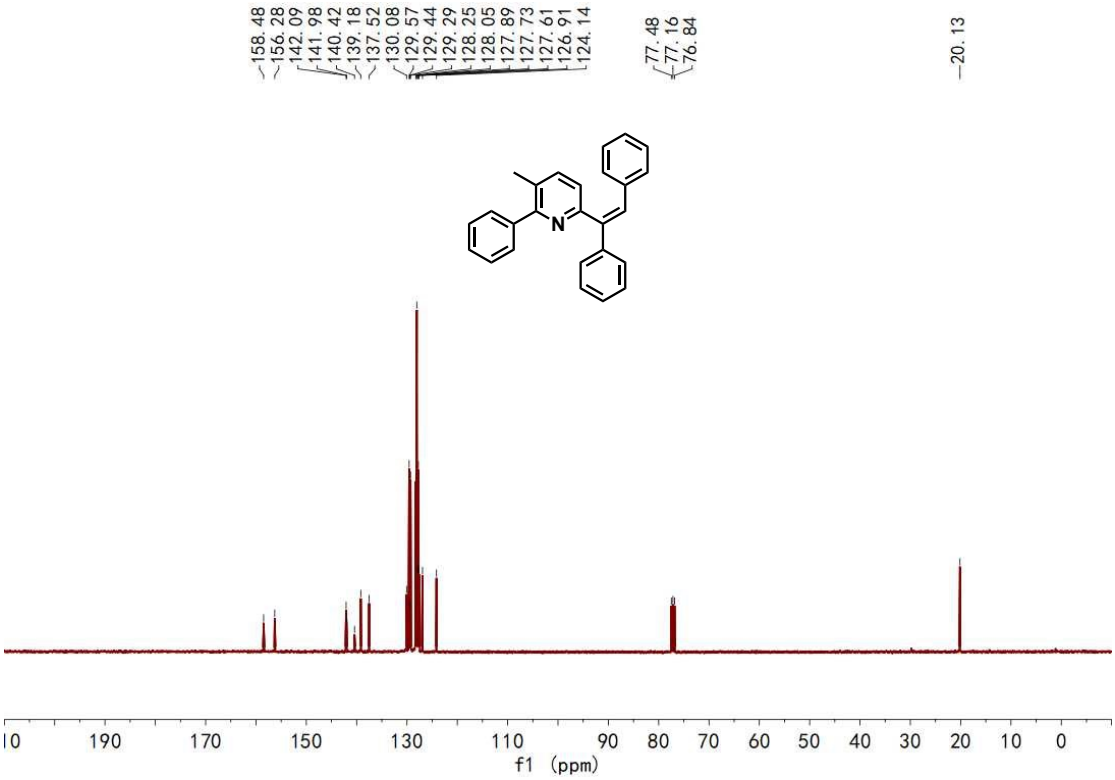
**(*Z*)-2-(1,2-Diphenylvinyl)-6-phenylpyridine (S1): $^1$H NMR (400 MHz, DMSO)**



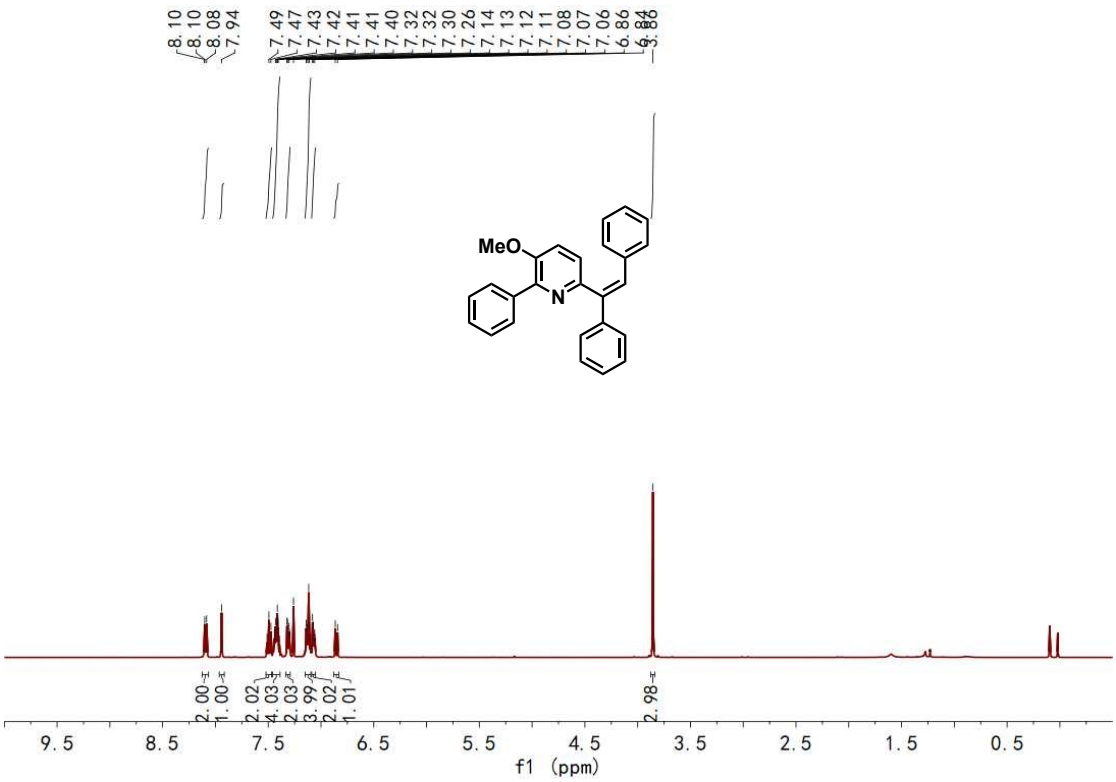

**(*Z*)-6-(1,2-Diphenylvinyl)-3-methyl-2-phenylpyridine (S2): $^1$H NMR (400 HMz, $CDCl_3$)**



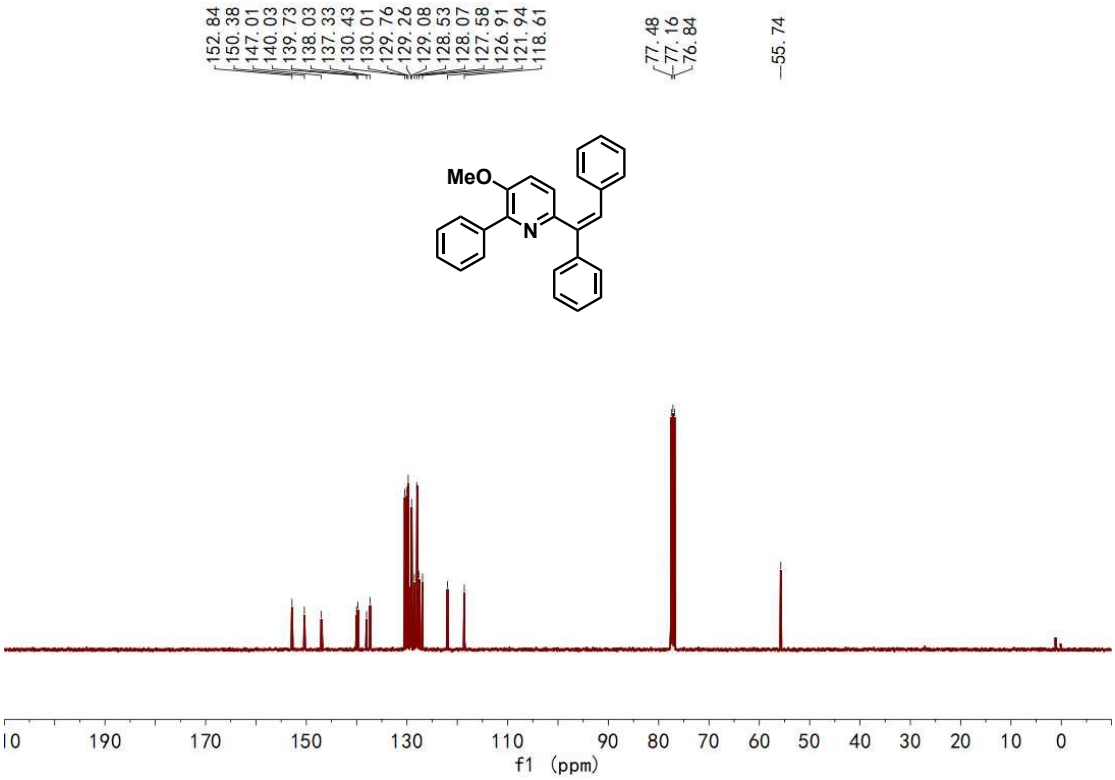
**(*Z*)-6-(1,2-Diphenylvinyl)-3-methyl-2-phenylpyridine (S2): $^{13}C$ NMR (101 HMz, $CDCl_3$)**



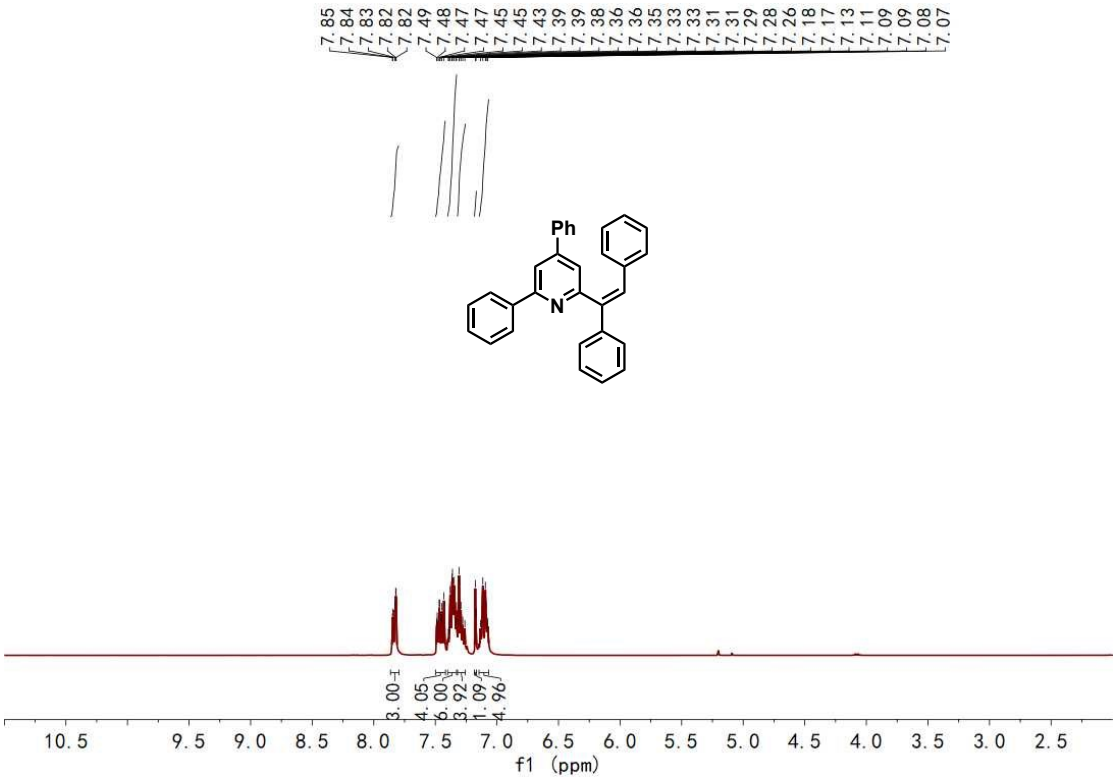

**(*Z*)-6-(1,2-Diphenylvinyl)-3-methoxy-2-phenylpyridine (S3): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



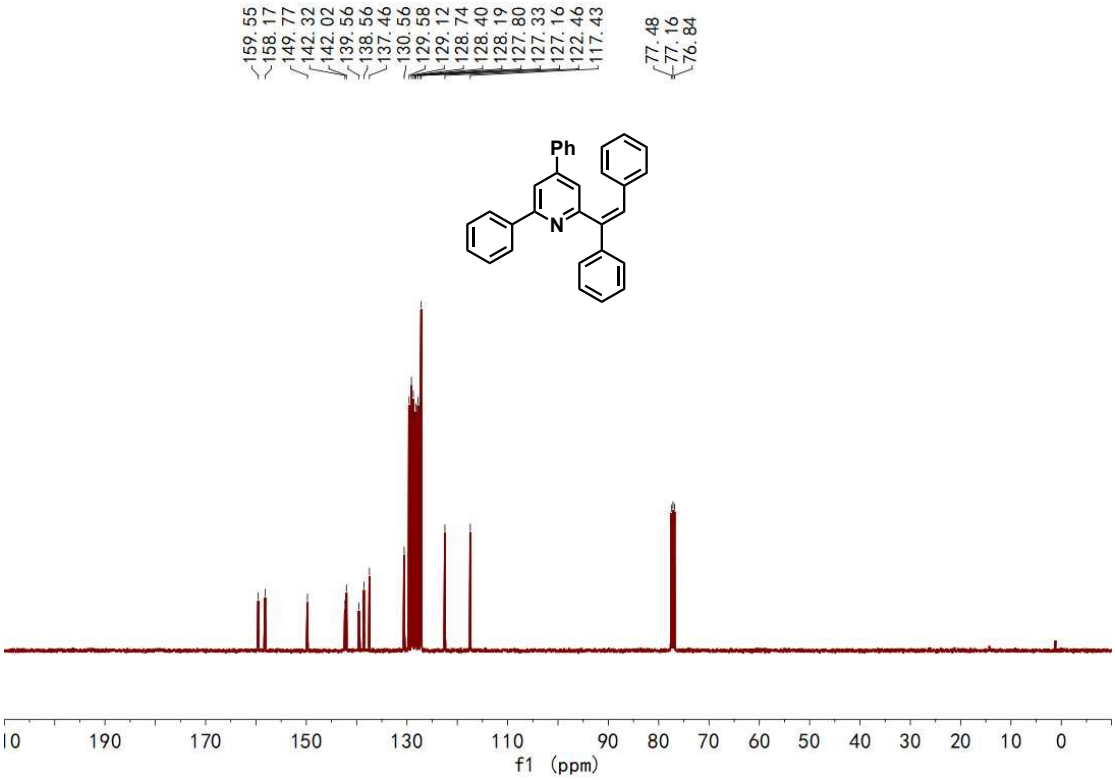
**(*Z*)-6-(1,2-Diphenylvinyl)-3-methoxy-2-phenylpyridine (S3): $^{13}$C NMR (101 MHz, $CDCl_3$)**



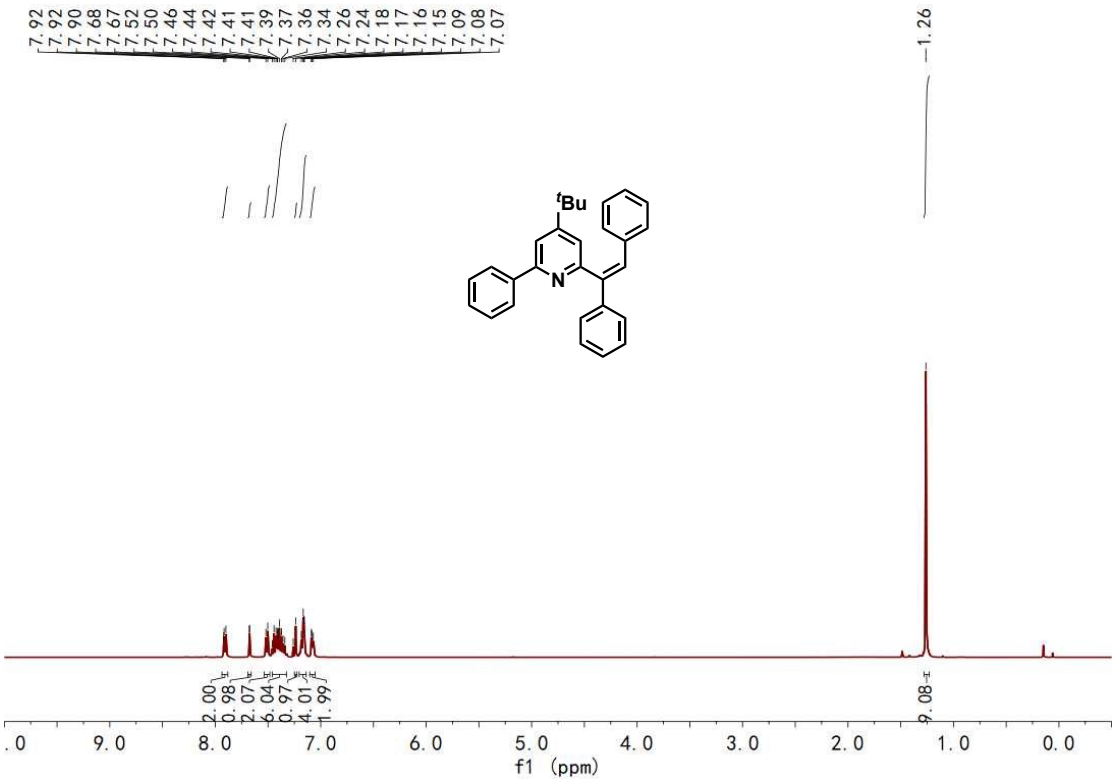

**(*Z*)-2-(1,2-Diphenylvinyl)-4,6-diphenylpyridine (S4): $^{1}$H NMR (400 MHz, $CDCl_3$)**



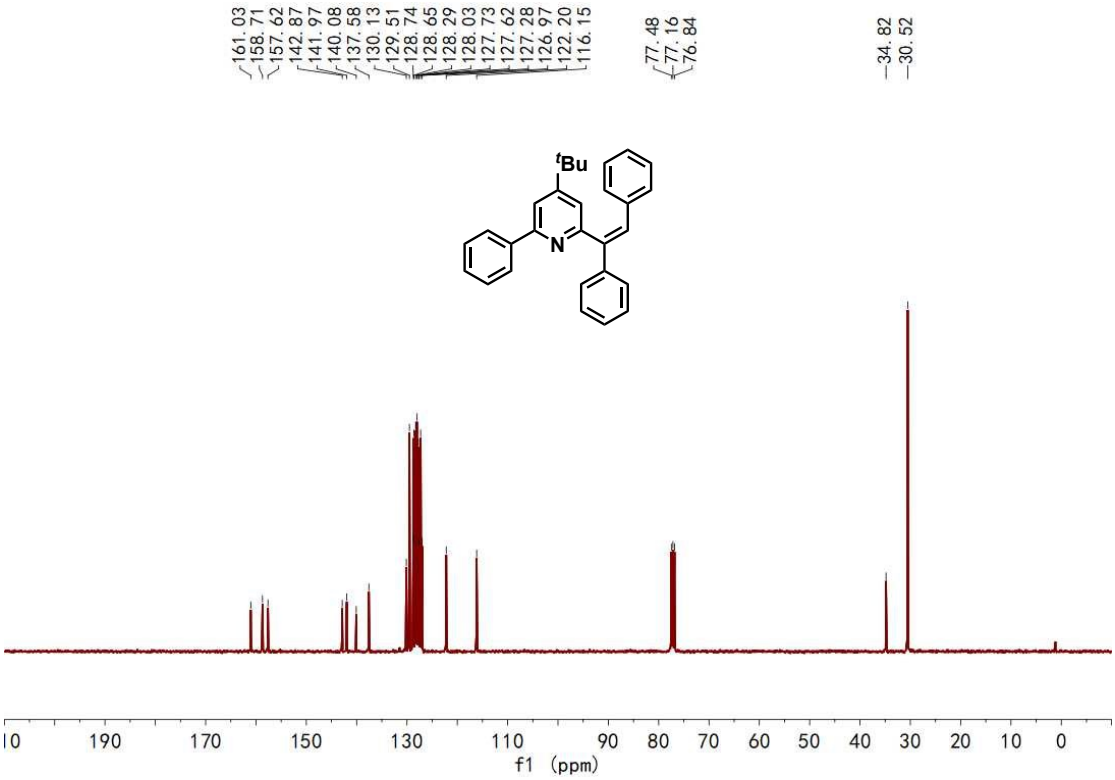
**(*Z*)-2-(1,2-Diphenylvinyl)-4,6-diphenylpyridine (S4): $^{13}$C NMR (101 MHz, $CDCl_3$)**



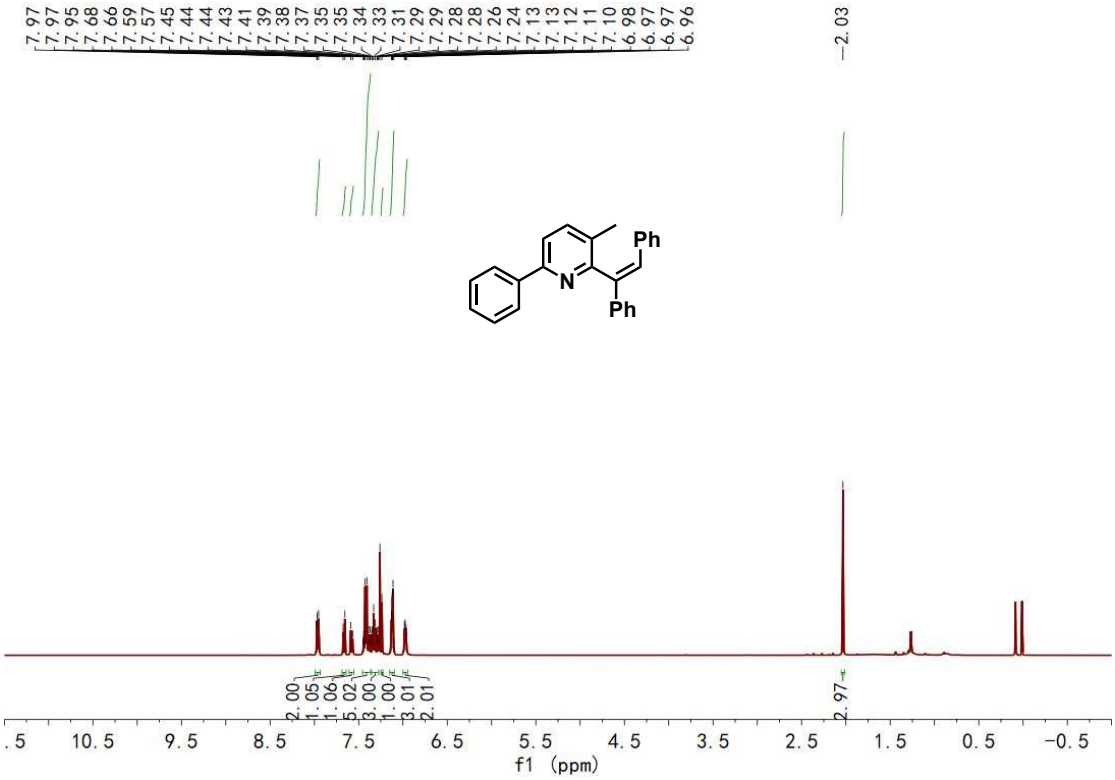

**(*Z*)-4-(*Tert*-butyl)-2-(1,2-diphenylvinyl)-6-phenylpyridine (S5): $^{1}$H NMR (400 MHz, $CDCl_3$)**



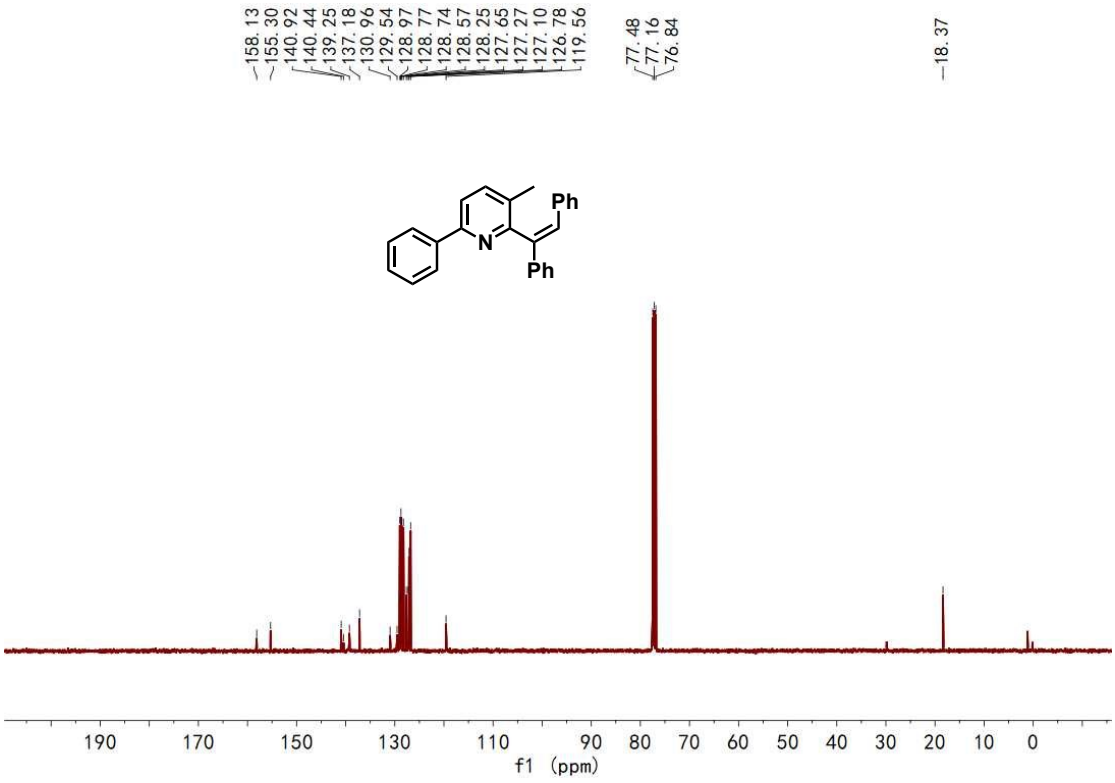
**(*Z*)-4-(*Tert*-butyl)-2-(1,2-diphenylvinyl)-6-phenylpyridine (S5): $^{13}$C NMR (101 MHz, $CDCl_3$)**



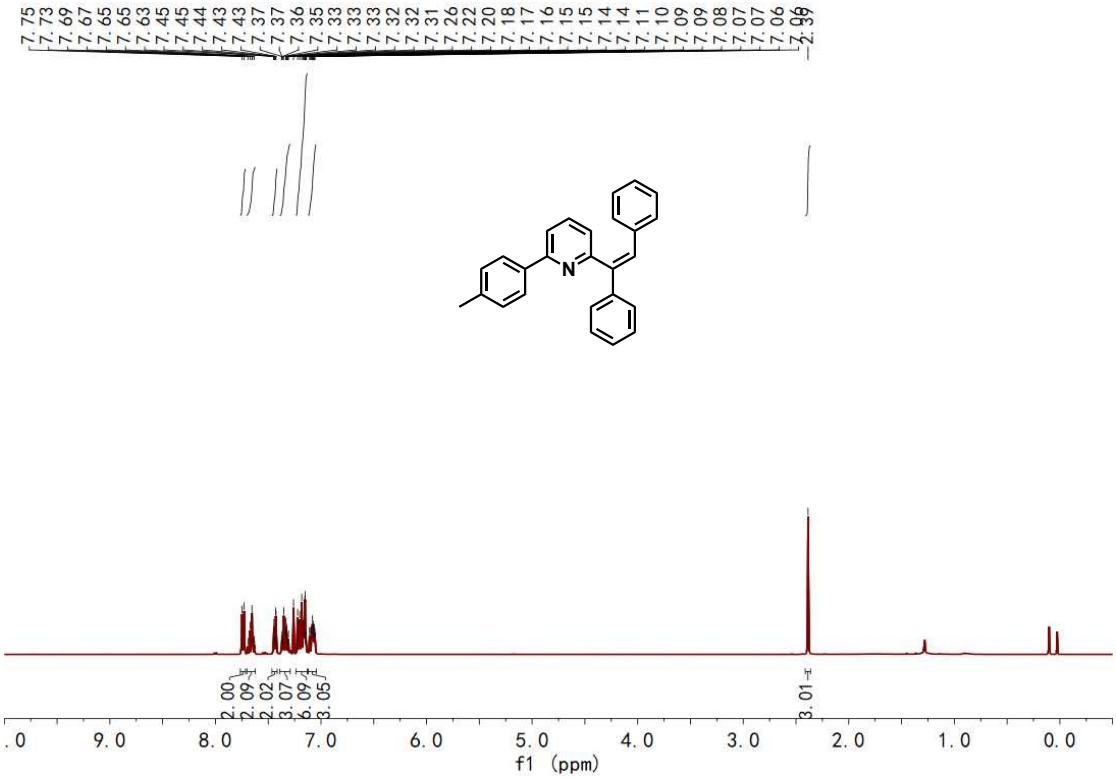

**(*Z*)-2-(1,2-Diphenylvinyl)-3-methyl-6-phenylpyridine (S6): $^{1}$H NMR (400 MHz, $CDCl_3$)**



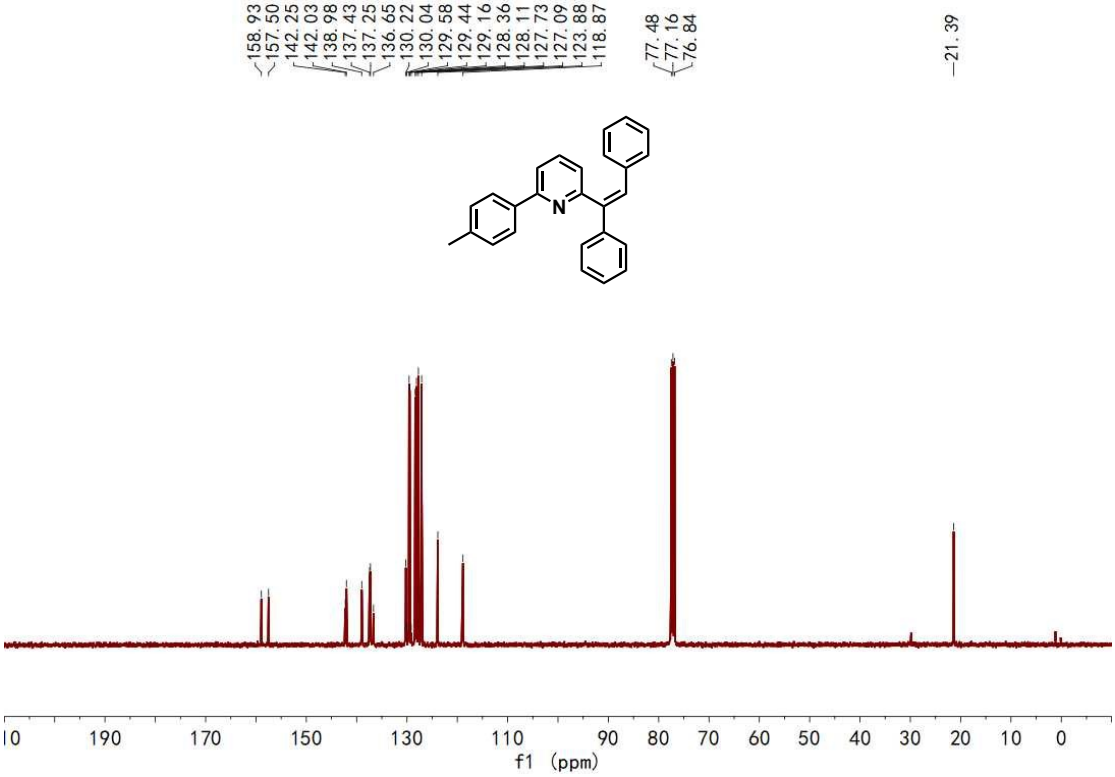
**(*Z*)-2-(1,2-Diphenylvinyl)-3-methyl-6-phenylpyridine (S6): $^{13}$C NMR (101 MHz, $CDCl_3$)**



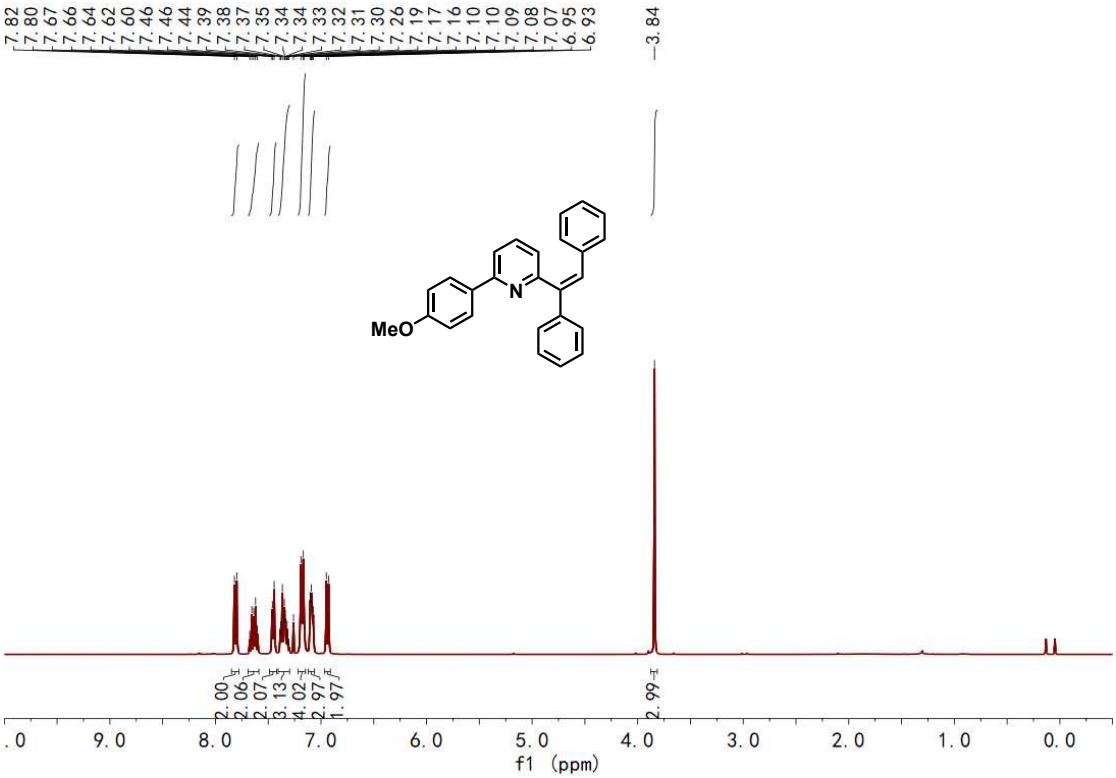

**(*Z*)-2-(1,2-Diphenylvinyl)-6-(*p*-tolyl)pyridine (S7): $^{1}$H NMR (400 MHz, $CDCl_3$)**



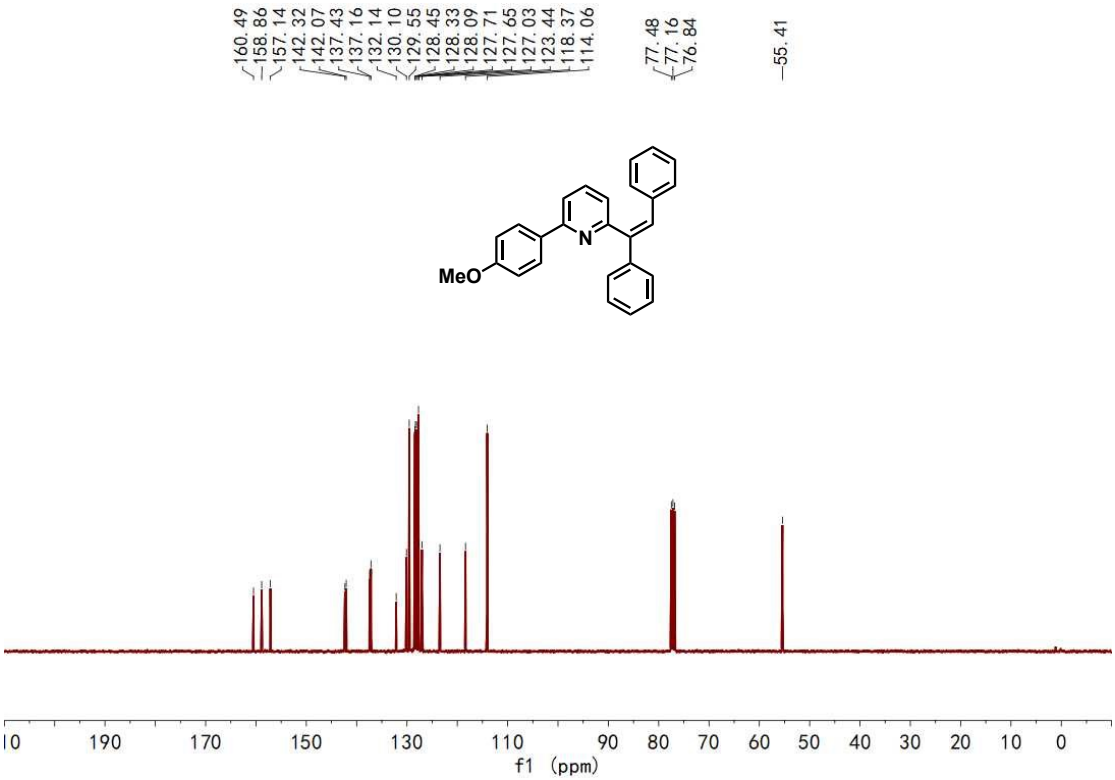
**(*Z*)-2-(1,2-Diphenylvinyl)-6-(*p*-tolyl)pyridine (S7): $^{13}$C NMR (101 MHz, $CDCl_3$)**



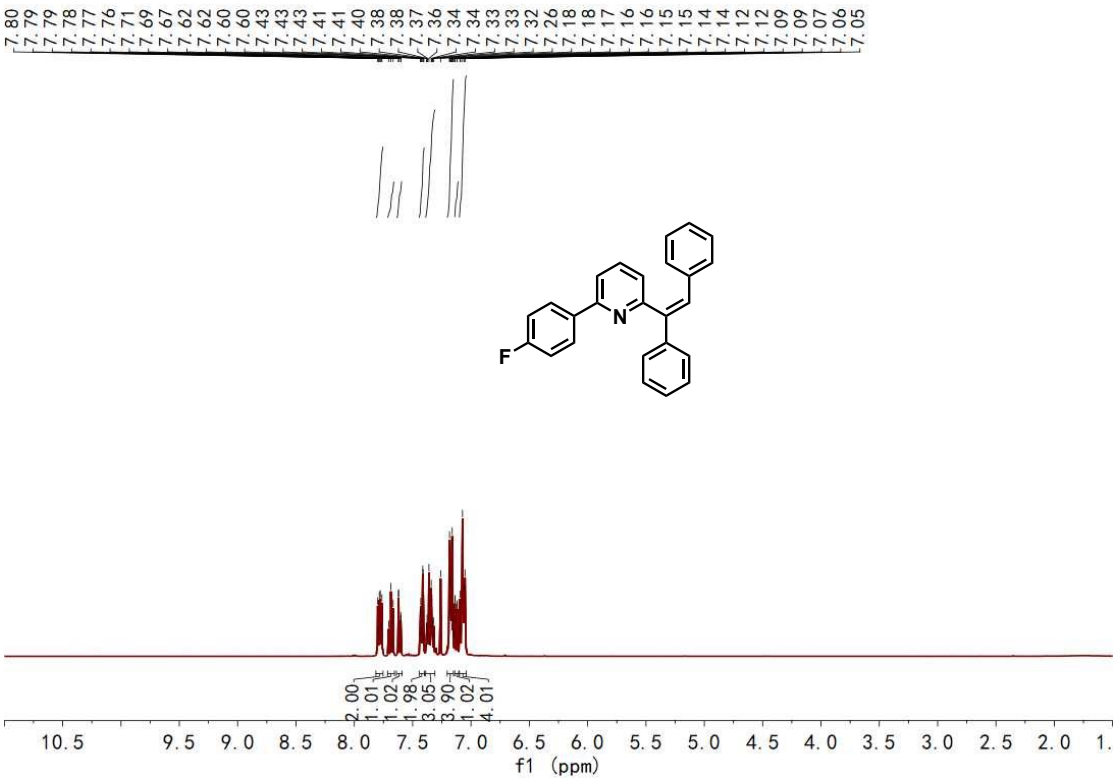

**(*Z*)-2-(1,2-Diphenylvinyl)-6-(4-methoxyphenyl)pyridine (S8): $^{1}$H NMR (400 MHz, $CDCl_3$)**



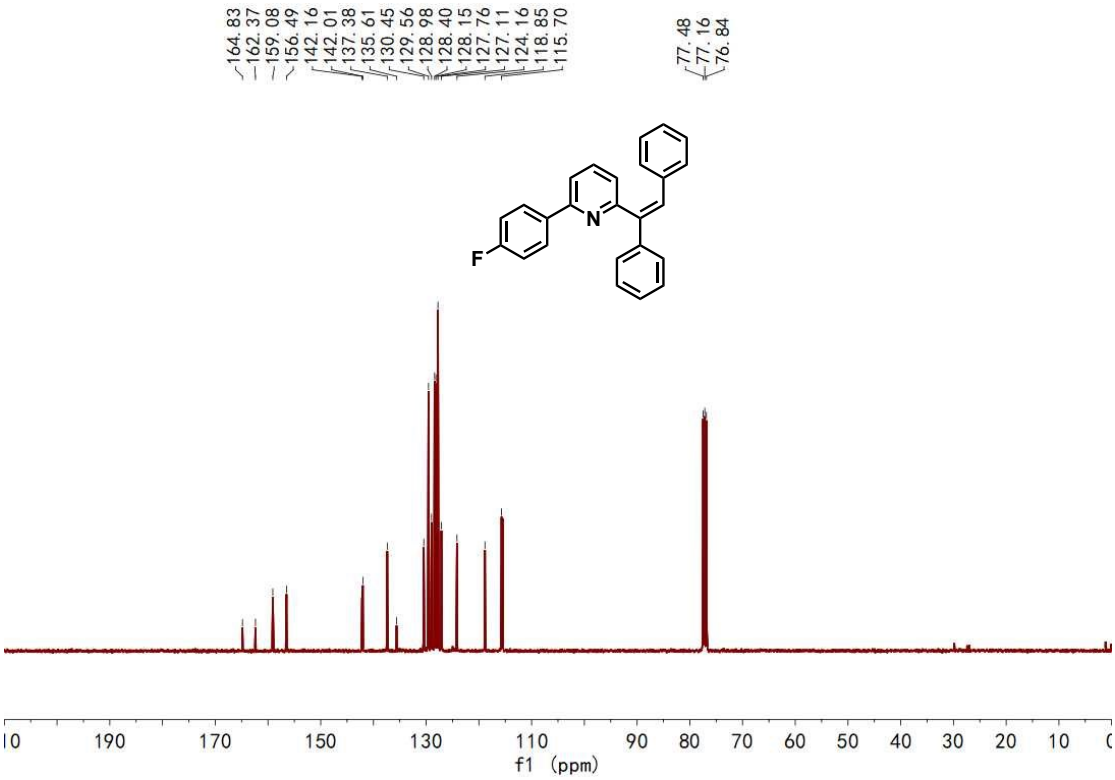
**(*Z*)-2-(1,2-Diphenylvinyl)-6-(4-methoxyphenyl)pyridine (S8): $^{13}$C NMR (101 MHz, $CDCl_3$)**



