Supporting Information

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I. General procedures

All reagents and solvents were purchased from commercial sources and used without further purification unless otherwise stated. All reactions were monitored by thin-layer chromatography (TLC). All reactions were carried out in argon atmosphere unless otherwise stated. Column chromatography was performed on silica gel (200-300 mesh) and visualized with ultraviolet light. Ethyl acetate and petroleum ether were used as eluents. ^{1}H, ^{13}C and ^{19}F spectra were recorded at room temperature on a Varian Mercury plus 300 or Bruker AV400 or Agilent INOVA 600 MHz with TMS as an internal standard and $CDCl_3$ as solvent. Fourier transform infrared spectra (FT-IR) were recorded on Agilent Technologies Cary 630 instrument or Bruker TENSOR 27 instrument. HRMS analyses were made by Lanzhou University by means of ESI. Melting points were measured on micro melting point apparatus and uncorrected.

II. General procedures for preparation of starting materials

i. General procedures for preparation of starting materials 1a~1f, 1h~1i, 1m~1w

Starting materials **1a~1f, 1h~1i, 1m~1z** were synthesized according to the literature procedures[1]. Salicylaldehyde (1.17 g, 9.6 mmol, 1.2 equiv.), 2-bromopyridine (1.26 g, 8.0 mmol, 1.0 equiv.), CuI (76.2 mg, 0.4 mmol, 0.05 equiv.), picolinic acid (98.5 mg, 0.8 mmol, 0.1 equiv.) and K_3PO_4 (3.4 g, 16 mmol, 2.0 equiv.) in 16 mL dry DMSO were heated at 80 °C for 24 h under argon. The reaction mixture was cooled to room temperature, 16 mL H_2O was added and extracted with 3 × 50 mL EtOAc. The combined organic phases were washed with brine, dried over anhydrous $MgSO_4$ and concentrated under reduced pressure. Purification by column chromatography on silica (PE/EA = 16/1) affords **1a**.

ii. General procedures for preparation of starting materials 1j~1l and 1x~y

Starting materials **1j~1l** and **1x~y** were synthesized according to the literature procedures[2]. Salicylaldehyde (977 mg, 8.0 mmol, 1.0 equiv.), 2-chloro-5-(trifluoromethyl) pyridine (1.45 g, 8.0 mmol, 1.0 equiv.) and K_2CO_3 (1.11 g, 8.0 mmol, 1.0 equiv.) in 16 mL dry DMF were heated at 150 °C for 5 h under argon. The reaction mixture was cooled to room temperature, 16 mL H_2O was added and extracted with 3 × 40 mL EtOAc. The combined organic phases were washed with brine, dried over anhydrous $MgSO_4$ and concentrated under reduced pressure. Purification by column chromatography on silica (PE/EA = 25/1) affords **1j.**

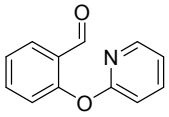
iii. General procedures for preparation of starting material 1g

Starting material **1g** was synthesized according to the literature procedures[1]. 2-Bromobenzaldehyde (1.78 g, 9.6 mmol, 1.2 equiv.), 5-fluoropyridin-2-ol (0.9 g, 8.0 mmol, 1.0 equiv.), CuI (76.2 mg, 0.4 mmol, 0.05 equiv.), picolinic acid (98.5 mg, 0.8 mmol, 0.1 equiv.) and K_3PO_4 (3.4 g, 16 mmol, 2.0 equiv.) in 16 mL dry DMSO were heated at 80 °C for 24 h under argon. The reaction mixture was cooled to room temperature, 16 mL H_2O was added and extracted with 3 × 50 mL EtOAc. The combined organic phases were washed with brine, dried over anhydrous $MgSO_4$ and concentrated under reduced pressure. Purification by column chromatography on silica (PE/EA = 20/1) affords **1g**.

iv. General procedures for preparation of starting materials 1z~1ag

Starting materials **1z~1ag** were synthesized according to the literature procedures[2]. To a DMA (16 mL) solution containing 2-fluorobenzaldehydes (0.85 mL, 8.0 mmol, 1.0 equiv.) and 4-hydroxybenzonitrile (954 mg, 8.0 mmol, 1.0 equiv.) were added K_2CO_3 (1.10 g, 8.0 mmol, 1.0 equiv.), and the reaction mixture was stirred for 3 h at 170 °C under argon atmosphere. The reaction mixture was cooled to room temperature, diluted with H_2O (16 mL), extracted with EtOAc (40 mL x 3), and the organic layer was washed with brine, dried with anhydrous $MgSO_4$ and concentrated under reduced pressure. Purification by column chromatography on silica (PE/EA = 25/1) affords **1z**.

III. Characterization data of starting materials

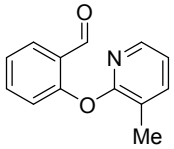


2-(Pyridin-2-yloxy)benzaldehyde (1a)

Light yellow solid, 1.37 g, 86%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.31 (s, 1H), 8.18 (d, J = 3.4 Hz, 1H), 7.98 (dd, J = 7.8, 1.6 Hz, 1H), 7.77 (td, J = 7.9, 2.0 Hz, 1H), 7.69 – 7.60 (m, 1H), 7.34 (t, J = 7.6 Hz, 1H), 7.18 (d, J = 8.3 Hz, 1H), 7.10 – 7.03 (m, 2H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.3, 163.5, 156.6, 147.9, 140.1, 135.7, 128.8, 128.6, 125.3, 122.6, 119.4, 112.0; ^{1}H and ^{13}C NMR data agreed with the literature [3].



2-((3-Methylpyridin-2-yl)oxy)benzaldehyde (1b)

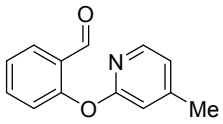
Colorless oil, 0.94 g, 55%

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.30 (d, J = 0.6 Hz, 1H), 8.01 – 7.93 (m, 2H), 7.66 – 7.55 (m, 2H), 7.31 (t, J = 7.3 Hz, 1H), 7.16 (d, J = 8.2 Hz, 1H), 7.01 – 6.93 (m, 1H), 2.41 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.4, 161.8, 156.9, 144.9, 140.4, 135.6, 128.7, 128.4, 125.0, 122.6, 121.9, 119.5, 16.1.

IR (KBr, ν / cm^{-1}): 2999, 2855, 2753, 1692, 1650, 1602, 1578, 1479, 1449, 1415, 1274, 1237, 1188, 1114, 1095, 990, 892, 833, 792, 750.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_2$ ($[M+H]^+$): 214.0863, found: 214.0863.



2-((4-Methylpyridin-2-yl)oxy)benzaldehyde (1c)

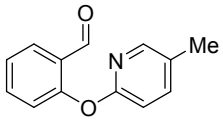
Colorless oil, 1.16 g, 68%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.31 (d, J = 0.5 Hz, 1H), 8.00 (dd, J = 20.1, 6.2 Hz, 2H), 7.62 (t, J = 7.2 Hz, 1H), 7.31 (t, J = 7.5 Hz, 1H), 7.15 (d, J = 8.3 Hz, 1H), 6.88 (d, J = 6.6 Hz, 2H), 2.39 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.4, 163.8, 156.8, 151.8, 147.4, 135.7, 128.7, 128.5, 125.1, 122.5, 120.8, 112.2, 21.2.

IR (KBr, ν / cm^{-1}): 3008, 2856, 2757, 1693, 1603, 1562, 1478, 1455, 1394, 1288, 1273, 1215, 1149, 1096, 947, 840, 792, 752, 631.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_2$ ($[M+H]^+$): 214.0863, found: 214.0862.



2-((5-Methylpyridin-2-yl)oxy)benzaldehyde (1d)

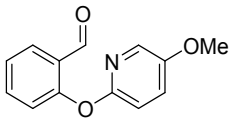
Colorless oil, 1.28 g, 75%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.34 (s, 1H), 7.98 (ddd, J = 9.5, 4.8, 1.2 Hz, 2H), 7.67 – 7.54 (m, 2H), 7.37 – 7.25 (m, 1H), 7.13 (d, J = 8.3 Hz, 1H), 6.96 (d, J = 8.3 Hz, 1H), 2.30 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.5, 161.65, 157.2, 147.6, 140.9, 135.7, 128.9, 128.7, 128.5, 125.0, 122.1, 111.6, 17.7.

IR (KBr, ν / cm^{-1}): 2996, 2864, 2757, 1692, 1602, 1580, 1473, 1455, 1377, 1274, 1240, 1154, 1096, 890, 832, 787, 749.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_2$ ($[M+H]^+$): 214.0863, found: 214.0869.



2-((5-Methoxypyridin-2-yl)oxy)benzaldehyde (1e)

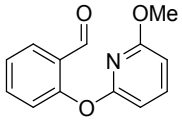
Colorless oil, 1.47 g, 80%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.38 (s, 1H), 7.95 (d, J = 7.6 Hz, 1H), 7.85 (d, J = 2.6 Hz, 1H), 7.59 (t, J = 7.7 Hz, 1H), 7.41 – 7.23 (m, 2H), 7.04 (dd, J = 19.7, 8.5 Hz, 2H), 3.84 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.2, 157.4, 156.8, 152.6, 135.4, 132.6, 128.3, 127.8, 126.3, 124.3, 121.0, 112.5, 55.9.

IR (KBr, ν / cm^{-1}): 3002, 2865, 2757, 1698, 1600, 1577, 1488, 1451, 1402, 1318, 1273, 1225, 1173, 1090, 955, 821, 792, 755.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_3$ ($[M+H]^+$): 230.0812, found: 230.0814.



2-((6-Methoxypyridin-2-yl)oxy)benzaldehyde (1f)

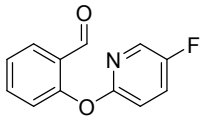
Colorless oil, 0.95 g, 52%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.34 (d, J = 0.7 Hz, 1H), 7.96 (dd, J = 7.8, 1.8 Hz, 1H), 7.64 – 7.59 (m, 2H), 7.31 (t, J = 7.5 Hz, 1H), 7.19 (dd, J = 8.2, 0.6 Hz, 1H), 6.51 – 6.48 (m, 2H), 3.69 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.5, 163.4, 162.0, 156.8, 142.0, 135.5, 128.8, 128.3, 125.1, 122.5, 105.2, 102.2, 53.7.

IR (KBr, ν / cm^{-1}): 2987, 2858, 2757, 1694, 1604, 1574, 1473, 1428, 1318, 1275, 1231, 1187, 1143, 1097, 1035, 974, 850, 789, 732.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_3$ ($[M+H]^+$): 230.0812, found: 230.0813.



2-((5-Fluoropyridin-2-yl)oxy)benzaldehyde (1g)

Light yellow oil, 1.23 g, 71%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.30 (s, 1H), 8.01 – 7.93 (m, 2H), 7.70 – 7.59 (m, 1H), 7.52 (ddd, J = 9.0, 7.3, 3.1 Hz, 1H), 7.34 (t, J = 7.5 Hz, 1H), 7.14 (d, J = 8.3 Hz, 1H), 7.07 (dd, J = 9.0, 3.5 Hz, 1H).

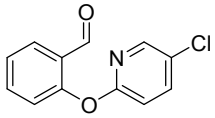
^{13}C NMR (75 MHz, $CDCl_3$) δ 189.2, 155.8 (d, J = 119.6 Hz), 146.4, 135.8, 134.8 (d, J = 26.6 Hz), 132.8, 129.1, 128.5, 127.7 (d, J = 21.2 Hz), 125.5, 122.4, 112.9 (d, J = 4.8

Hz).

^{19}F NMR (376 MHz, $CDCl_3$) δ -134.8 (s).

IR (KBr, ν / cm^{-1}): 3016, 2861, 1692, 1602, 1471, 1456, 1385, 1225, 1155, 1096, 1060, 895, 838, 812, 793, 752.

HRMS (ESI): calcd. for $C_{12}H_9FNO_2$ ($[M+H]^+$): 218.0612, found: 218.0615.



2-((5-Chloropyridin-2-yl)oxy)benzaldehyde (1h)

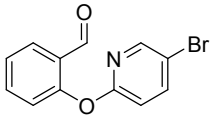
Colorless oil, 1.16 g, 62%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.26 (d, J = 0.5 Hz, 1H), 8.09 (dd, J = 2.6, 0.5 Hz, 1H), 7.97 (dd, J = 7.8, 1.5 Hz, 1H), 7.76 – 7.69 (m, 1H), 7.65 (td, J = 8.2, 1.8 Hz, 1H), 7.36 (t, J = 7.4 Hz, 1H), 7.17 (dd, J = 8.2, 0.4 Hz, 1H), 7.04 (dd, J = 8.7, 0.5 Hz, 1H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 188.1, 160.9, 155.0, 145.2, 138.9, 134.8, 128.3, 127.6, 125.8, 124.7, 121.7, 111.9.

IR (KBr, ν / cm^{-1}): 3034, 2860, 1692, 1603, 1558, 1454, 1396, 1371, 1241, 1209, 1155, 1110, 1062, 889, 829, 805, 766.

HRMS (ESI): calcd. for $C_{12}H_9ClNO_2$ ($[M+H]^+$): 234.0316, found: 234.0318.



2-((5-bromopyridin-2-yl)oxy)benzaldehyde (1i)

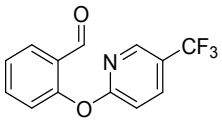
Light yellow oil, 1.11 g, 50%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.25 (s, 1H), 8.18 (d, J = 2.5 Hz, 1H), 7.96 (dd, J = 7.8, 1.6 Hz, 1H), 7.86 – 7.82 (m, 1H), 7.64 (ddd, J = 8.1, 7.5, 1.8 Hz, 1H), 7.35 (t, J = 7.6 Hz, 1H), 7.16 (dd, J = 8.2, 0.5 Hz, 1H), 6.99 (dd, J = 8.7, 0.5 Hz, 1H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.0, 162.4, 155.9, 148.5, 142.6, 135.7, 129.3, 128.7, 125.7, 122.7, 114.6, 113.5.

IR (KBr, ν / cm^{-1}): 3078, 2858, 1692, 1603, 1574, 1452, 1396, 1364, 1272, 1239, 1211, 1186, 1155, 1089, 1003, 888, 827, 804, 763, 638.

HRMS (ESI): calcd. for $C_{12}H_9BrNO_2$ ($[M+H]^+$): 277.9811, found: 277.9811.



2-((4-(Trifluoromethyl)pyridin-2-yl)oxy)benzaldehyde (1j)

Colorless oil, 0.98 g, 46%.

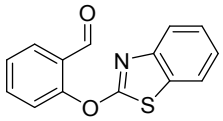
^{1}H NMR (300 MHz, $CDCl_3$) δ 10.20 (s, 1H), 8.40 (dd, J = 1.6, 0.9 Hz, 1H), 7.99 (dt, J = 4.7, 2.1 Hz, 2H), 7.73 – 7.65 (m, 1H), 7.42 (t, J = 7.6 Hz, 1H), 7.24 – 7.16 (m, 2H).

^{13}C NMR (151 MHz, $CDCl_3$) δ 188.8, 165.7, 155.1, 145.6 (d, J = 4.3 Hz), 136.6 (d, J = 235.1 Hz), 129.8, 128.8, 126.3, 124.4 (d, J = 37.3 Hz), 123.2, 122.8, 122.4 (d, J = 33.8 Hz), 111.8.

^{19}F NMR (376 MHz, $CDCl_3$) δ -61.7 (s).

IR (KBr, ν / cm^{-1}): 2996, 2865, 1696, 1606, 1478, 1456, 1393, 1328, 1281, 1254, 1210, 1162, 1126, 1077, 1013, 893, 837, 807, 780, 758.

HRMS (ESI): calcd. for $C_{13}H_9F_3NO_2$ ($[M+H]^+$): 268.0580, found: 268.0580.

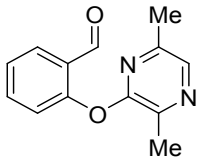


2-(Benzo[*d*]thiazol-2-yloxy)benzaldehyde (1k)

Orange solid, 1.67 g, 82%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.37 (d, J = 0.7 Hz, 1H), 8.01 (dd, J = 7.7, 1.8 Hz, 1H), 7.73 – 7.68 (m, 3H), 7.51 – 7.37 (m, 3H), 7.31 (td, J = 7.7, 1.3 Hz, 1H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 188.0, 171.2, 156.1, 148.5, 135.8, 132.3, 129.2, 127.6, 126.6, 126.4, 124.5, 121.9 (d, J = 2.3 Hz), 121.4; ^{1}H and ^{13}C NMR data agreed with literature[4].



2-((3,6-Dimethylpyrazin-2-yl)oxy)benzaldehyde (1l)

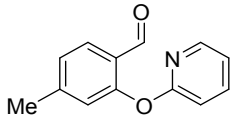
Yellow solid, M.p. 66 – 67 ℃, 1.32 g, 72%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.25 (d, J = 0.7 Hz, 1H), 8.07 (s, 1H), 7.97 (dd, J = 7.8, 1.8 Hz, 1H), 7.63 (ddd, J = 8.3, 7.4, 1.8 Hz, 1H), 7.43 – 7.30 (m, 1H), 7.16 (dd, J = 8.3, 1.0 Hz, 1H), 2.64 (s, 3H), 2.30 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.1, 157.3, 155.9, 148.7, 141.4, 138.0, 135.5, 129.2, 128.5, 125.4, 122.6, 20.7, 19.0.

IR (KBr, ν / cm^{-1}): 2935, 2858, 1694, 1603, 1540, 1457, 1361, 1281, 1214, 1189, 1158, 1095, 1023, 1006, 883, 851, 810, 759.

HRMS (ESI): calcd. for $C_{13}H_{13}N_2O_2$ ($[M+H]^+$): 229.0972, found: 229.0970.



4-Methyl-2-(pyridin-2-yloxy)benzaldehyde (1m)

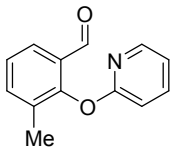
Light yellow oil, 1.52 g, 89%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.23 (d, J = 0.6 Hz, 1H), 8.18 (dd, J = 5.3, 2.0 Hz, 1H), 7.87 (d, J = 7.9 Hz, 1H), 7.75 (ddd, J = 8.1, 4.9, 2.0 Hz, 1H), 7.13 (dd, J = 8.0, 0.7 Hz, 1H), 7.08 – 7.02 (m, 2H), 6.97 (d, J = 0.4 Hz, 1H), 2.41 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.0, 163.6, 156.5, 147.8, 147.3, 140.0, 128.7, 126.4, 126.2, 122.9, 119.2, 111.9, 22.1.

IR (KBr, ν / cm^{-1}): 3011, 2856, 1689, 1612, 1571, 1496, 1467, 1429, 1239, 1144, 1106, 991, 949, 883, 846, 818, 805, 779, 736, 712.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_2$ ($[M+H]^+$): 214.0863, found: 214.0870.



3-Methyl-2-(pyridin-2-yloxy)benzaldehyde (1n)

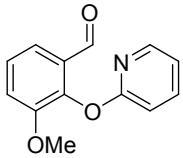
White solid, M.p. 67 – 68 ℃, 1.23 g, 72%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.15 (d, J = 0.7 Hz, 1H), 8.09 (ddd, J = 5.0, 2.0, 0.8 Hz, 1H), 7.82 (ddd, J = 7.7, 1.7, 0.5 Hz, 1H), 7.74 (ddd, J = 8.3, 7.2, 2.0 Hz, 1H), 7.54 (ddd, J = 7.5, 1.7, 0.8 Hz, 1H), 7.30 (t, J = 7.7 Hz, 1H), 7.05 – 6.97 (m, 2H), 2.17 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 190.0, 163.8, 154.4, 147.9, 140.1, 137.6, 132.9, 129.6, 126.7, 126.0, 118.8, 110.7, 16.4.

IR (KBr, ν / cm^{-1}): 3063, 2861, 1698, 1684, 1587, 1464, 1428, 1392, 1241, 1186, 1142, 1084, 922, 880, 817, 777, 736.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_2$ ($[M+H]^+$): 214.0863, found: 214.0862.



3-Methoxy-2-(pyridin-2-yloxy)benzaldehyde (1o)

White solid, M.p. 101 – 102 ℃, 1.15 g, 63%.

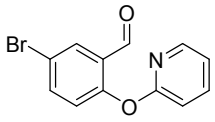
^{1}H NMR (300 MHz, $CDCl_3$) δ 10.24 (d, J = 0.6 Hz, 1H), 8.09 (dd, J = 5.0, 2.0 Hz, 1H), 7.73 (ddd, J = 8.3, 7.2, 2.0 Hz, 1H), 7.56 (dd, J = 7.7, 1.6 Hz, 1H), 7.33 (t, J = 7.9 Hz, 1H), 7.24 (dd, J = 8.1, 1.6 Hz, 1H), 7.07 (d, J = 8.3 Hz, 1H), 7.00 (ddd, J = 7.2, 5.0, 0.8 Hz, 1H), 3.77 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.7, 163.8, 152.5, 147.6, 145.5, 139.8, 130.3, 126.2,

119.6, 118.8, 118.2, 110.7, 56.4.

IR (KBr, ν / cm^{-1}): 2995, 2867, 1687, 1673, 1596, 1568, 1467, 1427, 1400, 1317, 1181, 1143, 1063, 991, 911, 878, 817, 779, 740.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_3$ ($[M+H]^+$): 230.0812, found: 230.0818.



5-bromo-2-(pyridin-2-yloxy)benzaldehyde (1p)

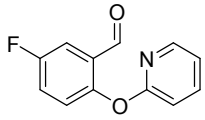
White solid, M.p. 54 – 55 ℃, 1.49 g, 67%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.21 (s, 1H), 8.15 (dd, J = 5.4, 2.0 Hz, 1H), 8.06 (d, J = 2.6 Hz, 1H), 7.80 – 7.75 (m, 1H), 7.71 (dd, J = 8.7, 2.6 Hz, 1H), 7.11 – 7.06 (m, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 187.9, 163.2, 155.5, 147.8, 140.2, 138.2, 131.4, 130.0, 124.7, 119.7, 118.6, 112.0.

IR (KBr, ν / cm^{-1}): 2996, 2856, 1689, 1590, 1572, 1464, 1428, 1388, 1240, 1178, 1143, 1110, 1058, 992, 893, 864, 837, 774.

HRMS (ESI): calcd. for $C_{12}H_9BrNO_2$ ($[M+H]^+$): 277.9811, found: 277.9812.



5-Fluoro-2-(pyridin-2-yloxy)benzaldehyde (1q)

White solid, M.p. 59 – 60 ℃, 0.88 g, 51%.

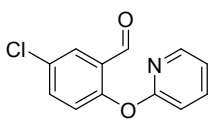
^{1}H NMR (300 MHz, $CDCl_3$) δ 10.21 (d, J = 3.0 Hz, 1H), 8.16 – 8.13 (m, 1H), 7.77 (ddd, J = 8.3, 7.3, 2.0 Hz, 1H), 7.63 (dd, J = 8.2, 3.2 Hz, 1H), 7.34 (ddd, J = 8.9, 7.5, 3.2 Hz, 1H), 7.19 (dd, J = 9.0, 4.3 Hz, 1H), 7.09 – 7.04 (m, 2H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 188.2, 163.5, 159.7 (d, J = 246.3 Hz), 152.4 (d, J = 2.5 Hz), 147.7, 140.2, 129.9 (d, J = 6.5 Hz), 124.8 (d, J = 7.7 Hz), 122.7 (d, J = 24.1 Hz), 119.5, 114.3 (d, J = 23.8 Hz), 111.7.

^{19}F NMR (376 MHz, $CDCl_3$) δ -116.1 (s).

IR (KBr, ν / cm^{-1}): 3068, 2865, 1692, 1594, 1594, 1487, 1466, 1428, 1396, 1245, 1183, 1141, 1099, 1057, 992, 965, 877, 838, 776, 734, 710.

HRMS (ESI): calcd. for $C_{12}H_9FNO_2$ ($[M+H]^+$): 218.0612, found: 218.0613.



5-Chloro-2-(pyridin-2-yloxy)benzaldehyde (1r)

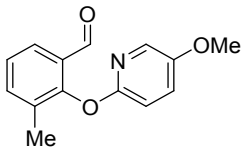
Light yellow solid, M.p. 52 – 53 ℃, 1.06 g, 57%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.23 (d, J = 0.6 Hz, 1H), 8.20 – 8.09 (m, 1H), 7.91 (d, J = 2.7 Hz, 1H), 7.81 – 7.73 (m, 1H), 7.57 (ddd, J = 8.7, 2.7, 0.6 Hz, 1H), 7.16 (d, J = 8.7 Hz, 1H), 7.11 – 7.04 (m, 2H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 187.9, 163.2, 154.9, 147.8, 140.2, 135.3, 131.1, 129.7, 128.3, 124.4, 119.7, 112.0.

IR (KBr, ν / cm^{-1}): 2995, 2866, 1691, 1594, 1464, 1429, 1389, 1242, 1179, 1111, 1058, 992, 870, 839, 774, 736.

HRMS (ESI): calcd. for $C_{12}H_9ClNO_2$ ($[M+H]^+$): 234.0316, found: 234.0319.



2-((5-Methoxypyridin-2-yl)oxy)-3-methylbenzaldehyde (1s)

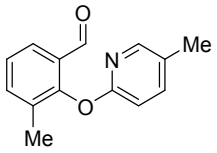
Colorless oil, 1.65 g, 85%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.17 (d, J = 0.7 Hz, 1H), 7.81 (dd, J = 7.7, 1.7 Hz, 1H), 7.73 (d, J = 3.1 Hz, 1H), 7.53 (ddd, J = 7.5, 1.7, 0.8 Hz, 1H), 7.36 – 7.23 (m, 2H), 6.96 (dd, J = 8.9, 0.5 Hz, 1H), 3.80 (s, 3H), 2.16 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 190.0, 158.1, 154.8, 152.3, 137.5, 132.9, 132.3, 129.7, 127.2, 126.5, 125.8, 110.8, 56.3, 16.3.

IR (KBr, ν / cm^{-1}): 2938, 2839, 1681, 1586, 1484, 1465, 1440, 1384, 1233, 1185, 1084, 1031, 1010, 922, 886, 831, 786, 769, 736, 716.

HRMS (ESI): calcd. for $C_{14}H_{14}NO_3$ ($[M+H]^+$): 244.0968, found: 244.0974.



3-Methyl-2-((5-methylpyridin-2-yl)oxy)benzaldehyde (1t)

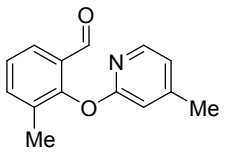
Colorless oil, 1.40 g, 77%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.15 (s, 1H), 7.89 (d, J = 0.9 Hz, 1H), 7.81 (d, J = 7.8 Hz, 1H), 7.53 (d, J = 8.3 Hz, 2H), 7.31 – 7.26 (m, 1H), 6.92 (d, J = 8.4 Hz, 1H), 2.26 (s, 3H), 2.16 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 190.0, 162.0, 154.6, 147.4, 140.9, 137.5, 132.8, 129.6, 127.9, 126.5, 125.8, 109.9, 17.6, 16.3.

IR (KBr, ν / cm^{-1}): 2925, 2863, 1682, 1604, 1586, 1480, 1465, 1377, 1269, 1239, 1186, 1125, 1084, 1026, 922, 884, 827, 786, 739, 718.

HRMS (ESI): calcd. for $C_{14}H_{14}NO_2$ ($[M+H]^+$): 228.1019, found: 228.1023.



3-Methyl-2-((4-methylpyridin-2-yl)oxy)benzaldehyde (1u)

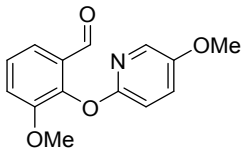
White solid, M.p. 67 – 68 ℃, 1.56 g, 86%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.15 (d, J = 0.4 Hz, 1H), 7.94 (dd, J = 5.0, 2.5 Hz, 1H), 7.80 (d, J = 7.7 Hz, 1H), 7.52 (d, J = 6.9 Hz, 1H), 7.30 – 7.24 (m, 1H), 6.81 (d, J = 9.1 Hz, 2H), 2.37 (s, 3H), 2.16 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.8, 163.9, 154.4, 151.6, 147.2, 137.4, 132.7, 129.5, 126.4, 125.7, 120.1, 110.6, 21.2, 16.2.

IR (KBr, ν / cm^{-1}): 2956, 2858, 1698, 1682, 1611, 1588, 1564, 1467, 1390, 1289, 1250, 1188, 1149, 1085, 946, 923, 866, 819, 793, 781, 767, 734.

HRMS (ESI): calcd. for $C_{14}H_{14}NO_2$ ($[M+H]^+$): 228.1019, found: 228.1028.



3-Methoxy-2-((5-methoxypyridin-2-yl)oxy)benzaldehyde (1v)

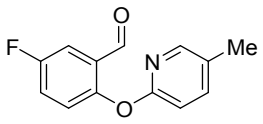
White solid, M.p. 64 – 65 ℃, 1.43 g, 69%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.25 (d, J = 0.7 Hz, 1H), 7.72 (d, J = 3.1 Hz, 1H), 7.54 (ddd, J = 7.7, 1.6, 0.8 Hz, 1H), 7.35 – 7.18 (m, 3H), 7.00 (dd, J = 8.9, 0.5 Hz, 1H), 3.80 (s, 3H), 3.76 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.8, 158.0, 152.6, 152.4, 146.0, 132.1, 130.5, 126.8, 126.0, 119.5, 118.3, 110.9, 56.4, 56.2.

IR (KBr, ν / cm^{-1}): 2941, 2839, 1696, 1584, 1479, 1385, 1316, 1272, 1234, 1181, 1065, 1032, 1011, 886, 834, 774, 736, 715.

HRMS (ESI): calcd. for $C_{14}H_{14}NO_4$ ($[M+H]^+$): 260.0917, found: 260.0928.



5-Fluoro-2-((5-methylpyridin-2-yl)oxy)benzaldehyde (1w)

Light yellow solid, M.p. 46 – 47 ℃, 1.24 g, 67%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.23 (d, J = 3.1 Hz, 1H), 7.95 (s, 1H), 7.67 – 7.53 (m, 2H), 7.38 – 7.26 (m, 1H), 7.15 (dd, J = 9.0, 4.3 Hz, 1H), 6.97 (d, J = 8.3 Hz, 1H), 2.29 (s, 3H).

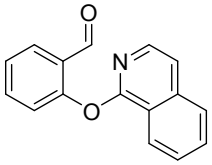
^{13}C NMR (75 MHz, $CDCl_3$) δ 188.3, 161.7, 159.5 (d, J = 246.3 Hz), 152.9 (d, J = 2.6

Hz), 147.3, 141.0, 129.7 (d, J = 6.3 Hz), 129.0, 124.4 (d, J = 7.6 Hz), 122.6 (d, J = 24.1 Hz), 114.1 (d, J = 23.7 Hz), 111.2, 17.6.

^{19}F NMR (376 MHz, $CDCl_3$) δ -116.6 (s).

IR (KBr, ν / cm^{-1}): 3023, 2866, 1690, 1604, 1581, 1472, 1425, 1377, 1244, 1183, 1141, 1027, 964, 881, 824, 744, 698.

HRMS (ESI): calcd. for $C_{13}H_{11}FNO_2$ ($[M+H]^+$): 232.0768, found: 232.0778.

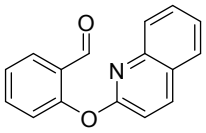


2-(Isoquinolin-1-yloxy)benzaldehyde (1x)

White solid. 15%, 0.3 g.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.29 (s, 1H), 8.47 (d, J = 8.1 Hz, 1H), 8.03 (dd, J = 7.8, 1.7 Hz, 1H), 7.94 (d, J = 5.9 Hz, 1H), 7.85 (d, J = 7.6 Hz, 1H), 7.81 – 7.74 (m, 1H), 7.73 – 7.65 (m, 2H), 7.43 – 7.30 (m, 3H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 189.2, 160.7, 156.5, 139.8, 138.8, 135.7, 131.4, 129.2, 128.9, 127.8, 126.7, 125.8, 124.1, 123.6, 119.6, 117.4; ^{1}H and ^{13}C NMR data agreed with literature [4].

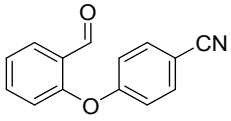


2-(Quinolin-2-yloxy)benzaldehyde (1y)

Light yellow soild. 57%, 1.1 g.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.32 (d, J = 0.7 Hz, 1H), 8.17 (d, J = 8.8 Hz, 1H), 8.00 (dd, J = 7.8, 1.7 Hz, 1H), 7.74 (dd, J = 17.3, 8.1 Hz, 2H), 7.68 – 7.56 (m, 2H), 7.43 (t, J = 7.5 Hz, 1H), 7.34 (td, J = 8.5, 4.6 Hz, 2H), 7.20 (d, J = 8.8 Hz, 1H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.3, 161.6, 156.3, 146.3, 140.5, 135.5, 130.2, 128.8, 128.7, 128.0, 127.6, 126.0, 125.4, 125.4, 123.1, 112.6; ^{1}H and ^{13}C NMR data agreed with literature [4].



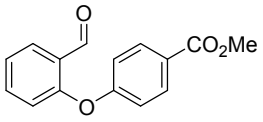
4-(2-Formylphenoxy)benzonitrile (1z)

White solid, 0.89 g, 50%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.35 (d, J = 0.7 Hz, 1H), 7.99 (dd, J = 7.8, 1.8 Hz, 1H),

7.69 – 7.64 (m, 3H), 7.39 – 7.33 (m, 1H), 7.13 – 7.06 (m, 2H), 7.05 (dd, *J* = 8.3, 0.7 Hz, 1H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 188.6, 161.0, 157.4, 136.3, 134.6, 129.5, 128.0, 125.6, 120.7, 119.9, 118.6, 107.3; ^{1}H and ^{13}C NMR data agreed with literature [4].

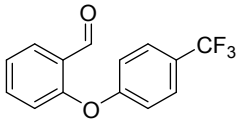


Methyl 4-(2-formylphenoxy)benzoate (1aa)

White solid, 0.80 g, 39%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.41 (d, *J* = 0.7 Hz, 1H), 8.09 – 8.03 (m, 2H), 7.97 (dd, *J* = 7.8, 1.8 Hz, 1H), 7.65 – 7.55 (m, 1H), 7.29 (dd, *J* = 8.3, 6.8 Hz, 1H), 7.12 – 6.98 (m, 3H), 3.91 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 188.9, 166.4, 161.0, 158.4, 136.1, 132.1, 128.9, 127.6, 125.7, 124.8, 120.1, 118.1, 52.3; ^{1}H and ^{13}C NMR data agreed with literature [4].

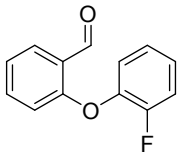


2-(4-(trifluoromethyl)phenoxy)benzaldehyde (1ab)

Colorless oil, 0.92 g, 43%.

^{1}H NMR (400 MHz, $CDCl_3$) δ 10.42 (s, 1H), 7.98 (dd, *J* = 7.8, 1.4 Hz, 1H), 7.69 – 7.51 (m, 3H), 7.30 (t, *J* = 7.5 Hz, 1H), 7.13 (d, *J* = 8.4 Hz, 2H), 6.99 (d, *J* = 8.3 Hz, 1H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 188.9, 159.9, 158.5, 136.2, 129.2, 127.8, 127.7 (q, *J* = 3.7 Hz), 126.3 (d, *J* = 33.0 Hz), 124.9, 124.2 (d, *J* = 271.7 Hz), 119.9, 118.7; ^{1}H and ^{13}C NMR data agreed with literature [5].

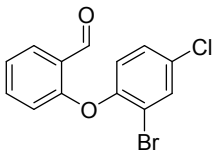


2-(2-Fluorophenoxy)benzaldehyde (1ac)

White solid, 0.94 g, 54%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.62 (d, *J* = 0.7 Hz, 1H), 7.94 (dd, *J* = 7.7, 1.8 Hz, 1H), 7.49 (ddd, *J* = 8.4, 7.3, 1.8 Hz, 1H), 7.25 – 7.11 (m, 5H), 6.79 (d, *J* = 8.4 Hz, 1H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.2, 160.1, 154.5 (d, *J* = 249.6 Hz), 142.7 (d, *J* = 11.2 Hz), 135.9, 128.6, 126.2 (d, *J* = 6.9 Hz), 125.9, 125.2 (d, *J* = 4.0 Hz), 123.3, 122.8, 117.5 (d, *J* = 18.0 Hz), 116.3; ^{1}H and ^{13}C NMR data agreed with literature [6].



2-(2-bromo-4-chlorophenoxy)benzaldehyde (1ad)

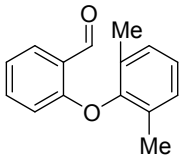
Colorless oil, 1.62 g, 65%.

^{1}H NMR (400 MHz, $CDCl_3$) δ 10.56 (s, 1H), 7.96 (dd, J = 7.7, 1.7 Hz, 1H), 7.66 (d, J = 2.3 Hz, 1H), 7.54 – 7.47 (m, 1H), 7.41 (dd, J = 8.7, 2.3 Hz, 1H), 7.22 (t, J = 7.5 Hz, 1H), 6.96 (d, J = 8.7 Hz, 1H), 6.74 (d, J = 8.3 Hz, 1H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 189.0, 159.2, 150.9, 136.0, 133.9, 131.6, 129.1, 127.8, 126.4, 124.0, 123.0, 118.0, 117.0.

IR (KBr, ν / cm^{-1}): 3125, 2919, 2873, 1690, 1652, 1601, 1541, 1469, 1456, 1396, 1258, 1236, 1197, 1132, 1079, 1057, 823, 760, 742.

HRMS (ESI): calcd. for $C_{13}H_9BrClO_2$ ($[M+H]^+$): 312.9448, found: 312.9455.



2-(2,6-Dimethylphenoxy)benzaldehyde (1ae)

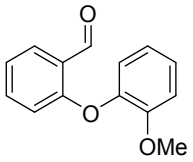
Light yellow solid, M.p. 62 – 63 ℃, 0.87 g, 48%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.78 (d, J = 0.7 Hz, 1H), 7.93 (dd, J = 7.7, 1.8 Hz, 1H), 7.49 – 7.33 (m, 1H), 7.19 – 7.11 (m, 3H), 7.07 (dd, J = 11.7, 4.2 Hz, 1H), 6.44 (d, J = 8.4 Hz, 1H), 2.15 (s, 6H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.5, 160.3, 150.4, 136.1, 131.3, 129.4, 128.7, 125.9, 124.4, 121.7, 115.3, 113.6, 16.5.

IR (KBr, ν / cm^{-1}): 2981, 2854, 1690, 1651, 1600, 1581, 1474, 1456, 1395, 1267, 1224, 1180, 1156, 1099, 1089, 1035, 876, 825, 800, 762.

HRMS (ESI): calcd. for $C_{15}H_{15}O_2$ ($[M+H]^+$): 227.1607, found: 227.1068.



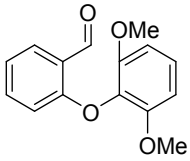
2-(2-Methoxyphenoxy)benzaldehyde (1af)

White solid, 0.84 g, 46%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.65 (d, J = 0.8 Hz, 1H), 7.91 (dd, J = 7.7, 1.8 Hz, 1H), 7.43 (ddd, J = 8.4, 7.3, 1.8 Hz, 1H), 7.21 (ddd, J = 8.1, 7.4, 1.8 Hz, 1H), 7.14 – 6.93

(m, 4H), 6.75 – 6.67 (m, 1H), 3.78 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 189.7, 161.0, 151.6, 143.8, 135.7, 128.1, 126.2, 125.6, 122.5, 122.1, 121.3, 116.3, 113.0, 55.9; ^{1}H and ^{13}C NMR data agreed with literature [2].



2-(2,6-Dimethoxyphenoxy)benzaldehyde (1ag)

White solid, M.p. 110 – 111 ℃, 1.09 g, 53%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 10.77 (d, J = 0.7 Hz, 1H), 7.89 (dd, J = 7.7, 1.8 Hz, 1H), 7.38 (ddd, J = 8.5, 7.3, 1.8 Hz, 1H), 7.18 (t, J = 8.4 Hz, 1H), 7.05 (t, J = 7.5 Hz, 1H), 6.72 – 6.55 (m, 3H), 3.77 (s, 6H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 190.1, 161.5, 153.5, 135.6, 132.0, 127.9, 126.2, 125.1, 121.9, 114.9, 109.9, 105.4, 56.3.

IR (KBr, ν / cm^{-1}): 2996, 2832, 1684, 1599, 1480, 1444, 1397, 1303, 1280, 1257, 1235, 1184, 1157, 1033, 875, 823, 799, 768, 750, 735, 701.

HRMS (ESI): calcd. for $C_{15}H_{15}O_4$ ($[M+H]^+$): 259.0965, found: 259.0964.

IV. UV-vis absorption spectra of 1a

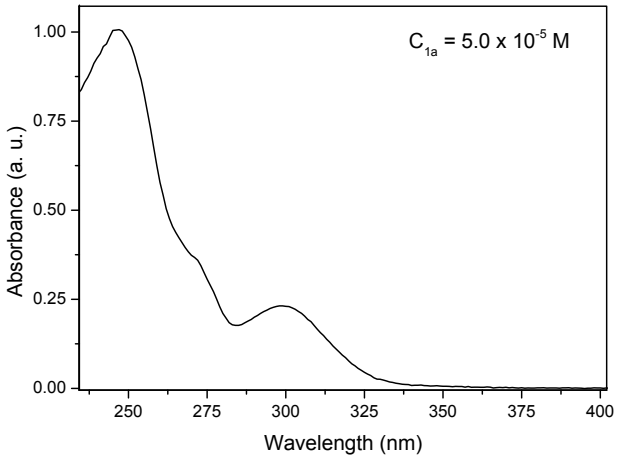


Figure S1 UV-vis absorption spectra of **1a**

V. General procedures for heteroaryl/aryl rearrangement

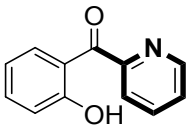
i. General procedures for heteroaryl rearrangement

The starting materials **1** (0.2 mmol), TFA (0.2 mmol) were added into 2.0 mL of ethyl acetate in an airtight quartz tube, which was then evacuated by four freeze-pump-thaw cycles and back-filled with ultra-purified argon prior to use. The reaction was stirred at room temperature under UV irradiation (254 nm) for 24 h and 5 mL saturated $NaHCO_3$ aqueous solution was added into the reaction solution, and extracted with 3 × 5 mL EtOAc. The combined organic phases were washed with brine, dried over anhydrous $MgSO_4$ and concentrated under reduced pressure. Purification by column chromatography on silica (PE/EA = 20/1) affords **2**.

ii. General procedures for aryl rearrangement

The starting materials **1** (0.2 mmol) were added into 2.0 mL of ethyl acetate in an airtight quartz tube, which was then evacuated by four freeze-pump-thaw cycles and back-filled with ultra-purified argon prior to use. The reaction was stirred at room temperature under UV irradiation (254 nm) for 24 h. The reaction mixture was concentrated under reduced pressure. Purification by column chromatography on silica (PE/EA = 30/1) affords **2**.

VI. Characterization data of rearrangement products

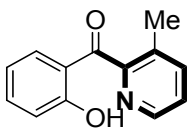


(2-Hydroxyphenyl)(pyridin-2-yl)methanone (2a)

Yellow oil. 33.1 mg, 83%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.36 (s, 1H), 8.73 (dt, J = 4.8, 1.4 Hz, 1H), 8.11 (dd, J = 8.1, 1.7 Hz, 1H), 7.96 – 7.89 (m, 2H), 7.56 – 7.47 (m, 2H), 7.06 (dd, J = 8.4, 0.7 Hz, 1H), 6.90 (ddd, J = 8.2, 7.2, 1.2 Hz, 1H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 197.4, 163.6, 155.4, 148.4, 137.6, 136.8, 134.5, 126.3, 124.8, 119.3, 119.0, 118.6; ^{1}H and ^{13}C NMR data agreed with literature[4].



(2-Hydroxyphenyl)(3-methylpyridin-2-yl)methanone (2b)

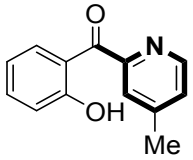
Light yellow oil. 34.5 mg, 81%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.08 (s, 1H), 8.52 (dd, J = 4.7, 0.7 Hz, 1H), 7.67 (d, J = 7.8 Hz, 1H), 7.53 – 7.48 (m, 1H), 7.40 – 7.32 (m, 2H), 7.06 (dd, J = 8.4, 1.0 Hz, 1H), 6.88 – 6.76 (m, 1H), 2.37 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 200.6, 163.9, 154.4, 146.2, 139.2, 137.2, 133.7, 132.0, 124.8, 119.2, 119.1, 118.4, 18.2.

IR (KBr, ν / cm^{-1}): 3052, 2933, 1694, 1638, 1485, 1455, 1340, 1149, 1107, 1062, 1034, 944, 864, 795, 762.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_2$ ($[M+H]^+$): 214.0863, found: 214.0860.



(2-Hydroxyphenyl)(4-methylpyridin-2-yl)methanone (2c)

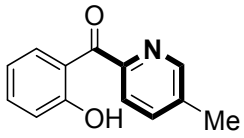
Yellow oil. 30.2 mg, 71%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.53 (s, 1H), 8.57 (d, J = 5.0 Hz, 1H), 8.09 (dd, J = 8.1, 1.7 Hz, 1H), 7.77 – 7.76 (m, 1H), 7.54 – 7.46 (m, 1H), 7.33 (ddd, J = 5.0, 1.6, 0.7 Hz, 1H), 7.05 (dd, J = 8.4, 1.1 Hz, 1H), 6.90 (ddd, J = 8.2, 7.2, 1.2 Hz, 1H), 2.47 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 197.5, 163.3, 155.2, 149.2, 148.0, 136.7, 134.4, 127.2, 125.5, 119.7, 119.0, 118.6, 21.4.

IR (KBr, ν / cm^{-1}): 3058, 2920, 1627, 1599, 1485, 1444, 1330, 1308, 1258, 1211, 1161, 954, 855, 807, 756, 661.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_2$ ($[M+H]^+$): 214.0863, found: 214.0861.



(2-Hydroxyphenyl)(5-methylpyridin-2-yl)methanone (2d)

Light yellow solid, M.p. 77 – 78 ℃. 38.3 mg, 90%.

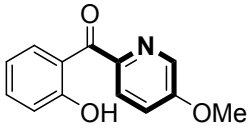
^{1}H NMR (300 MHz, $CDCl_3$) δ 12.51 (s, 1H), 8.54 (dd, J = 1.4, 0.6 Hz, 1H), 8.17 (dd, J = 8.1, 1.7 Hz, 1H), 7.88 (d, J = 8.0 Hz, 1H), 7.71 (ddd, J = 8.0, 2.1, 0.5 Hz, 1H), 7.49 (ddd, J = 8.8, 7.2, 1.7 Hz, 1H), 7.06 – 7.02 (m, 1H), 6.93 – 6.86 (m, 1H), 2.45 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 196.9, 163.3, 152.8, 148.7, 138.0, 136.9, 136.5, 134.4, 124.6, 119.6, 118.9, 118.6, 18.8.

IR (KBr, ν / cm^{-1}): 3037, 2926, 1627, 1567, 1477, 1491, 1381, 1336, 1318, 1148, 1142,

1084, 943, 849, 799, 786, 691.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_2$ ([M+H]$^+$): 214.0863, found: 214.0860.



(2-Hydroxyphenyl)(5-methoxypyridin-2-yl)methanone (2e)

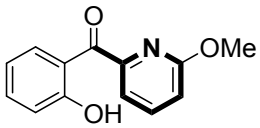
Yellow oil. 44.0 mg, 96%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.46 (s, 1H), 8.38 (d, J = 2.7 Hz, 1H), 8.31 (d, J = 8.1 Hz, 1H), 8.02 (d, J = 8.7 Hz, 1H), 7.49 (t, J = 7.1 Hz, 1H), 7.35 (dd, J = 8.7, 2.8 Hz, 1H), 7.04 (d, J = 8.3 Hz, 1H), 6.91 (t, J = 7.6 Hz, 1H), 3.95 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 195.8, 163.3, 157.8, 147.8, 136.4 (d, J = 4.4 Hz), 134.5, 126.7, 120.6, 119.5, 118.8, 118.4, 56.0.

IR (KBr, ν / cm^{-1}): 3013, 2970, 2942, 2844, 1623, 1570, 1477, 1442, 1395, 1272, 1148, 1026, 941, 829, 805, 758, 687.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_3$ ([M+H]$^+$): 230.0812, found: 230.0811.



(2-Hydroxyphenyl)(6-methoxypyridin-2-yl)methanone (2f)

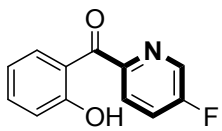
Yellow oil. 26.1 mg, 57%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.24 (s, 1H), 8.27 (dd, J = 8.1, 1.7 Hz, 1H), 7.77 (dd, J = 8.3, 7.3 Hz, 1H), 7.56 – 7.45 (m, 2H), 7.06 (dd, J = 8.4, 1.1 Hz, 1H), 6.96 (dd, J = 8.4, 0.7 Hz, 1H), 6.93 – 6.85 (m, 1H), 3.97 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 197.5, 164.0, 163.0, 152.8, 139.5, 136.7, 134.4, 119.0, 118.6, 118.4, 118.0, 114.4, 54.0.

IR (KBr, ν / cm^{-1}): 3080, 3015, 2983, 2952, 2857, 1630, 1586, 1468, 1436, 1345, 1293, 1246, 1151, 1079, 971, 875, 825, 792, 730, 687.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_3$ ([M+H]$^+$): 230.0812, found: 230.0809.



(5-Fluoropyridin-2-yl)(2-hydroxyphenyl)methanone (2g)

Yellow solid, M.p. 72 – 73 ℃. 34.7 mg, 80%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.12 (s, 1H), 8.58 (d, J = 2.6 Hz, 1H), 8.20 – 8.14 (m,

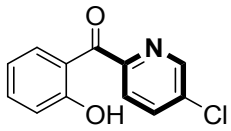
1H), 8.02 (dd, *J* = 8.7, 4.5 Hz, 1H), 7.62 (td, *J* = 8.3, 2.7 Hz, 1H), 7.52 (t, *J* = 7.1 Hz, 1H), 7.06 (d, *J* = 8.4 Hz, 1H), 6.92 (t, *J* = 7.4 Hz, 1H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 196.0, 164.0, 160.7 (d, *J* = 263.3 Hz), 151.7, 137.0 (d, *J* = 24.2 Hz), 137.0, 134.5, 126.8 (d, *J* = 5.4 Hz), 124.2 (d, *J* = 18.5 Hz), 119.0, 118.6, 118.5.

^{19}F NMR (376 MHz, $CDCl_3$) δ -120.5 (dd, *J* = 8.0, 4.6 Hz).

IR (KBr, ν / cm^{-1}): 2918, 2875, 2853, 1627, 1584, 1566, 1513, 1384, 1261, 1224, 1181, 1149, 1049, 1034, 941, 872, 792, 751, 690.

HRMS (ESI): calcd. for $C_{12}H_9FNO_2$ ($[M+H]^+$): 218.0612, found: 218.0611.



(5-Chloropyridin-2-yl)(2-hydroxyphenyl)methanone (2h)

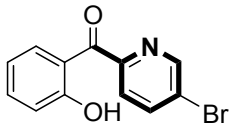
Light yellow solid, M.p. 89 – 90 ℃. 33.6 mg, 72%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.09 (s, 1H), 8.69 (s, 1H), 8.15 (d, *J* = 8.1 Hz, 1H), 7.91 (s, 2H), 7.53 (t, *J* = 7.8 Hz, 1H), 7.06 (d, *J* = 8.4 Hz, 1H), 6.91 (t, *J* = 7.6 Hz, 1H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 196.3, 163.9, 153.3, 147.5, 137.3, 137.1, 135.2, 134.3, 125.8, 119.0, 118.5.

IR (KBr, ν / cm^{-1}): 3054, 2998, 2924, 2867, 1627, 1572, 1483, 1461, 1373, 1310, 1248, 1112, 1015, 941, 851, 825, 801, 754, 734, 730, 691.

HRMS (ESI): calcd. for $C_{12}H_9ClNO_2$ ($[M+H]^+$): 234.0316, found: 234.0321.



(5-bromopyridin-2-yl)(2-hydroxyphenyl)methanone (2i)

Light yellow solid, M.p. 103 – 104 ℃. 37.3 mg, 67%.

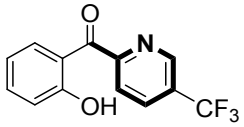
^{1}H NMR (300 MHz, $CDCl_3$) δ 12.07 (s, 1H), 8.79 (dd, *J* = 2.2, 0.6 Hz, 1H), 8.14 (dd, *J* = 8.1, 1.6 Hz, 1H), 8.05 (dd, *J* = 8.4, 2.3 Hz, 1H), 7.83 (dd, *J* = 8.4, 0.6 Hz, 1H), 7.52 (ddd, *J* = 8.7, 7.3, 1.6 Hz, 1H), 7.05 (dd, *J* = 8.4, 1.0 Hz, 1H), 6.90 (ddd, *J* = 8.2, 7.2, 1.2 Hz, 1H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 196.5, 163.9, 153.8, 149.7, 140.2, 137.1, 134.3, 126.1, 124.3, 119.1, 118.6, 118.5.

IR (KBr, ν / cm^{-1}): 3027, 2948, 2879, 1627, 1565, 1483, 1445, 1369, 1333, 1310, 1251,

1230, 1148, 1112, 1088, 1008, 940, 849, 824, 800, 755, 667.

HRMS (ESI): calcd. for $C_{12}H_9BrNO_2$ ([M+H]$^+$): 277.9811, found: 277.9814.



(2-Hydroxyphenyl)(5-(trifluoromethyl)pyridin-2-yl)methanone (2j)

Yellow oil. 25.1 mg, 47%.

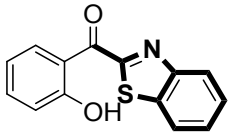
^{1}H NMR (300 MHz, $CDCl_3$) δ 11.97 (s, 1H), 9.01 (dd, J = 1.4, 0.7 Hz, 1H), 8.23 – 8.12 (m, 1H), 8.03 (ddd, J = 8.2, 3.6, 1.1 Hz, 2H), 7.55 (ddd, J = 8.5, 7.2, 1.7 Hz, 1H), 7.13 – 7.03 (m, 1H), 6.98 – 6.86 (m, 1H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 196.5, 164.2, 158.5, 145.6 (q, J = 4.0 Hz), 137.5, 134.8 (q, J = 3.5 Hz), 134.3, 128.6 (d, J = 33.5 Hz), 124.4, 123.2 (d, J = 272.9 Hz), 119.2, 118.7, 118.4.

^{19}F NMR (376 MHz, $CDCl_3$) δ -62.6 (s).

IR (KBr, ν / cm^{-1}): 3080, 2922, 1630, 1571, 1487, 1448, 1394, 1325, 1258, 1243, 1170, 1148, 1017, 943, 815, 786.

HRMS (ESI): calcd. for $C_{13}H_9F_3NO_2$ ([M+H]$^+$): 268.0580, found: 268.0583.

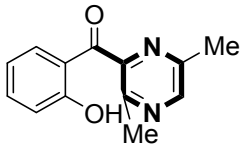


Benzo[*d*]thiazol-2-yl(2-hydroxyphenyl)methanone (2k)

Yellow solid, M.p. 89 – 90 ℃. 29.2 mg, 57%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.10 (s, 1H), 9.25 (dd, J = 8.2, 1.7 Hz, 1H), 8.29 – 8.18 (m, 1H), 8.04 – 7.95 (m, 1H), 7.65 – 7.50 (m, 3H), 7.10 – 6.98 (m, 2H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 187.8, 167.2, 164.3, 153.8, 137.7, 136.9, 134.2, 128.0, 127.3, 125.9, 122.3, 119.7, 118.6, 118.3; ^{1}H and ^{13}C NMR data agreed with literature [4].



(3,6-Dimethylpyrazin-2-yl)(2-hydroxyphenyl)methanone (2l)

Light yellow oil. 36.9 mg, 81%.

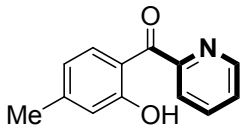
1H NMR (300 MHz, $CDCl_3$) δ 11.93 (s, 1H), 8.52 (s, 1H), 7.54 (ddd, J = 8.6, 7.2, 1.7 Hz, 1H), 7.30 (dd, J = 8.0, 1.7 Hz, 1H), 7.08 (dd, J = 8.5, 1.0 Hz, 1H), 6.85 (ddd, J =

8.2, 7.2, 1.1 Hz, 1H), 2.60 (s, 3H), 2.55 (s, 3H).

13C NMR (75 MHz, $CDCl_3$) δ 199.4, 164.1, 150.1, 148.8, 148.6, 144.9, 137.7, 133.5, 119.3, 118.9, 118.7, 21.2, 21.1.