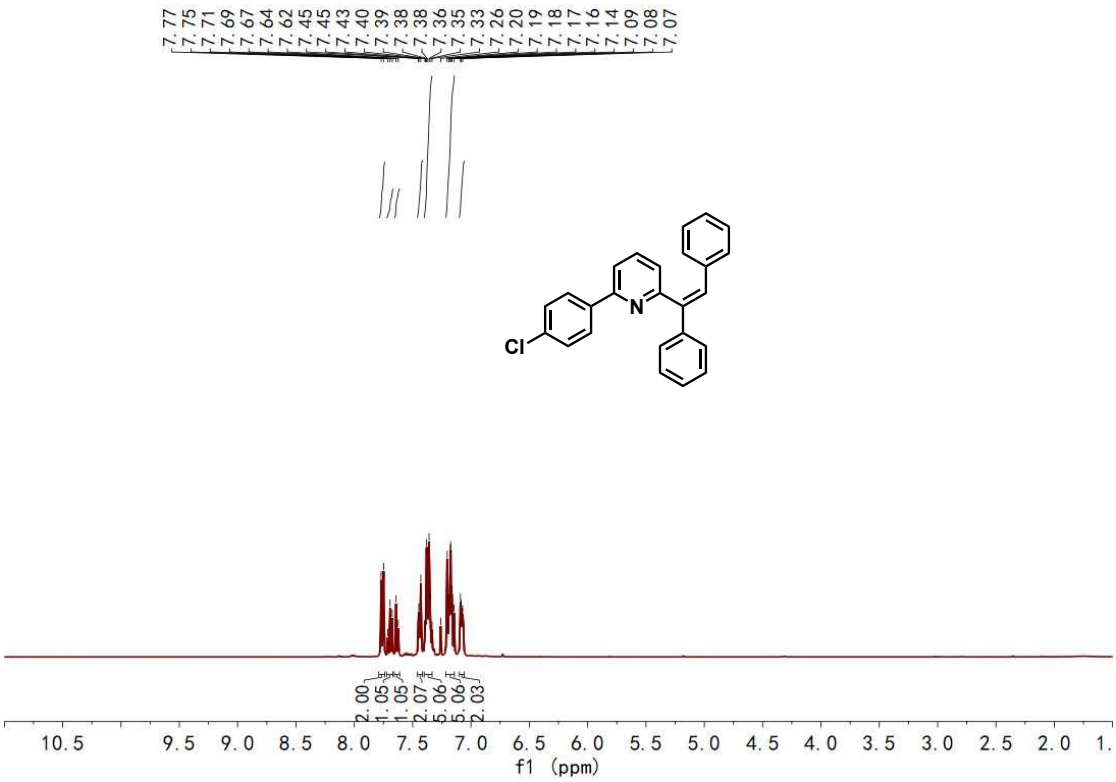

**(*Z*)-2-(1,2-Diphenylvinyl)-6-(4-fluorophenyl)pyridine (S9): $^{1}$H NMR (400 MHz, $CDCl_3$)**



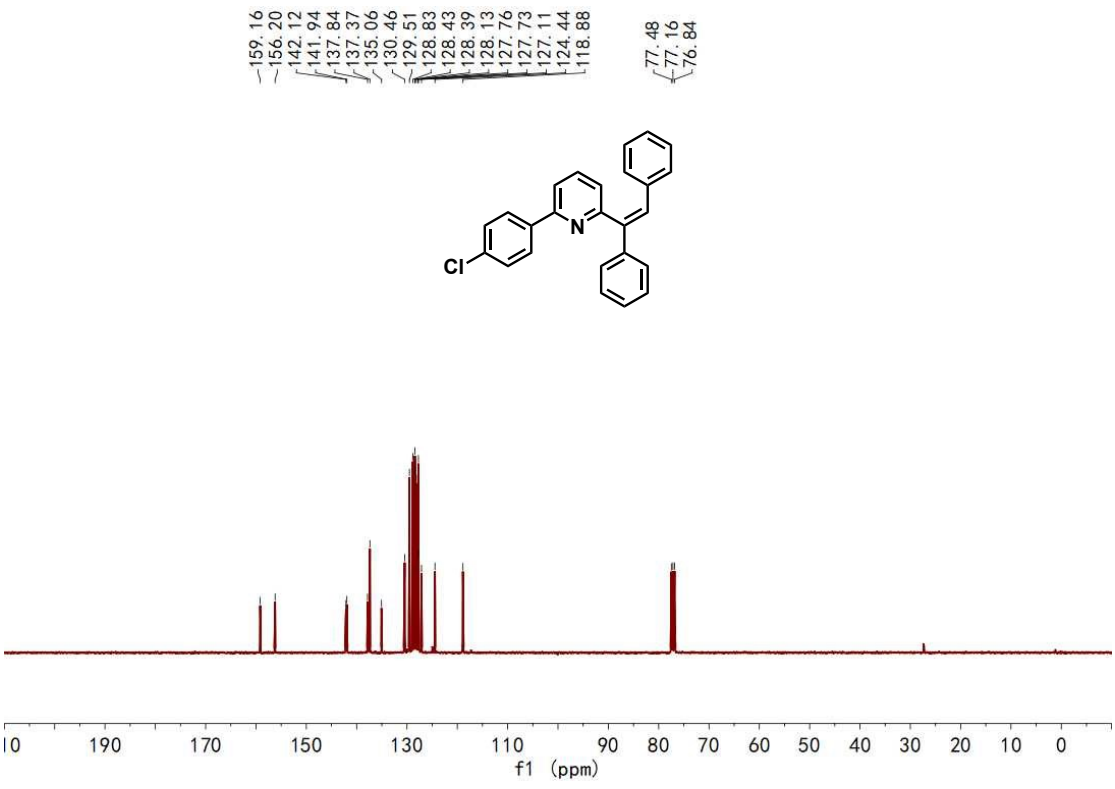

**(*Z*)-2-(1,2-Diphenylvinyl)-6-(4-fluorophenyl)pyridine (S9): $^{13}$C NMR (101 MHz, $CDCl_3$)**



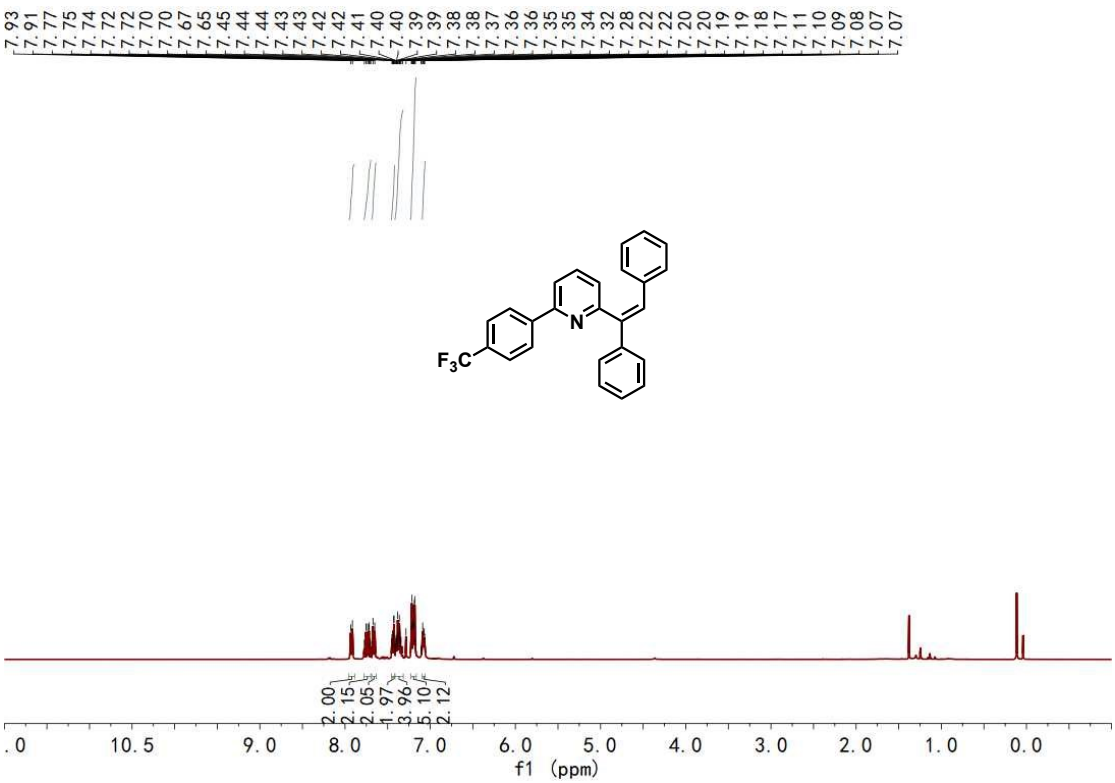

**(*Z*)-2-(4-Chlorophenyl)-6-(1,2-diphenylvinyl)pyridine (S10): $^{1}$H NMR (400 MHz, $CDCl_3$)**



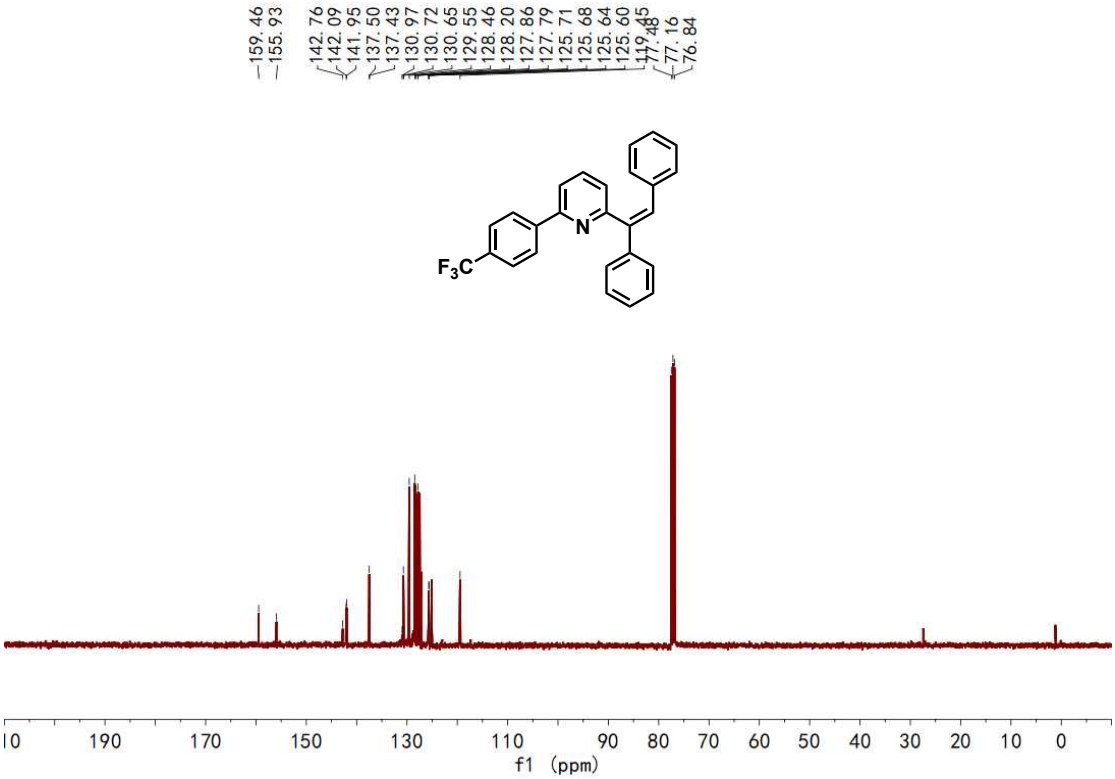

**(*Z*)-2-(4-Chlorophenyl)-6-(1,2-diphenylvinyl)pyridine (S10): $^{13}$C NMR (101 MHz, $CDCl_3$)**



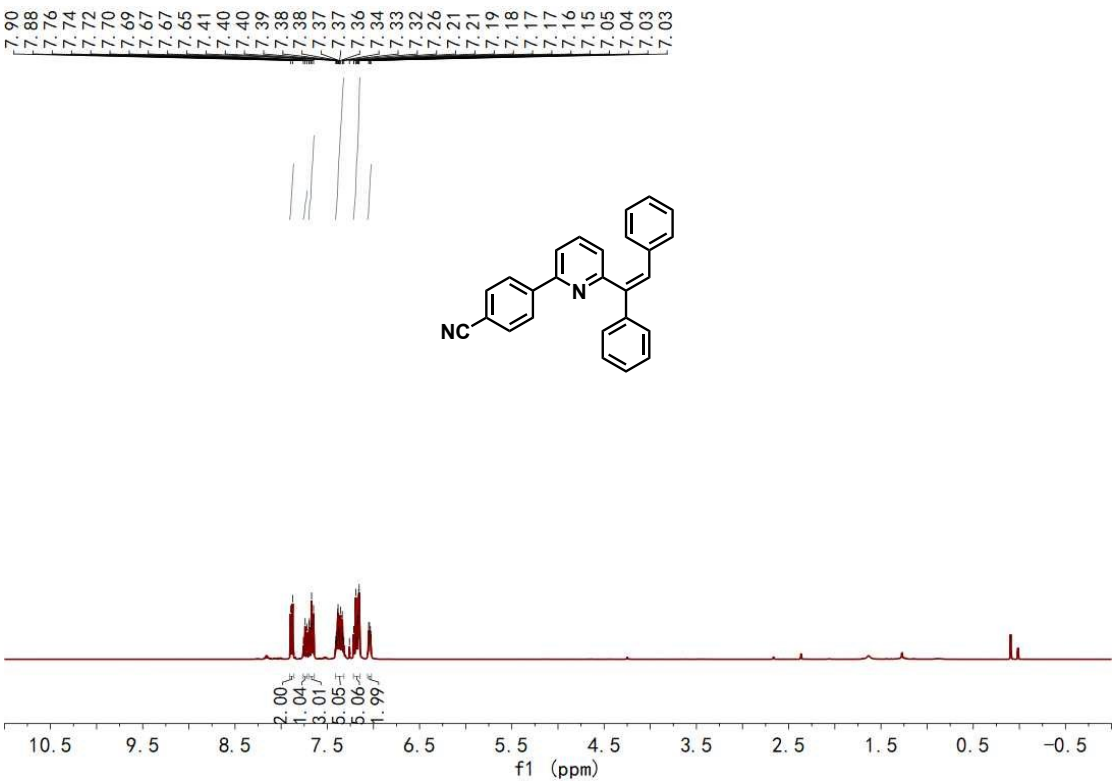

**(*Z*)-2-(1,2-Diphenylvinyl)-6-(4-(trifluoromethyl)phenyl)pyridine (S11): $^{1}$H NMR (400 MHz, $CDCl_3$)**



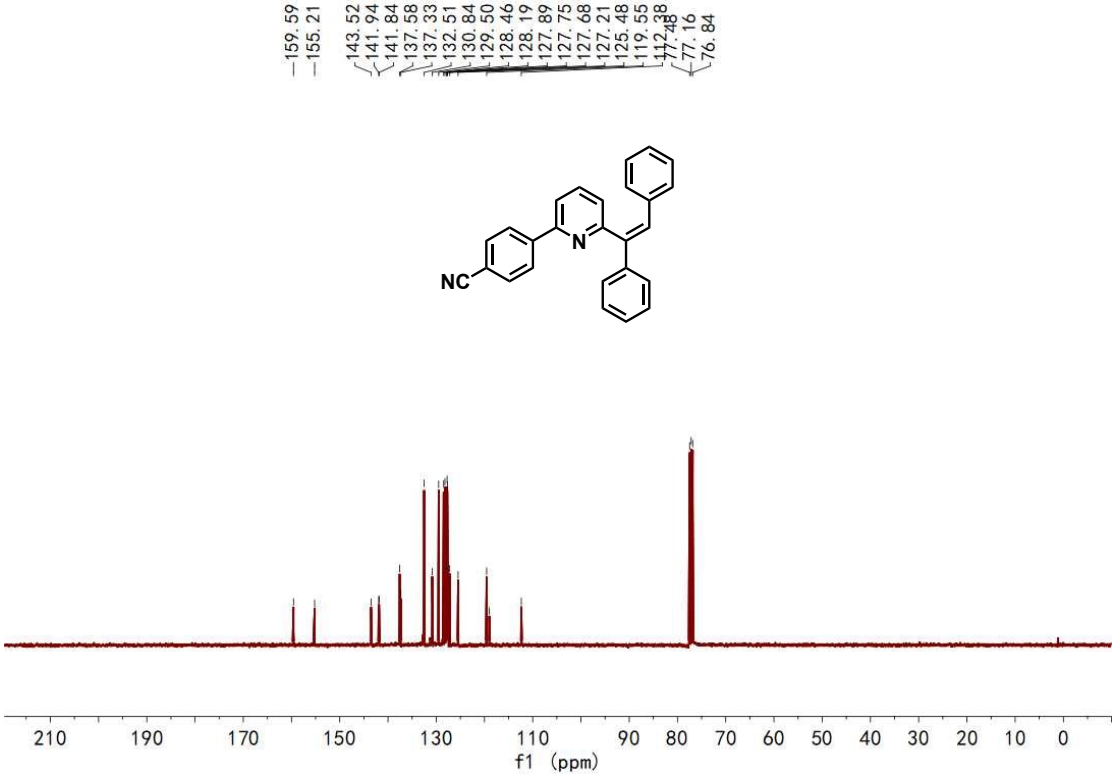

**(*Z*)-2-(1,2-Diphenylvinyl)-6-(4-(trifluoromethyl)phenyl)pyridine (S11): $^{13}$C NMR (101 MHz, $CDCl_3$)**



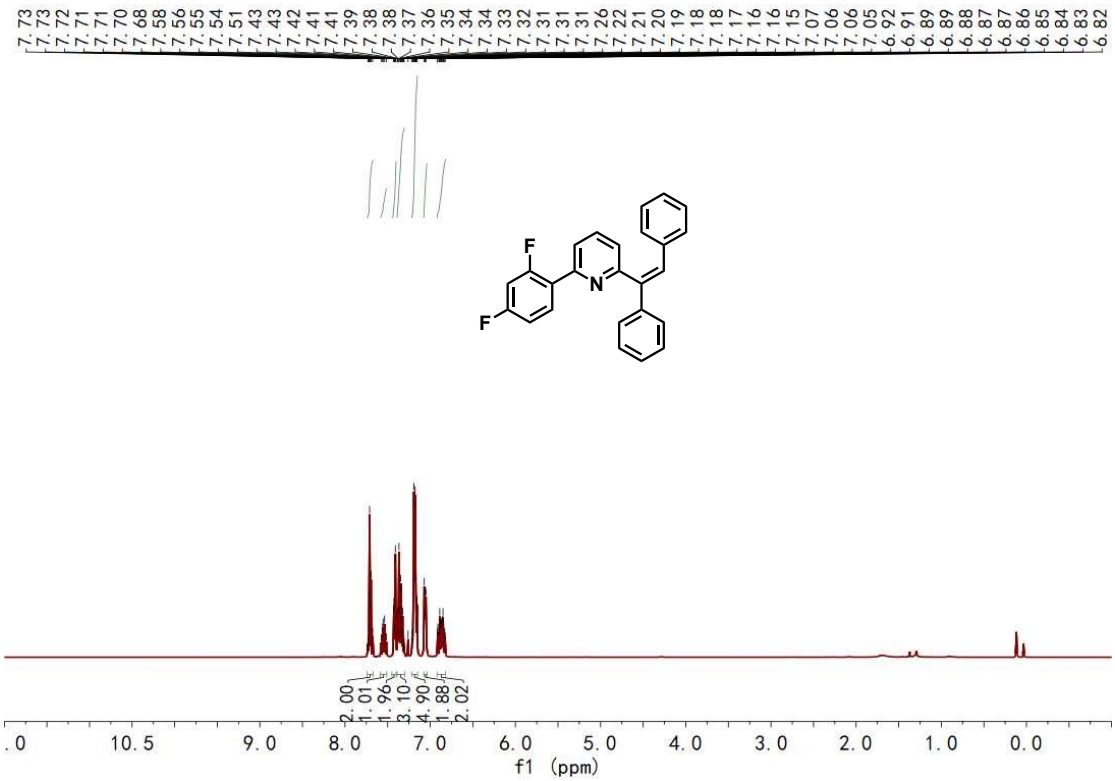

**(*Z*)-4-(6-(1,2-Diphenylvinyl)pyridin-2-yl)benzonitrile (S12): $^{1}$H NMR (400 MHz, $CDCl_3$)**



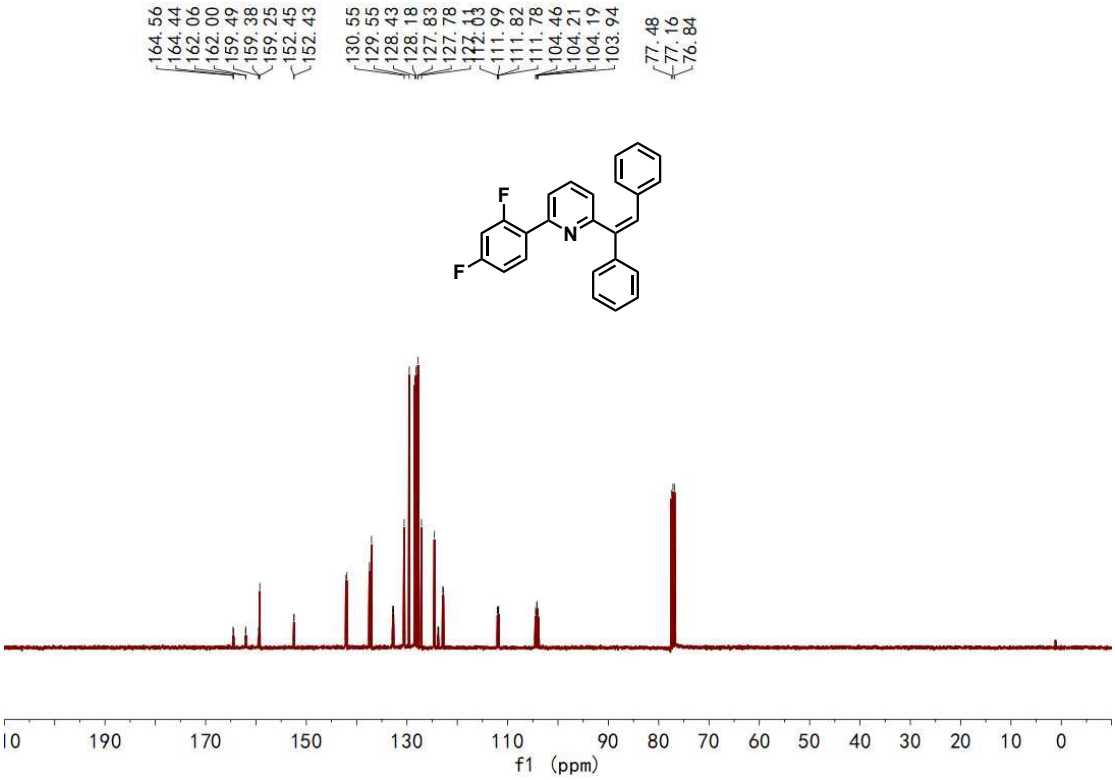

**(*Z*)-4-(6-(1,2-Diphenylvinyl)pyridin-2-yl)benzonitrile (S12): $^{13}$C NMR (101 MHz, $CDCl_3$)**



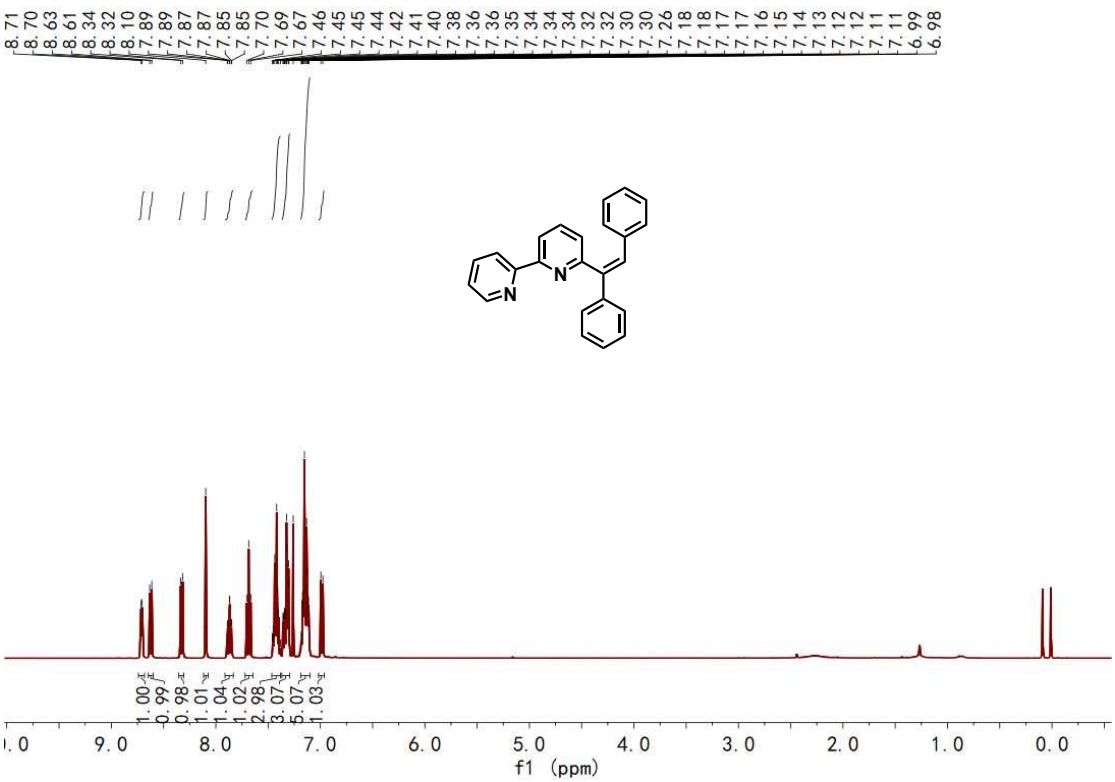

**(*Z*)-2-(2,4-Difluorophenyl)-6-(1,2-diphenylvinyl)pyridine (S13): $^{1}$H NMR (400 MHz, $CDCl_3$)**



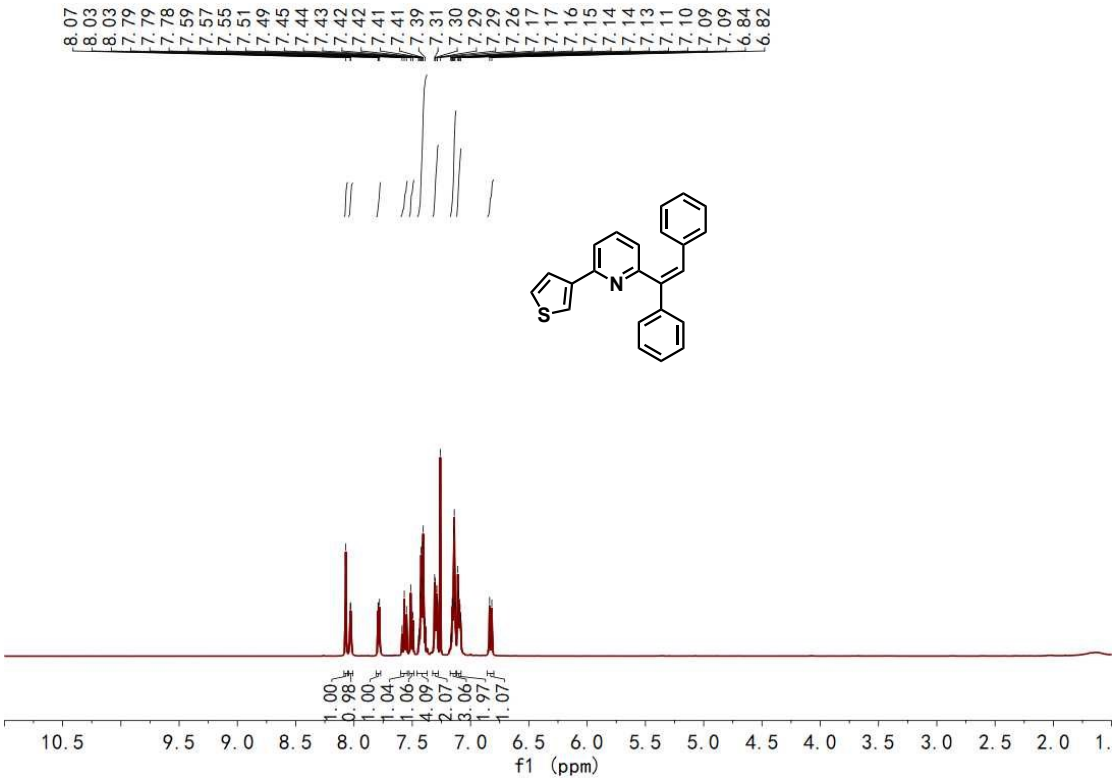

**(*Z*)-2-(2,4-Difluorophenyl)-6-(1,2-diphenylvinyl)pyridine (S13): $^{13}$C NMR (101 MHz, $CDCl_3$)**



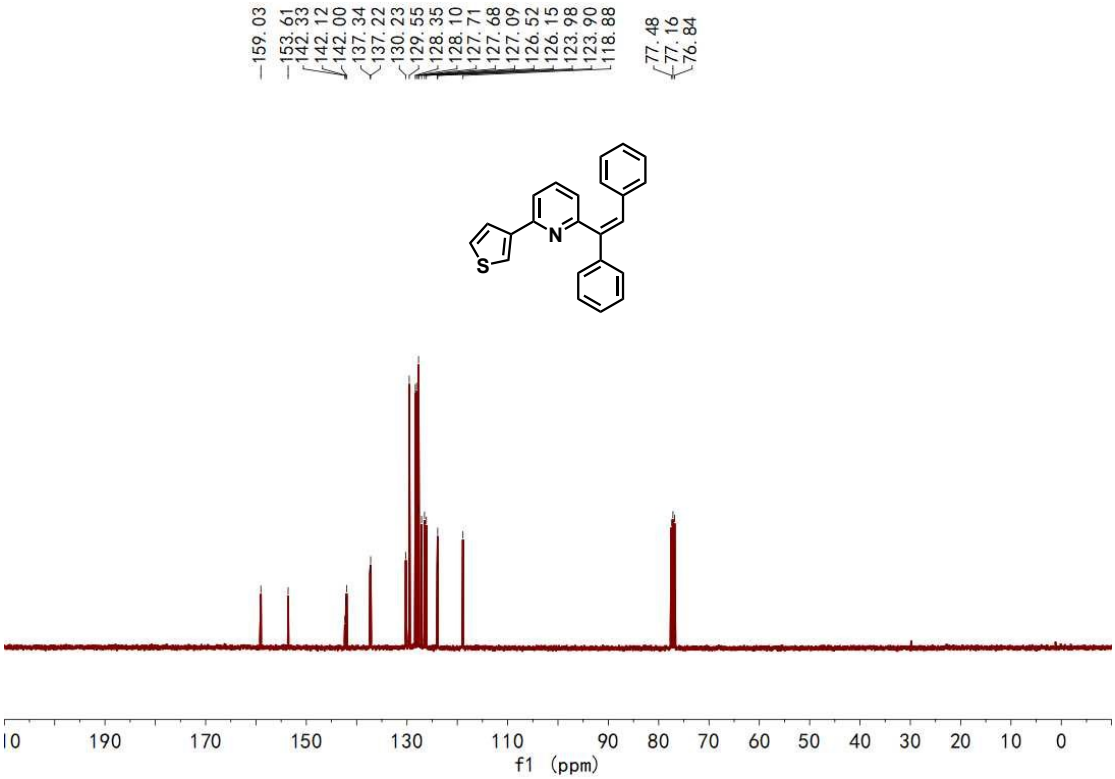

**(*Z*)-6-(1,2-Diphenylvinyl)-2,2'-bipyridine (S14): $^{1}$H NMR (400 MHz, $CDCl_3$)**



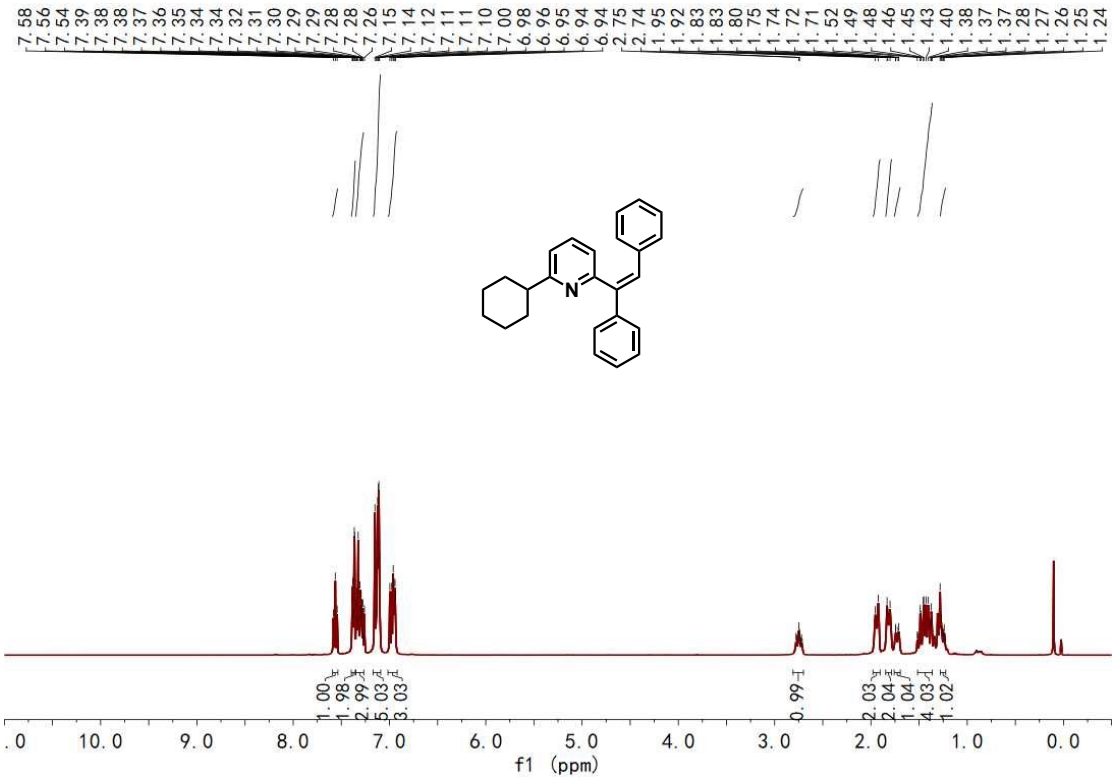

**(*Z*)-2-(1,2-Diphenylvinyl)-6-(thiophen-2-yl)pyridine (S15): $^{1}$H NMR (400 MHz, $CDCl_3$)**



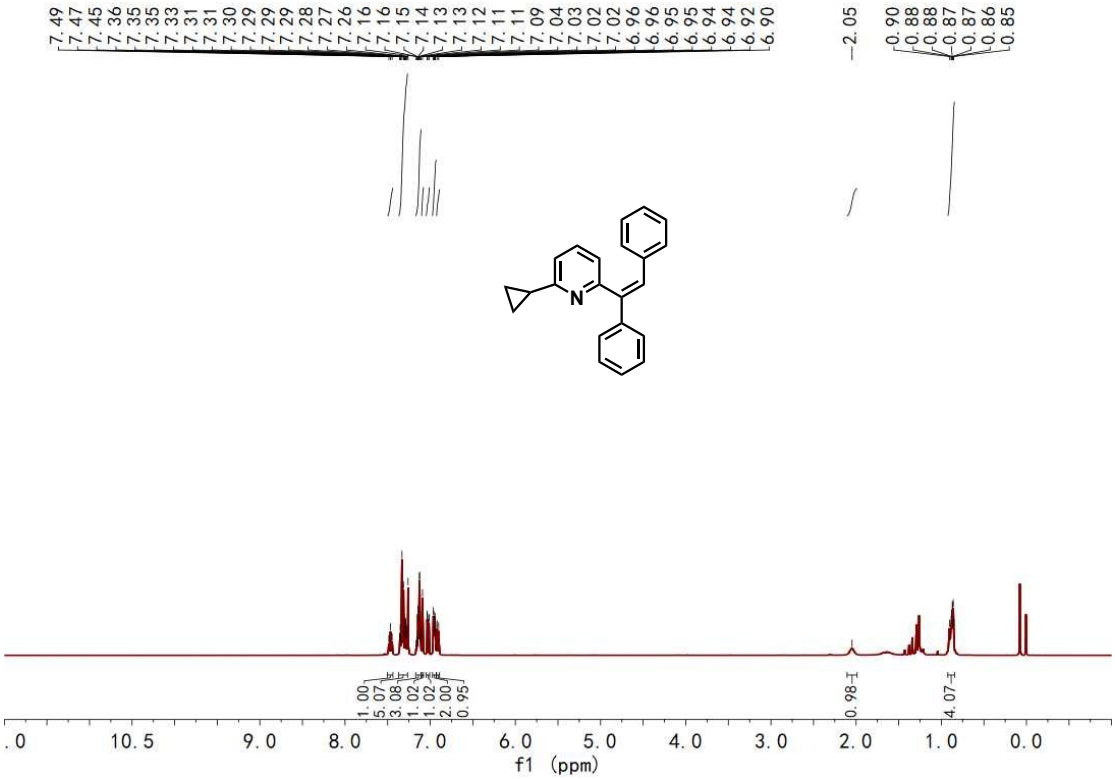

**(*Z*)-2-(1,2-Diphenylvinyl)-6-(thiophen-2-yl)pyridine (S15): $^{13}$C NMR (101 MHz, $CDCl_3$)**



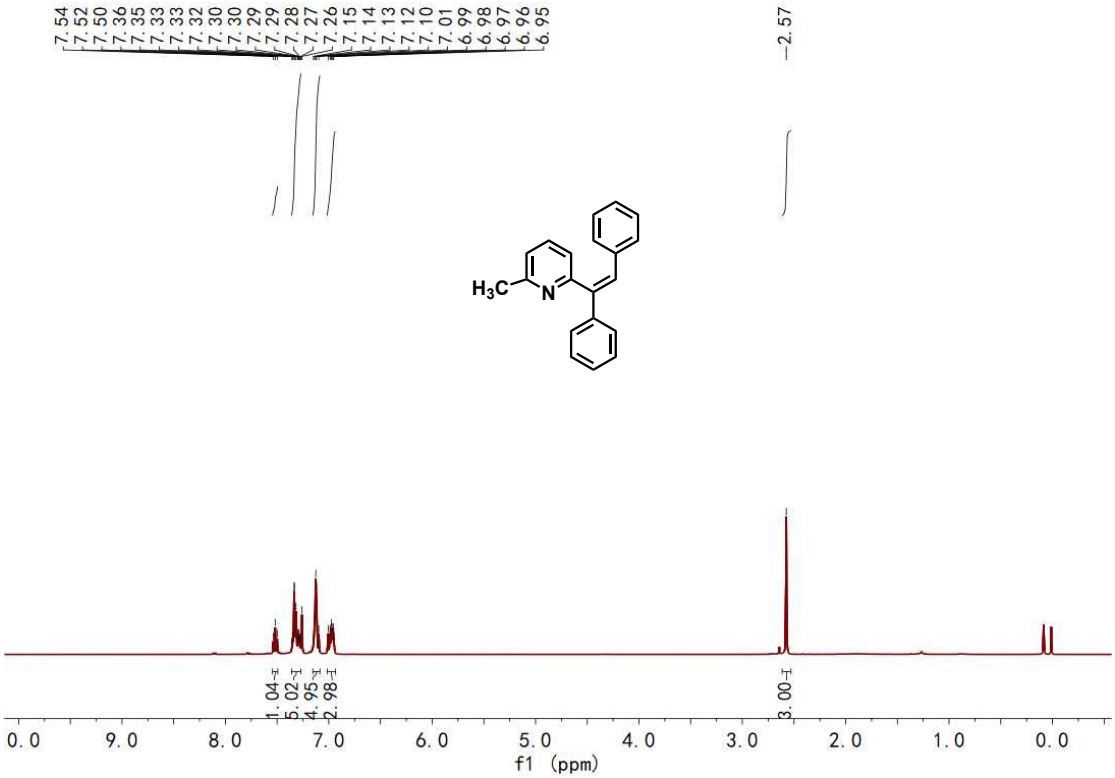

**(*Z*)-2-Cyclohexyl-6-(1,2-diphenylvinyl)pyridine (S16): $^{1}$H NMR (400 MHz, $CDCl_3$)**



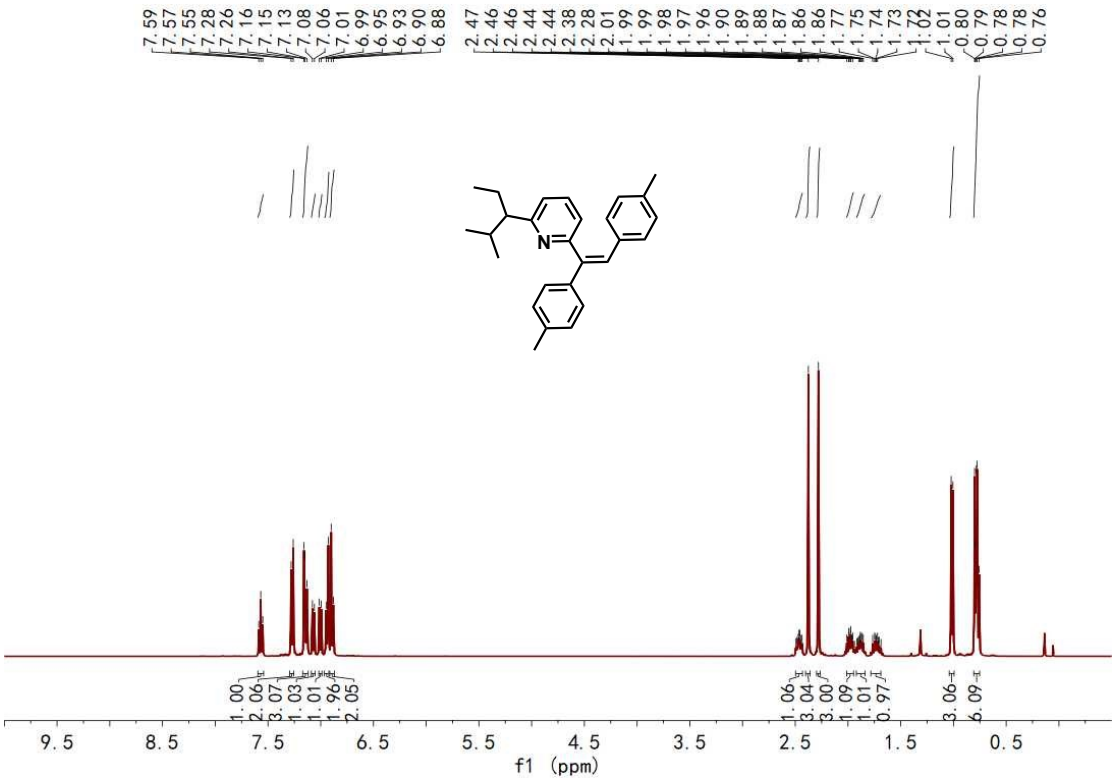

**(*Z*)-2-Cyclopropyl-6-(1,2-diphenylvinyl)pyridine (S17): $^{1}$H NMR (400 MHz, $CDCl_3$)**



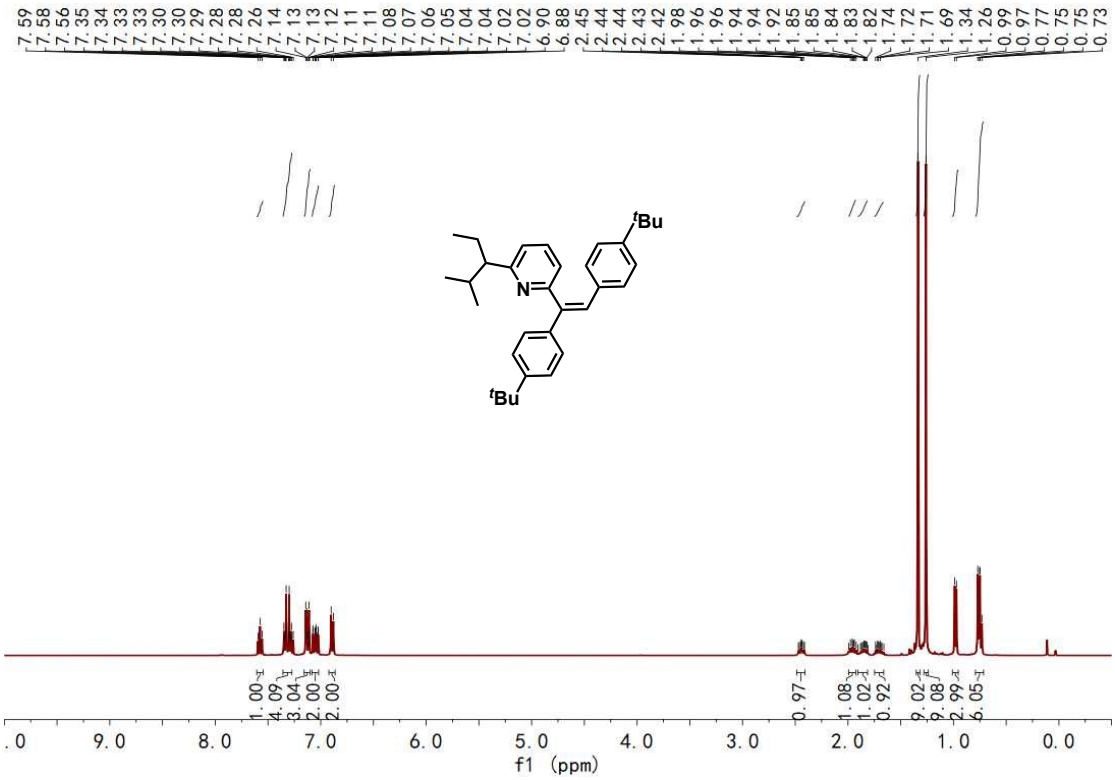

**(*Z*)-2-(1,2-Diphenylvinyl)-6-methylpyridine (S18): $^{1}$H NMR (400 MHz, $CDCl_3$)**



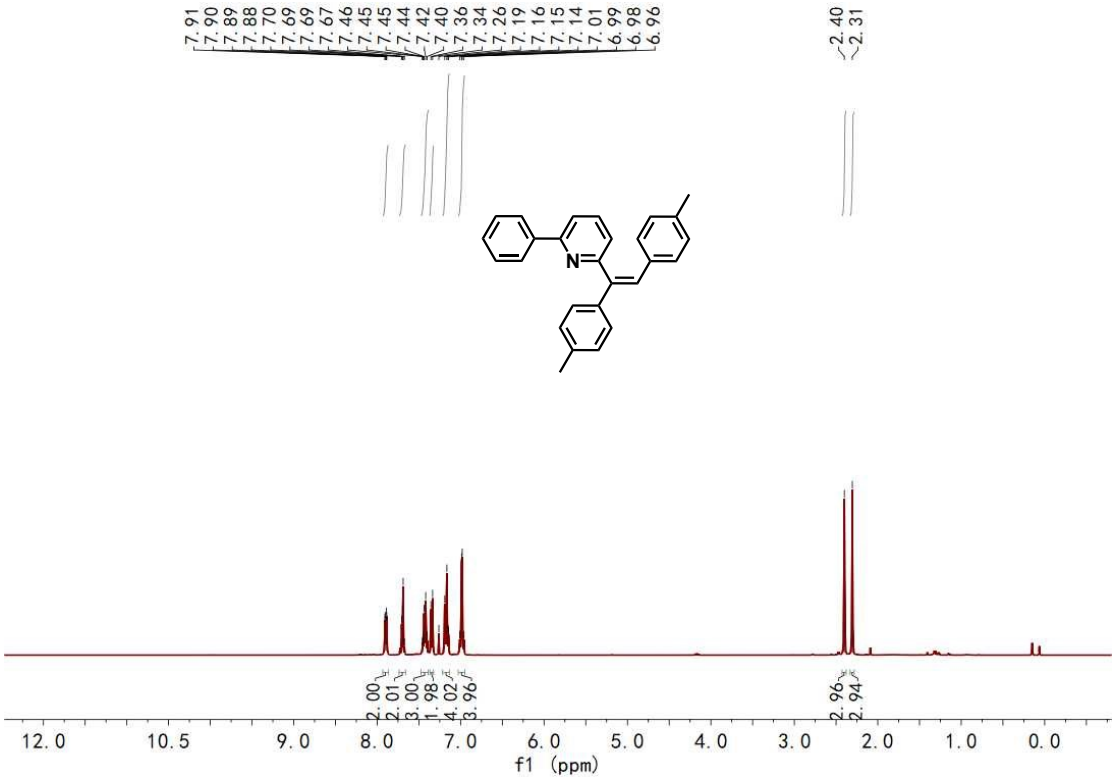

**(*Z*)-2-(1,2-Di-*p*-tolylvinyl)-6-(2-methylpentan-3-yl)pyridine (S19): $^{1}$H NMR (400 MHz, $CDCl_3$)**



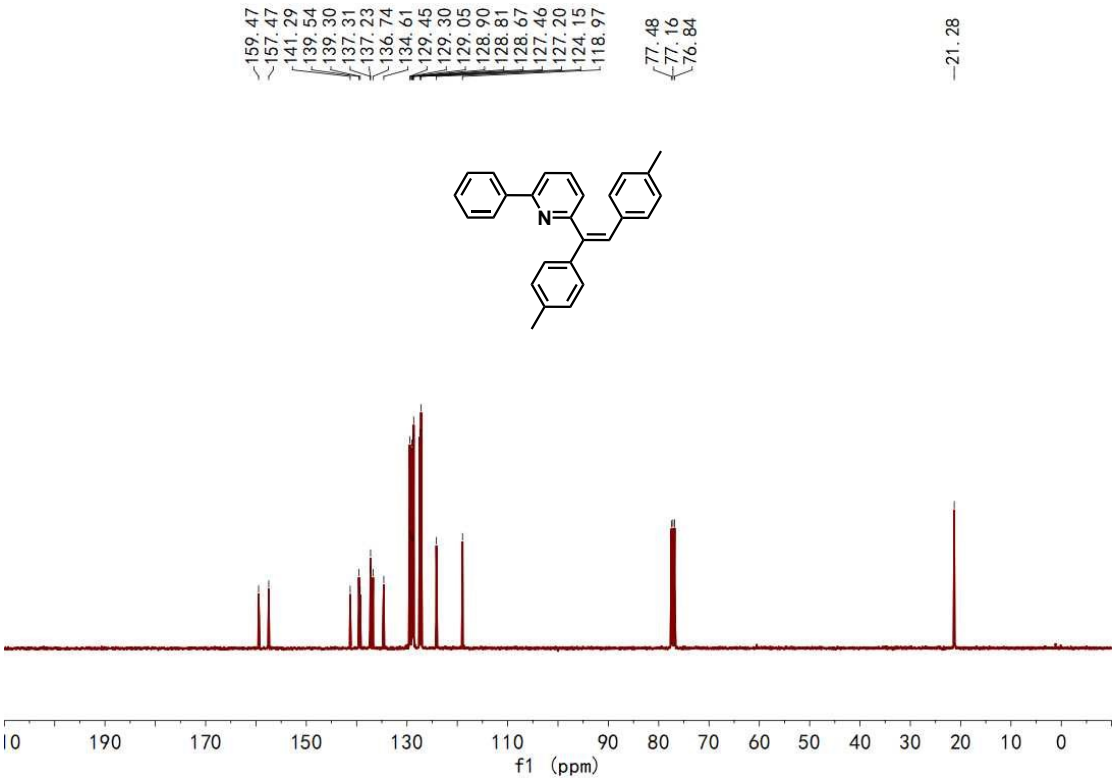

**(*Z*)-2-(1,2-Bis(4-(*tert*-butyl)phenyl)vinyl)-6-(2-methylpentan-3-yl)pyridine (S20): $^1$H NMR (400 MHz, $CDCl_3$)**



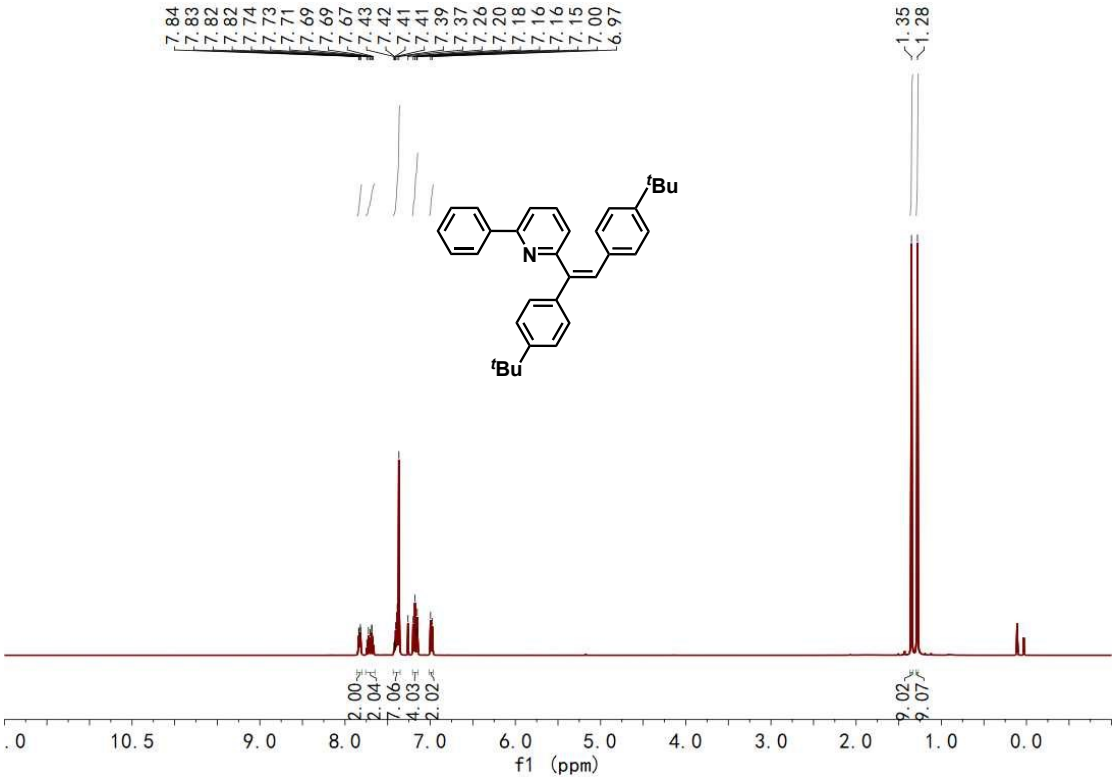

**(*Z*)-2-(1,2-Di-*p*-tolylvinyl)-6-phenylpyridine (S21): $^1$H NMR (400 MHz, $CDCl_3$)**



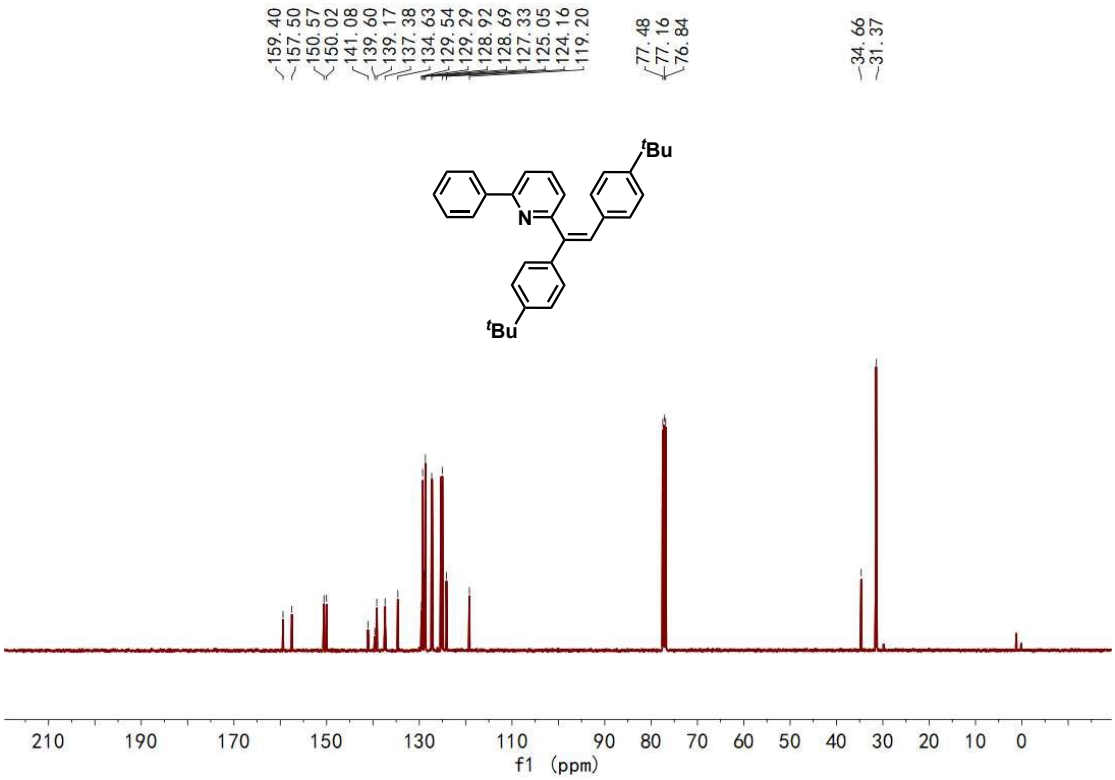

**(*Z*)-2-(1,2-Di-*p*-tolylvinyl)-6-phenylpyridine (S21): $^{13}$C NMR (101 MHz, $CDCl_3$)**



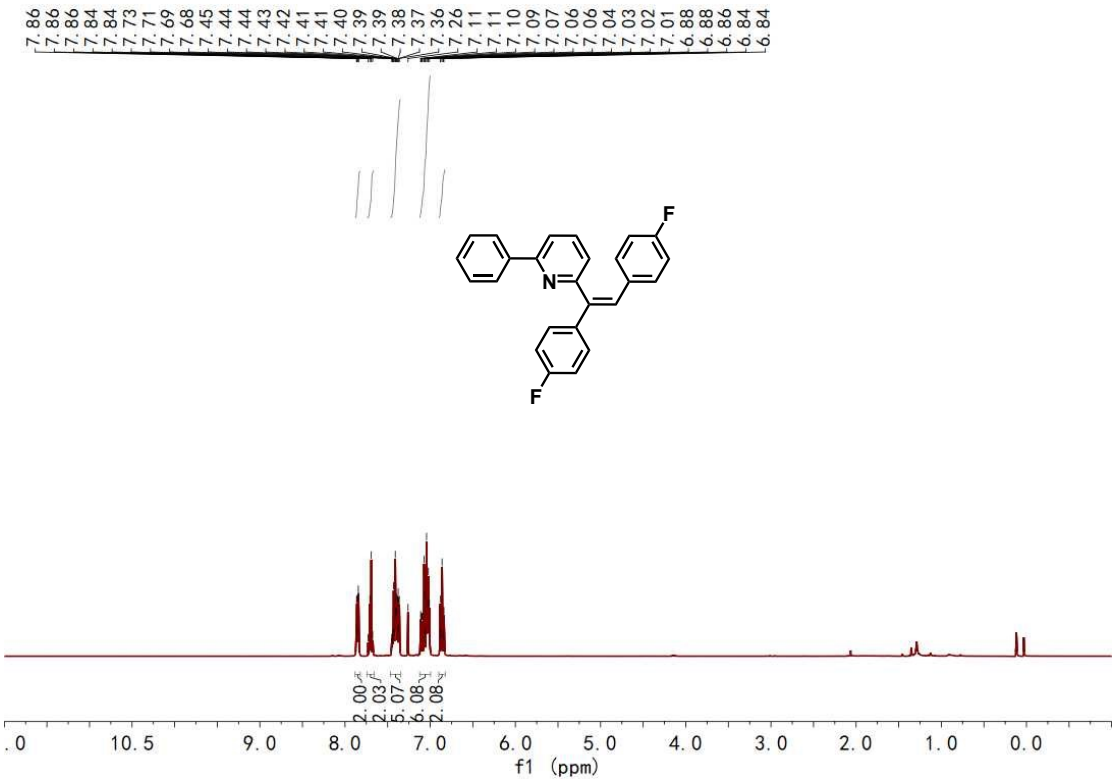

**(*Z*)-2-(1,2-Bis(4-(*tert*-butyl)phenyl)vinyl)-6-phenylpyridine (S22): $^{1}$H NMR (400 MHz, $CDCl_3$)**



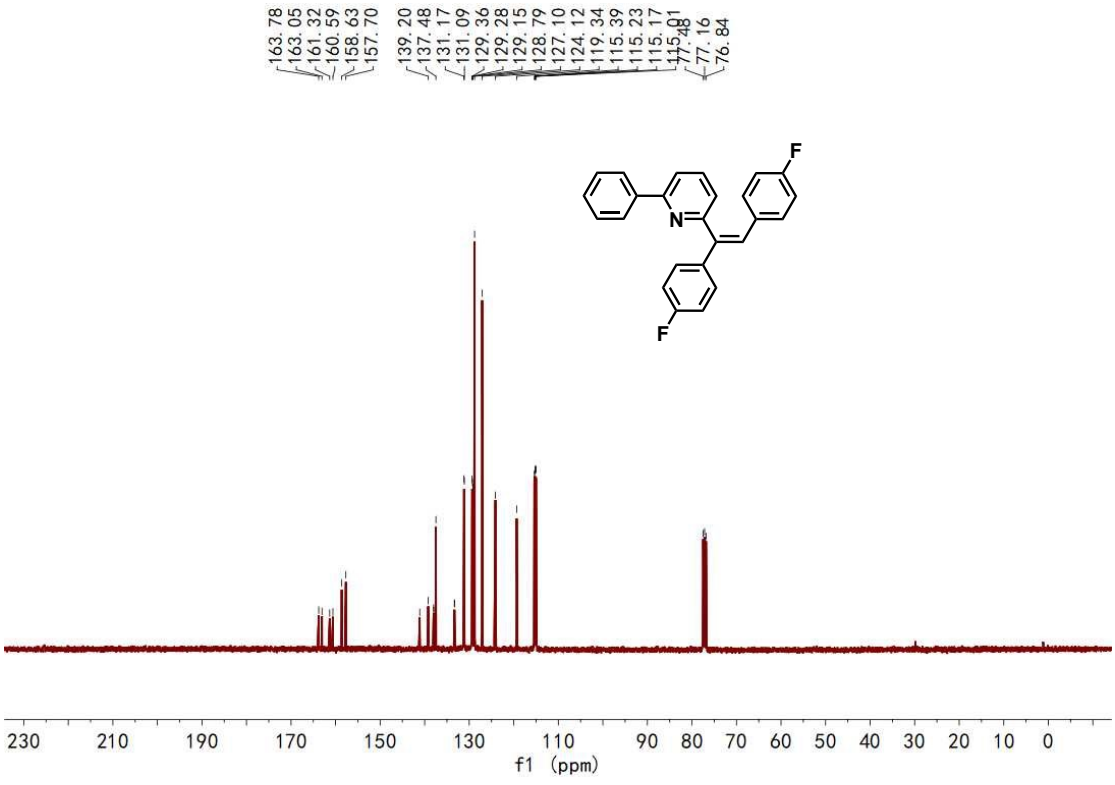

**(*Z*)-2-(1,2-Bis(4-(*tert*-butyl)phenyl)vinyl)-6-phenylpyridine (S22): $^{13}$C NMR (101 MHz, $CDCl_3$)**



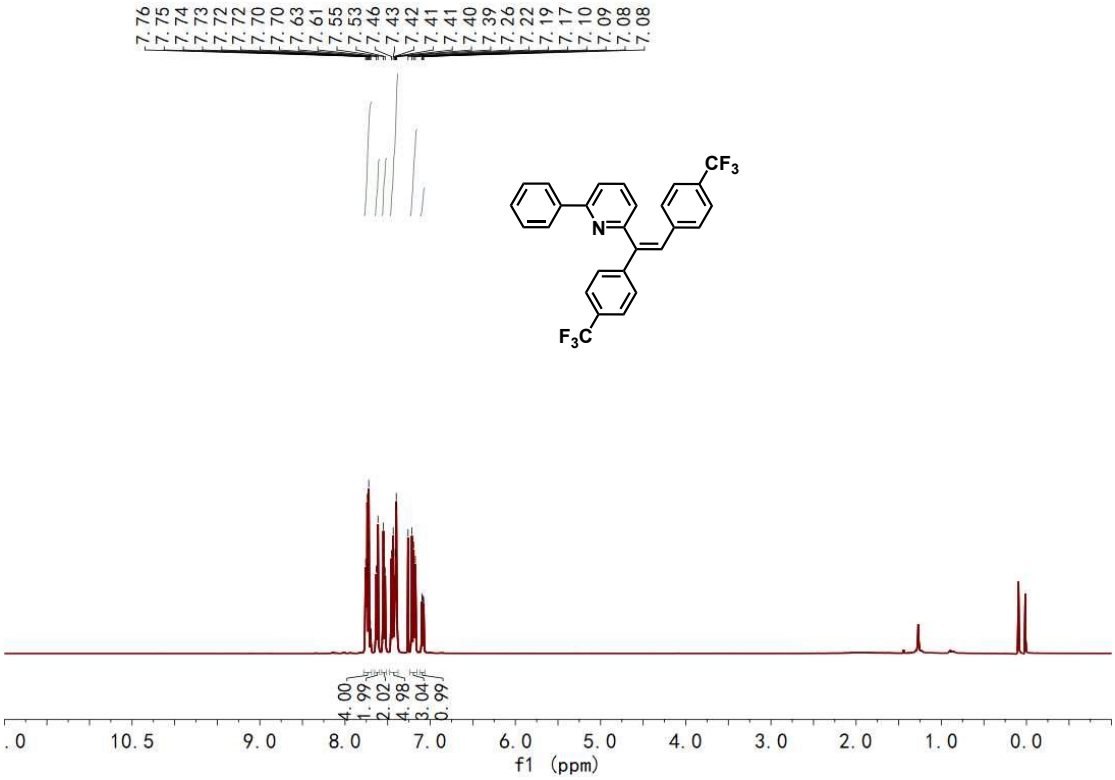

**(*Z*)-2-(1,2-Bis(4-fluorophenyl)vinyl)-6-phenylpyridine (S23): $^{1}$H NMR (400 MHz, $CDCl_3$)**



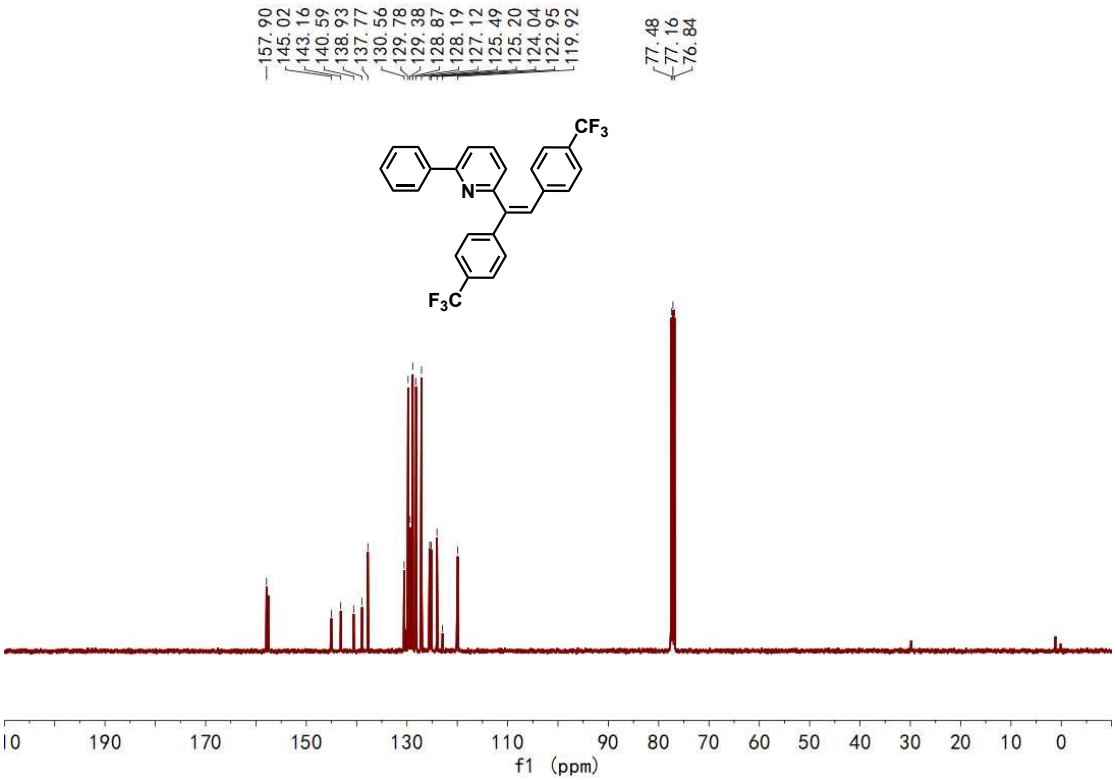

**(*Z*)-2-(1,2-Bis(4-fluorophenyl)vinyl)-6-phenylpyridine (S23): $^{1}$H NMR (400 MHz, $CDCl_3$)**



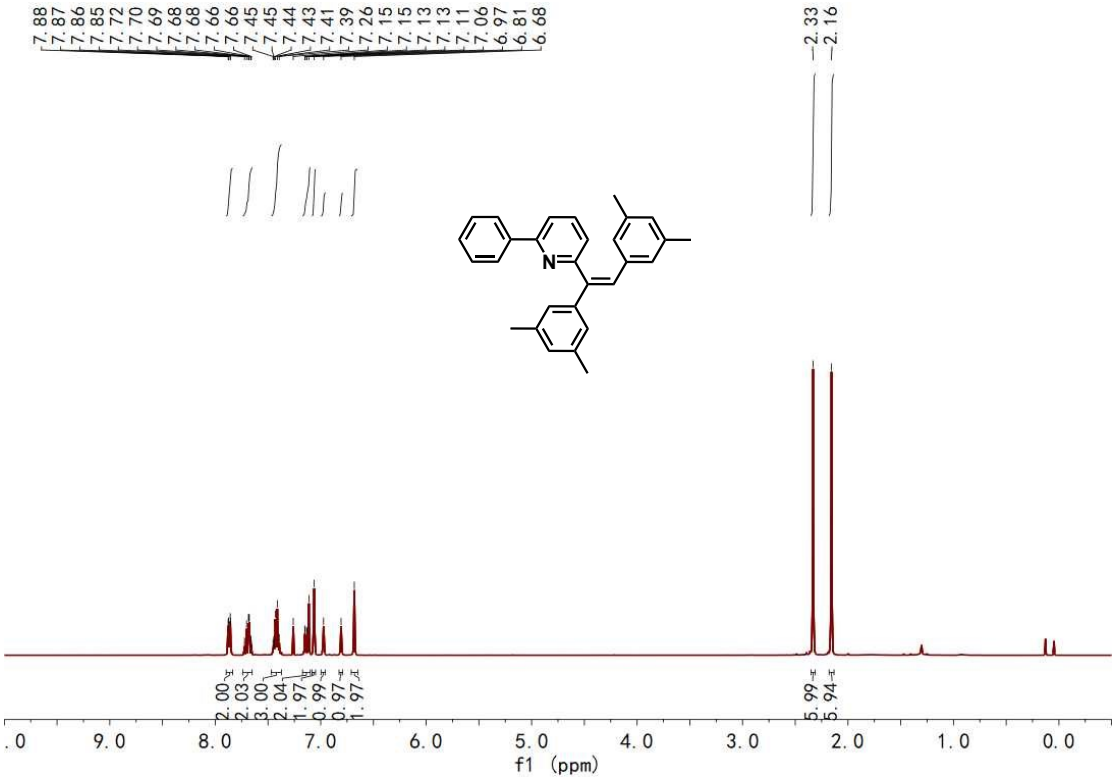
**(*Z*)-2-(1,2-Bis(4-(trifluoromethyl)phenyl)vinyl)-6-phenylpyridine (S24): $^{1}$H NMR (400 MHz, $CDCl_3$)**