IR (KBr, ν / cm^{-1}): 3047, 3067, 2929, 2858, 1630, 1576, 1485, 1448, 1371, 1254, 1215, 1138, 1108, 1034, 1004, 952, 885, 864, 820, 756, 736, 691.

HRMS (ESI): calcd. for $C_{13}H_{13}N_2O_2$ ($[M+H]^+$): 229.0972, found: 229.0971.



(2-Hydroxy-4-methylphenyl)(pyridin-2-yl)methanone (2m)

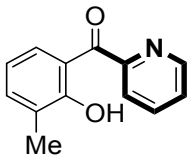
Light yellow solid, M.p. 32 – 33 ℃. 32.4 mg, 76%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.38 (s, 1H), 8.72 (d, J = 4.7 Hz, 1H), 7.99 (d, J = 8.3 Hz, 1H), 7.91 (d, J = 3.7 Hz, 2H), 7.49 (dd, J = 8.9, 4.7 Hz, 1H), 6.86 (s, 1H), 6.72 (d, J = 8.3 Hz, 1H), 2.37 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 196.9, 163.9, 155.6, 148.7, 148.4, 137.5, 134.3, 126.1, 124.6, 120.4, 118.6, 116.8, 22.2.

IR (KBr, ν / cm^{-1}): 3060, 2985, 2924, 1641, 1584, 1556, 1504, 1345, 1308, 1261, 1171, 1047, 997, 870, 793, 785, 703.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_2$ ($[M+H]^+$): 214.0863, found: 214.0869.



(2-Hydroxy-3-methylphenyl)(pyridin-2-yl)methanone (2n)

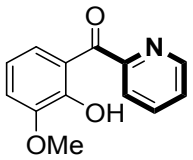
Yellow solid, M.p. 42 – 45 ℃. 36.2 mg, 85%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.53 (s, 1H), 8.72 (dd, J = 4.9, 1.0 Hz, 1H), 7.94 – 7.88 (m, 3H), 7.51 – 7.46 (m, 1H), 7.38 (d, J = 7.2 Hz, 1H), 6.80 (t, J = 7.7 Hz, 1H), 2.31 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 198.1, 162.2, 155.7, 148.5, 137.6, 137.4, 132.0, 127.4, 126.0, 124.6, 118.3, 118.2, 15.9.

IR (KBr, ν / cm^{-1}): 3056, 3015, 2955, 2922, 1623, 1584, 1479, 1423, 1340, 1304, 1258, 1194, 1032, 995, 853, 780, 751, 687.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_2$ ($[M+H]^+$): 214.0863, found: 214.0871.



(2-Hydroxy-3-methoxyphenyl)(pyridin-2-yl)methanone (2o)

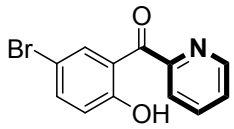
Yellow solid, M.p. 85 – 86 ℃. 23.4 mg, 51%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.78 (s, 1H), 8.73 (d, J = 4.8 Hz, 1H), 8.01 – 7.87 (m, 2H), 7.69 (dd, J = 8.3, 1.2 Hz, 1H), 7.58 – 7.49 (m, 1H), 7.11 (d, J = 8.0 Hz, 1H), 6.86 (t, J = 8.1 Hz, 1H), 3.94 (s, 3H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 197.3, 155.3, 153.7, 149.2, 148.2, 137.7, 126.4, 125.5, 124.8, 119.9, 118.4, 117.3, 56.4.

IR (KBr, ν / cm^{-1}): 3054, 3009, 2924, 2851, 1630, 1586, 1453, 1436, 1340, 1310, 1254, 1194, 1079, 985, 842, 803, 784, 747, 698.

HRMS (ESI): calcd. for $C_{13}H_{12}NO_3$ ($[M+H]^+$): 230.0812, found: 230.0816.



(5-bromo-2-hydroxyphenyl)(pyridin-2-yl)methanone (2p)

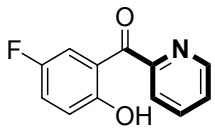
Yellow solid, M.p. 69 – 70 ℃. 43.4 mg, 78%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.63 (s, 1H), 8.75 – 8.73(m, 1H), 8.37 (d, J = 2.5 Hz, 1H), 8.04 – 7.92 (m, 2H), 7.59 – 7.54 (m, 2H), 6.96 (d, J = 8.9 Hz, 1H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 195.3, 162.1, 154.6, 148.2, 139.3, 138.0, 136.4, 126.9, 125.1, 121.1, 120.8, 110.7.

IR (KBr, ν / cm^{-1}): 3081, 2996, 1627, 1604, 1584, 1566, 1460, 1433, 1383, 1332, 1283, 1332, 1283, 1236, 1152, 1094, 1047, 1022, 995, 947, 901, 828, 750, 676.

HRMS (ESI): calcd. for $C_{12}H_9BrNO_2$ ($[M+H]^+$): 277.9811, found: 277.9815.



(5-Fluoro-2-hydroxyphenyl)(pyridin-2-yl)methanone (2q)

Yellow solid, M.p. 48 – 49 ℃. 35.6 mg, 82%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.33 (s, 1H), 8.74 (d, J = 4.7 Hz, 1H), 8.05 – 7.99 (m, 2H), 7.95 (td, J = 7.7, 1.7 Hz, 1H), 7.55 (ddd, J = 7.3, 4.8, 1.4 Hz, 1H), 7.30 – 7.21 (m, 1H), 7.02 (dd, J = 9.1, 4.6 Hz, 1H).

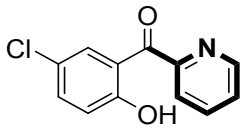
^{13}C NMR (75 MHz, $CDCl_3$) δ 195.5, 159.6, 154.9 (d, J = 237.3 Hz), 154.8, 148.2,

137.9, 126.8, 125.0, 124.4 (d, J = 24.0 Hz), 119.9 (d, J = 7.4 Hz), 119.2 (d, J = 24.5 Hz), 119.2.

^{19}F NMR (376 MHz, $CDCl_3$) δ -124.3 (ddd, J = 9.8, 7.6, 4.6 Hz).

IR (KBr, ν / cm^{-1}): 3093, 3060, 2920, 1641, 1615, 1584, 1485, 1422, 1343, 1284, 1252, 1138, 995, 980, 874, 833, 790, 672.

HRMS (ESI): calcd. for $C_{12}H_9FNO_2$ ($[M+H]^+$): 218.0612, found: 218.0611.



(5-Chloro-2-hydroxyphenyl)(pyridin-2-yl)methanone (2r)

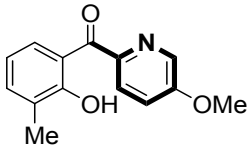
Yellow solid, M.p. 42 – 43 ℃. 36.8 mg, 79%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.60 (s, 1H), 8.75 (d, J = 4.8 Hz, 1H), 8.24 (d, J = 2.7 Hz, 1H), 8.07 – 7.90 (m, 2H), 7.63 – 7.53 (m, 1H), 7.44 (dd, J = 8.9, 2.6 Hz, 1H), 7.01 (d, J = 8.9 Hz, 1H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 195.4, 161.7, 154.6, 148.2, 138.0, 136.5, 133.4, 126.9, 125.1, 123.7, 120.3, 120.2.

IR (KBr, ν / cm^{-1}): 3019, 2968, 2920, 2799, 1632, 1587, 1567, 1463, 1435, 1390, 1336, 1287, 1237, 1157, 1130, 1025, 997, 874, 833, 752, 730, 692.

HRMS (ESI): calcd. for $C_{12}H_9ClNO_2$ ($[M+H]^+$): 234.0316, found: 234.0316.



(2-Hydroxy-3-methylphenyl)(5-methoxypyridin-2-yl)methanone (2s)

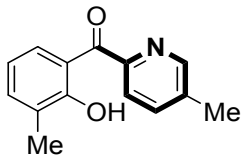
Yellow solid, M.p. 65 – 66 ℃. 46.2 mg, 95%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.63 (s, 1H), 8.38 (d, J = 2.9 Hz, 1H), 8.09 (dd, J = 8.2, 1.7 Hz, 1H), 7.97 (d, J = 8.7 Hz, 1H), 7.34 (dt, J = 8.8, 4.3 Hz, 2H), 6.86 – 6.73 (m, 1H), 3.93 (s, 3H), 2.30 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 196.5, 162.0, 157.6, 148.1, 137.2, 136.5, 132.1, 127.2, 126.5, 120.4, 118.5, 118.1, 55.9, 15.9.

IR (KBr, ν / cm^{-1}): 3054, 2976, 2929, 2845, 1619, 1578, 1476, 1423, 1341, 1306, 1267, 1241, 1135, 1039, 1023, 978, 874, 853, 814, 740, 704.

HRMS (ESI): calcd. for $C_{14}H_{14}NO_3$ ($[M+H]^+$): 244.0968, found: 244.0971.



(2-Hydroxy-3-methylphenyl)(5-methylpyridin-2-yl)methanone (2t)

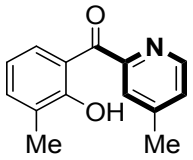
Yellow solid, M.p. 43 – 44 ℃. 40.4 mg, 89%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.63 (s, 1H), 8.54 (dd, J = 1.4, 0.7 Hz, 1H), 7.95 (ddd, J = 8.2, 1.7, 0.5 Hz, 1H), 7.82 (d, J = 8.0 Hz, 1H), 7.73 – 7.65 (m, 1H), 7.37 (d, J = 7.2 Hz, 1H), 6.85 – 6.72 (m, 1H), 2.44 (s, 3H), 2.31 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 197.8, 162.0, 153.0, 148.9, 137.7, 137.4, 136.5, 132.0, 127.3, 124.4, 118.5, 118.2, 18.8, 15.9.

IR (KBr, ν / cm^{-1}): 3025, 3012, 2931, 1633, 1575, 1497, 1412, 1367, 1304, 1222, 1180, 1032, 995, 853, 789, 751, 686.

HRMS (ESI): calcd. for $C_{14}H_{14}NO_2$ ($[M+H]^+$): 228.1019, found: 228.1027.



(2-Hydroxy-3-methylphenyl)(4-methylpyridin-2-yl)methanone (2u)

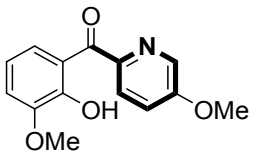
Yellow oil. 30.9 mg, 68%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.62 (s, 1H), 8.57 (d, J = 5.0 Hz, 1H), 7.88 (ddd, J = 8.1, 1.1, 0.5 Hz, 1H), 7.76 – 7.66 (m, 1H), 7.39 – 7.35 (m, 1H), 7.30 (ddd, J = 5.0, 1.6, 0.7 Hz, 1H), 6.80 (t, J = 7.7 Hz, 1H), 2.46 (s, 3H), 2.31 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 198.3, 162.0, 155.5, 148.9, 148.2, 137.5, 132.0, 127.4, 126.9, 125.3, 118.5, 118.3, 21.3, 15.9.

IR (KBr, ν / cm^{-1}): 3054, 2955, 2924, 1620, 1599, 1559, 1477, 1451, 1425, 1330, 1256, 1170, 1086, 1051, 997, 812, 799, 783, 751, 697.

HRMS (ESI): calcd. for $C_{14}H_{14}NO_2$ ($[M+H]^+$): 228.1019, found: 228.1023.



(2-Hydroxy-3-methoxyphenyl)(5-methoxypyridin-2-yl)methanone (2v)

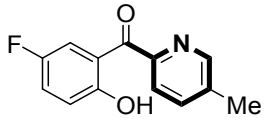
Yellow solid, M.p. 88 – 89 ℃. 28.0 mg, 54%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.83 (s, 1H), 8.37 (d, J = 2.9 Hz, 1H), 8.05 (d, J = 8.8 Hz, 1H), 7.87 (dd, J = 8.3, 1.3 Hz, 1H), 7.37 (dd, J = 8.8, 2.9 Hz, 1H), 7.09 (d, J = 7.9 Hz, 1H), 6.86 (t, J = 8.1 Hz, 1H), 3.96 (s, 3H), 3.93 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 195.8, 157.9, 153.5, 149.1, 147.8, 136.2, 126.7, 125.6, 120.8, 120.1, 118.1, 116.9, 56.4, 56.0.

IR (KBr, ν / cm^{-1}): 3058, 3006, 2940, 2840, 1625, 1576, 1451, 1436, 1343, 1313, 1250, 1189, 1178, 985, 844, 779, 738, 687.

HRMS (ESI): calcd. for $C_{14}H_{14}NO_4$ ($[M+H]^+$): 260.0917, found: 260.0917.



(5-Fluoro-2-hydroxyphenyl)(5-methylpyridin-2-yl)methanone (2w)

Yellow solid, M.p. 81 – 82 ℃. 43.0 mg, 93%.

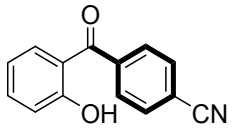
^{1}H NMR (300 MHz, $CDCl_3$) δ 12.52 (s, 1H), 8.57 – 8.52 (m, 1H), 8.07 (dd, *J* = 9.9, 3.2 Hz, 1H), 7.96 (d, *J* = 8.0 Hz, 1H), 7.81 – 7.68 (m, 1H), 7.33 – 7.17 (m, 1H), 7.00 (dd, *J* = 9.1, 4.7 Hz, 1H), 2.47 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 195.1, 159.4, 154.9 (d, *J* = 236.8 Hz), 152.2, 148.5, 138.3, 137.5, 124.9, 124.1 (d, *J* = 23.9 Hz), 119.9 (d, *J* = 7.4 Hz), 119.6 (d, *J* = 6.8 Hz), 119.2 (d, *J* = 24.7 Hz), 18.9.

^{19}F NMR (376 MHz, $CDCl_3$) δ -124.5 (ddd, *J* = 9.8, 7.5, 4.7 Hz).

IR (KBr, ν / cm^{-1}): 3037, 2965, 2931, 1638, 1612, 1593, 1479, 1422, 1384, 1343, 1287, 1218, 1136, 1034, 976, 874, 833, 784, 728, 687.

HRMS (ESI): calcd. for $C_{13}H_{11}FNO_2$ ($[M+H]^+$): 232.0768, found: 230.0777.

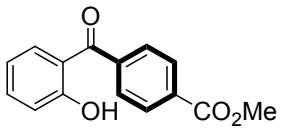


4-(2-Hydroxybenzoyl)benzonitrile (2z)

Yellow solid, M.p. 121 – 122 ℃. 17.0 mg, 38%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 11.79 (s, 1H), 7.85 – 7.80 (m, 2H), 7.79 – 7.74 (m, 2H), 7.56 (ddd, *J* = 8.6, 7.3, 1.7 Hz, 1H), 7.45 (dd, *J* = 8.1, 1.6 Hz, 1H), 7.10 (dd, *J* = 8.4, 0.9 Hz, 1H), 6.90 (ddd, *J* = 8.2, 7.2, 1.1 Hz, 1H).

^{13}C NMR (151 MHz, $CDCl_3$) δ 199.7, 163.4, 141.6, 137.2, 133.0, 132.2, 129.4, 119.0, 118.8, 118.5, 117.9, 115.3; ^{1}H and ^{13}C NMR data agreed with literature [4].

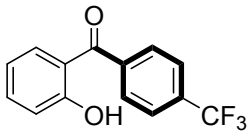


Methyl 4-(2-hydroxybenzoyl)benzoate (2aa)

White solid, M.p. 97 – 98 ℃. 22.0 mg, 43%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 11.93 (s, 1H), 8.21 – 8.12 (m, 2H), 7.75 – 7.68 (m, 2H), 7.57 – 7.47 (m, 2H), 7.09 (ddd, J = 8.3, 1.1, 0.6 Hz, 1H), 6.89 (ddd, J = 8.2, 7.2, 1.1 Hz, 1H), 3.98 (s, 3H).

^{13}C NMR (75 MHz, $CDCl_3$) δ 201.1, 167.0, 166.4, 163.5, 141.8, 137.0, 133.5, 133.0, 129.7, 129.1, 119.1, 118.8, 52.7; ^{1}H and ^{13}C NMR data agreed with literature [4].

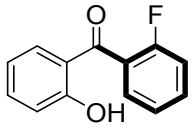


(2-Hydroxyphenyl)(4-(trifluoromethyl)phenyl)methanone (2ab)

White solid, M.p. 49 – 50 ℃. 17.6 mg, 33%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 11.89 (s, 1H), 7.79 (s, 4H), 7.65 – 7.46 (m, 2H), 7.10 (dd, J = 8.4, 1.1 Hz, 1H), 6.90 (ddd, J = 8.2, 7.2, 1.1 Hz, 1H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 200.6, 163.6, 141.2, 137.2, 133.6 (d, J = 32.7 Hz), 133.5, 129.5, 125.6 (q, J = 3.7 Hz), 123.8 (d, J = 272.6 Hz), 119.2, 118.9, 118.9; ^{1}H and ^{13}C NMR data agreed with literature [8].



(2-Fluorophenyl)(2-hydroxyphenyl)methanone (2ac)

Light yellow oil. 21.6 mg, 50%.

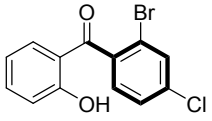
^{1}H NMR (300 MHz, $CDCl_3$) δ 11.98 (s, 1H), 7.60 – 7.38 (m, 4H), 7.30 (td, J = 7.5, 1.0 Hz, 1H), 7.21 (ddd, J = 9.5, 8.4, 0.9 Hz, 1H), 7.07 (dd, J = 8.4, 1.1 Hz, 1H), 6.87 (ddd, J = 8.2, 7.2, 1.1 Hz, 1H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 198.7, 163.2, 159.3 (d, J = 251.5 Hz), 137.3, 133.6 (d, J = 2.2 Hz), 133.1 (d, J = 8.2 Hz), 130.1 (d, J = 2.9 Hz), 126.5 (d, J = 15.9 Hz), 124.6 (d, J = 3.6 Hz), 119.9, 119.2, 118.5, 116.5 (d, J = 21.3 Hz).

^{19}F NMR (376 MHz, $CDCl_3$) δ -112.2 – -112.3 (m).

IR (KBr, ν / cm^{-1}): 3063, 2920, 2862, 1630, 1615, 1580, 1485, 1451, 1336, 1269, 1246, 1220, 1146, 937, 834, 816, 754, 685.

HRMS (ESI): calcd. for $C_{13}H_{10}FO_2$ ($[M+H]^+$): 217.0659, found: 217.0663.



(2-Bromo-4-chlorophenyl)(2-hydroxyphenyl)methanone (2ad)

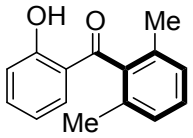
Light yellow oil. 27.4 mg, 44%.

^{1}H NMR (400 MHz, $CDCl_3$) δ 11.83 (s, 1H), 7.68 (d, J = 1.8 Hz, 1H), 7.57 – 7.48 (m, 2H), 7.25 – 7.20 (m, 2H), 7.07 (dd, J = 8.4, 0.8 Hz, 1H), 6.84 (ddd, J = 8.1, 7.3, 1.1 Hz, 1H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 199.7, 163.4, 137.6, 136.4, 133.4, 133.0, 132.2, 130.3, 129.9, 124.9, 119.4, 119.3, 118.7.

IR (KBr, ν / cm^{-1}): 3085, 2971, 2851, 1628, 1579, 1485, 1454, 1371, 1337, 1308, 1243, 1219, 1148, 1114, 1084, 935, 833, 777, 757, 656.

HRMS (ESI): calcd. for $C_{13}H_9BrClO_2$ ($[M+H]^+$): 312.9448, found: 312.9458.



(2,6-Dimethylphenyl)(2-hydroxyphenyl)methanone (2ae)

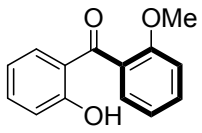
White solid, M.p. 112 – 113 ℃. 25.8 mg, 57%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.32 (s, 1H), 7.55 – 7.45 (m, 1H), 7.31 – 7.23 (m, 1H), 7.17 (dd, J = 8.0, 1.7 Hz, 1H), 7.12 – 7.04 (m, 3H), 6.83 – 6.75 (m, 1H), 2.16 (s, 6H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 206.6, 163.1, 138.3, 137.2, 134.2, 132.8, 129.3, 127.8, 120.2, 119.5, 118.5, 19.5.

IR (KBr, ν / cm^{-1}): 3069, 3000, 2955, 2924, 1623, 1576, 1489, 1449, 1328, 1306, 1243, 1224, 1151, 1030, 933, 827, 780, 766, 730, 690.

HRMS (ESI): calcd. for $C_{15}H_{15}O_2$ ($[M+H]^+$): 227.1067, found: 227.1071.



(2-Hydroxyphenyl)(2-methoxyphenyl)methanone (2af)

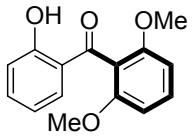
Colorless oil. 18.3 mg, 40%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.20 (s, 1H), 7.53 – 7.44 (m, 2H), 7.32 (ddd, J = 13.3, 7.7, 1.7 Hz, 2H), 7.11 – 6.98 (m, 3H), 6.87 – 6.75 (m, 1H), 3.78 (s, 3H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 202.3, 163.1, 156.7, 136.7, 134.0, 132.0, 129.0, 127.9, 120.7, 120.3, 118.9, 118.2, 111.6, 55.8.

IR (KBr, ν / cm^{-1}): 3013, 2955, 2840, 1628, 1600, 1487, 1461, 1332, 1310, 1280, 1246, 1148, 1121, 1023, 944, 980, 827, 754, 687.

HRMS (ESI): calcd. for $C_{14}H_{13}O_3$ ($[M+H]^+$): 229.0859, found: 229.0865.



(2,6-Dimethoxyphenyl)(2-hydroxyphenyl)methanone (2ag)

White solid, M.p. 117 – 118 ℃. 20.1 mg, 39%.

^{1}H NMR (300 MHz, $CDCl_3$) δ 12.16 (s, 1H), 7.50 – 7.43 (m, 1H), 7.38 (t, J = 8.4 Hz, 1H), 7.28 (dd, J = 8.0, 1.7 Hz, 1H), 7.02 (dd, J = 8.4, 1.0 Hz, 1H), 6.83 – 6.75 (m, 1H), 6.63 (d, J = 8.4 Hz, 2H), 3.73 (s, 6H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 201.5, 162.7, 157.5, 136.6, 133.2, 131.5, 121.1, 119.1, 118.1, 116.6, 104.1, 56.1.

IR (KBr, ν / cm^{-1}): 3011, 2963, 2842, 1630, 1593, 1474, 1448, 1332, 1306, 1254, 1220, 1146, 1112, 937, 758, 725, 678.

HRMS (ESI): calcd. for $C_{15}H_{15}O_4$ ($[M+H]^+$): 259.0965, found: 259.0972.

VII. References

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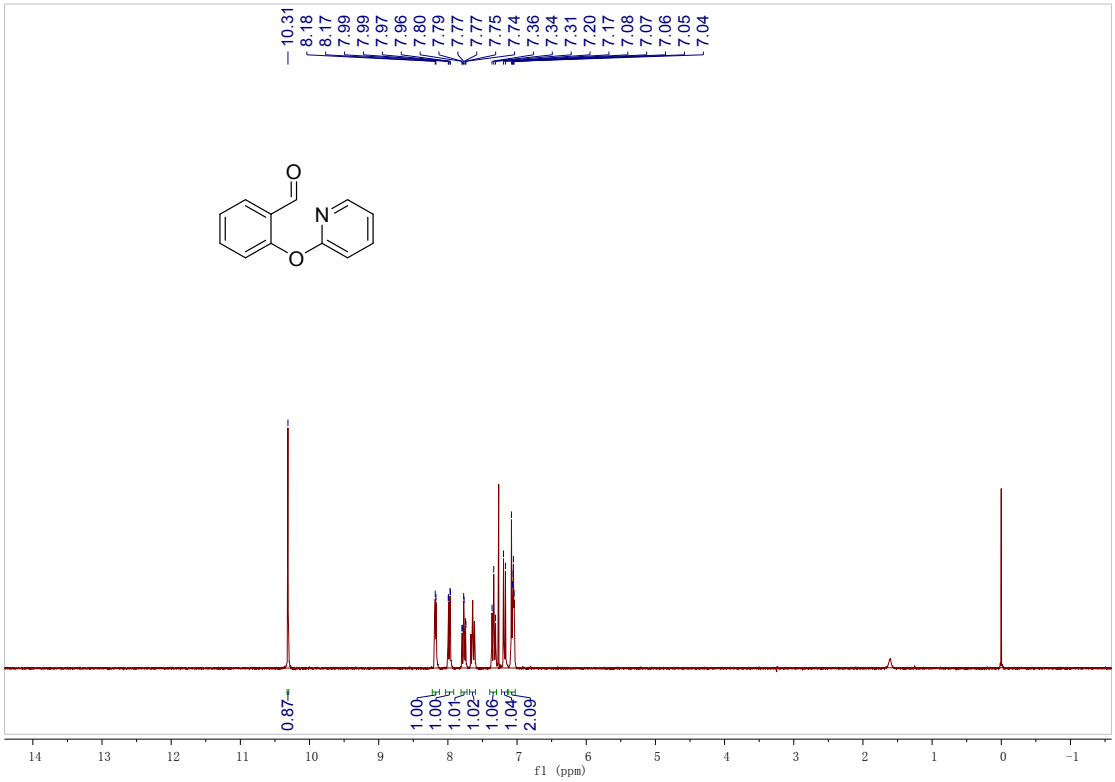
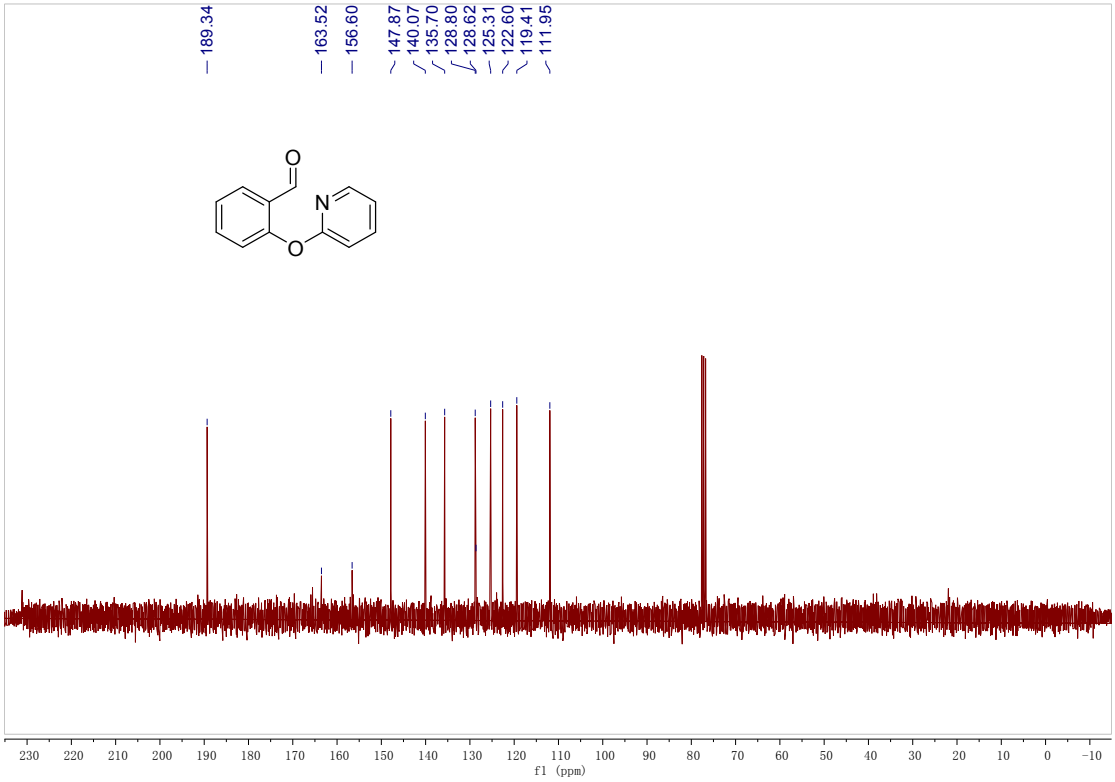
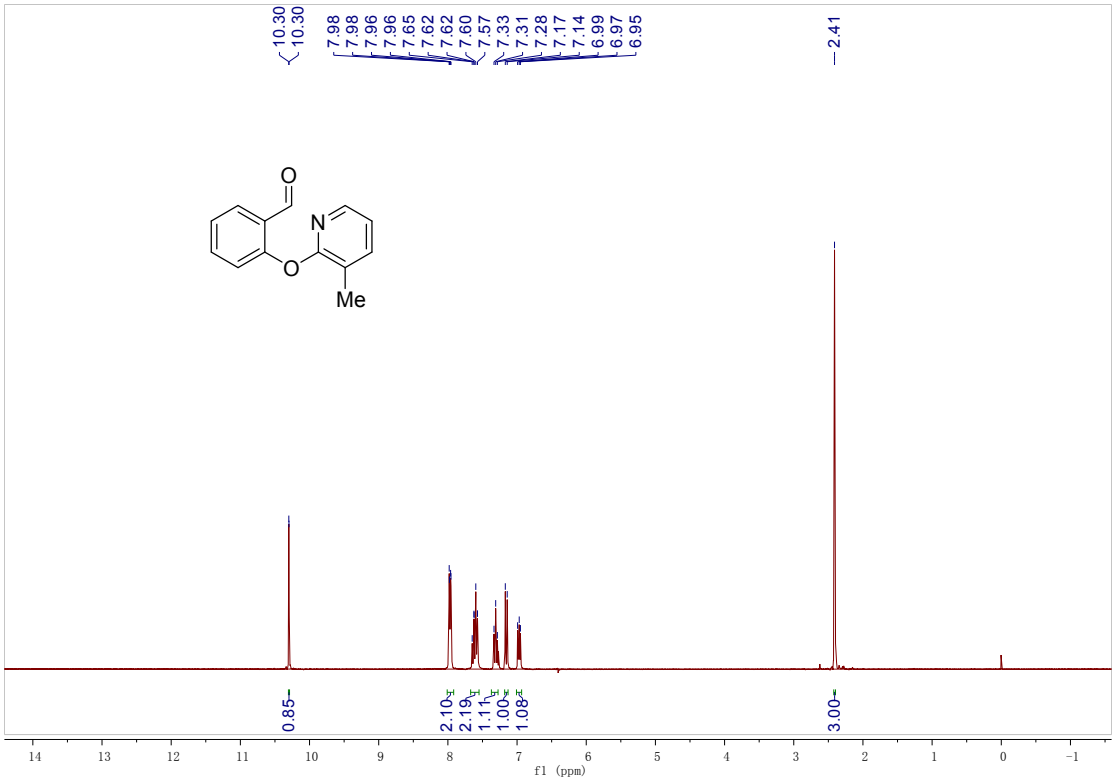
VIII. Copies of the ^{1}H, ^{19}F and ^{13}C NMR spectra

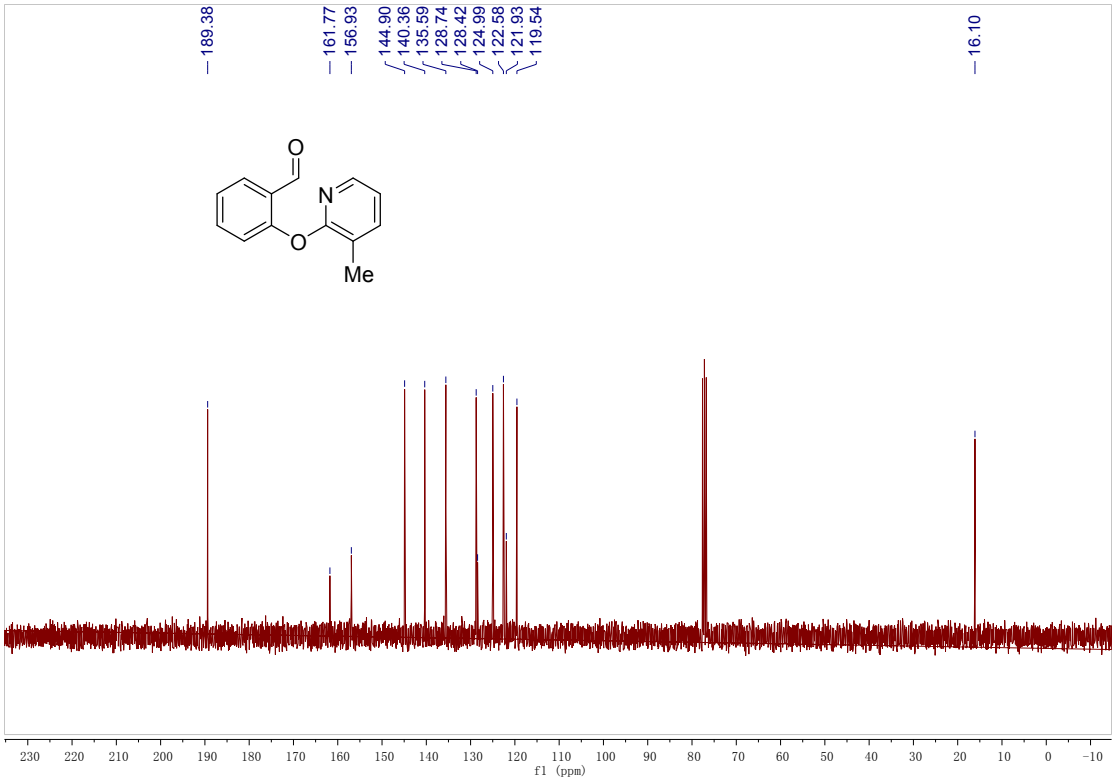
^{1}H and ^{13}C NMR spectra of compound **1a**



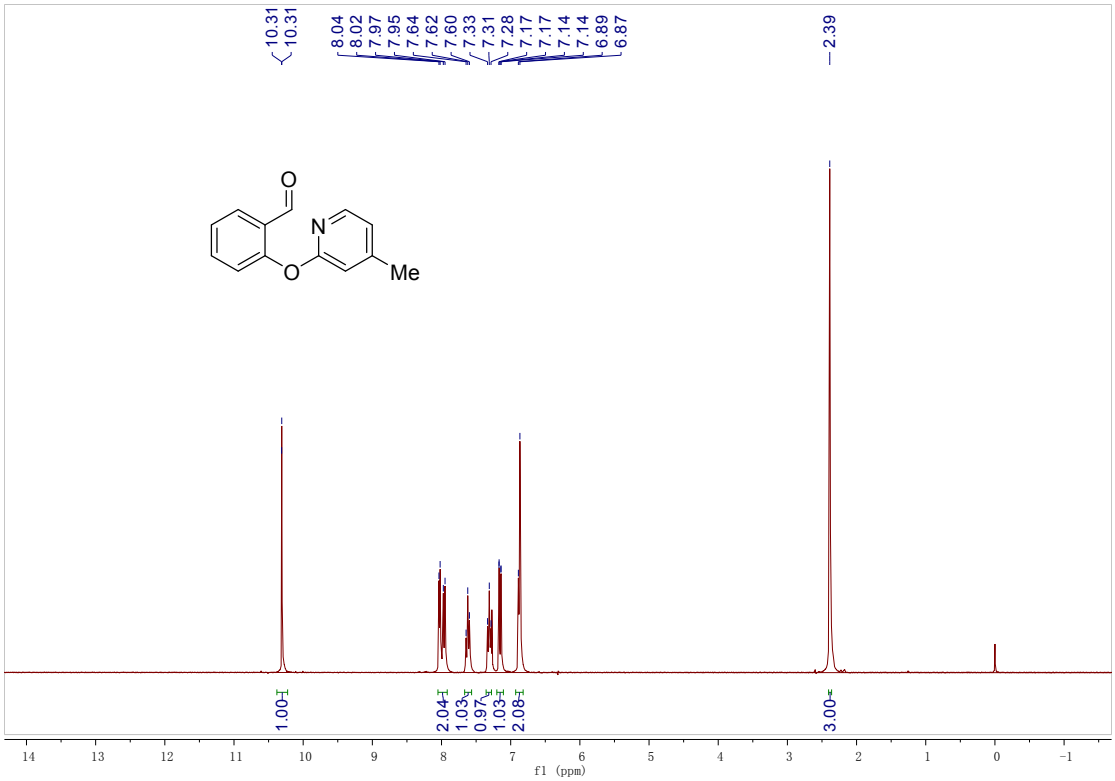


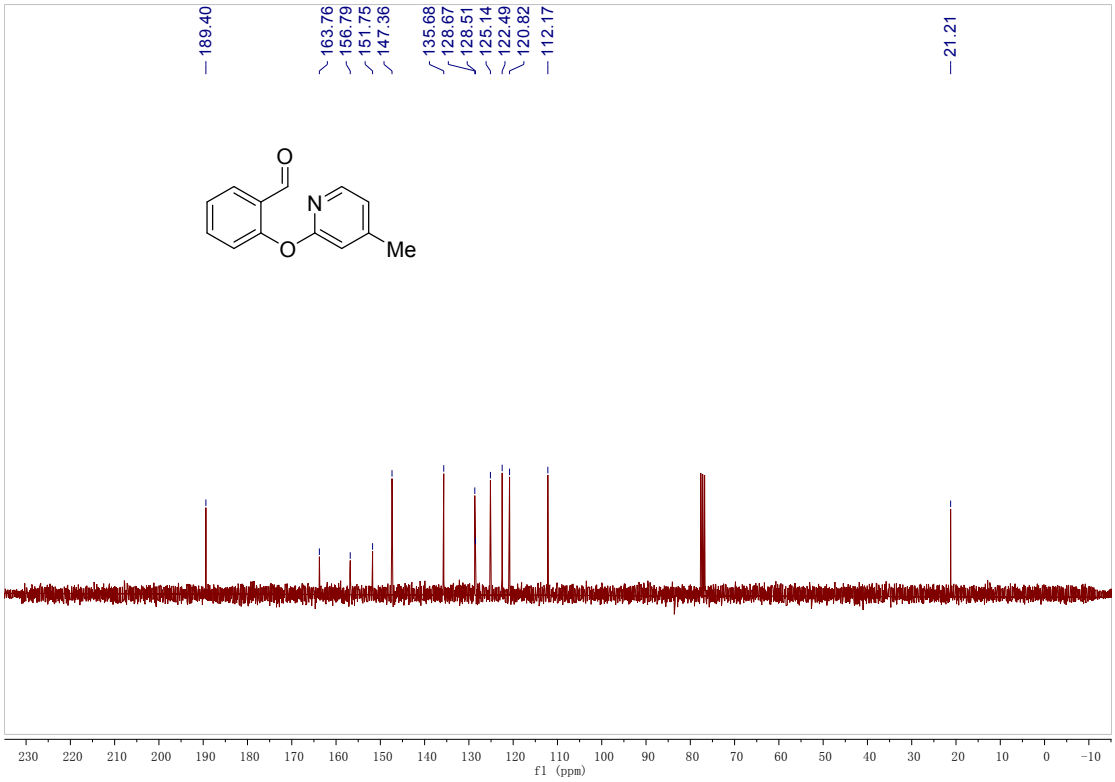
^{1}H and ^{13}C NMR spectra of compound **1b**



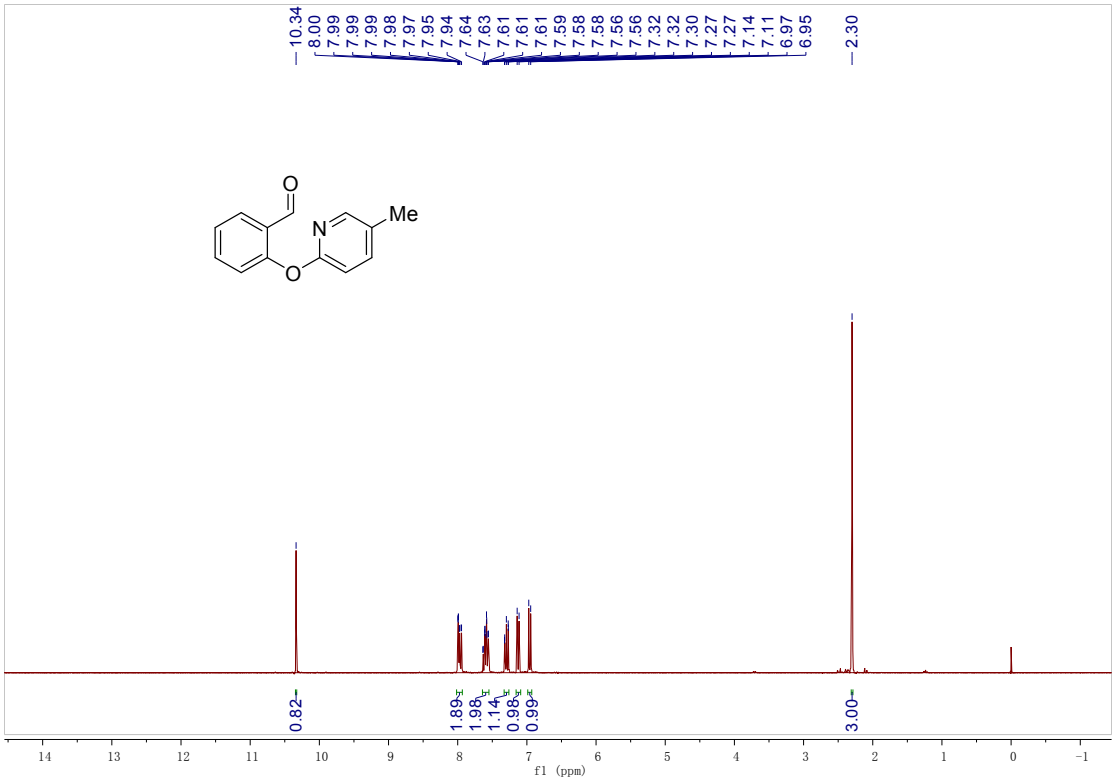


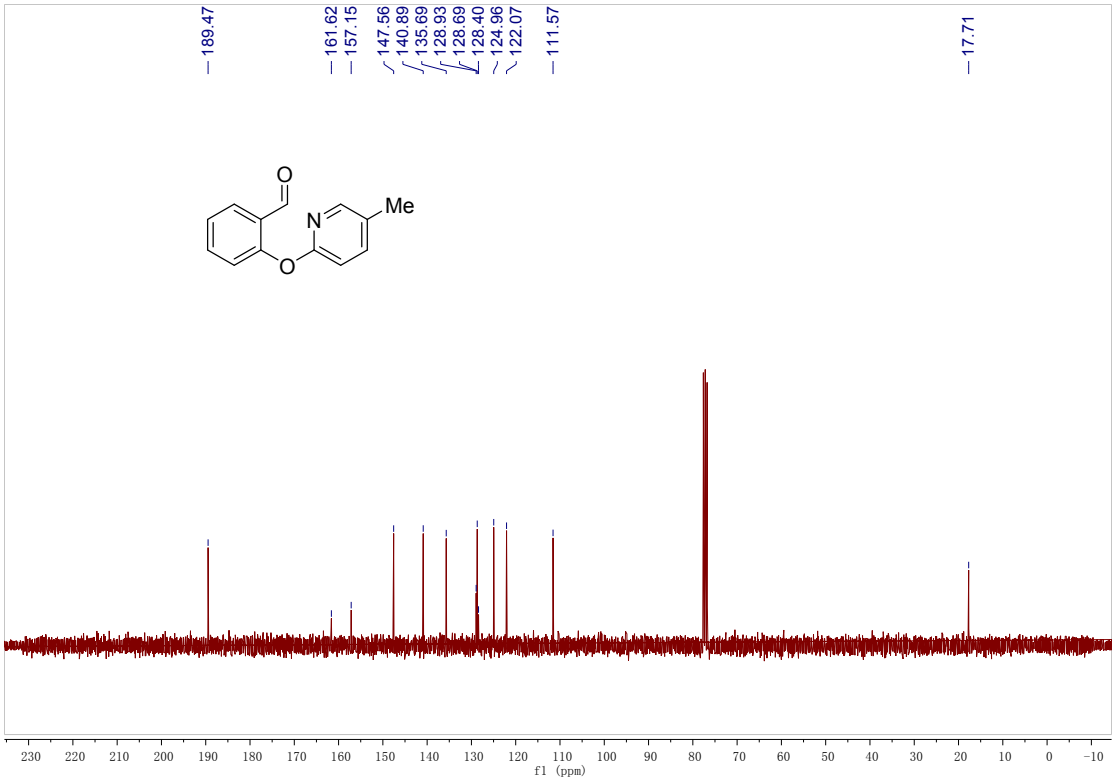
^{1}H and ^{13}C NMR spectra of compound **1c**



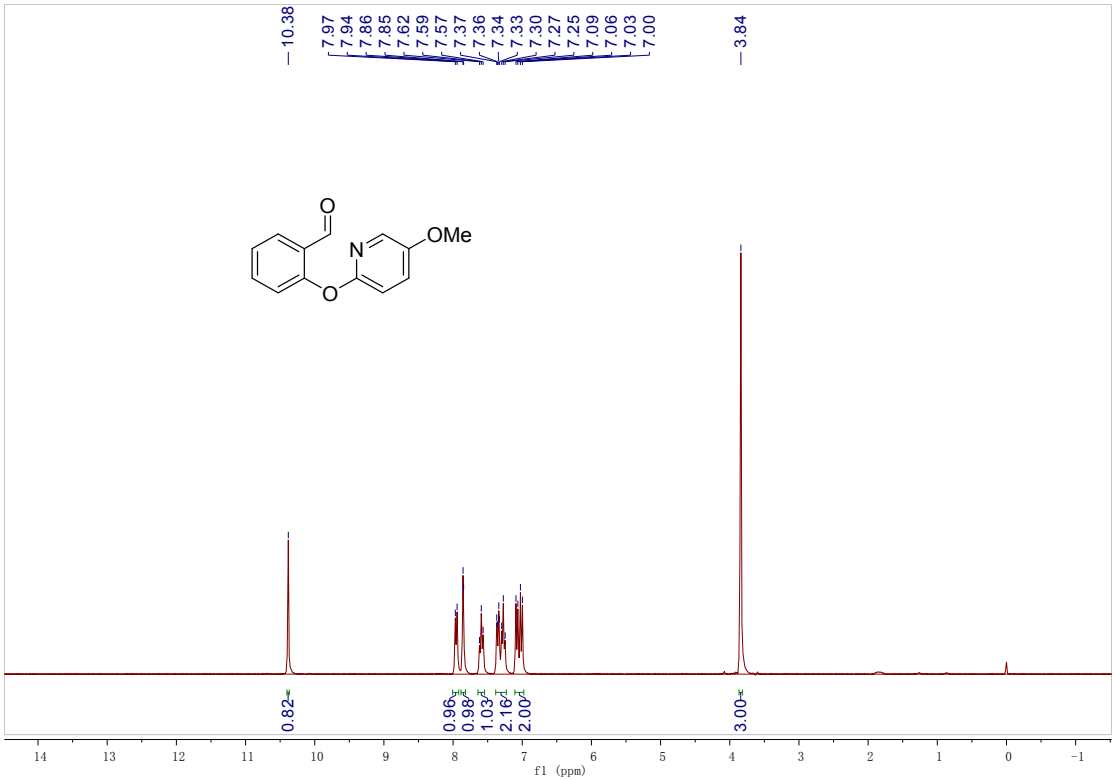


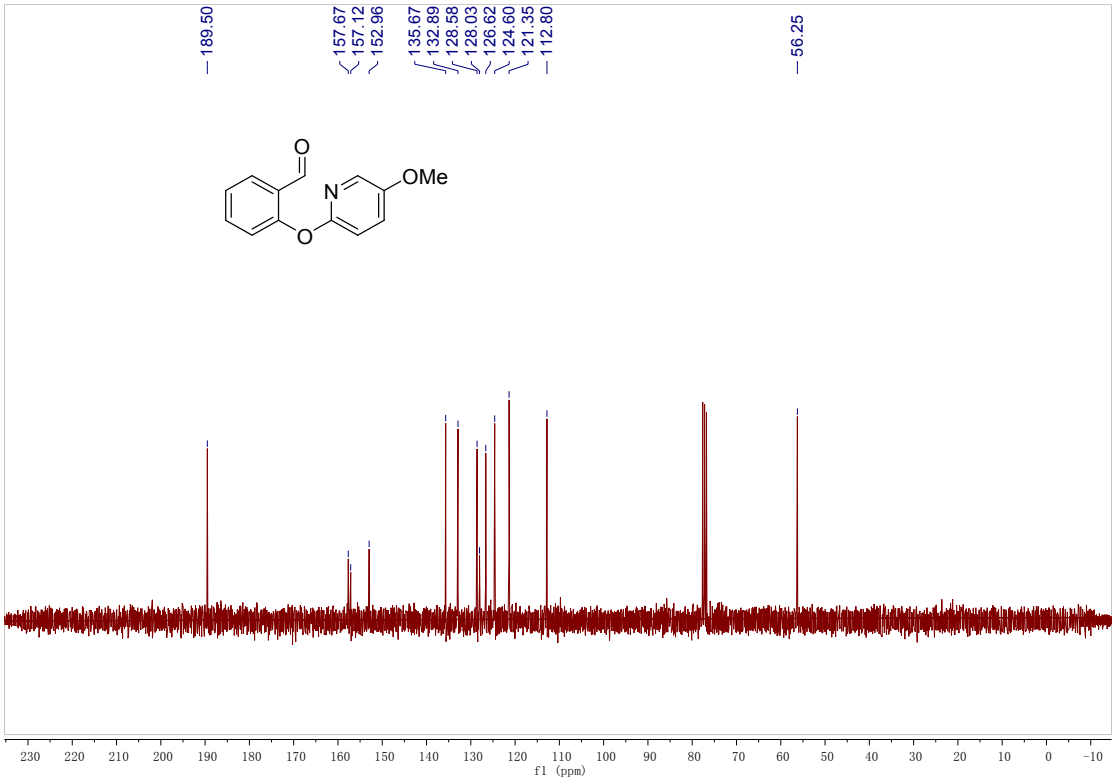
^{1}H and ^{13}C NMR spectra of compound **1d**



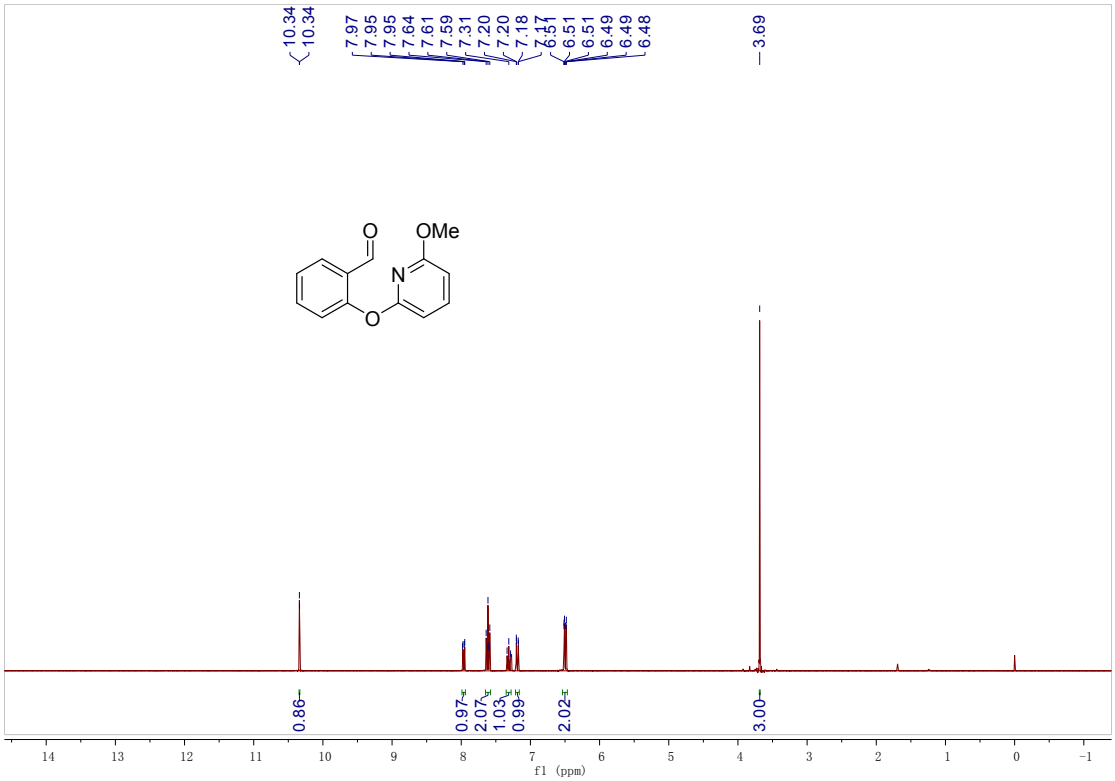


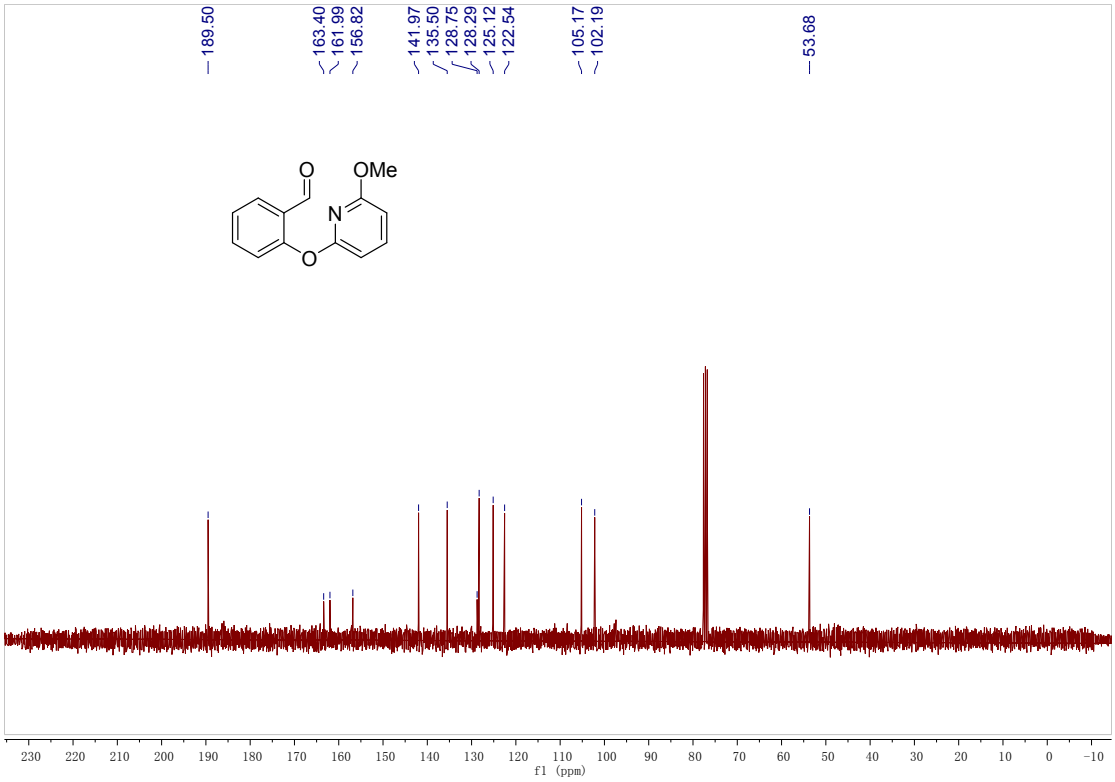
^{1}H and ^{13}C NMR spectra of compound **1e**



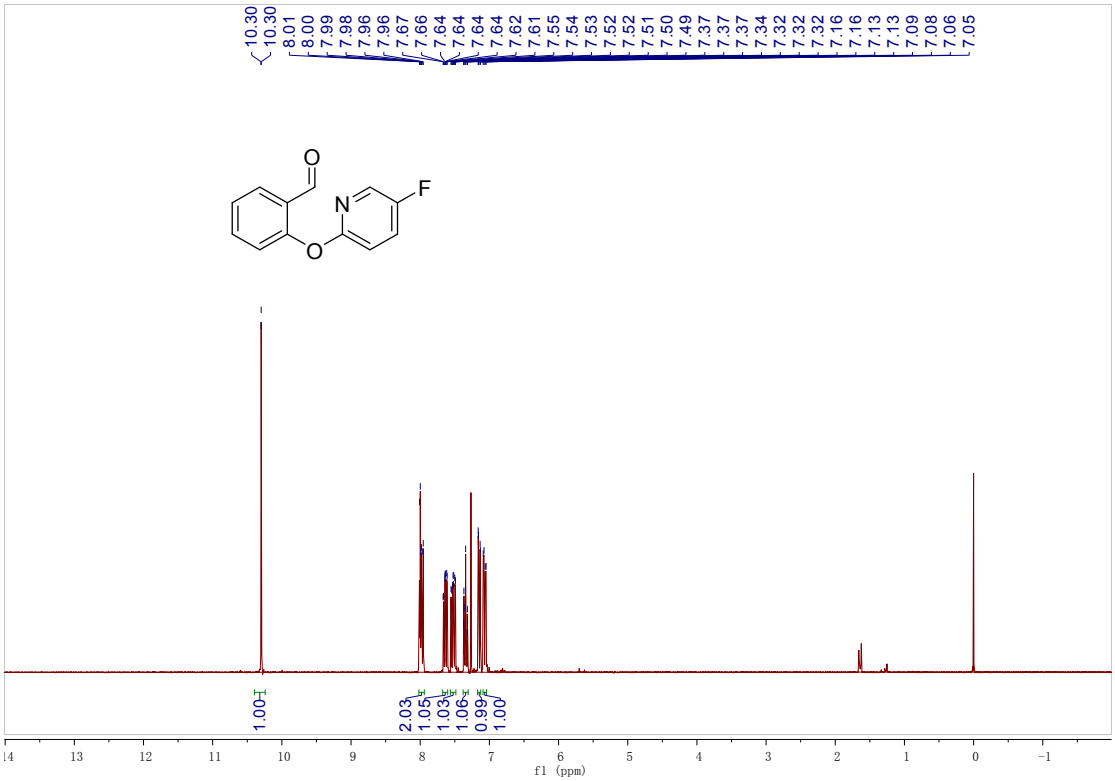


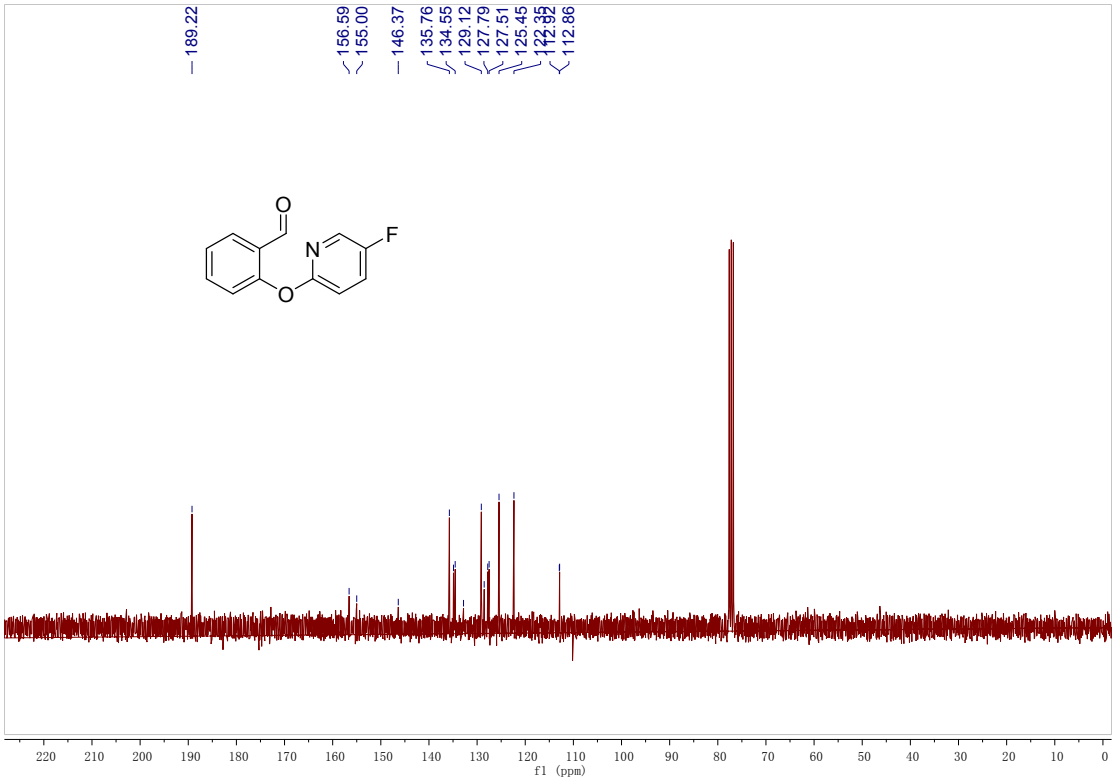
^{1}H and ^{13}C NMR spectra of compound **1f**



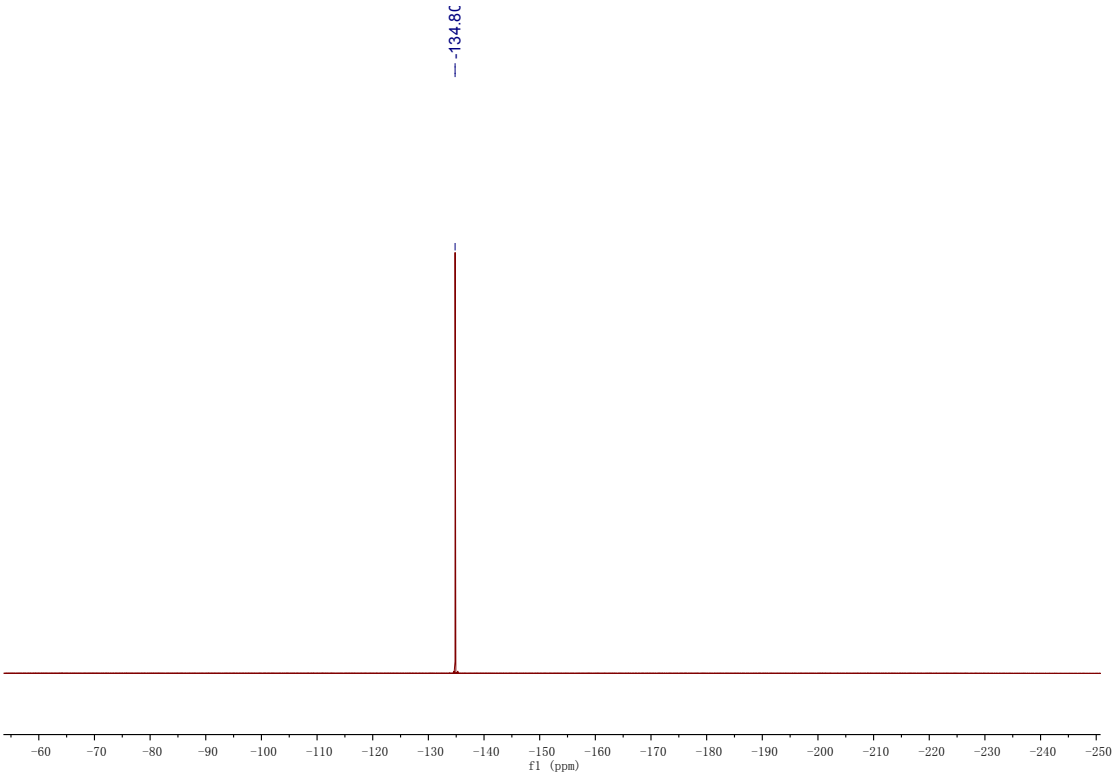


^{1}H and ^{13}C NMR spectra of compound **1g**

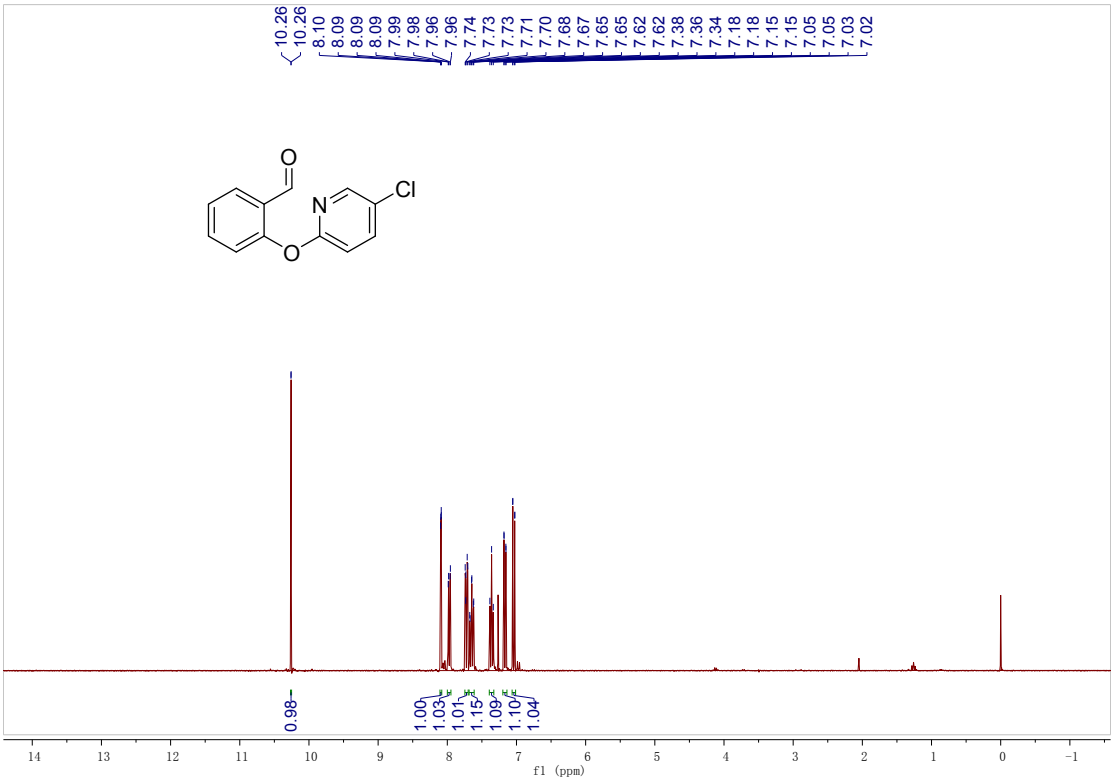


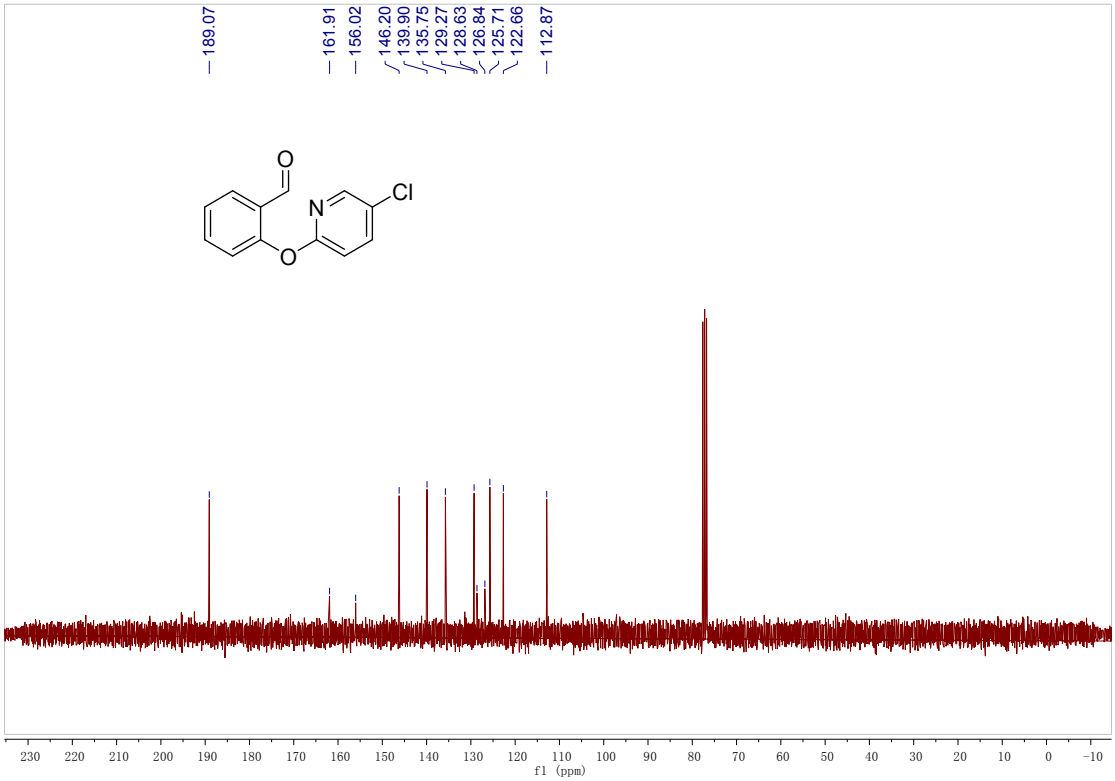


^{19}F NMR spectra of compound **1g**

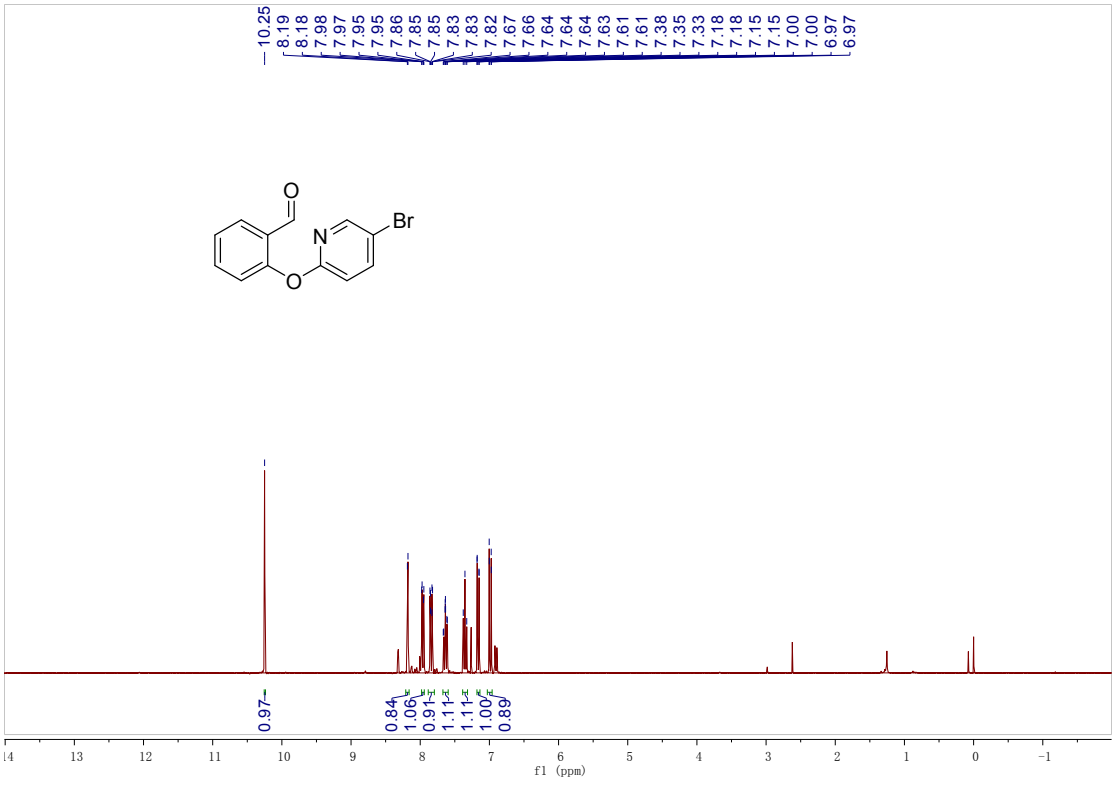


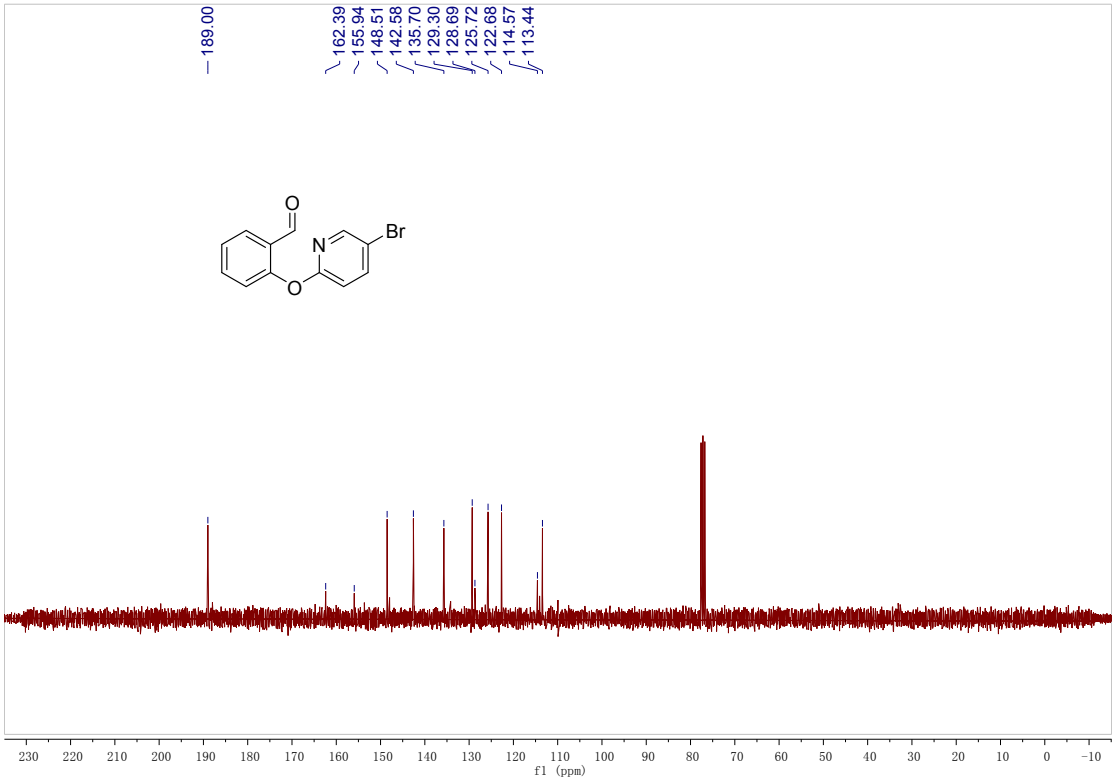
^{1}H and ^{13}C NMR spectra of compound **1h**



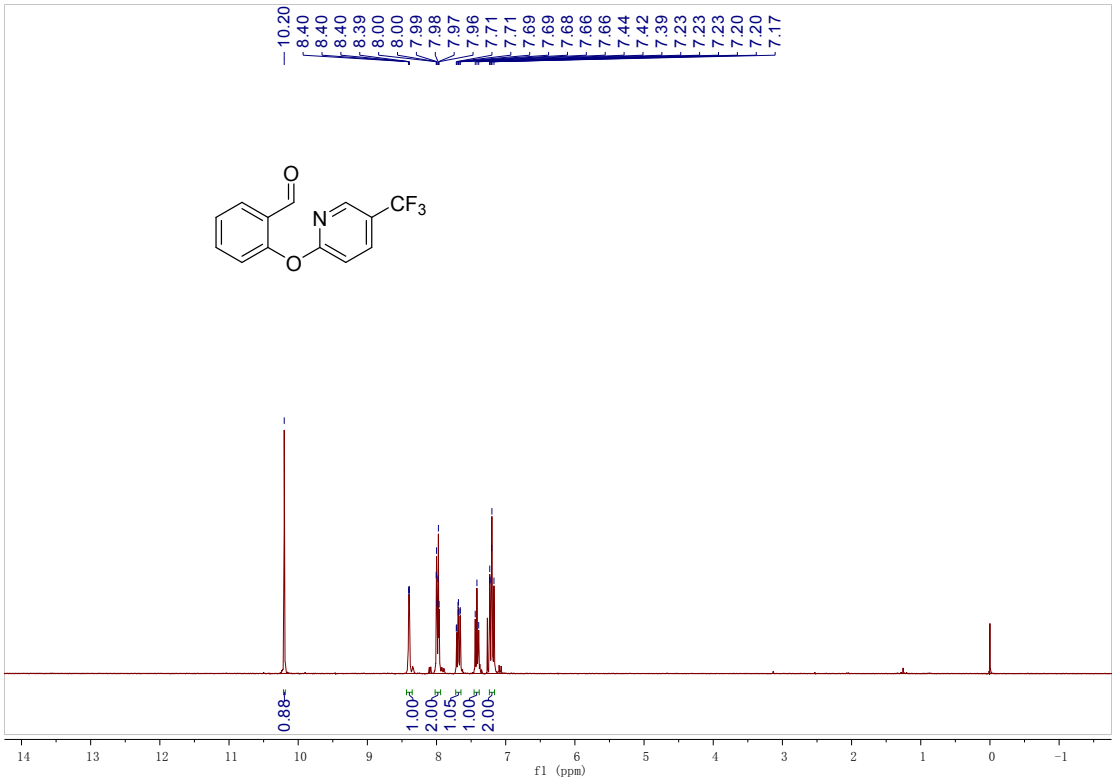


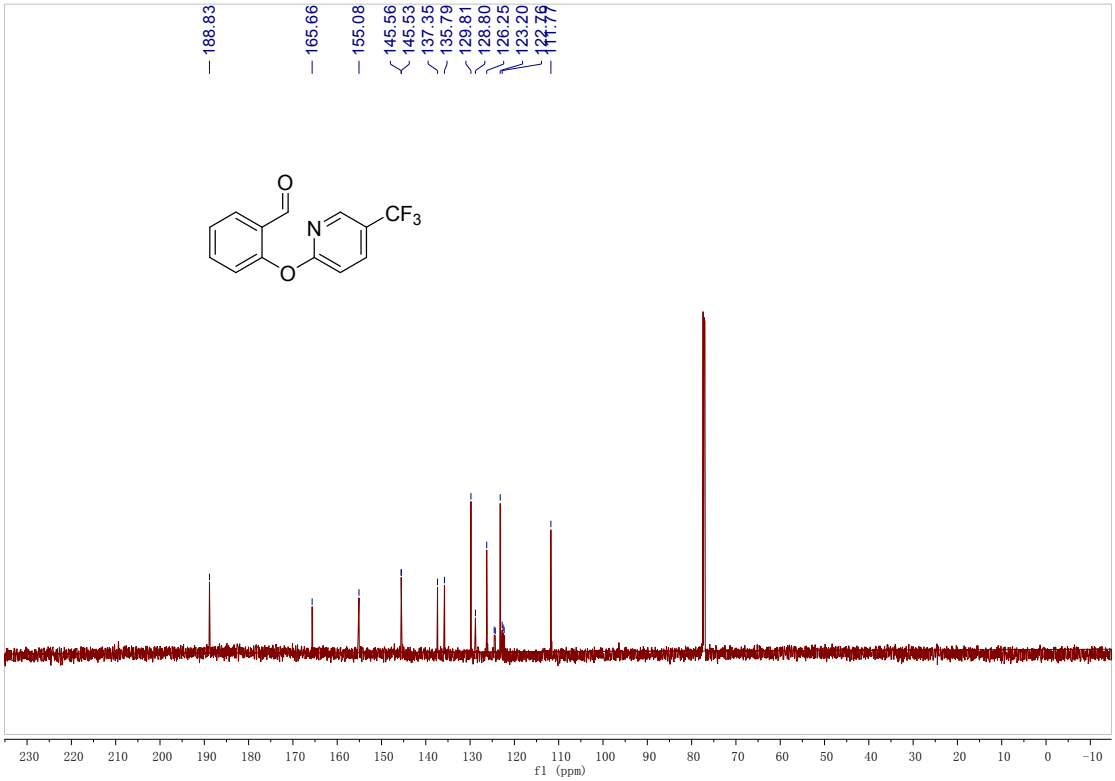
^{1}H and ^{13}C NMR spectra of compound **1i**



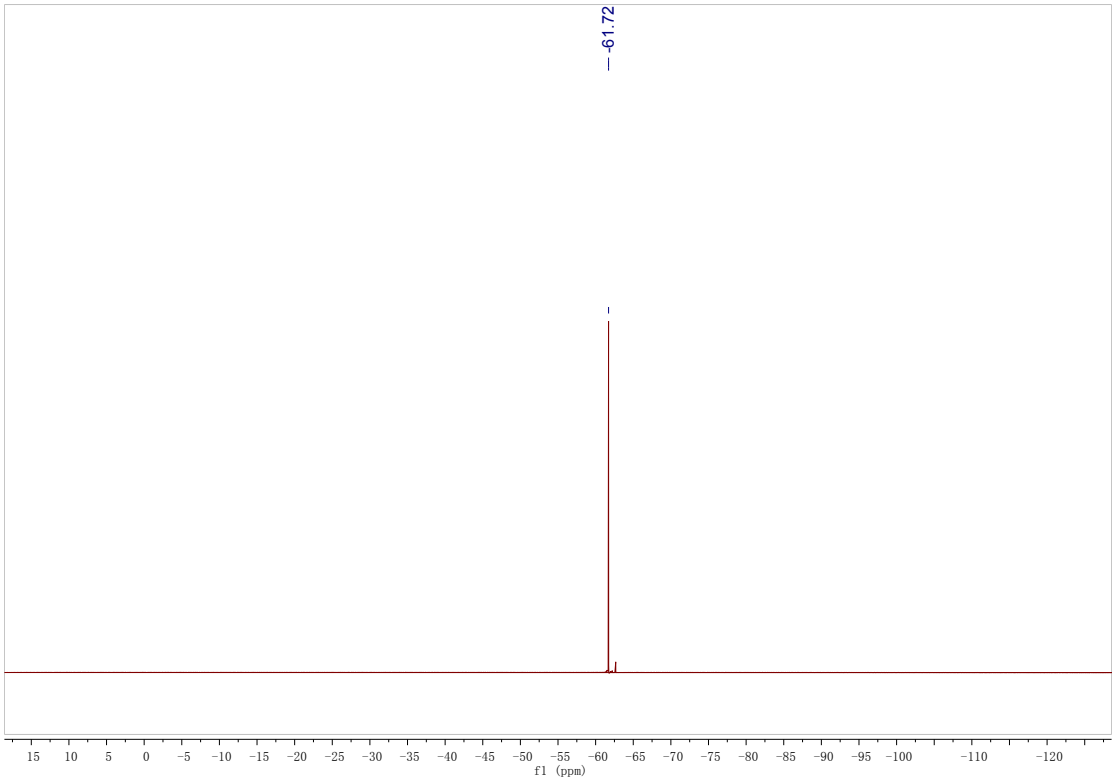


^{1}H and ^{13}C NMR spectra of compound **1j**

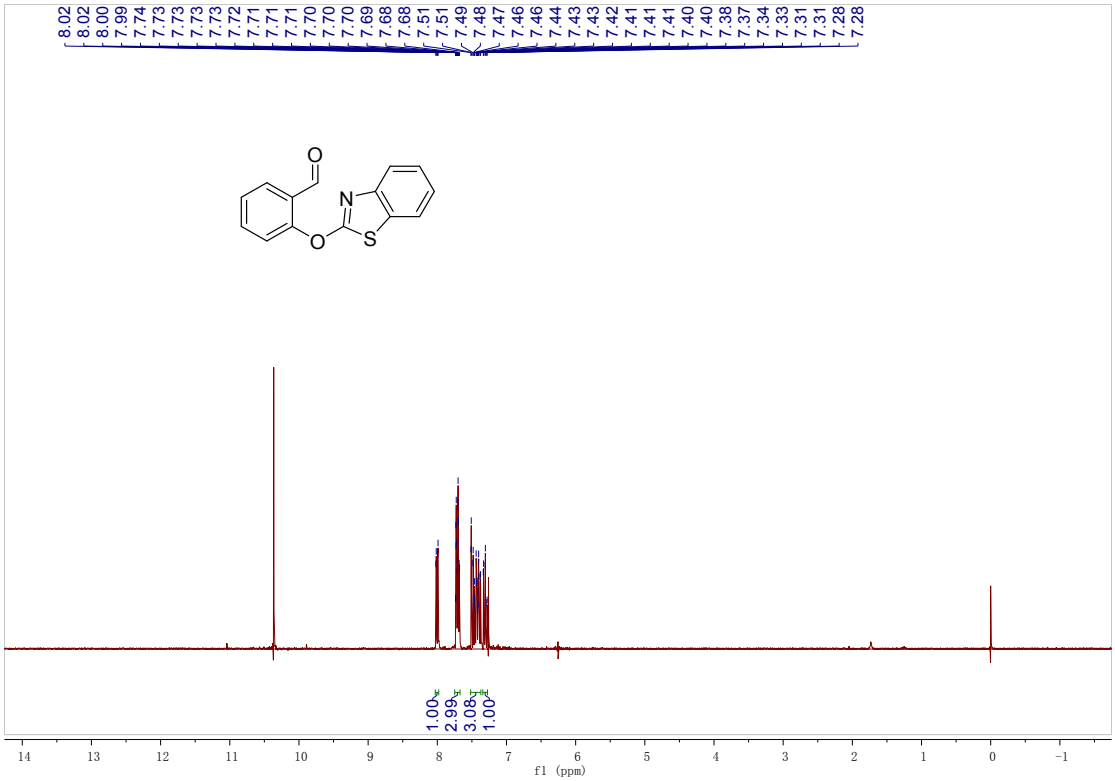


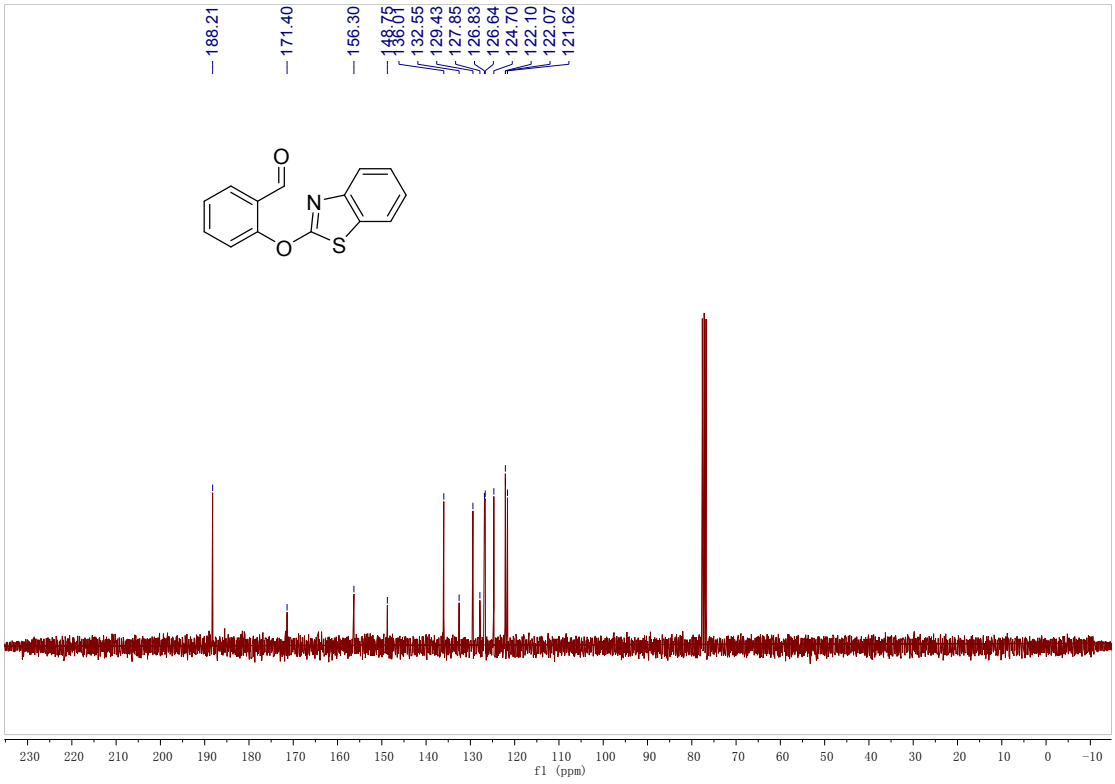


^{19}F NMR spectra of compound **1j**

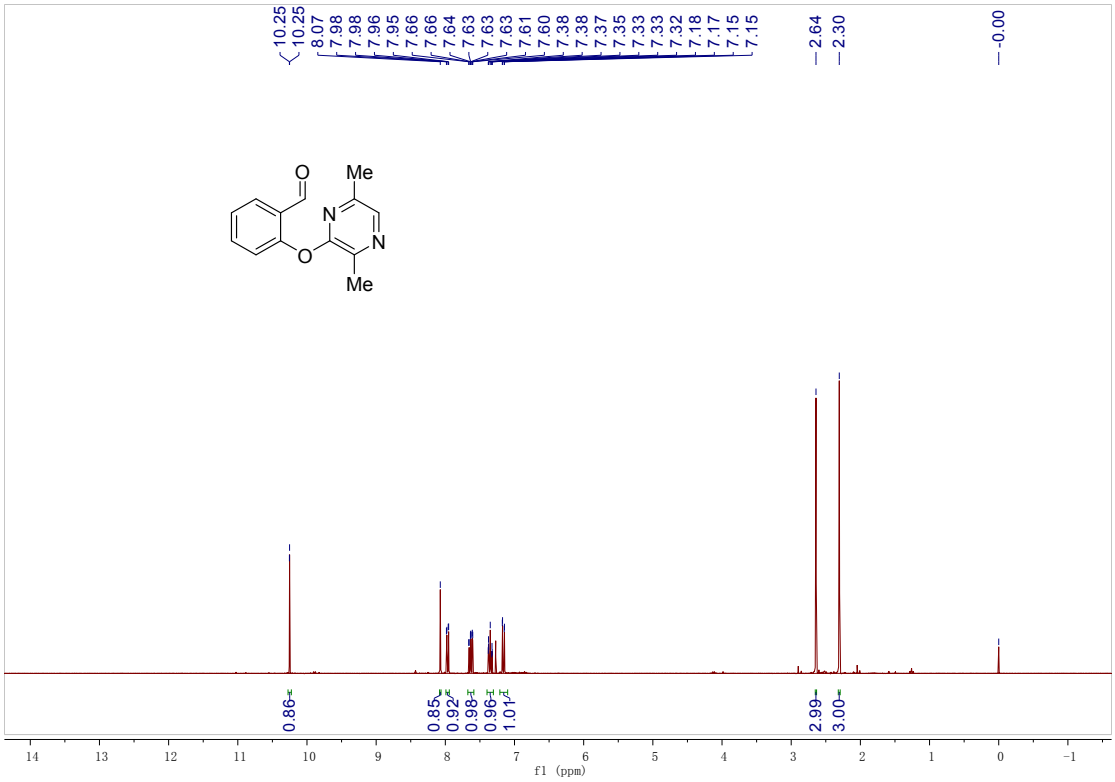


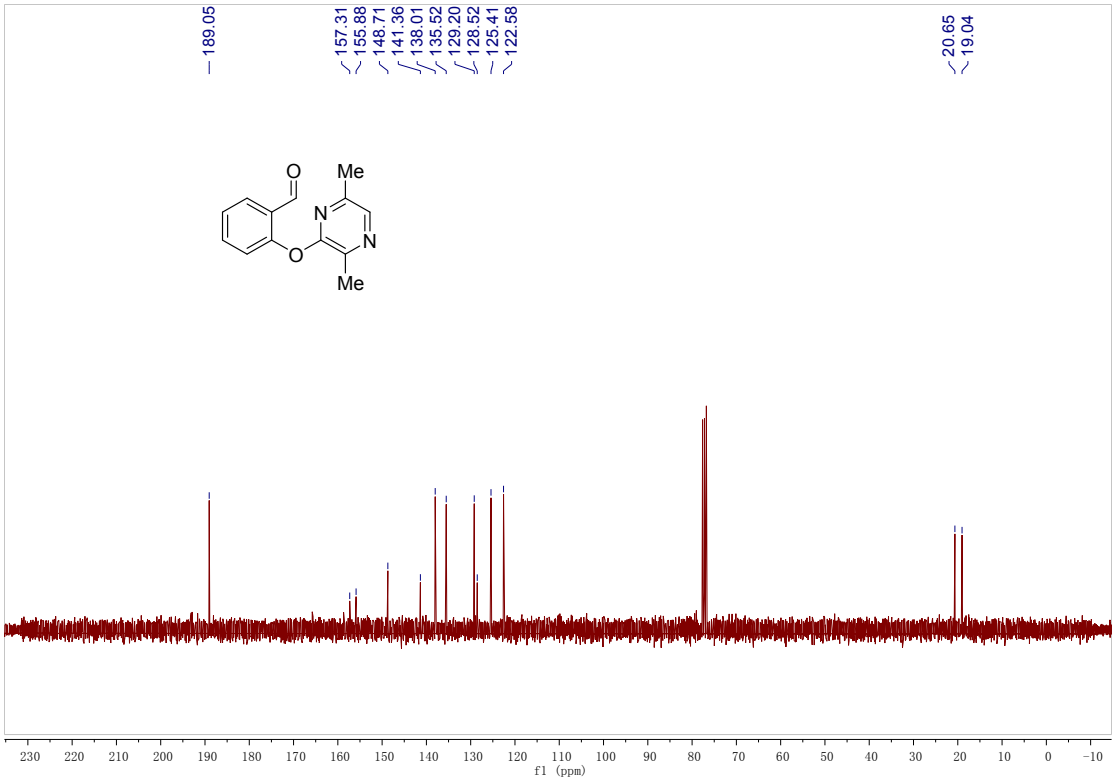
^{1}H and ^{13}C NMR spectra of compound **1k**



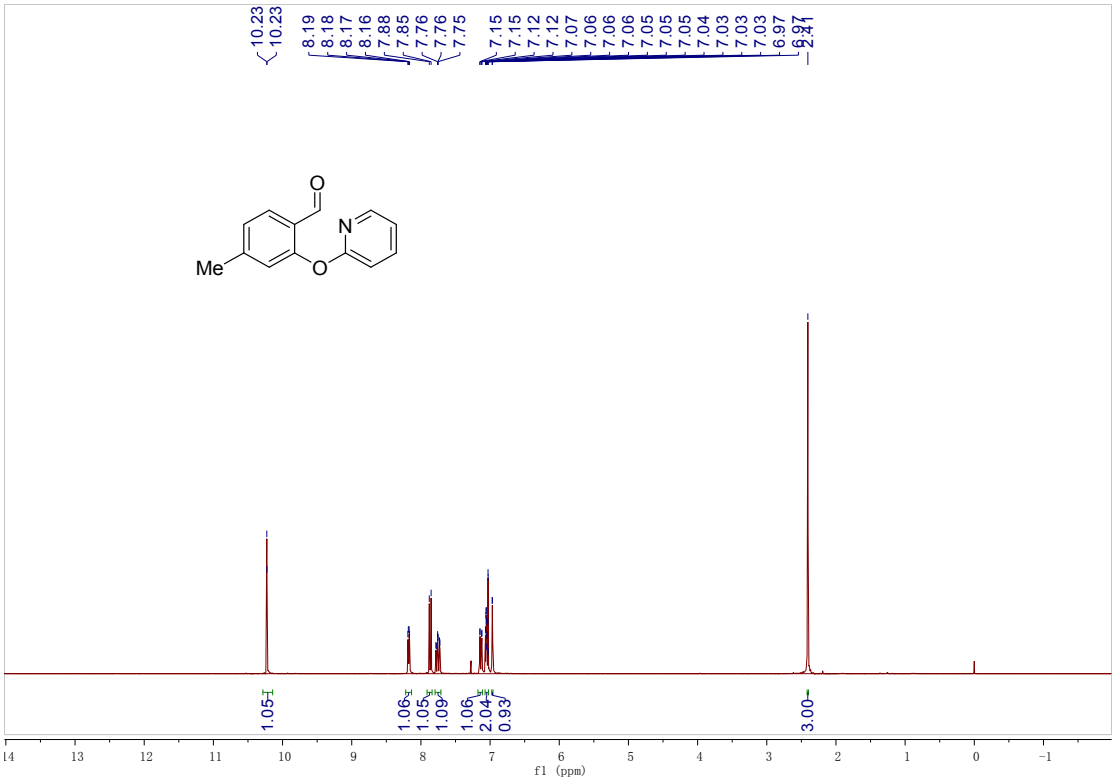


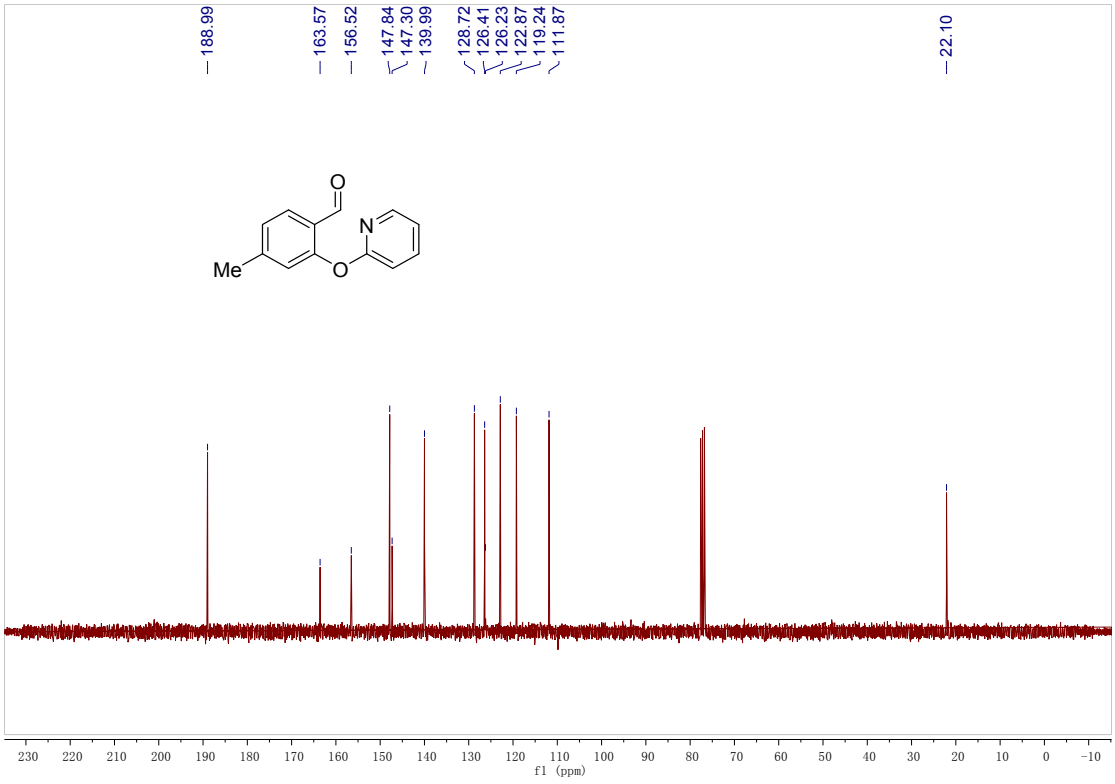
^{1}H and ^{13}C NMR spectra of compound **1l**



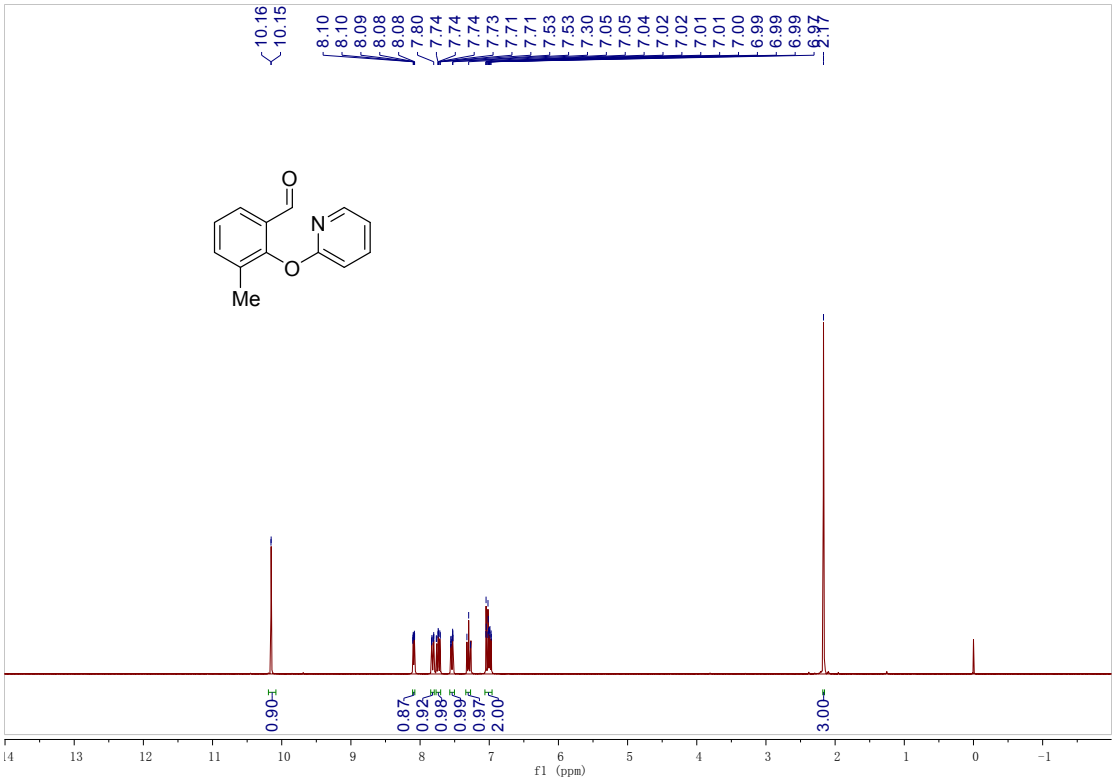


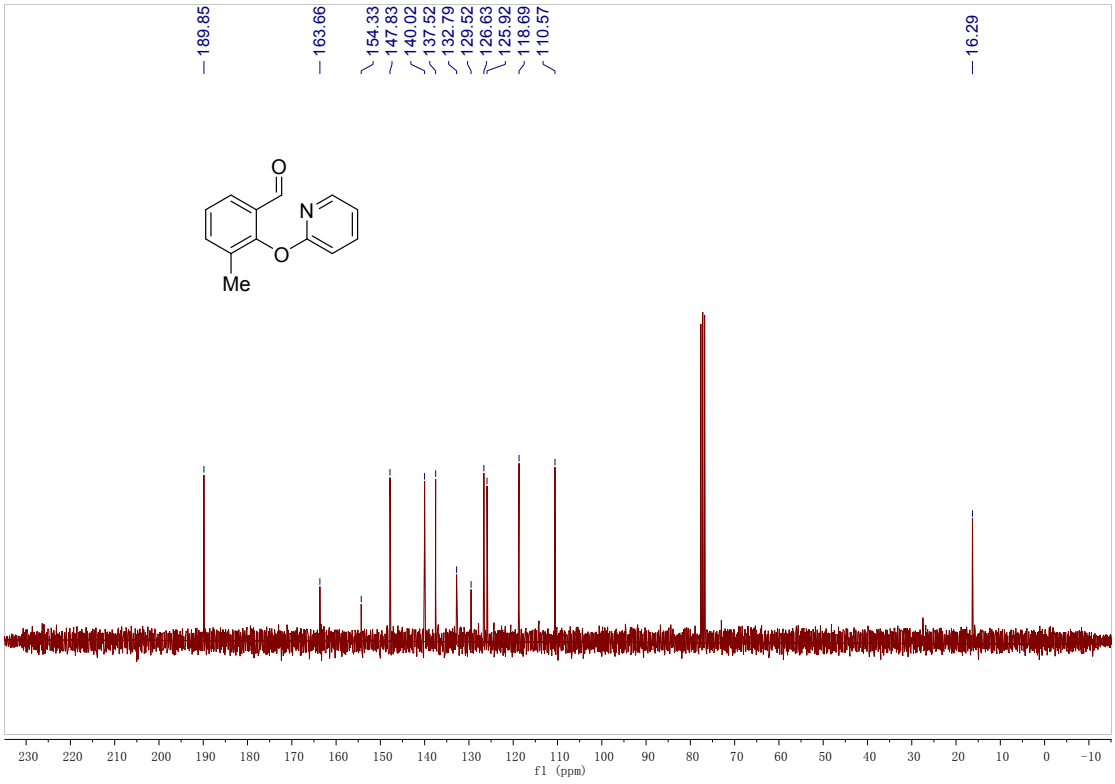
^{1}H and ^{13}C NMR spectra of compound **1m**



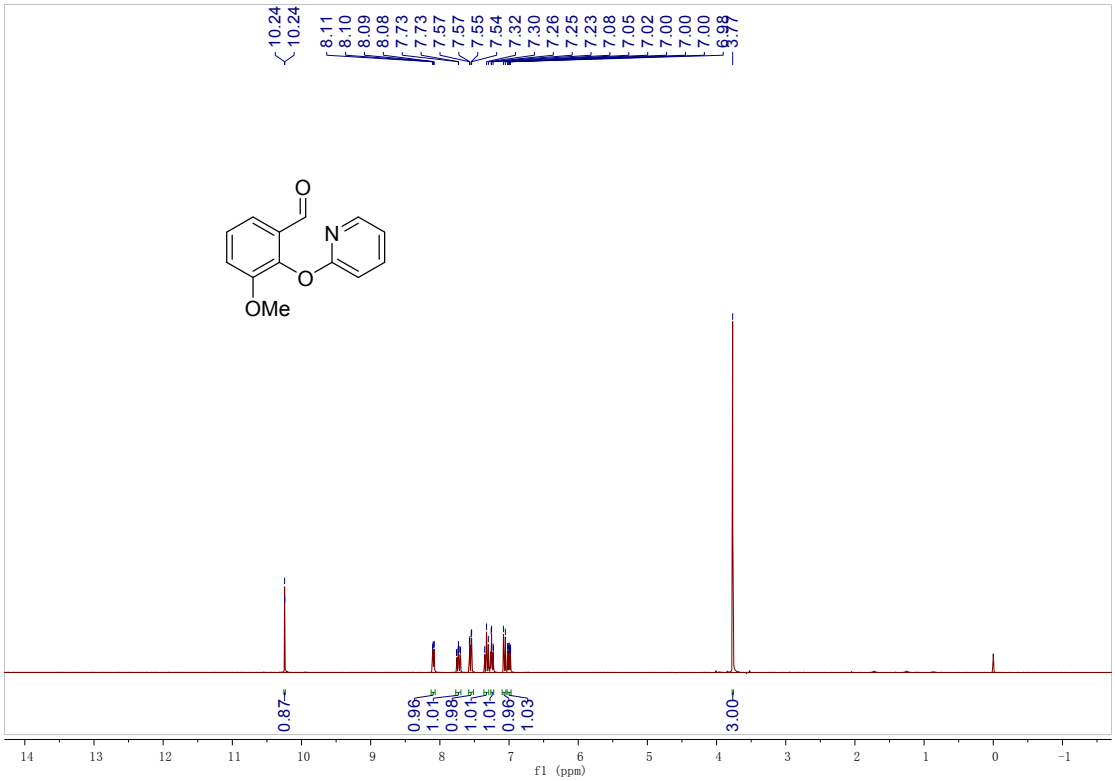


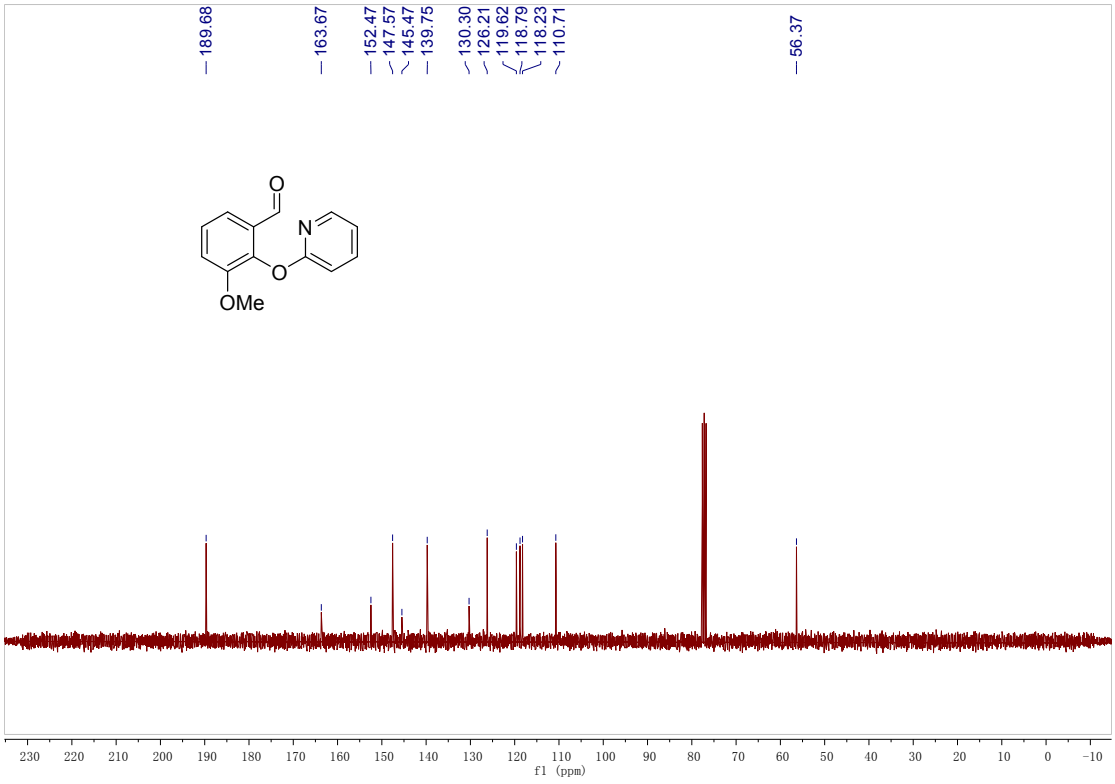
^{1}H and ^{13}C NMR spectra of compound **1n**



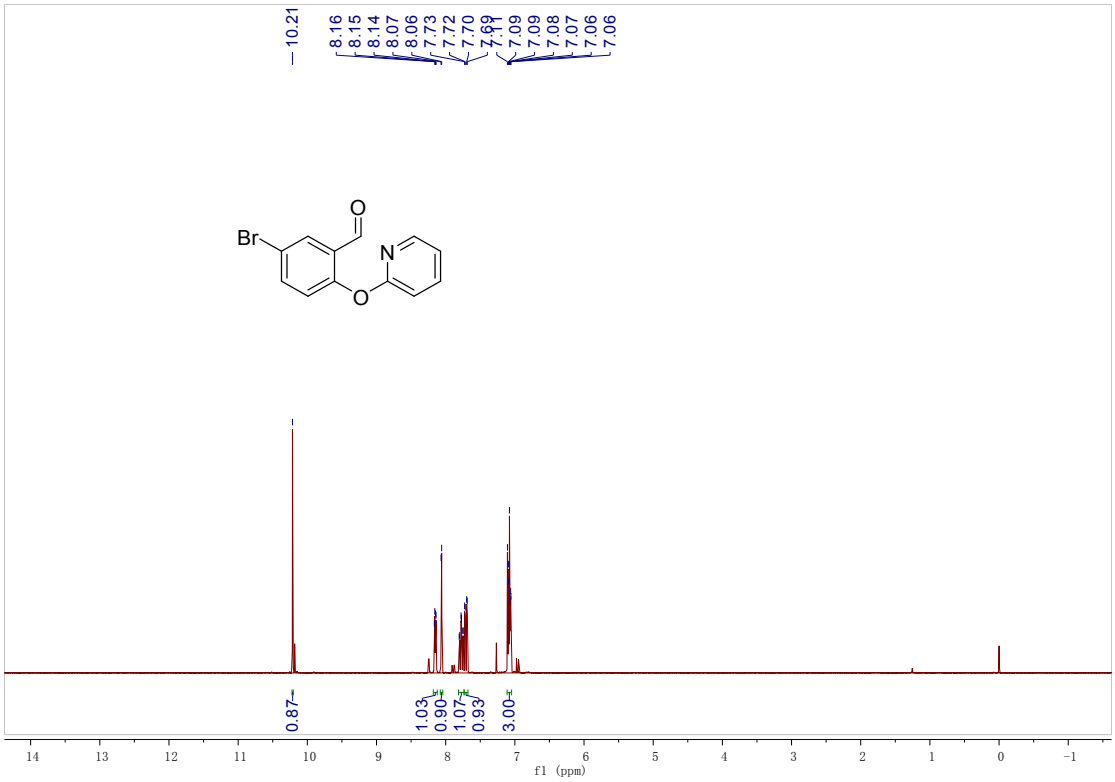


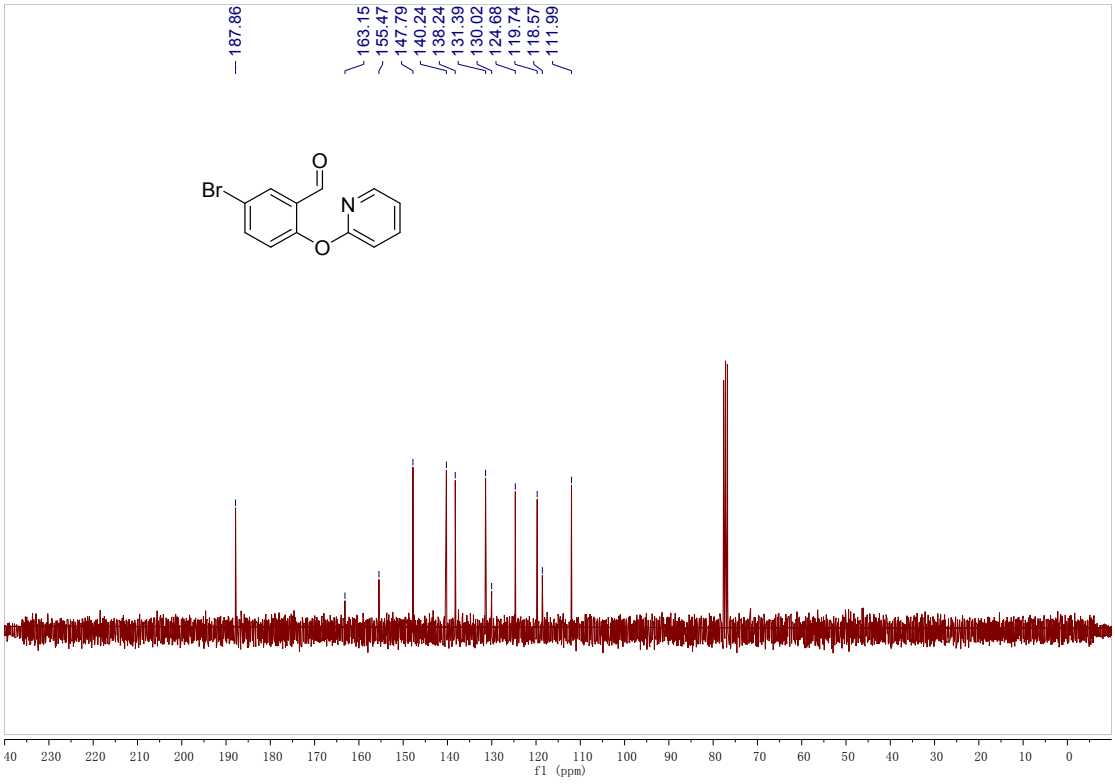
^{1}H and ^{13}C NMR spectra of compound **1o**