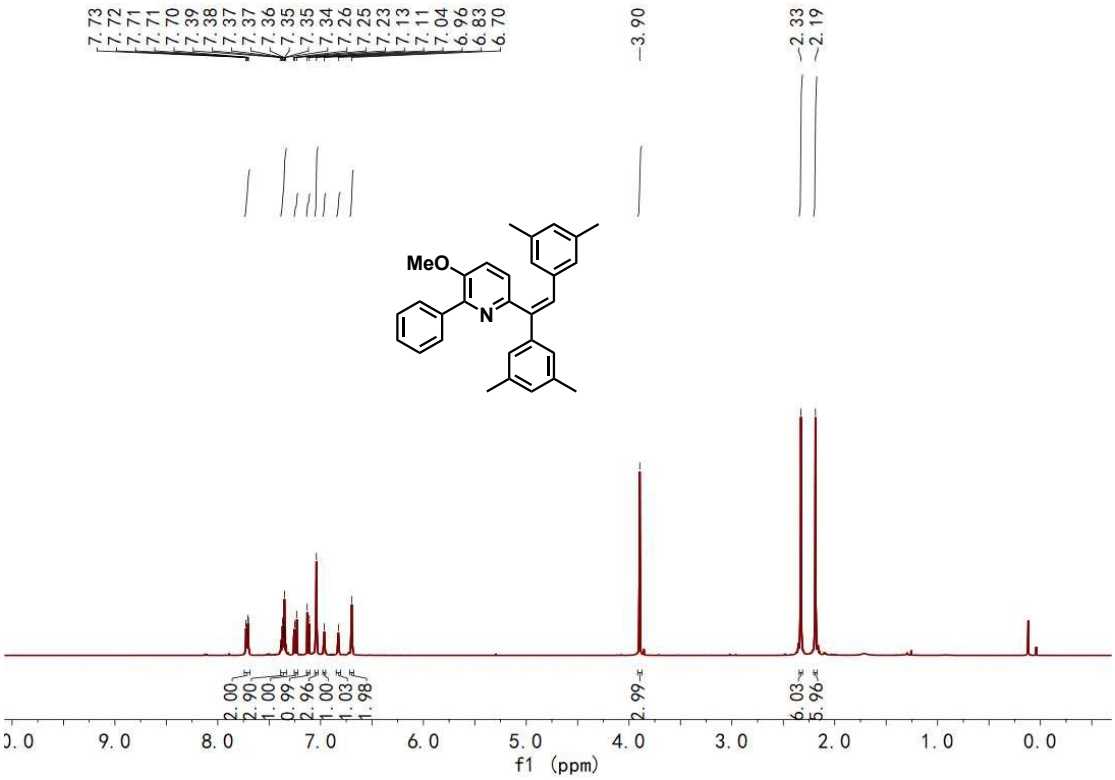

**(*Z*)-2-(1,2-Bis(4-(trifluoromethyl)phenyl)vinyl)-6-phenylpyridine (S24): $^{13}$C NMR (101 MHz, $CDCl_3$)**



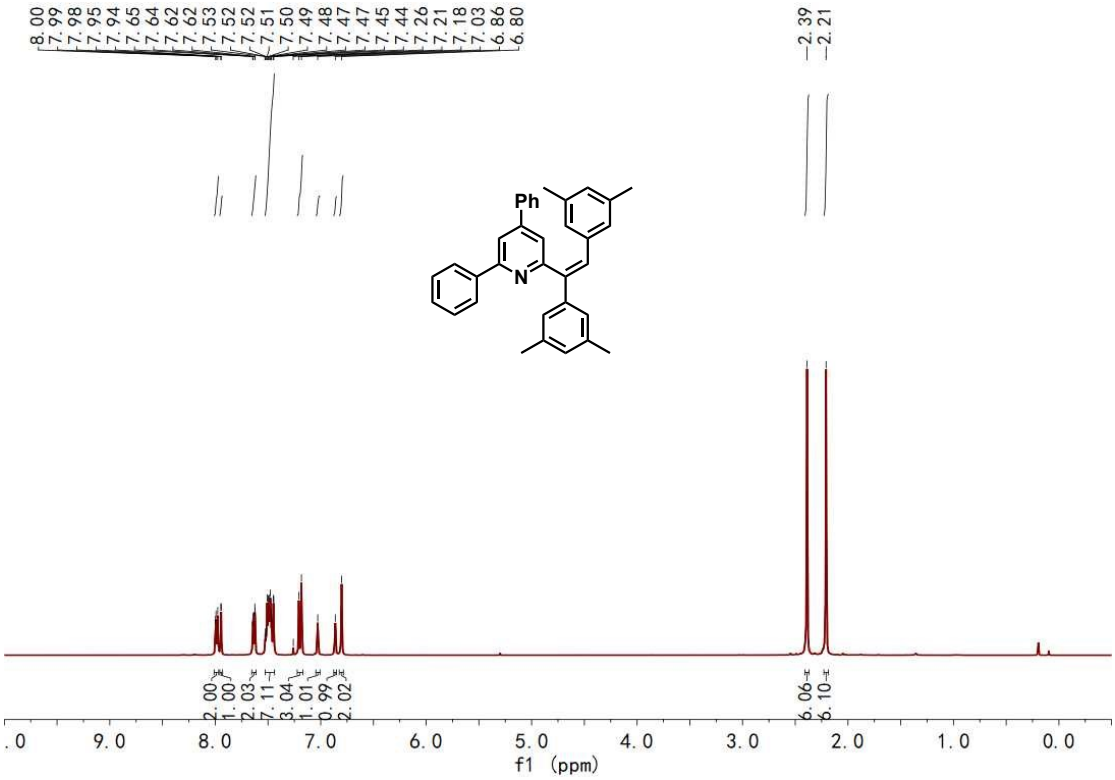

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-phenylpyridine (S25): $^{1}$H NMR (400 MHz, $CDCl_3$)**



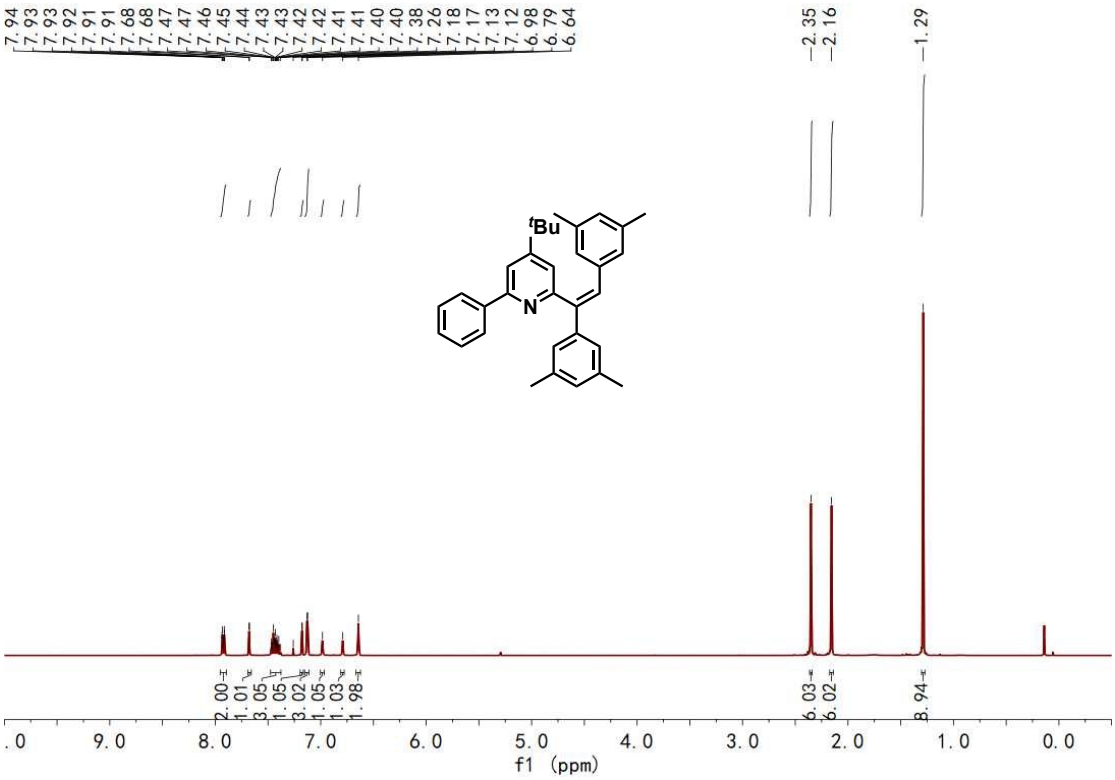

**(*Z*)-6-(1,2-Bis(3,5-dimethylphenyl)vinyl)-3-methoxy-2-phenylpyridine (S26): $^{1}$H NMR (400 MHz, $CDCl_3$)**



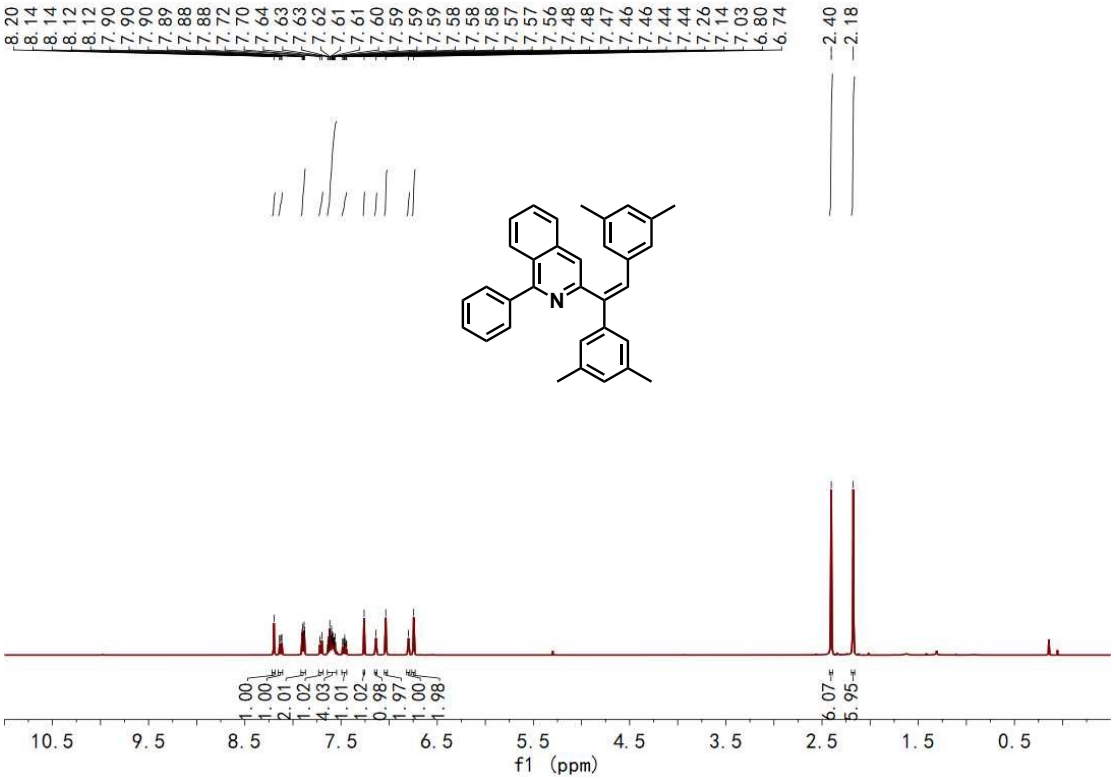

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-4,6-diphenylpyridine (S27): $^{1}$H NMR (400 HMz, $CDCl_3$)**



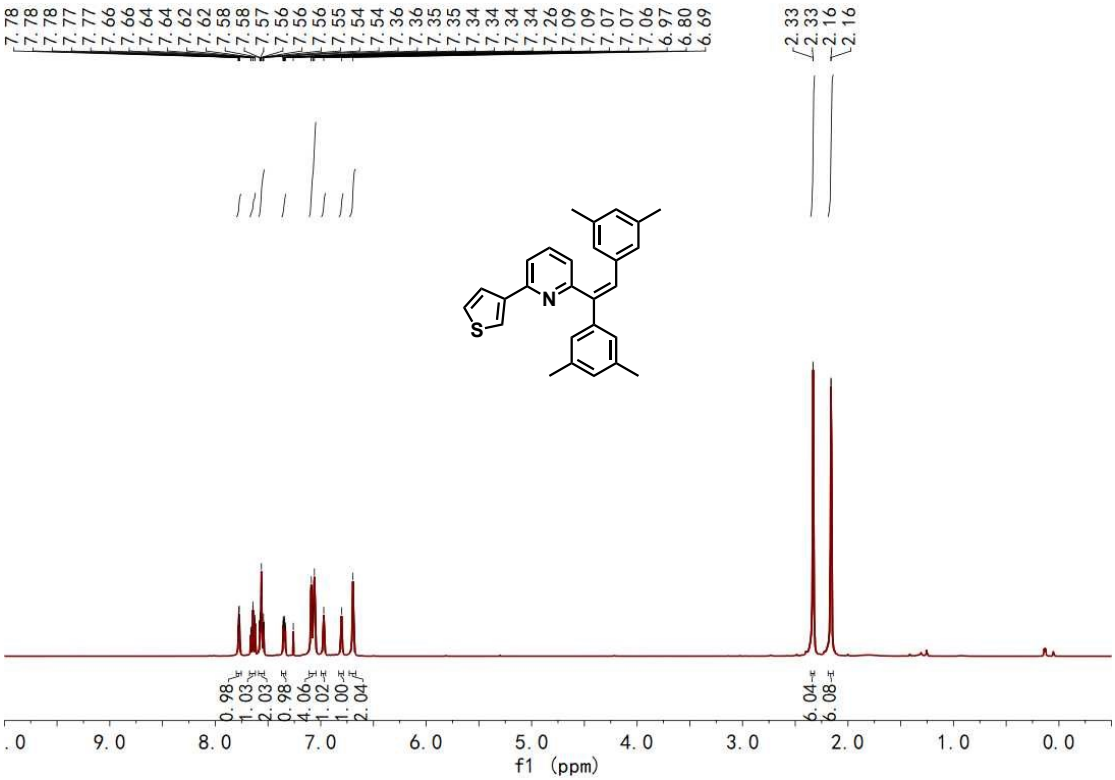

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-4-(*tert*-butyl)-6-phenylpyridine (S28): $^1$H NMR (400 MHz, $CDCl_3$)**



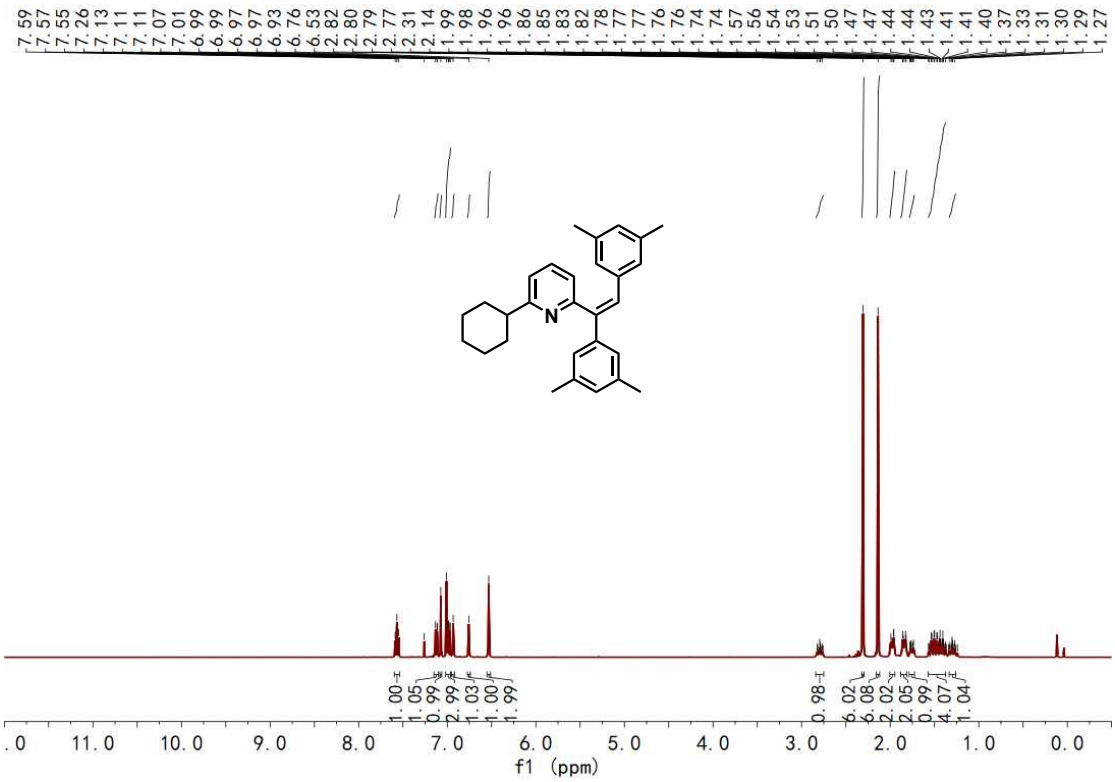

**(*Z*)-3-(1,2-Bis(3,5-dimethylphenyl)vinyl)-1-phenylisoquinoline (S29): $^1$H NMR (400 MHz, $CDCl_3$)**



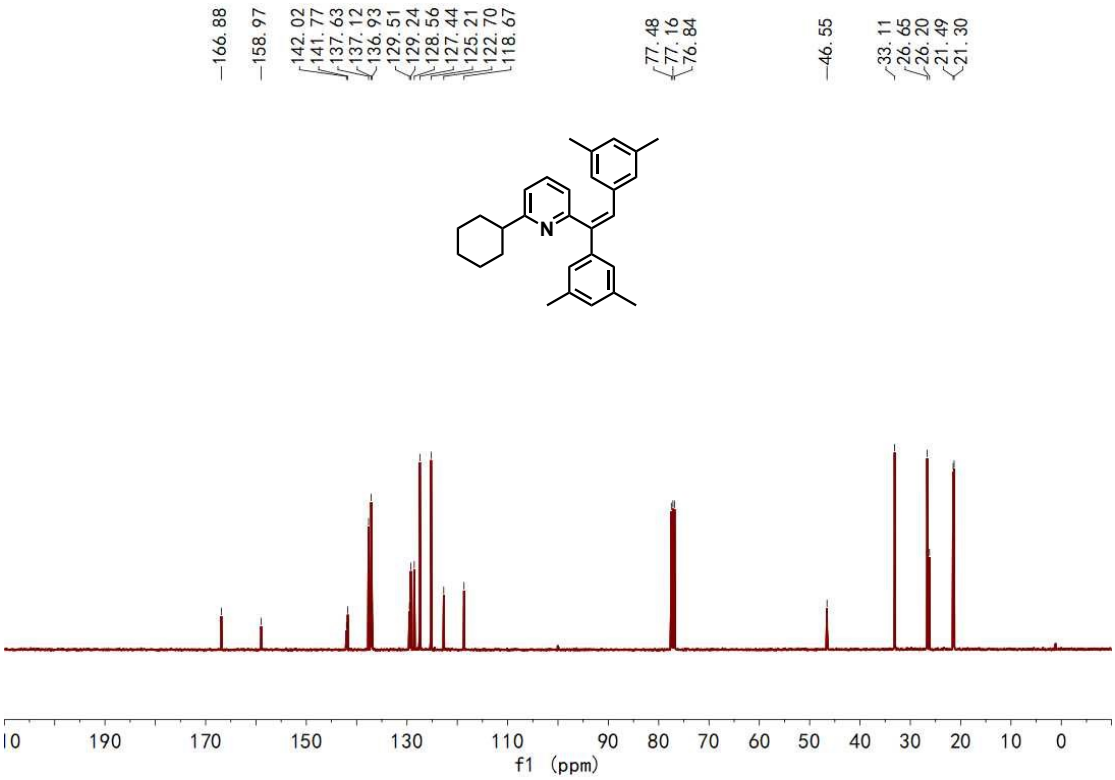
**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(thiophen-3-yl)pyridine (S30): $^{1}$H NMR (400 MHz, $CDCl_3$)**



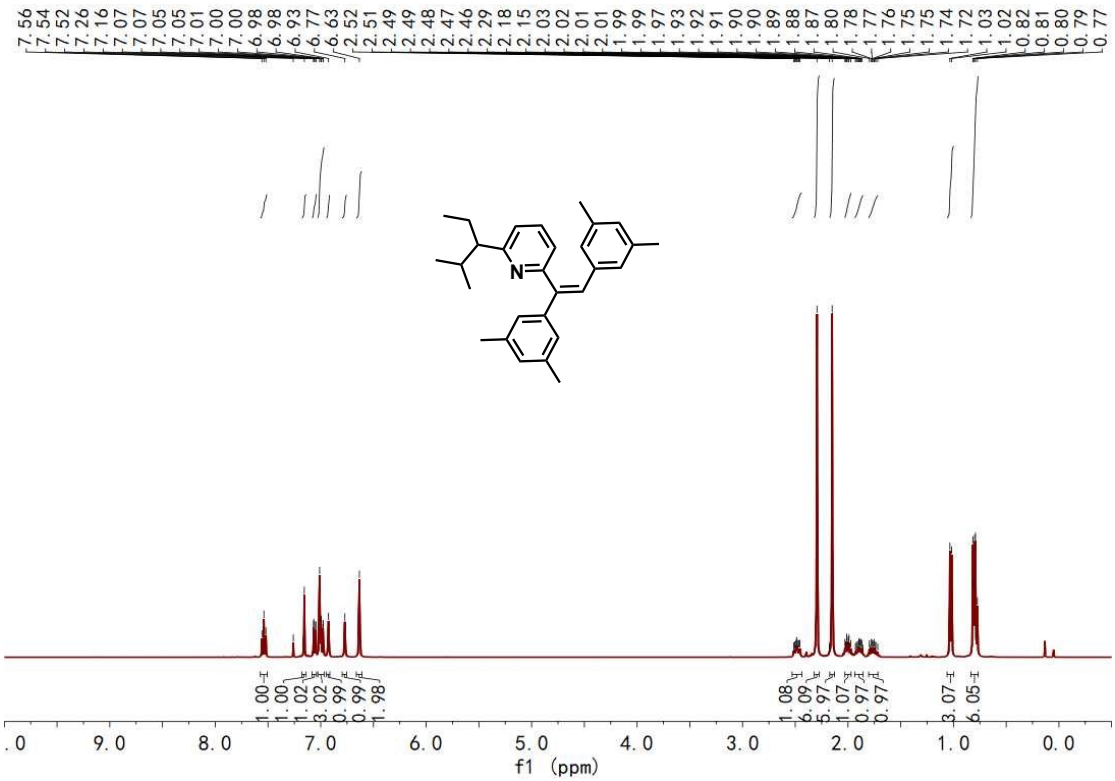
**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-cyclohexylpyridine (S31): $^{1}$H NMR (400 MHz, $CDCl_3$)**



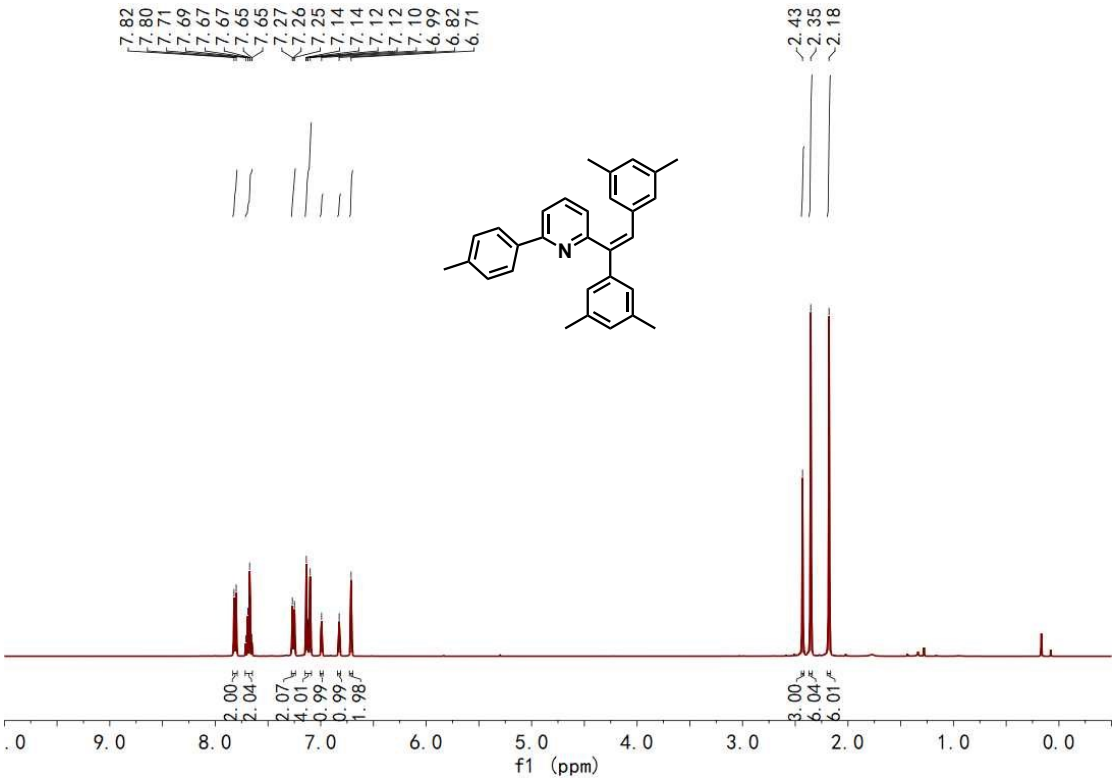

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-cyclohexylpyridine (S31): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



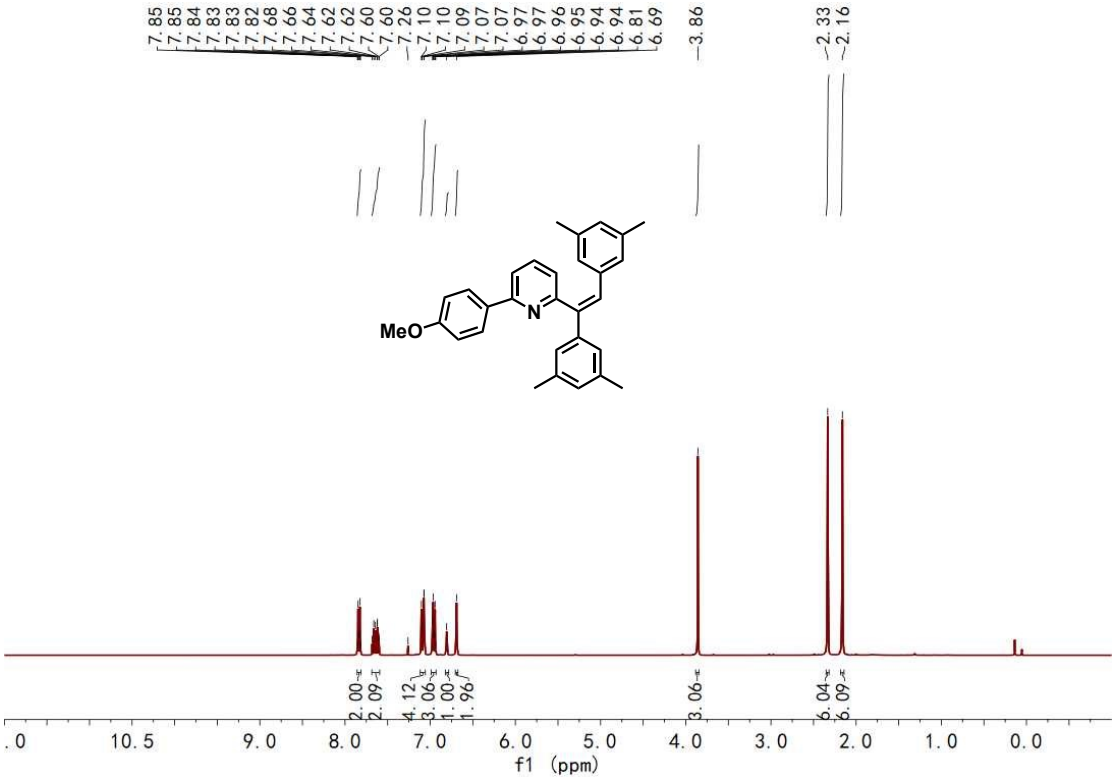

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(2-methylpentan-3-yl)pyridine (S32): $^{1}H$ NMR(400 MHz, $CDCl_3$)**



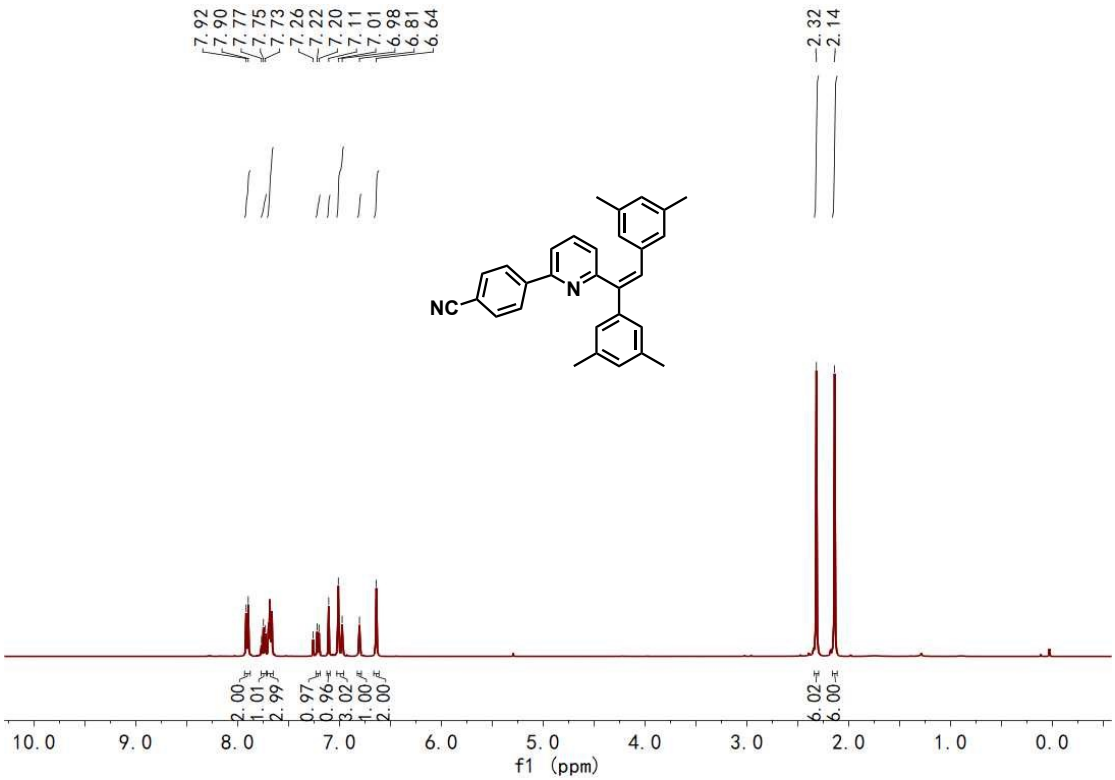
**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(*p*-tolyl)pyridine (S33): $^{1}$H NMR (400 MHz, $CDCl_3$)**



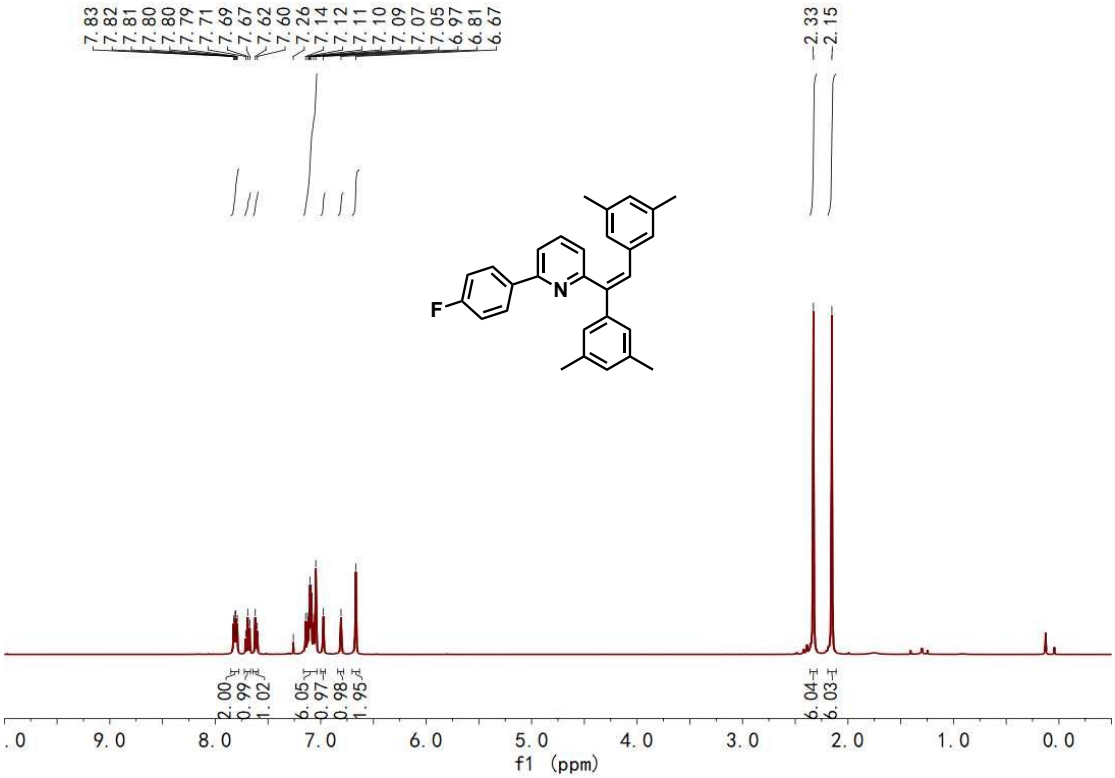
**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(4-methoxyphenyl)pyridine (S34): $^1$H NMR (400 MHz, $CDCl_3$)**



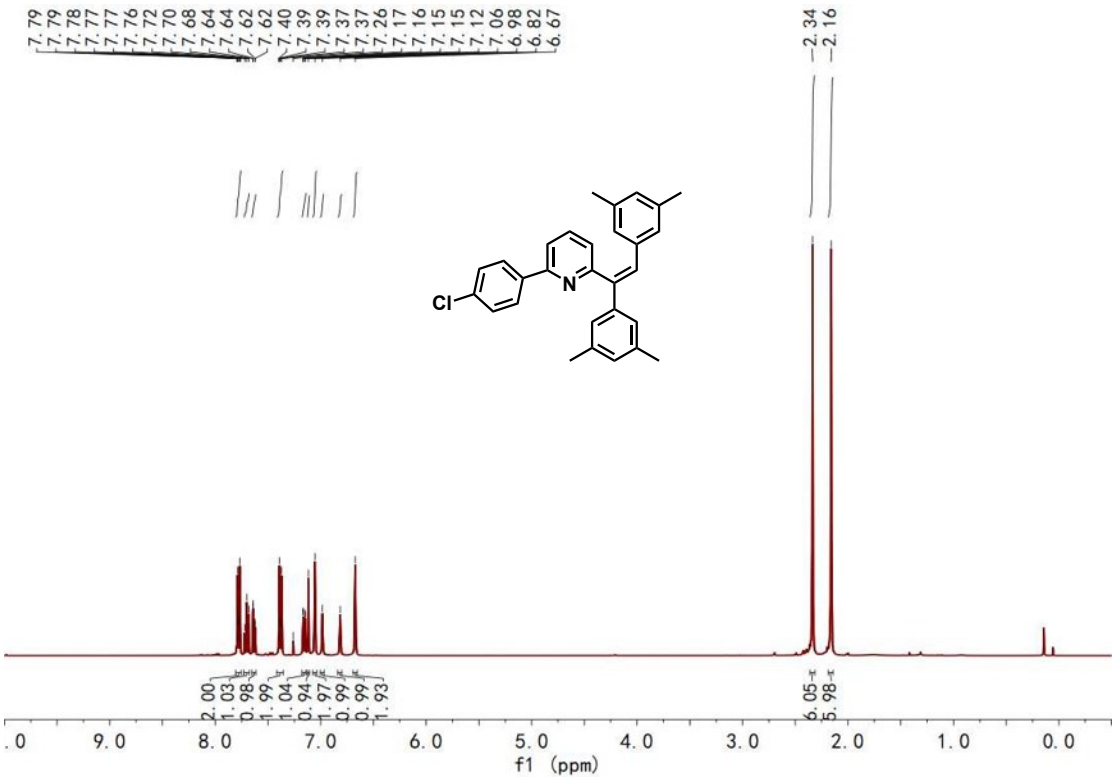

**(*Z*)-4-(6-(1,2-Bis(3,5-dimethylphenyl)vinyl)pyridin-2-yl)benzonitrile (S35): $^1$H NMR (400 MHz, $CDCl_3$)**



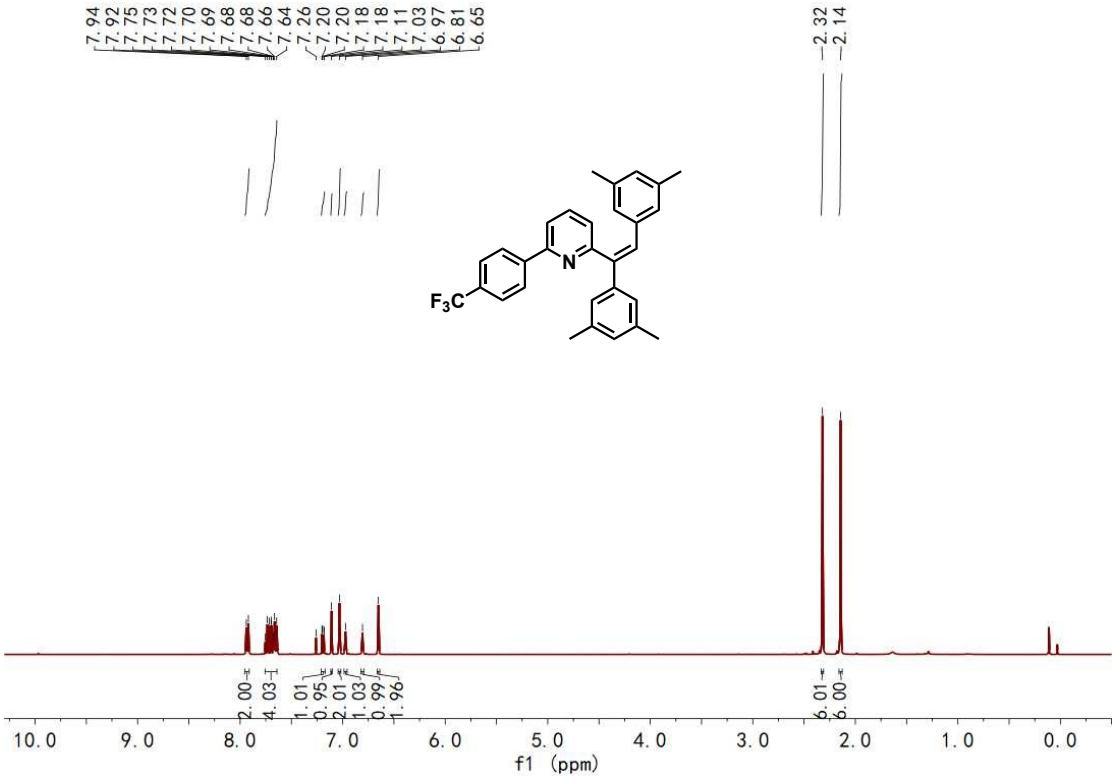
**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(4-fluorophenyl)pyridine (S36): $^1$H NMR (400 MHz, $CDCl_3$)**



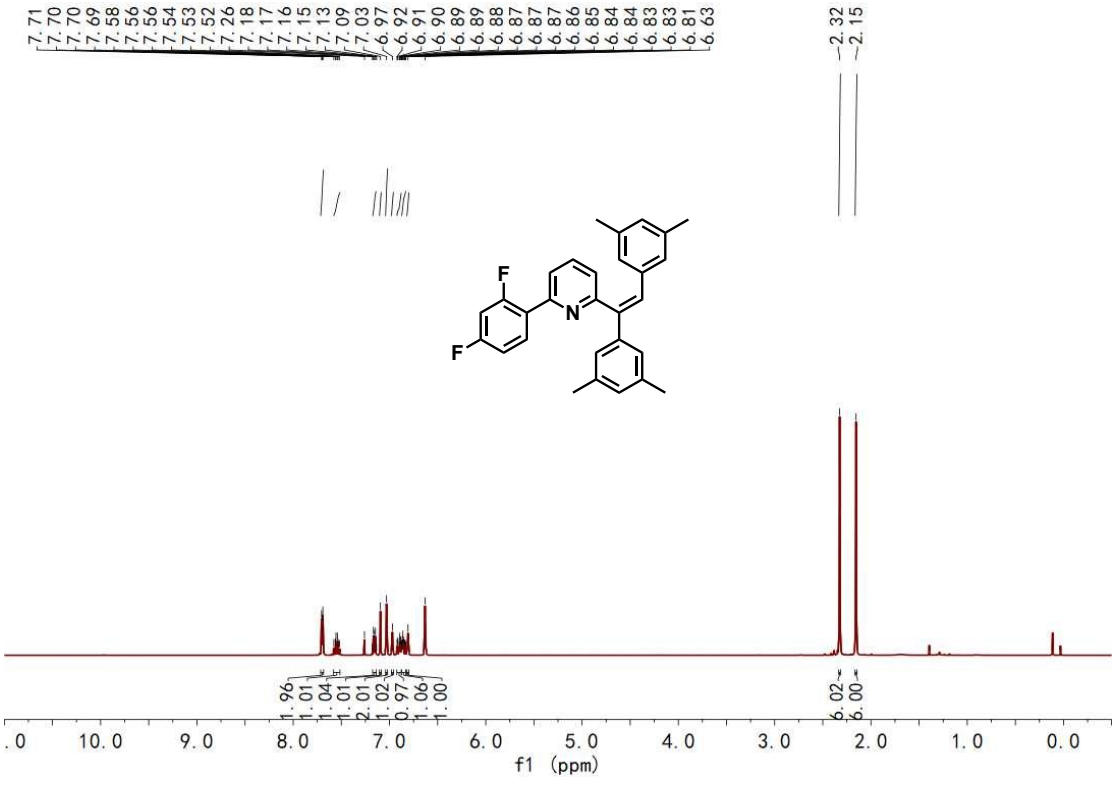

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(4-chlorophenyl)pyridine (S37): $^1$H NMR (400 MHz, $CDCl_3$)**



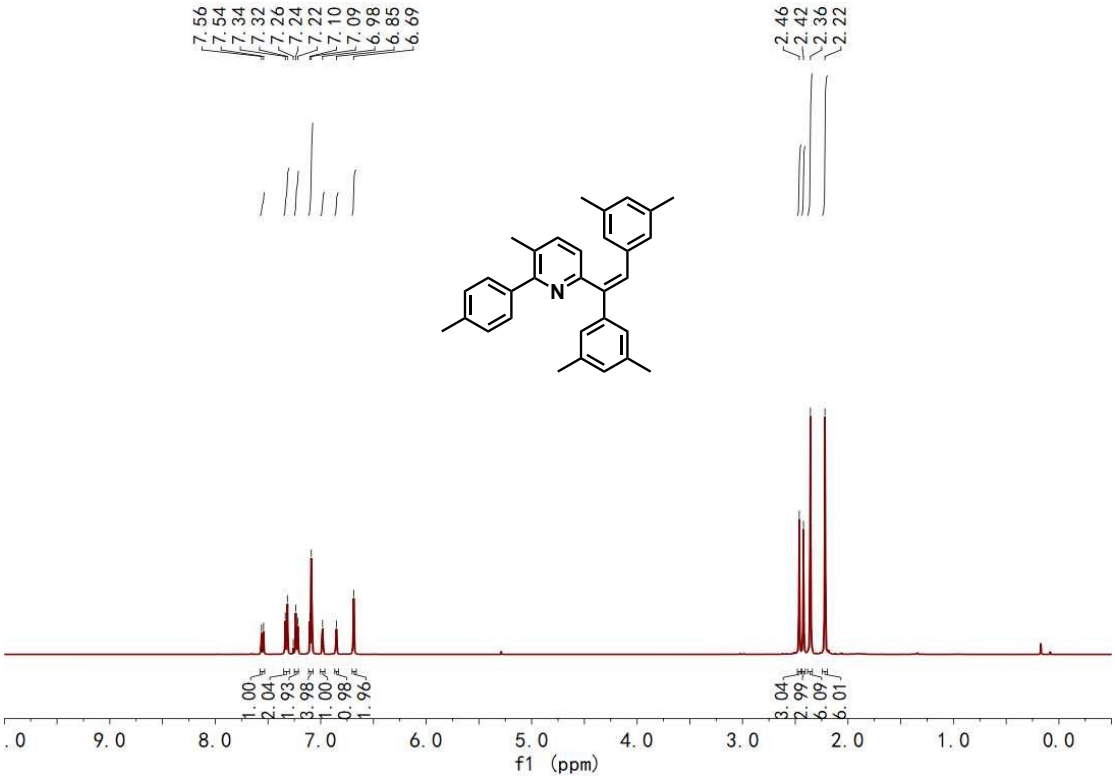
**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(4-(trifluoromethyl)phenyl)pyridine (S38): $^1$H NMR (400 MHz, $CDCl_3$)**



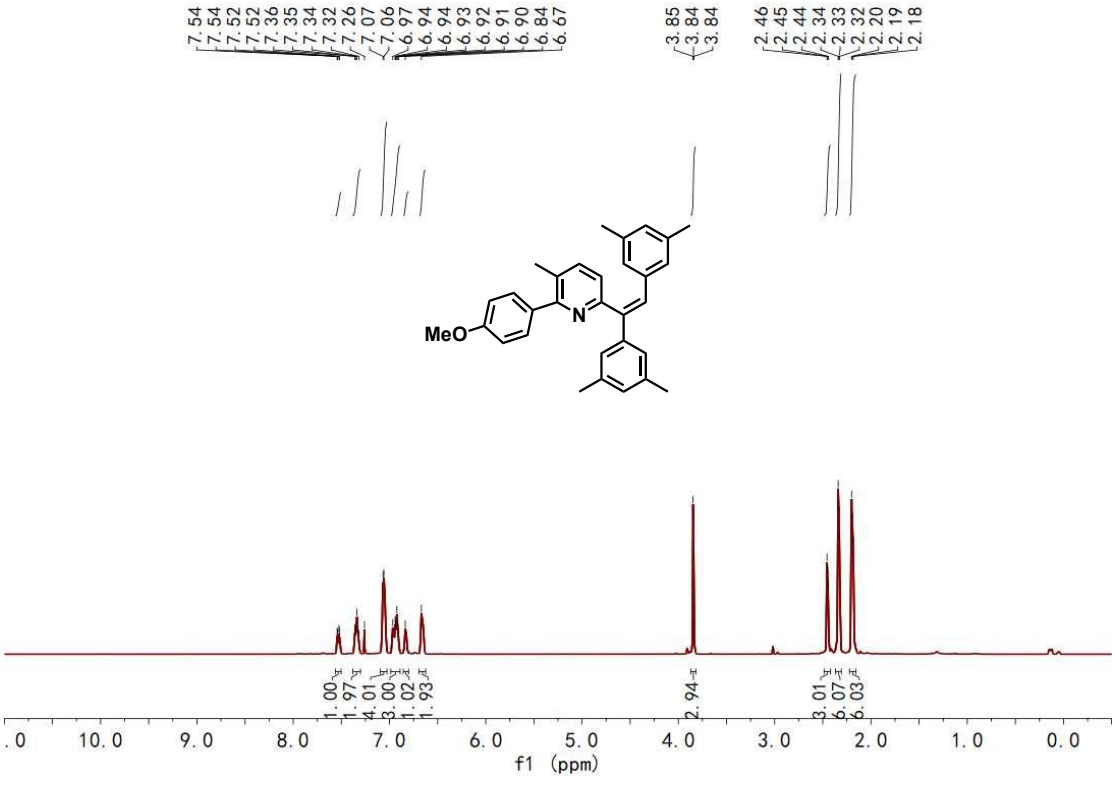

**(*Z*)-2-(1,2-Bis(3,5-dimethylphenyl)vinyl)-6-(2,4-difluorophenyl)pyridine (S39): $^1$H NMR (400 MHz, $CDCl_3$)**



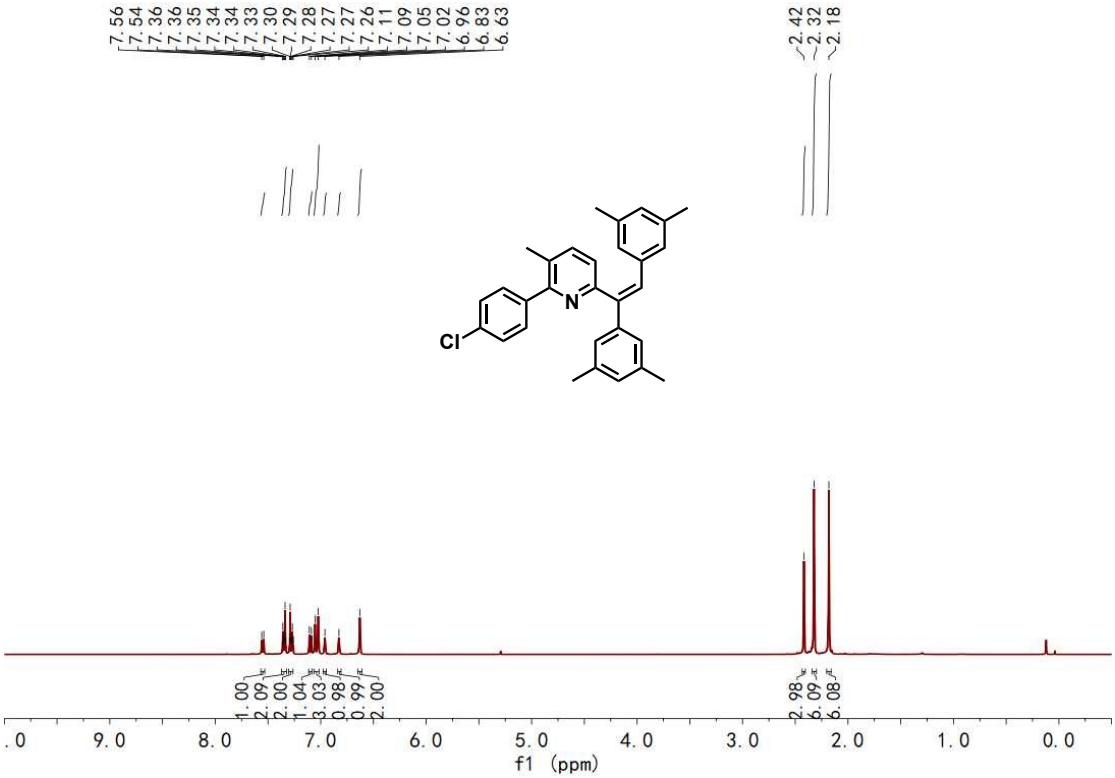
**(*Z*)-6-(1,2-Bis(3,5-dimethylphenyl)vinyl)-3-methyl-2-(*p*-tolyl)pyridine (S40): $^1$H NMR (400 MHz, $CDCl_3$)**