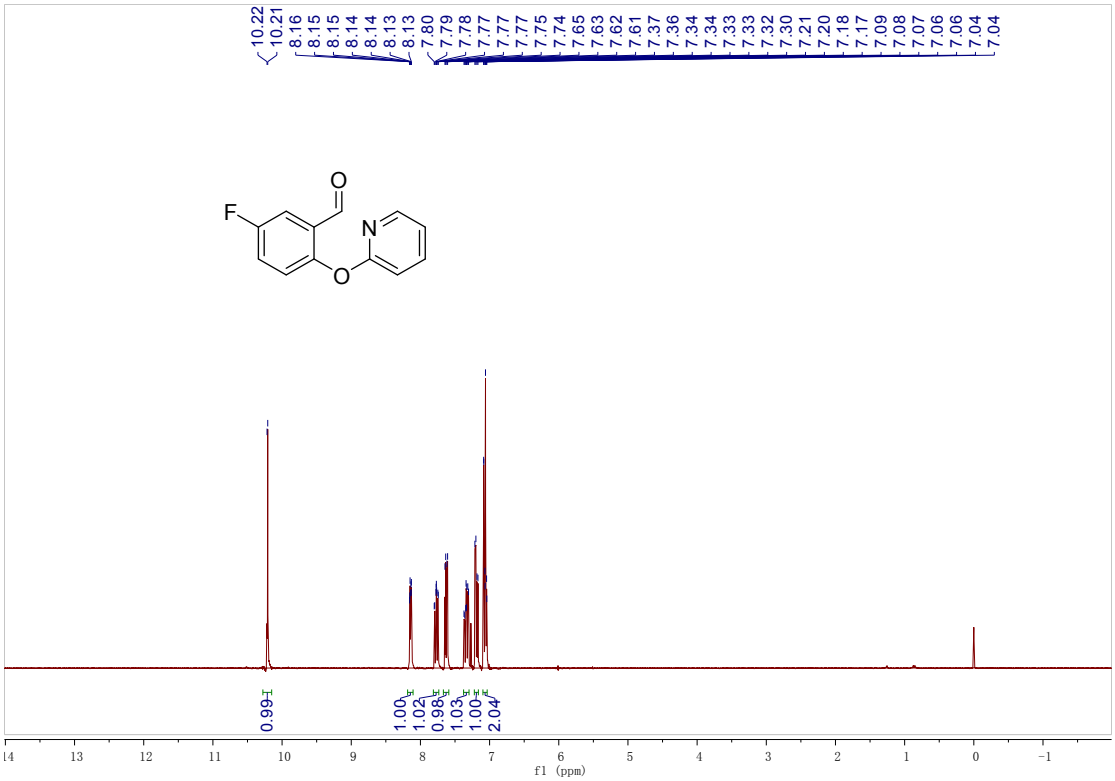


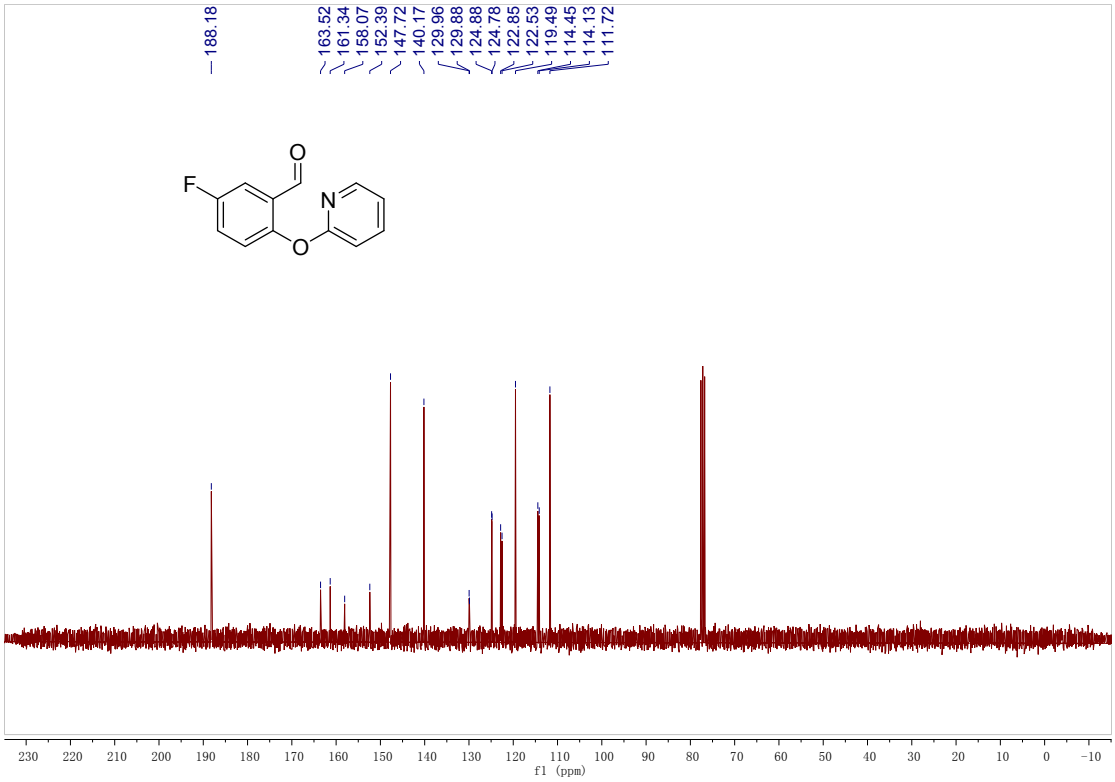
^{1}H and ^{13}C NMR spectra of compound **1p**



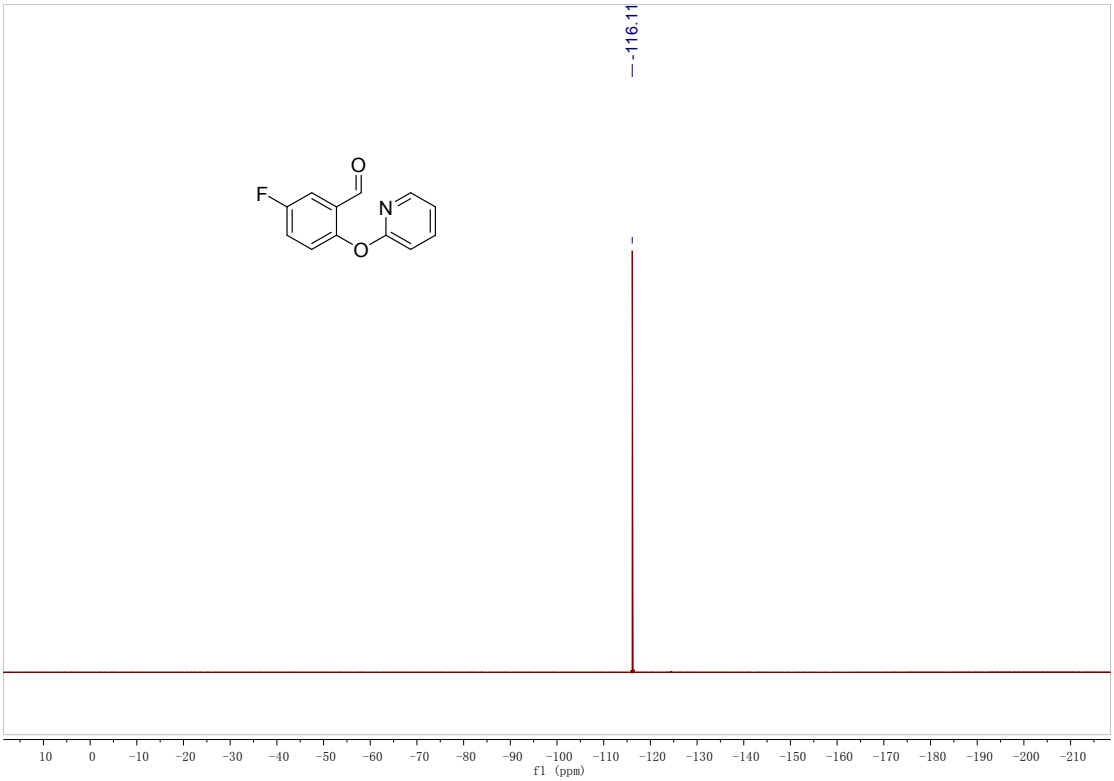


^{1}H and ^{13}C NMR spectra of compound **1q**





^{19}F NMR spectra of compound **1q**



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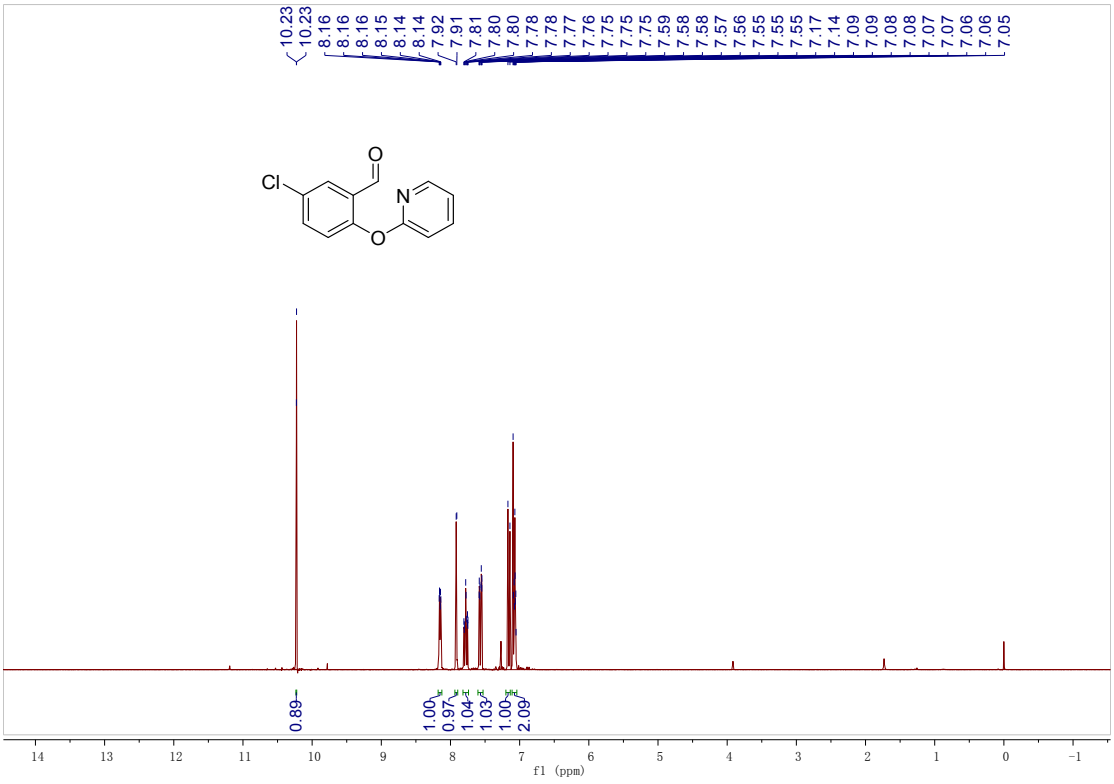
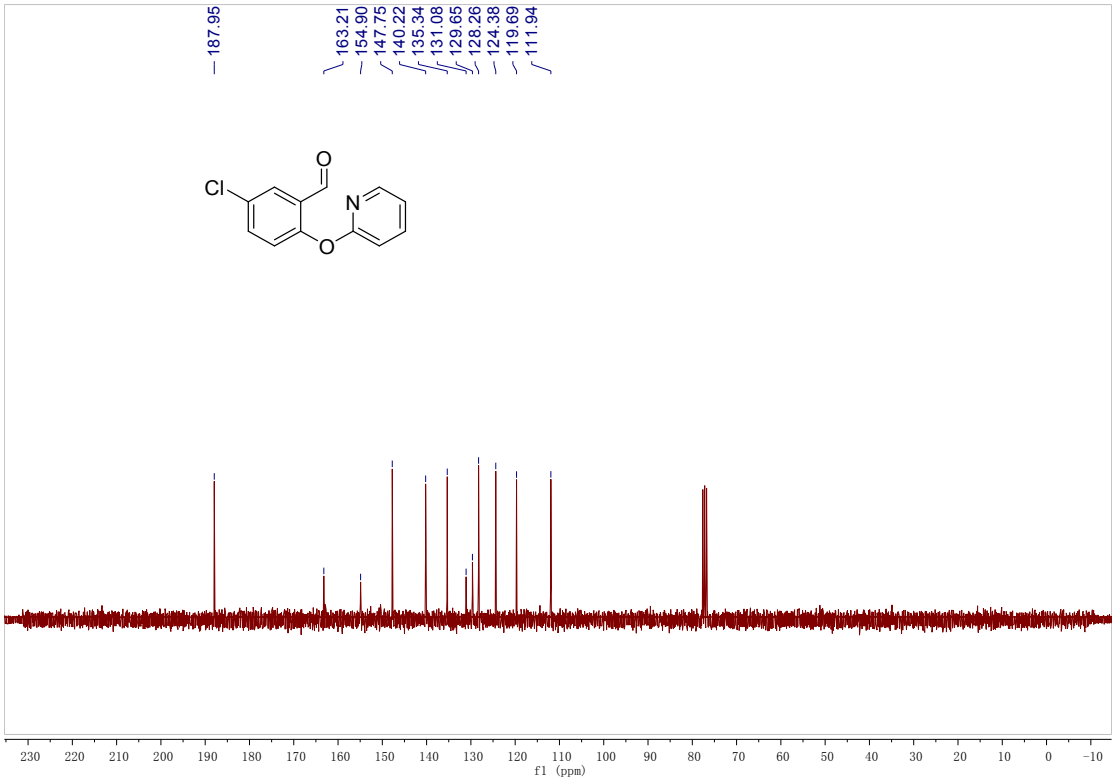
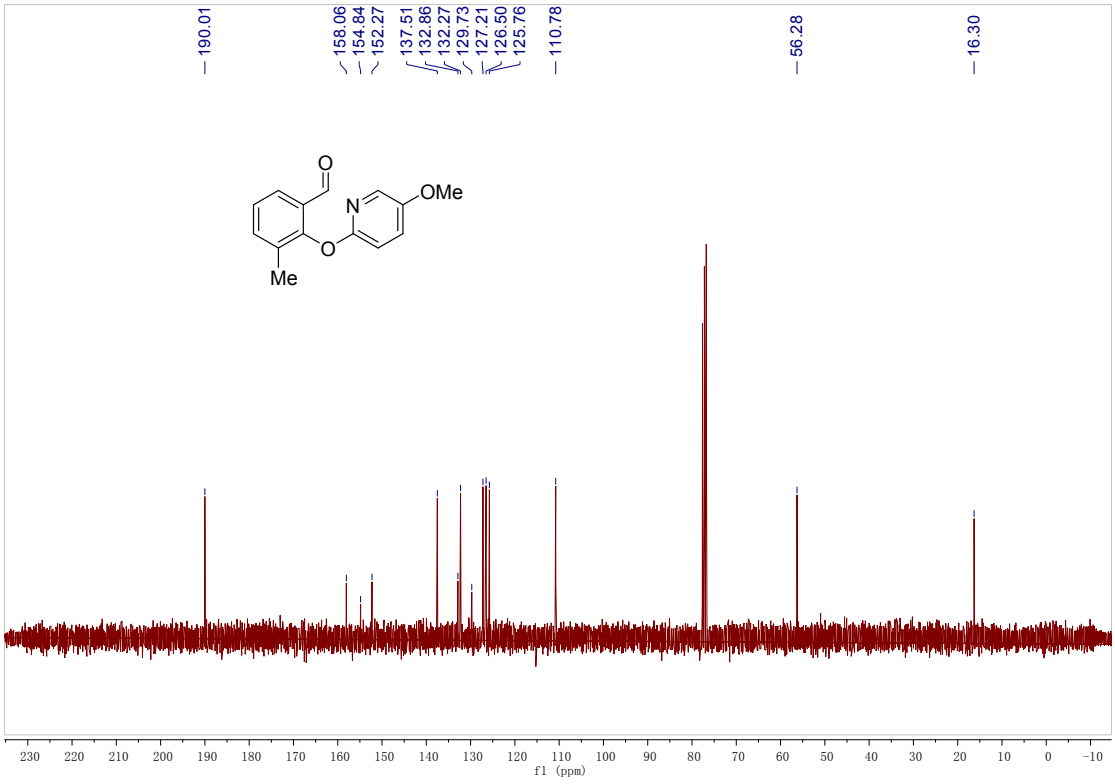
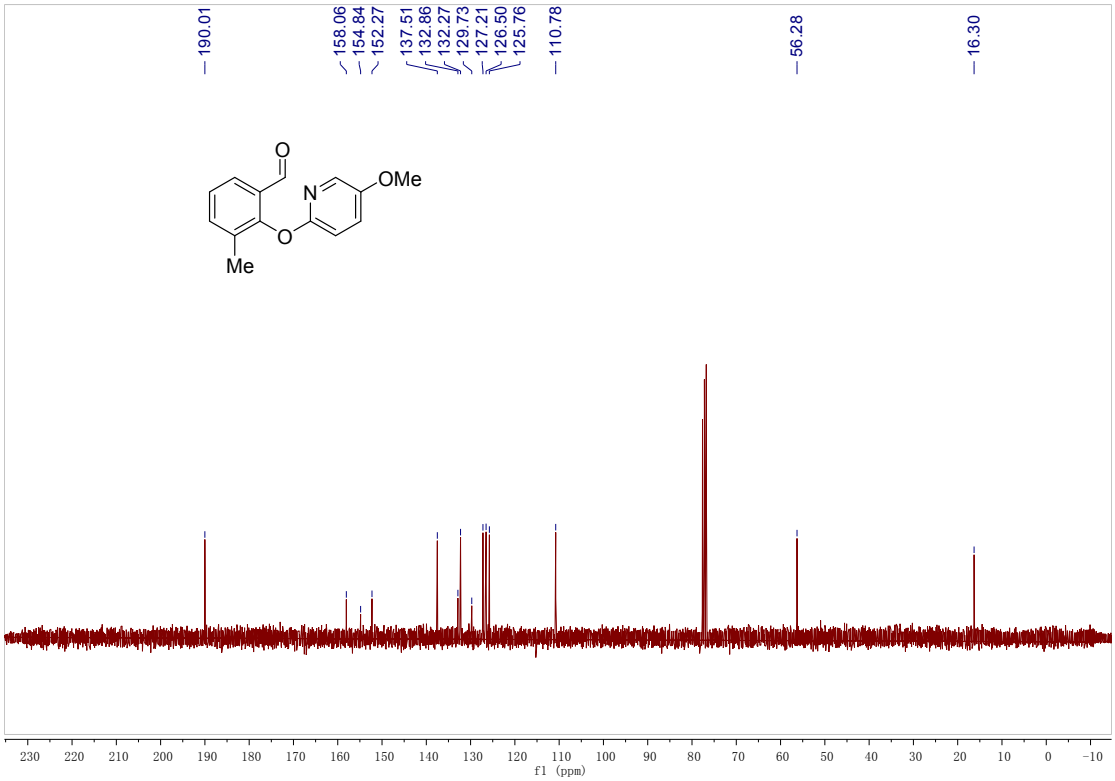


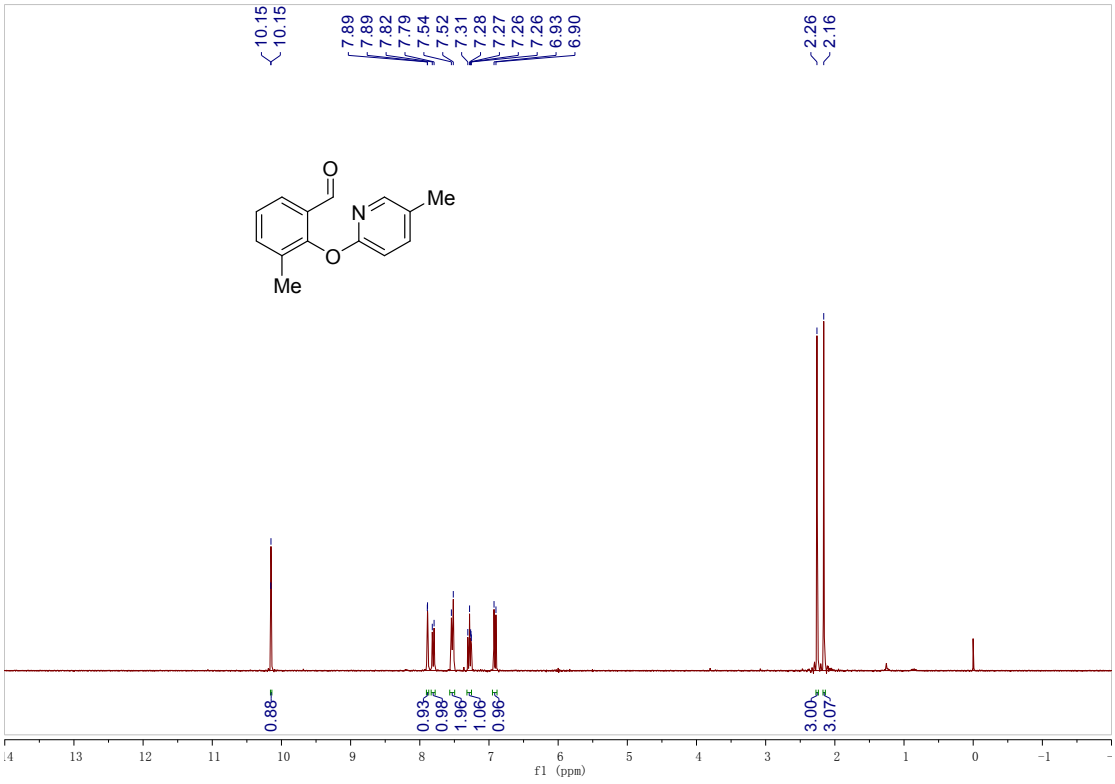


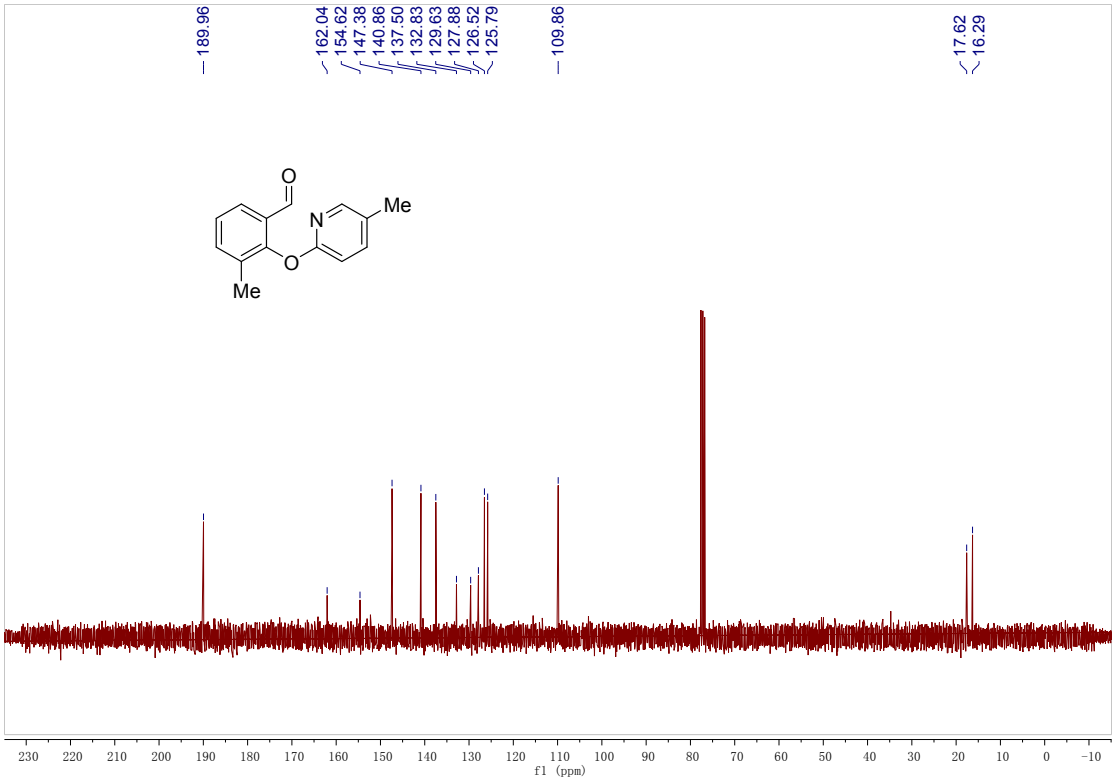
^{1}H and ^{13}C NMR spectra of compound **1s**



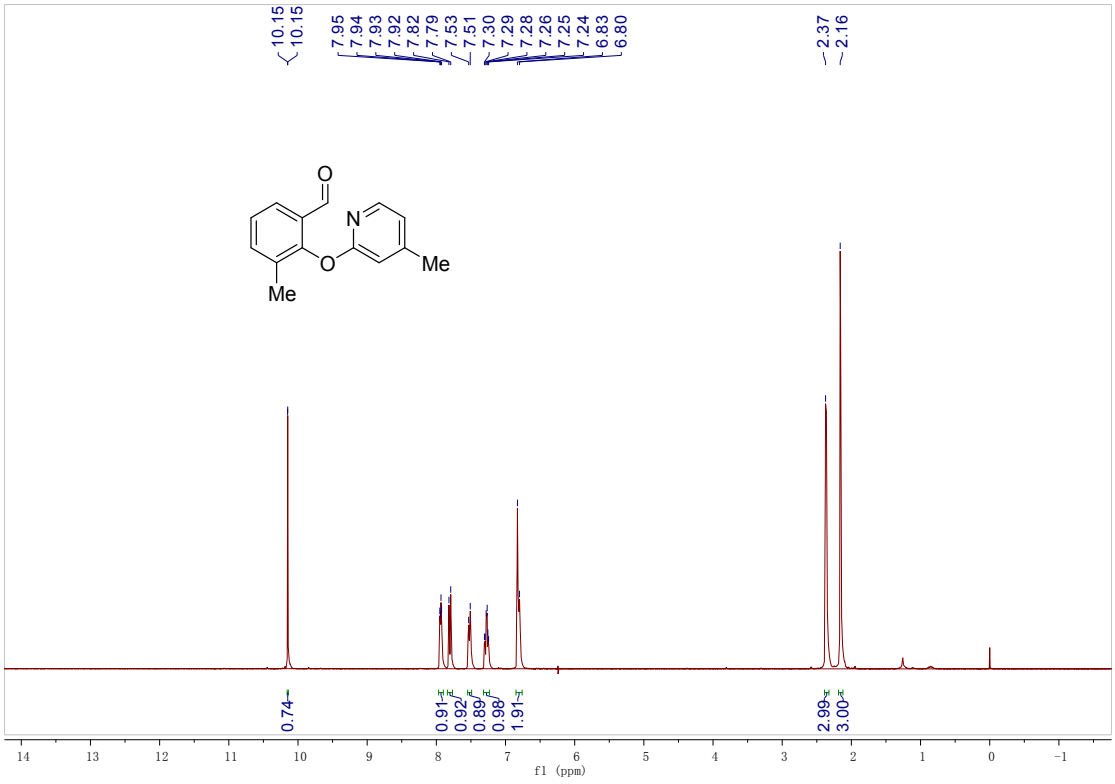


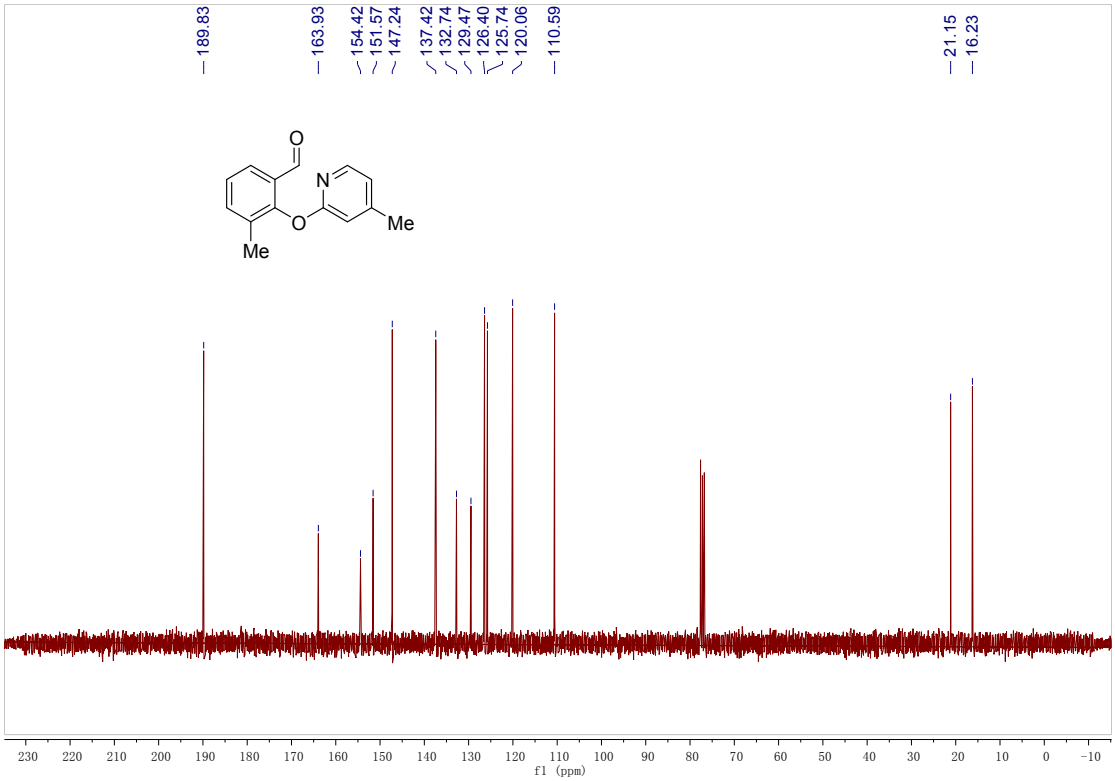
^{1}H and ^{13}C NMR spectra of compound **1t**



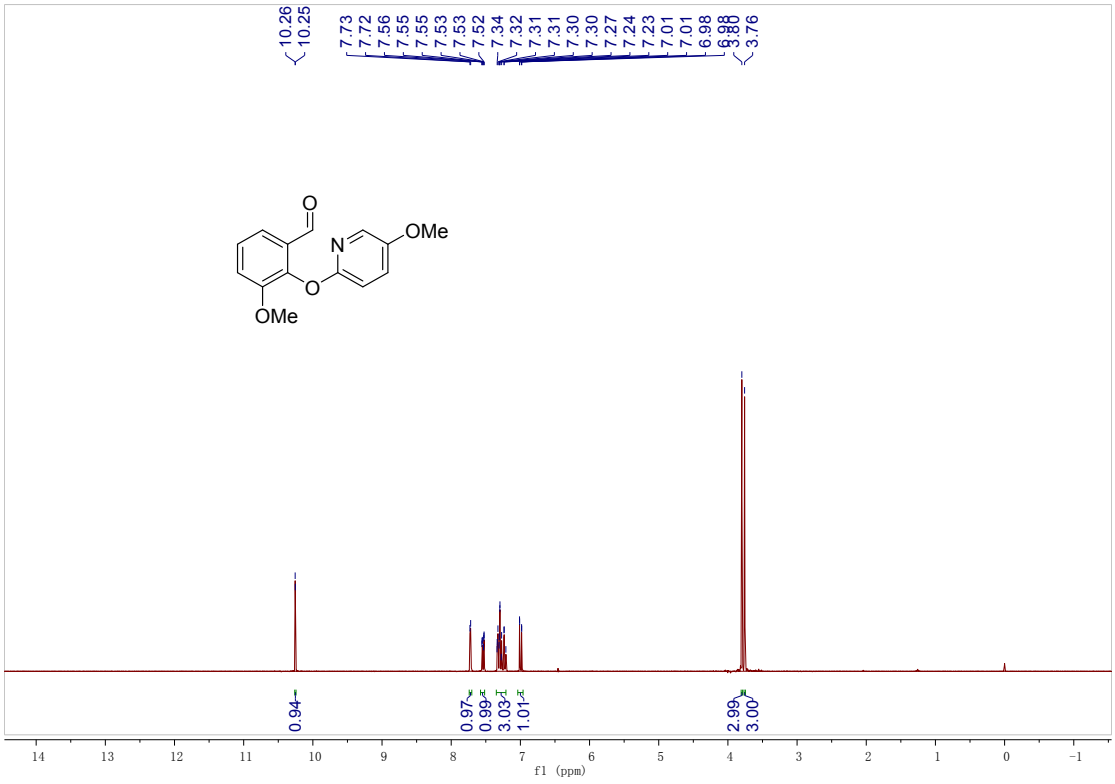


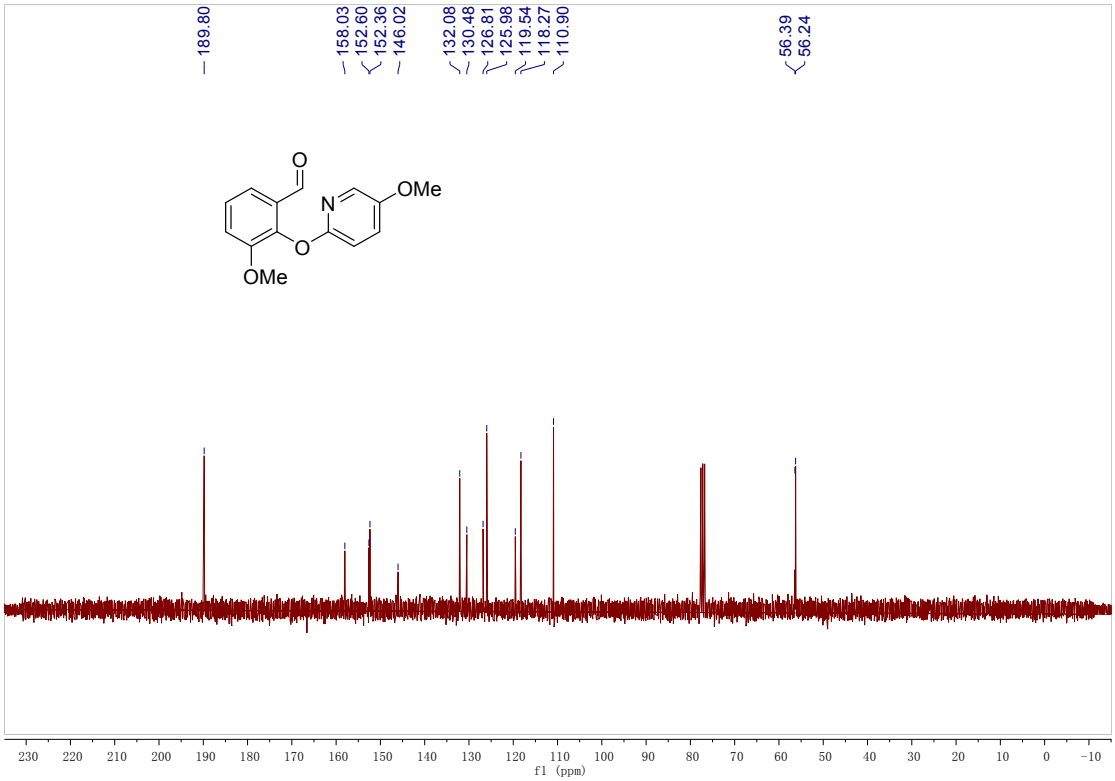
^{1}H and ^{13}C NMR spectra of compound **1u**



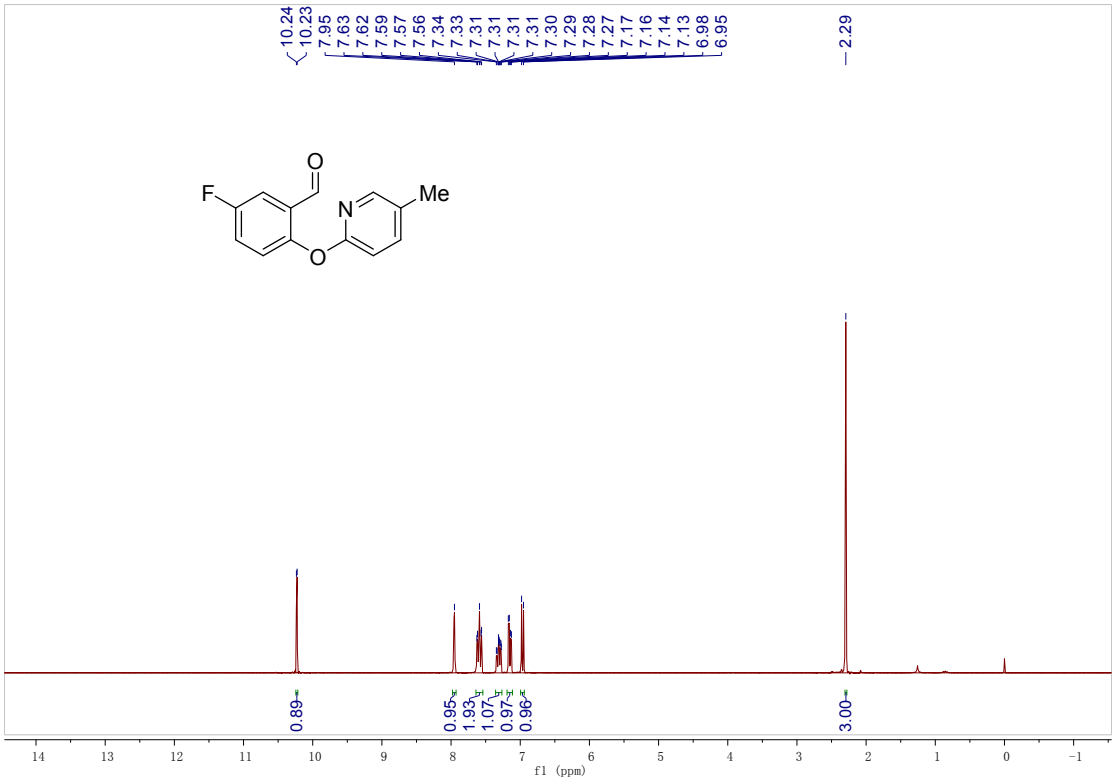


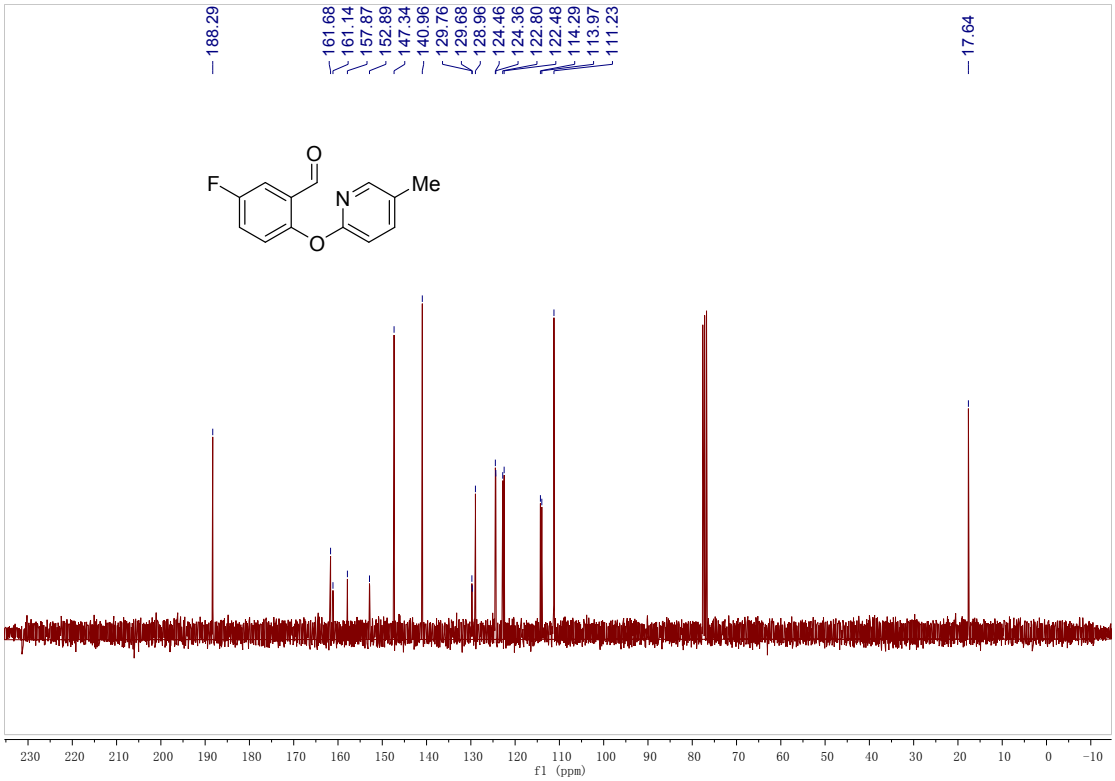
^{1}H and ^{13}C NMR spectra of compound **1v**



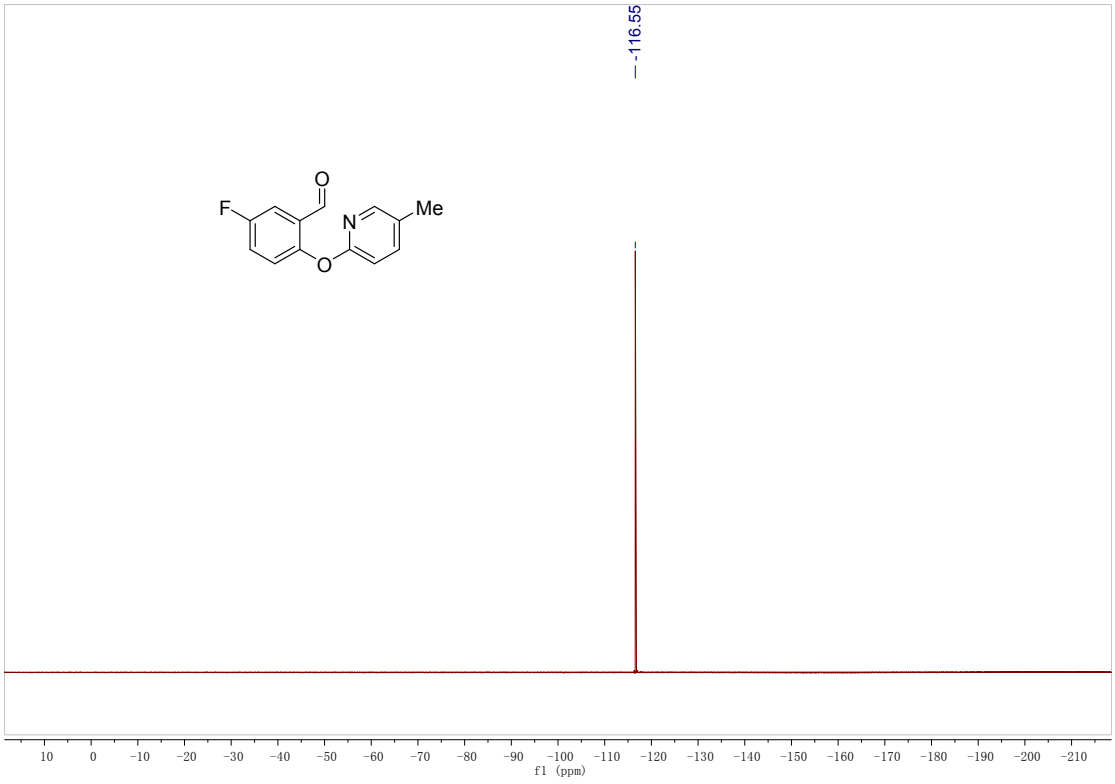


^{1}H and ^{13}C NMR spectra of compound **1w**

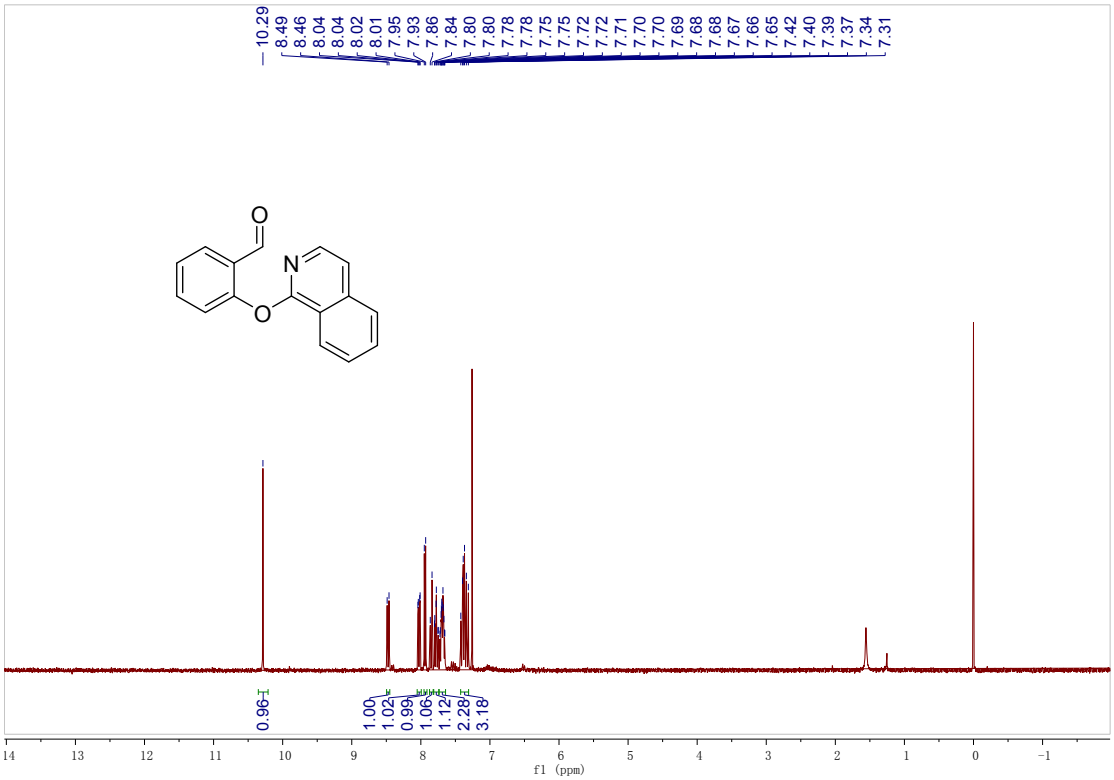


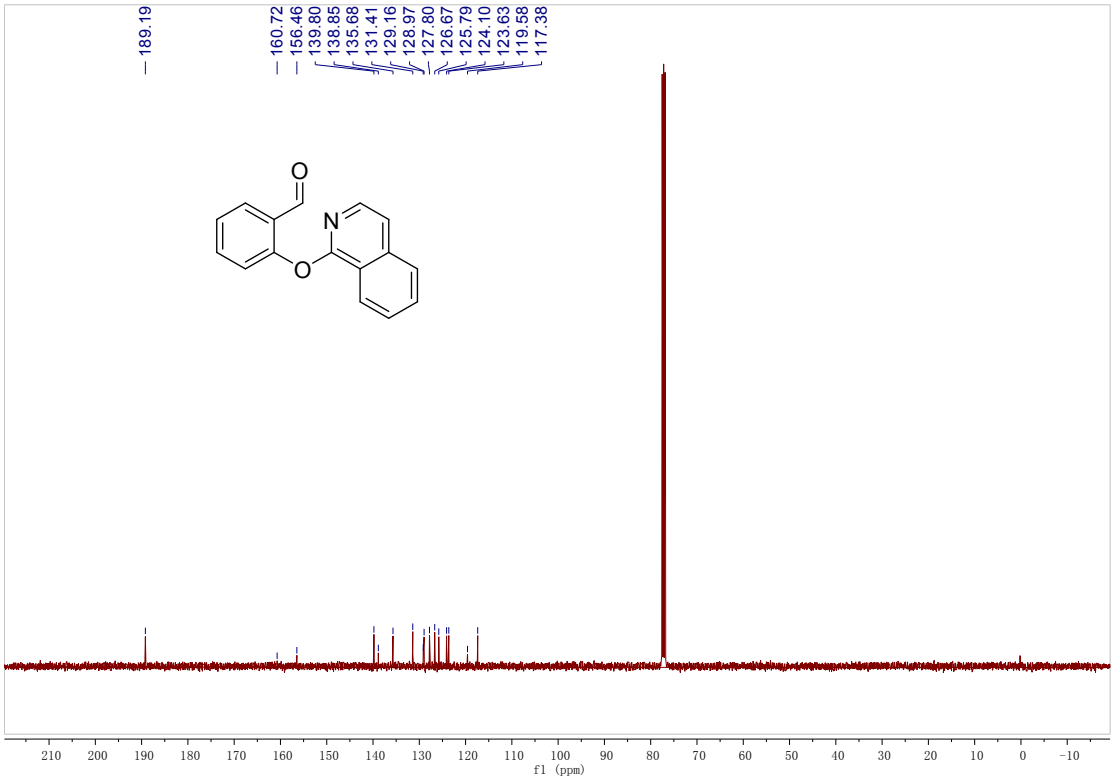


^{19}F NMR spectra of compound **1w**

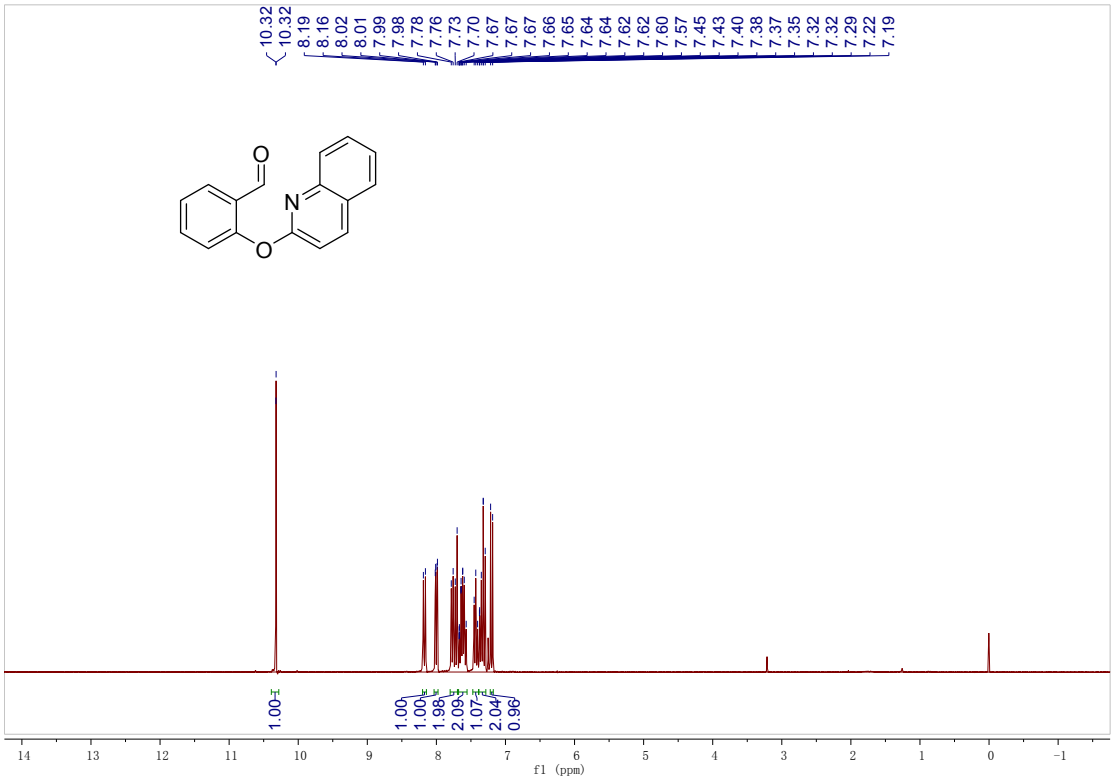


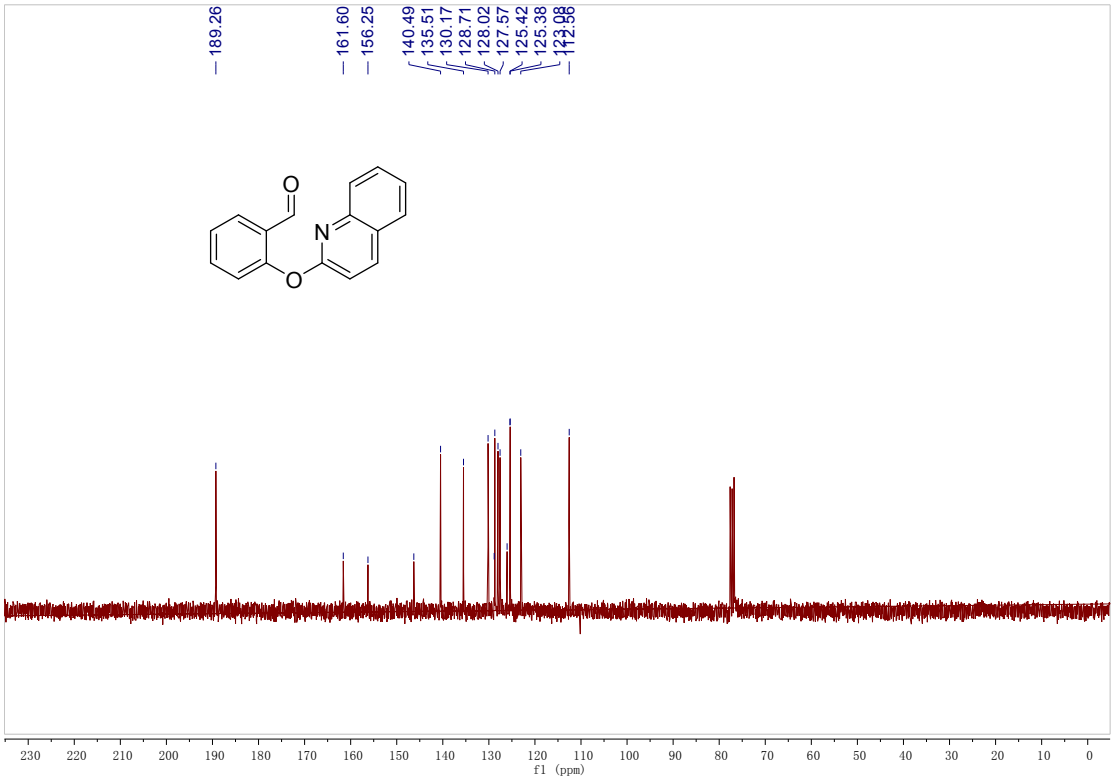
^{1}H and ^{13}C NMR spectra of compound **1x**