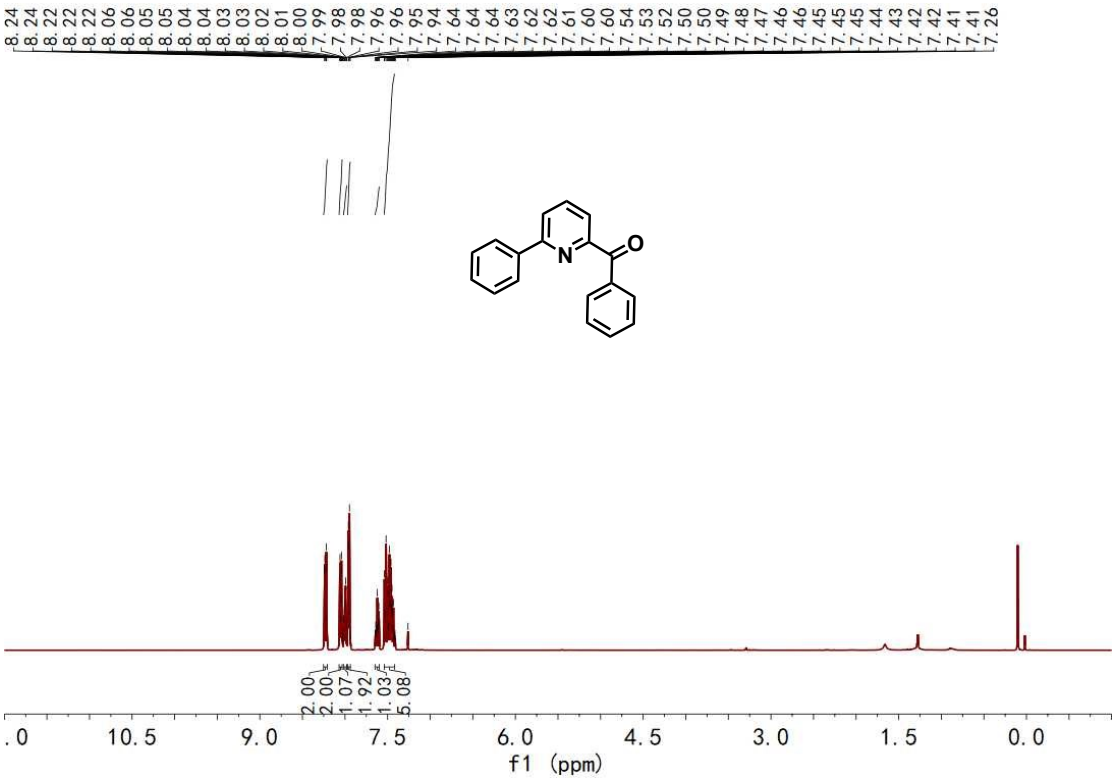

**(*Z*)-6-(1,2-Bis(3,5-dimethylphenyl)vinyl)-2-(4-methoxyphenyl)-3-methylpyridine (S41): $^1$H NMR (400 MHz, $CDCl_3$)**



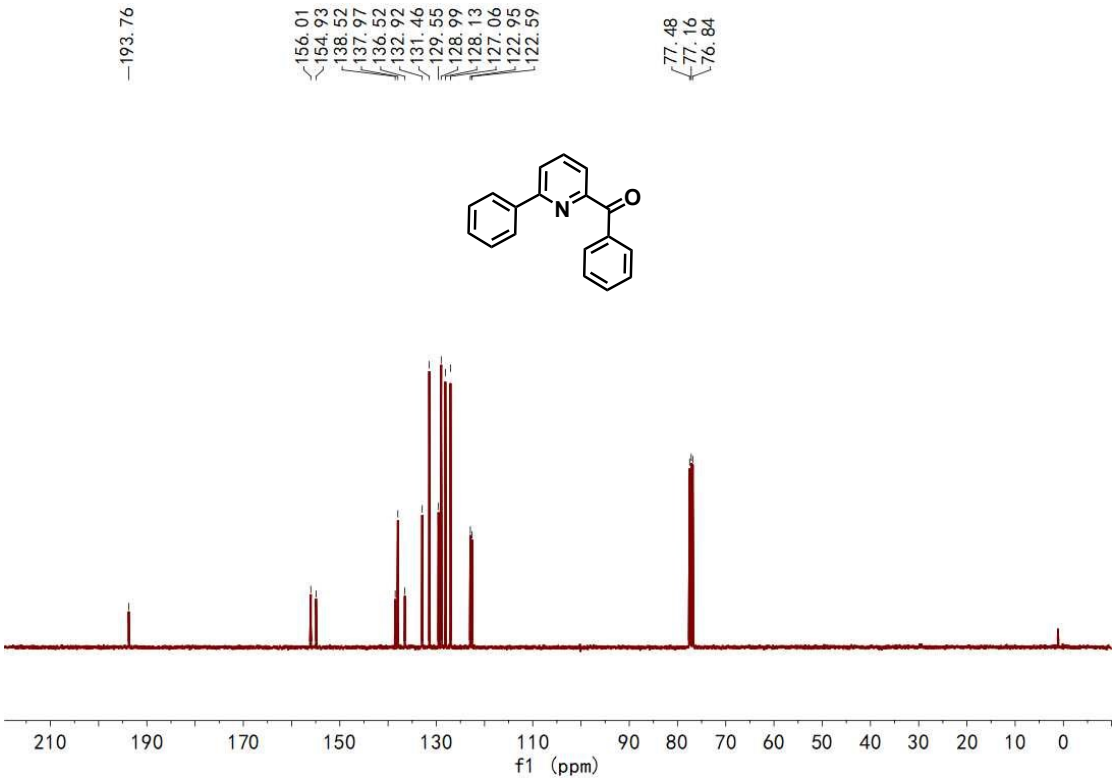
**(*Z*)-6-(1,2-Bis(3,5-dimethylphenyl)vinyl)-2-(4-chlorophenyl)-3-methylpyridine (S42): $^1$H NMR (400 MHz, $CDCl_3$)**



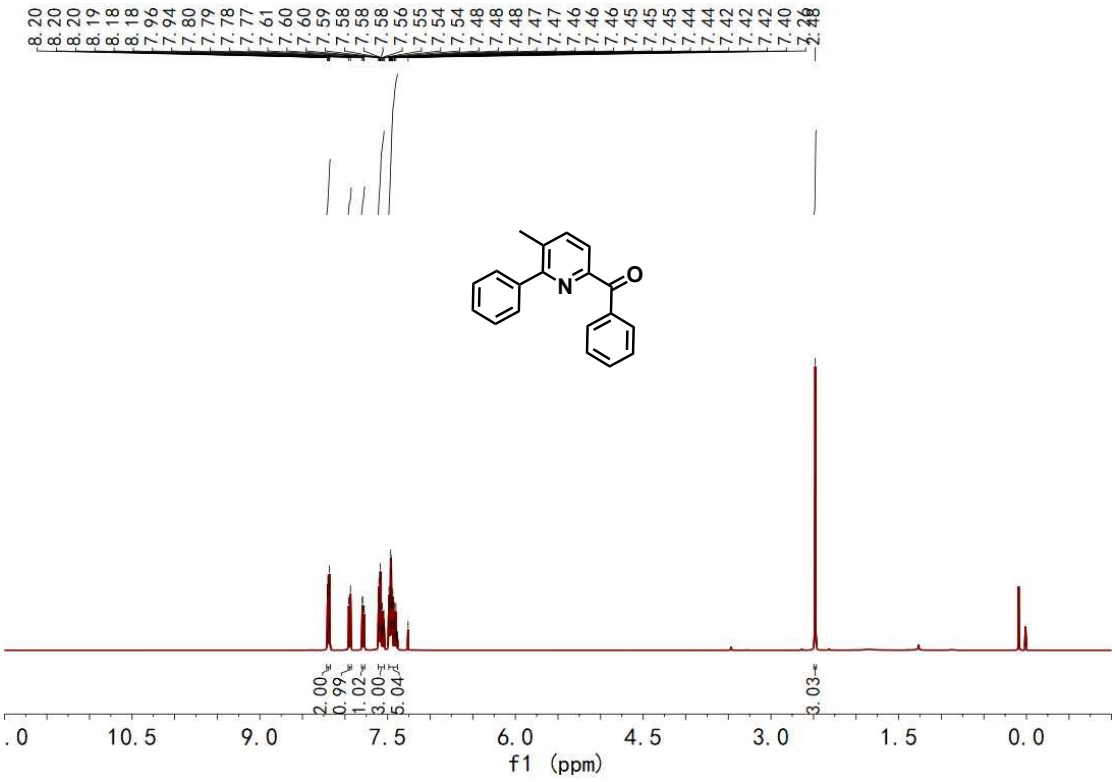

**Phenyl(6-phenylpyridin-2-yl)methanone (1): $^1$H NMR(400 MHz, $CDCl_3$)**



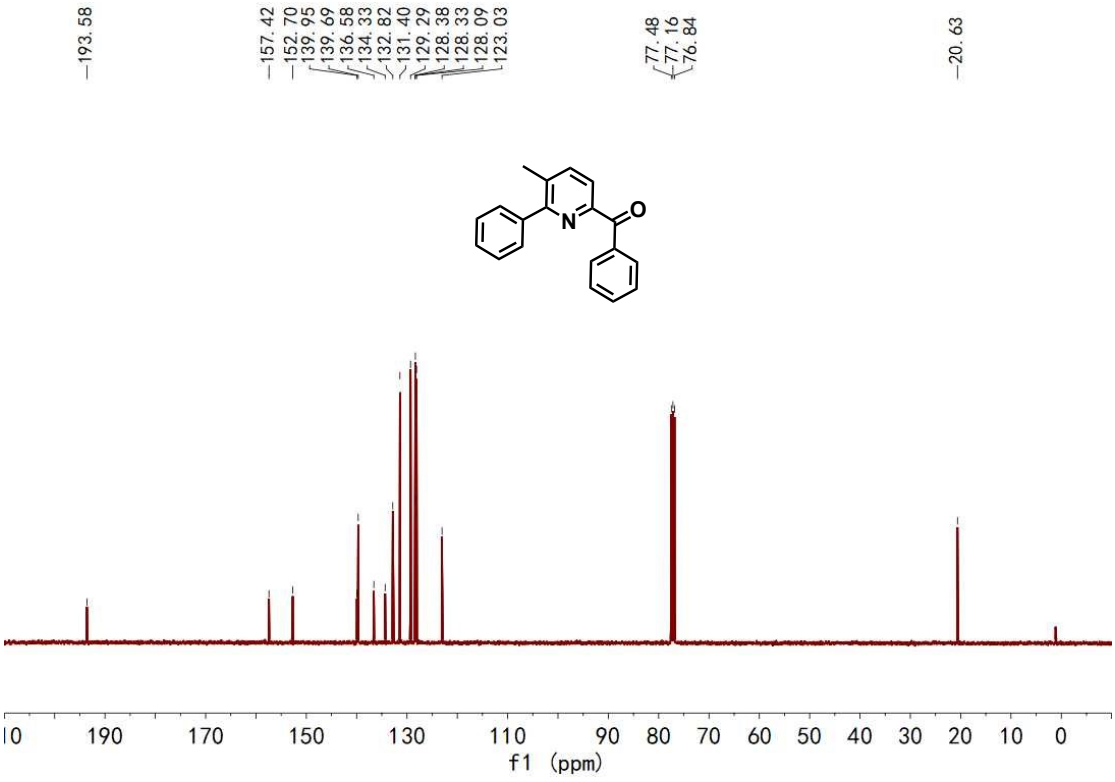
**Phenyl(6-phenylpyridin-2-yl)methanone (1): $^{13}C$ NMR(101 MHz, $CDCl_3$)**



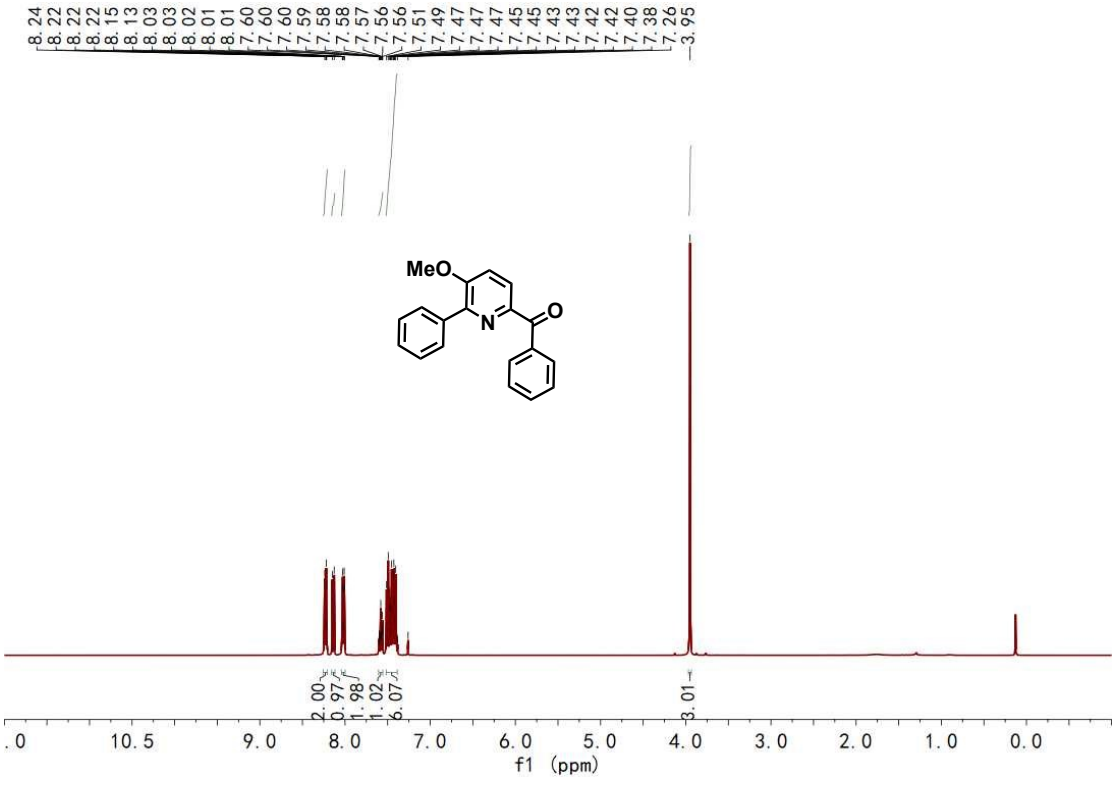

**(5-Methyl-6-phenylpyridin-2-yl)(phenyl)methanone (2): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



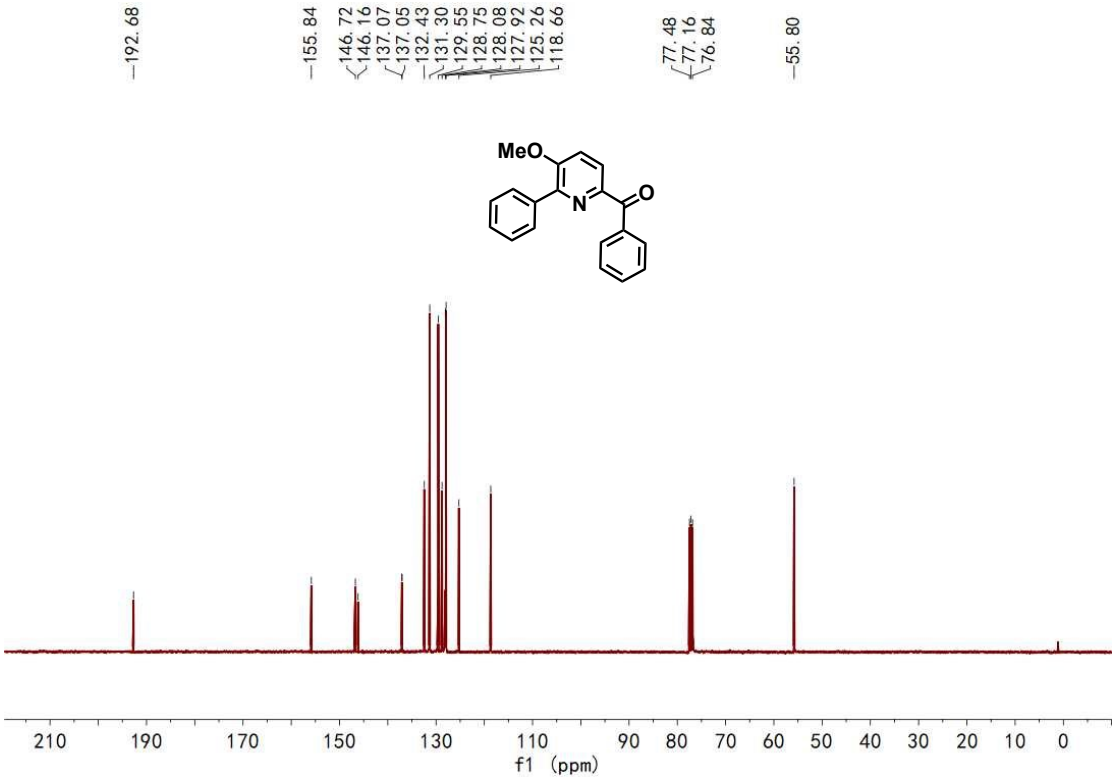
**(5-Methyl-6-phenylpyridin-2-yl)(phenyl)methanone (2): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



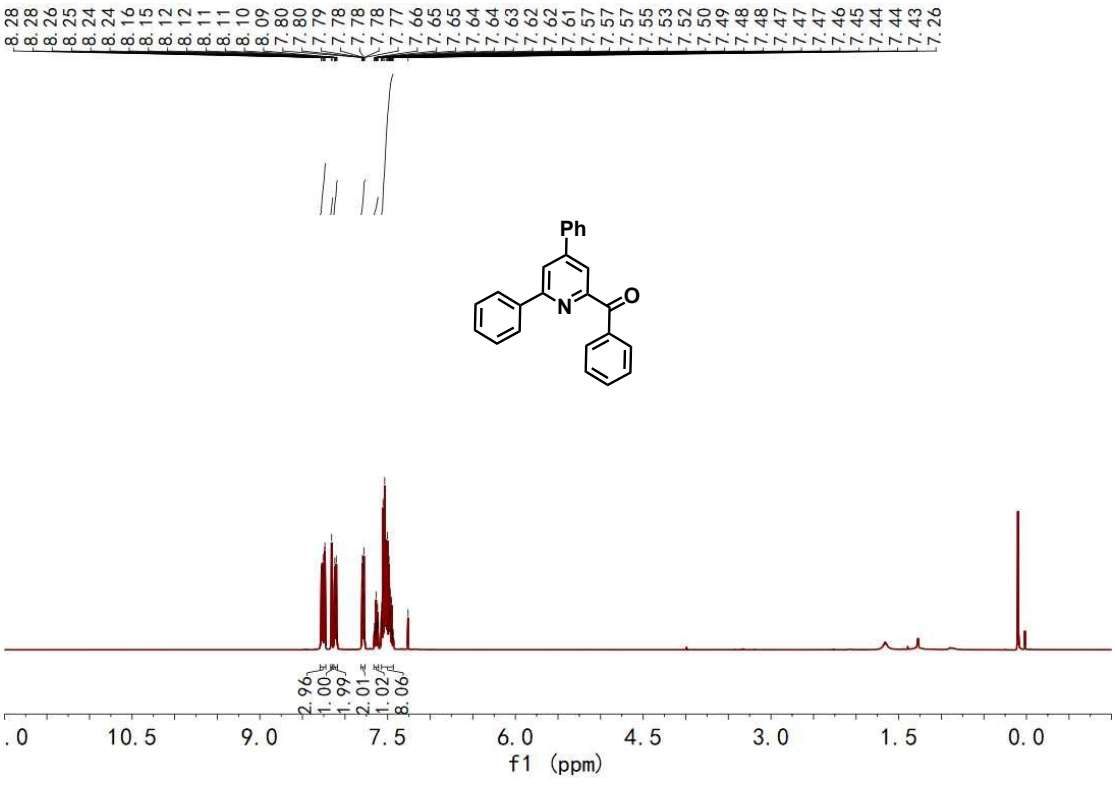

**(5-Methoxy-6-phenylpyridin-2-yl)(phenyl)methanone (3): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



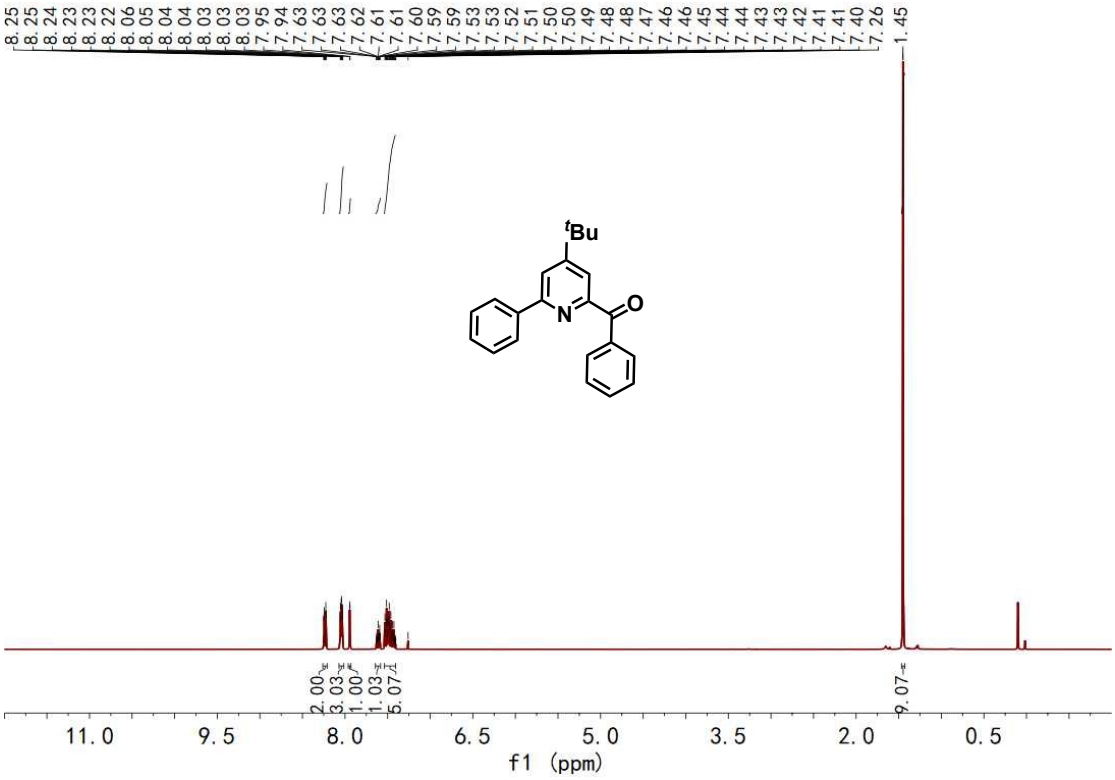
**(5-Methoxy-6-phenylpyridin-2-yl)(phenyl)methanone (3): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



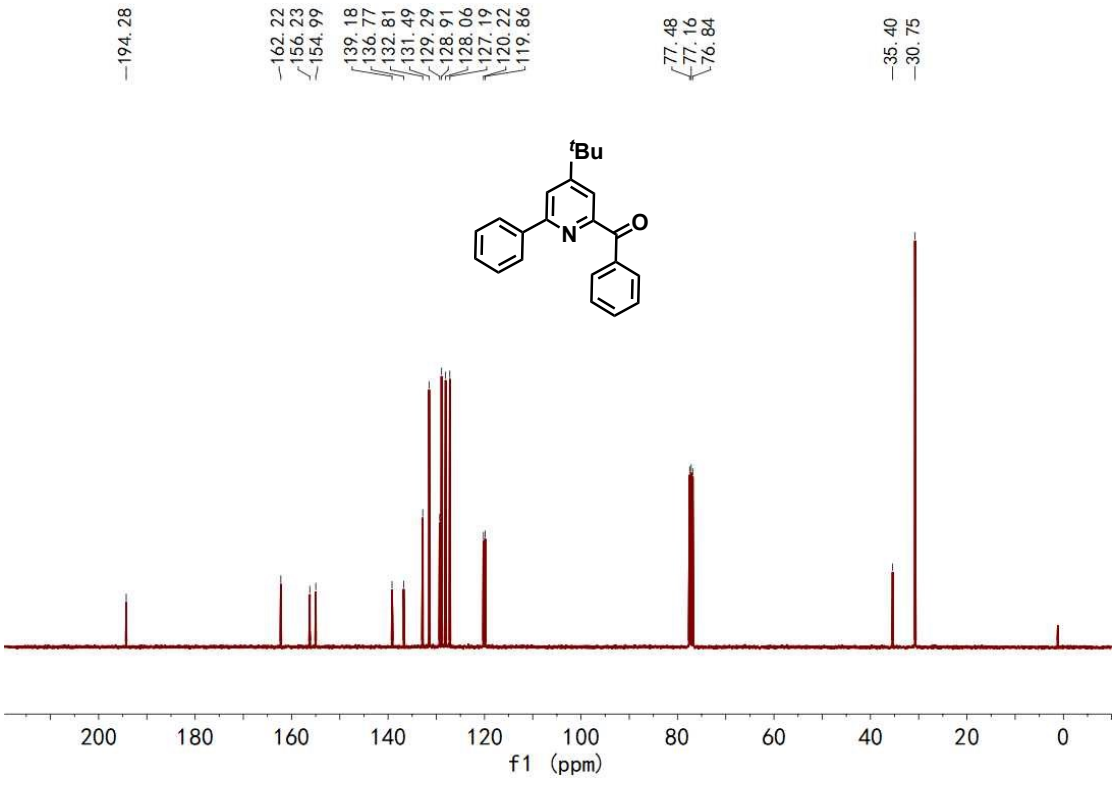

**(4,6-Diphenylpyridin-2-yl)(phenyl)methanone (4): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



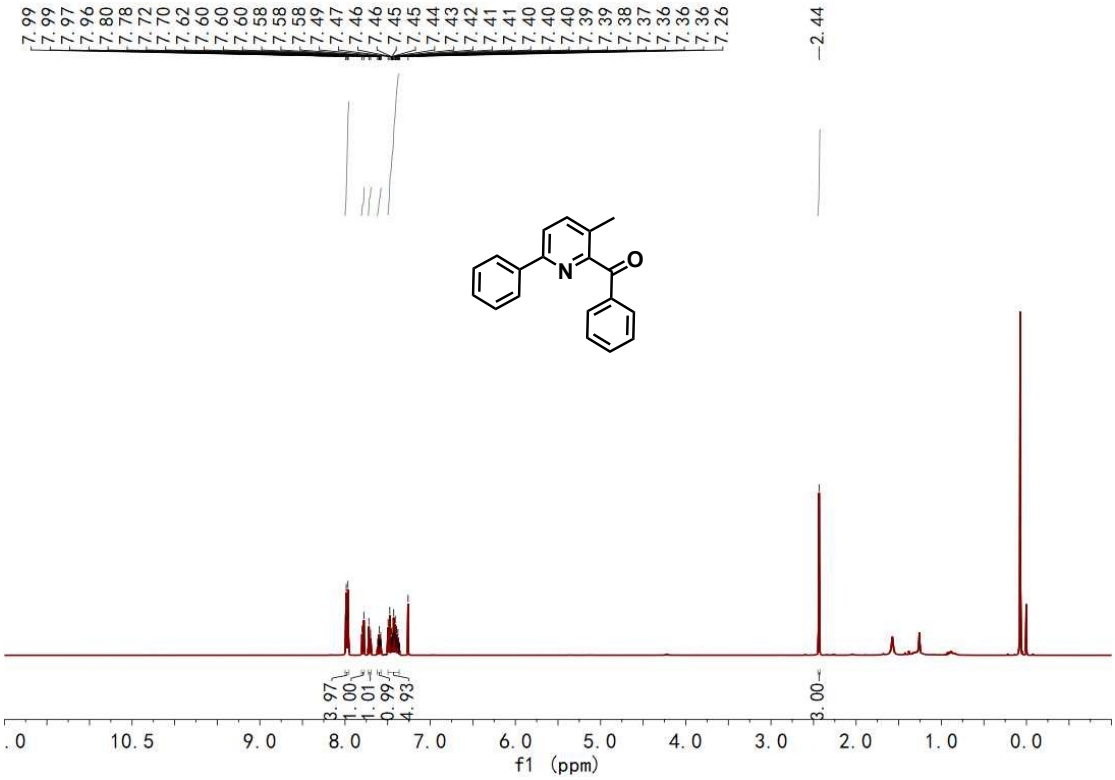
**(4-(*Tert*-butyl)-6-phenylpyridin-2-yl)(phenyl)methanone (5): $^{1}$H NMR (400 MHz, $CDCl_3$)**



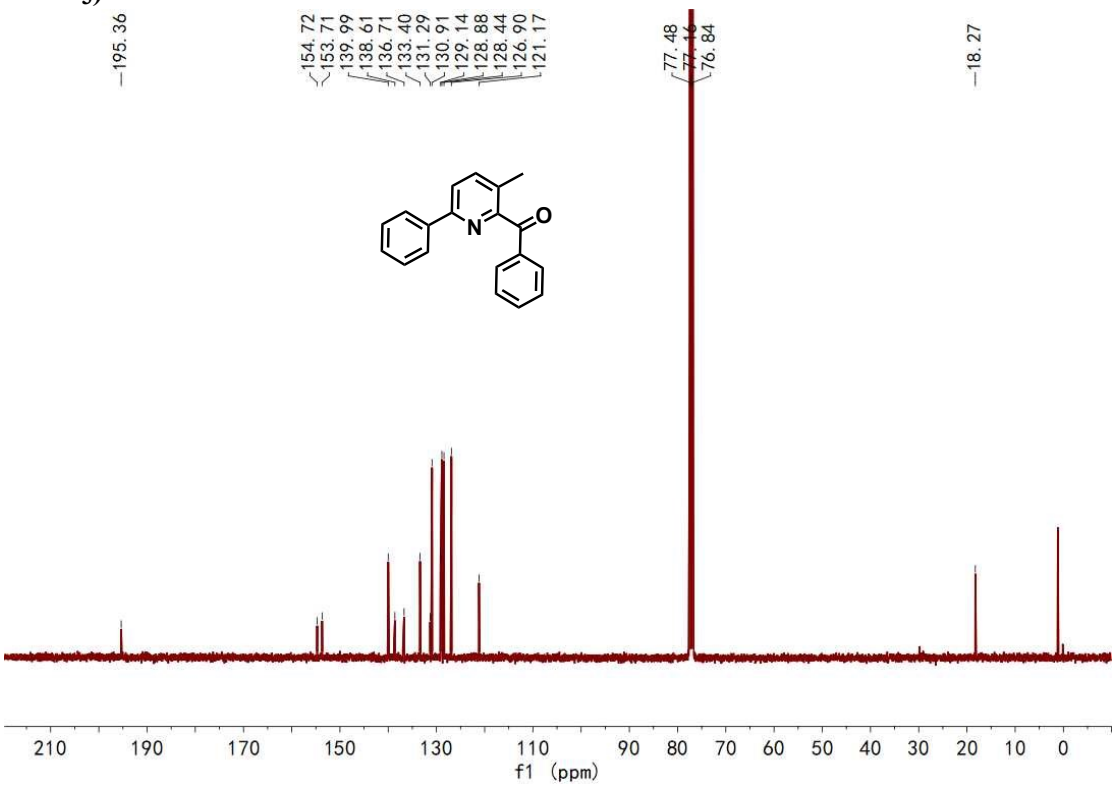

**(4-(*Tert*-butyl)-6-phenylpyridin-2-yl)(phenyl)methanone (5): $^{13}$C NMR (101 MHz, $CDCl_3$)**



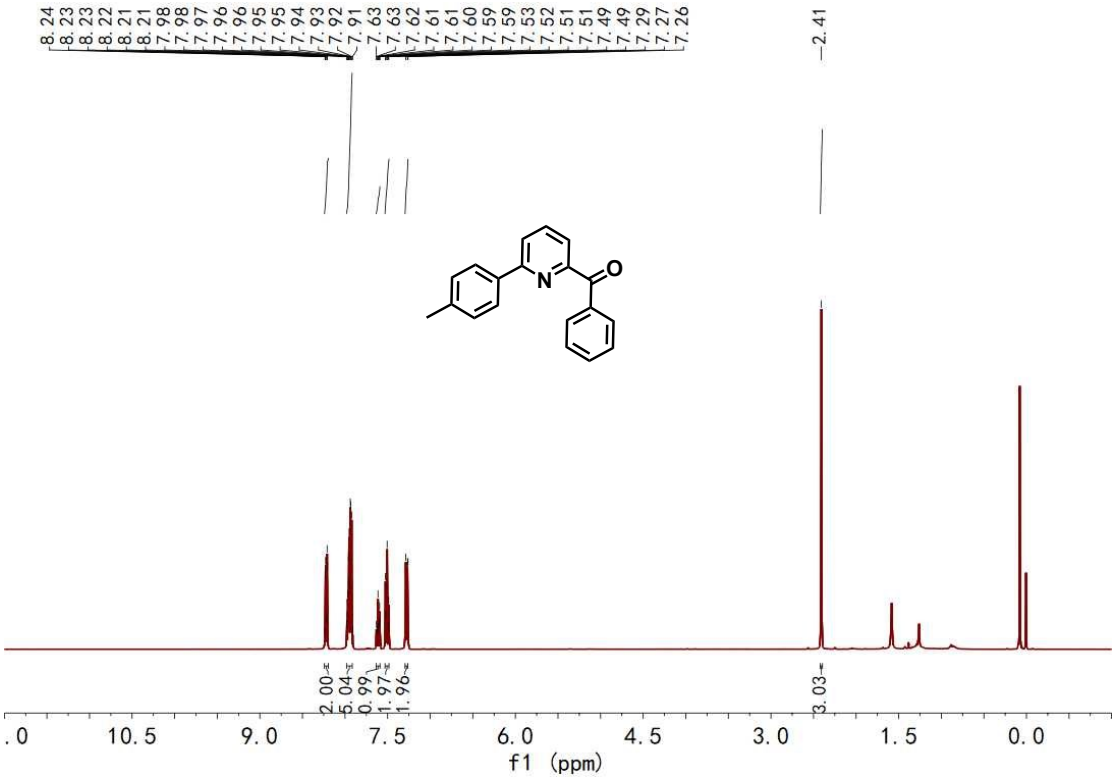
**(3-Methyl-6-phenylpyridin-2-yl)(phenyl)methanone (6): $^{1}$H NMR (400 MHz, $CDCl_3$)**



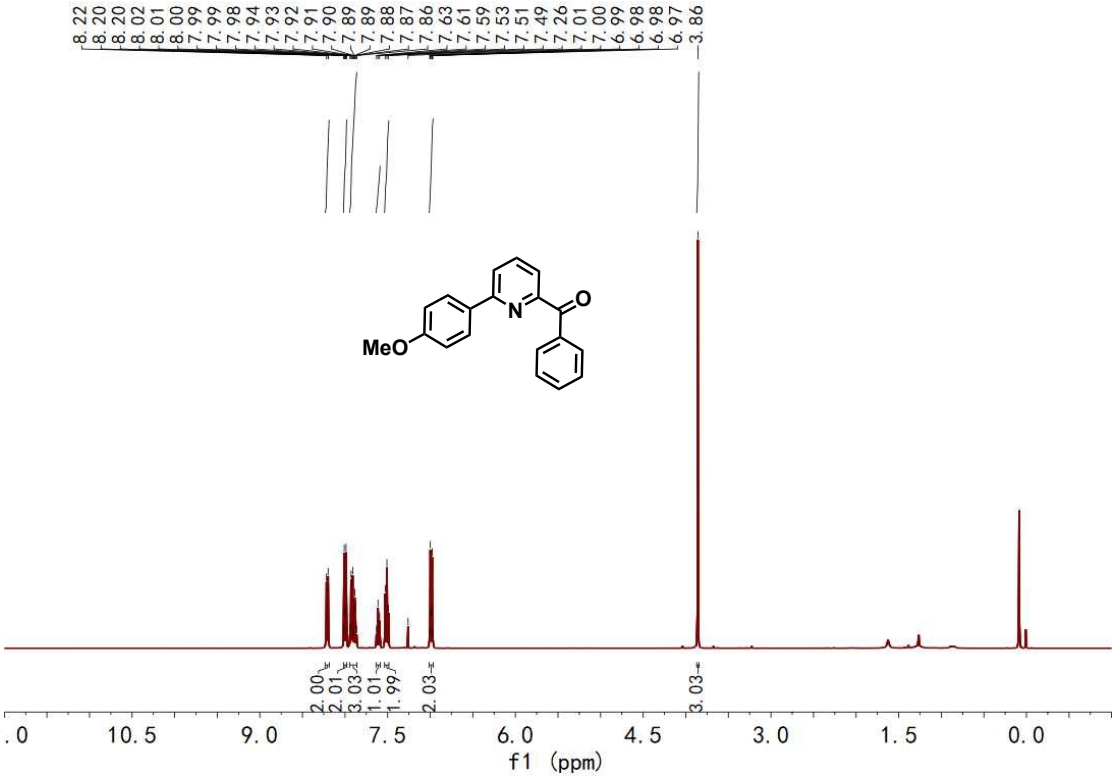

**(3-Methyl-6-phenylpyridin-2-yl)(phenyl)methanone (6): $^{13}$H NMR (101 MHz, $CDCl_3$)**



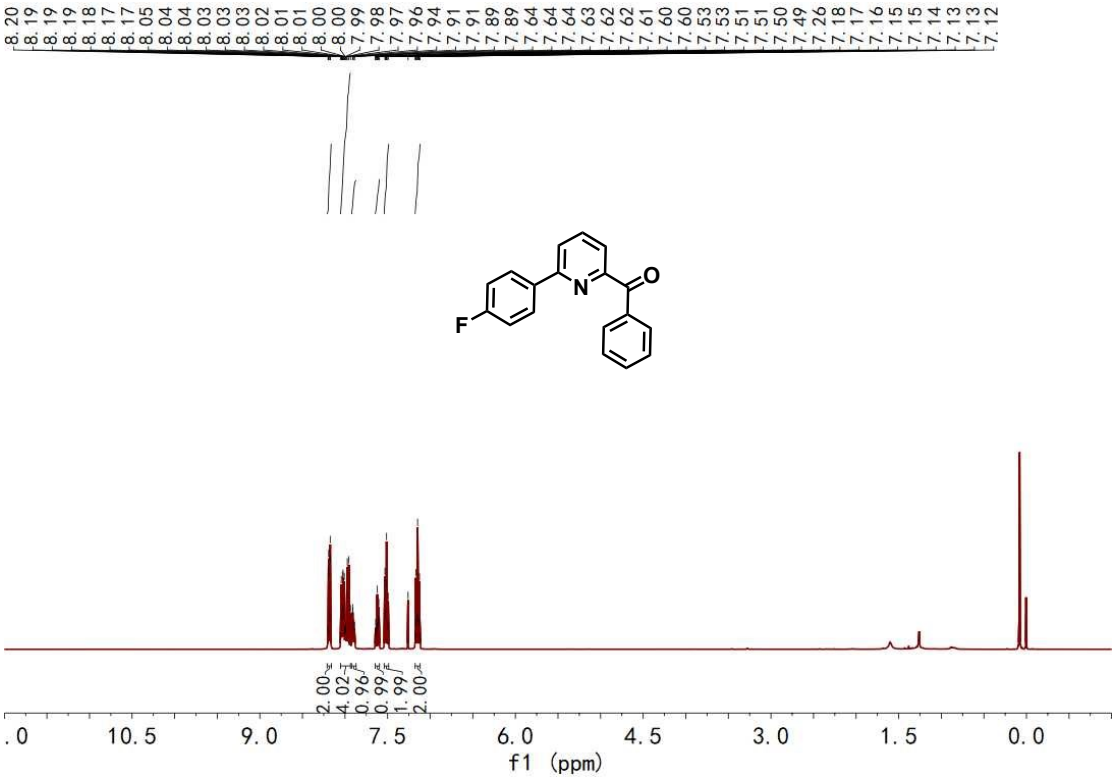

**Phenyl(6-(*p*-tolyl)pyridin-2-yl)methanone (7): $^{1}$H NMR (400 MHz, $CDCl_3$)**



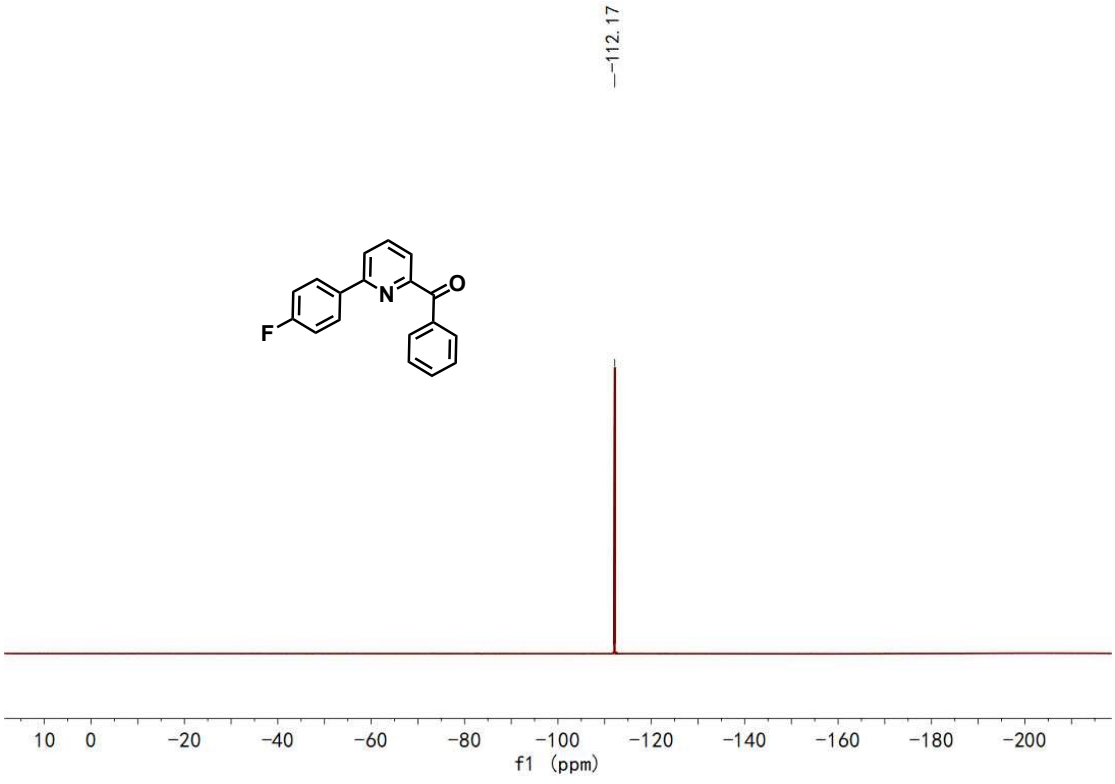

**(6-(4-Methoxyphenyl)pyridin-2-yl)(phenyl)methanone (8): $^{1}$H NMR (400 MHz, $CDCl_3$)**



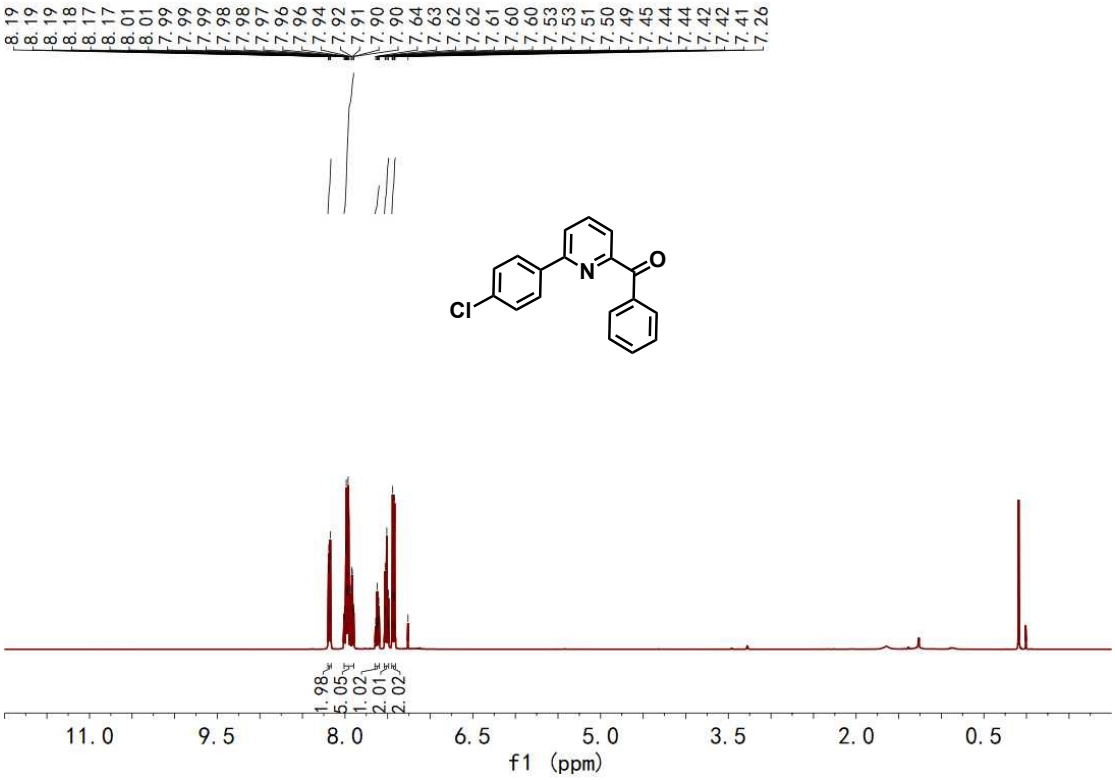
**(6-(4-Fluorophenyl)pyridin-2-yl)(phenyl)methanone (9): $^{1}$H NMR (400 MHz, $CDCl_3$)**



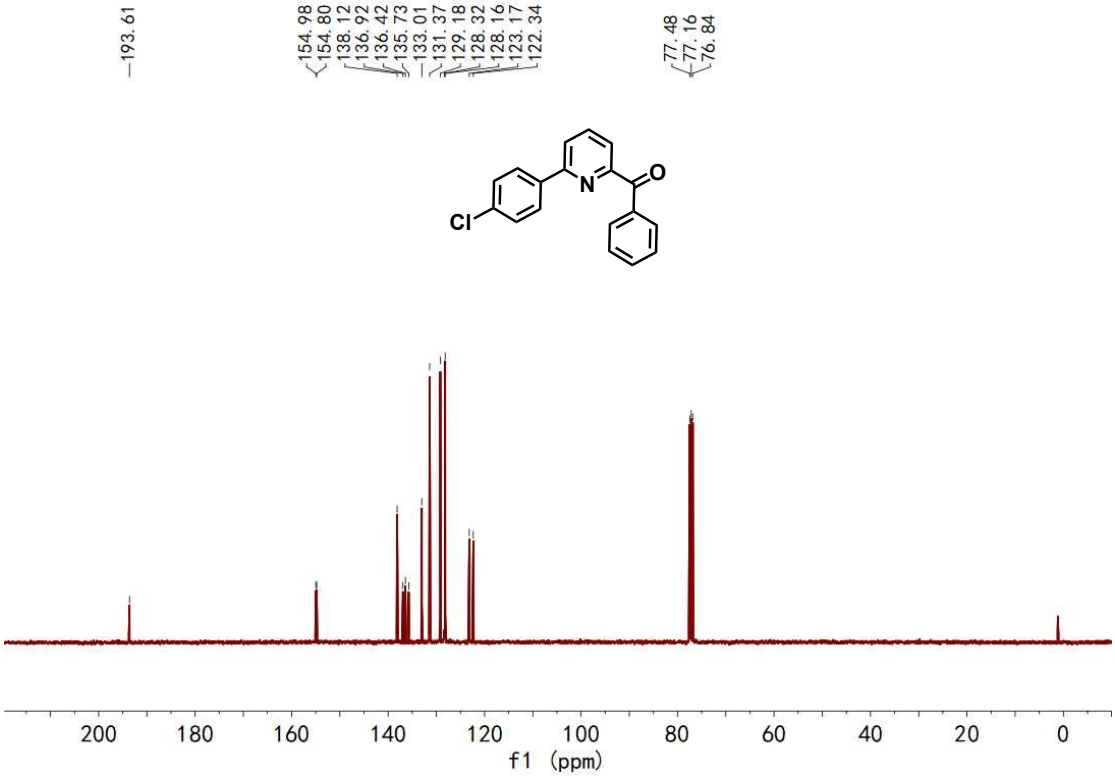

**(6-(4-Fluorophenyl)pyridin-2-yl)(phenyl)methanone (9): $^{19}$F NMR (376 MHz, $CDCl_3$)**



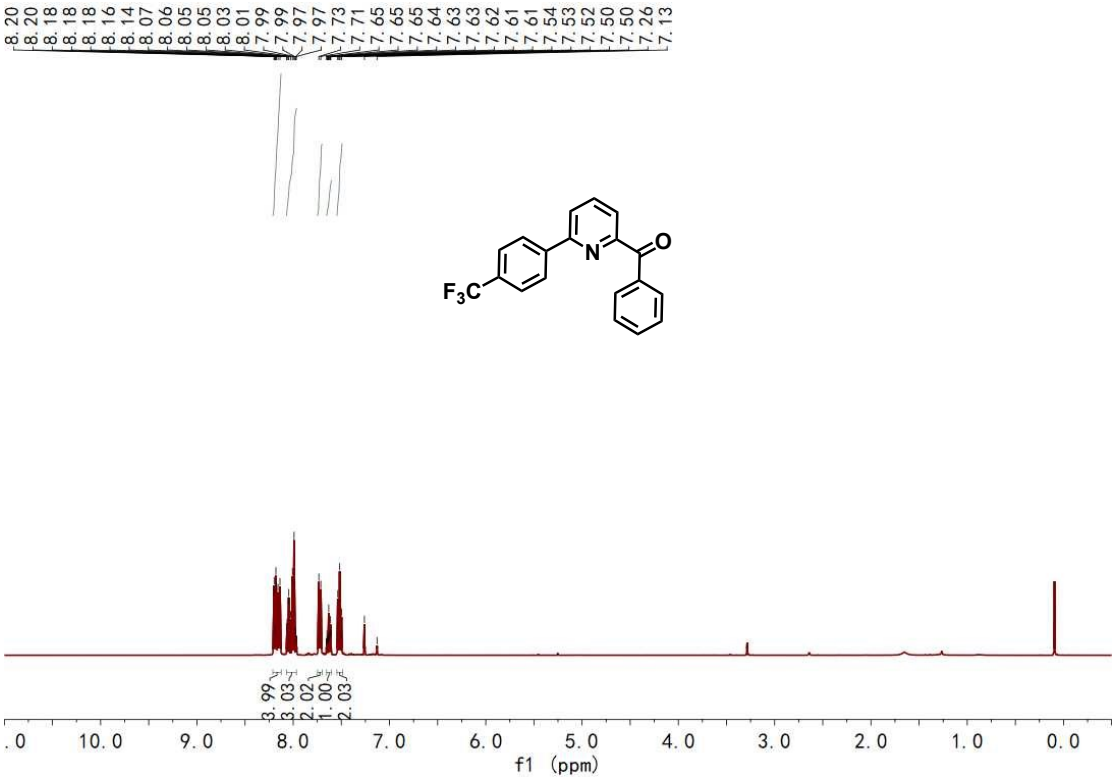
**(6-(4-Chlorophenyl)pyridin-2-yl)(phenyl)methanone (10): $^{1}$H NMR (400 MHz, $CDCl_3$)**



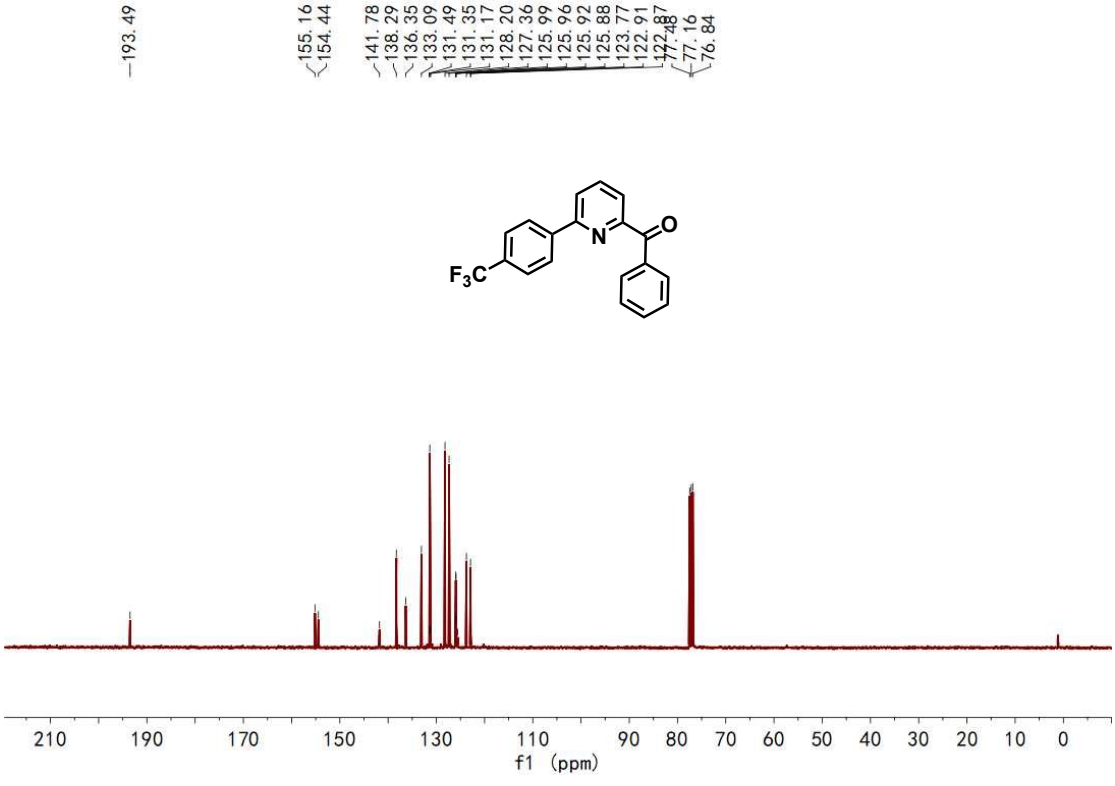

**(6-(4-Chlorophenyl)pyridin-2-yl)(phenyl)methanone (10): $^{13}$C NMR (101 MHz, $CDCl_3$)**



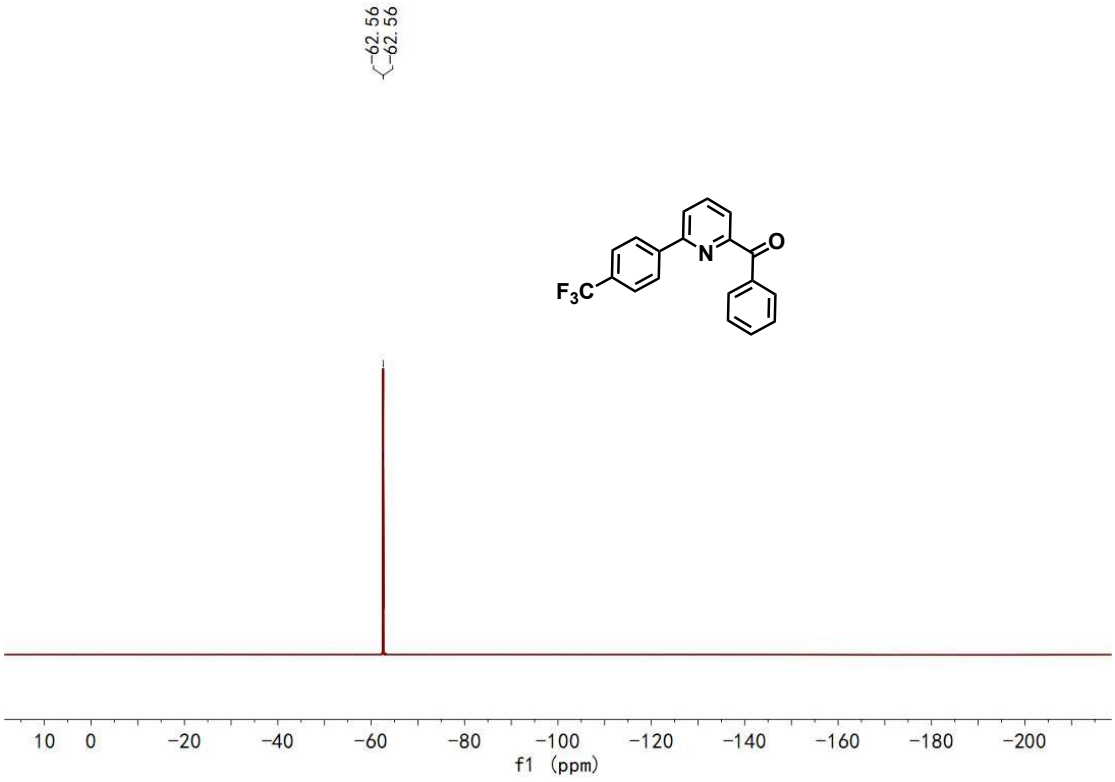
**Phenyl(6-(4-(trifluoromethyl)phenyl)pyridin-2-yl)methanone (11): $^{1}$H NMR (400 MHz, $CDCl_3$)**