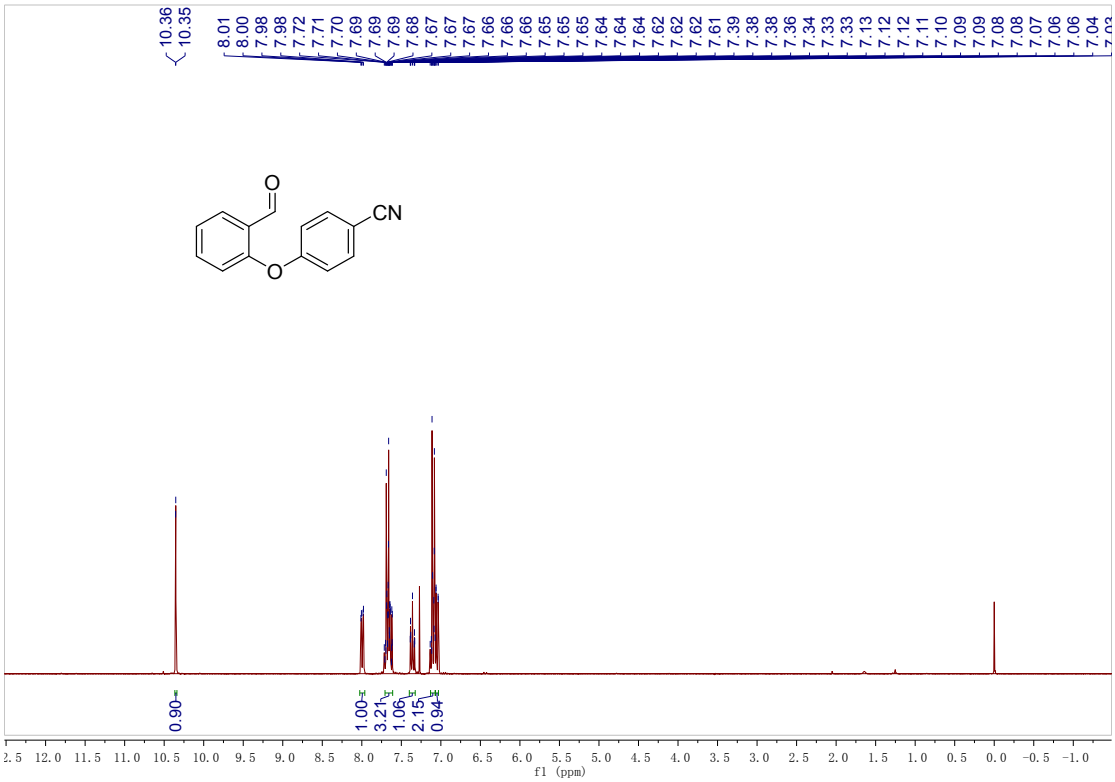


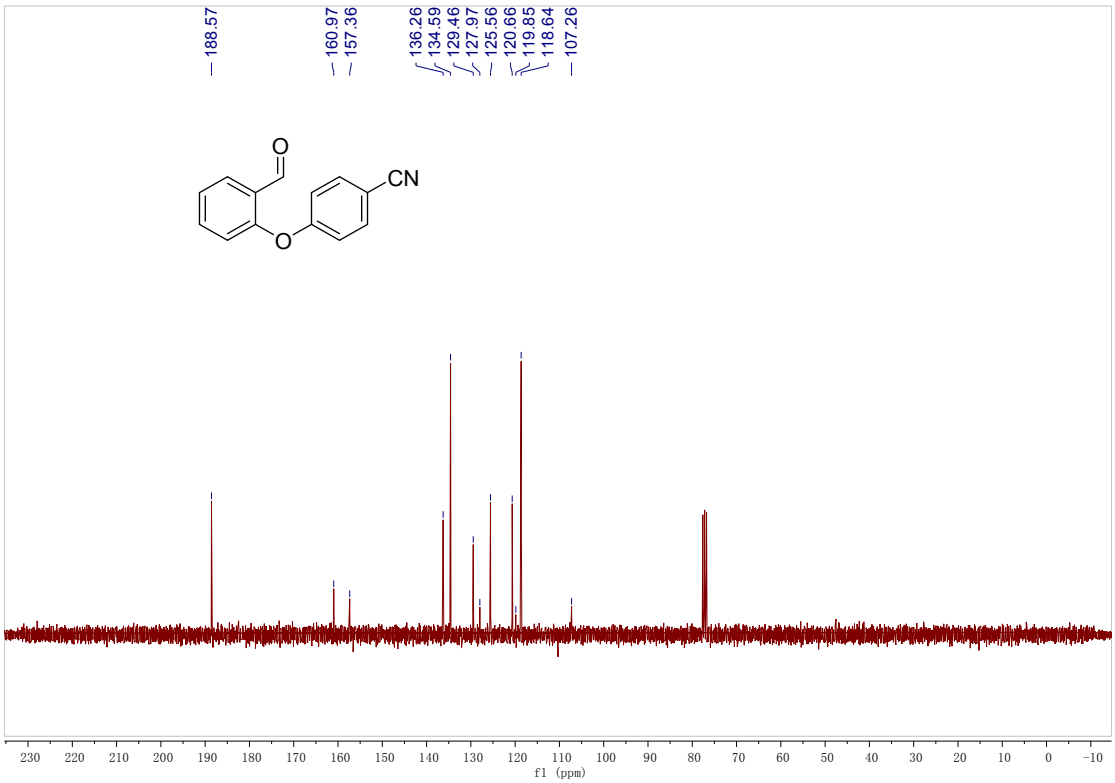
^{1}H and ^{13}C NMR spectra of compound **1y**



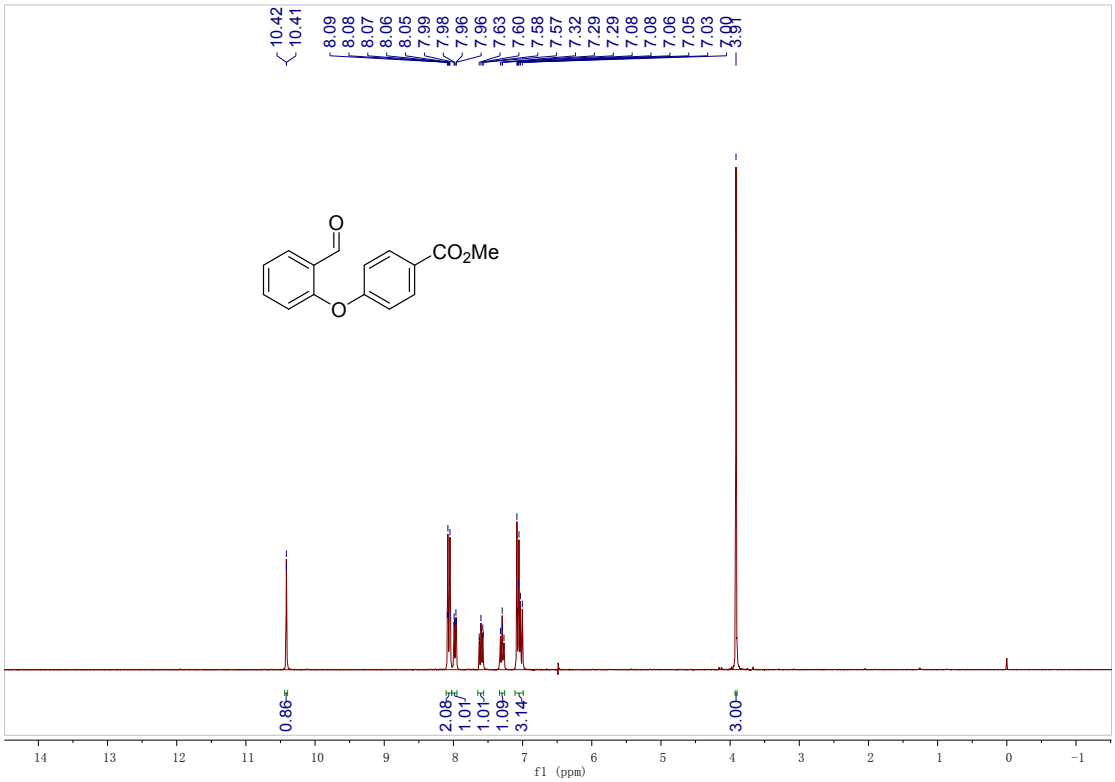


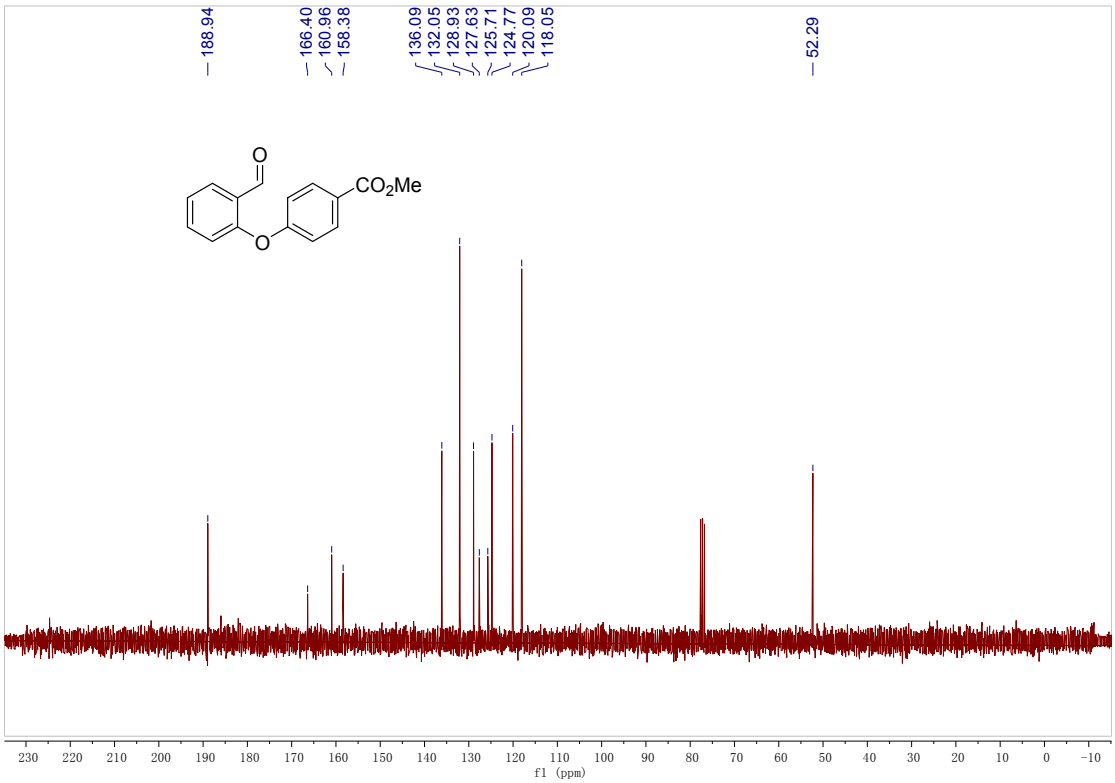
^{1}H and ^{13}C NMR spectra of compound **1z**



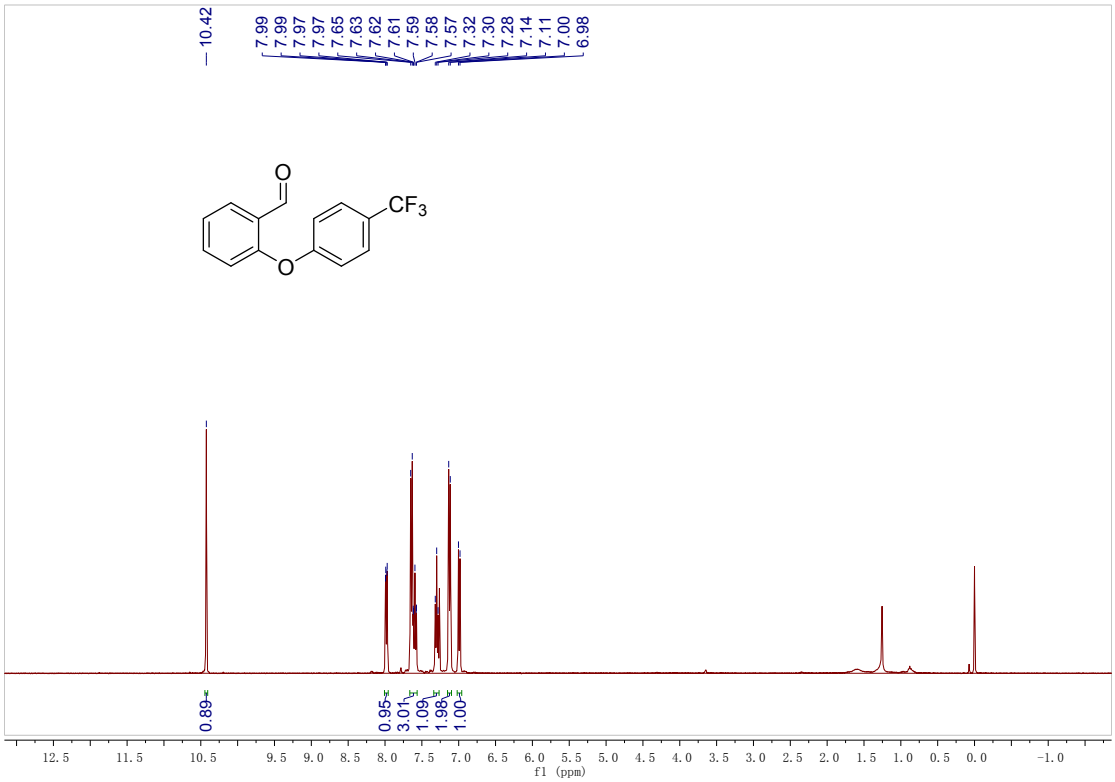


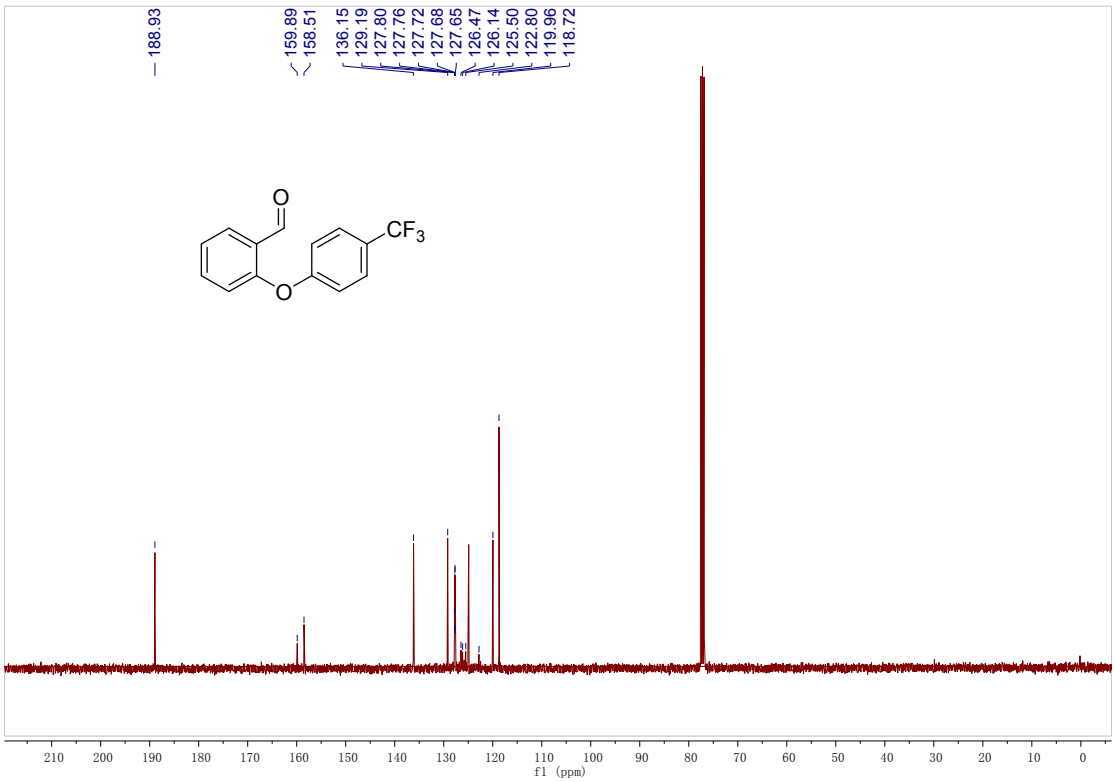
^{1}H and ^{13}C NMR spectra of compound **1aa**



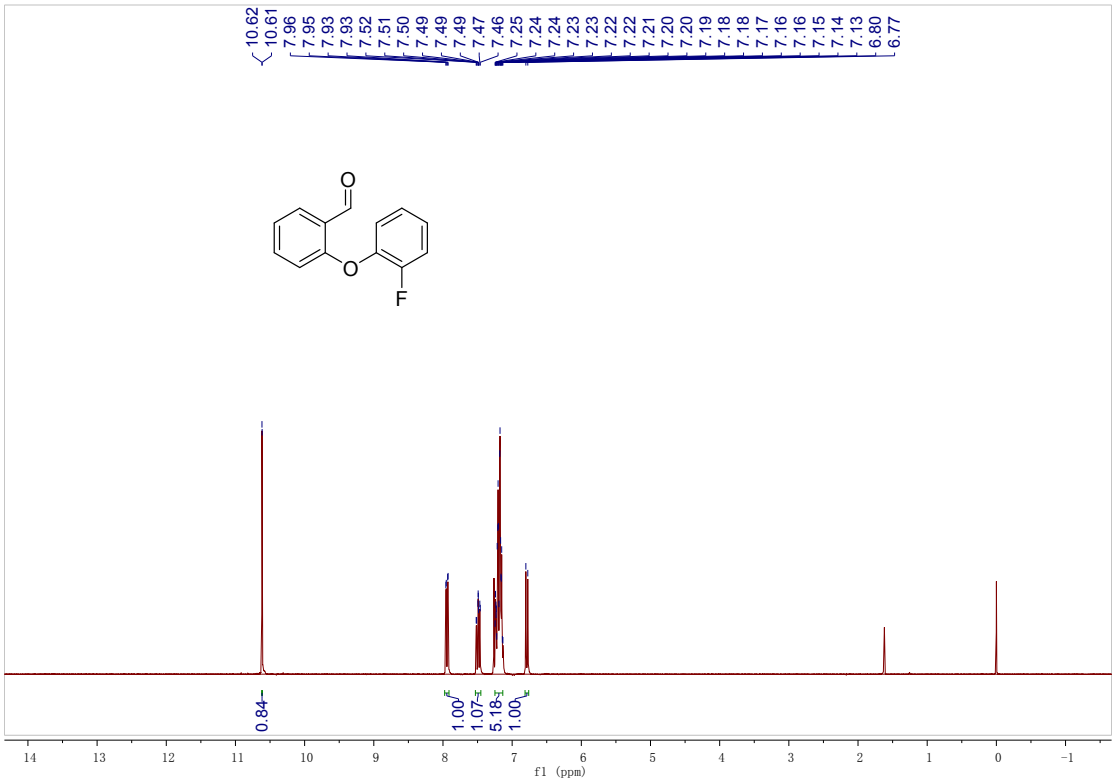


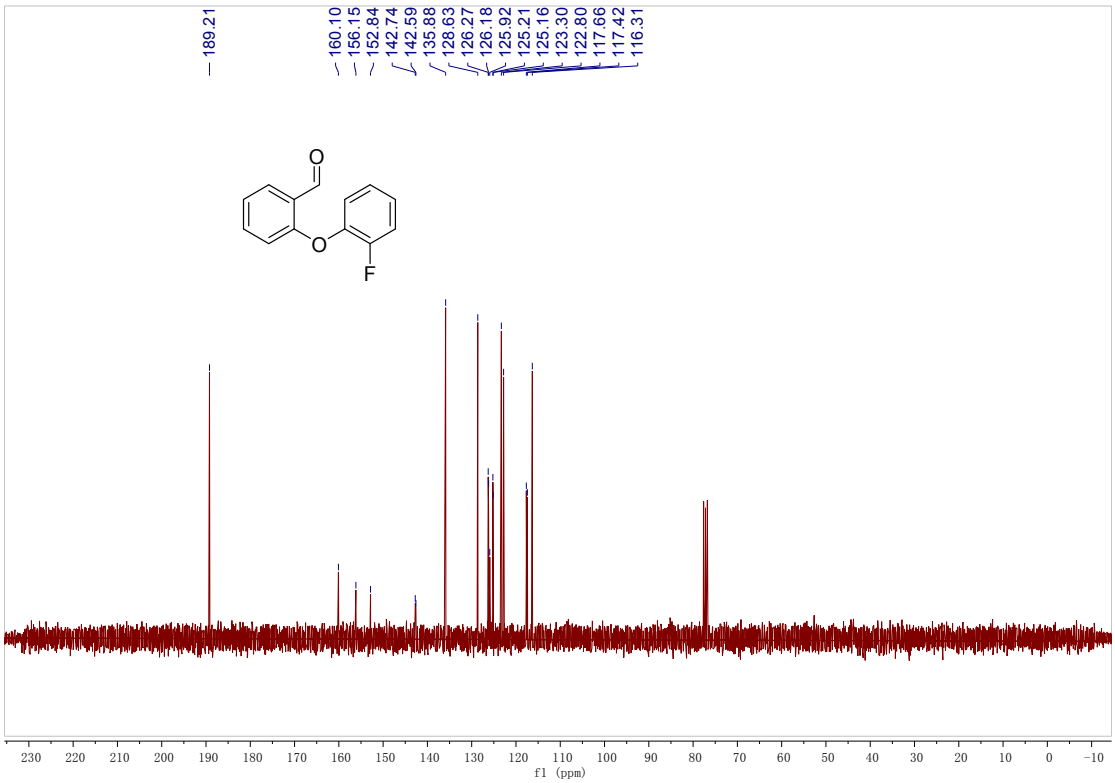
^{1}H and ^{13}C NMR spectra of compound **1ab**



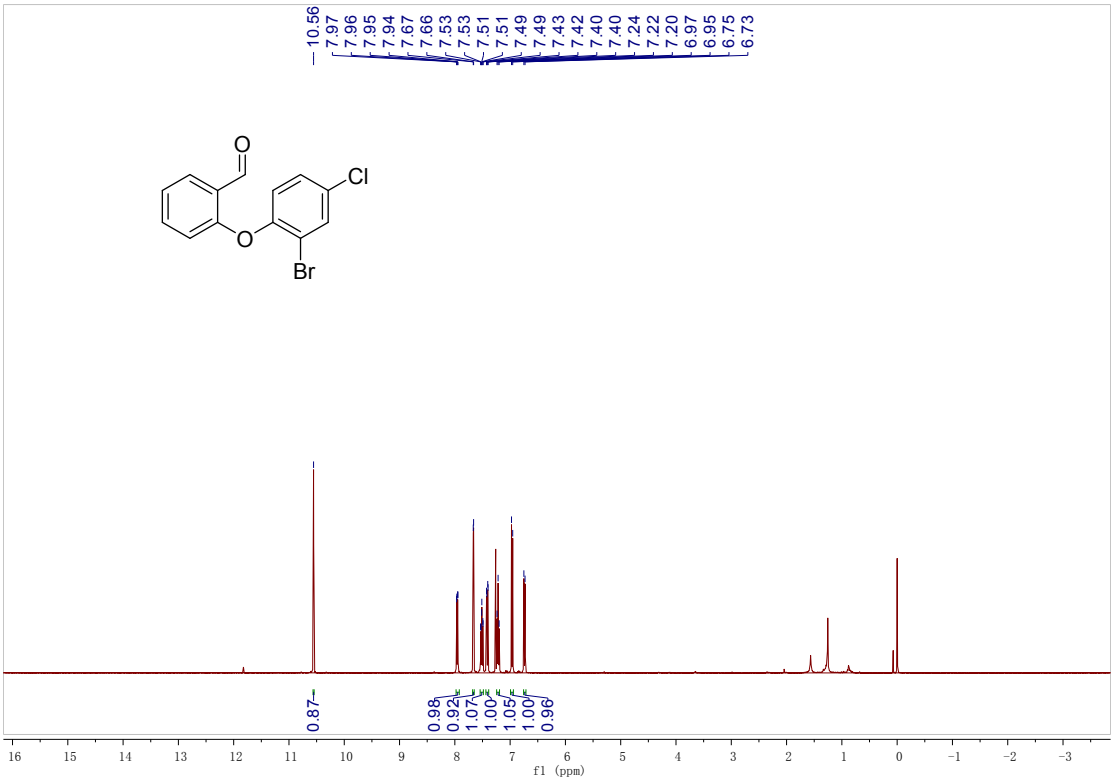


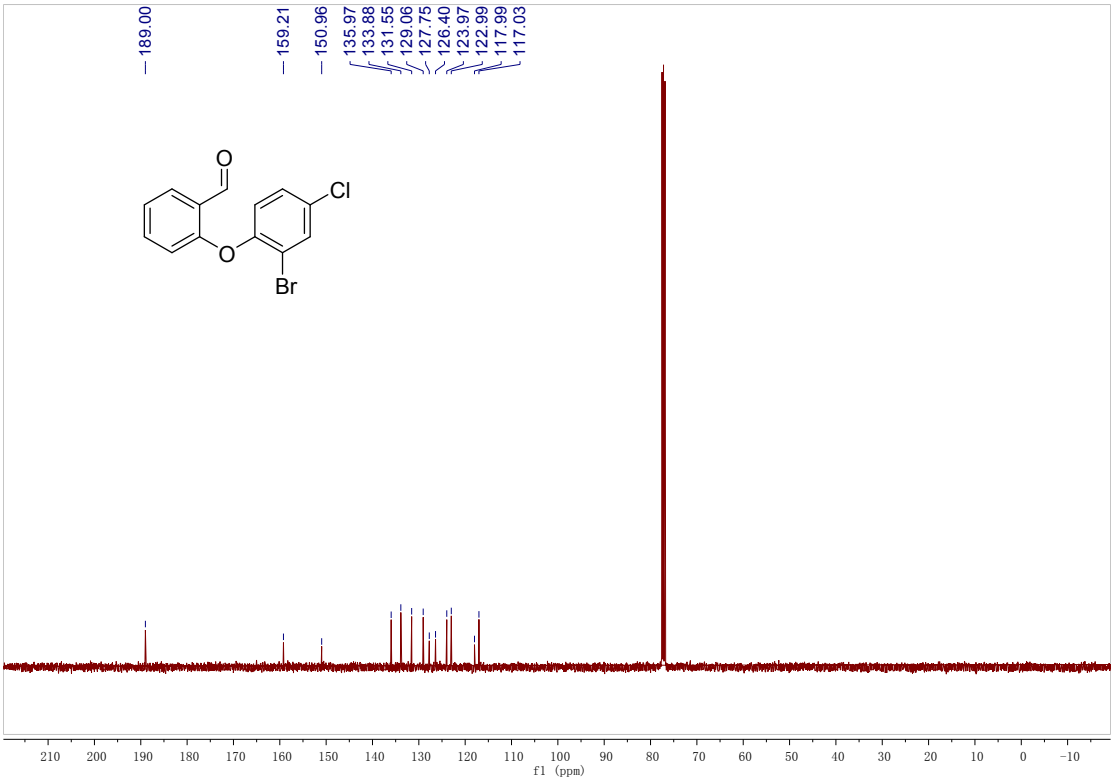
^{1}H and ^{13}C NMR spectra of compound **1ac**



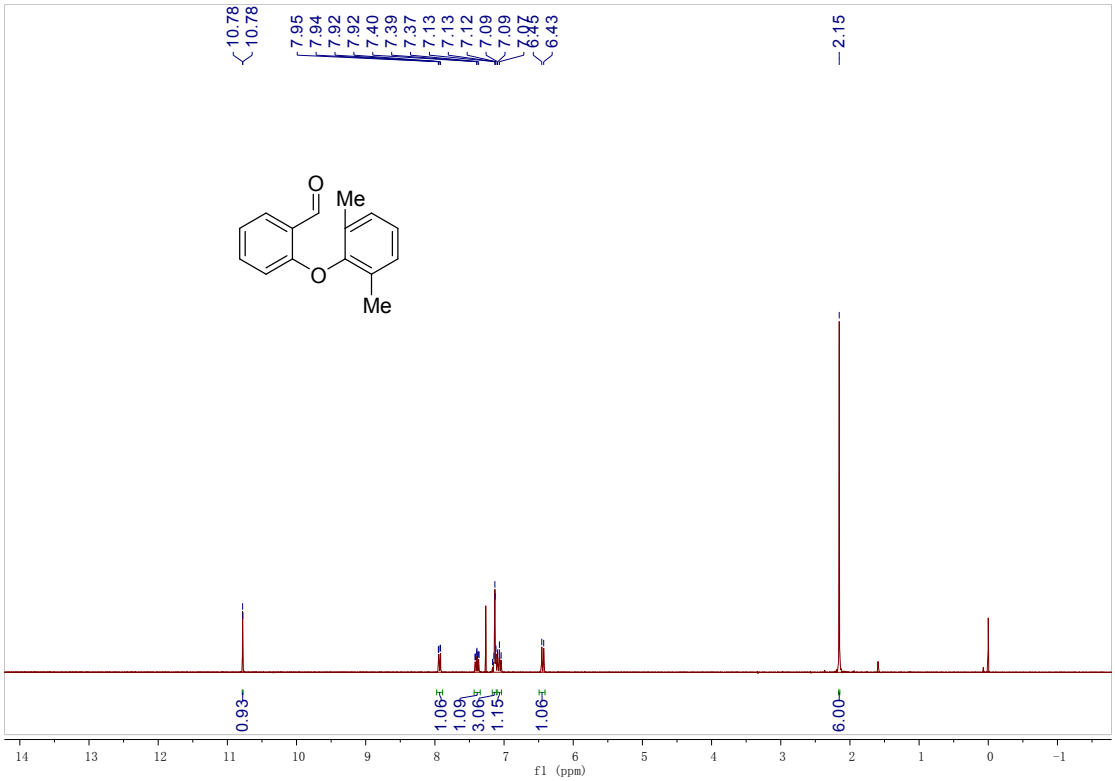


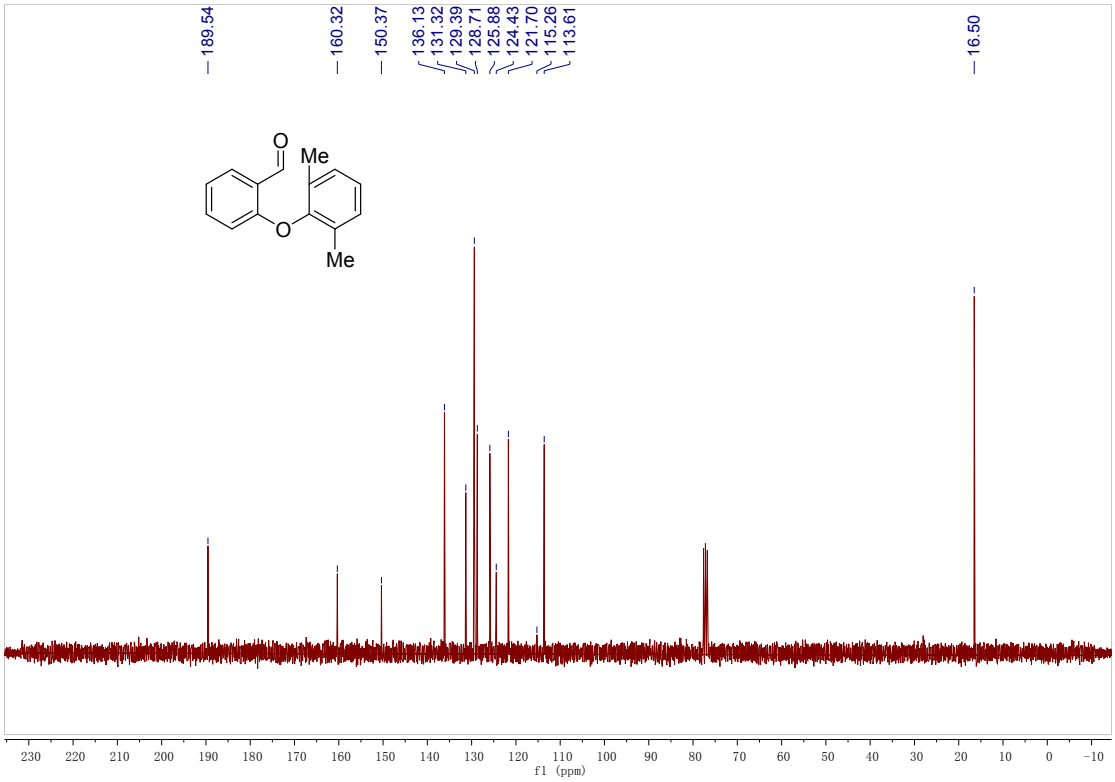
^{1}H and ^{13}C NMR spectra of compound **1ad**



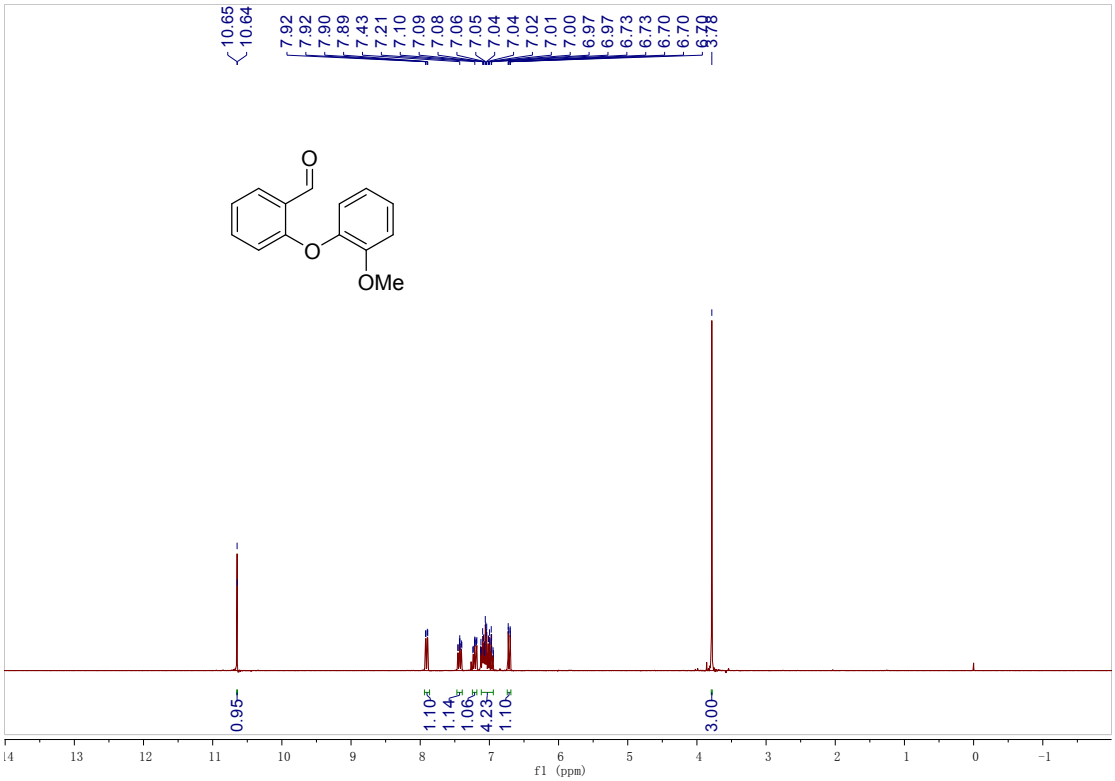


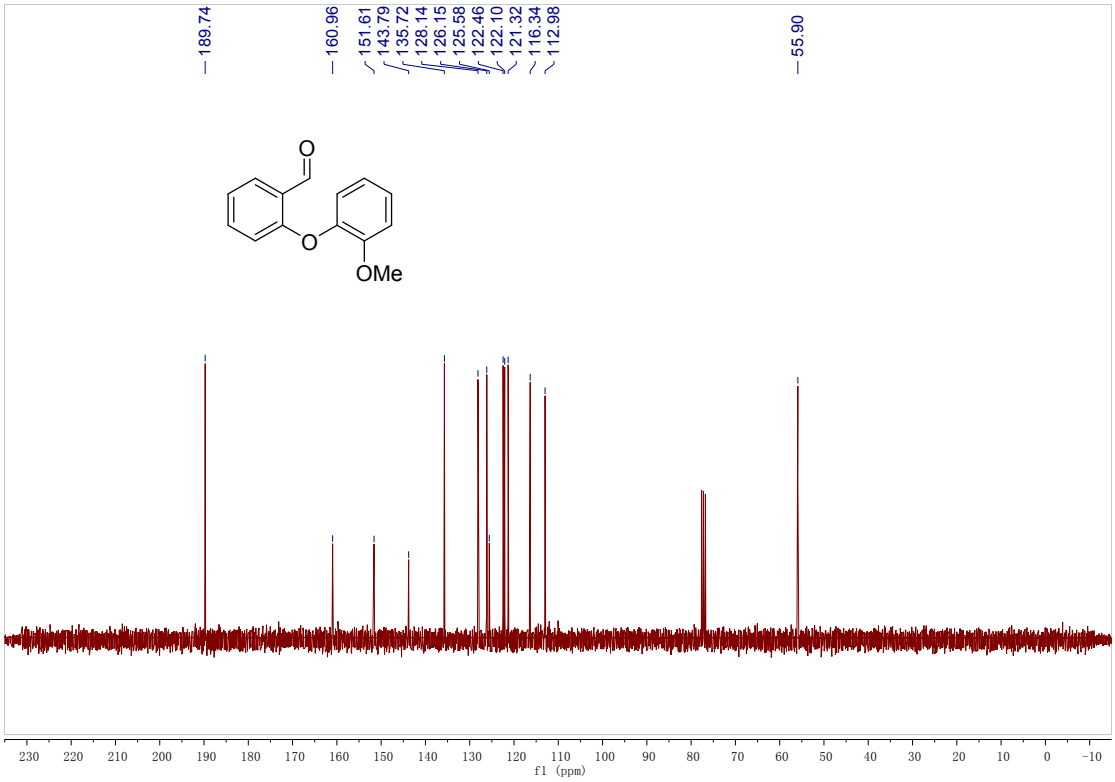
^{1}H and ^{13}C NMR spectra of compound **1ae**



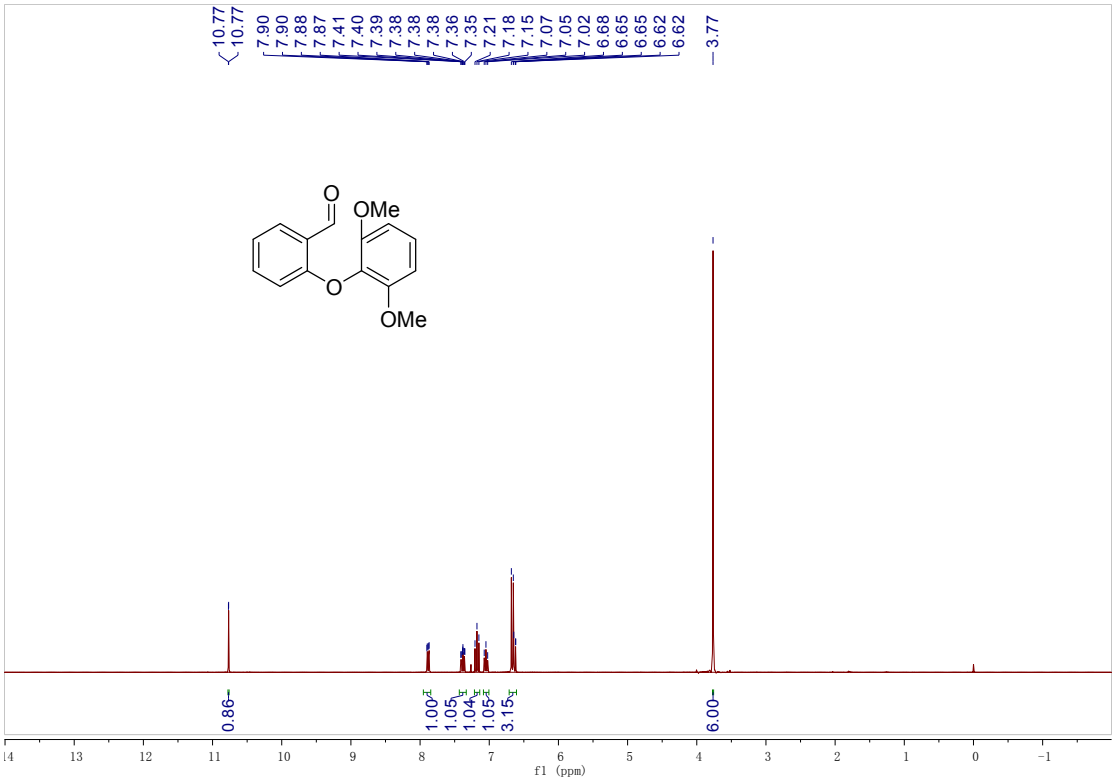


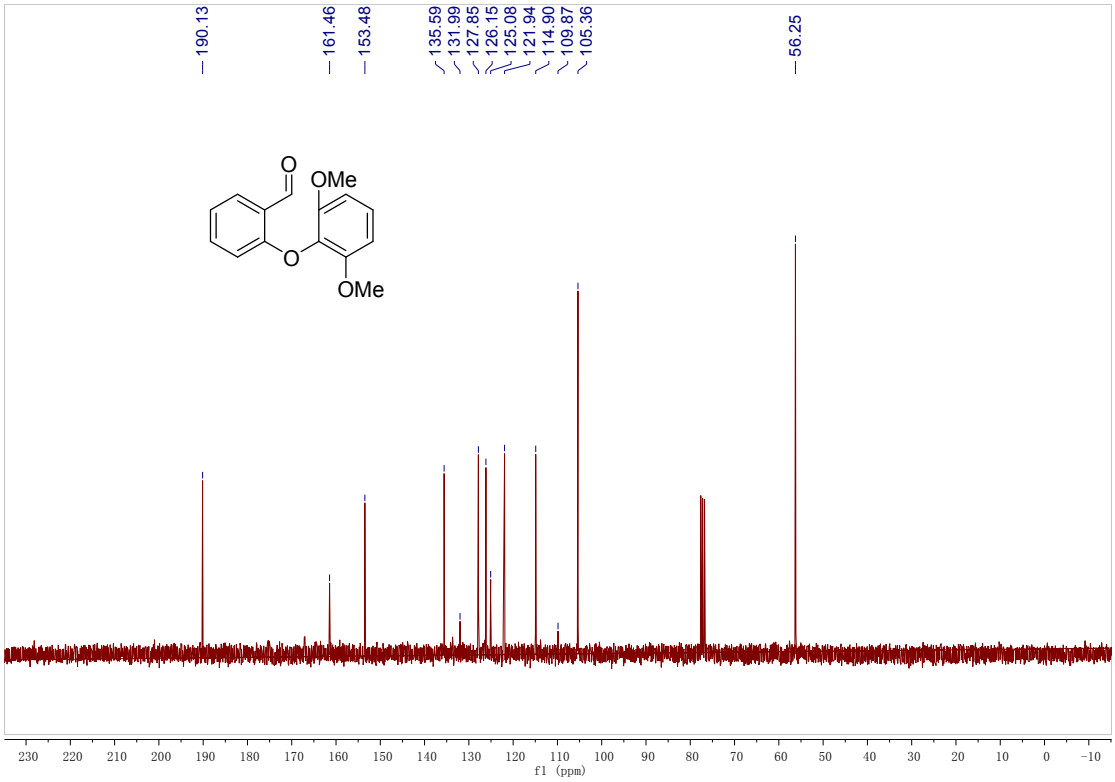
^{1}H and ^{13}C NMR spectra of compound **1af**



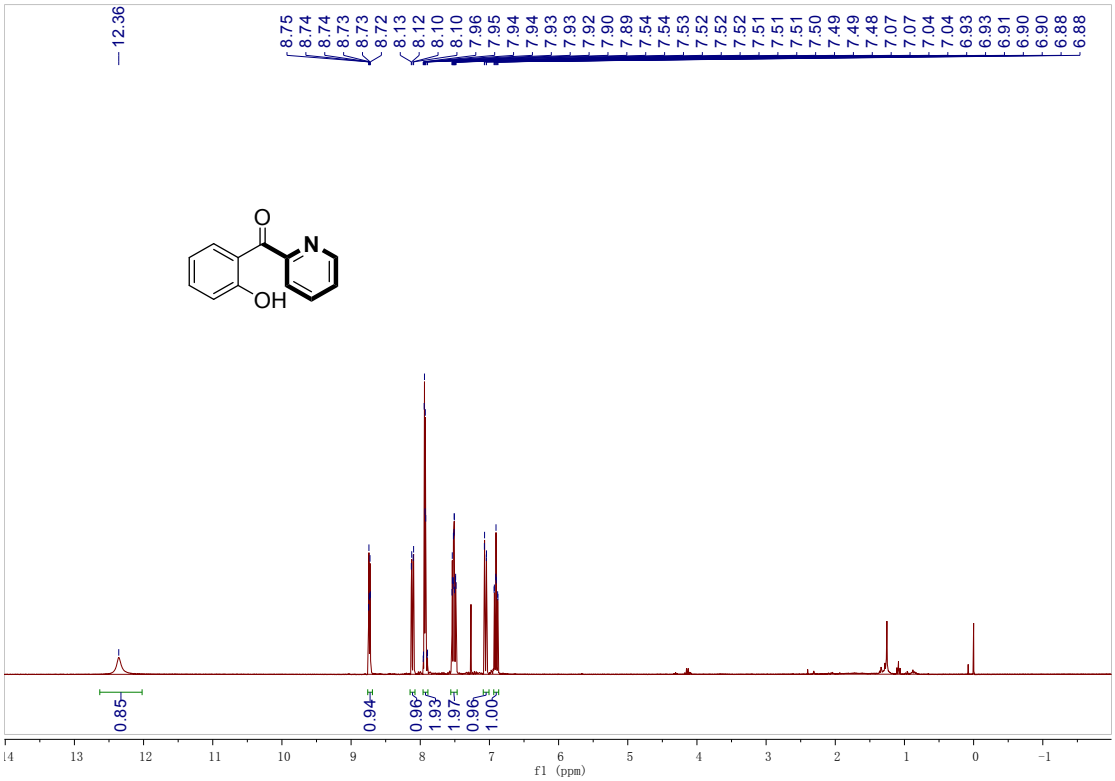


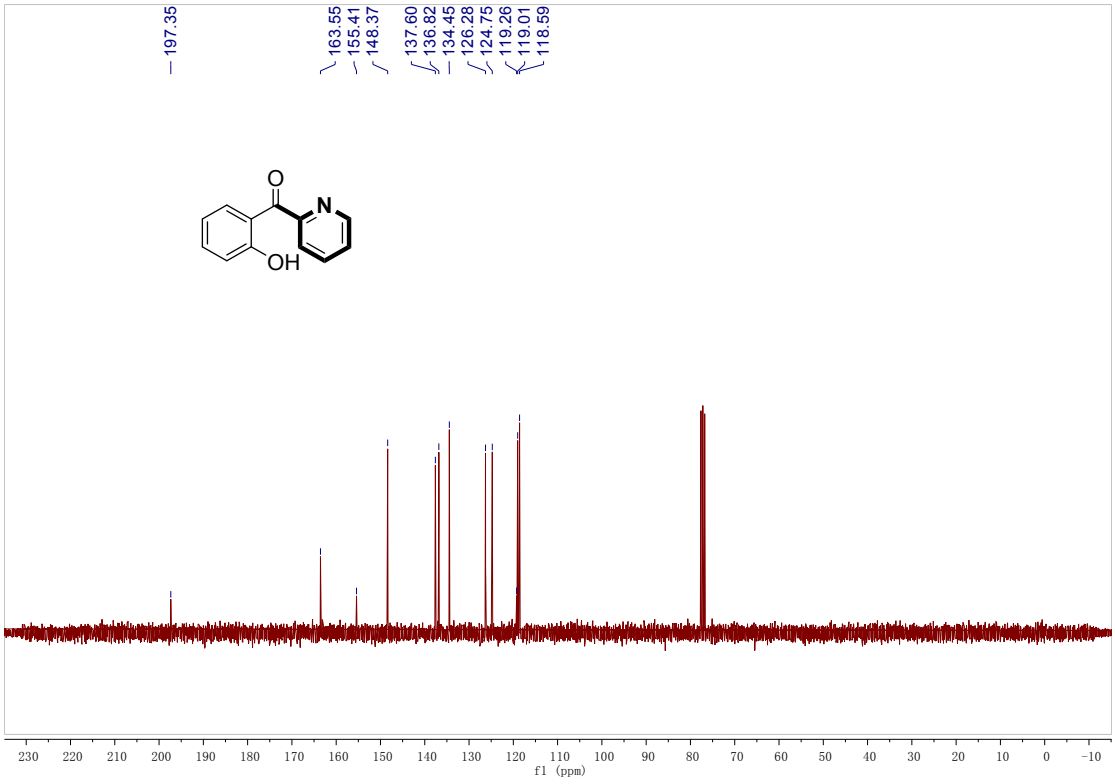
^{1}H and ^{13}C NMR spectra of compound **1ag**



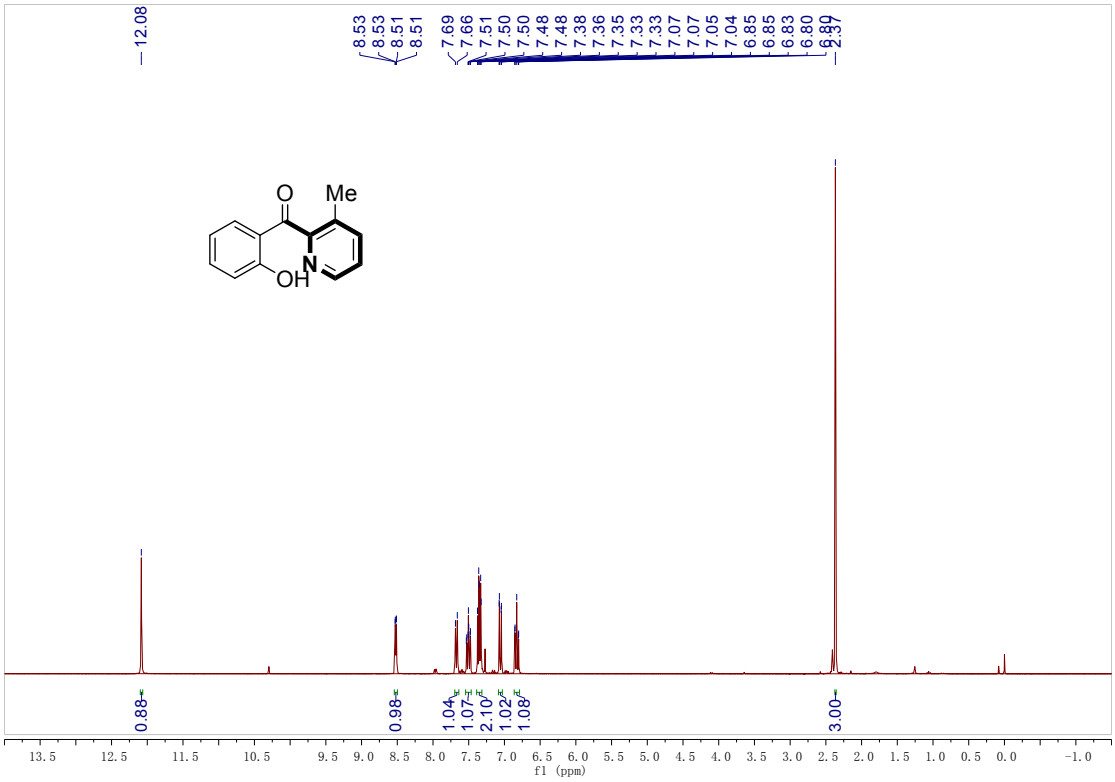


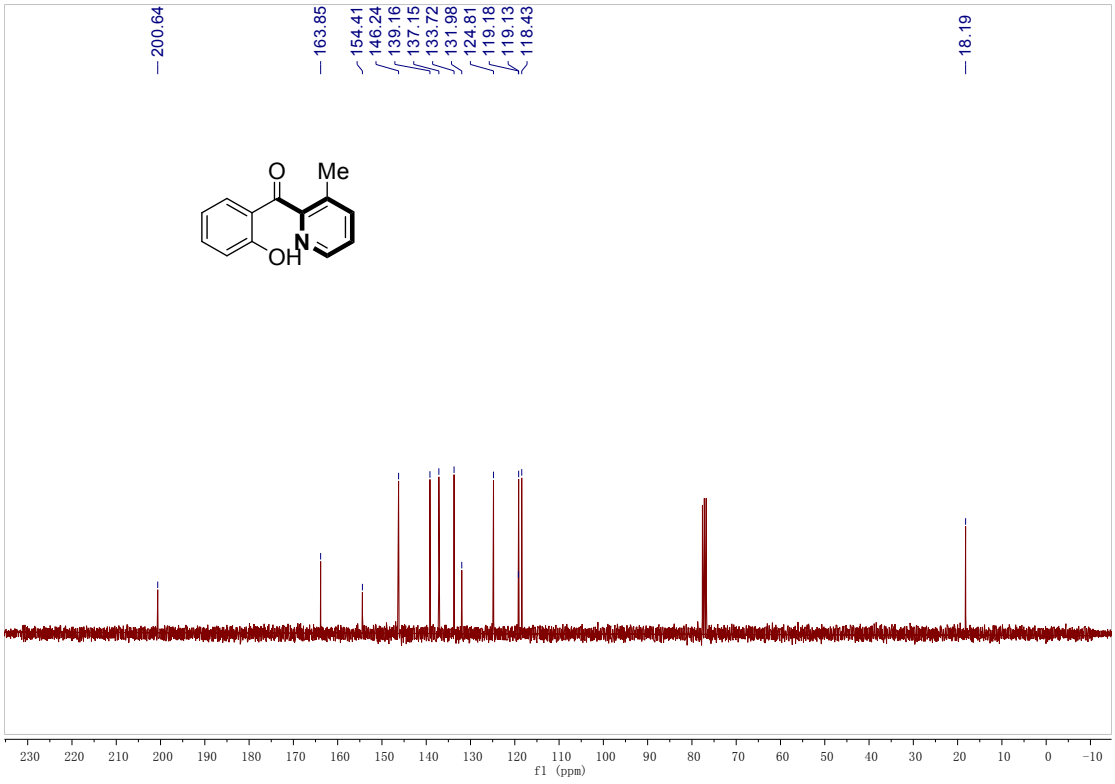
^{1}H and ^{13}C NMR spectra of compound **2a**