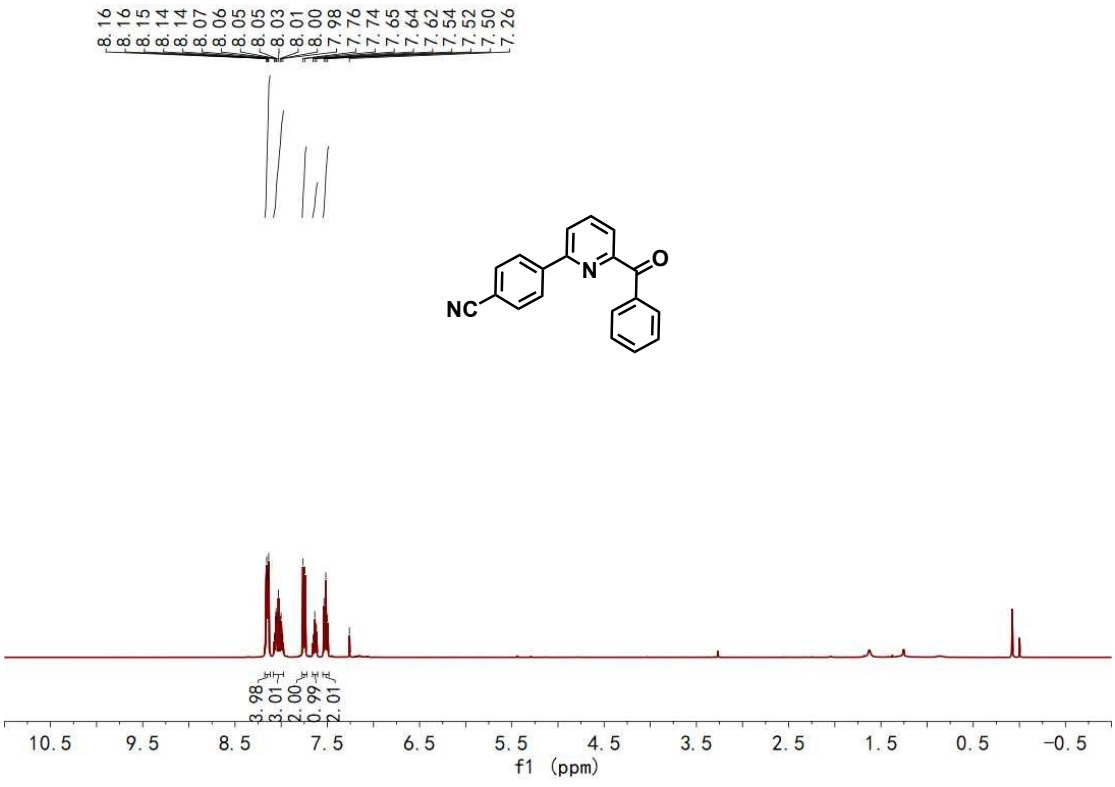

**Phenyl(6-(4-(trifluoromethyl)phenyl)pyridin-2-yl)methanone (11): $^{13}$C NMR (101 MHz, $CDCl_3$)**



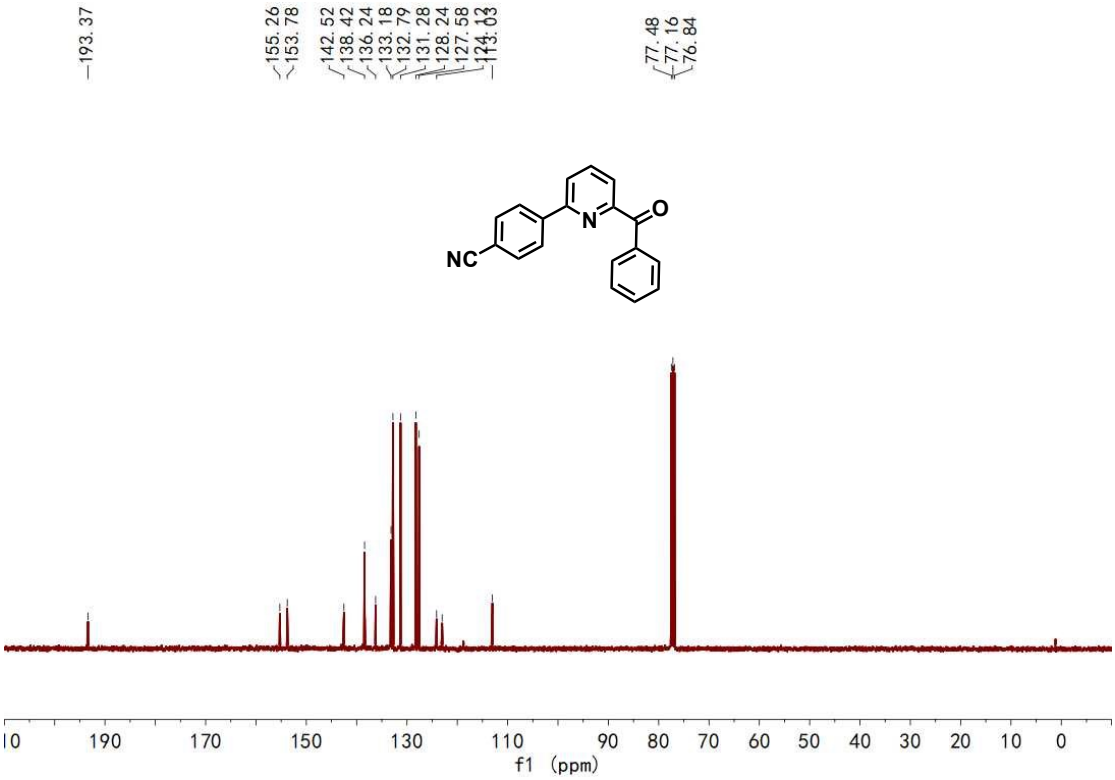
**Phenyl(6-(4-(trifluoromethyl)phenyl)pyridin-2-yl)methanone (11): $^{19}$F NMR (376 MHz, $CDCl_3$)**



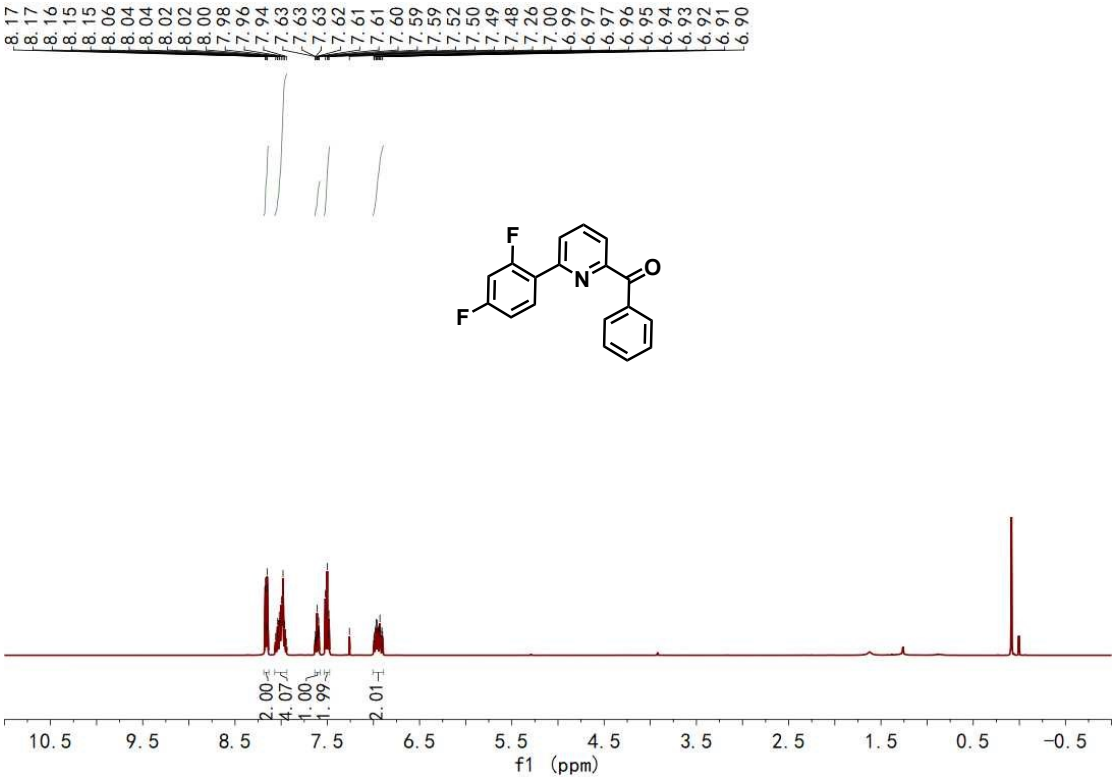

**4-(6-Benzoylpyridin-2-yl)benzonitrile (12): $^{1}$H NMR (400 MHz, $CDCl_3$)**



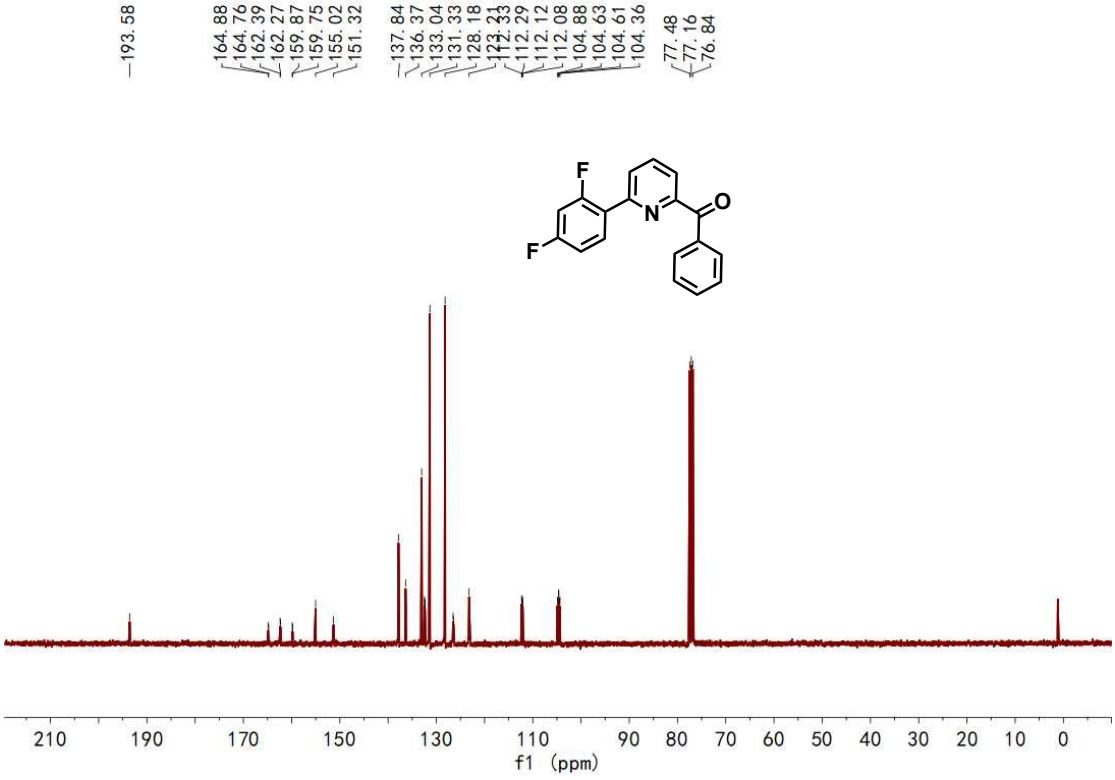
**4-(6-Benzoylpyridin-2-yl)benzonitrile (12): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



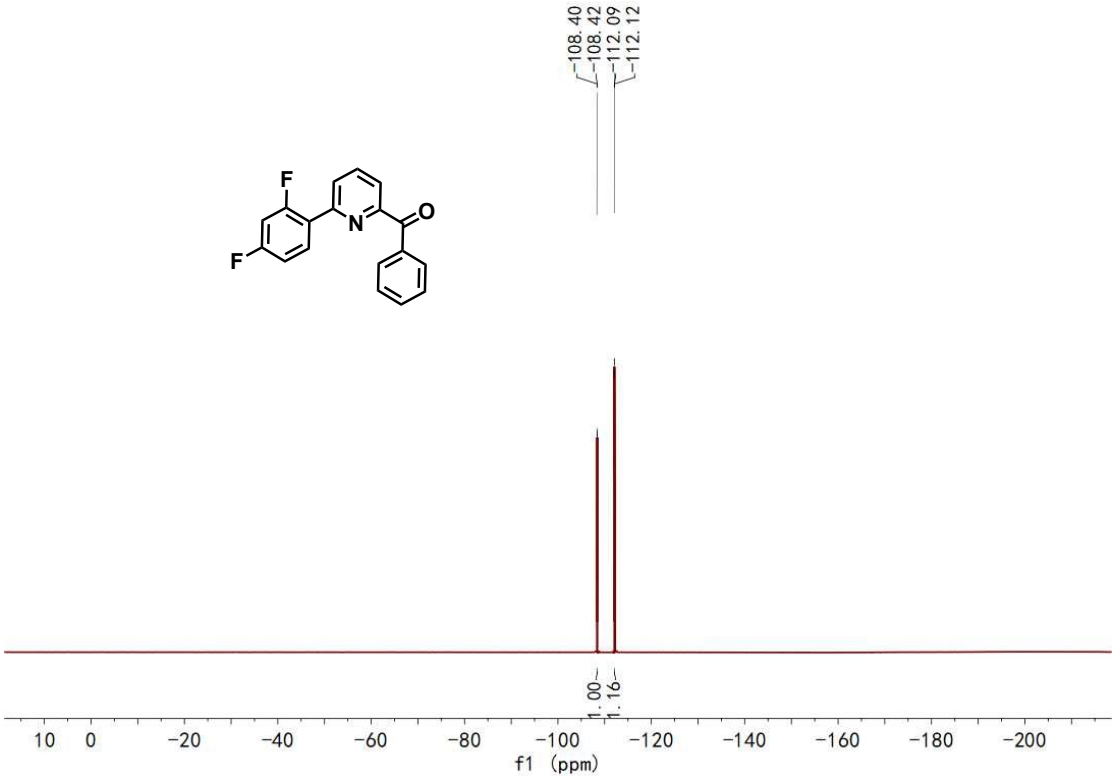

**(6-(2,4-Difluorophenyl)pyridin-2-yl)(phenyl)methanone (13): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



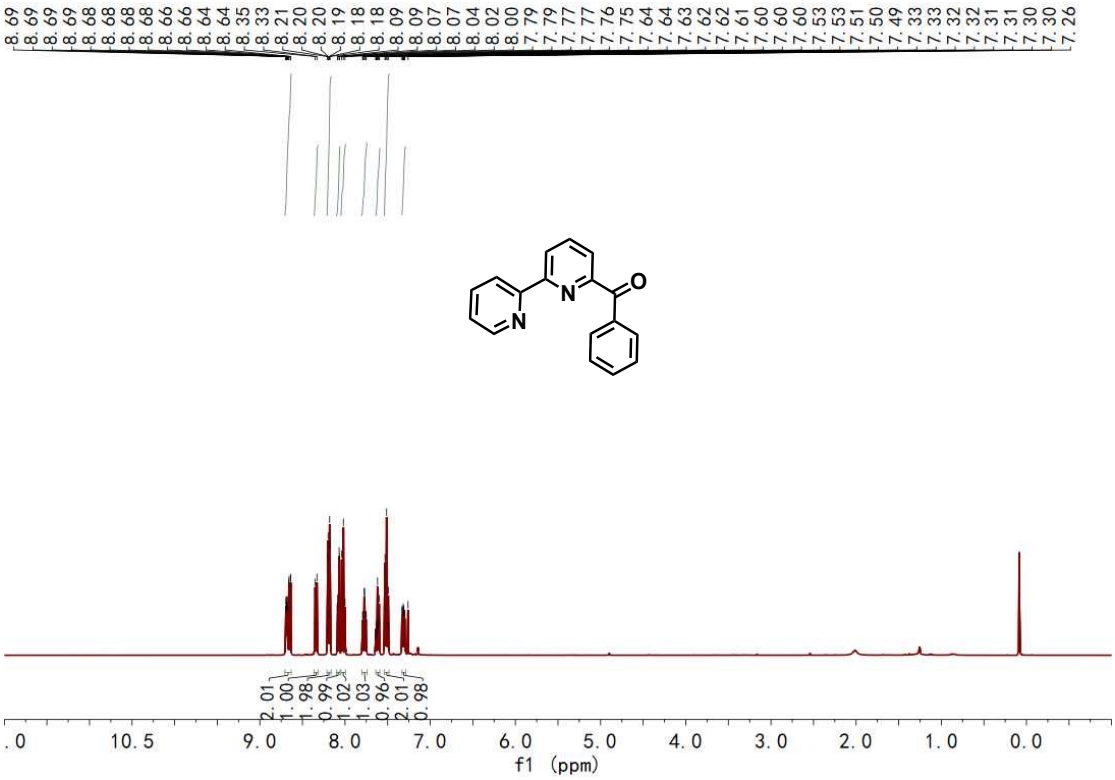
**(6-(2,4-Difluorophenyl)pyridin-2-yl)(phenyl)methanone (13): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



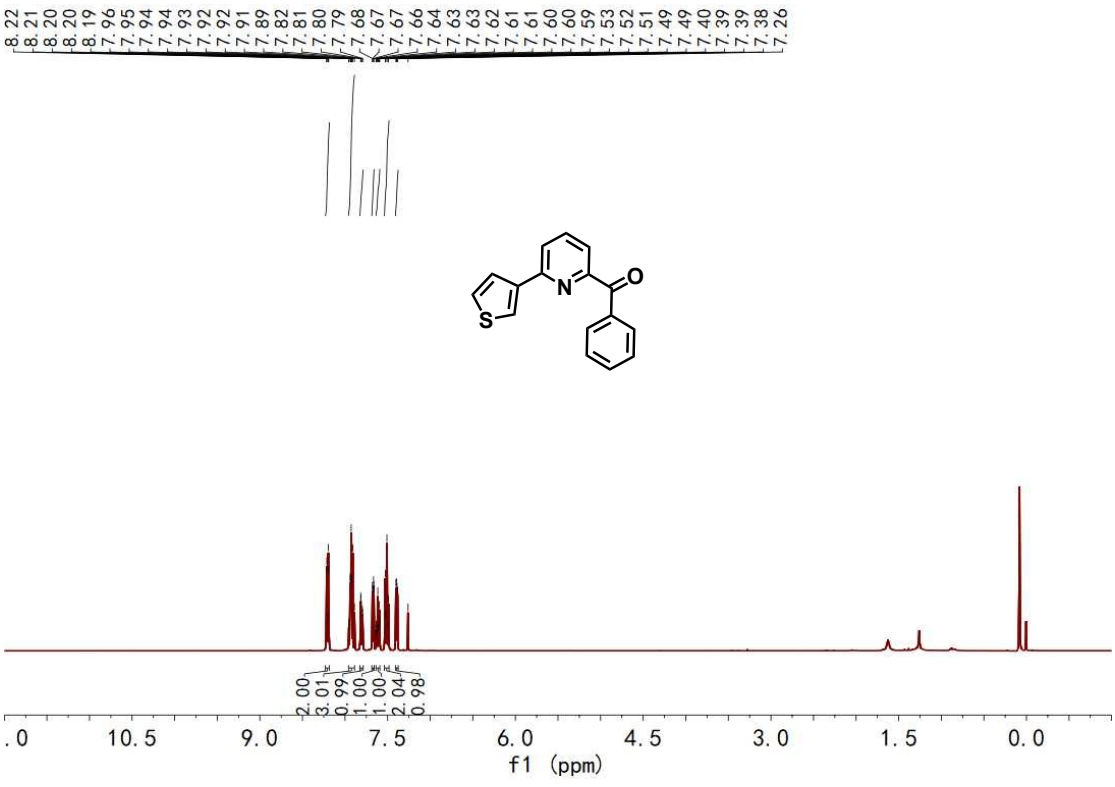

**(6-(2,4-Difluorophenyl)pyridin-2-yl)(phenyl)methanone (13): $^{19}F$ NMR (376 MHz, $CDCl_3$)**



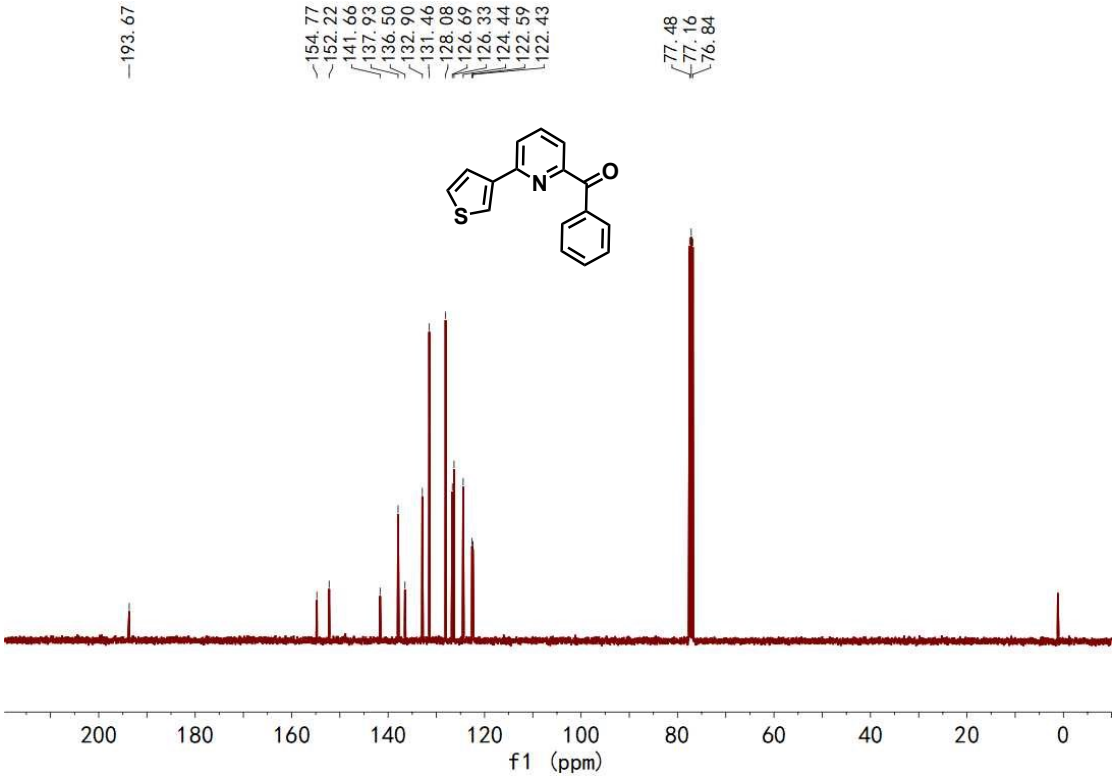
**[2,2'-bipyridin]-6-yl(phenyl)methanone (14): $^1$H NMR (400 MHz, $CDCl_3$)**



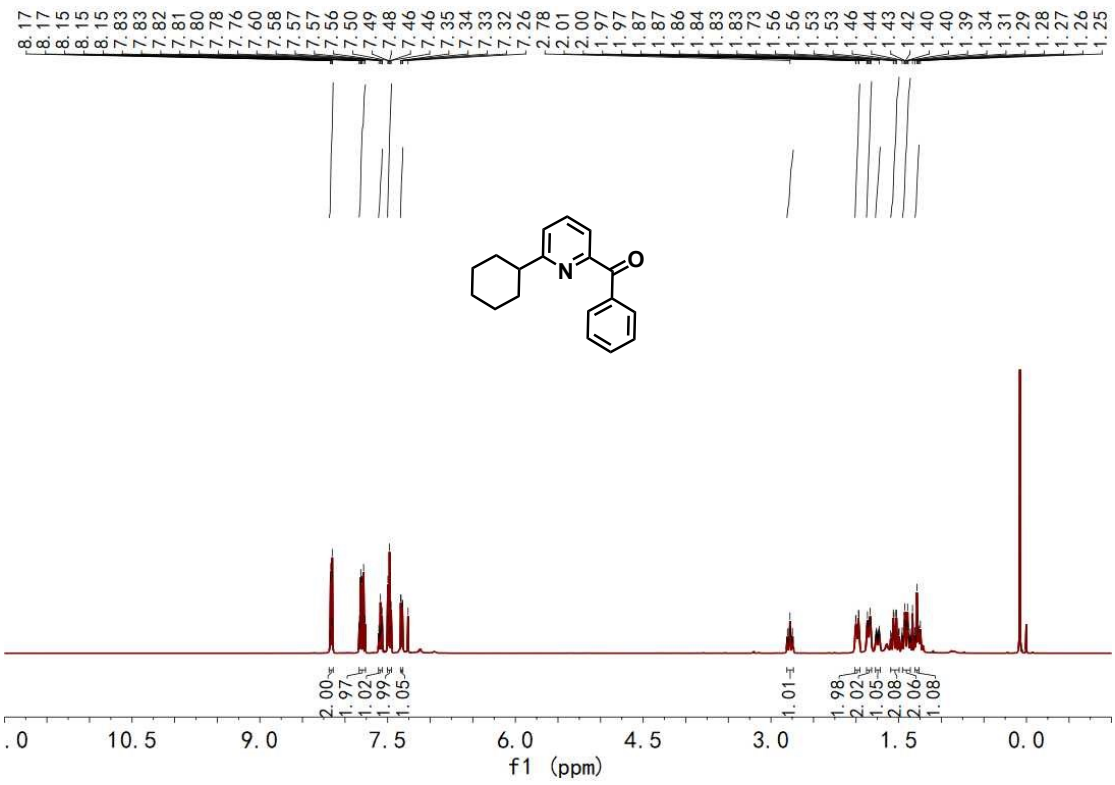

**Phenyl(6-(thiophen-3-yl)pyridin-2-yl)methanone (15): $^1$H NMR (400 MHz, $CDCl_3$)**



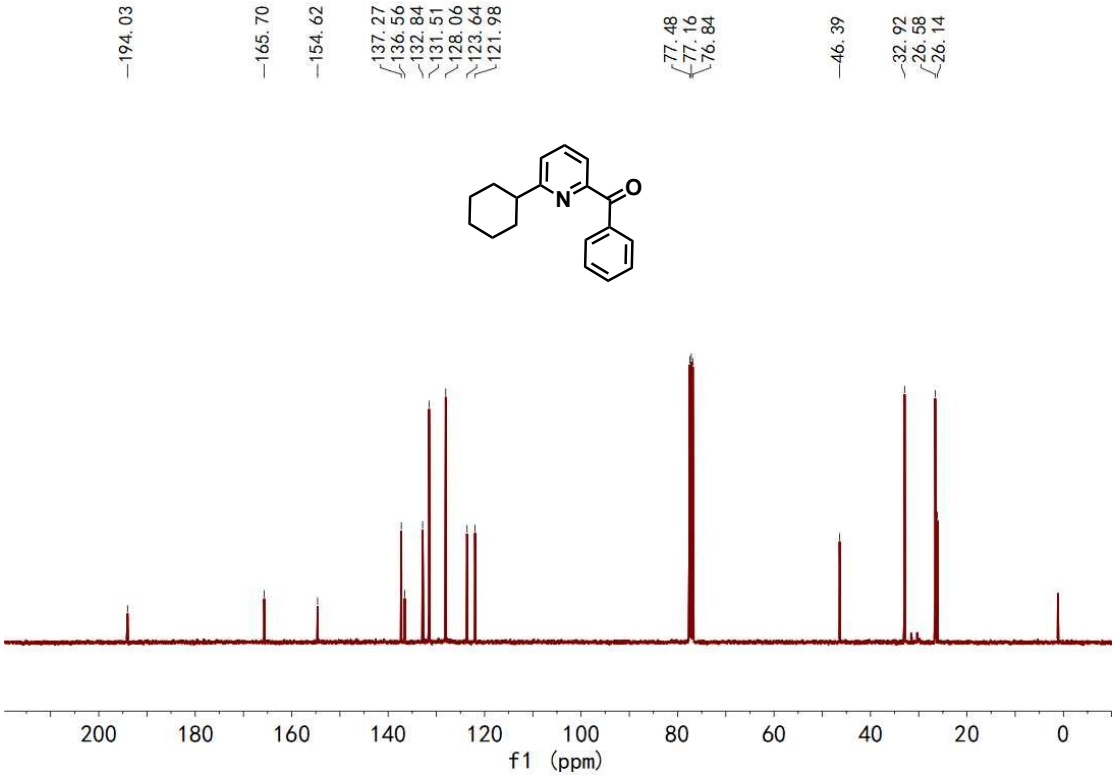
**Phenyl(6-(thiophen-3-yl)pyridin-2-yl)methanone (15): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



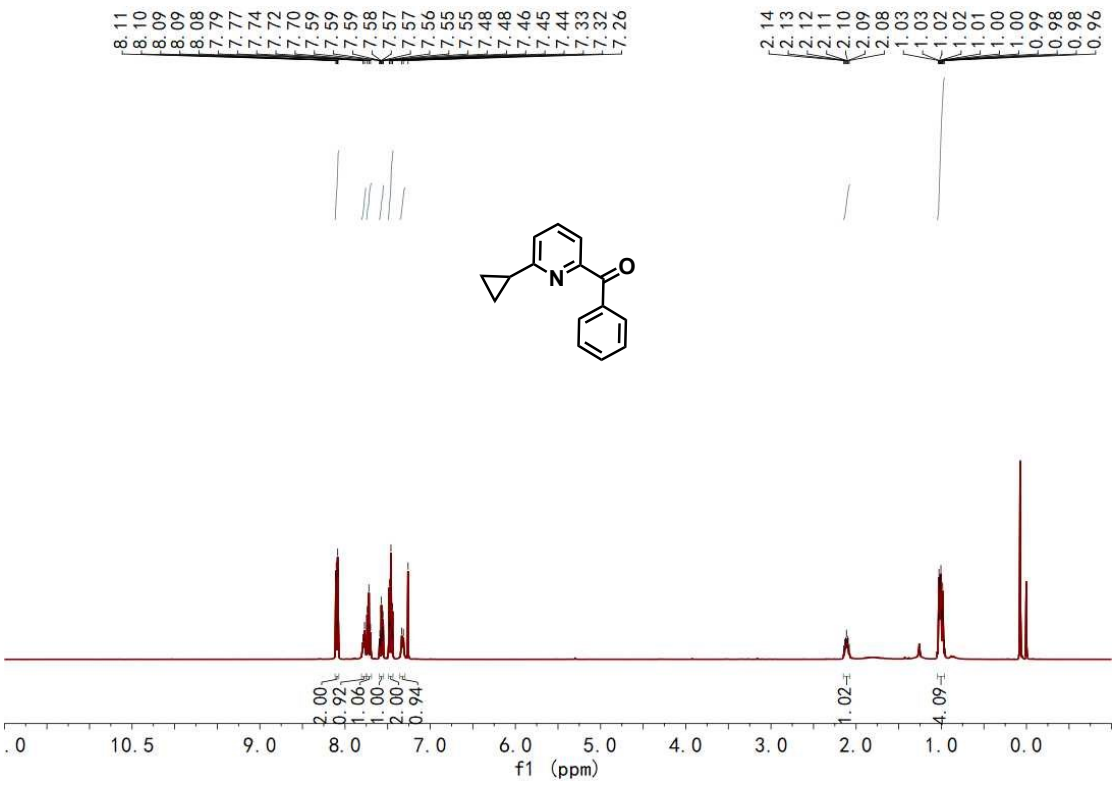

**(6-Cyclohexylpyridin-2-yl)(phenyl)methanone (16): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



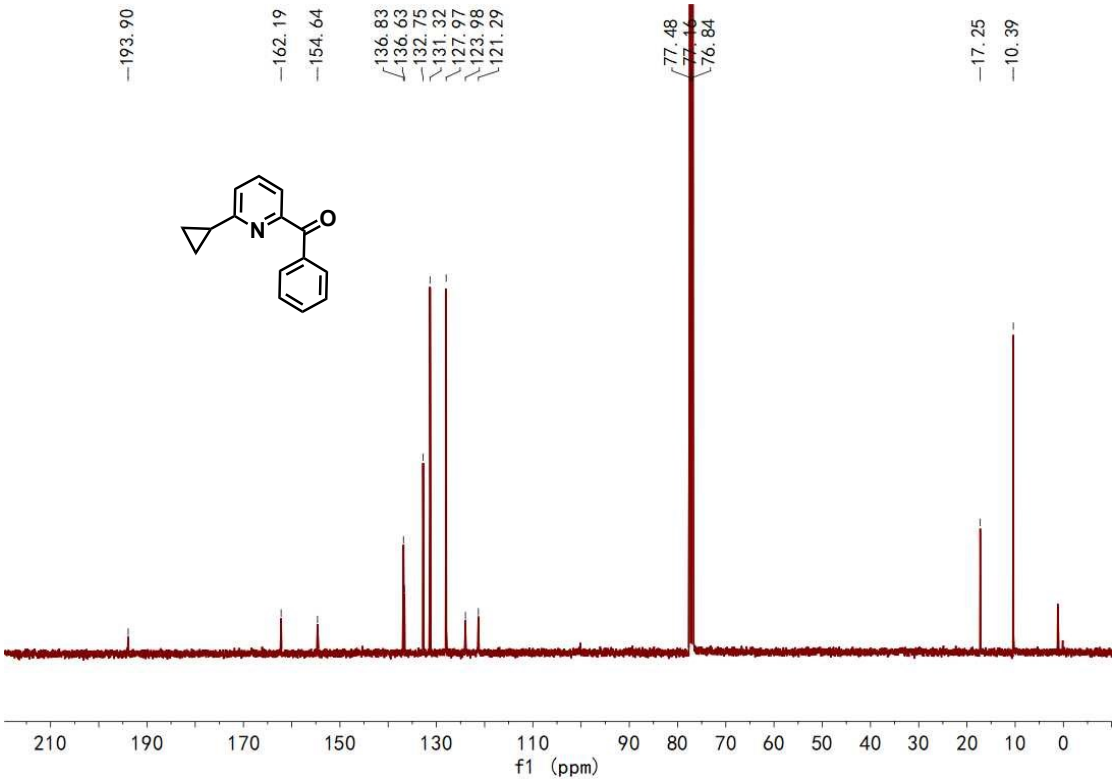
**(6-Cyclohexylpyridin-2-yl)(phenyl)methanone (16): $^{13}$C NMR (101 MHz, $CDCl_3$)**



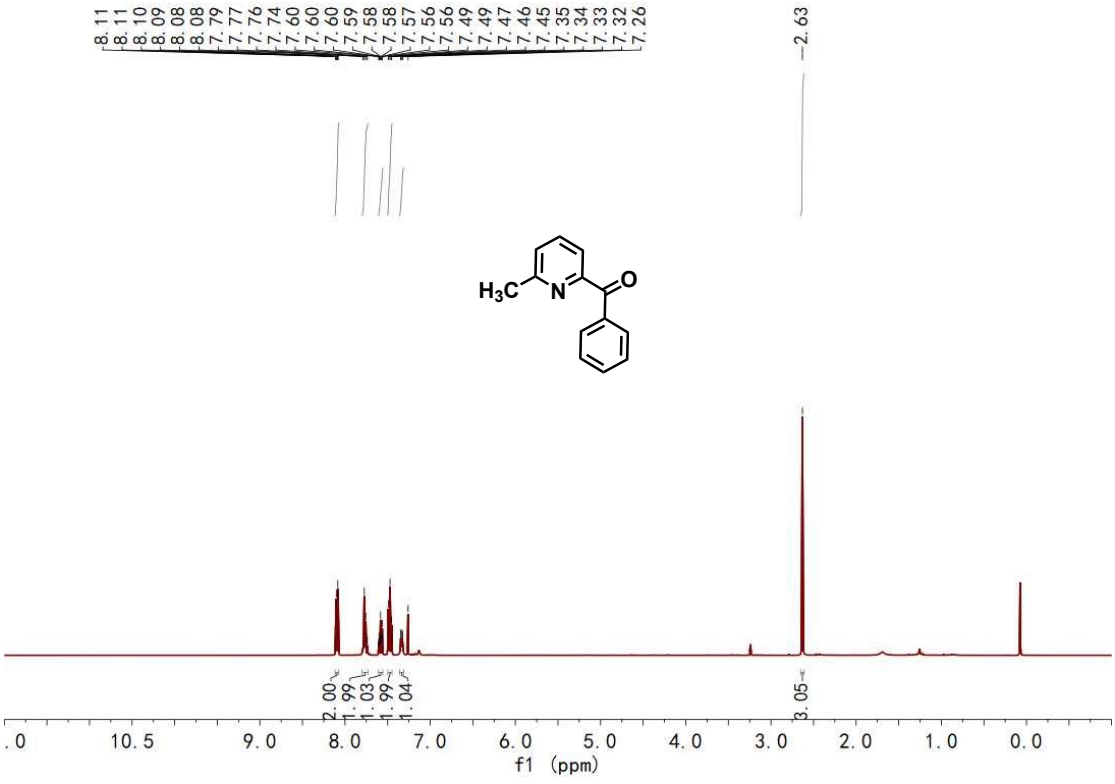

**(6-Cyclopropylpyridin-2-yl)(phenyl)methanone (17): $^{1}$H NMR (400 MHz, $CDCl_3$)**



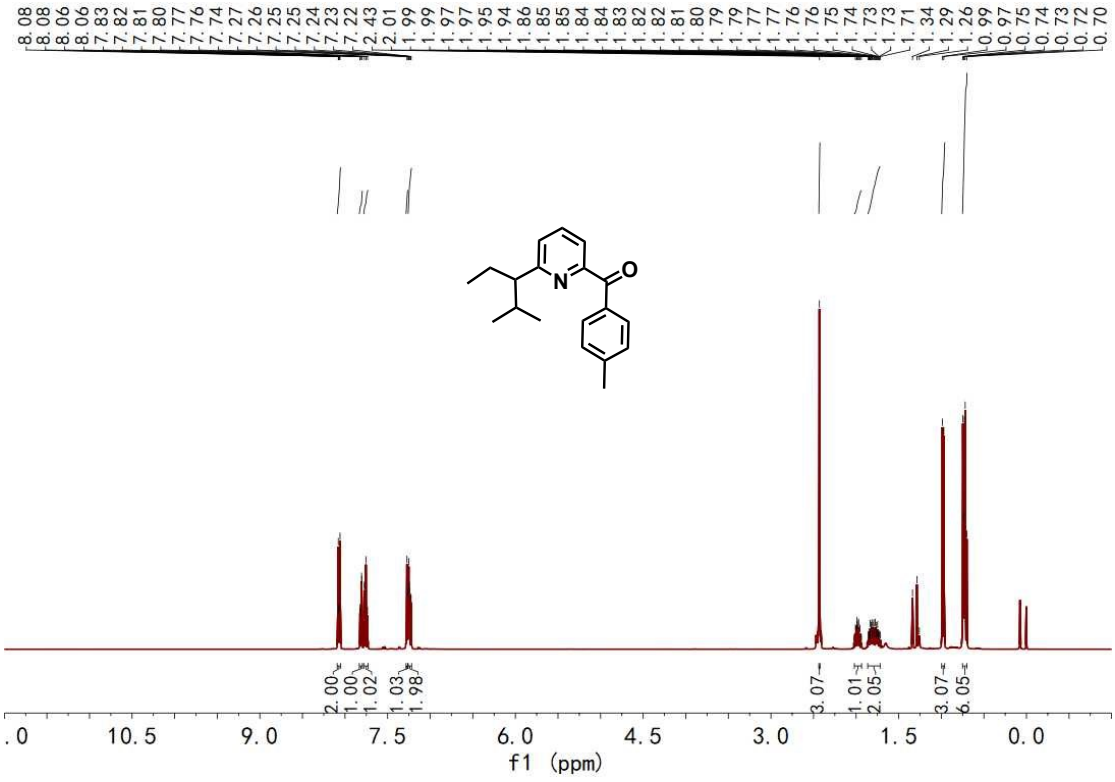
**(6-Cyclopropylpyridin-2-yl)(phenyl)methanone (17): $^1$H NMR (400 MHz, $CDCl_3$)**



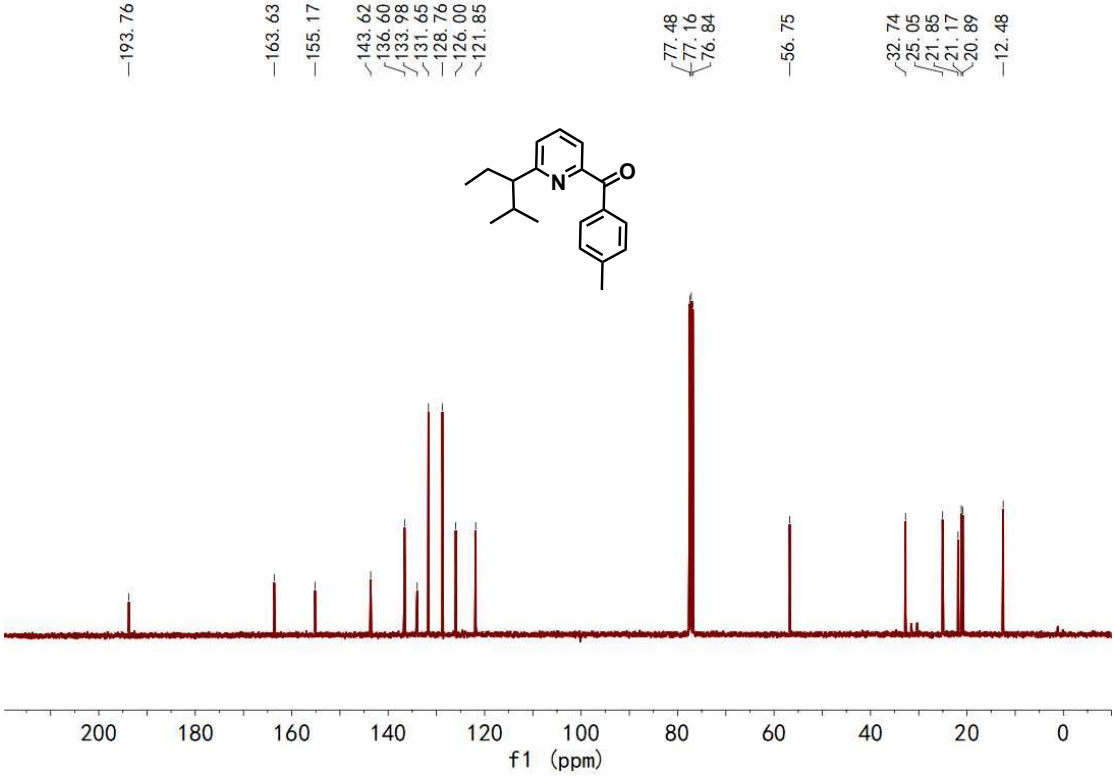

**(6-Methylpyridin-2-yl)(phenyl)methanone (18): $^1$H NMR (400 MHz, $CDCl_3$)**



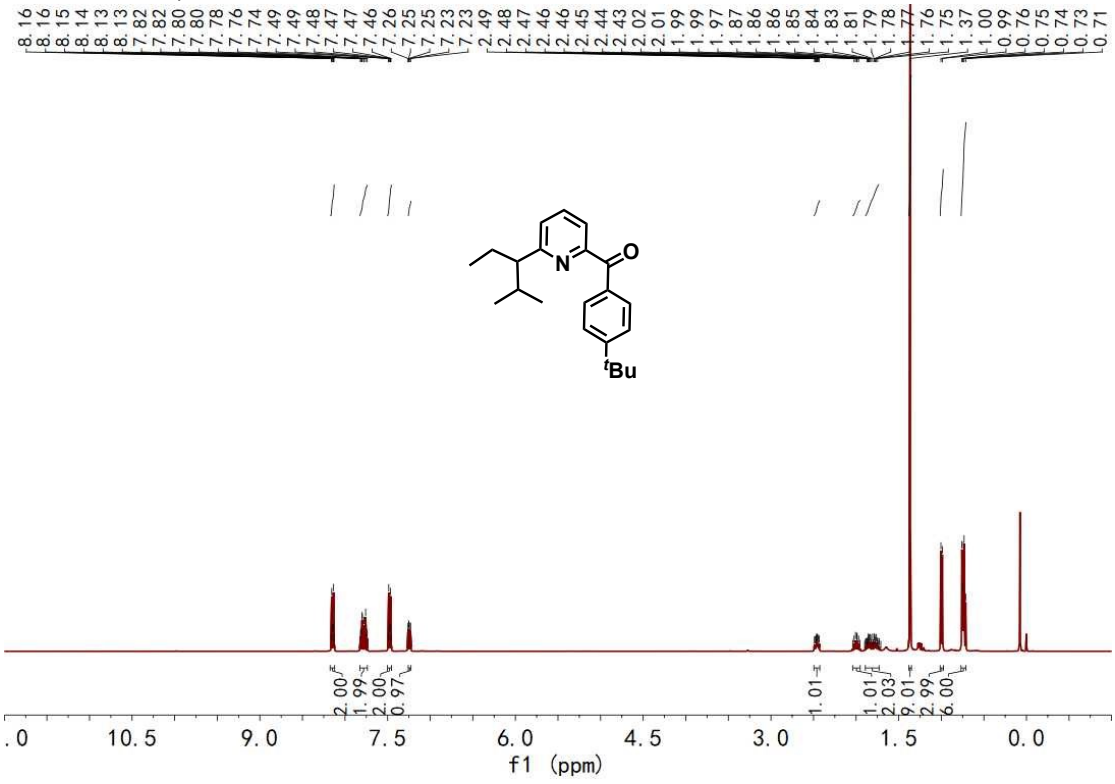
**(6-(2-Methylpentan-3-yl)pyridin-2-yl)(p-tolyl)methanone (19): $^{1}$H NMR (400 MHz, $CDCl_3$)**



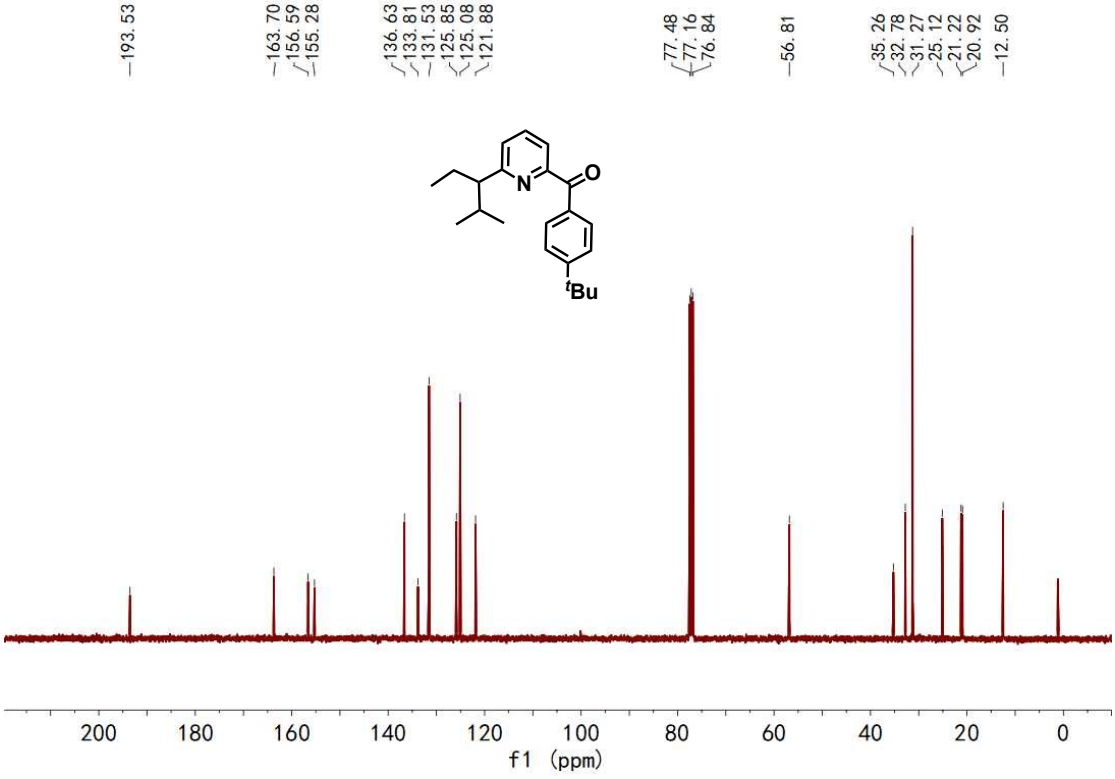

**(6-(2-Methylpentan-3-yl)pyridin-2-yl)(p-tolyl)methanone (19): $^{13}$C NMR (101 MHz, $CDCl_3$)**



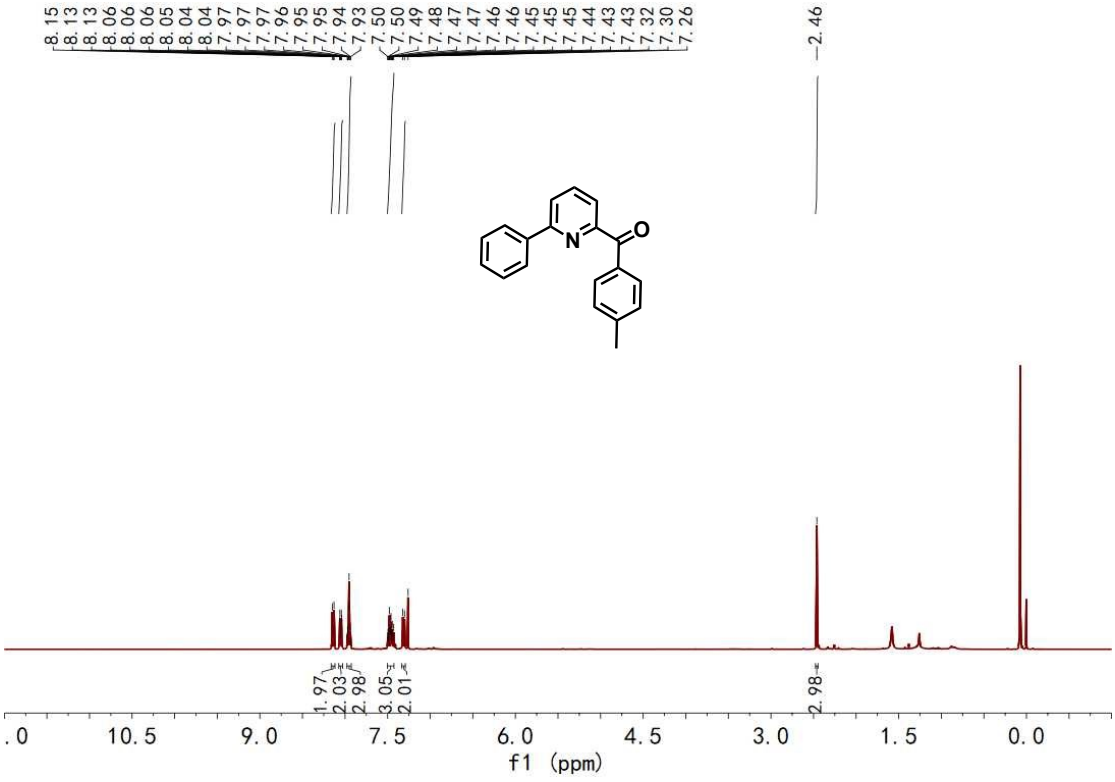
**(6-(2-Methylpentan-3-yl)pyridin-2-yl)(*p*-tolyl)methanone (20): $^{1}$H NMR (400 MHz, $CDCl_3$)**