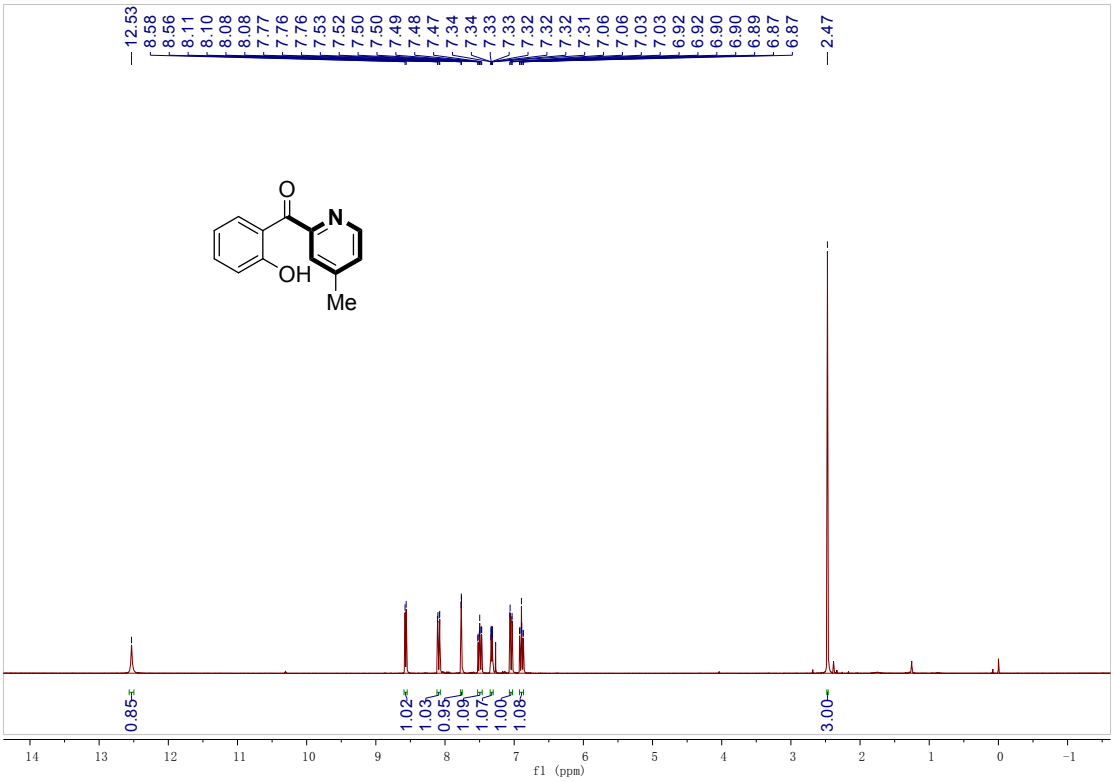


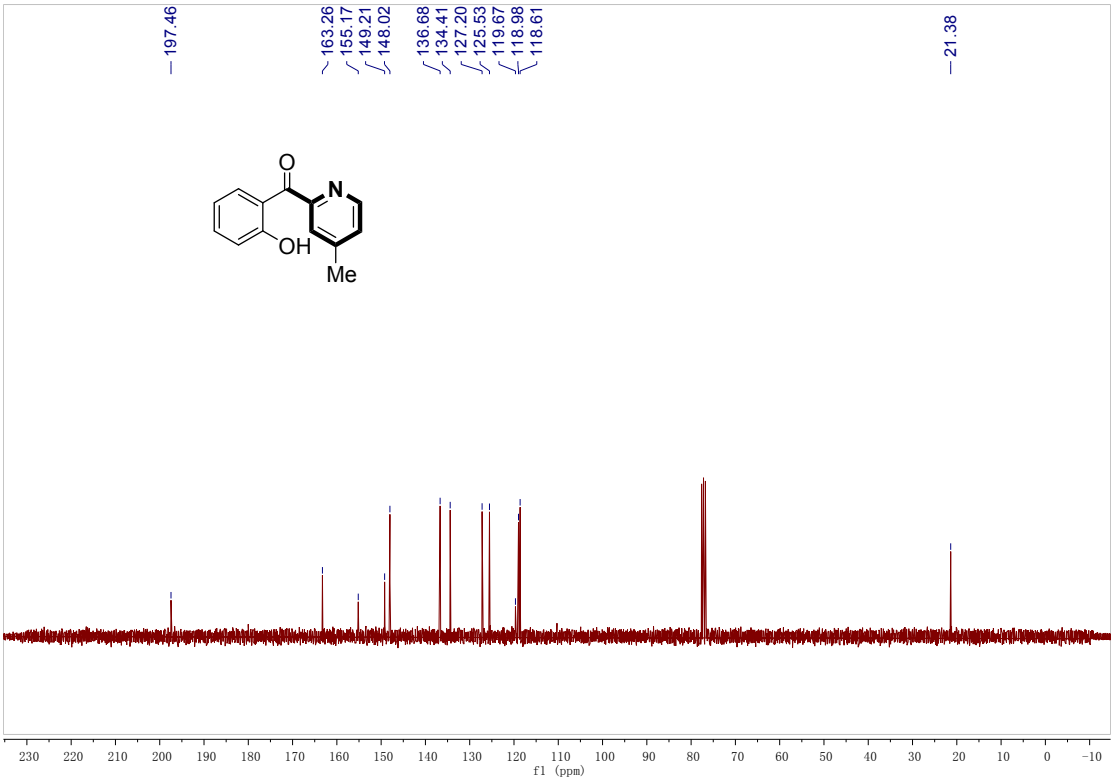
^{1}H and ^{13}C NMR spectra of compound **2b**



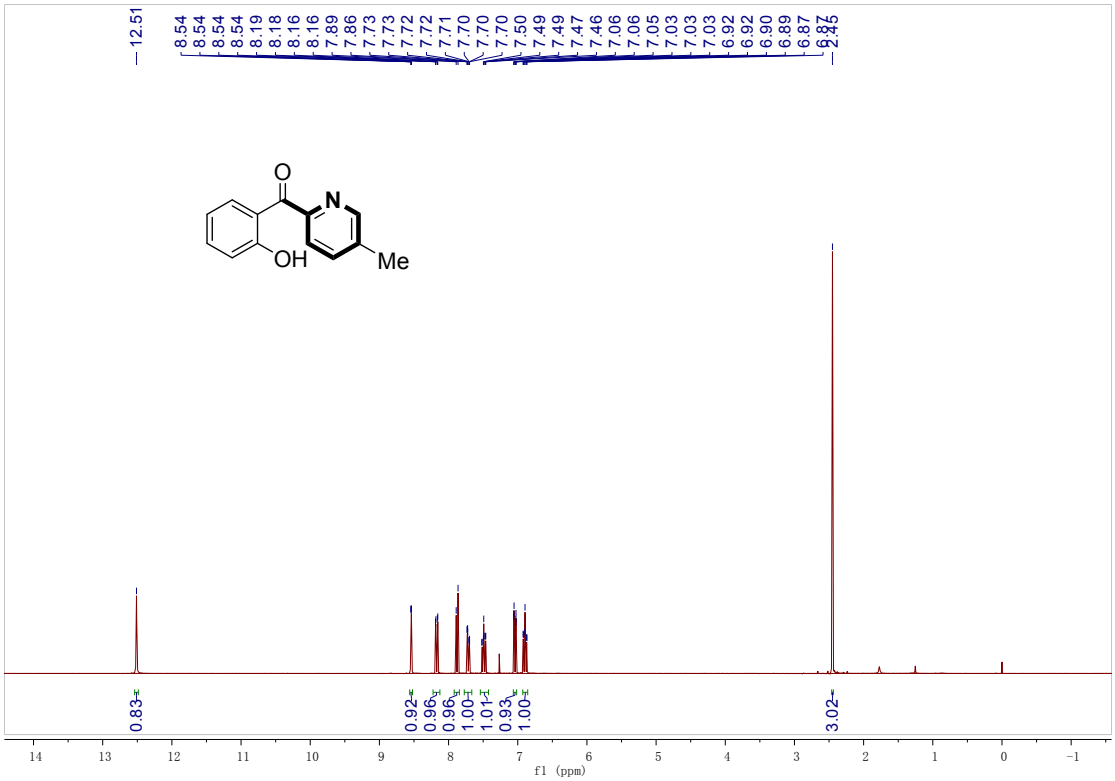


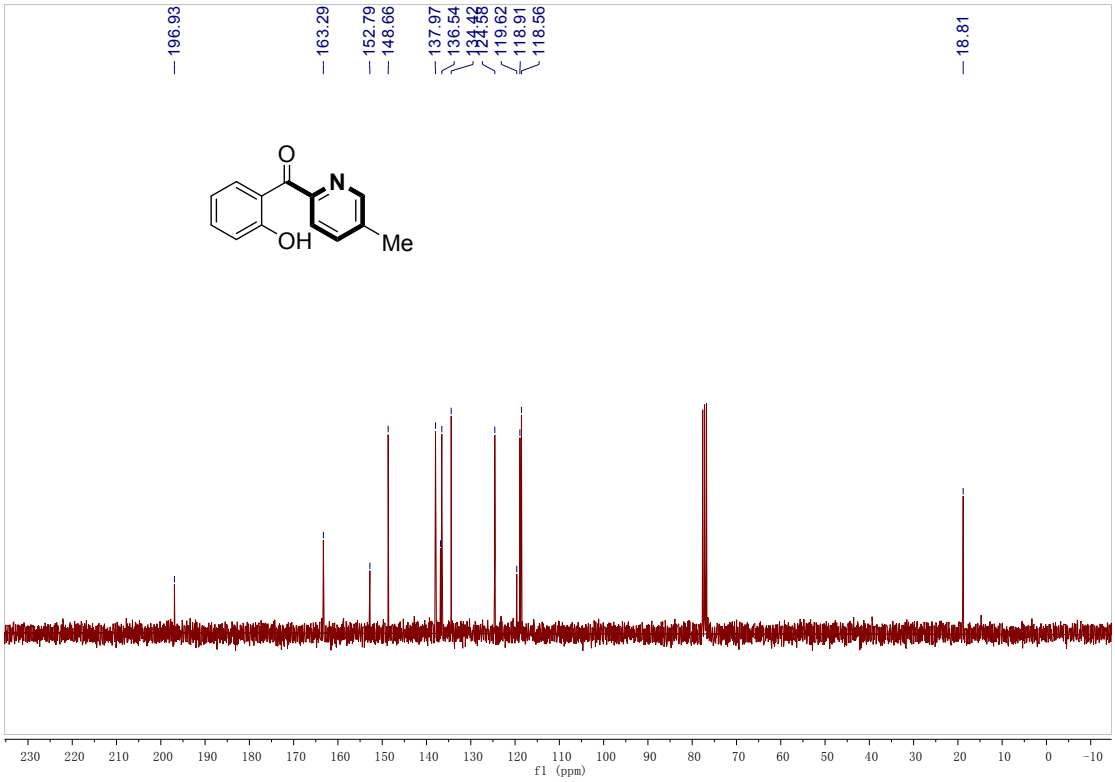
^{1}H and ^{13}C NMR spectra of compound **2c**



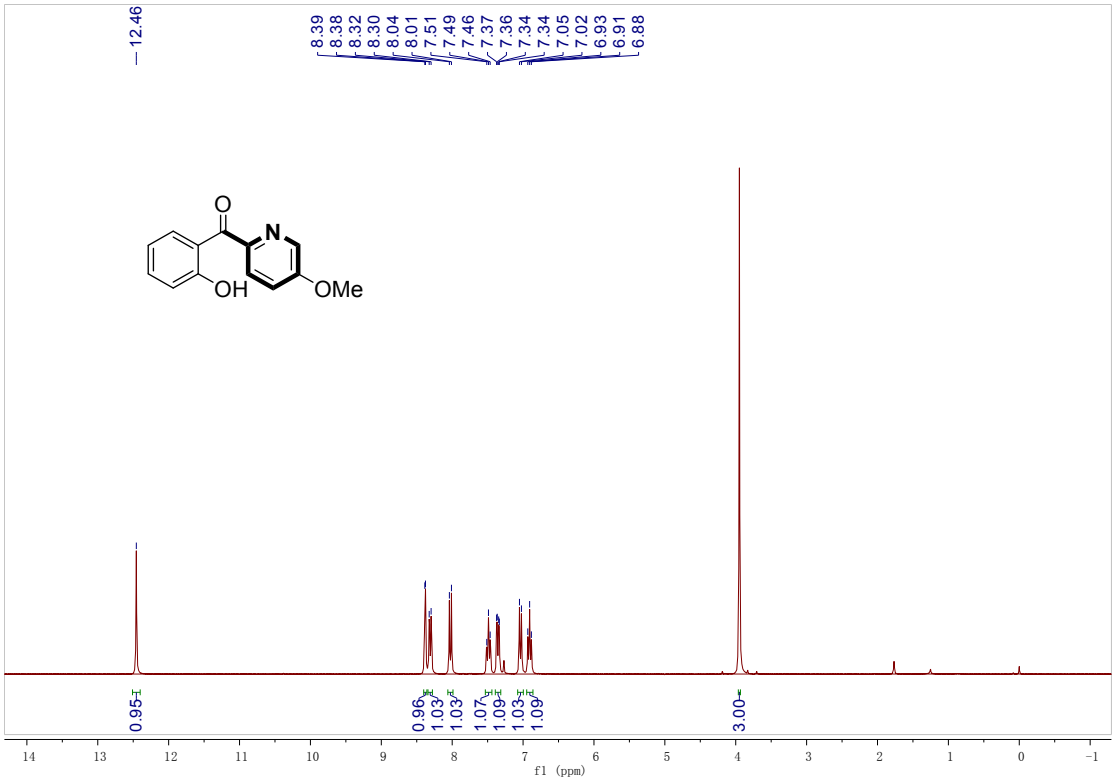


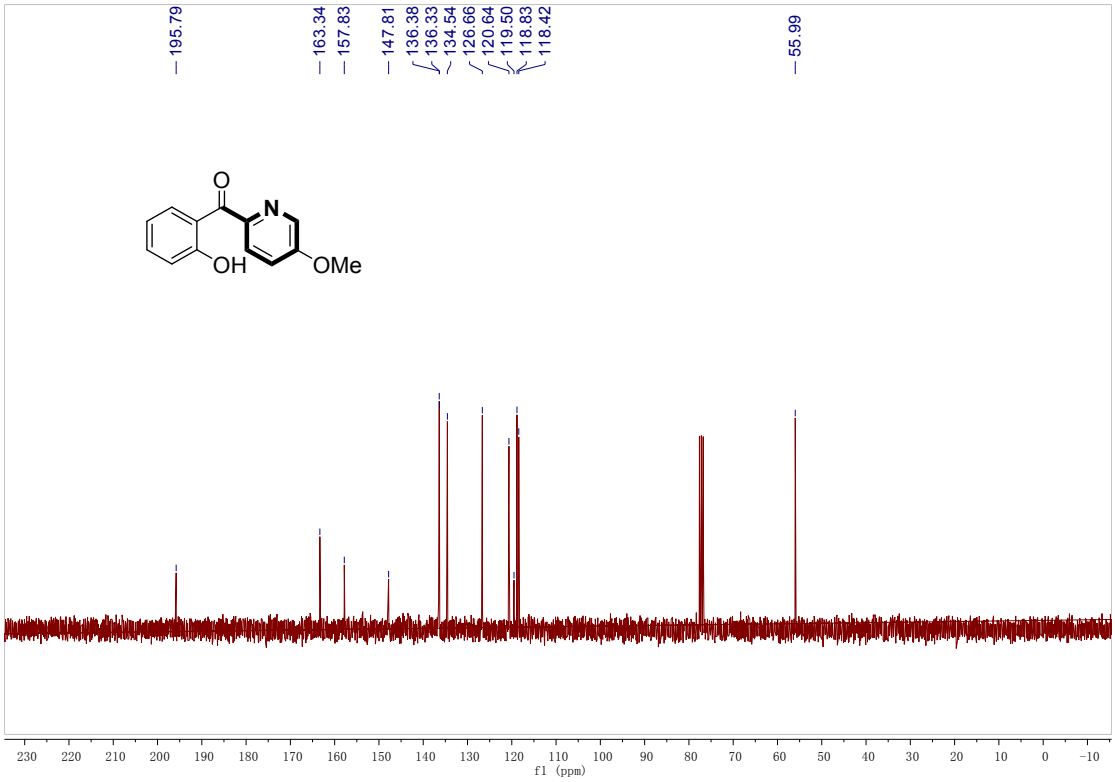
^{1}H and ^{13}C NMR spectra of compound **2d**



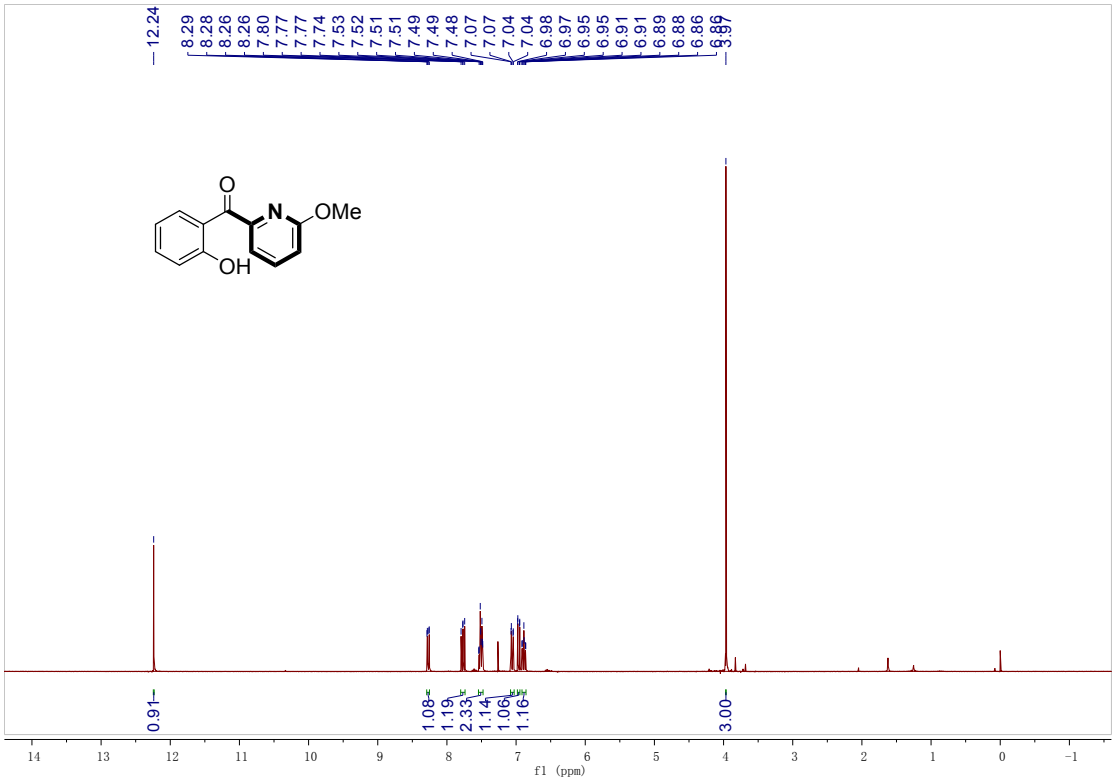


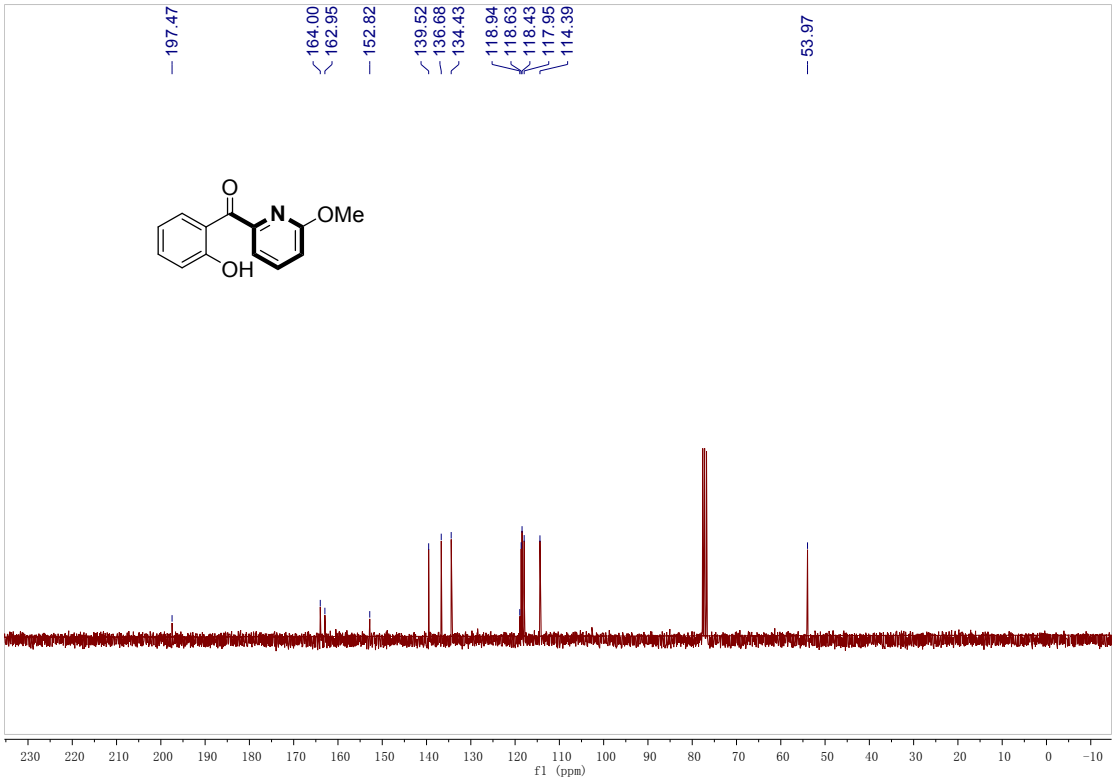
^{1}H and ^{13}C NMR spectra of compound **2e**



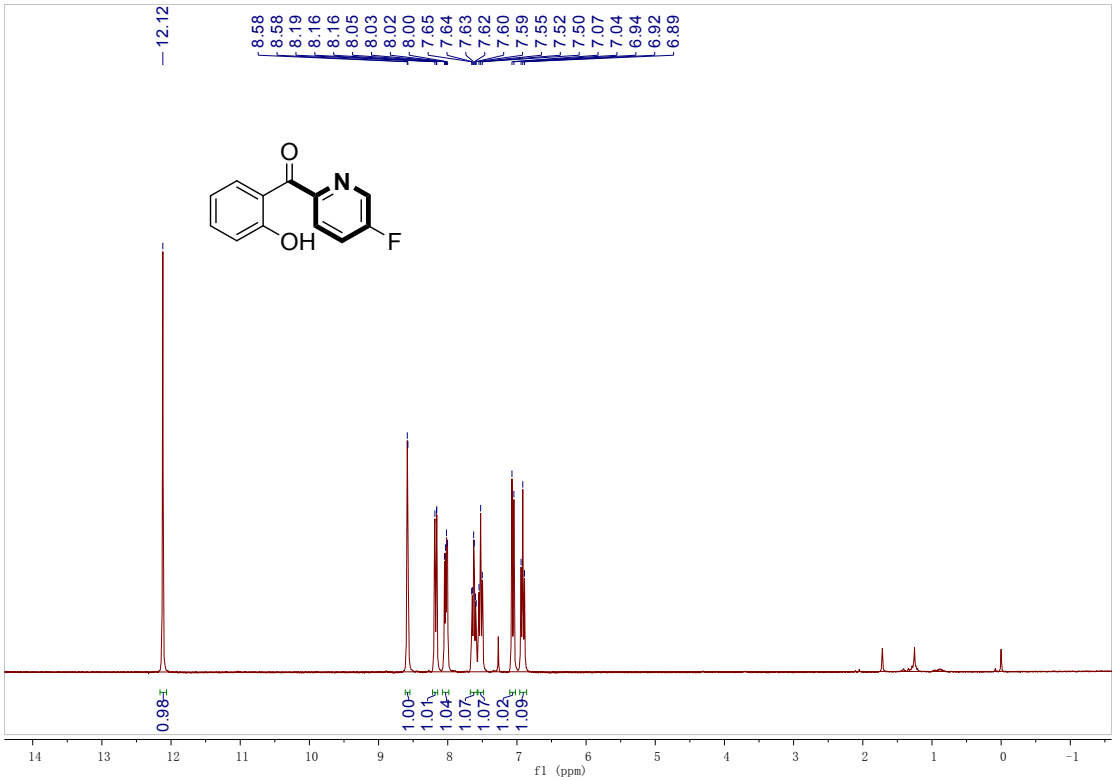


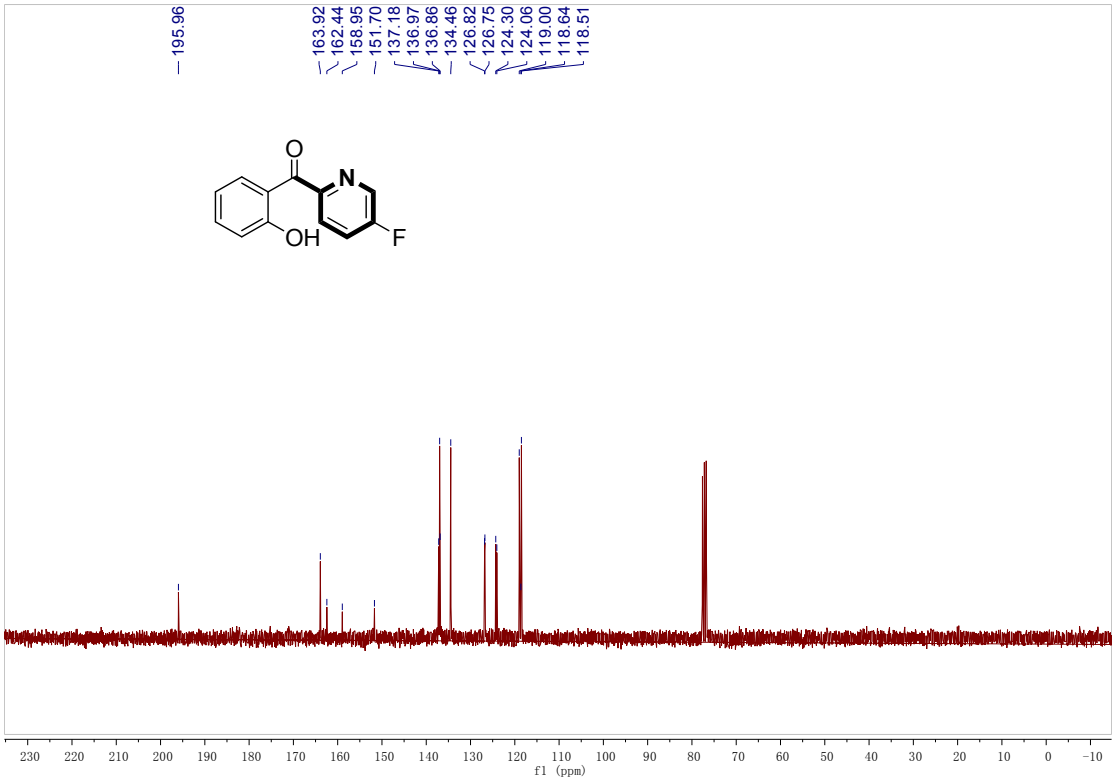
^{1}H and ^{13}C NMR spectra of compound **2f**



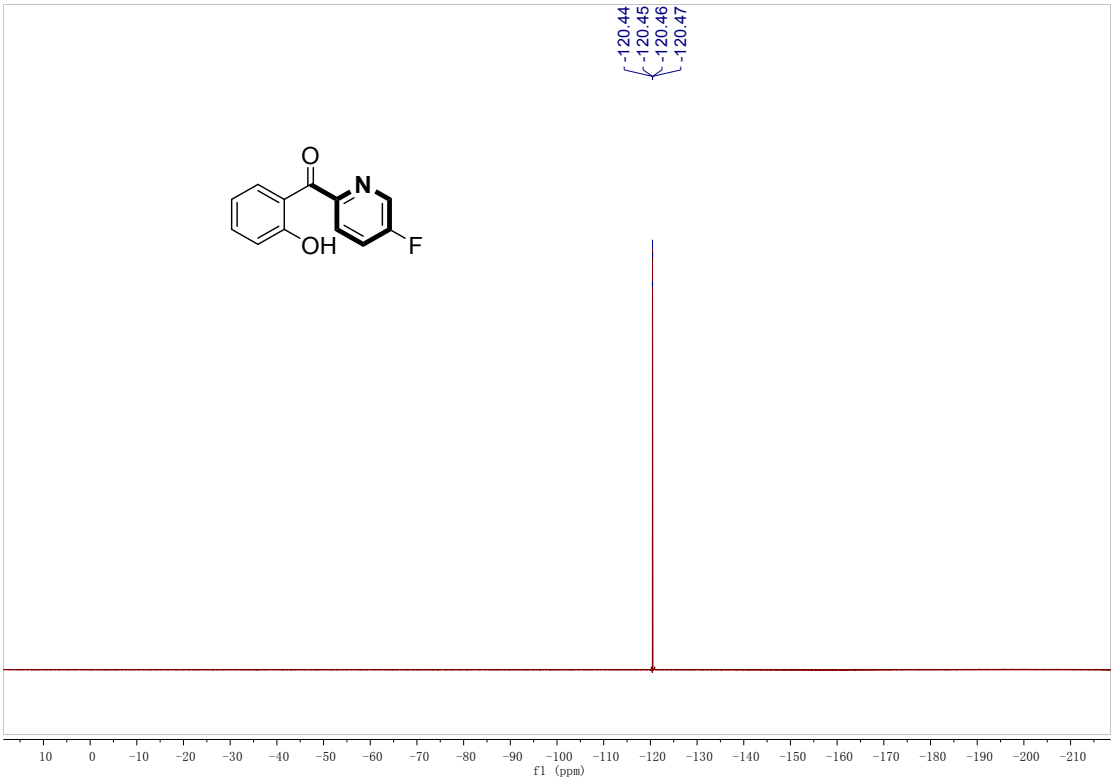


^{1}H and ^{13}C NMR spectra of compound **2g**

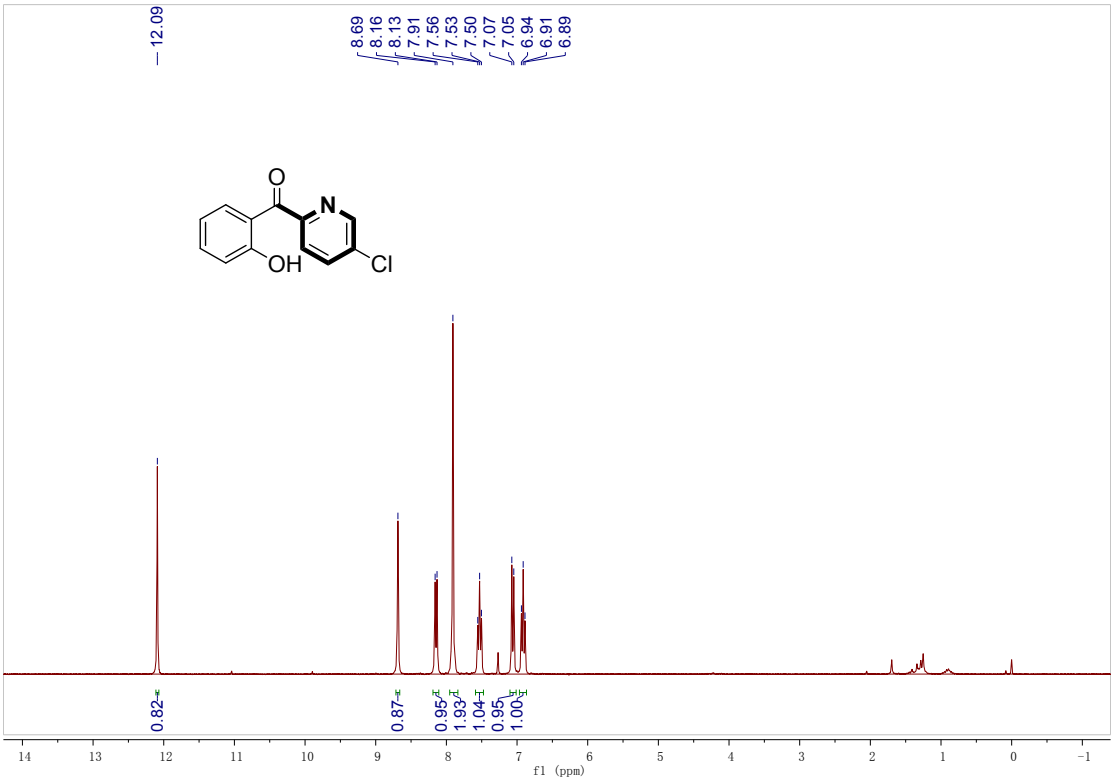


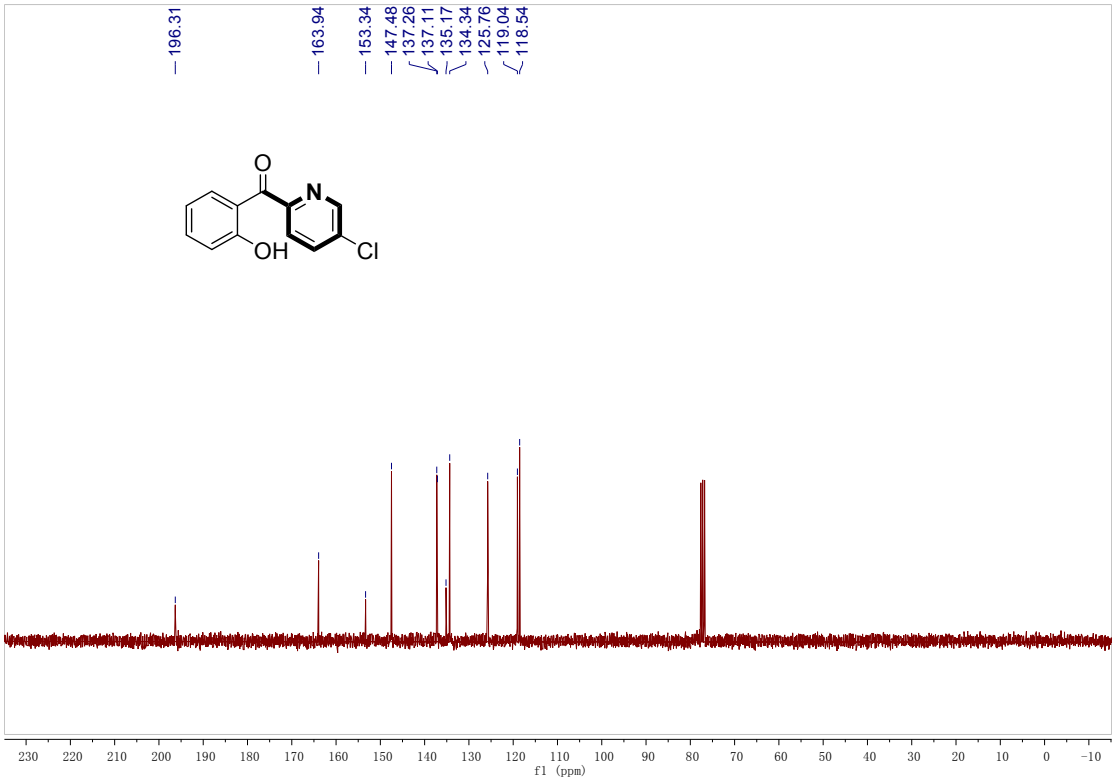


^{19}F NMR spectra of compound **2g**

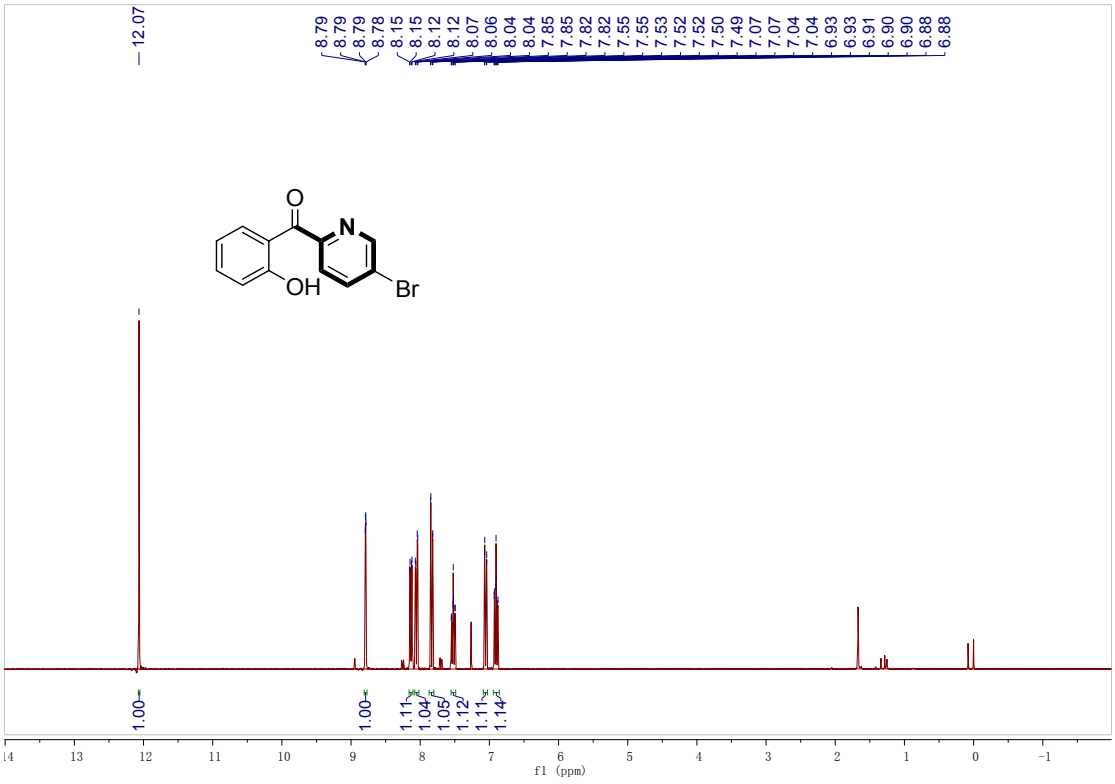


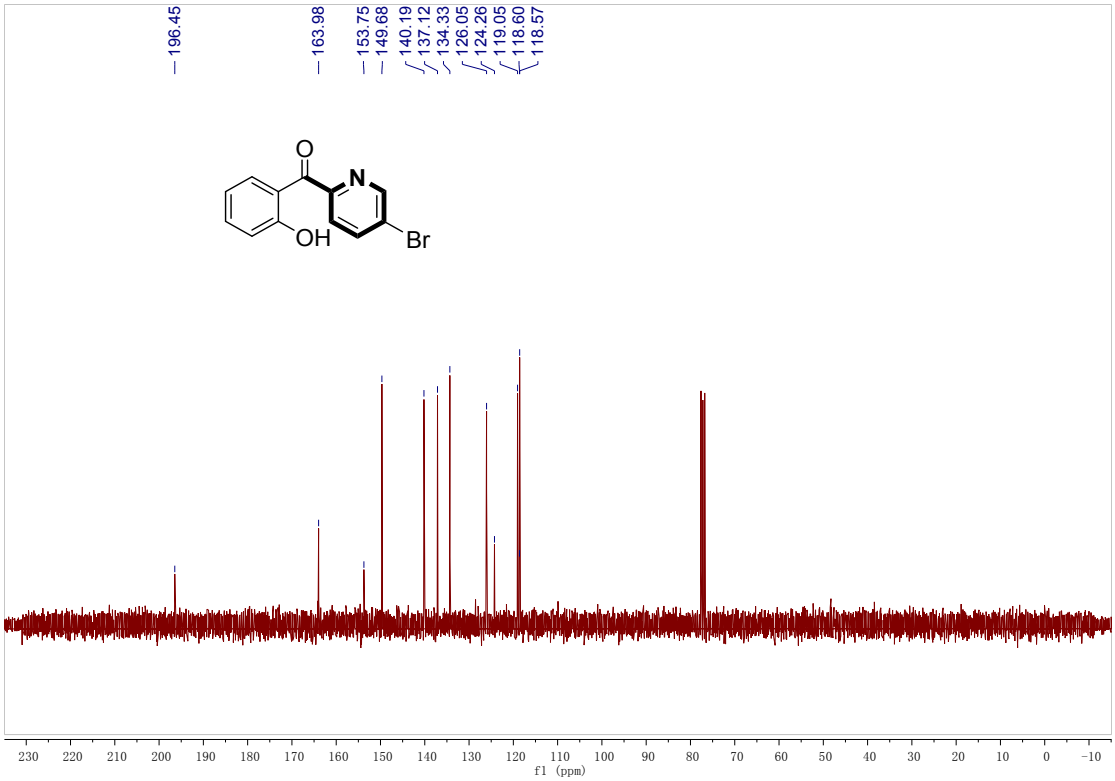
^{1}H and ^{13}C NMR spectra of compound **2h**



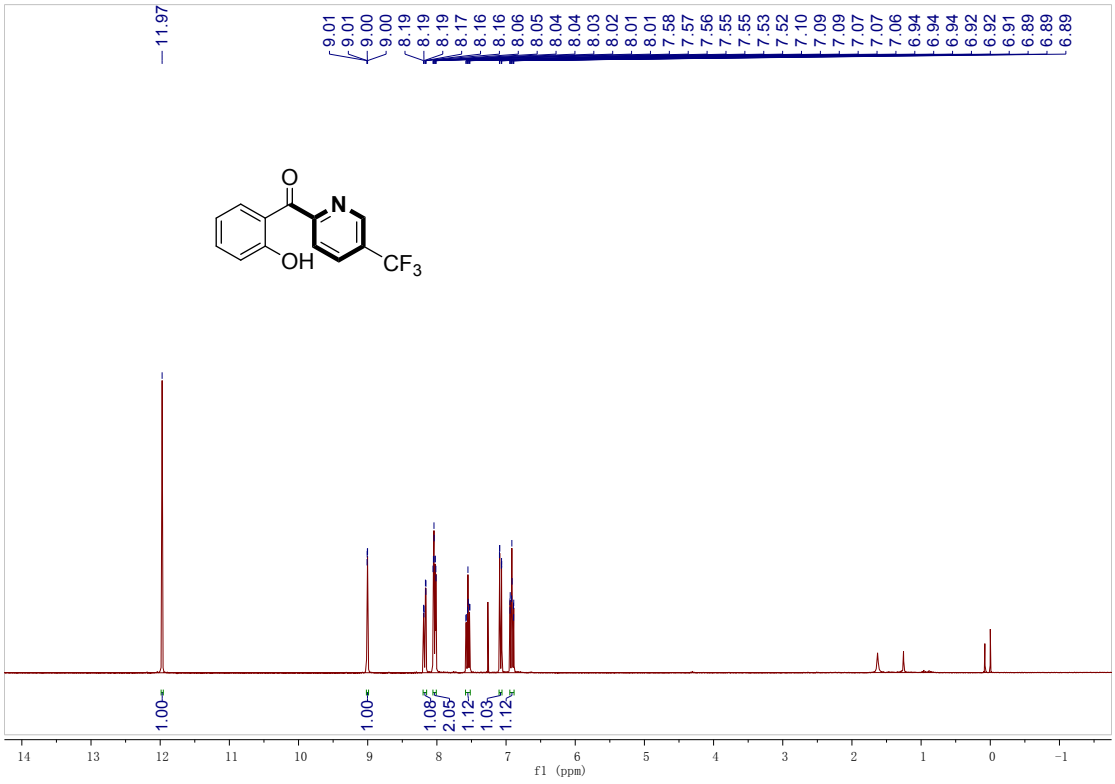


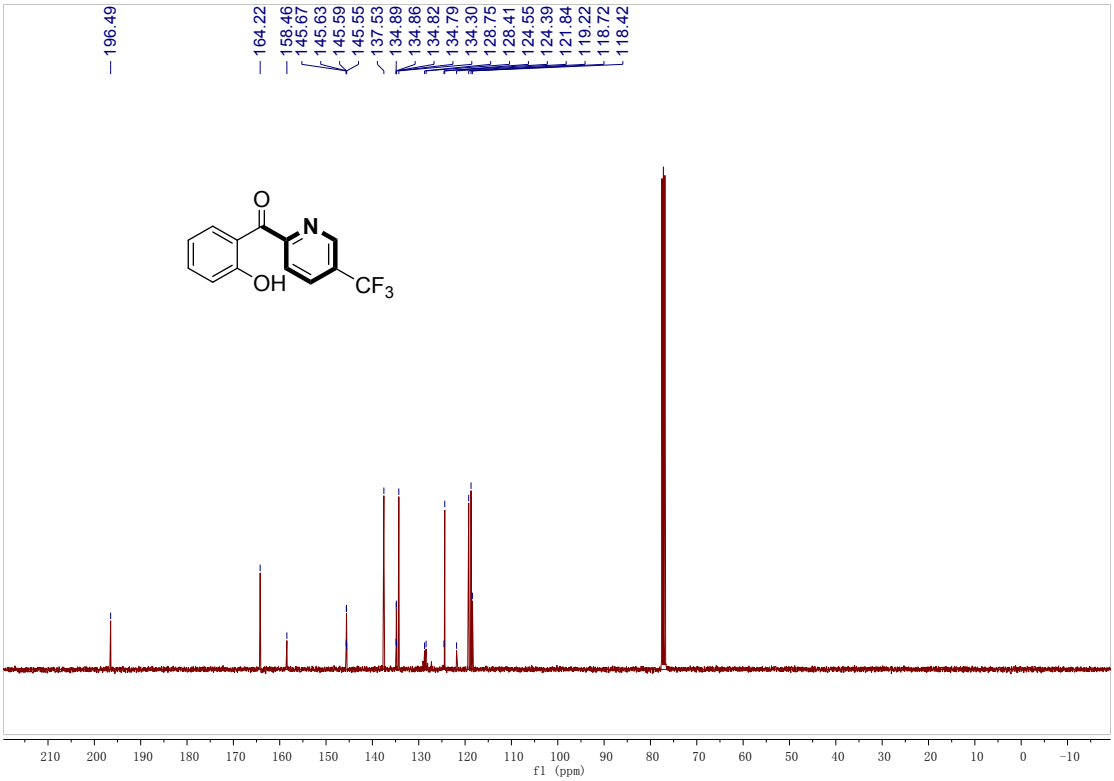
^{1}H and ^{13}C NMR spectra of compound **2i**



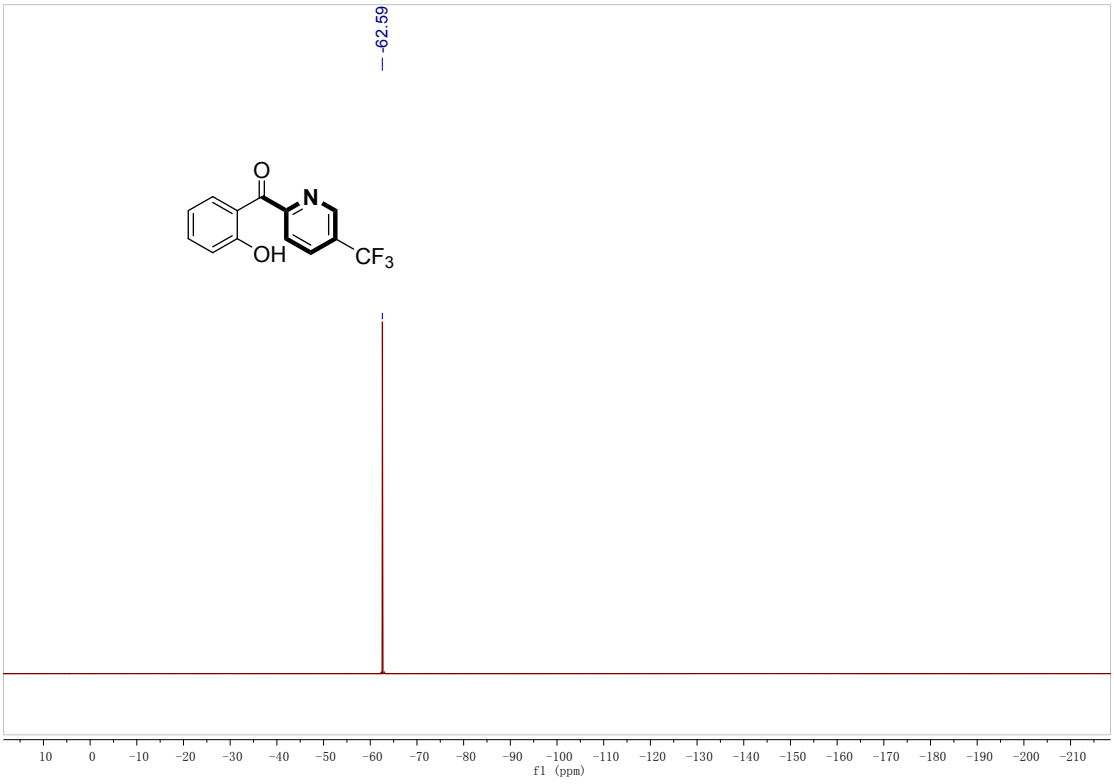


^{1}H and ^{13}C NMR spectra of compound **2j**

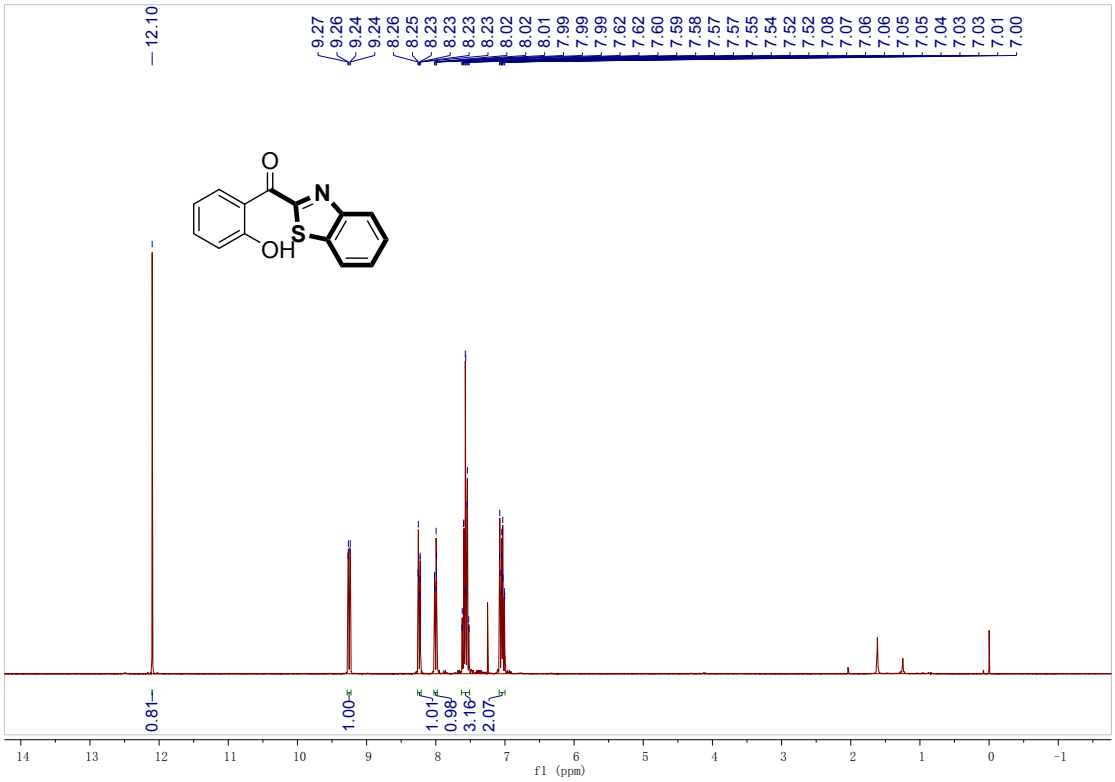


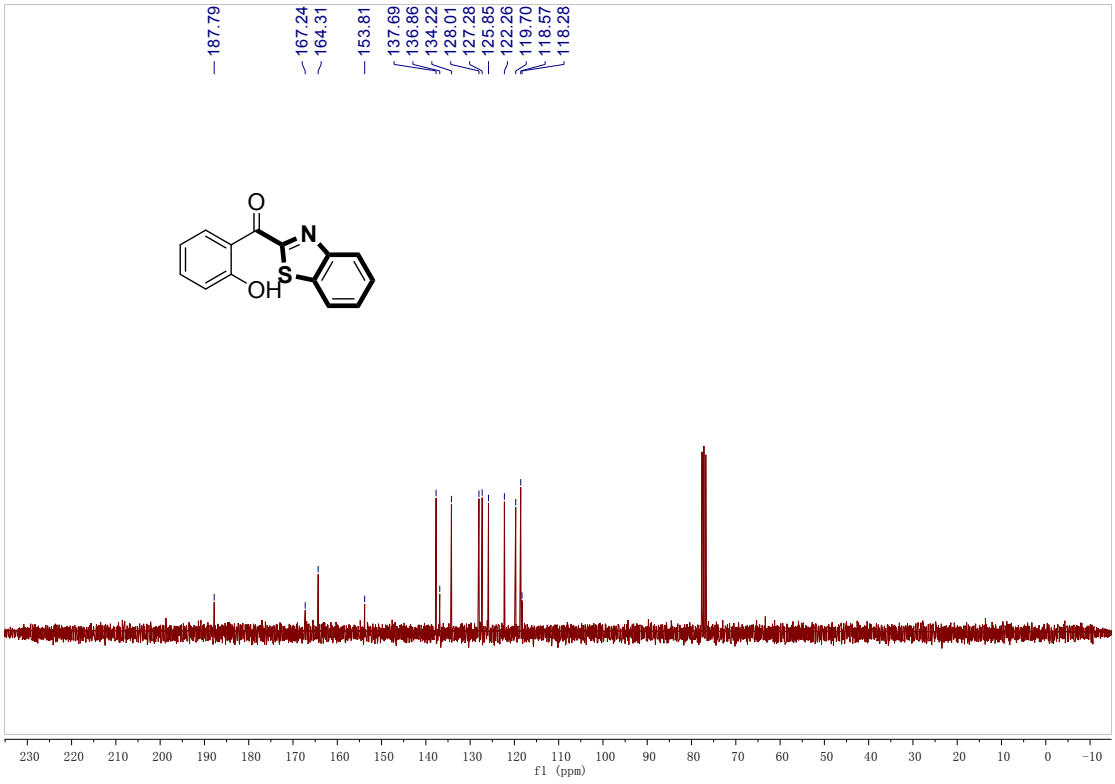


^{19}F NMR spectra of compound **2j**

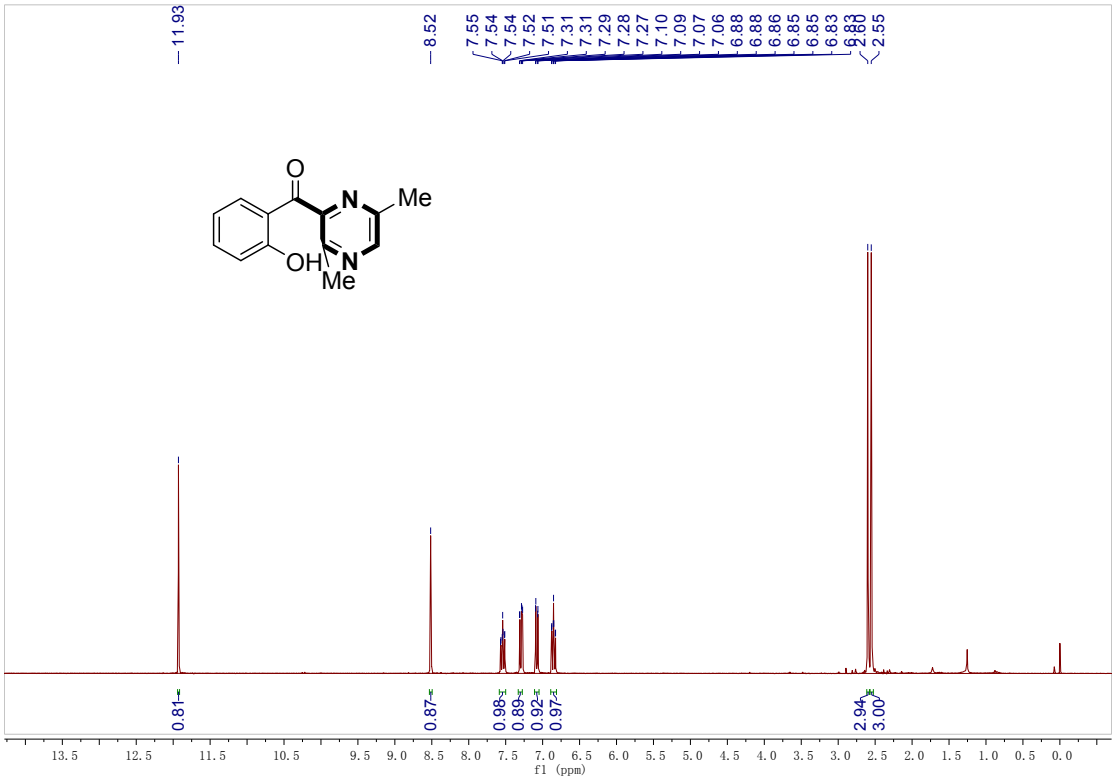


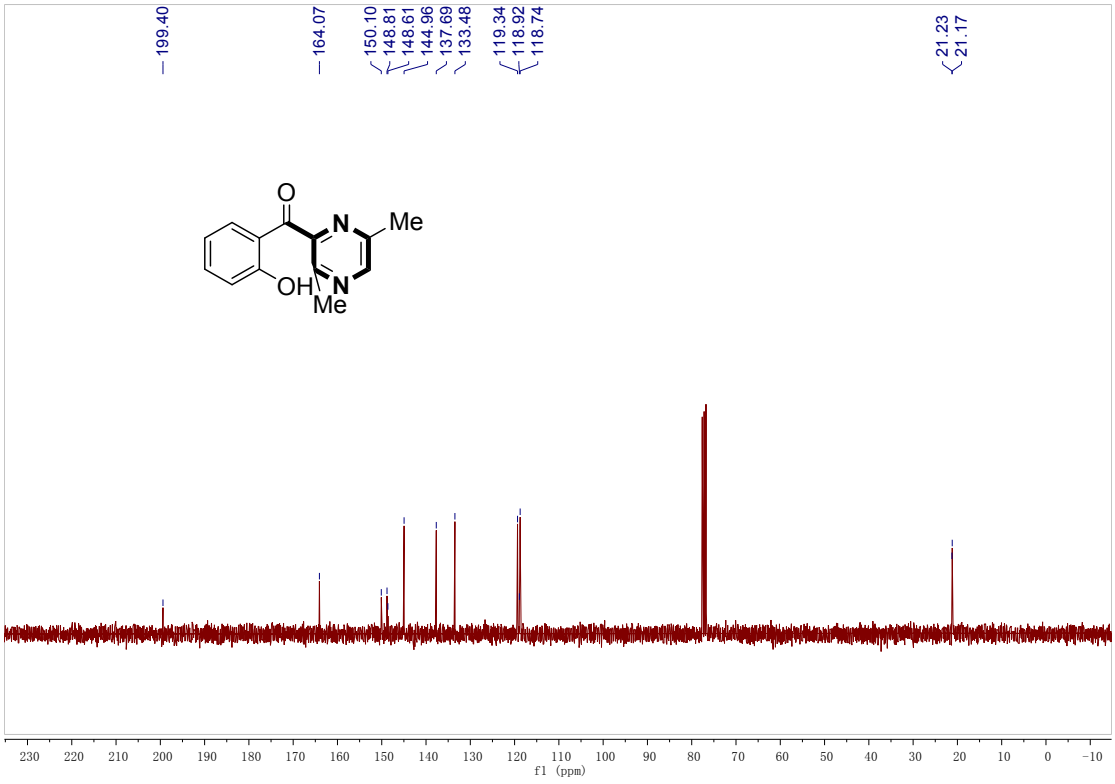
^{1}H and ^{13}C NMR spectra of compound **2k**



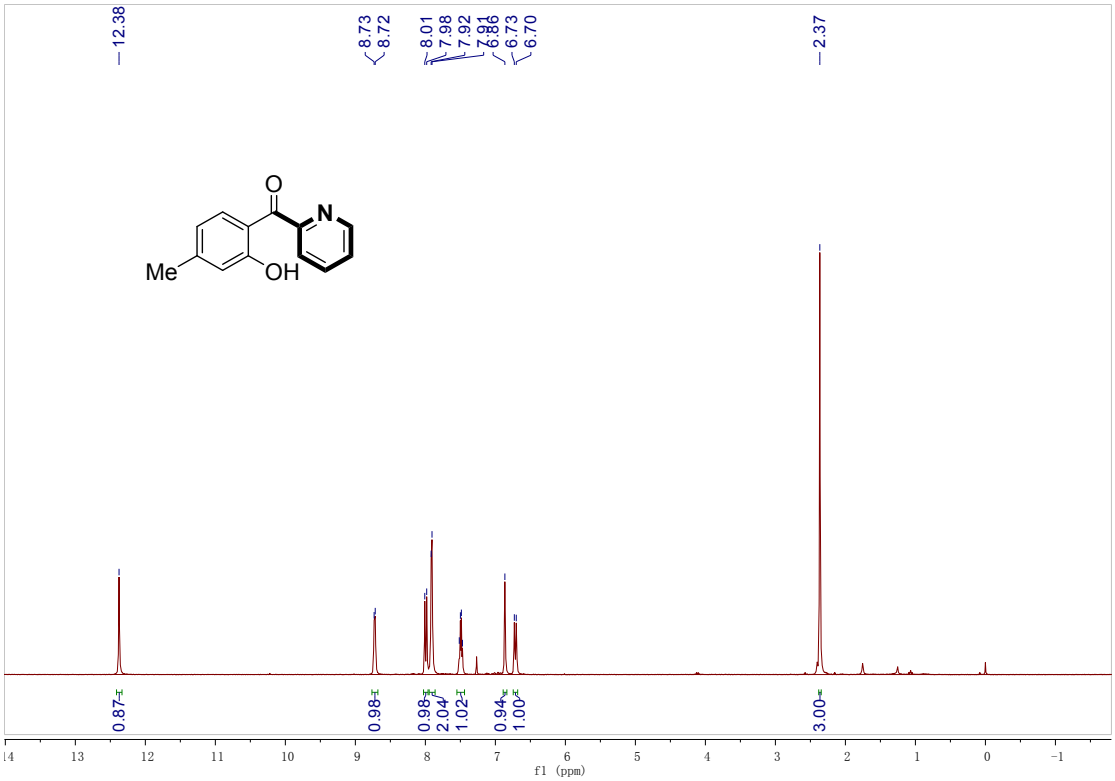


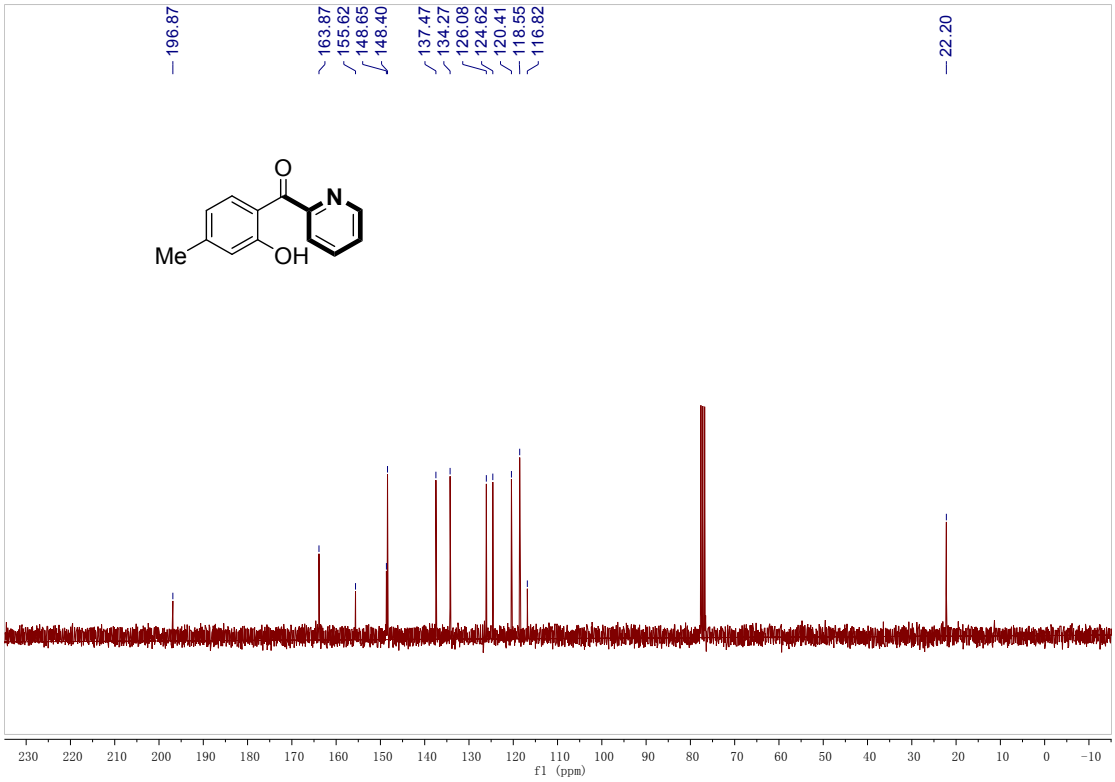
^{1}H and ^{13}C NMR spectra of compound **2l**



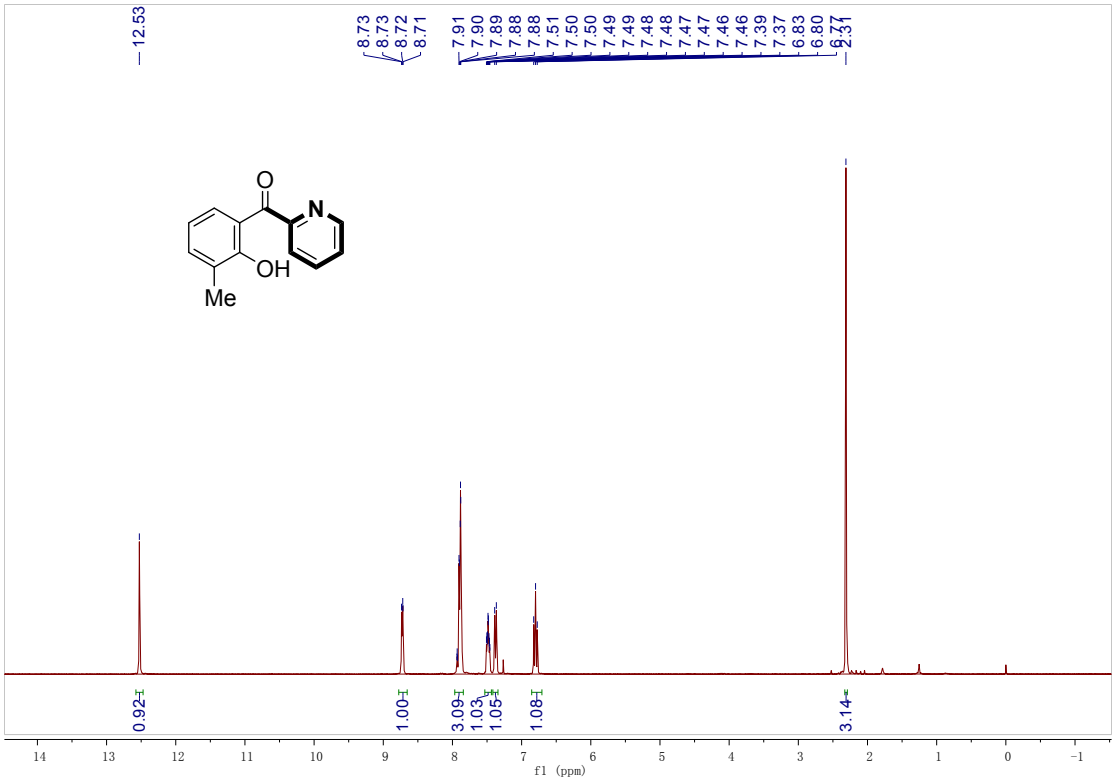


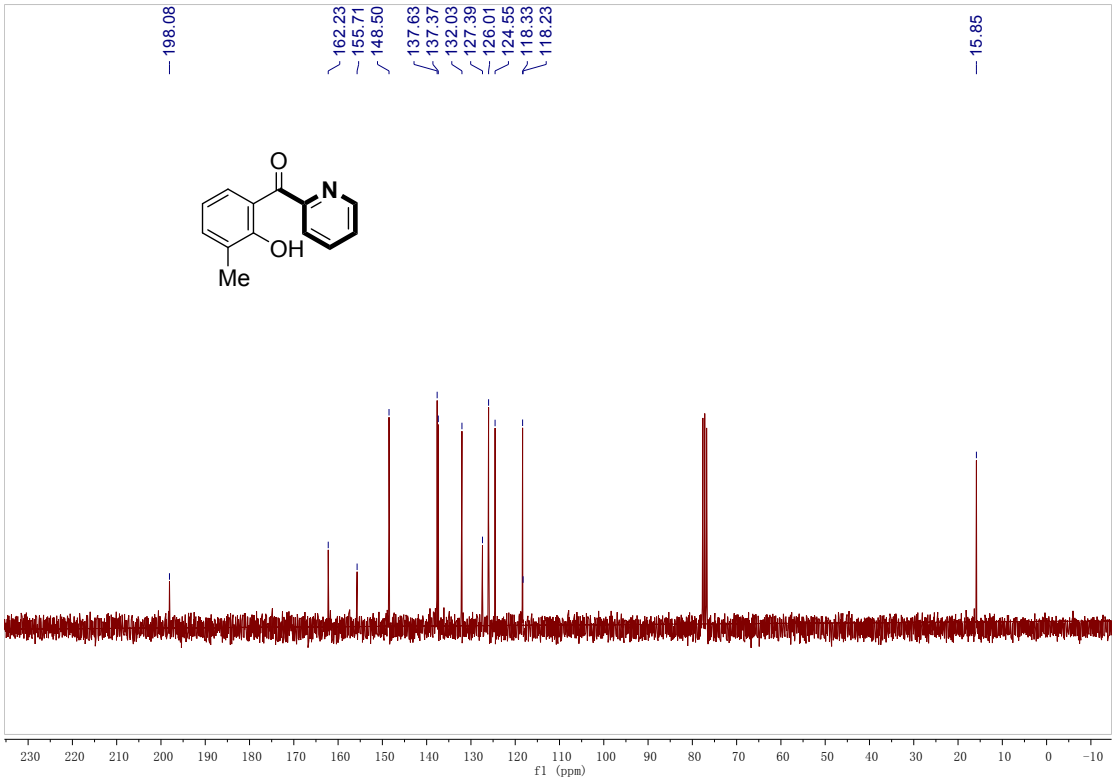
^{1}H and ^{13}C NMR spectra of compound **2m**



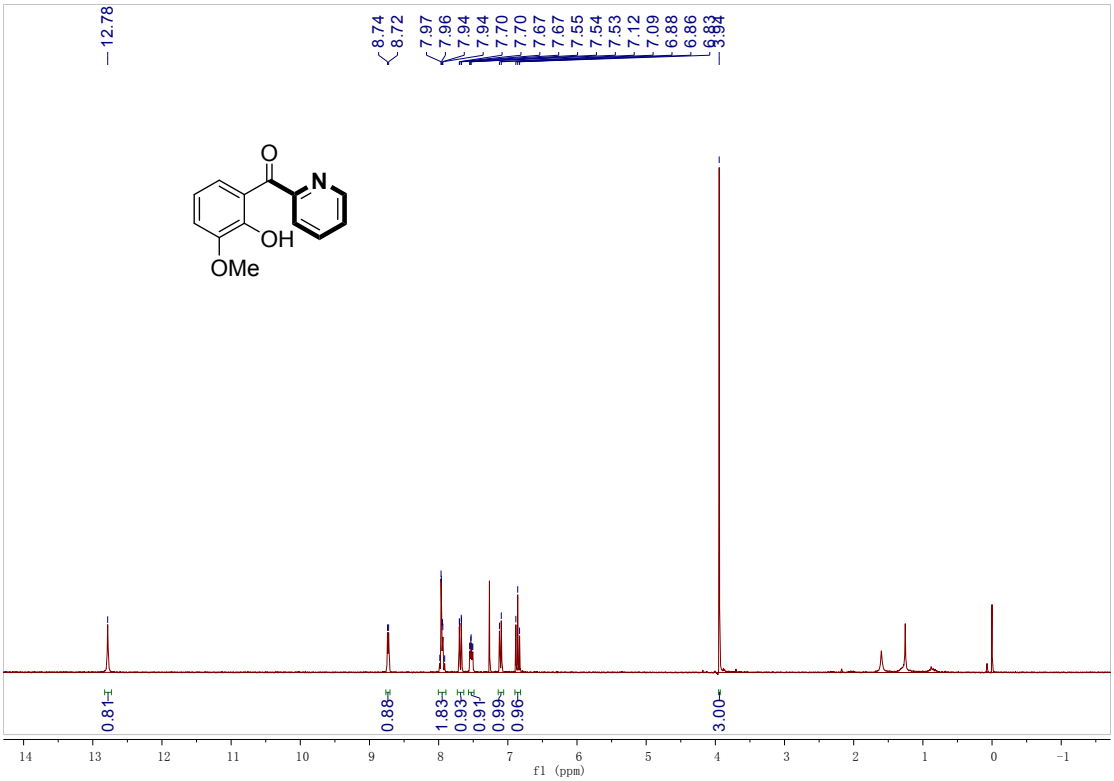


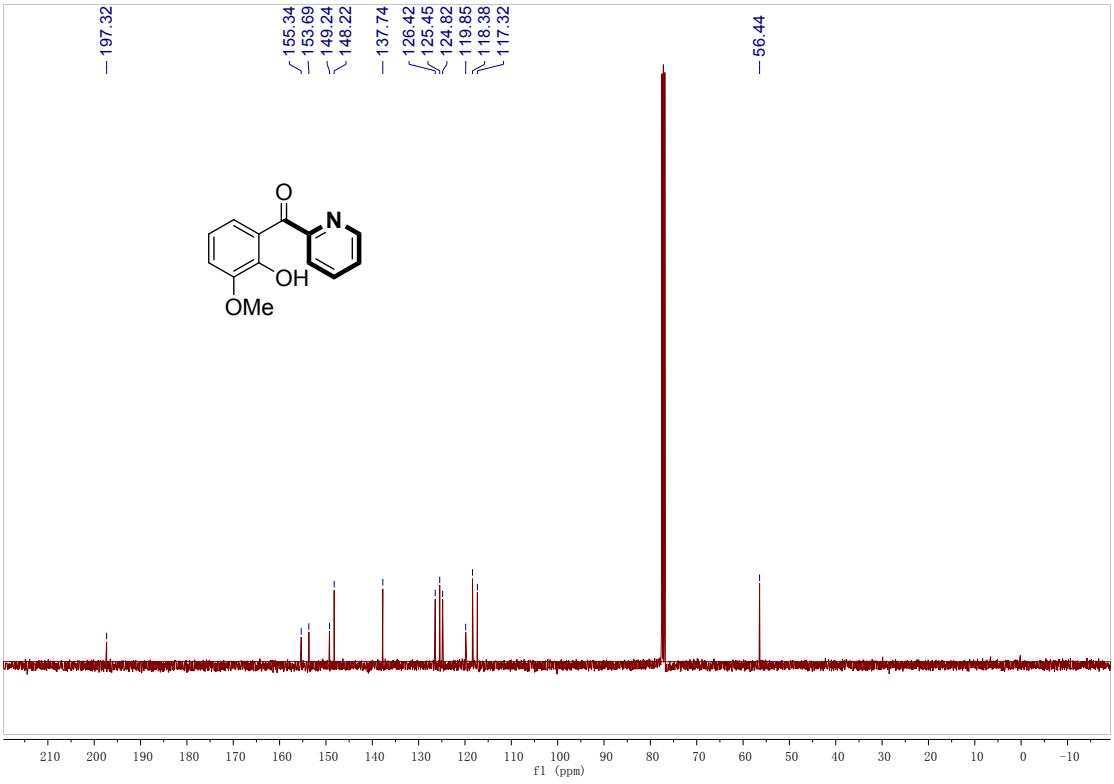
^{1}H and ^{13}C NMR spectra of compound **2n**



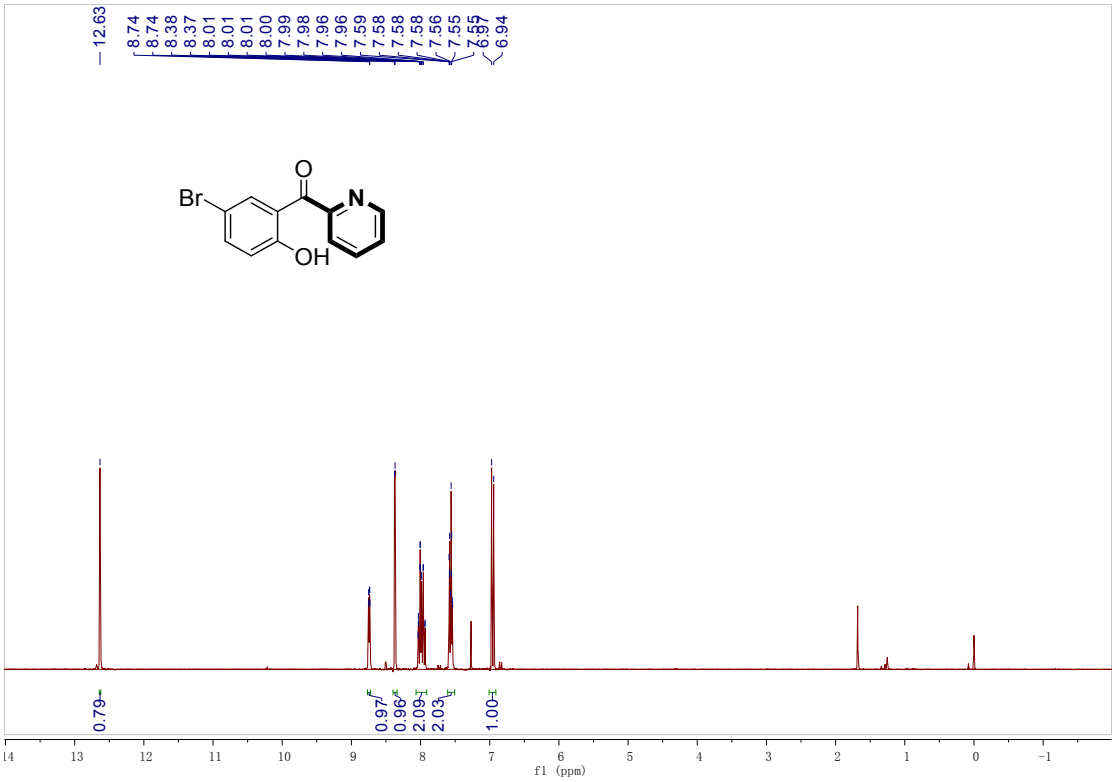


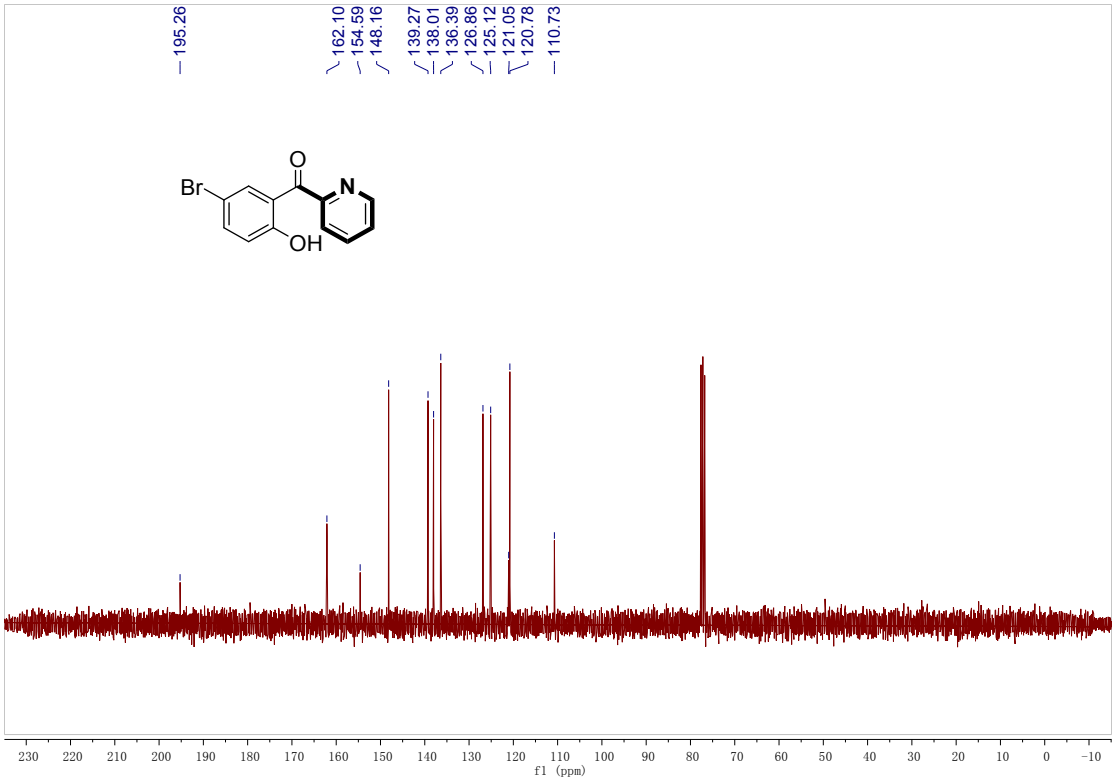
^{1}H and ^{13}C NMR spectra of compound **2o**



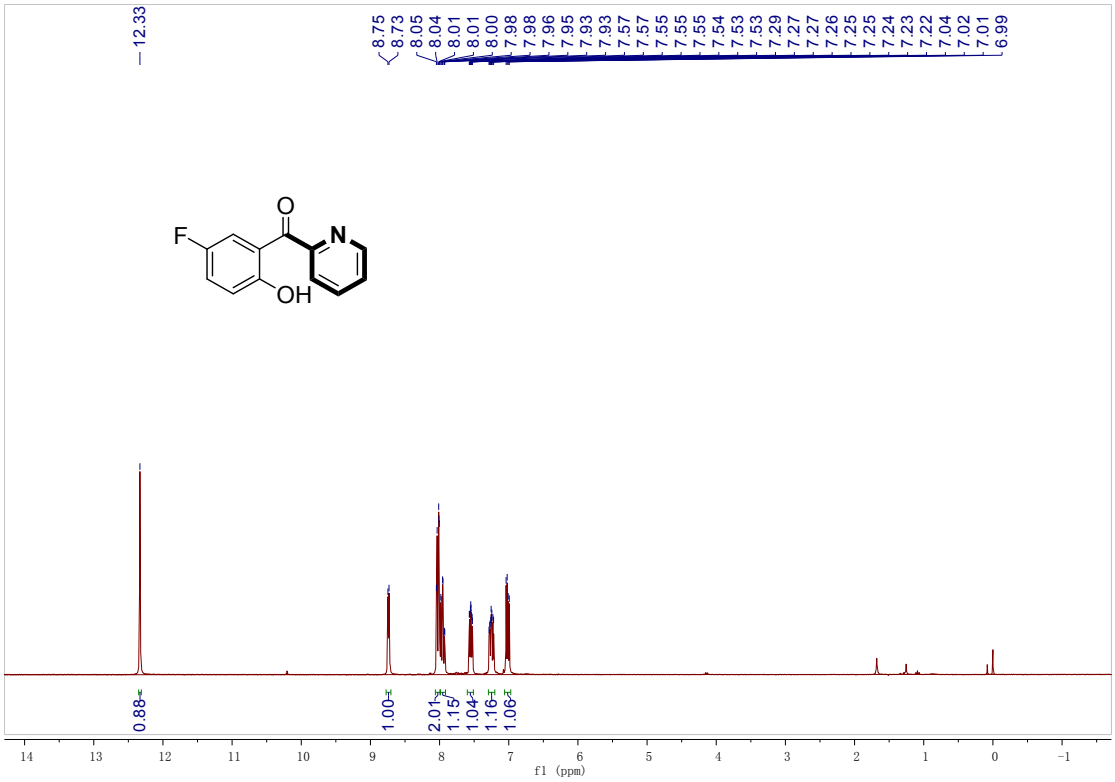


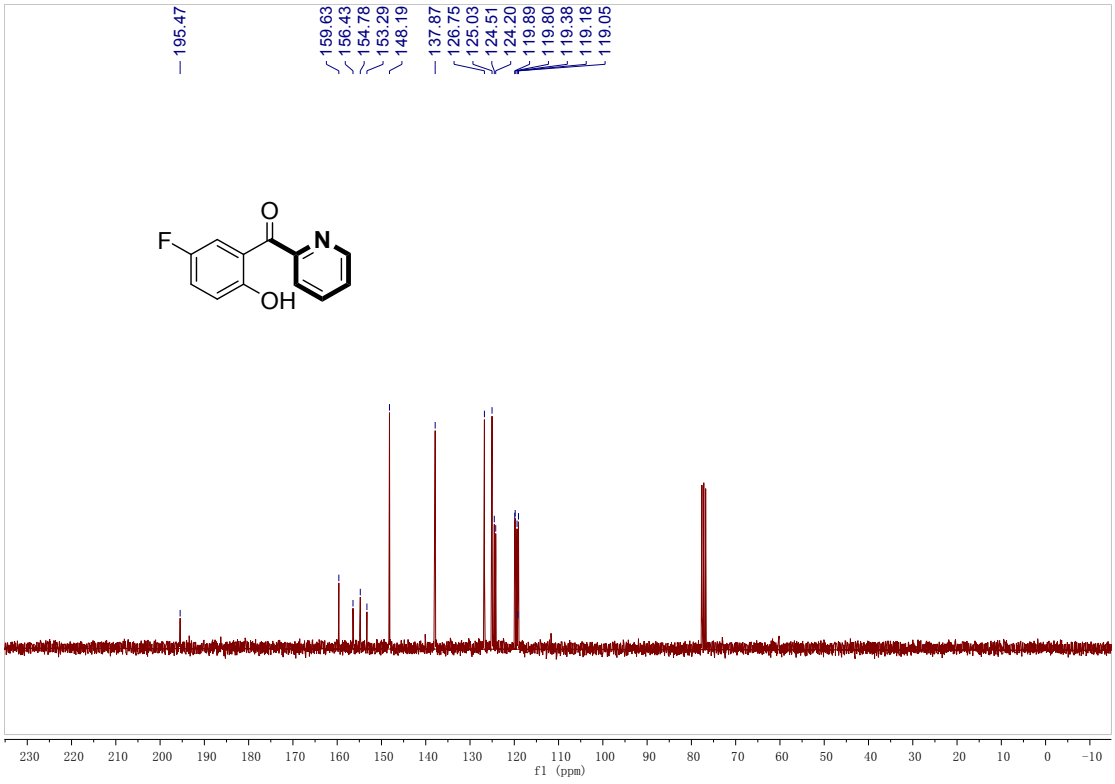
^{1}H and ^{13}C NMR spectra of compound **2p**



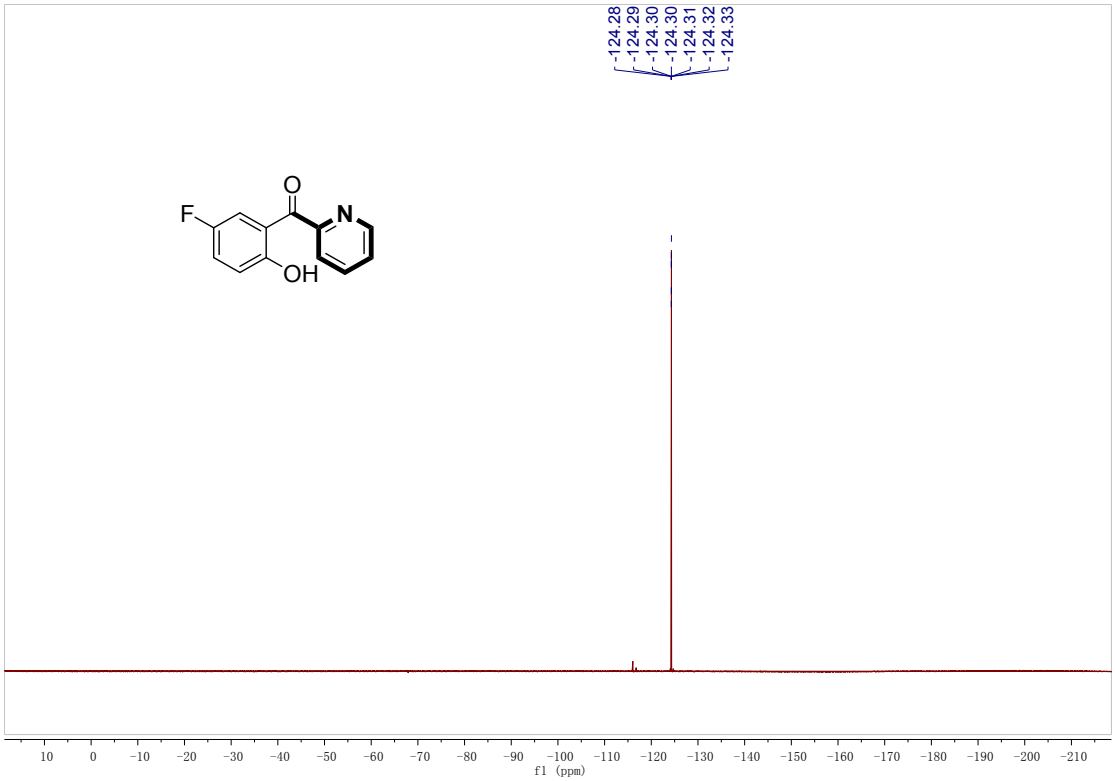


^{1}H and ^{13}C NMR spectra of compound **2q**

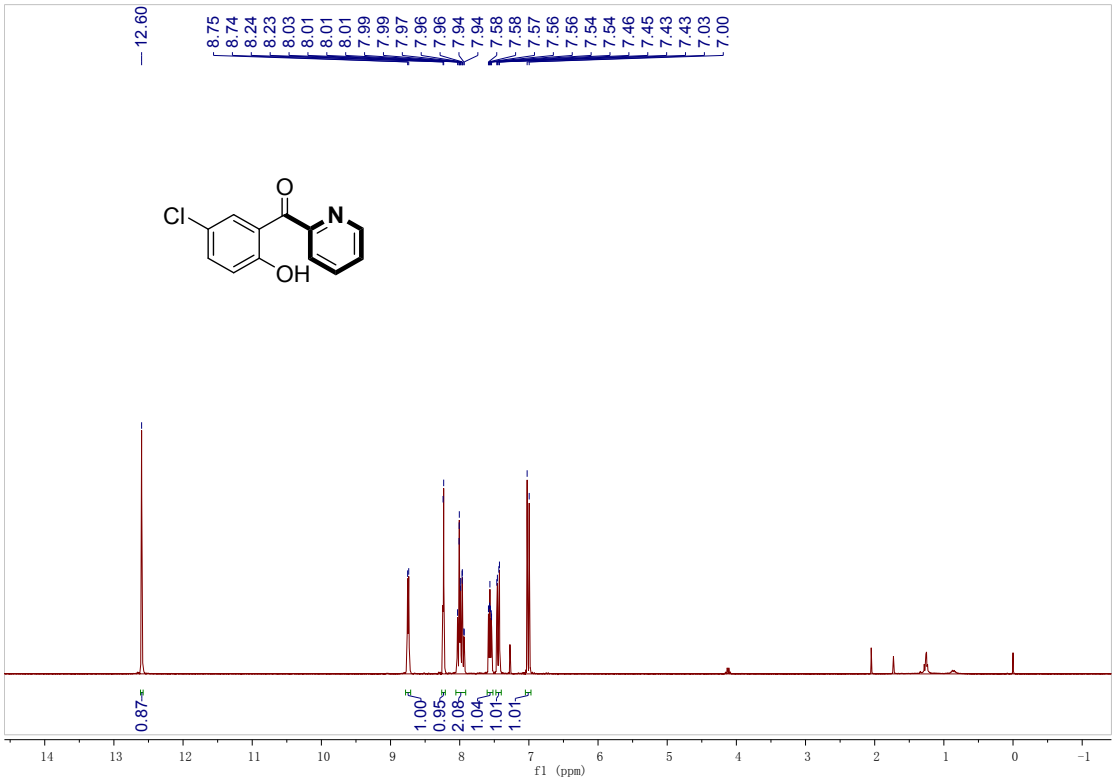


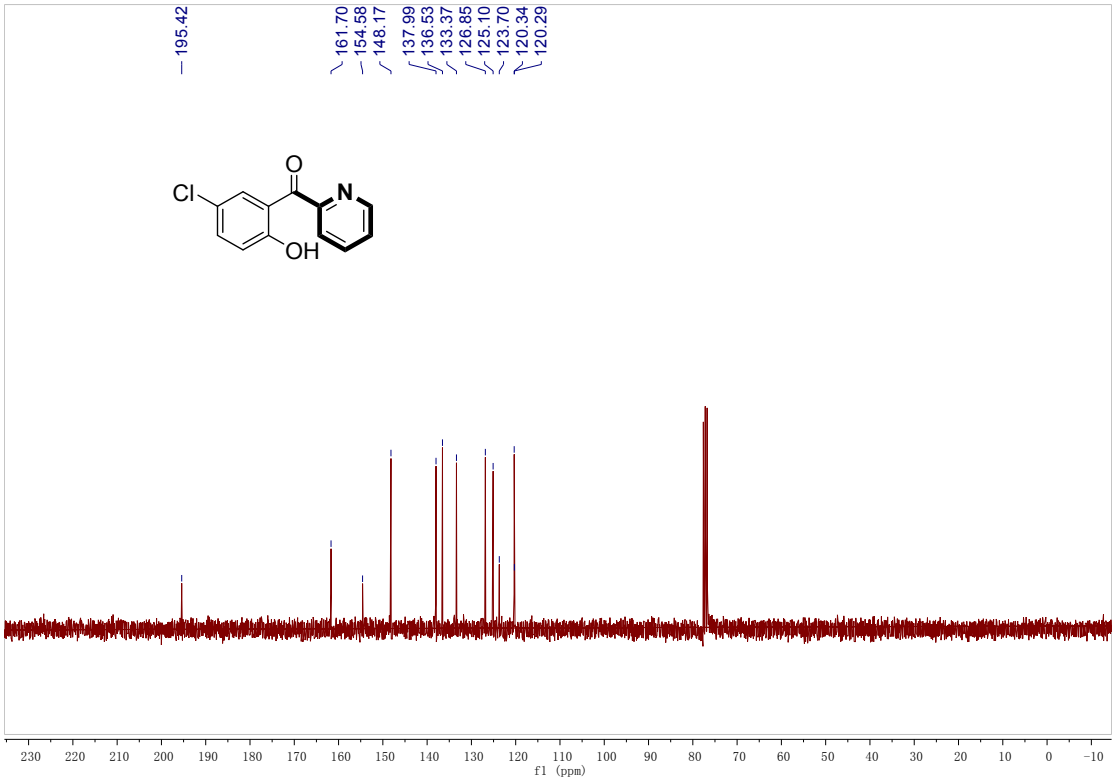


^{19}F NMR spectra of compound **2q**

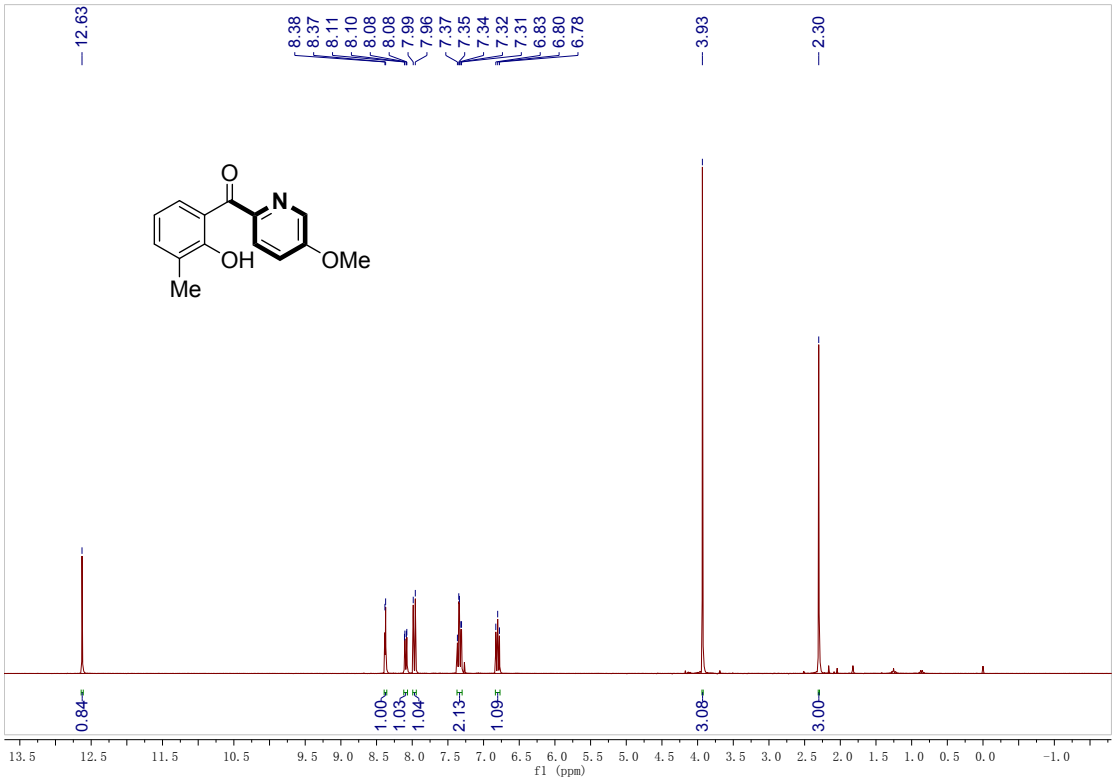


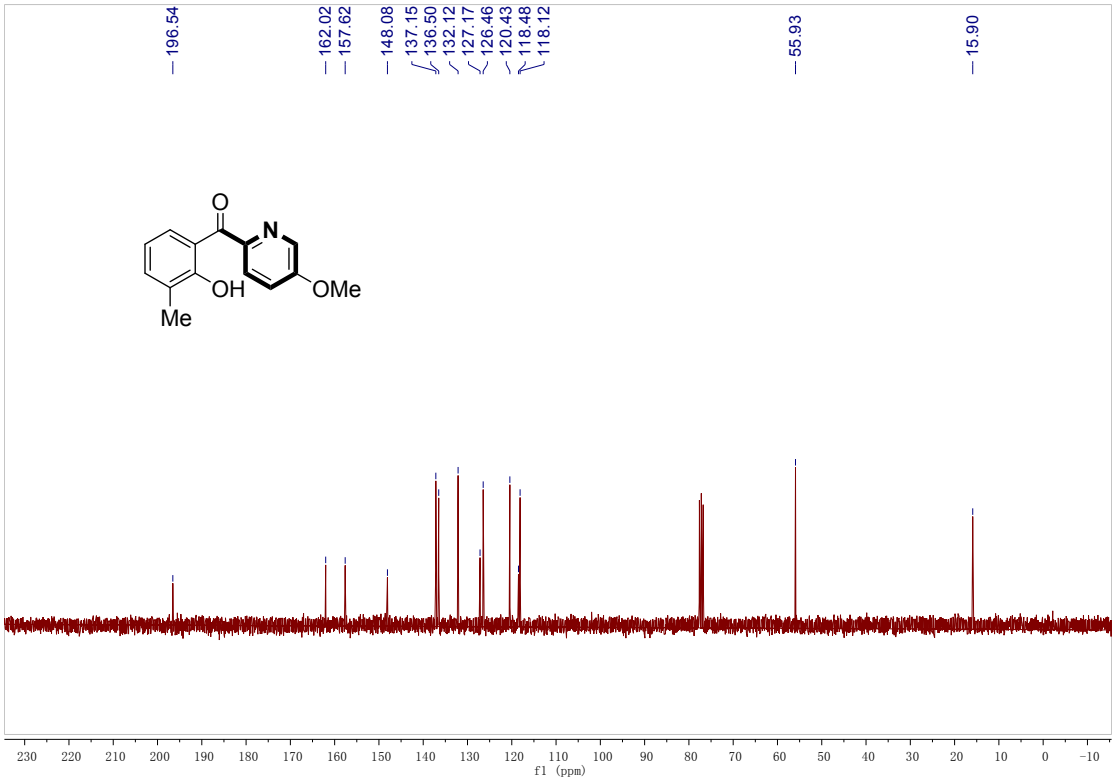
^{1}H and ^{13}C NMR spectra of compound **2r**



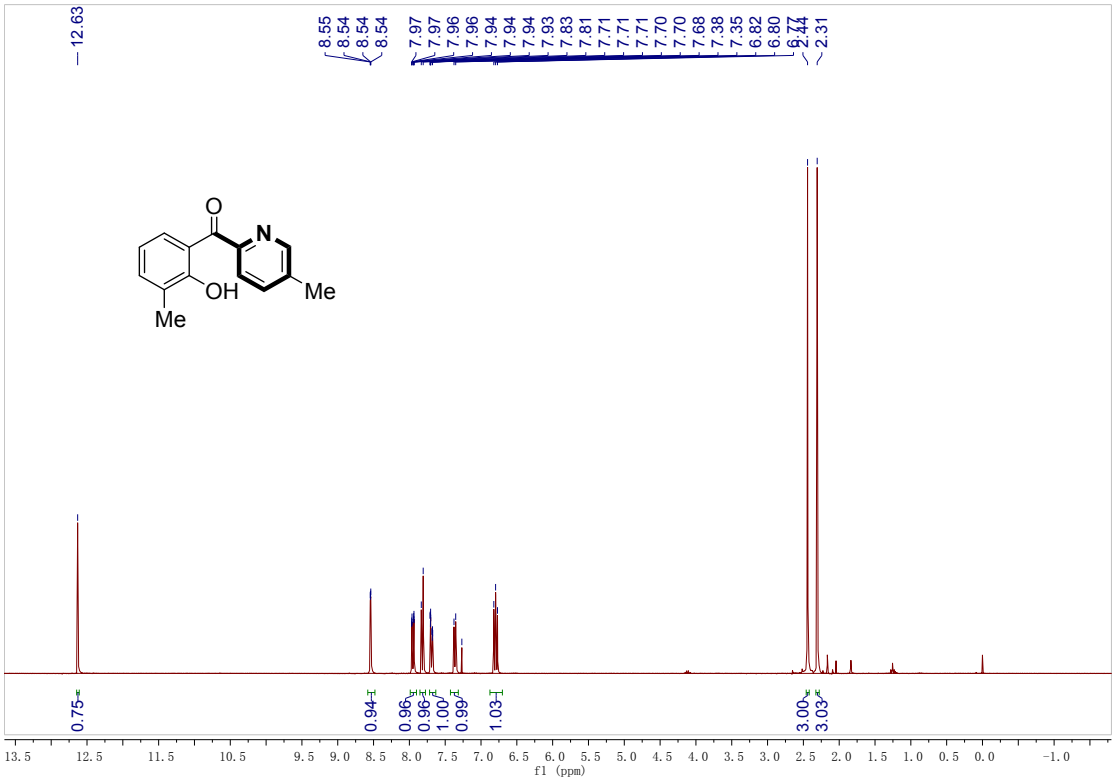


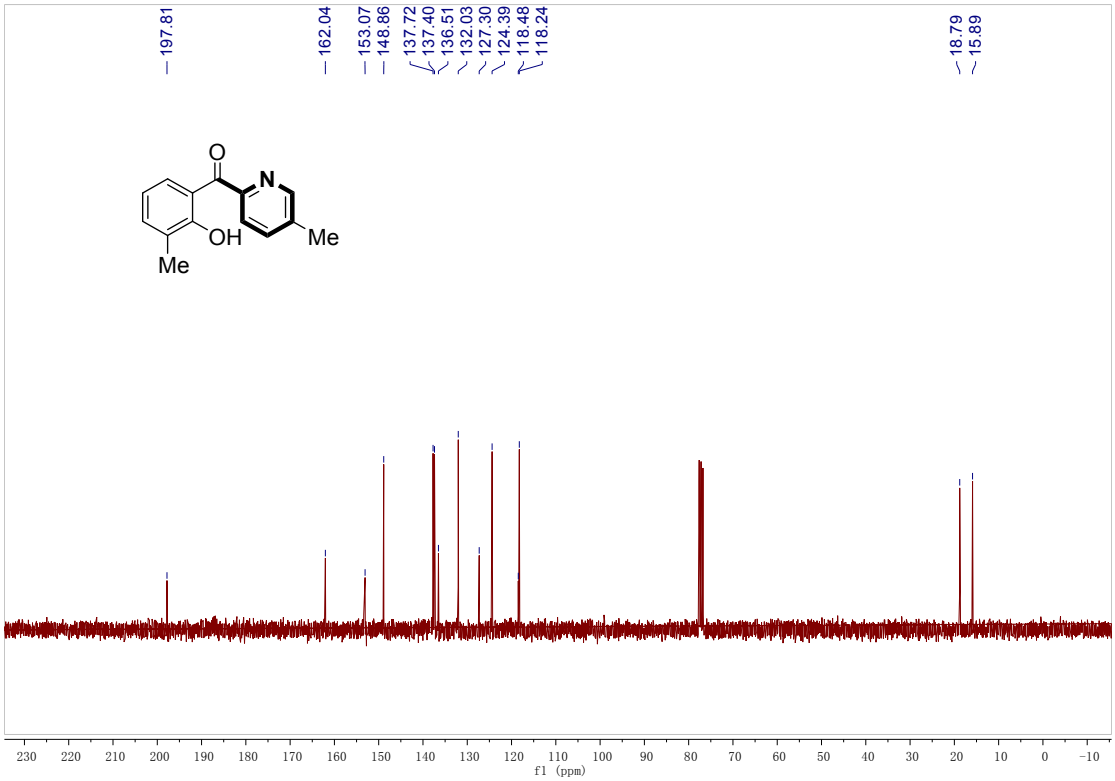
^{1}H and ^{13}C NMR spectra of compound **2s**



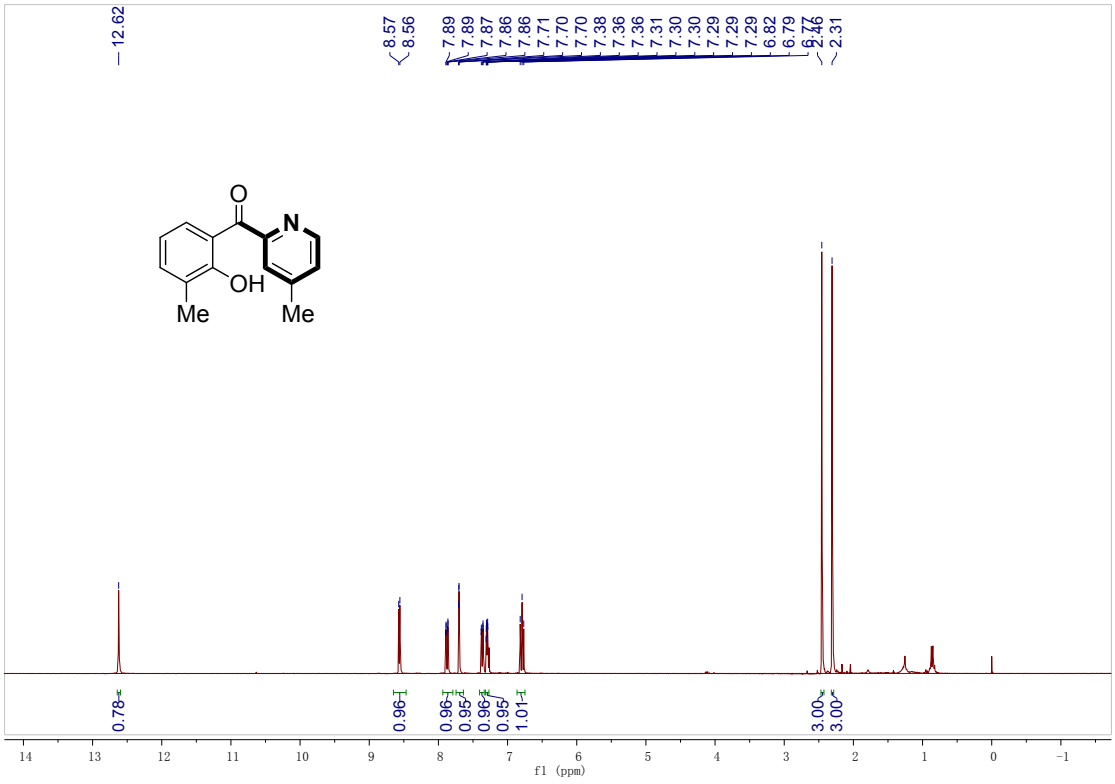


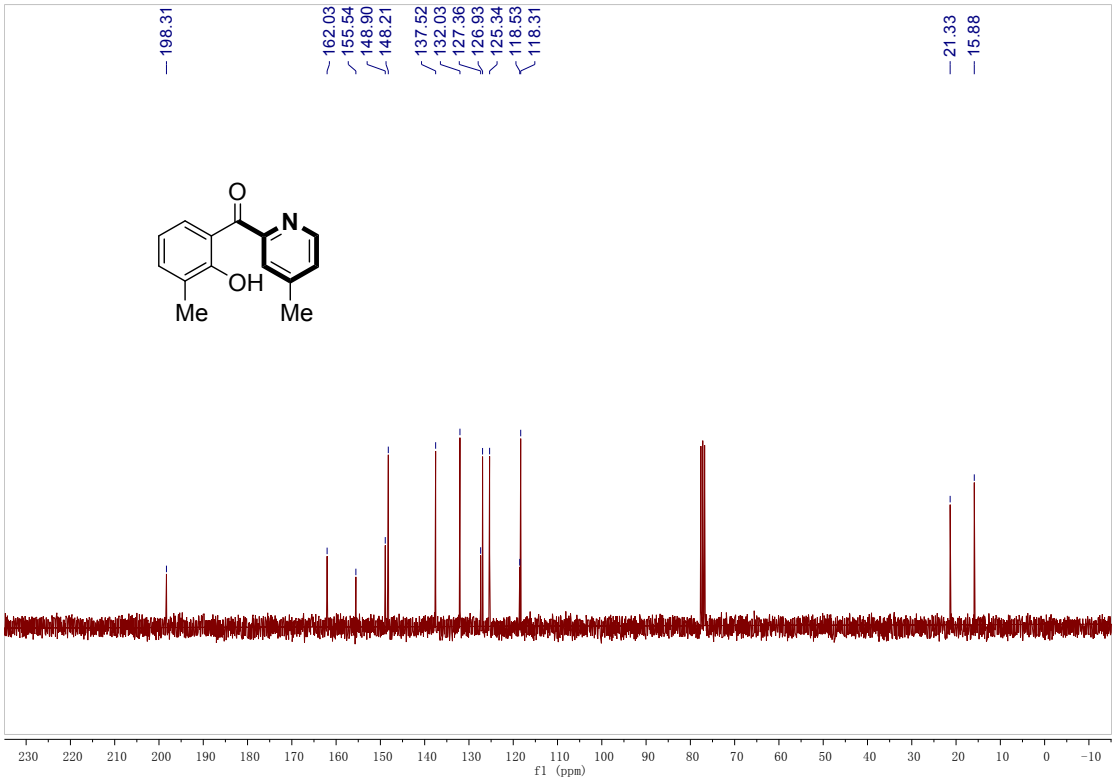
^{1}H and ^{13}C NMR spectra of compound **2t**



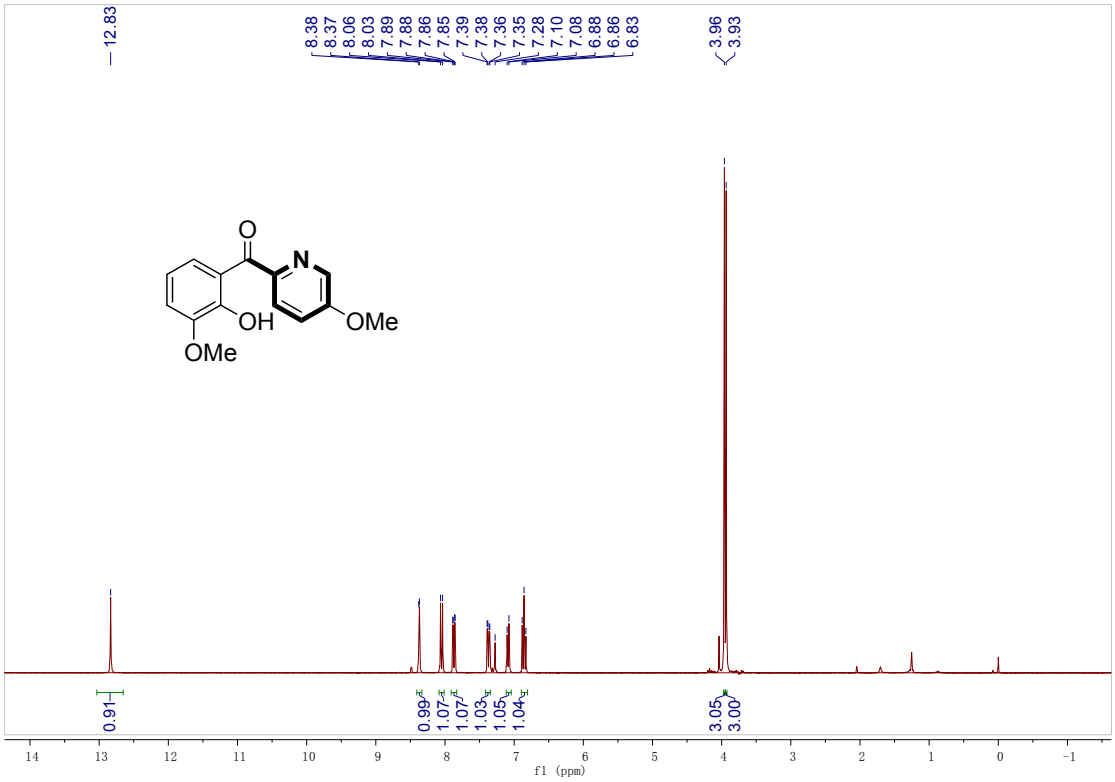


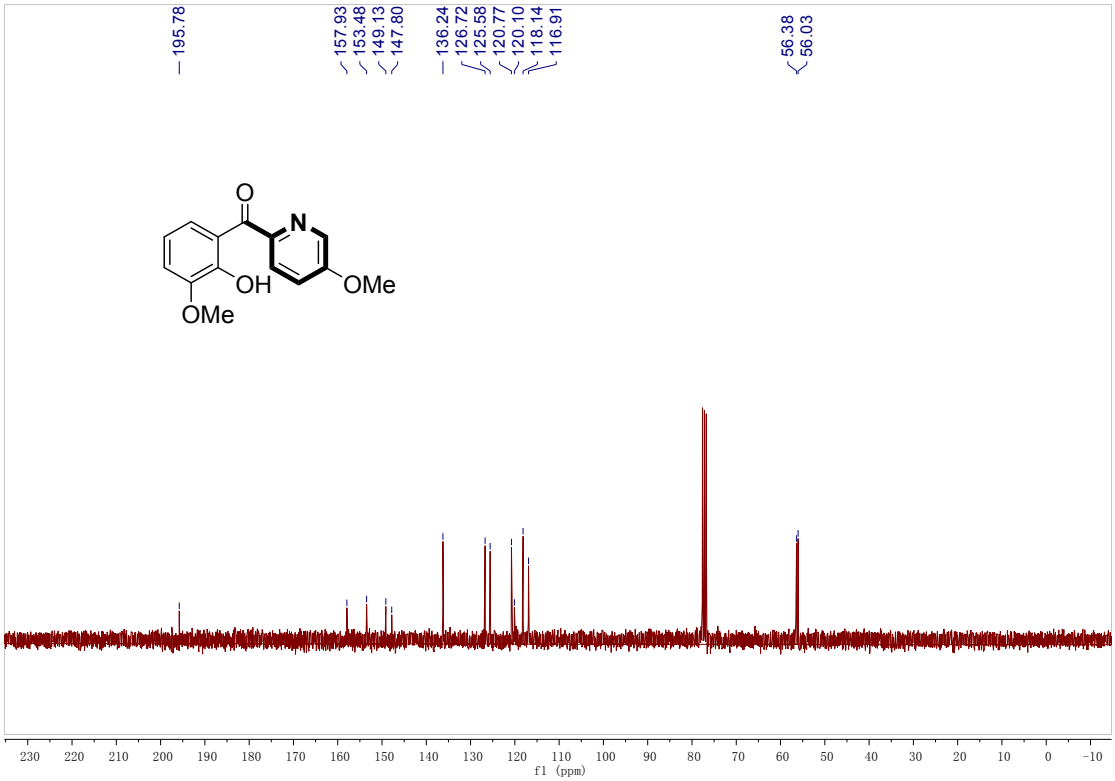
^{1}H and ^{13}C NMR spectra of compound **2u**