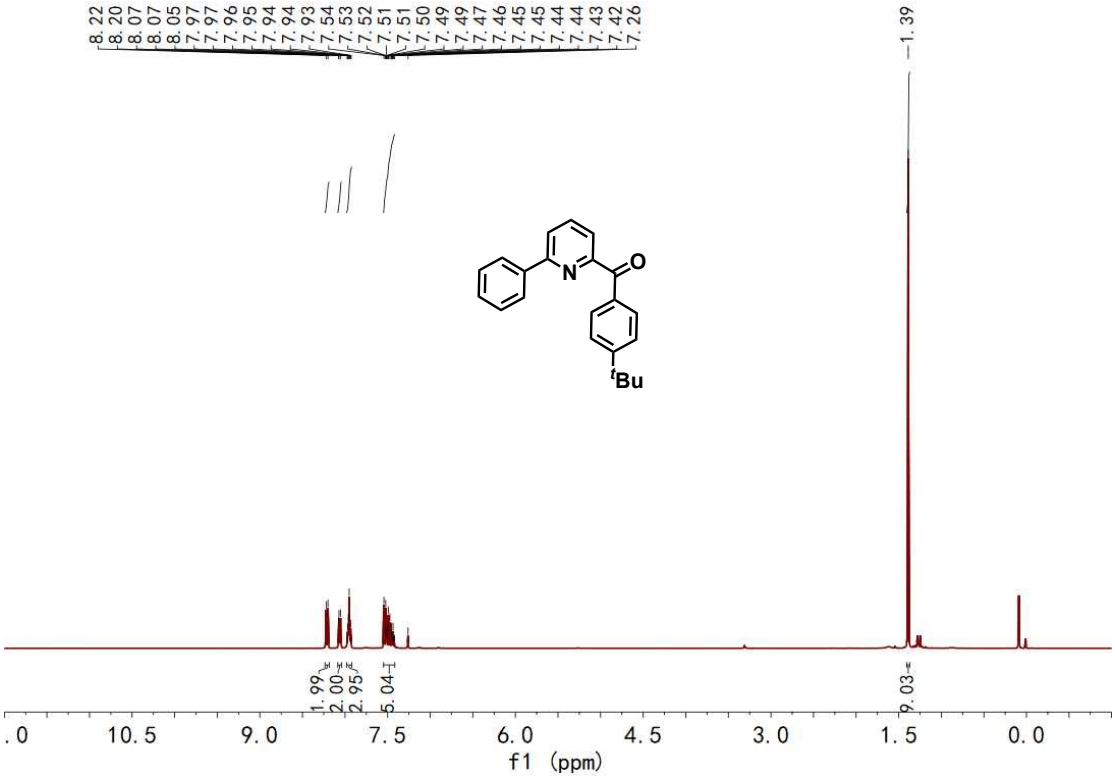

**(6-(2-Methylpentan-3-yl)pyridin-2-yl)(*p*-tolyl)methanone (20): $^{13}$C NMR (101 MHz, $CDCl_3$)**



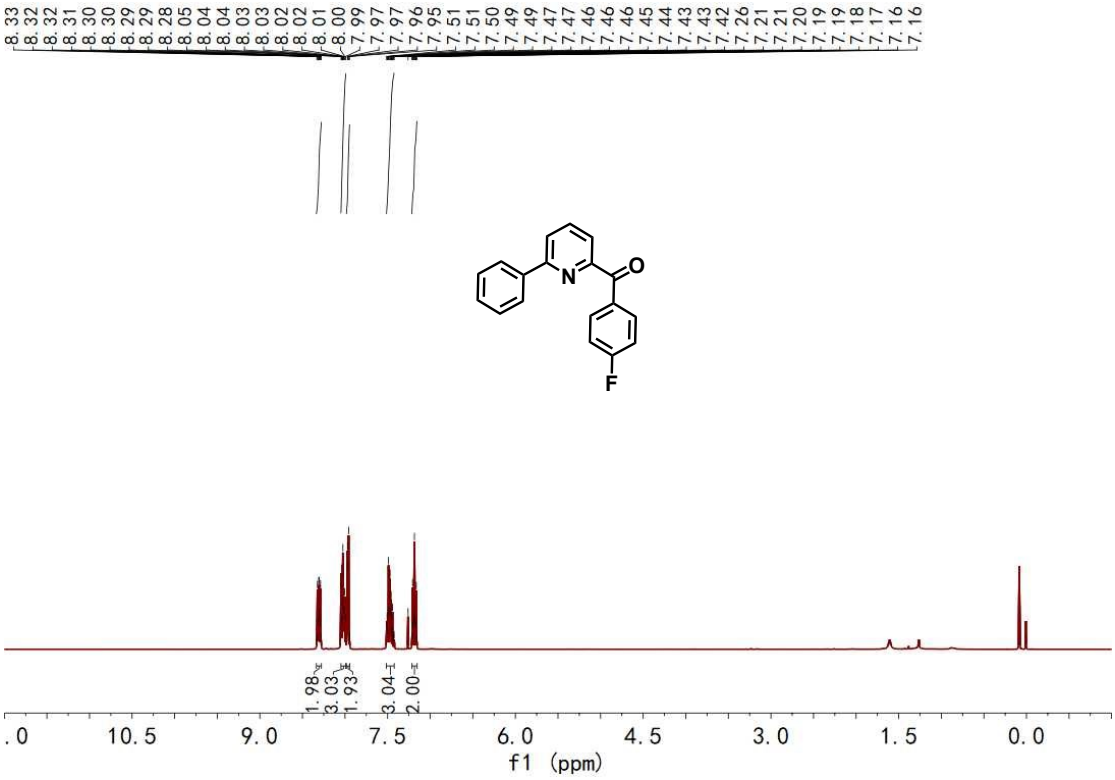
**(6-Phenylpyridin-2-yl)(*p*-tolyl)methanone (21): $^1$H NMR (400 MHz, $CDCl_3$)**



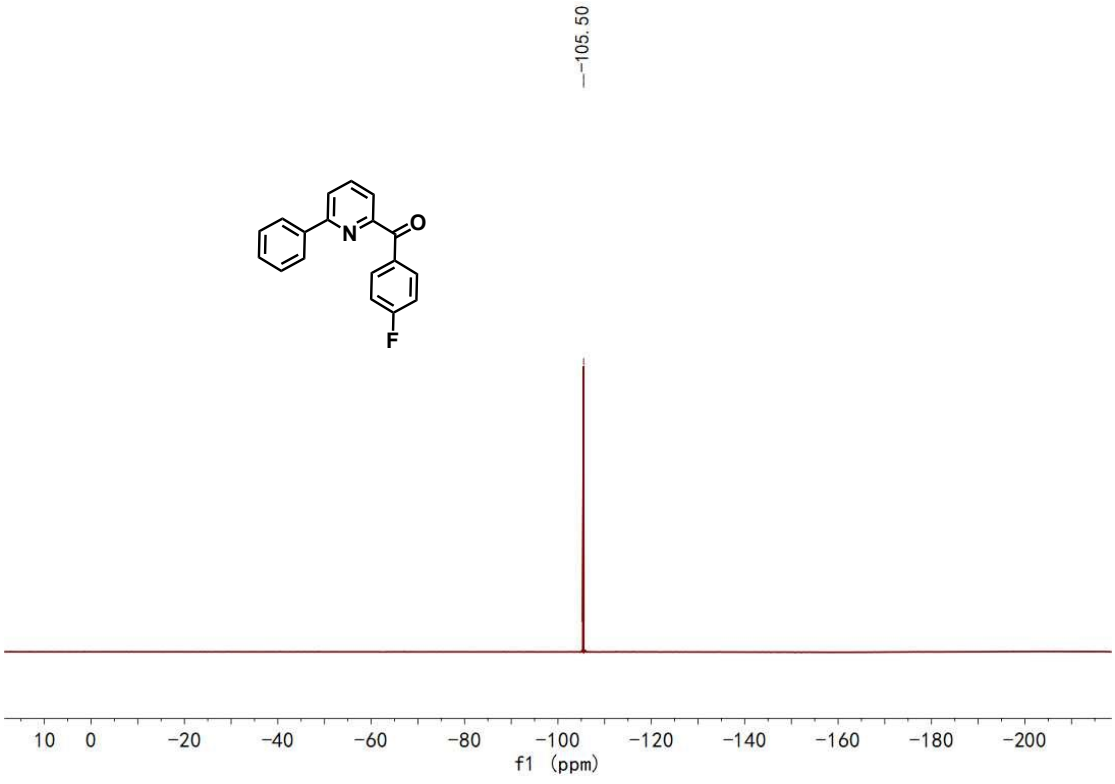

**(4-(*Tert*-butyl)phenyl)(6-phenylpyridin-2-yl)methanone (22): $^1$H NMR (400 MHz, $CDCl_3$)**



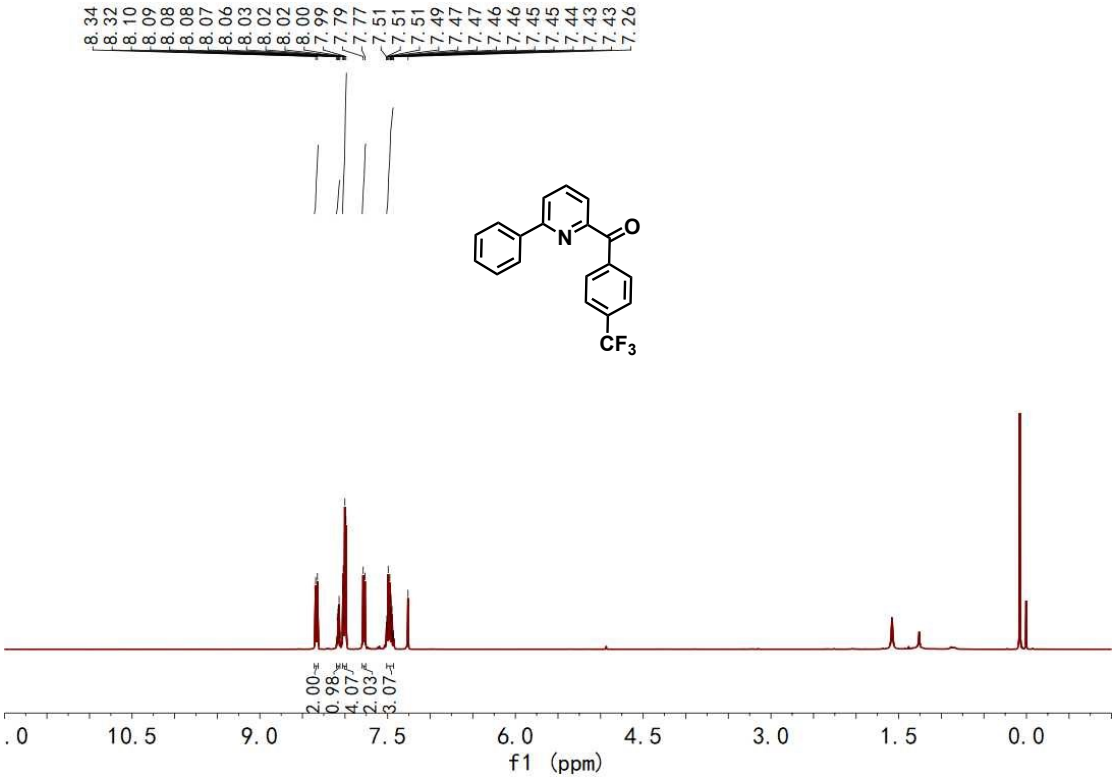
**(4-Fluorophenyl)(6-phenylpyridin-2-yl)methanone (23): $^{1}$H NMR (400 MHz, $CDCl_3$)**



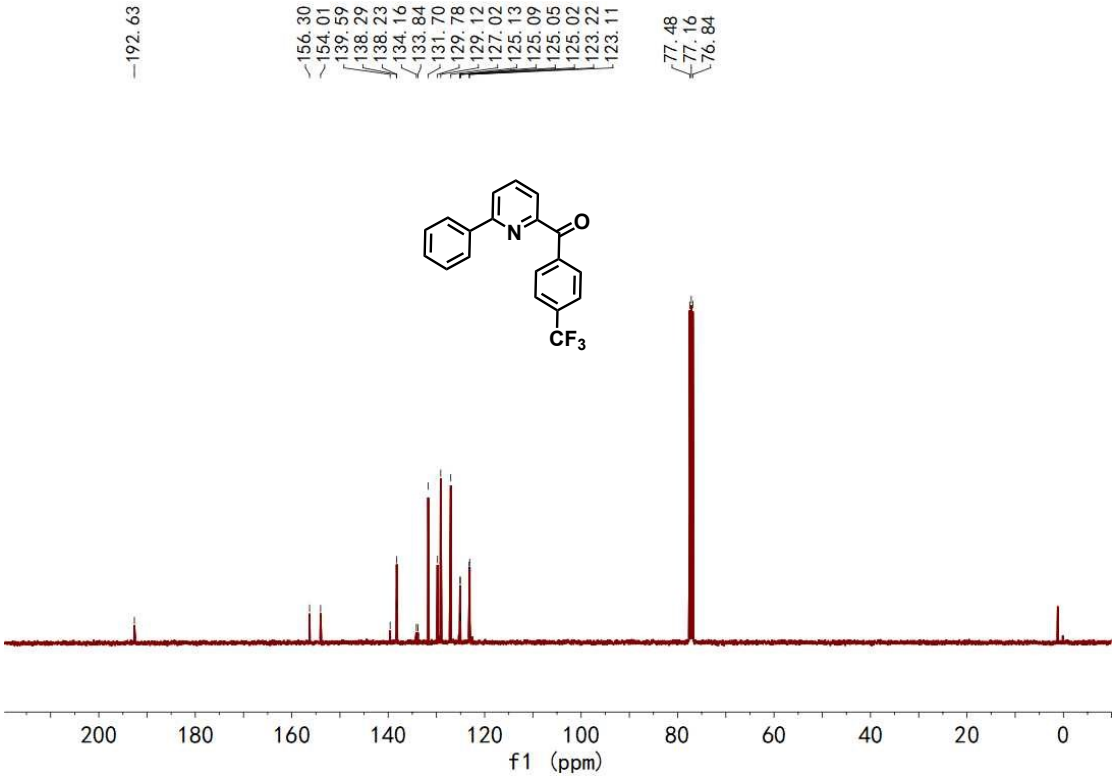

**(4-Fluorophenyl)(6-phenylpyridin-2-yl)methanone (23): $^{19}$F NMR (376 MHz, $CDCl_3$)**



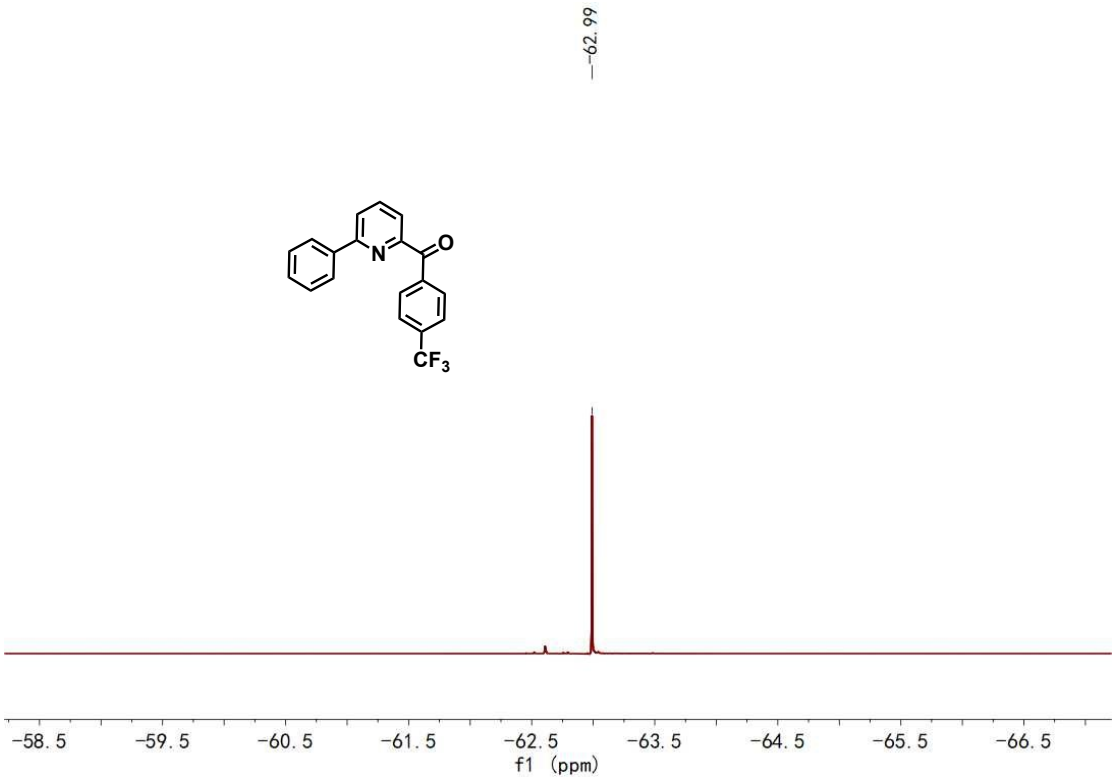
**(6-Phenylpyridin-2-yl)(4-(trifluoromethyl)phenyl)methanone (24): $^{1}$H NMR (400 MHz, $CDCl_3$)**



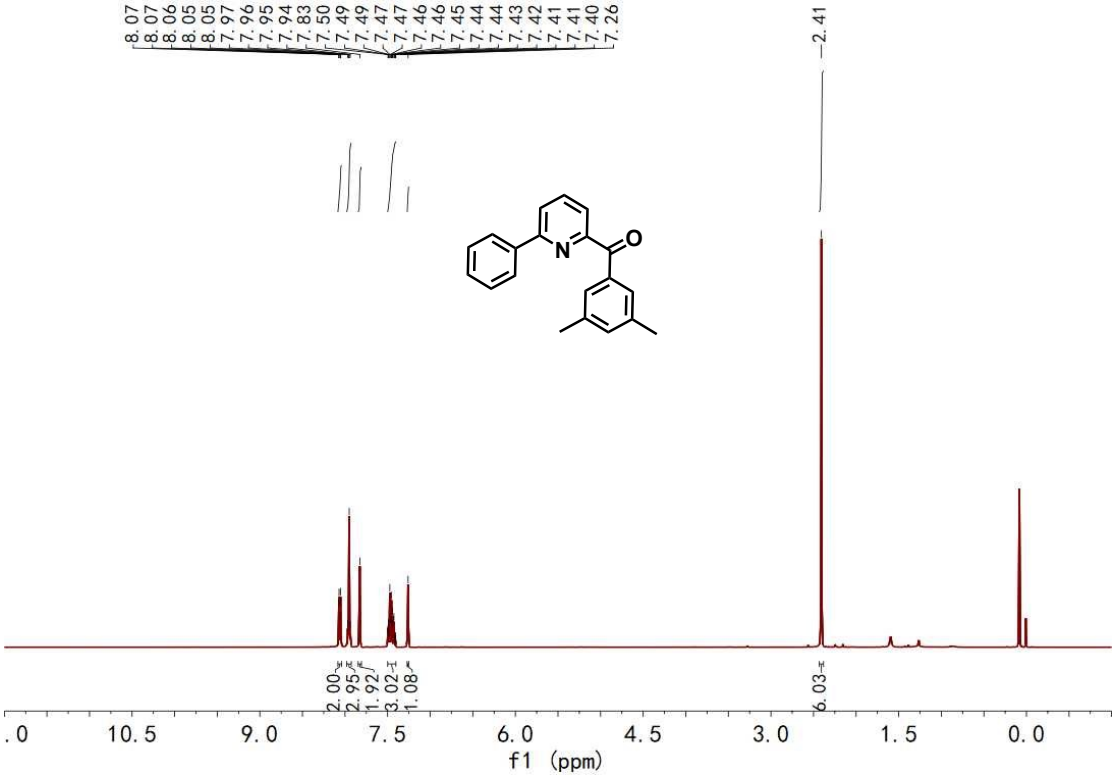

**(6-Phenylpyridin-2-yl)(4-(trifluoromethyl)phenyl)methanone (24): $^{13}$C NMR (101 MHz, $CDCl_3$)**



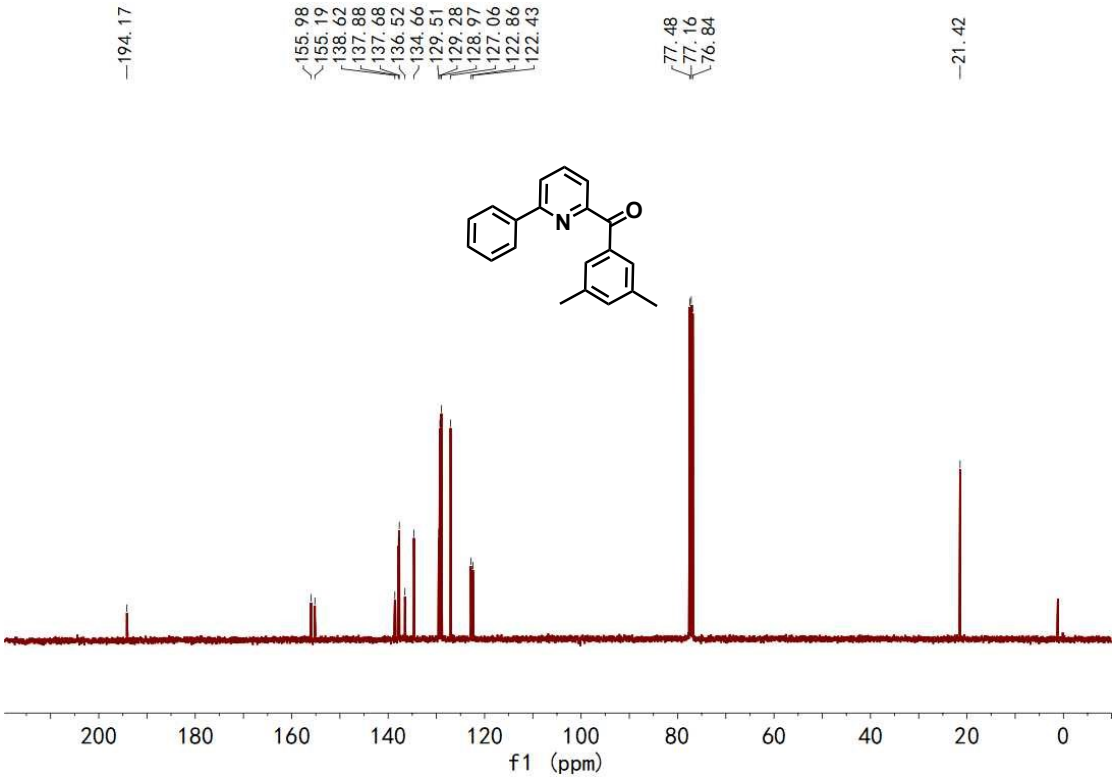
**(6-Phenylpyridin-2-yl)(4-(trifluoromethyl)phenyl)methanone (24): $^{19}$F NMR (376 MHz, $CDCl_3$)**



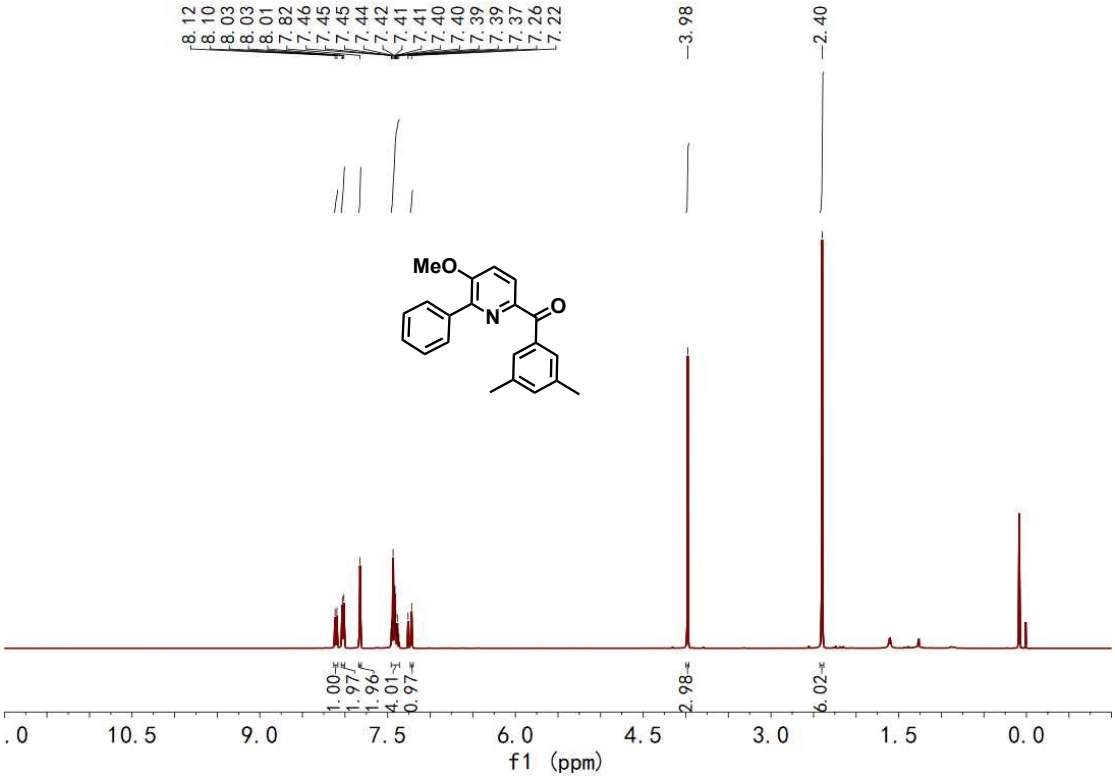

**(3,5-Dimethylphenyl)(6-phenylpyridin-2-yl)methanone (25): $^{1}$H NMR (400 MHz, $CDCl_3$)**



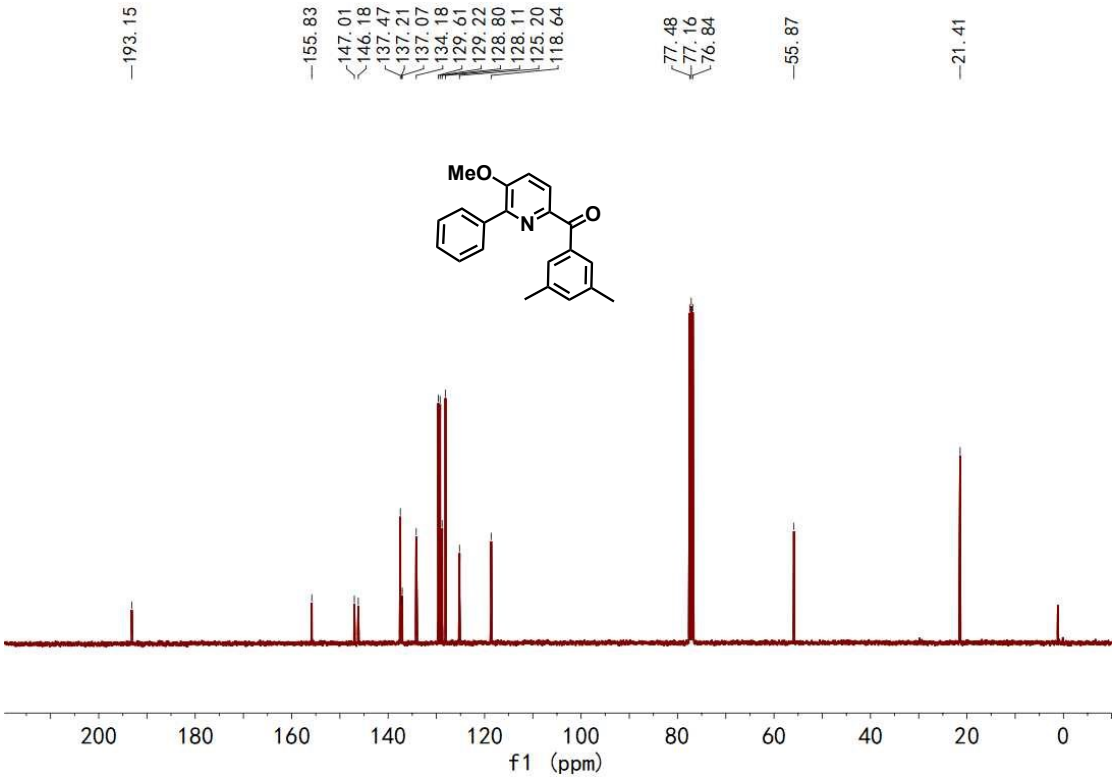
**(3,5-Dimethylphenyl)(6-phenylpyridin-2-yl)methanone (25): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



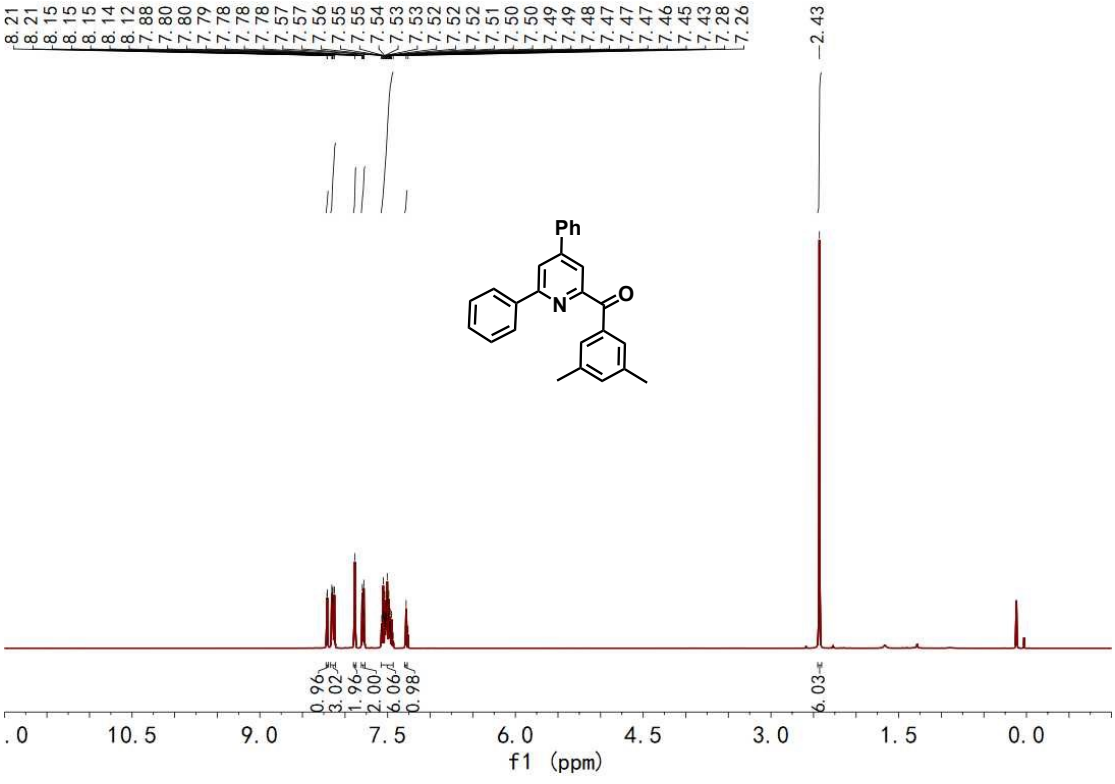

**(3,5-Dimethylphenyl)(5-methoxy-6-phenylpyridin-2-yl)methanone (26): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



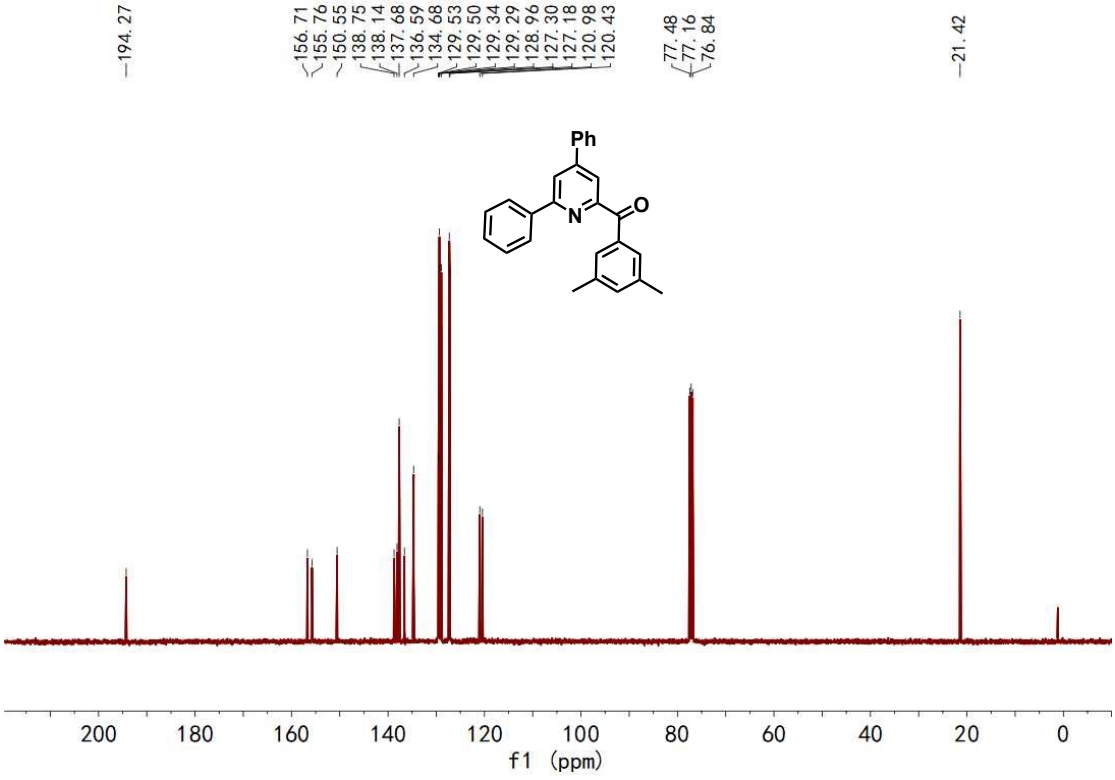
**(3,5-Dimethylphenyl)(5-methoxy-6-phenylpyridin-2-yl)methanone (26): $^{13}$C NMR (101 MHz, $CDCl_3$)**



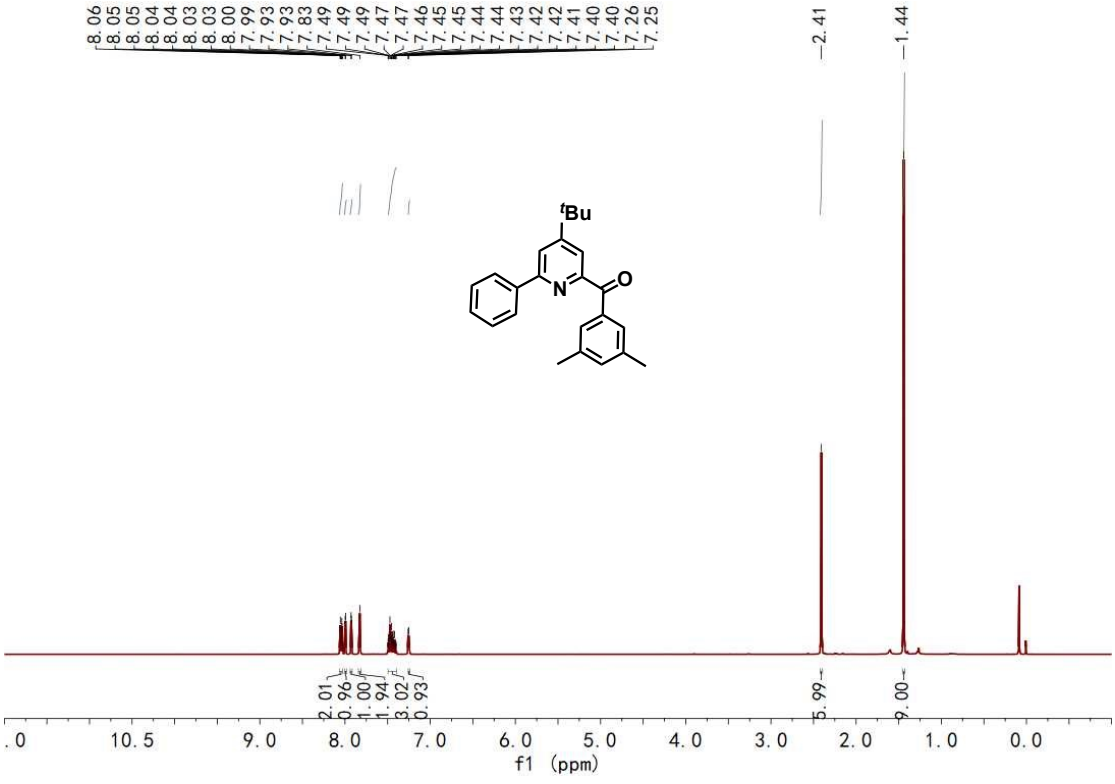

**(3,5-Dimethylphenyl)(4,6-diphenylpyridin-2-yl)methanone (27): $^{1}$H NMR (400 MHz, $CDCl_3$)**



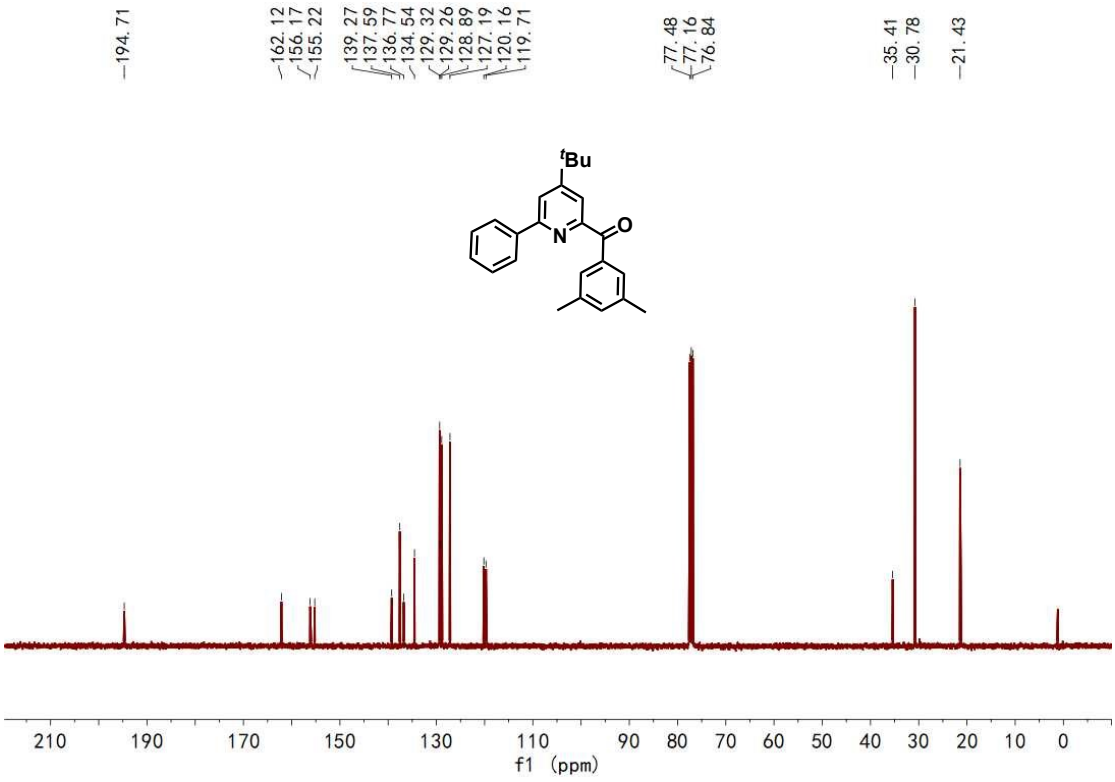
**(3,5-Dimethylphenyl)(4,6-diphenylpyridin-2-yl)methanone (27): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



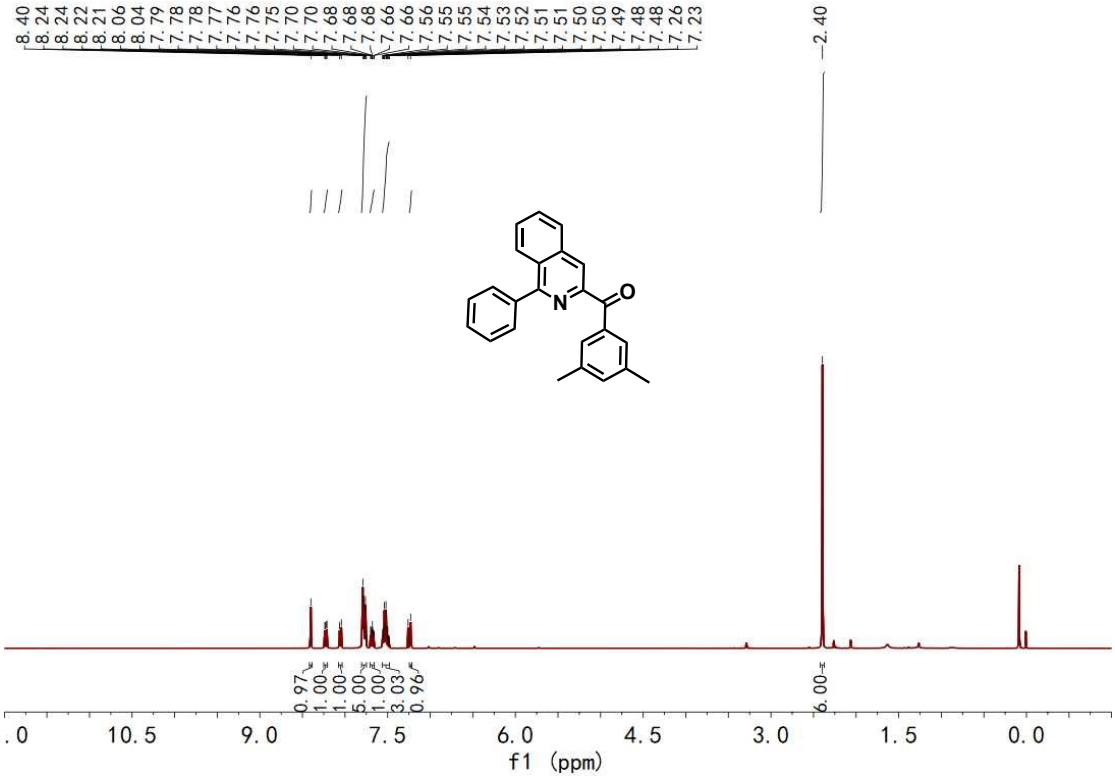

**(4-(*Tert*-butyl)-6-phenylpyridin-2-yl)(3,5-dimethylphenyl)methanone (28): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



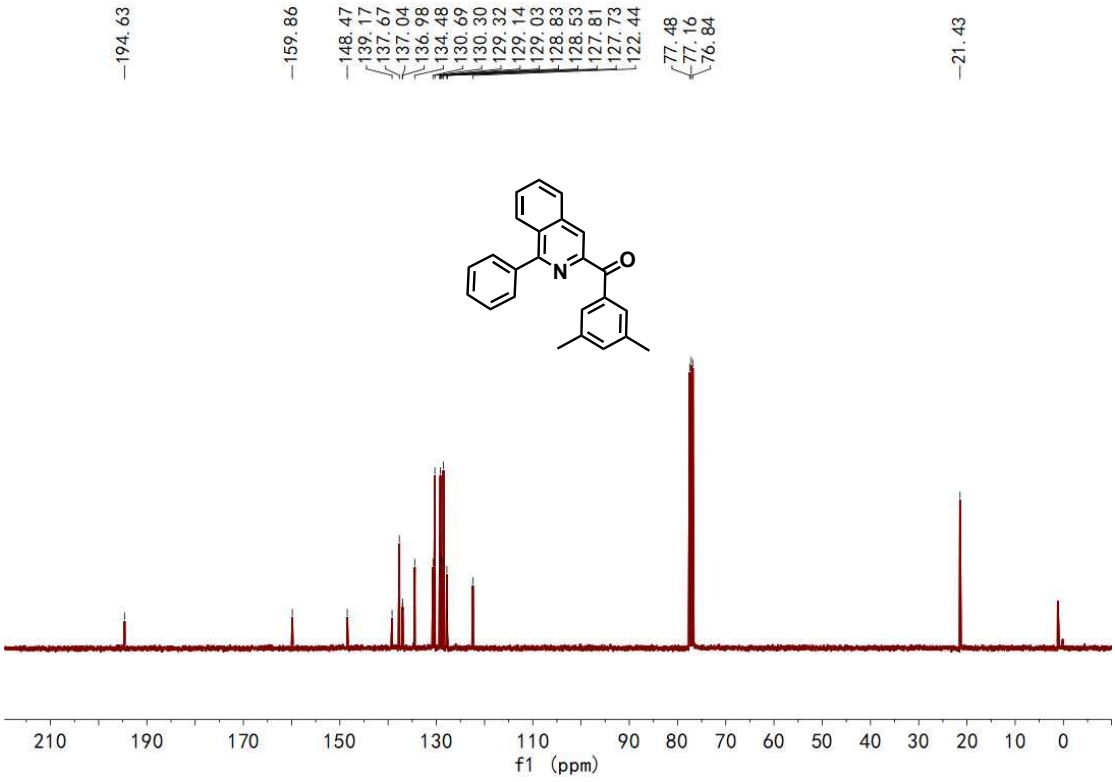
**(4-(*Tert*-butyl)-6-phenylpyridin-2-yl)(3,5-dimethylphenyl)methanone (28): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



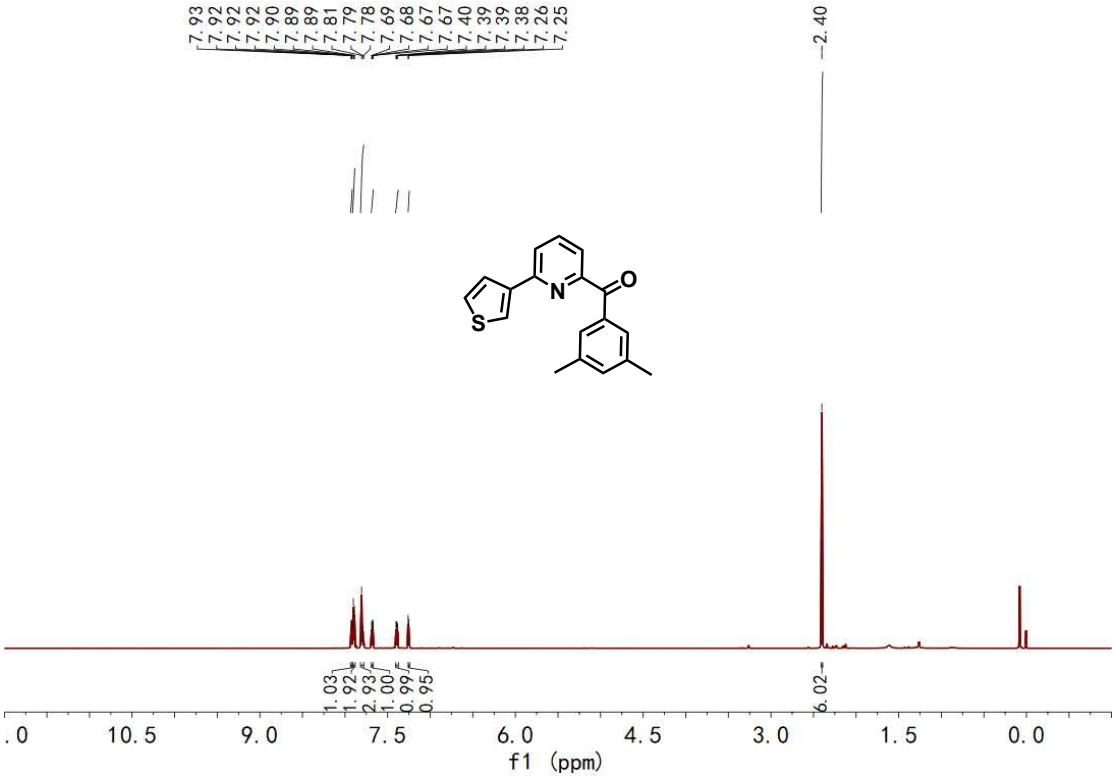

**(3,5-Dimethylphenyl)(1-phenylisoquinolin-3-yl)methanone (29): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



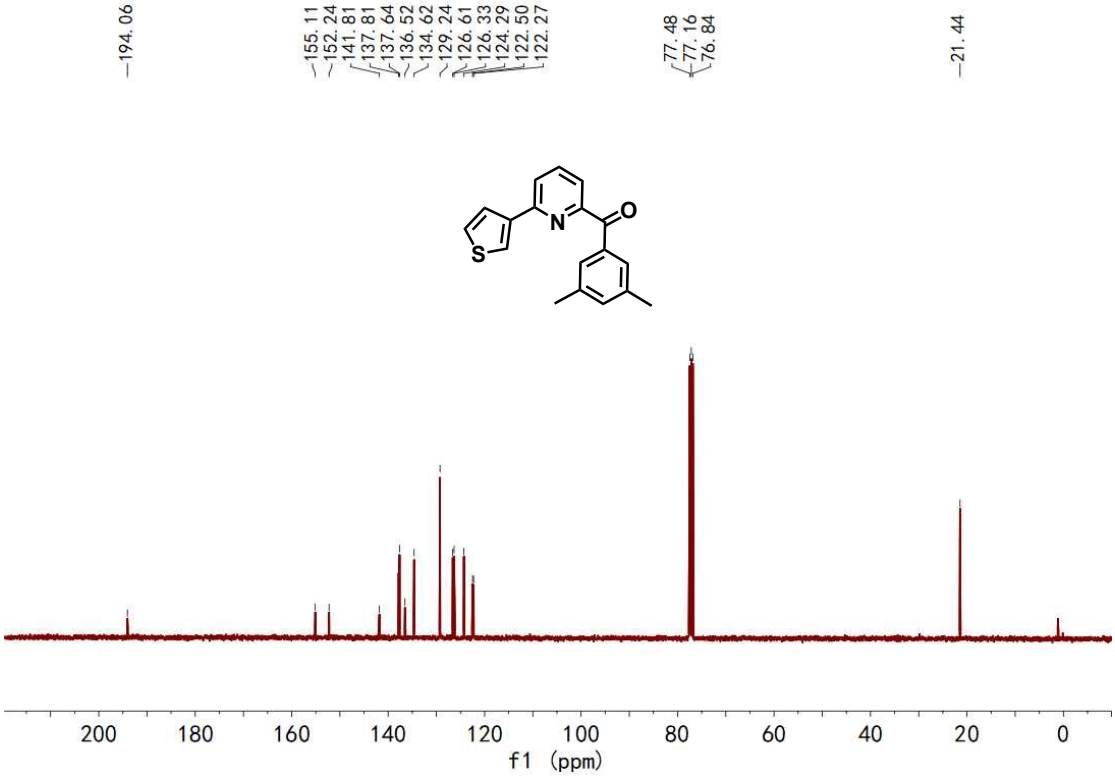
**(3,5-Dimethylphenyl)(1-phenylisoquinolin-3-yl)methanone (29): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



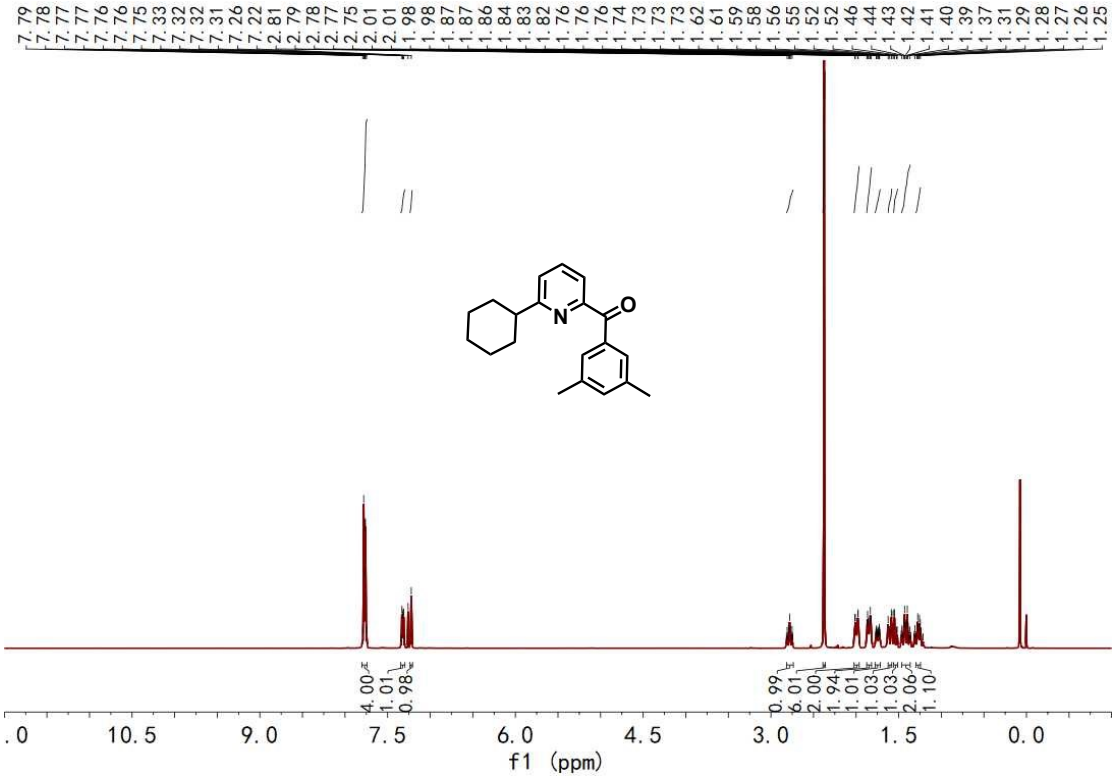

**(3,5-Dimethylphenyl)(6-(thiophen-3-yl)pyridin-2-yl)methanone (30): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



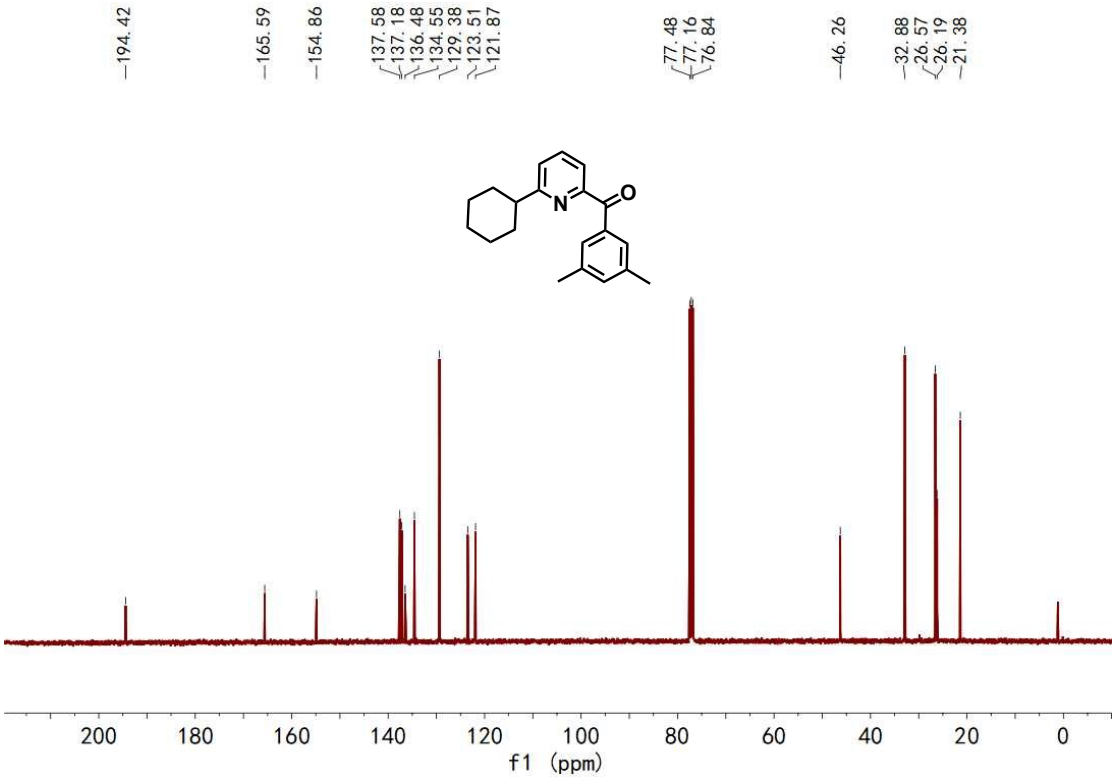
**(3,5-Dimethylphenyl)(6-(thiophen-3-yl)pyridin-2-yl)methanone (30): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