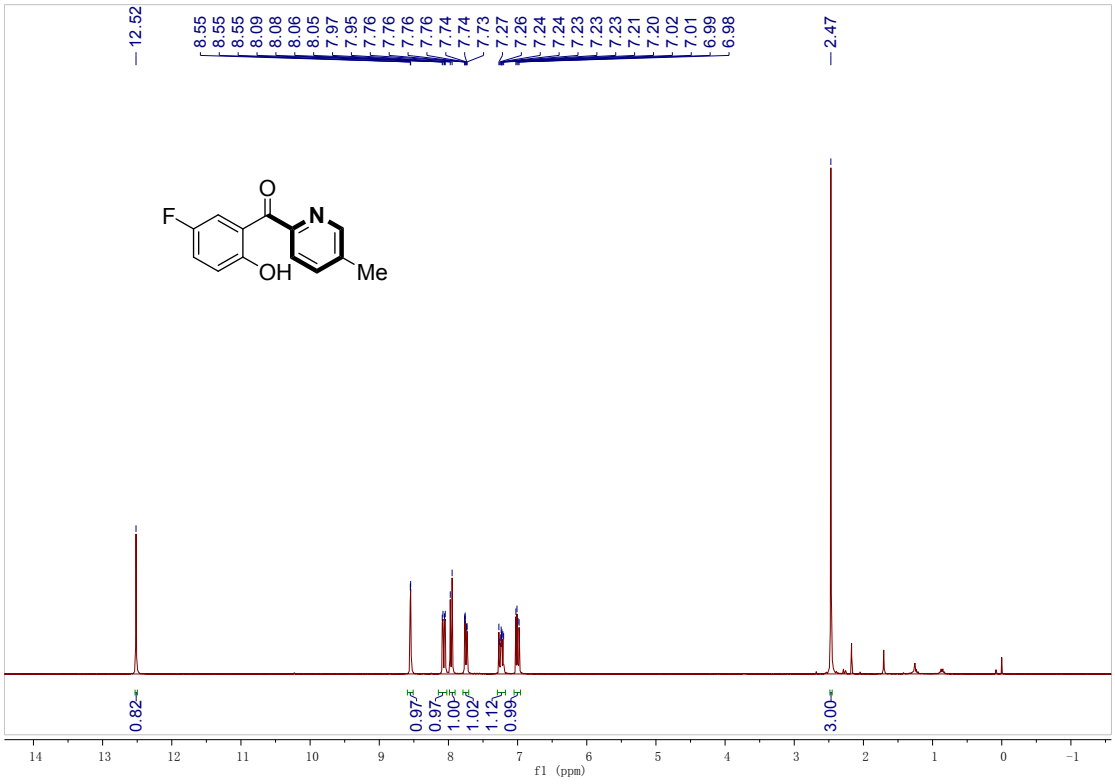


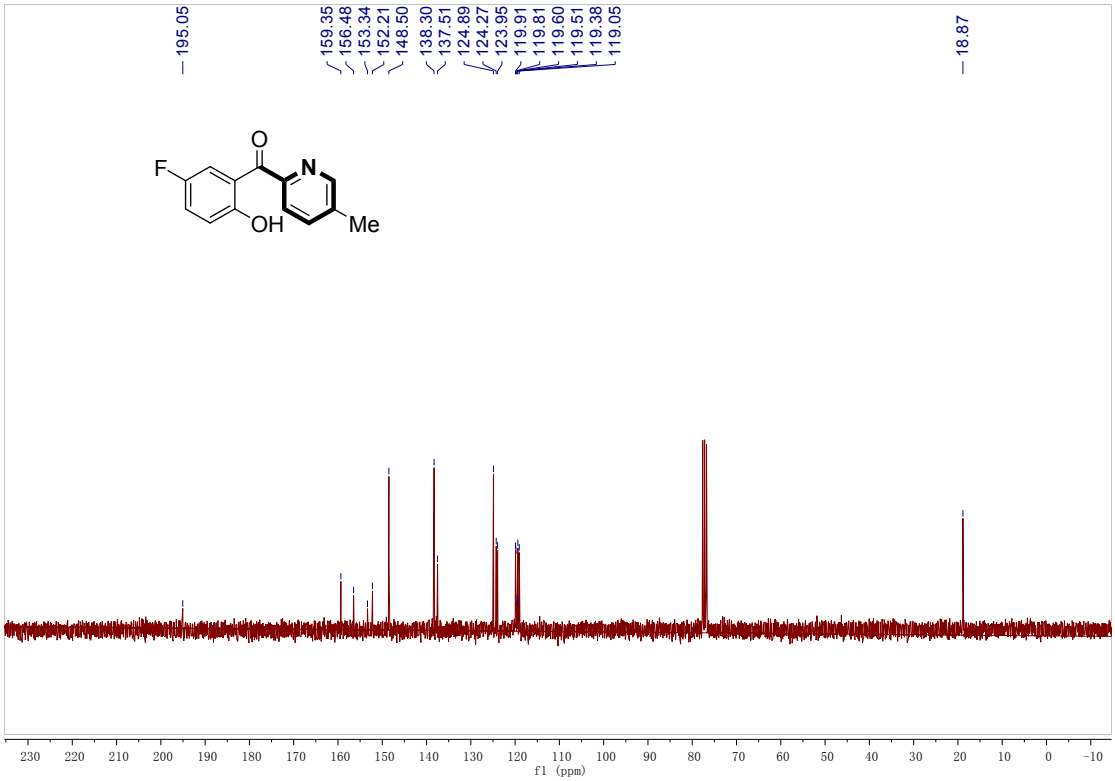
^{1}H and ^{13}C NMR spectra of compound **2v**



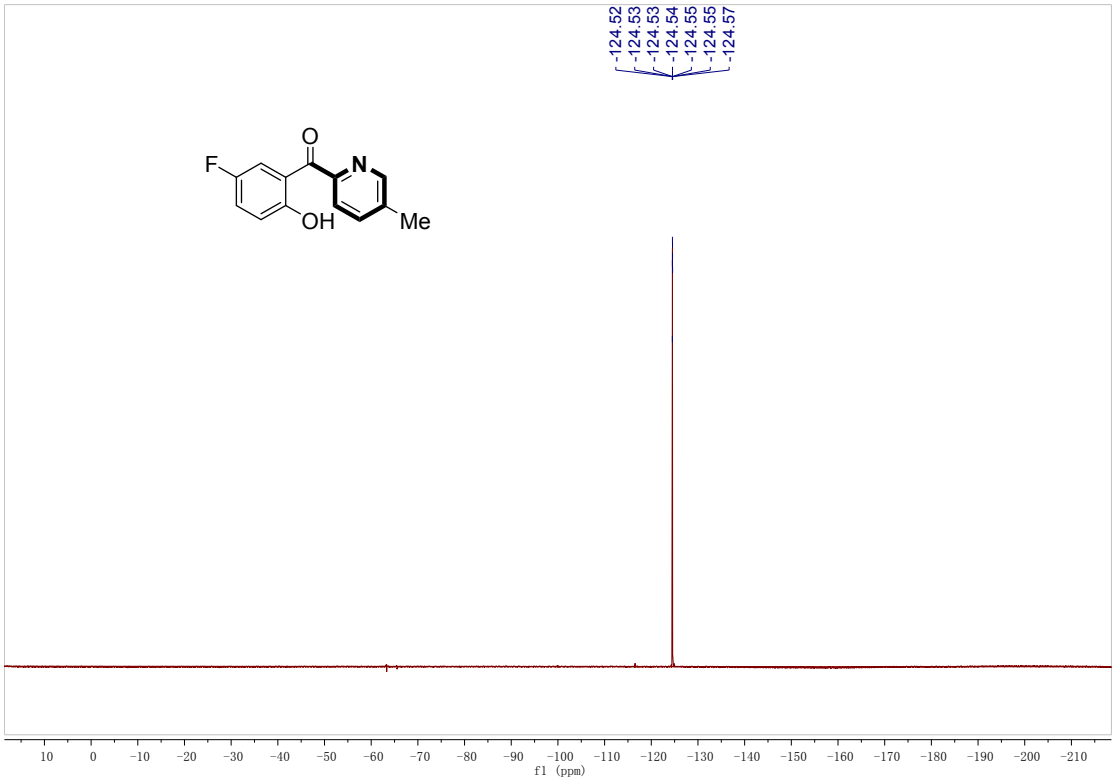


^{1}H and ^{13}C NMR spectra of compound **2w**

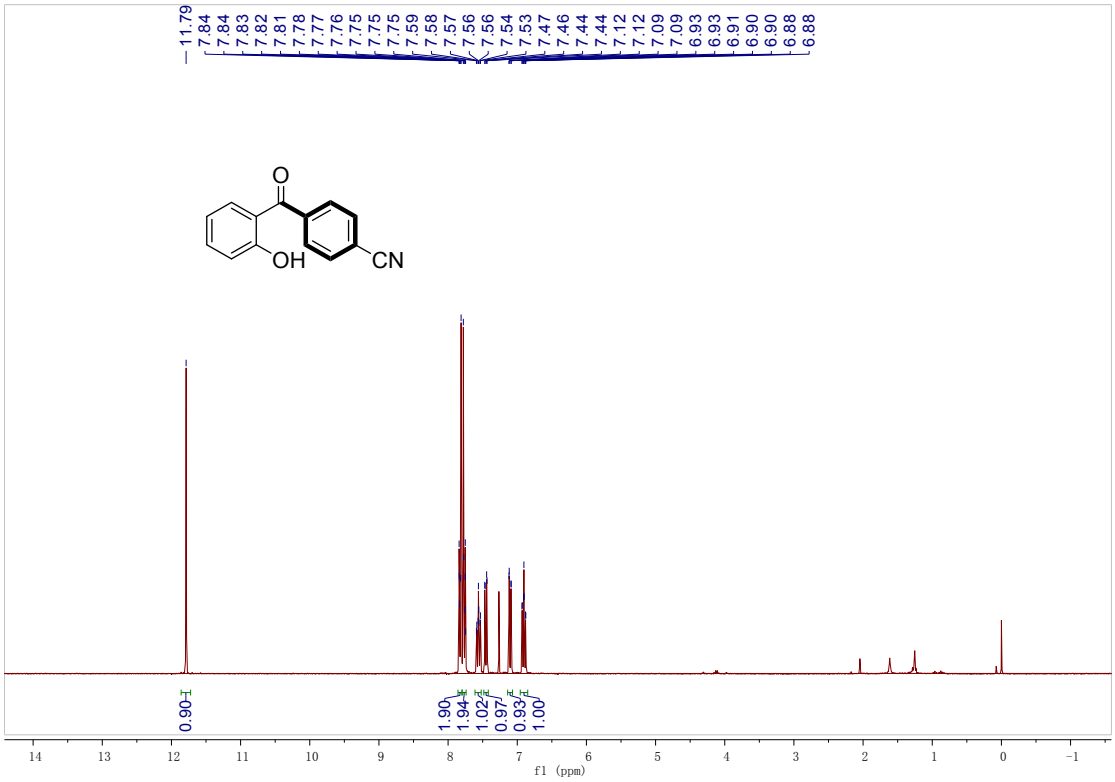


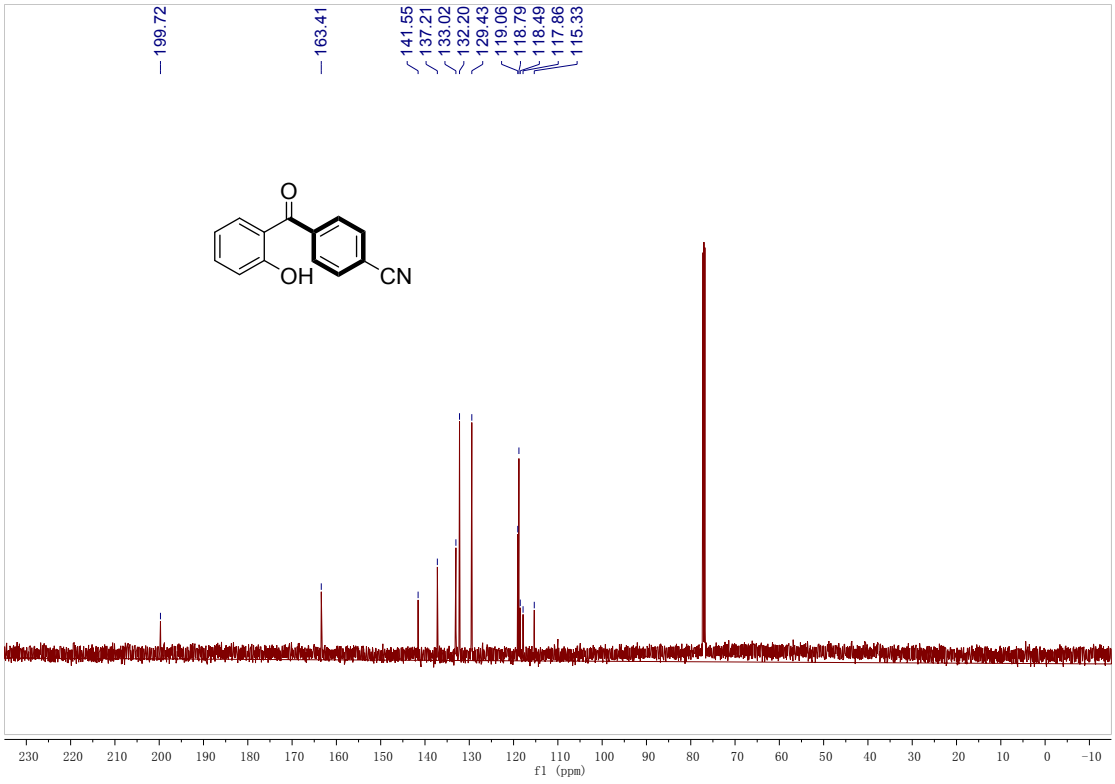


^{19}F NMR spectra of compound **2w**

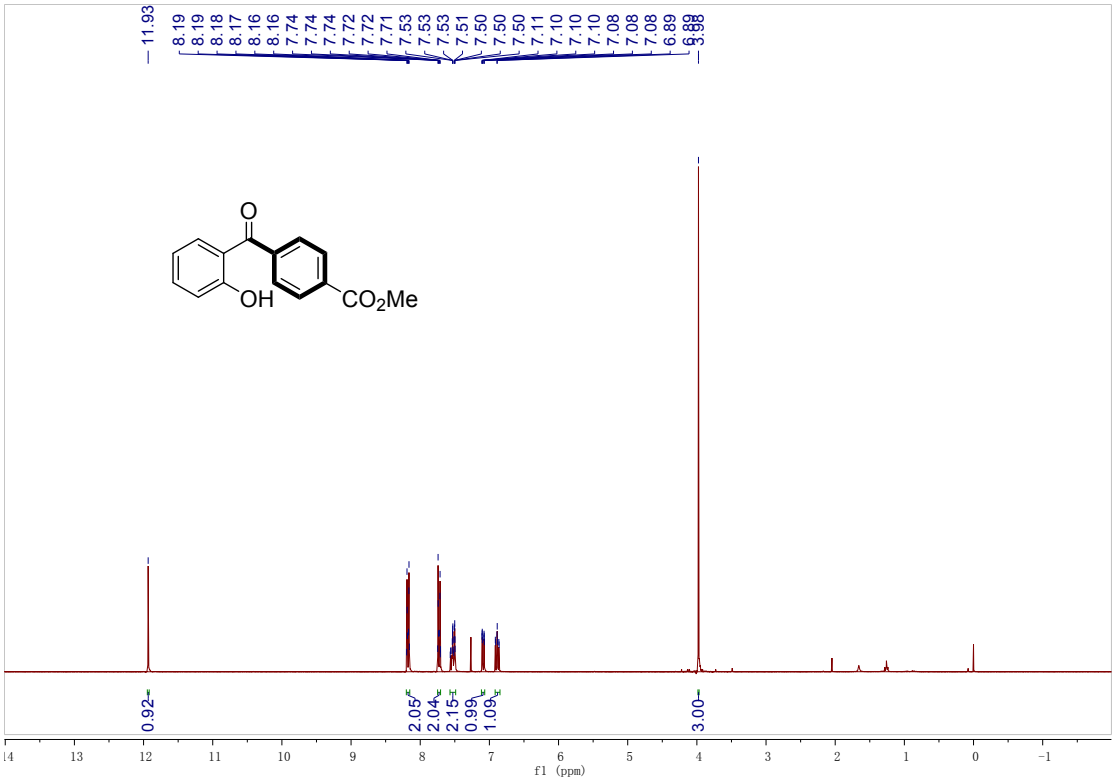


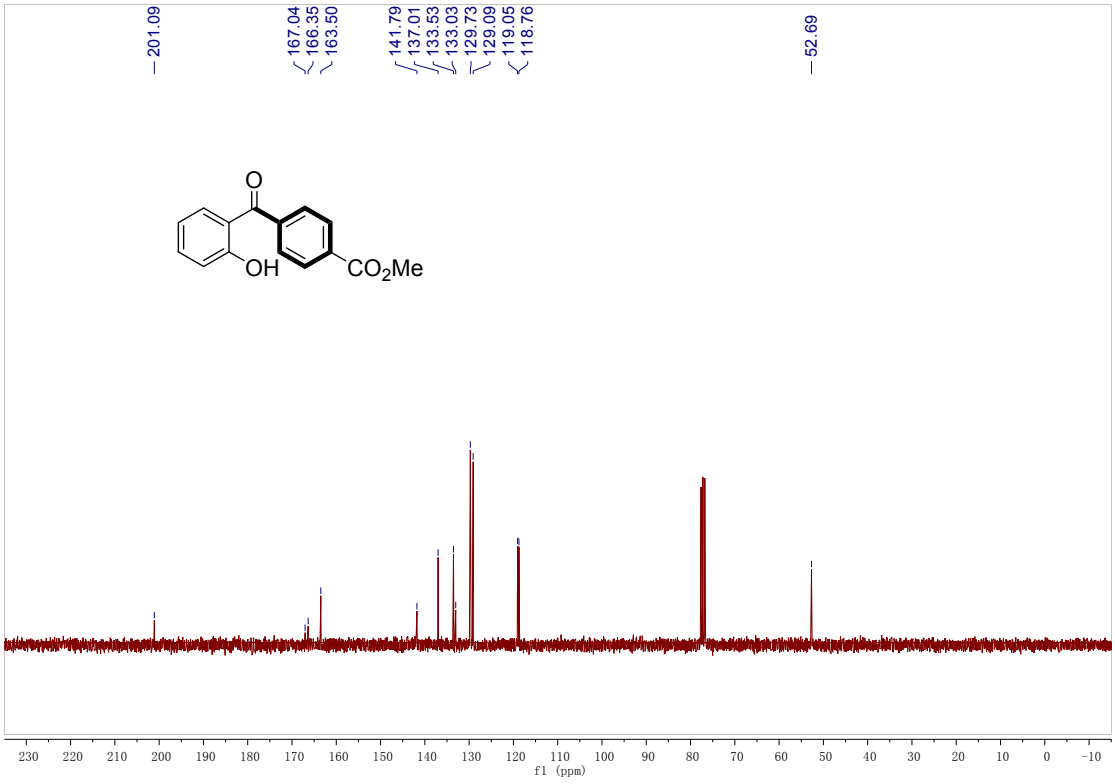
^{1}H and ^{13}C NMR spectra of compound **2z**



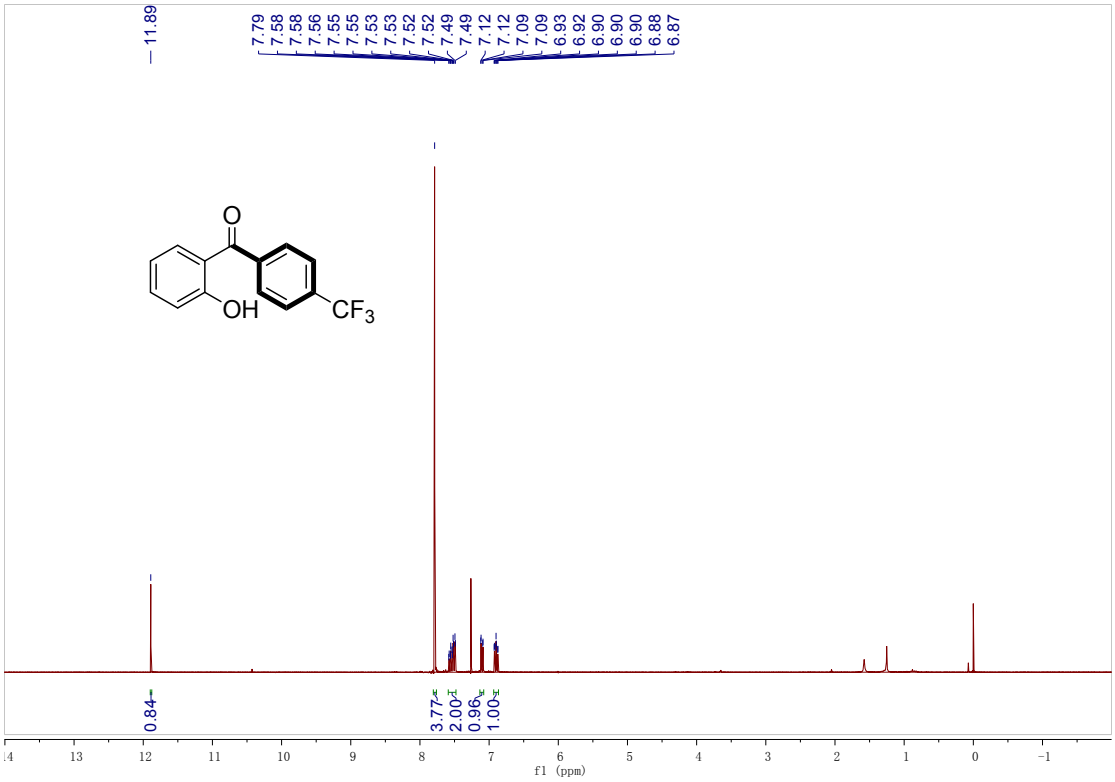


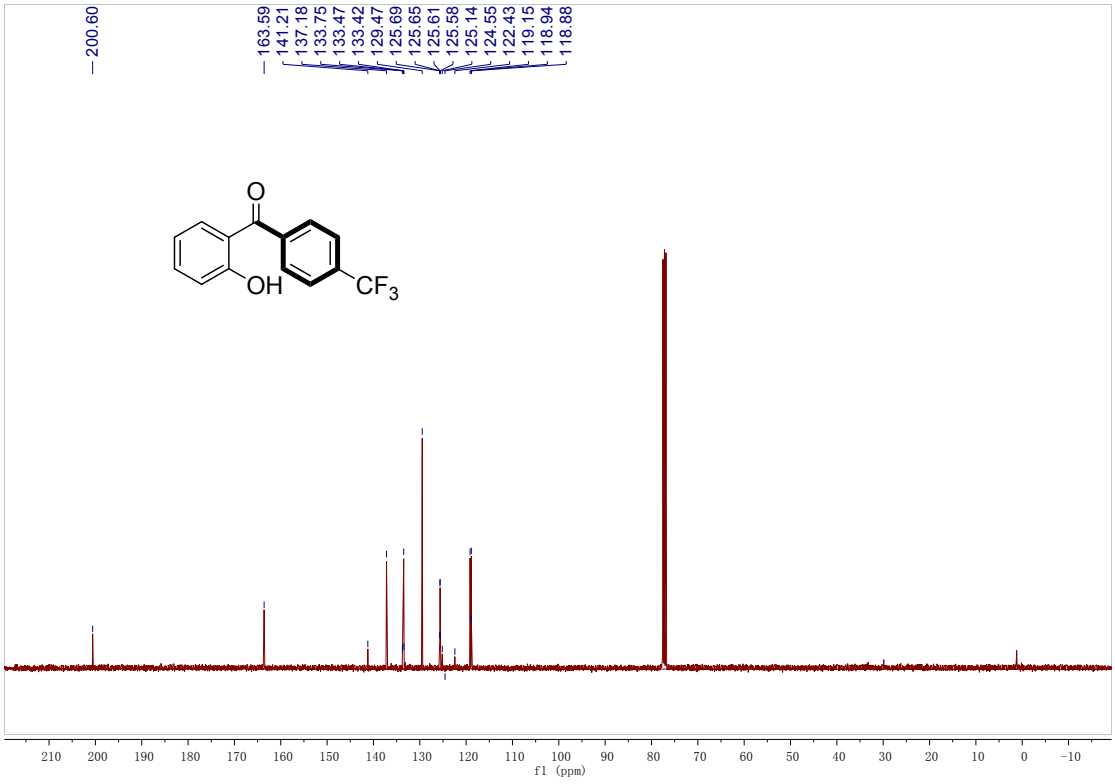
^{1}H and ^{13}C NMR spectra of compound **2aa**



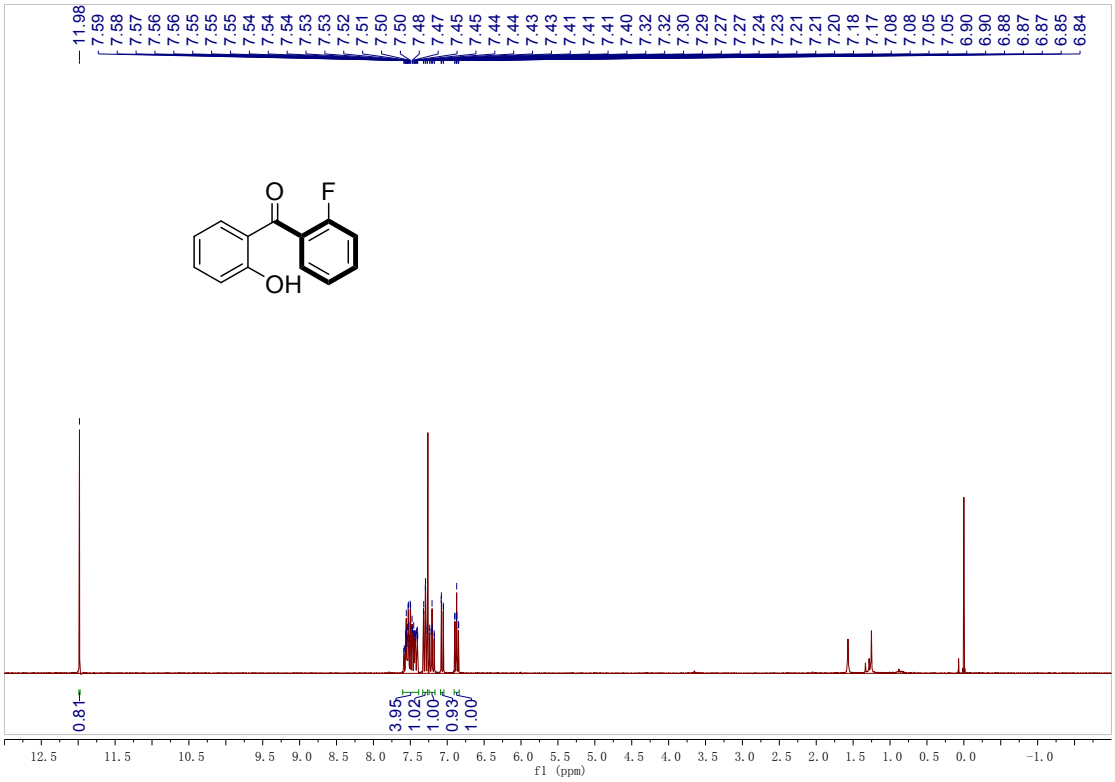


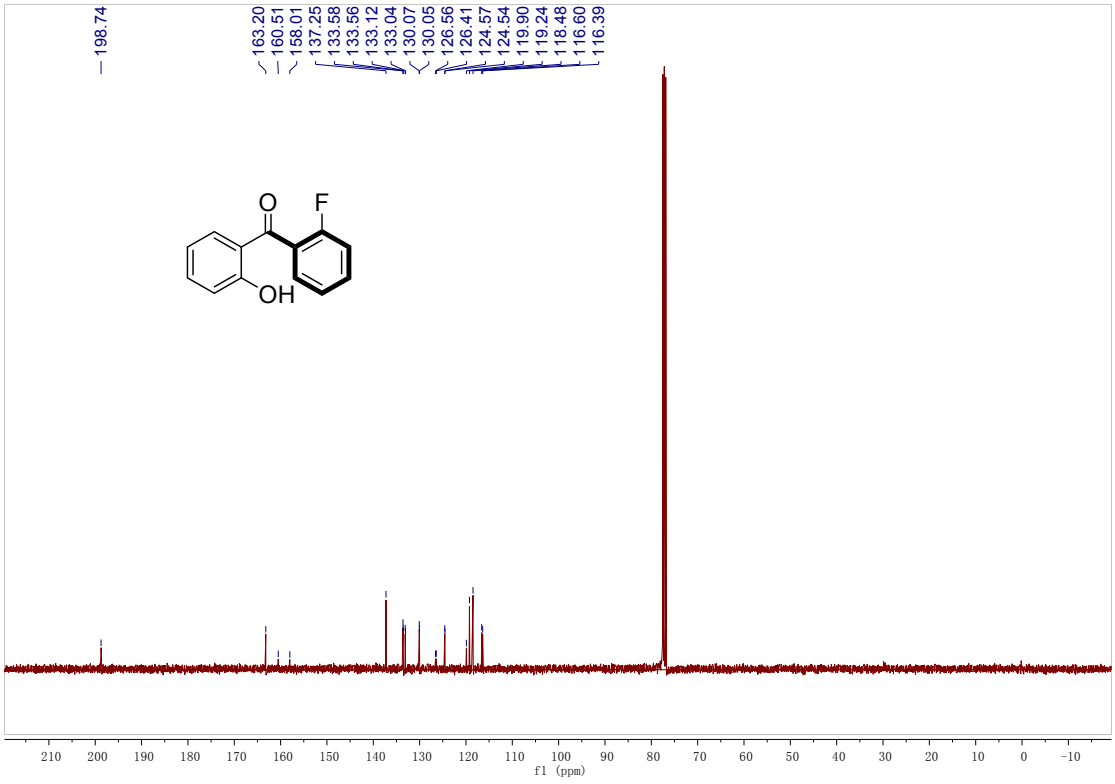
^{1}H and ^{13}C NMR spectra of compound **2ab**



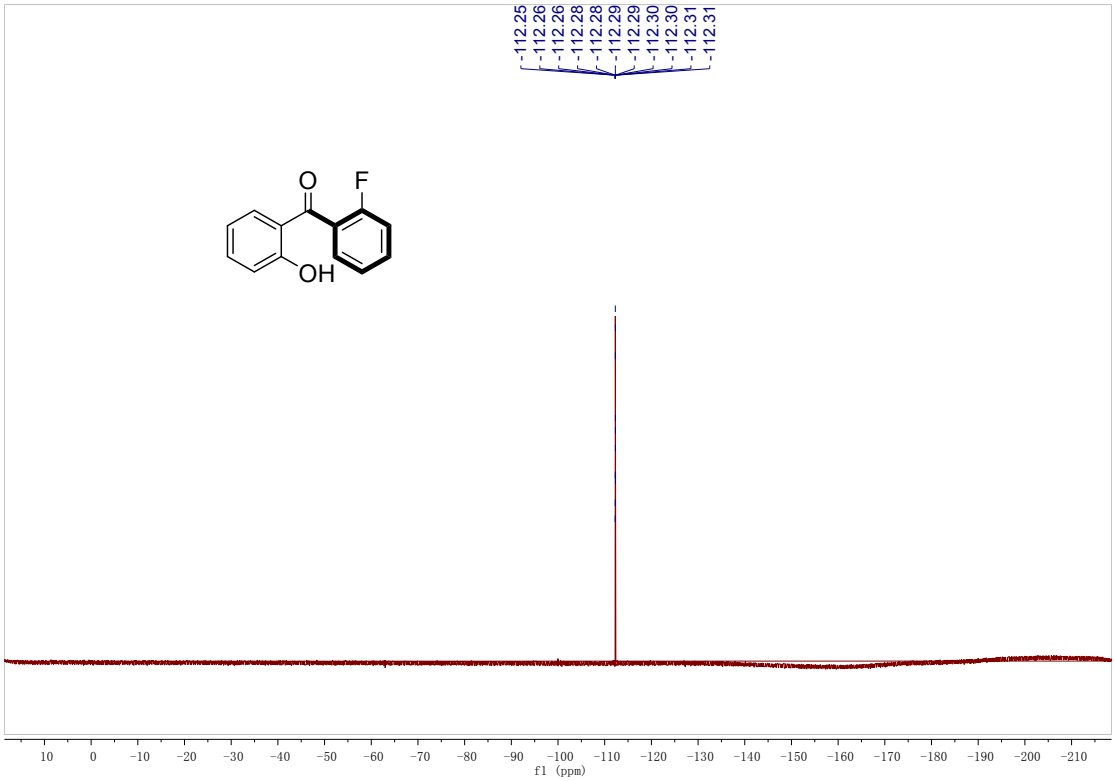


^{1}H and ^{13}C NMR spectra of compound **2ac**

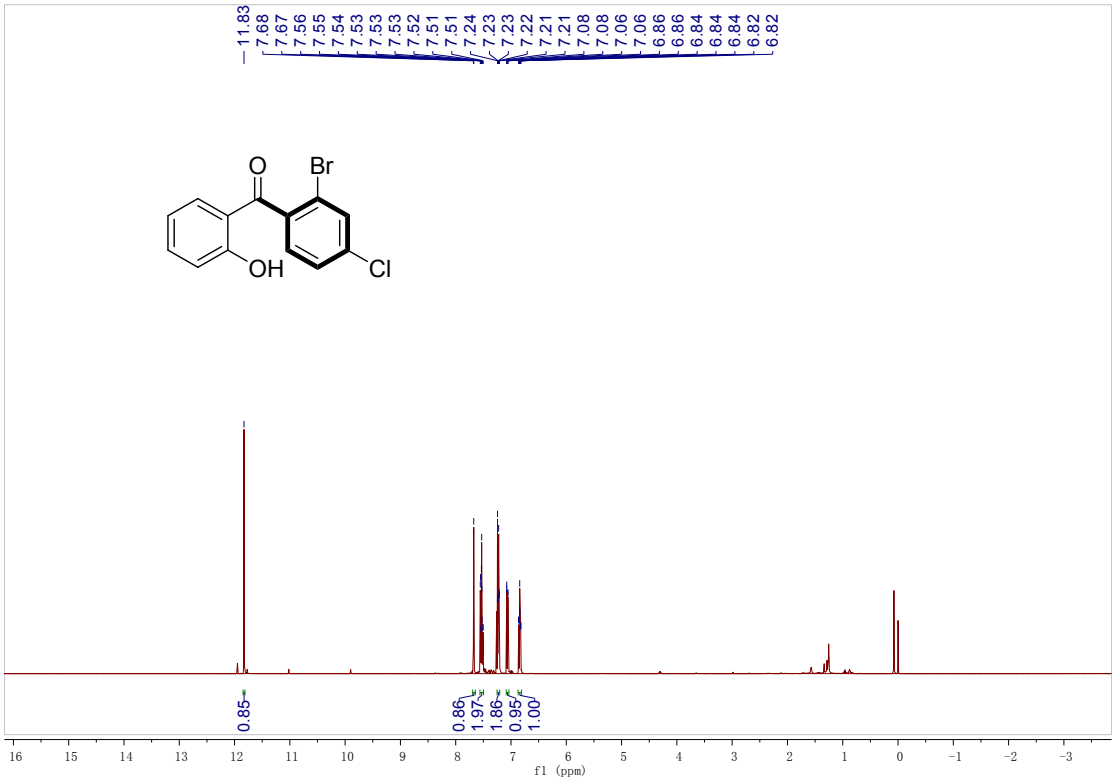


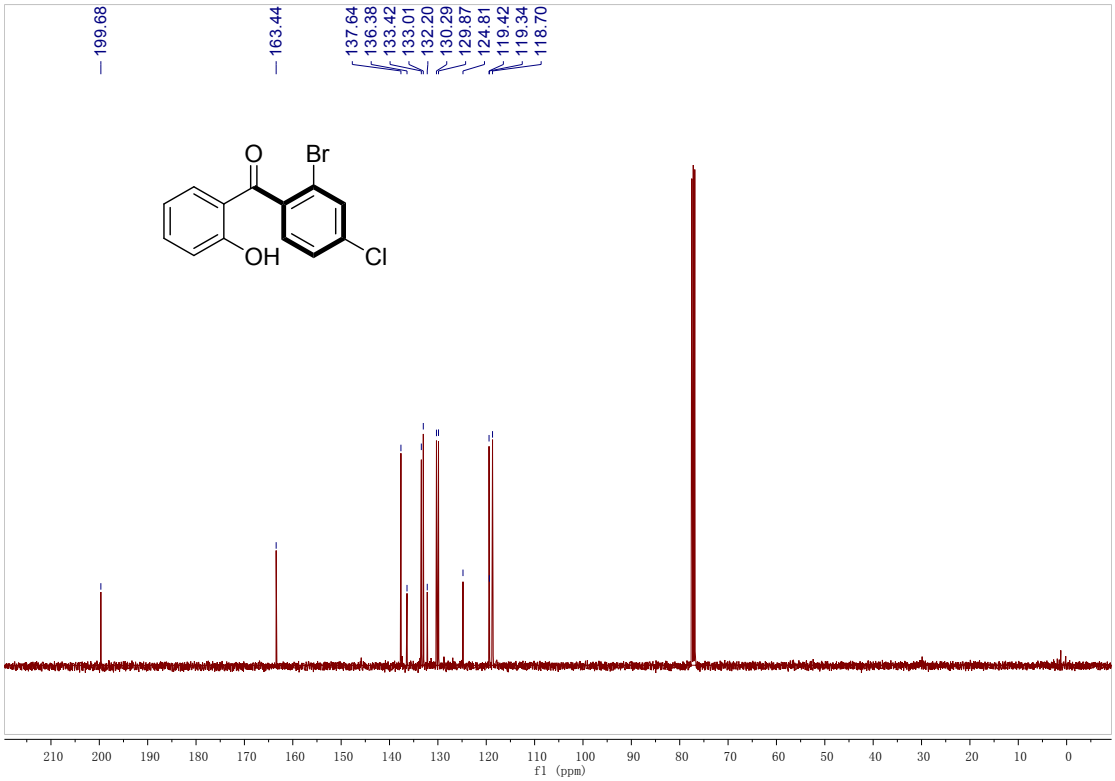


^{19}F NMR spectra of compound **2ac**

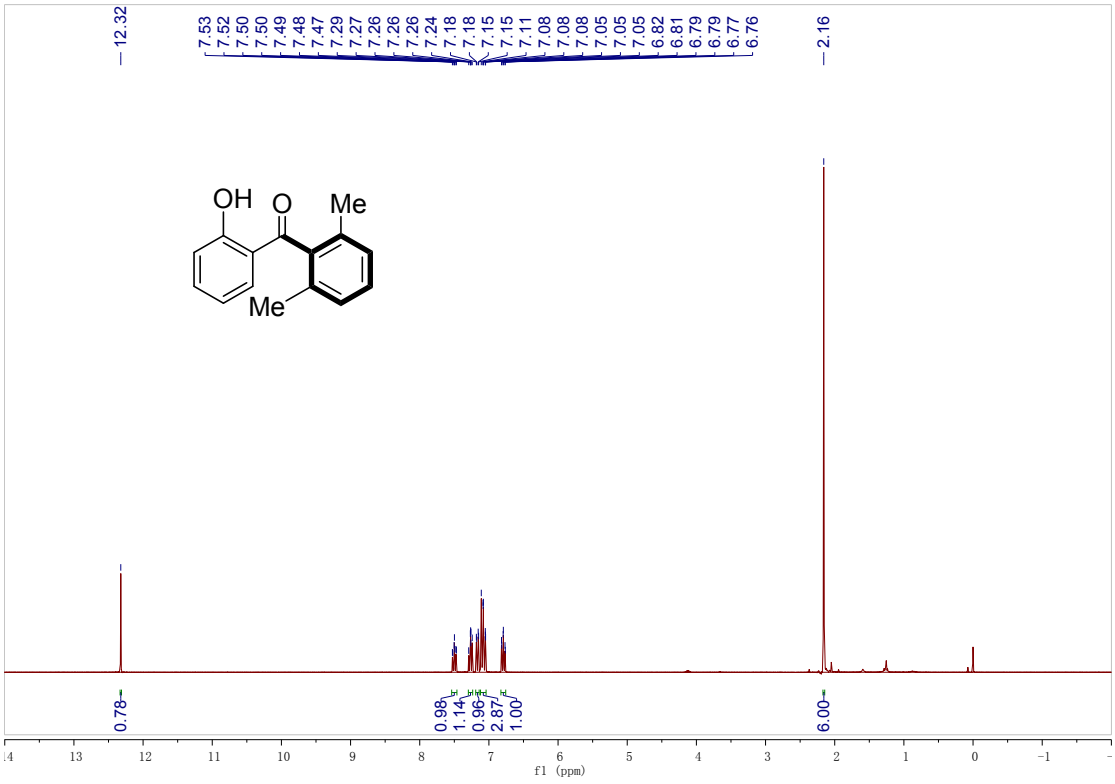


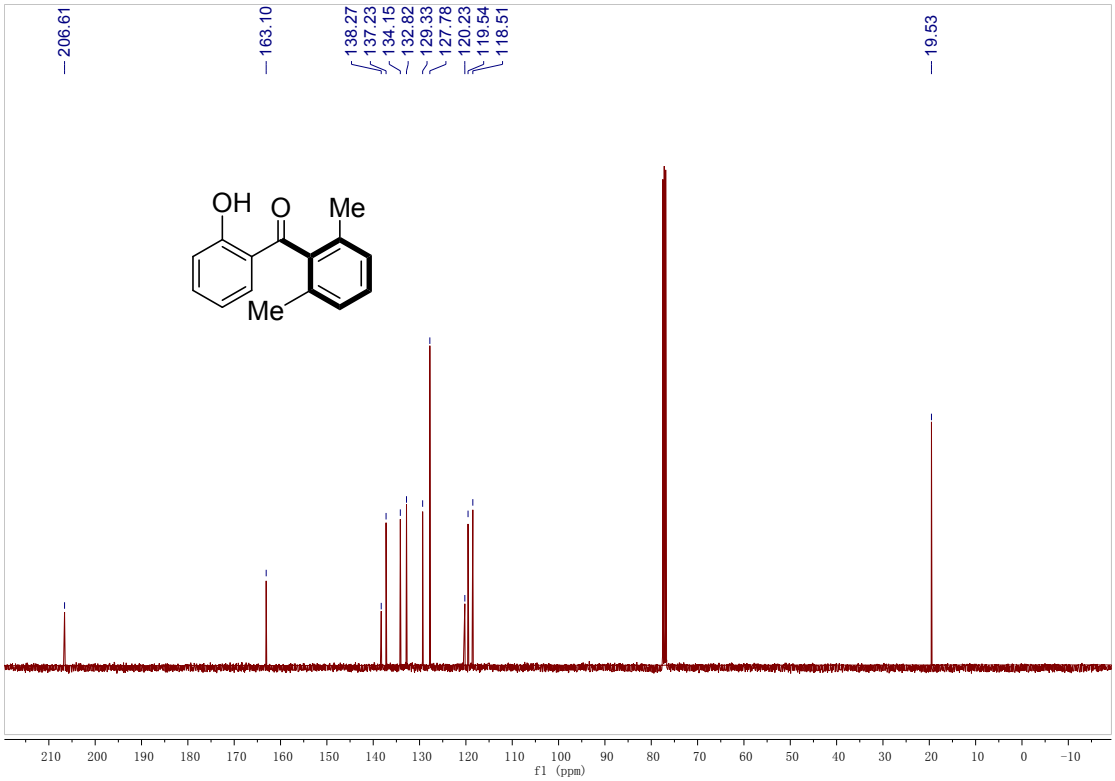
^{1}H and ^{13}C NMR spectra of compound **2ad**



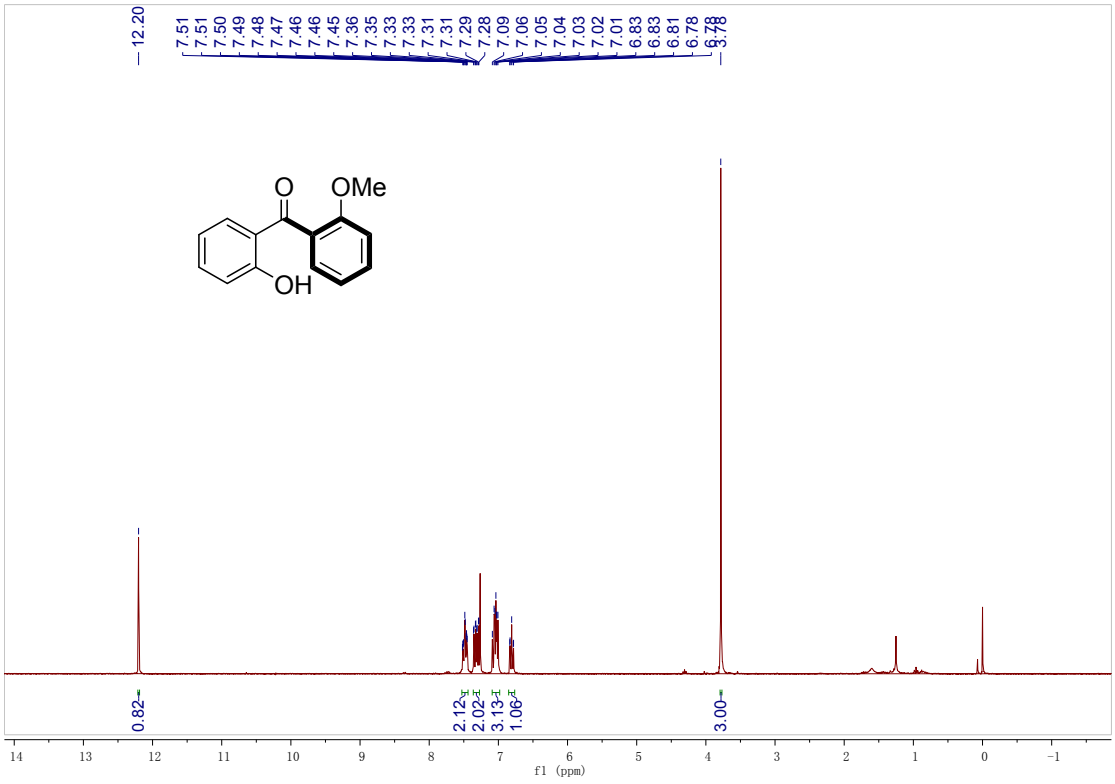


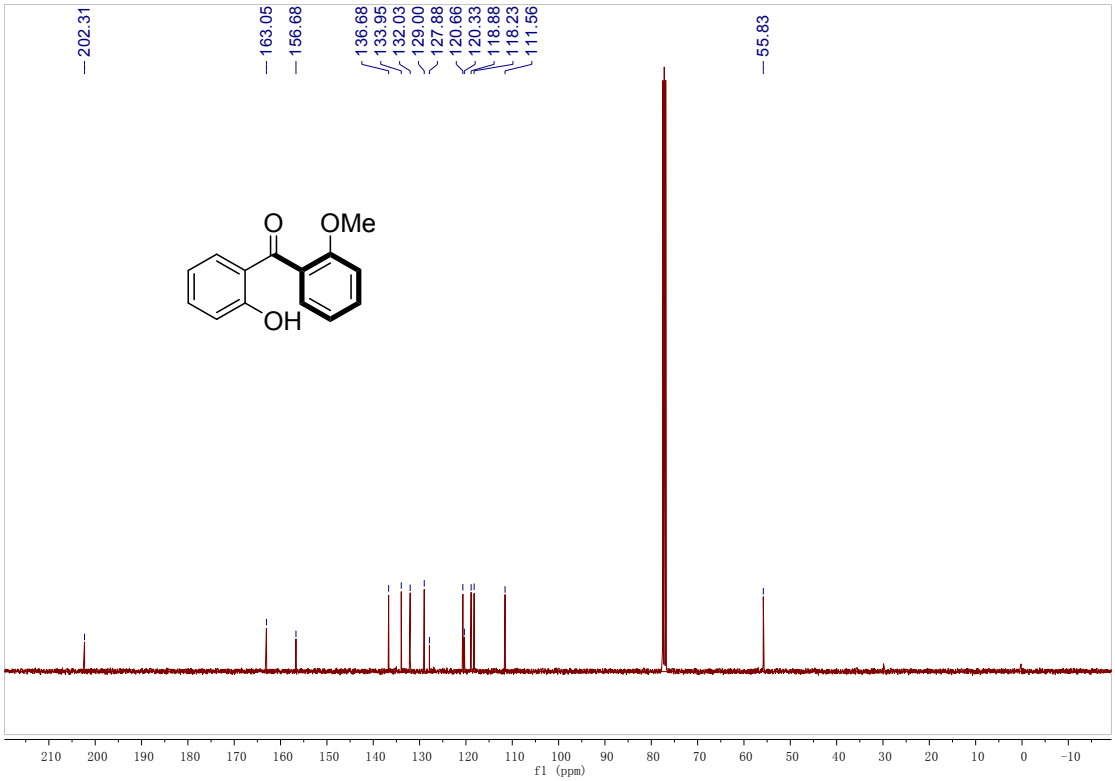
^{1}H and ^{13}C NMR spectra of compound **2ae**



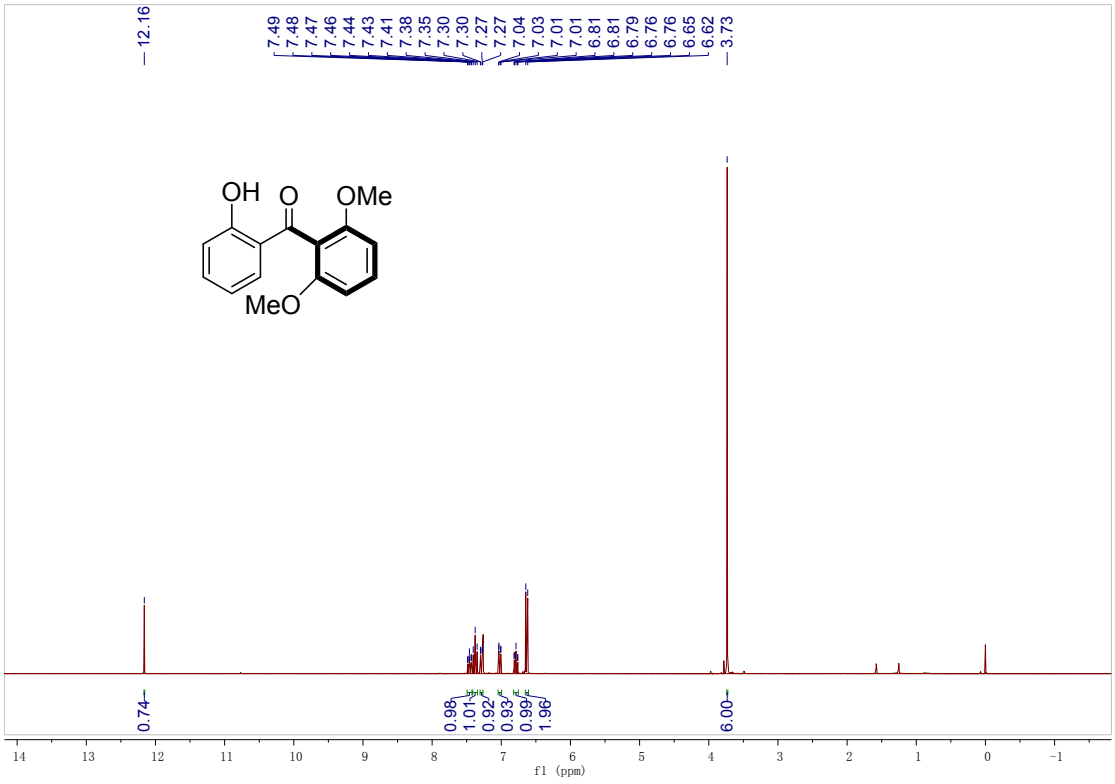


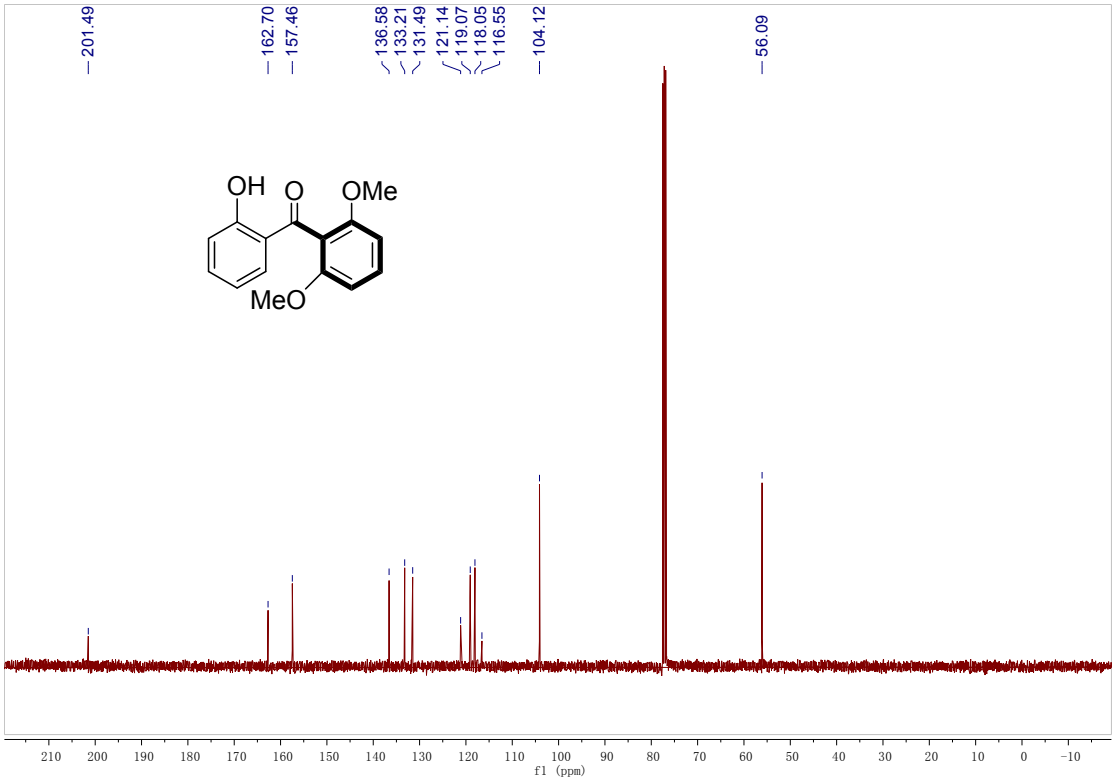
^{1}H and ^{13}C NMR spectra of compound **2af**





^{1}H and ^{13}C NMR spectra of compound **2ag**

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131.49
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104.12
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O
OMe
MeO
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)