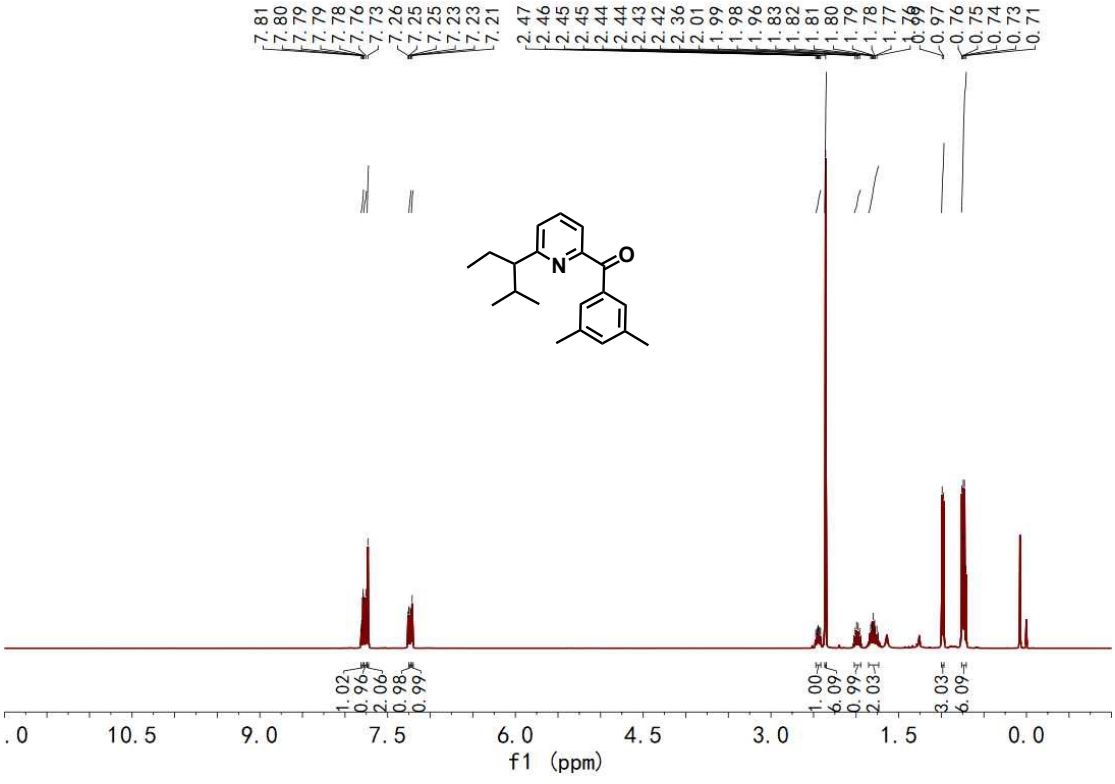

**(6-Cyclohexylpyridin-2-yl)(3,5-dimethylphenyl)methanone (31): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



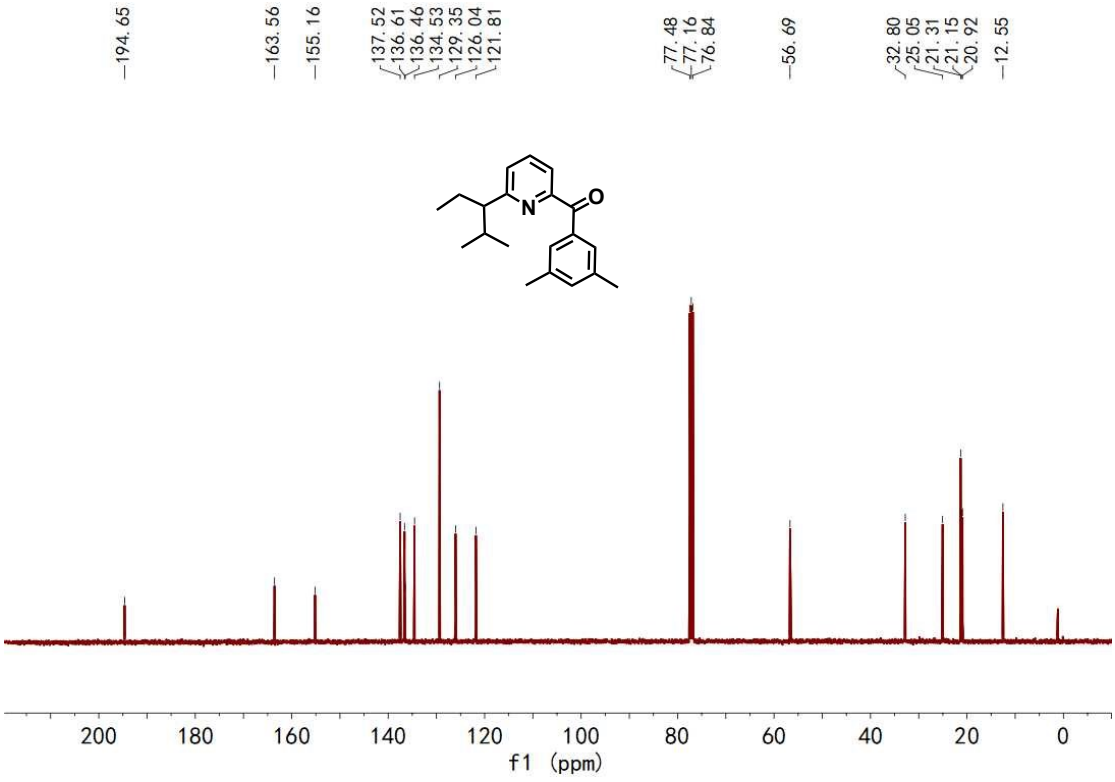
**(6-Cyclohexylpyridin-2-yl)(3,5-dimethylphenyl)methanone (31): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



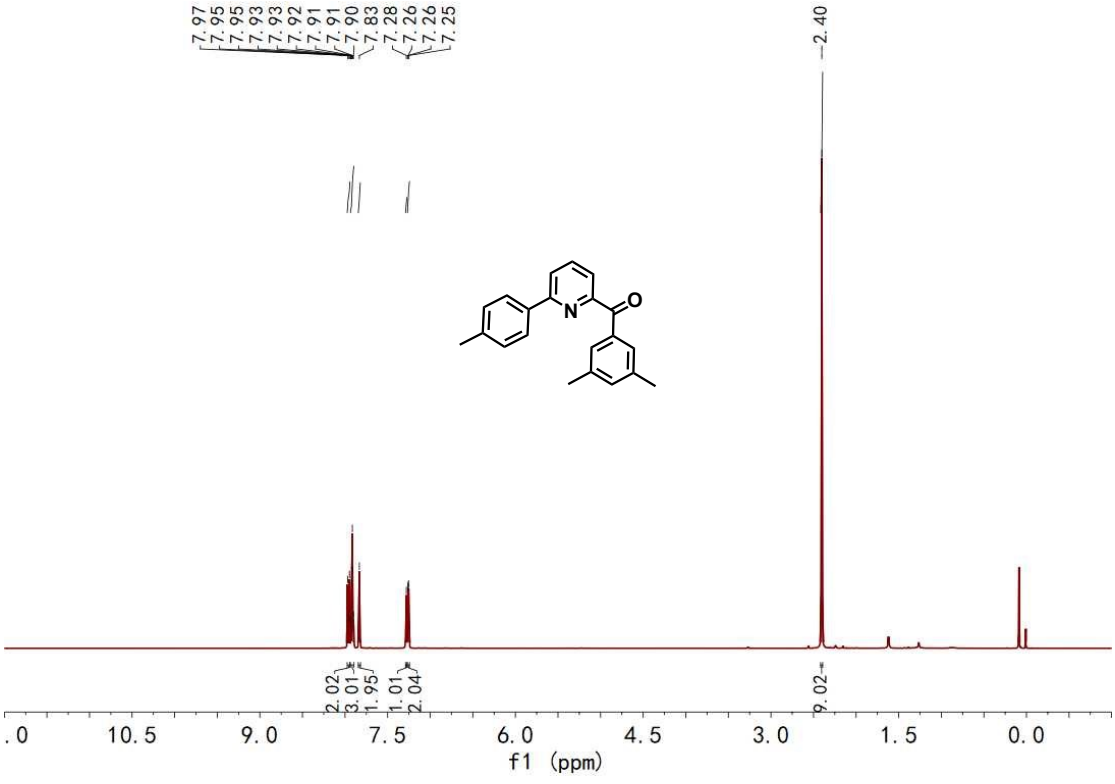

**(3,5-Dimethylphenyl)(6-(2-methylpentan-3-yl)pyridin-2-yl)methanone (32): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



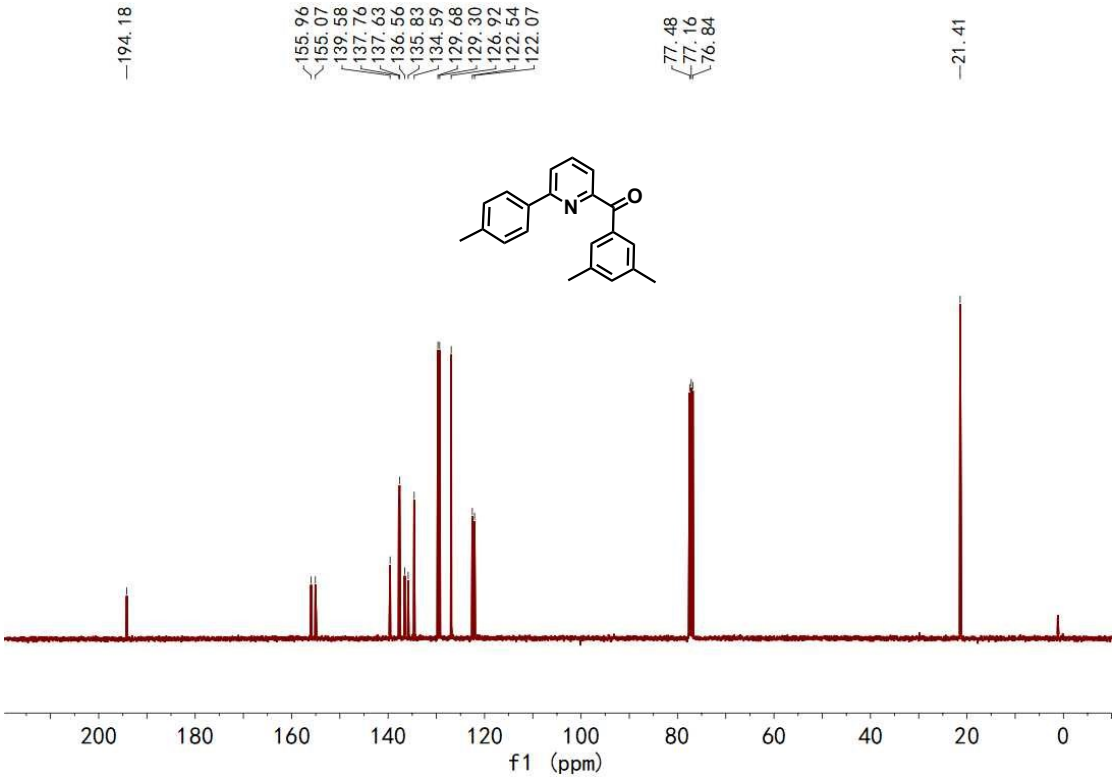
**(3,5-Dimethylphenyl)(6-(2-methylpentan-3-yl)pyridin-2-yl)methanone (32): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



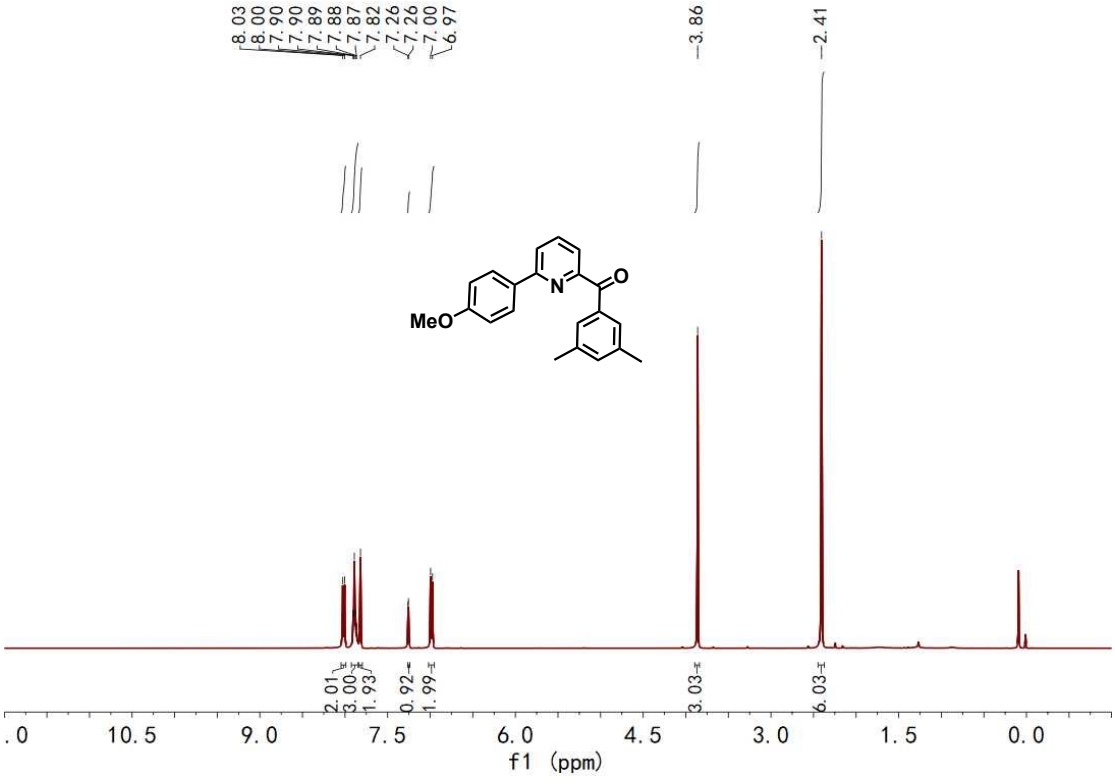

**(3,5-Dimethylphenyl)(6-(*p*-tolyl)pyridin-2-yl)methanone (33): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



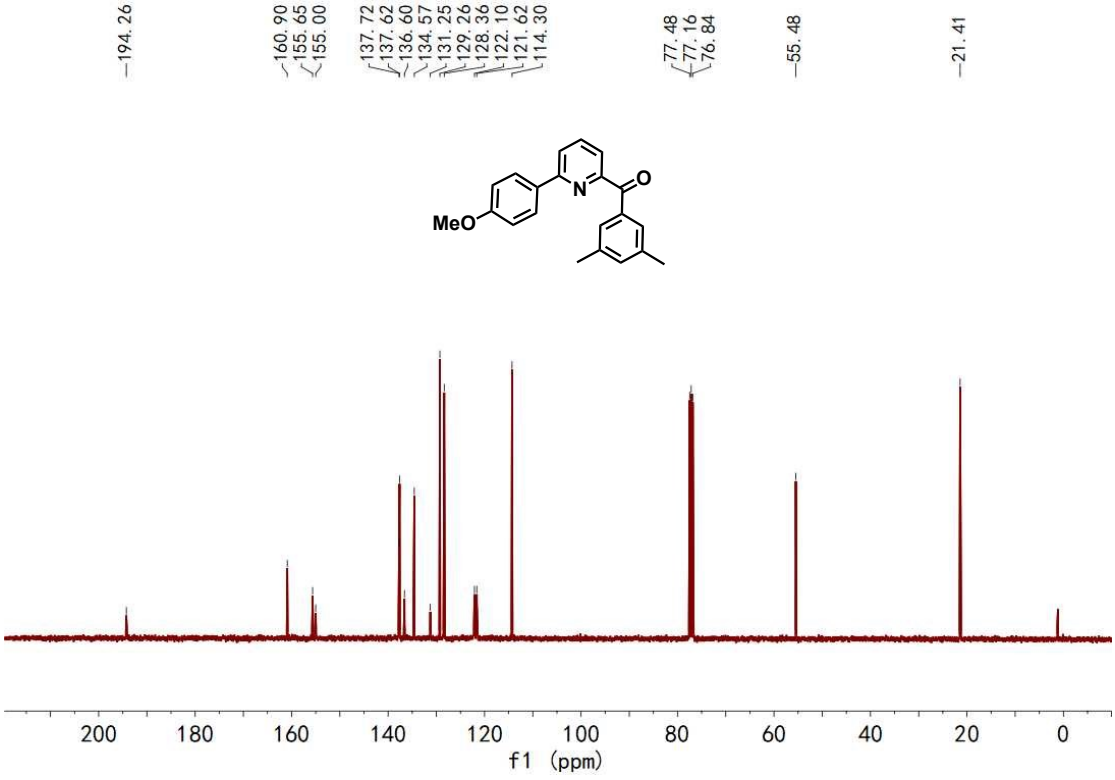
**(3,5-Dimethylphenyl)(6-(*p*-tolyl)pyridin-2-yl)methanone (33): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



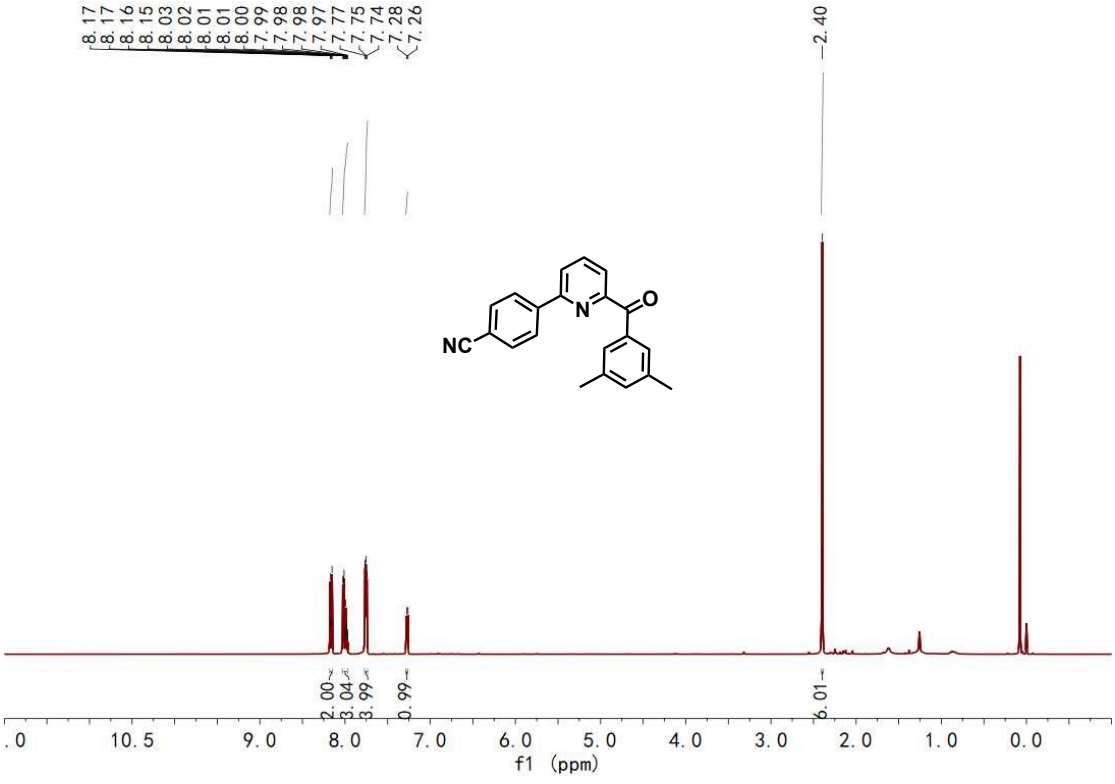

**(3,5-Dimethylphenyl)(6-(4-methoxyphenyl)pyridin-2-yl)methanone (34): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



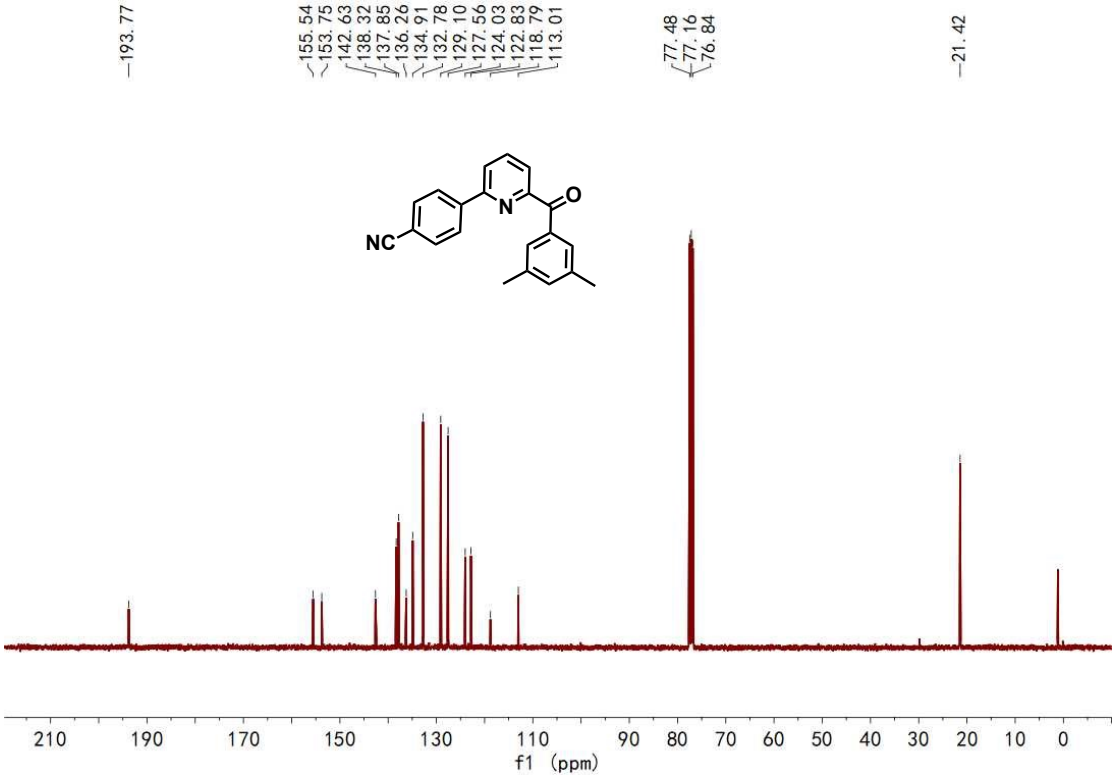
**(3,5-Dimethylphenyl)(6-(4-methoxyphenyl)pyridin-2-yl)methanone (34): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



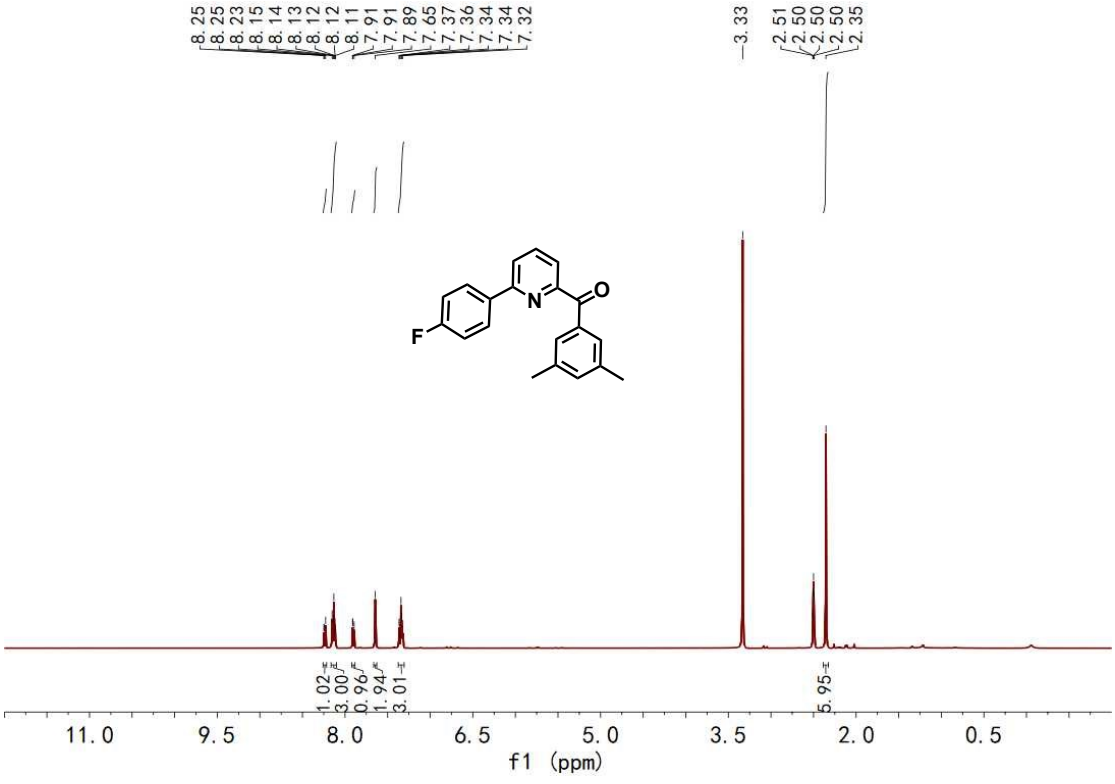

**4-(6-(3,5-Dimethylbenzoyl)pyridin-2-yl)benzonitrile (35): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



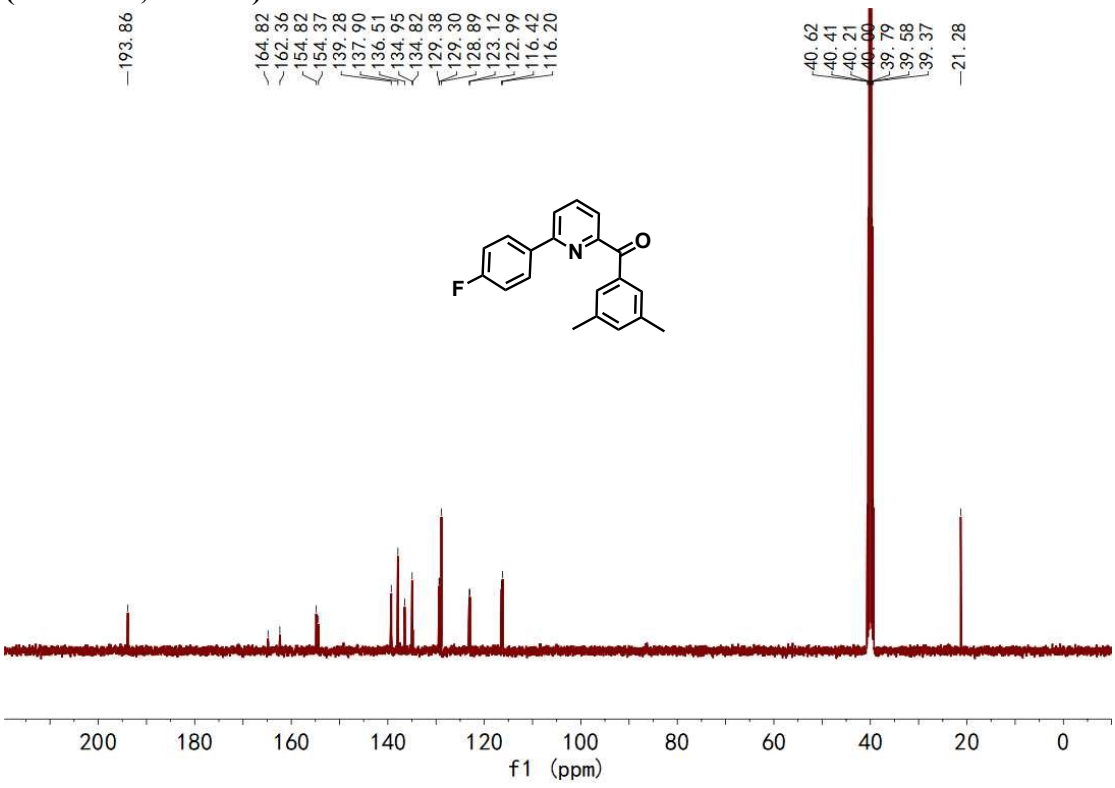
**4-(6-(3,5-Dimethylbenzoyl)pyridin-2-yl)benzonitrile (35): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



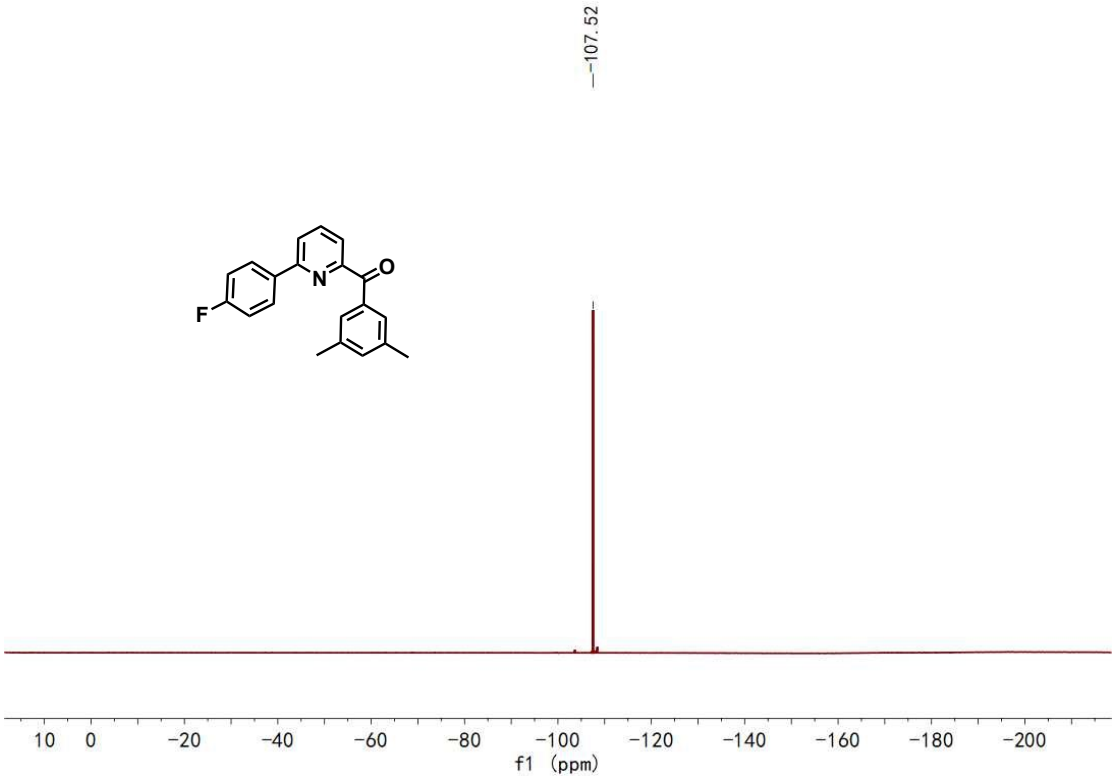

**(3,5-Dimethylphenyl)(6-(4-fluorophenyl)pyridin-2-yl)methanone (36): $^{1}H$ NMR (400 MHz, DMSO)**



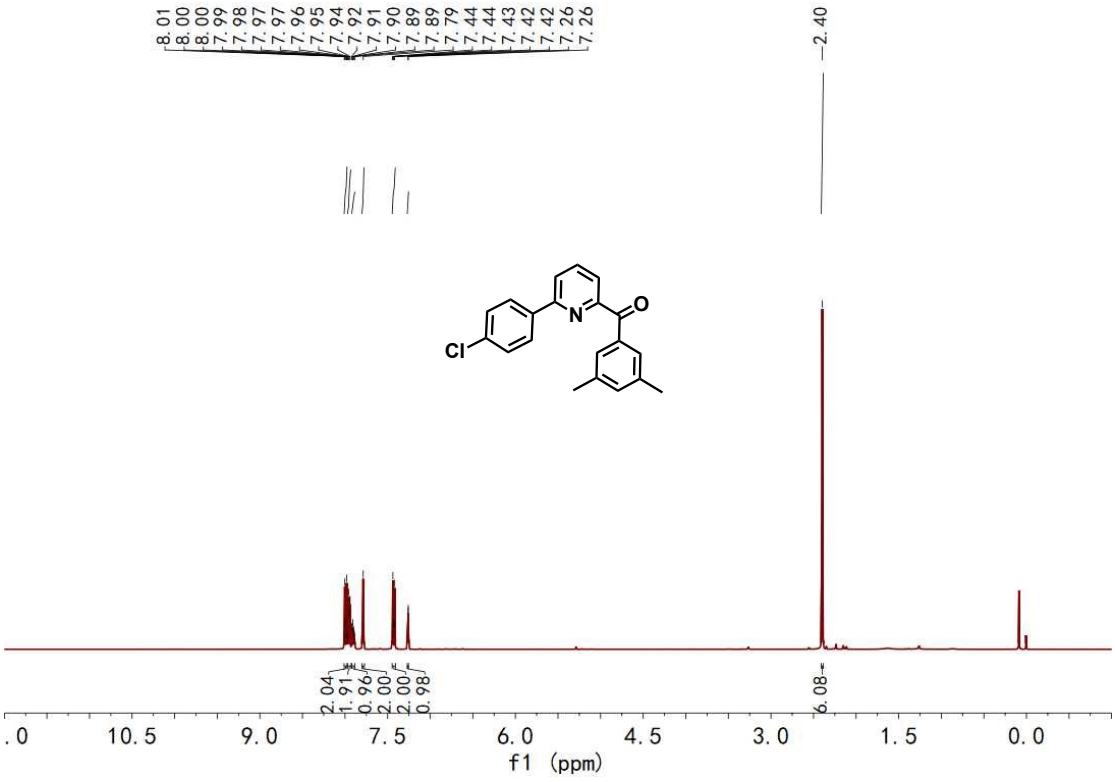
**(3,5-Dimethylphenyl)(6-(4-fluorophenyl)pyridin-2-yl)methanone (36): $^{13}C$ NMR (101 MHz, DMSO)**



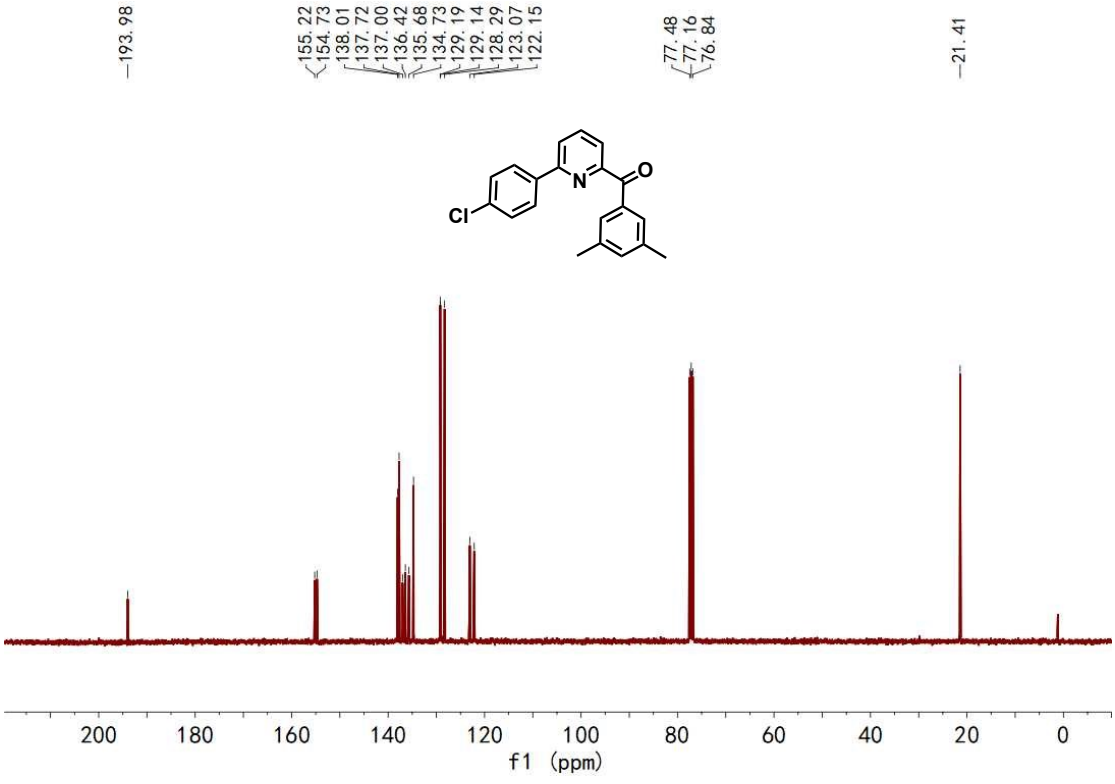

**(3,5-Dimethylphenyl)(6-(4-fluorophenyl)pyridin-2-yl)methanone (36): $^{19}F$ NMR (376 MHz, DMSO)**



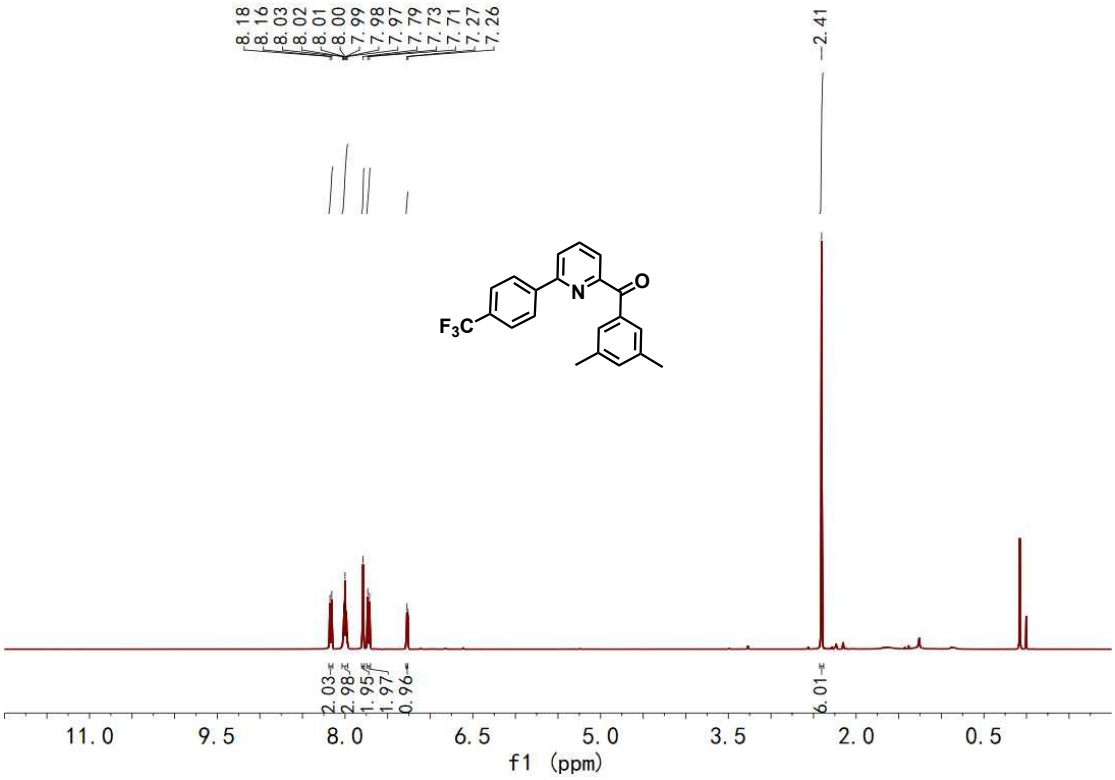
**(6-(4-Chlorophenyl)pyridin-2-yl)(3,5-dimethylphenyl)methanone (37): $^{1}$H NMR (400 MHz, $CDCl_3$)**



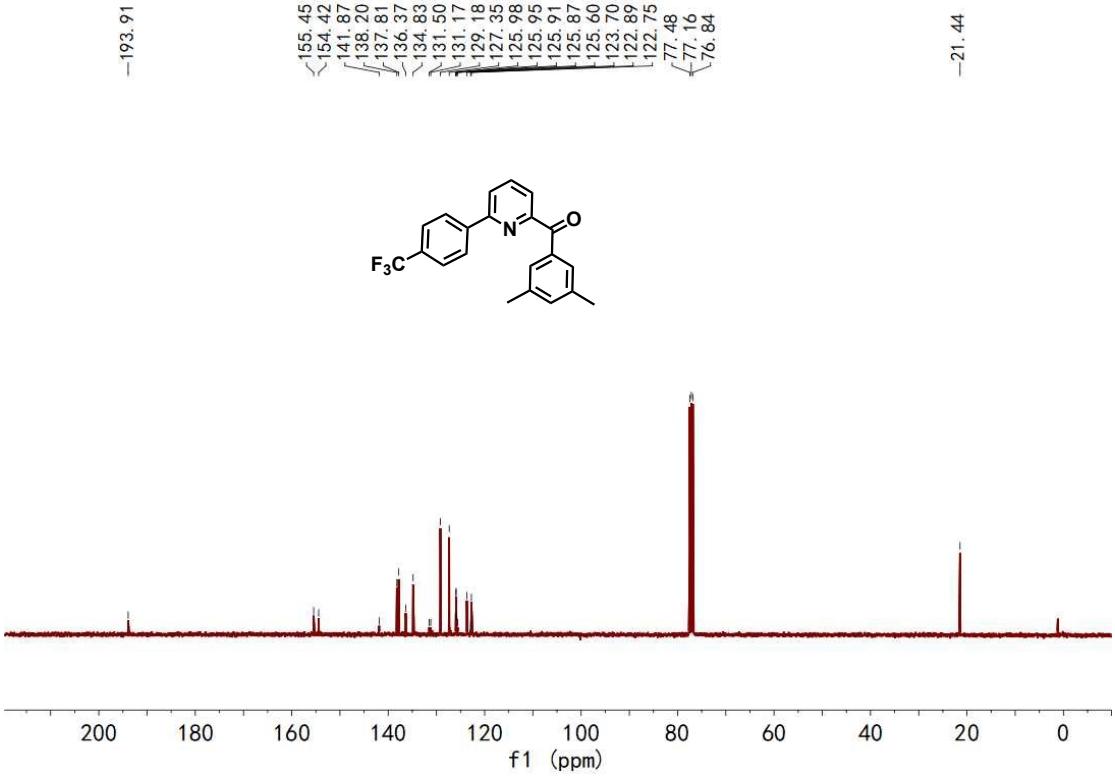

**(6-(4-Chlorophenyl)pyridin-2-yl)(3,5-dimethylphenyl)methanone (37): $^{13}$C NMR (101 MHz, $CDCl_3$)**



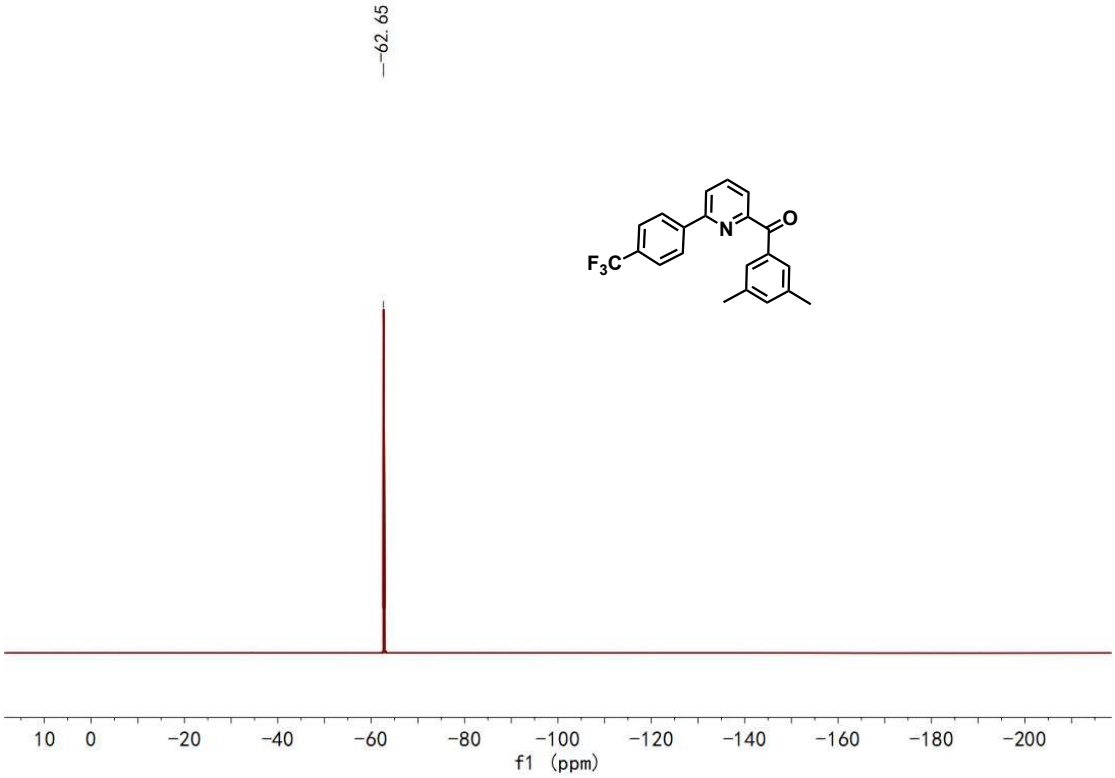
**(3,5-Dimethylphenyl)(6-(4-(trifluoromethyl)phenyl)pyridin-2-yl)methanone (38): $^{1}$H NMR (400 MHz, $CDCl_3$)**



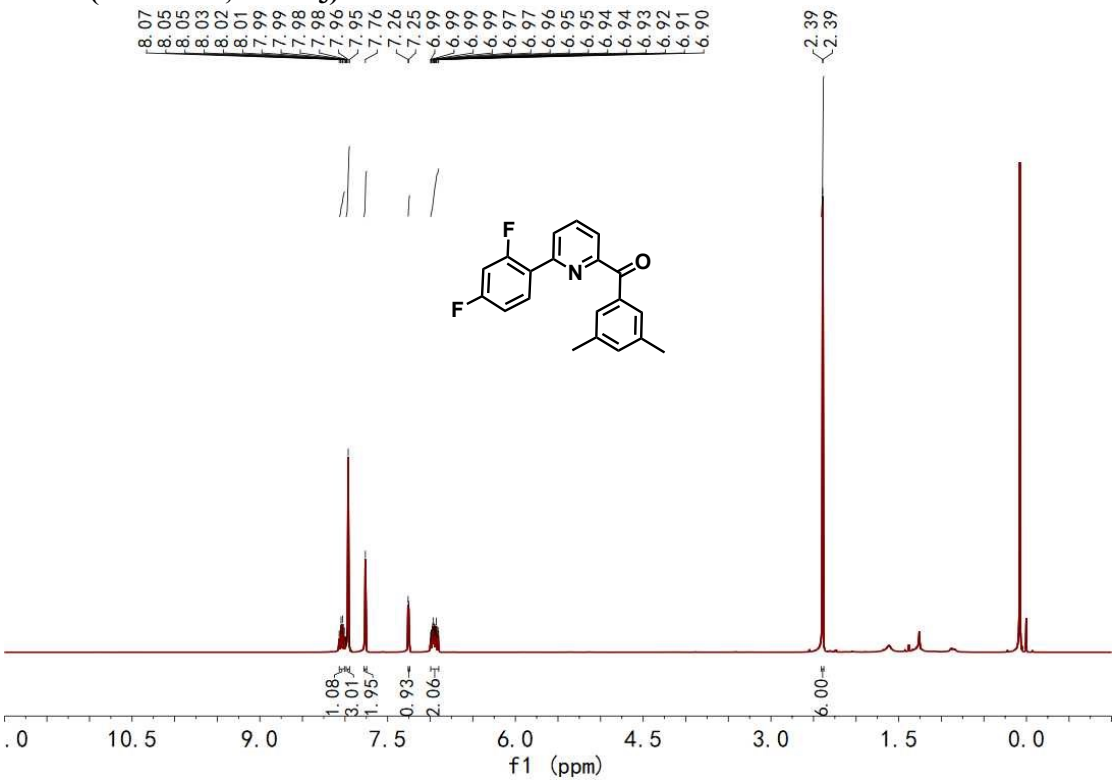

**(3,5-Dimethylphenyl)(6-(4-(trifluoromethyl)phenyl)pyridin-2-yl)methanone (38): $^{13}$C NMR (101 MHz, $CDCl_3$)**



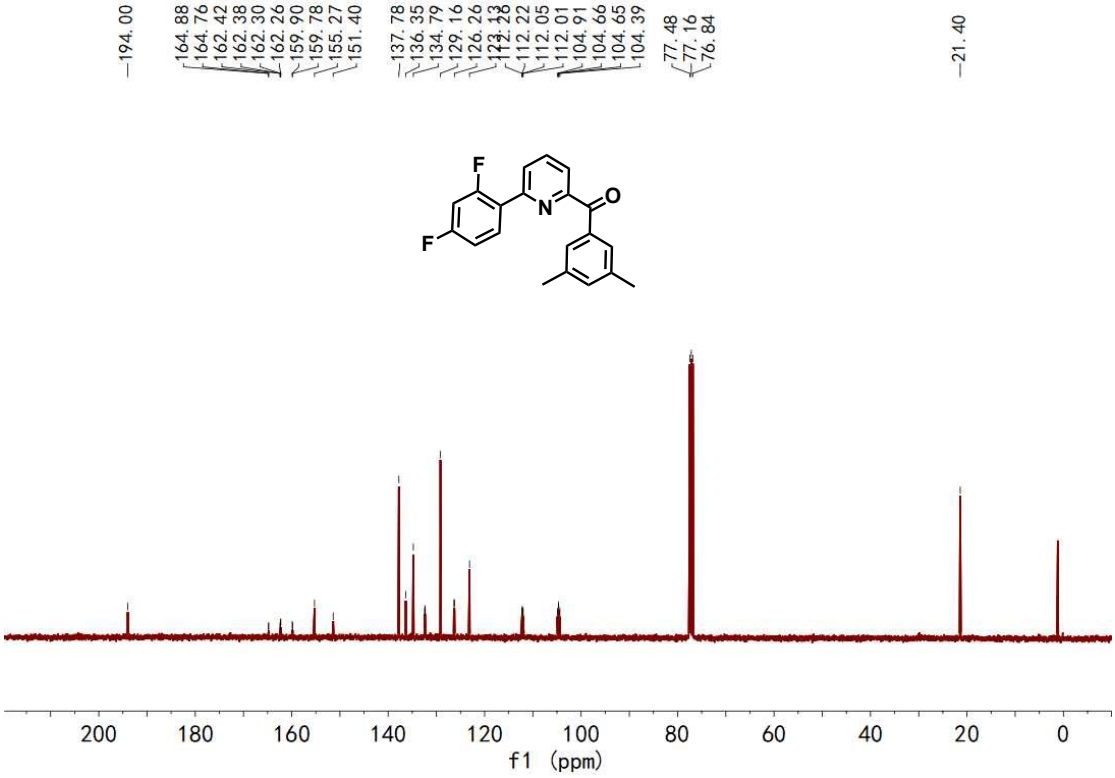
**(3,5-Dimethylphenyl)(6-(4-(trifluoromethyl)phenyl)pyridin-2-yl)methanone (38): $^{19}$F NMR (376 MHz, $CDCl_3$)**



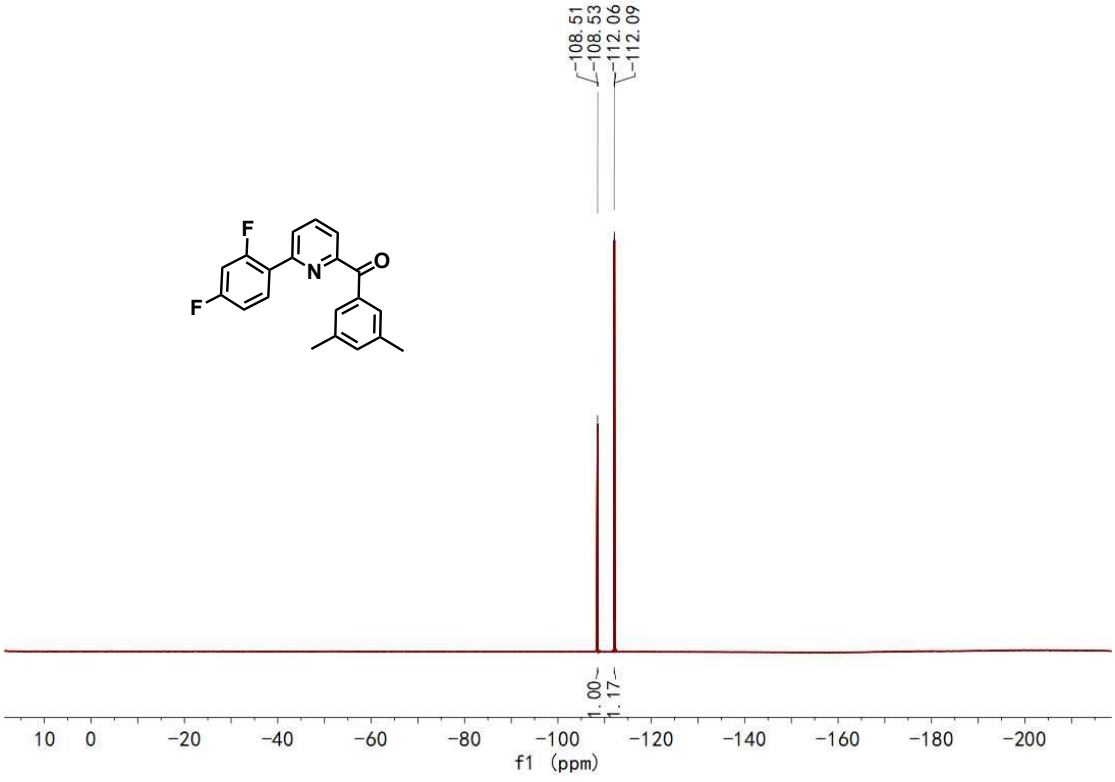

**(6-(2,4-Difluorophenyl)pyridin-2-yl)(3,5-dimethylphenyl)methanone (39): $^{1}$H NMR (400 MHz, $CDCl_3$)**



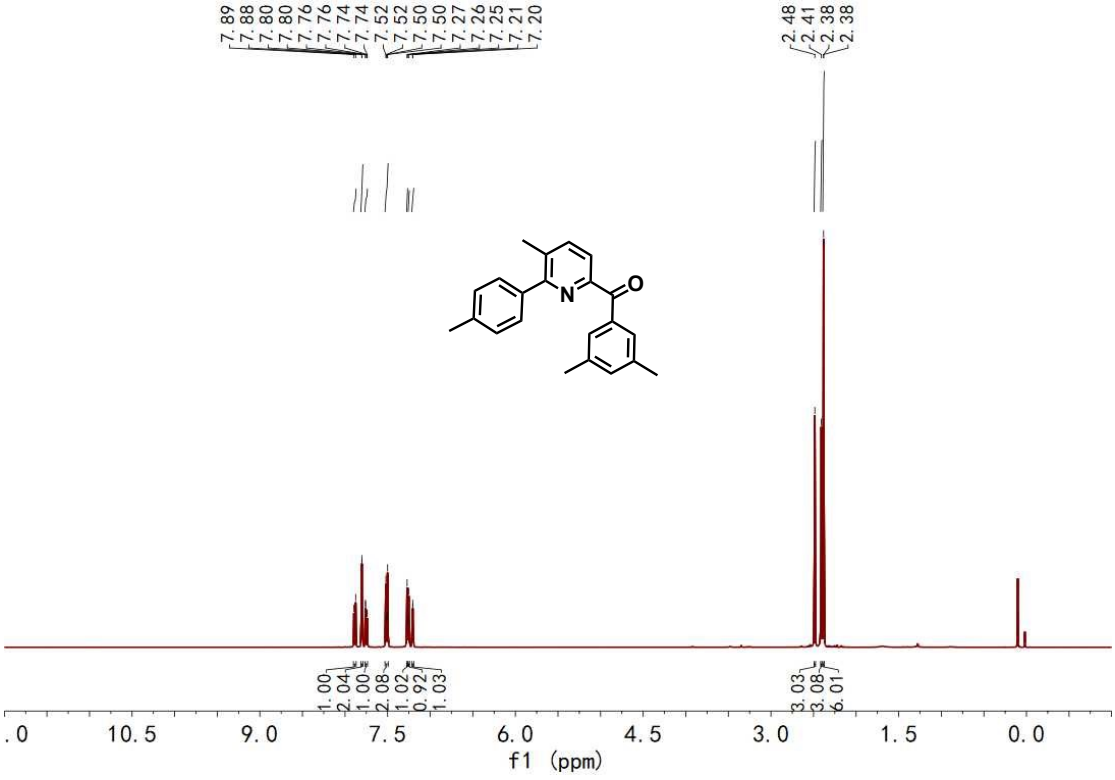
**(6-(2,4-Difluorophenyl)pyridin-2-yl)(3,5-dimethylphenyl)methanone (39): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



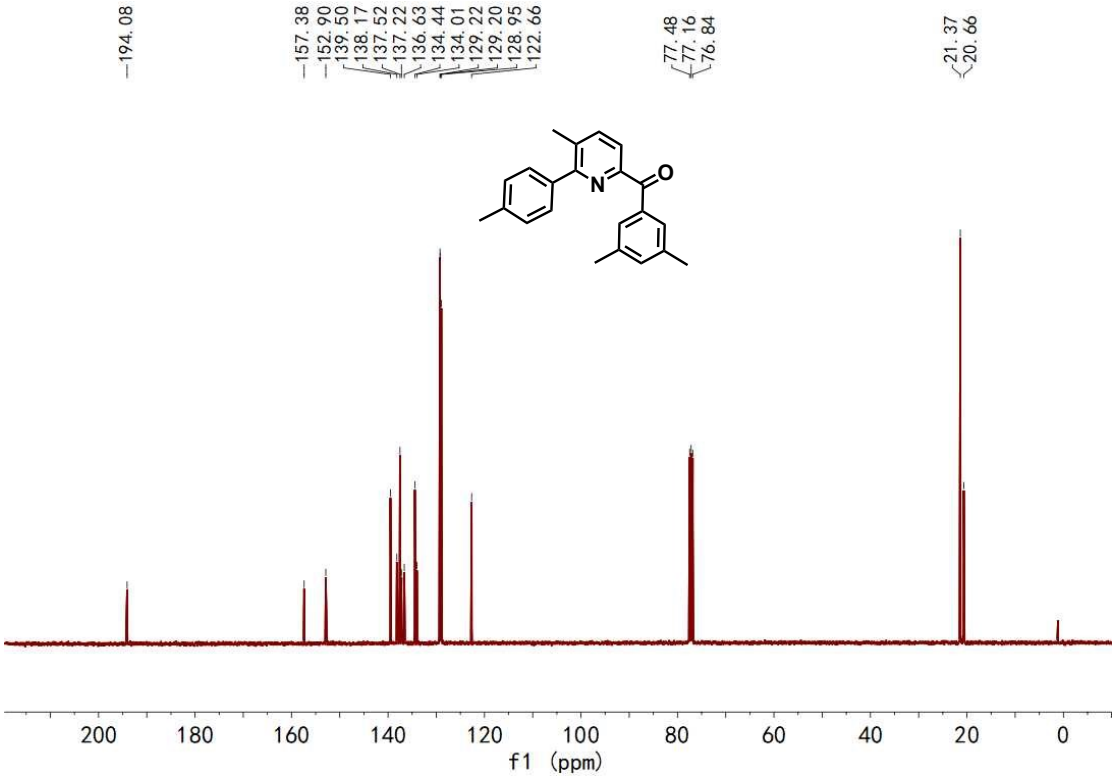

**(6-(2,4-Difluorophenyl)pyridin-2-yl)(3,5-dimethylphenyl)methanone (39): $^{19}F$ NMR (376 MHz, $CDCl_3$)**



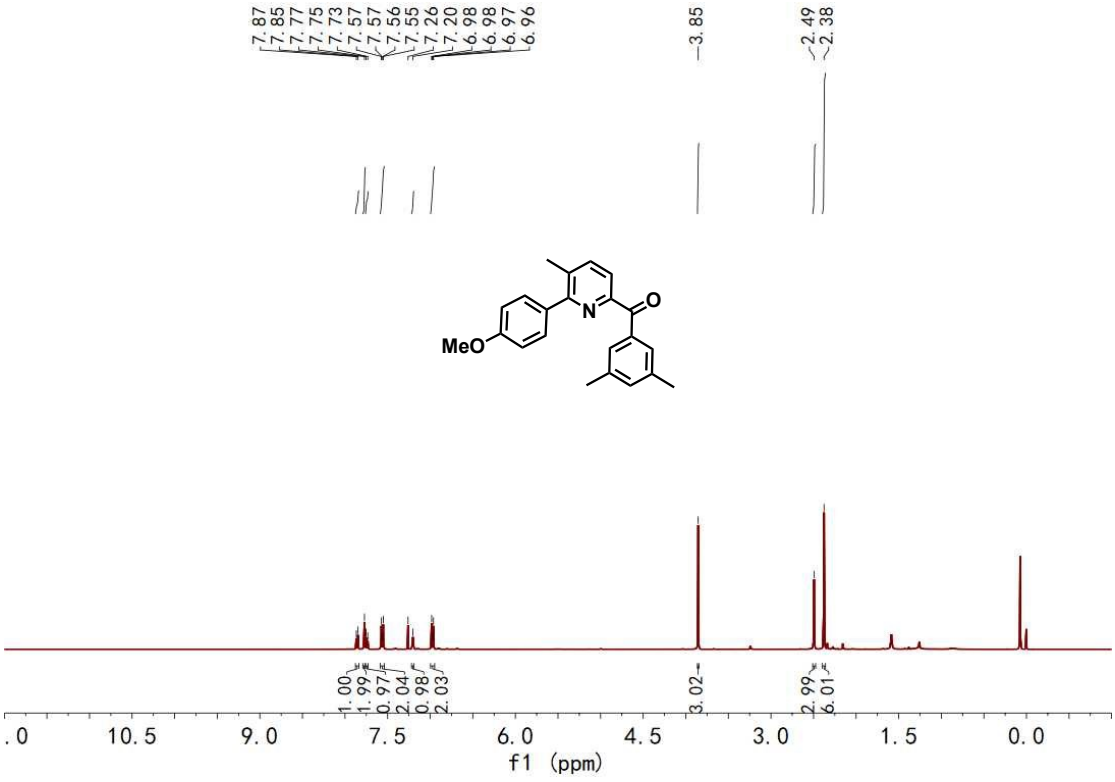
**(3,5-Dimethylphenyl)(5-methyl-6-(*p*-tolyl)pyridin-2-yl)methanone (40): $^{1}$H NMR (400 MHz, $CDCl_3$)**



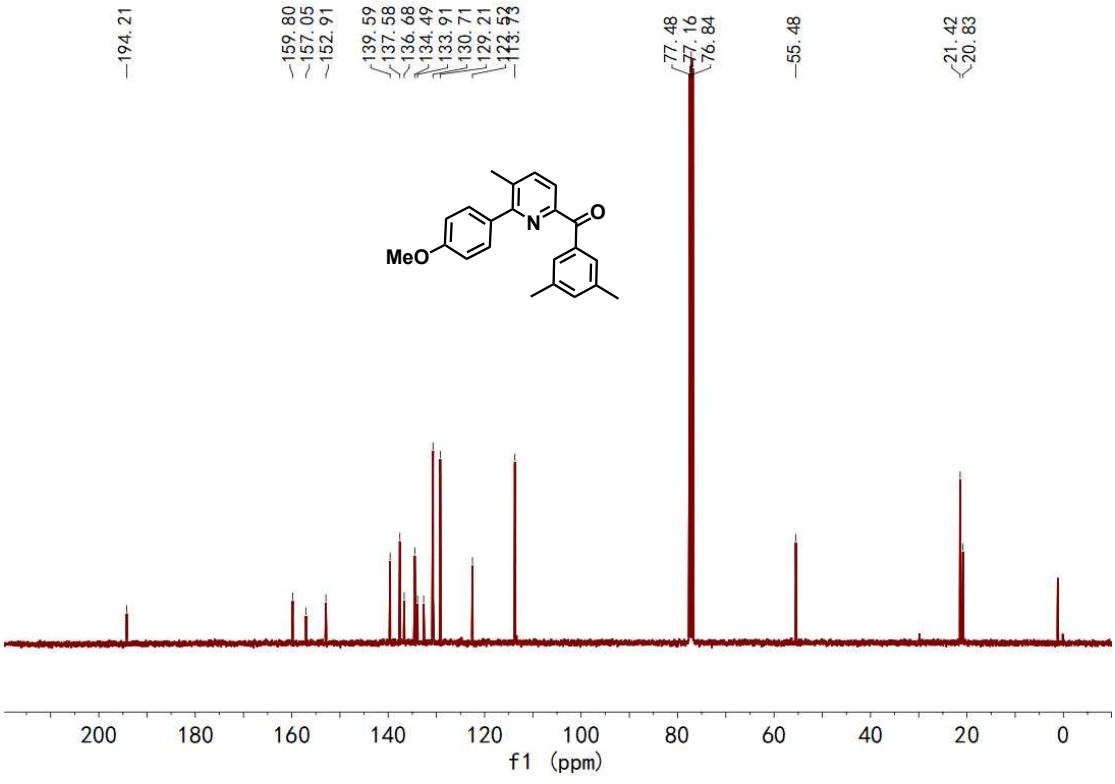

**(3,5-Dimethylphenyl)(5-methyl-6-(*p*-tolyl)pyridin-2-yl)methanone (40): $^{13}$C NMR (101 MHz, $CDCl_3$)**



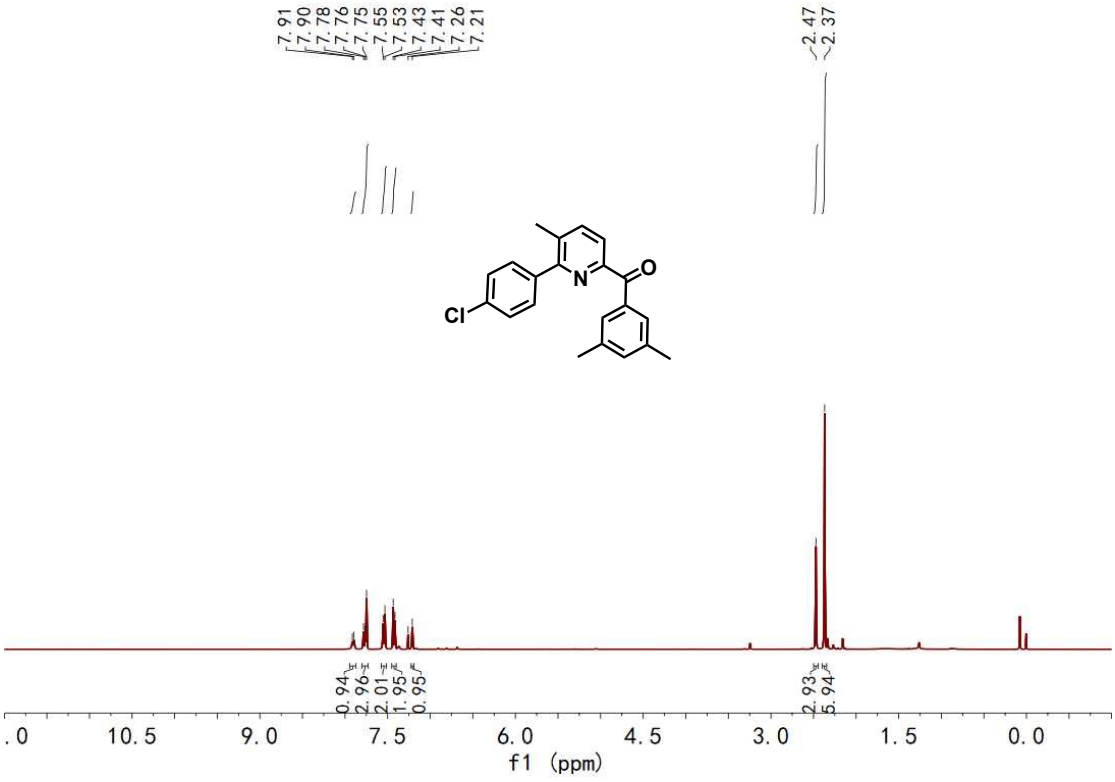
**(3,5-Dimethylphenyl)(6-(4-methoxyphenyl)-5-methylpyridin-2-yl)methanone (41): $^{1}$H NMR (400 MHz, $CDCl_3$)**



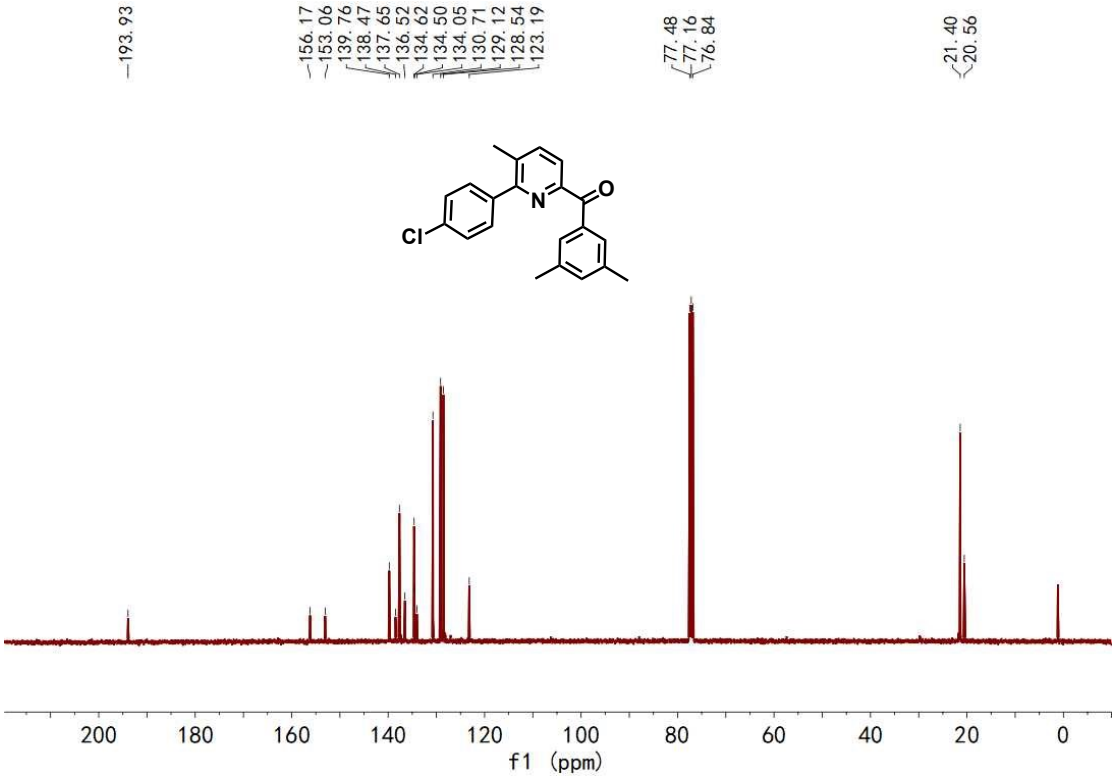

**(3,5-Dimethylphenyl)(6-(4-methoxyphenyl)-5-methylpyridin-2-yl)methanone (41): $^{13}$C NMR (101 MHz, $CDCl_3$)**



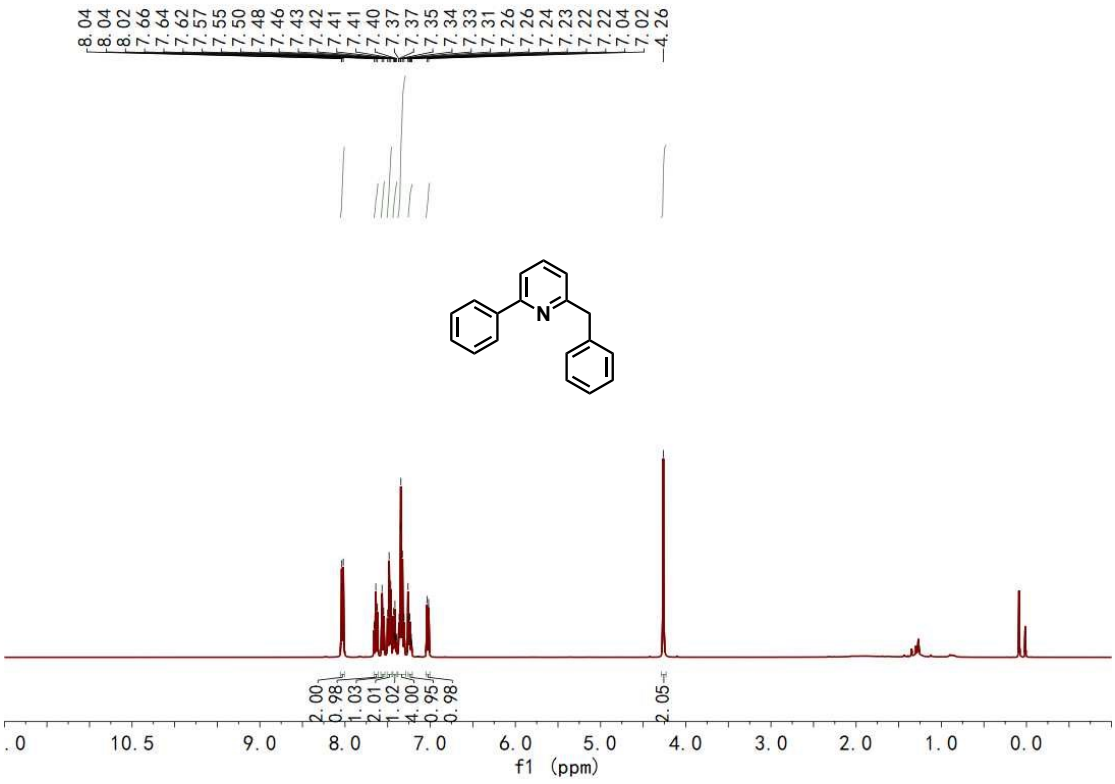
**(6-(4-Chlorophenyl)-5-methylpyridin-2-yl)(3,5-dimethylphenyl)methanone (42): $^{1}$H NMR (400 MHz, $CDCl_3$)**



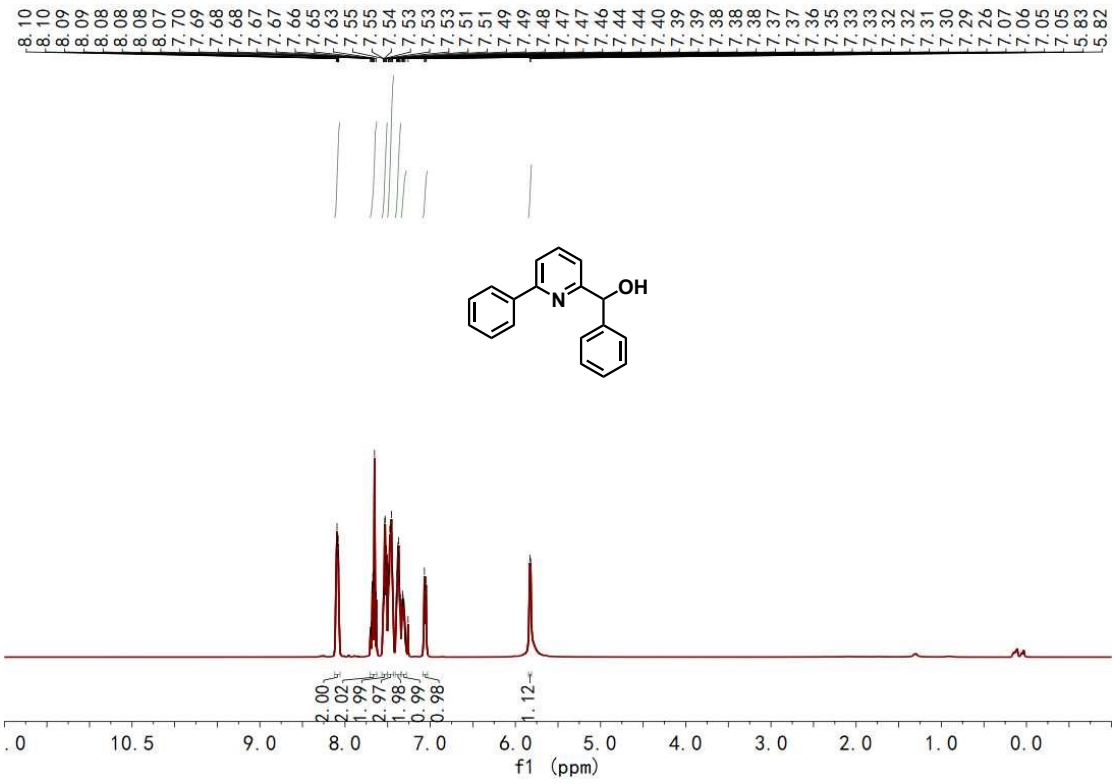

**(6-(4-Chlorophenyl)-5-methylpyridin-2-yl)(3,5-dimethylphenyl)methanone (42): $^{13}$C NMR (101 MHz, $CDCl_3$)**



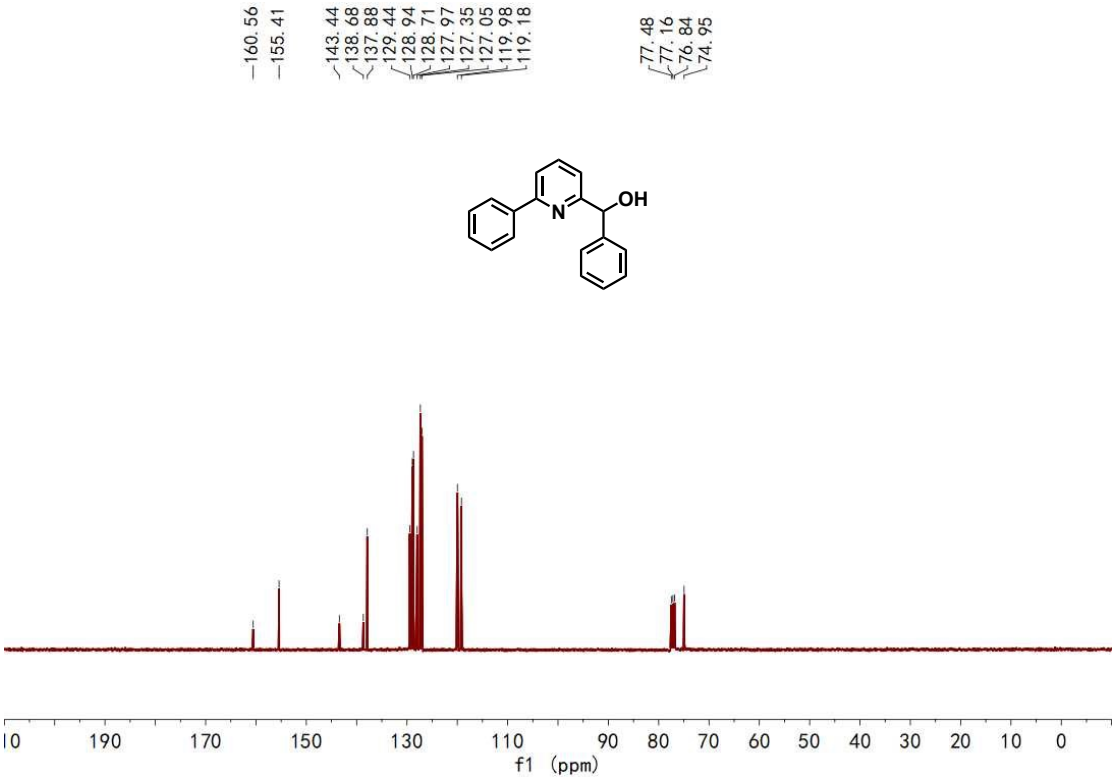
**2-Benzyl-6-phenylpyridine (43): $^1$H NMR (400 MHz, $CDCl_3$)**



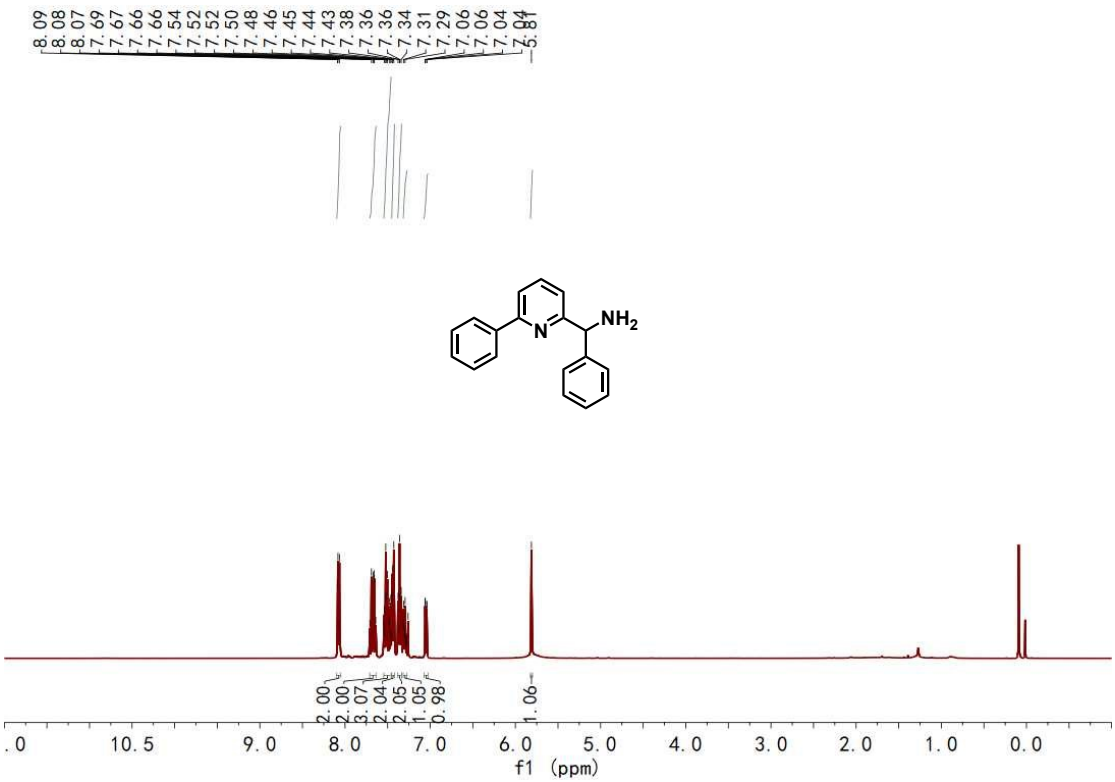

**Phenyl(6-phenylpyridin-2-yl)methanol (44): $^1$H NMR (400 MHz, $CDCl_3$)**



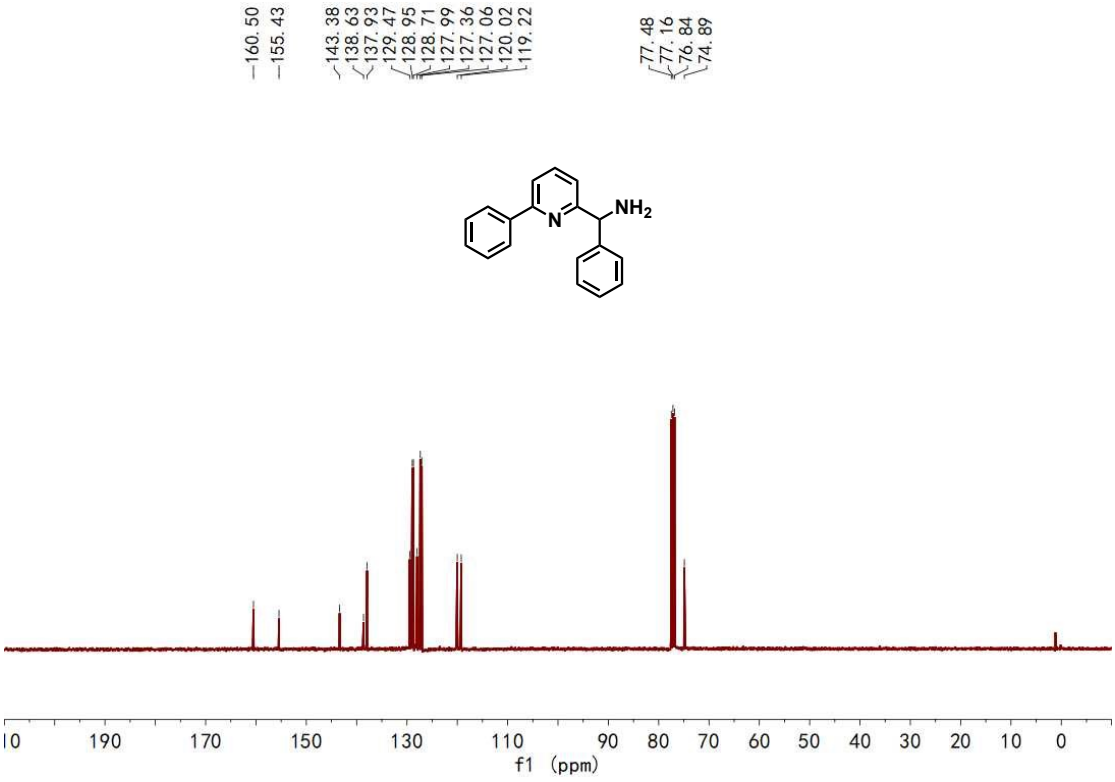
**Phenyl(6-phenylpyridin-2-yl)methanol (44): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



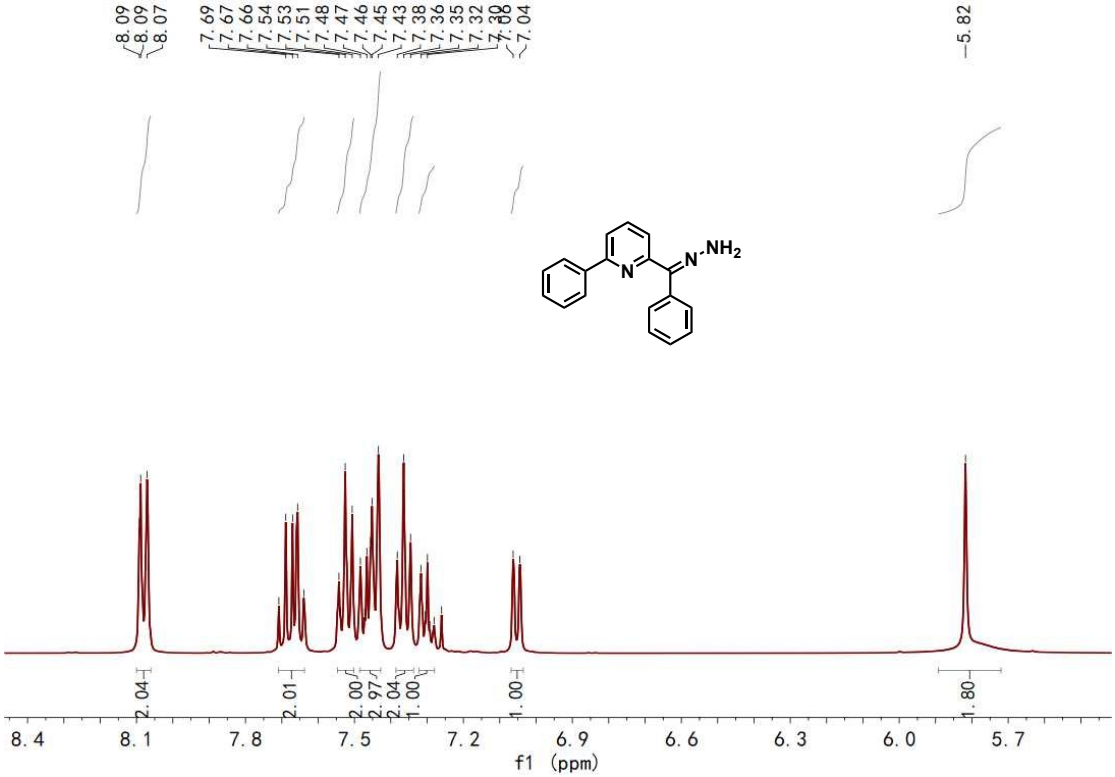

**Phenyl(6-phenylpyridin-2-yl)methanamine (45): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



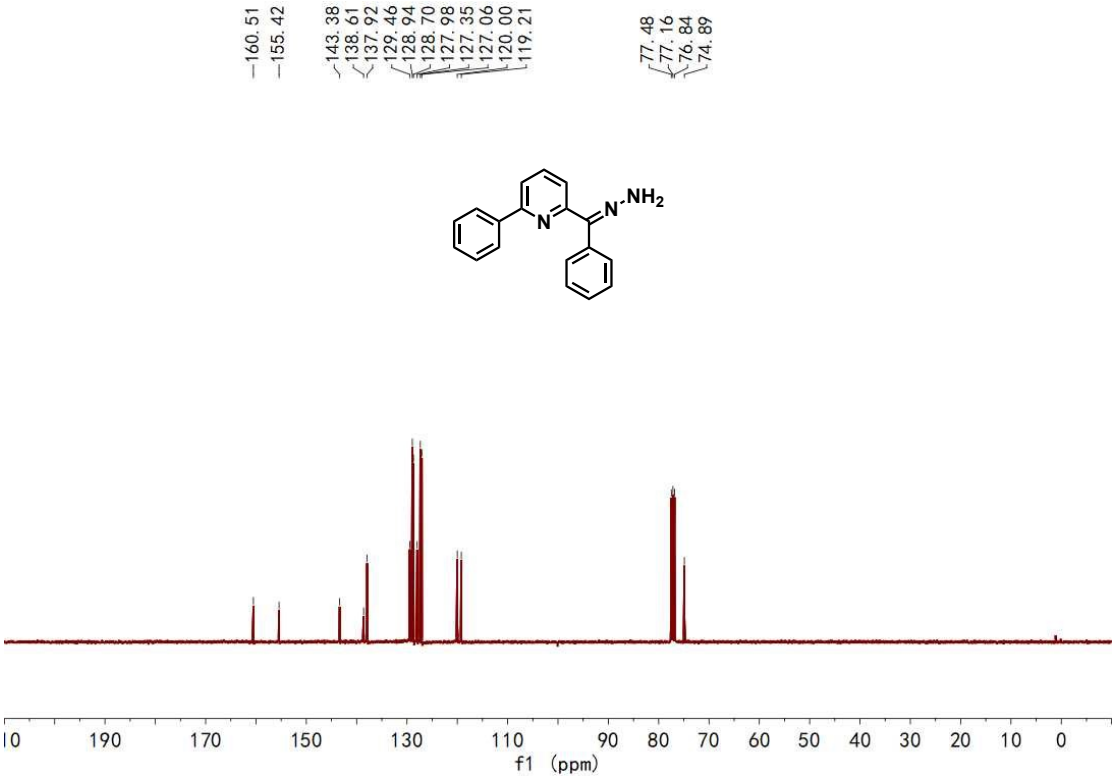
**Phenyl(6-phenylpyridin-2-yl)methanamine (45): $^{13}$C NMR (101 MHz, $CDCl_3$)**



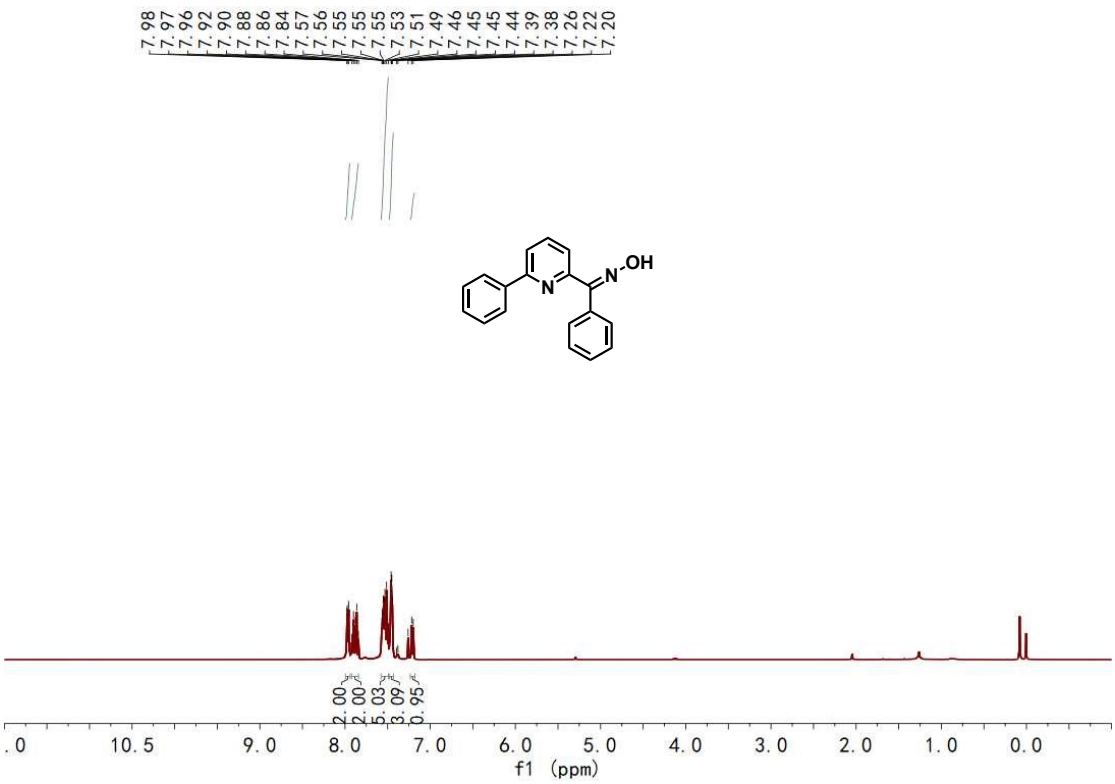

**2-(Hydrazono(phenyl)methyl)-6-phenylpyridine (46): $^{1}$H NMR (400 MHz, $CDCl_3$)**



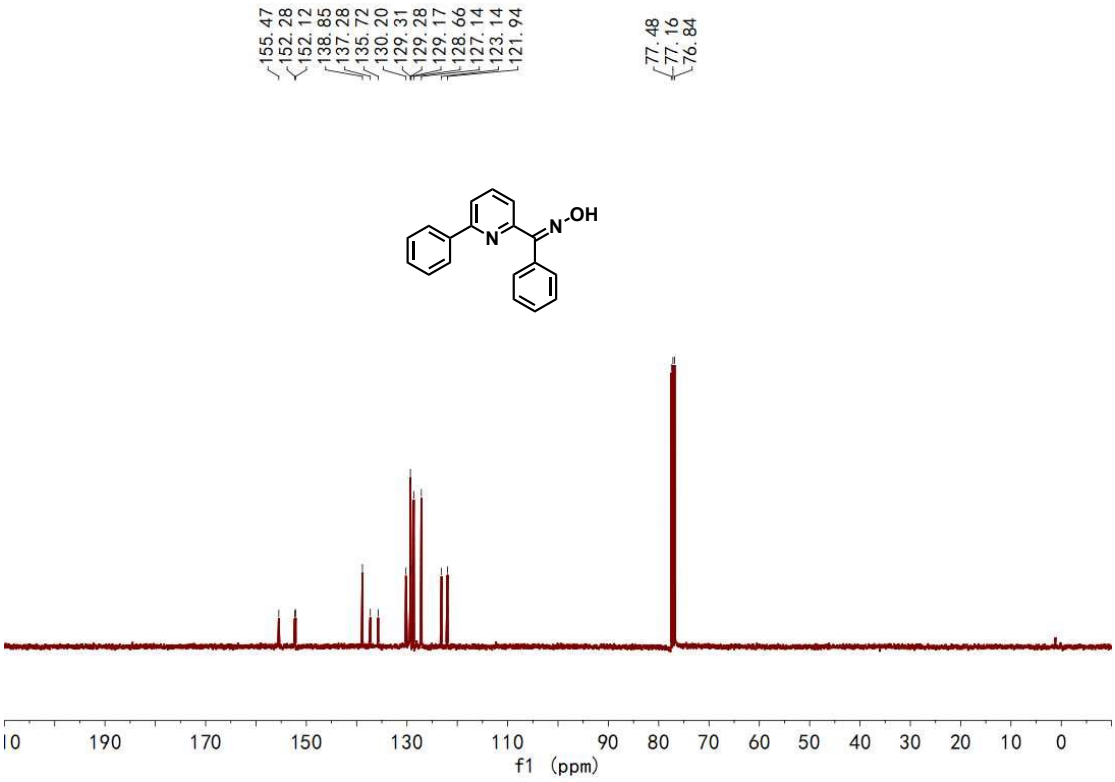
**2-(Hydrazono(phenyl)methyl)-6-phenylpyridine (46): $^{13}C$ NMR (101 MHz, $CDCl_3$)**



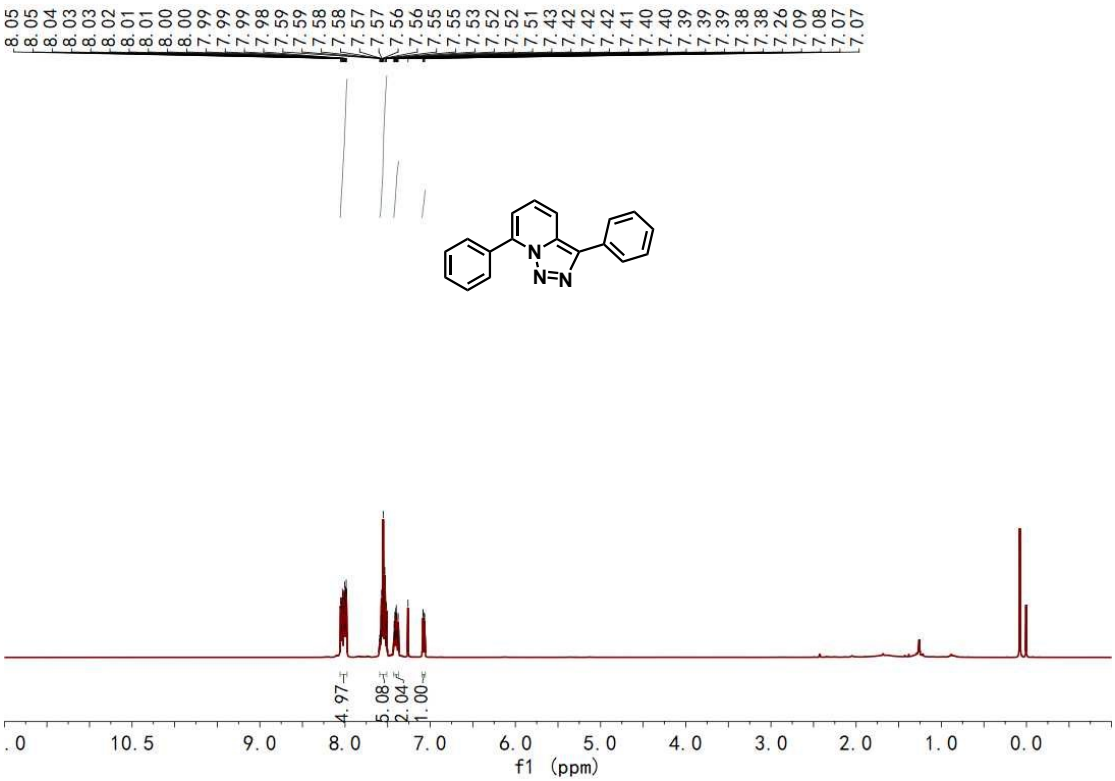

**Phenyl(6-phenylpyridin-2-yl)methanone oxime (47): $^{1}H$ NMR (400 MHz, $CDCl_3$)**



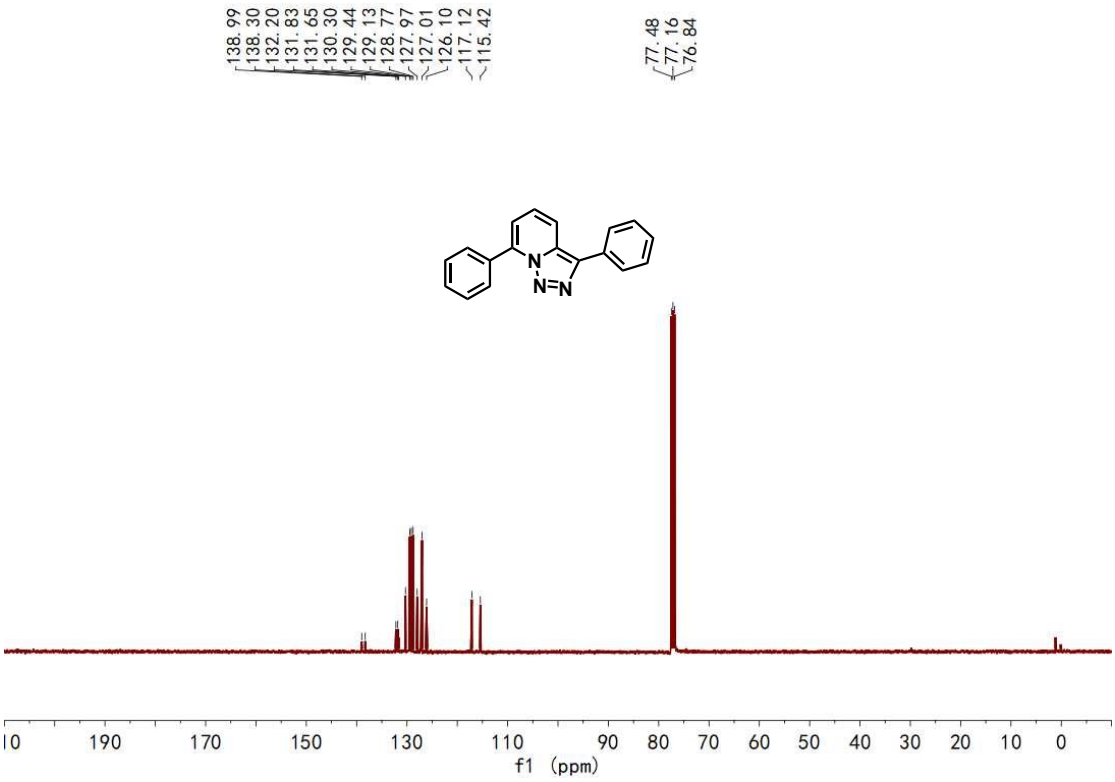

**Phenyl(6-phenylpyridin-2-yl)methanone oxime (47): $^{13}$C NMR (400 MHz, $CDCl_3$)**



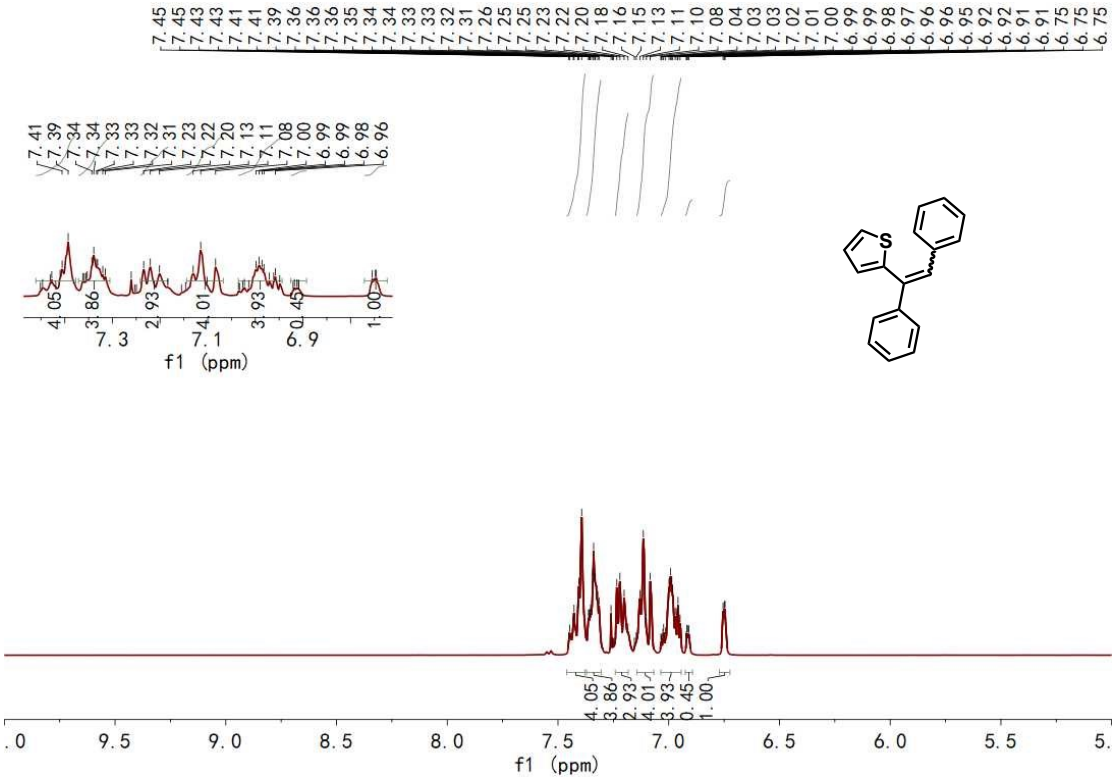

**3,7-Diphenyl-[1,2,3]triazolo[1,5-a]pyridine (48): $^{1}$H NMR (400 MHz, $CDCl_3$)**



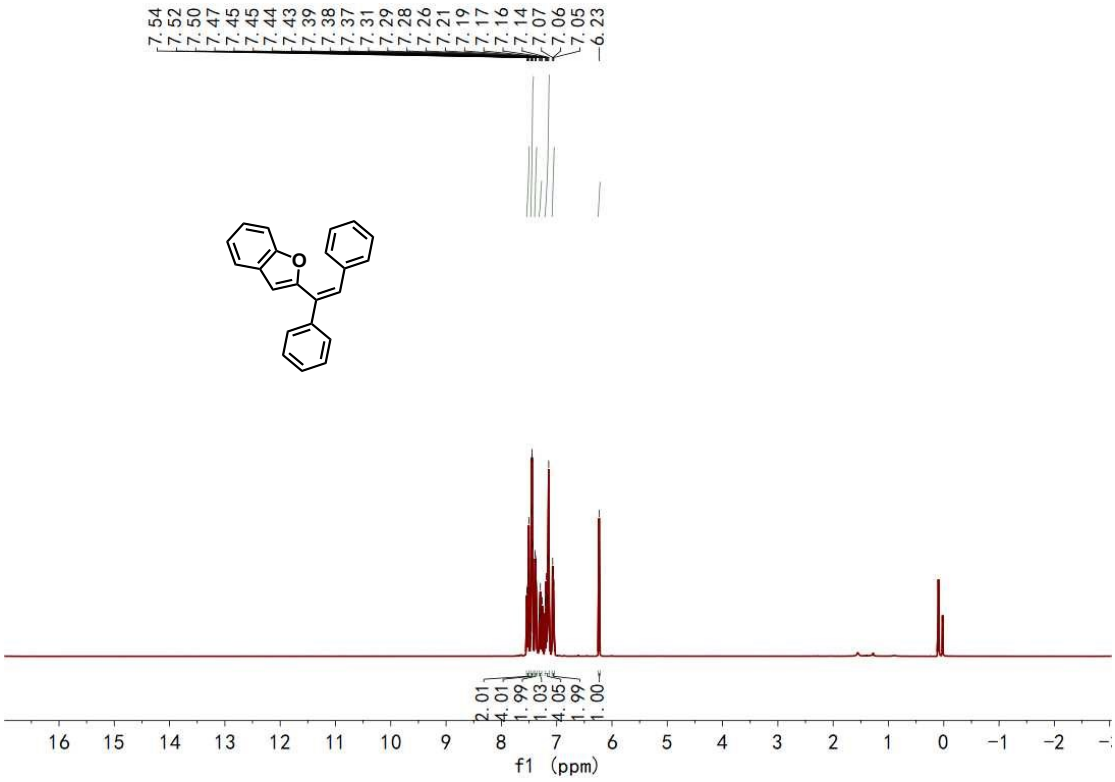

**3,7-Diphenyl-[1,2,3]triazolo[1,5-a]pyridine (48): $^{13}$C NMR (101 MHz, $CDCl_3$)**



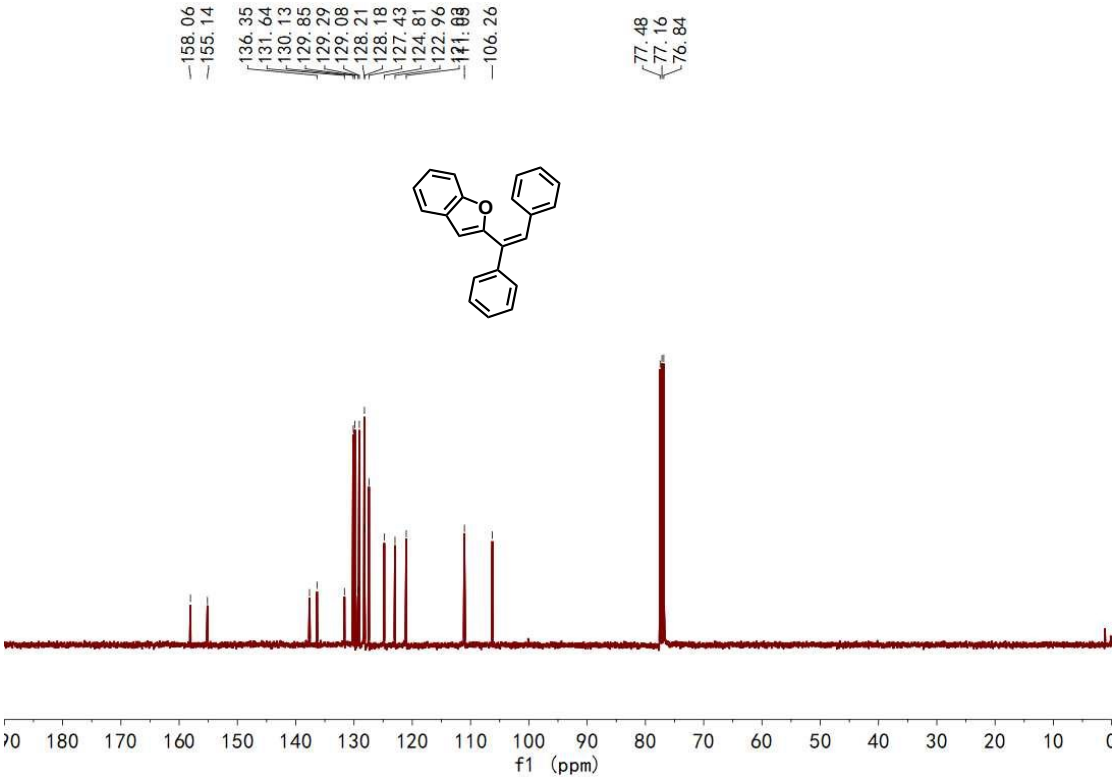

**(*Z*)/(*E*)-2-(1,2-diphenylvinyl)thiophene: $^{1}$H NMR (400 NMR, $CDCl_3$)**




**(*Z*)-2-(1,2-diphenylvinyl)benzofuran: $^{1}$H NMR (400 NMR, $CDCl_3$)**




**(*Z*)-2-(1,2-diphenylvinyl)benzofuran: $^{13}$C NMR (101 NMR, $CDCl_3$)**




**3,5-Bis((*Z*)-1,2-diphenylvinyl)-1-methyl-1*H*-pyrazole: $^{1}$H NMR (400 NMR, $CDCl_3$)**