Ru-catalyzed Activation of sp^3 C–O Bonds: *O*- to *N*-Alkyl Migratory Rearrangement in Pyridines and Related Heterocycles

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1. General considerations

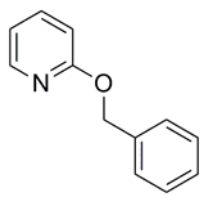
Commercial reagents were purchased from Sigma-Aldrich, Strem, Alfa Aesar, or Oakwood and used without further purification. All solvents were purchased from Caledon, ACP, or Fisher. Toluene was passed through two columns of activated alumina and degassed by three freeze-pump-thaw cycles prior to storage in the glovebox. Dioxane was distilled from CaH_2. Syntheses of starting materials were conducted under N_2 or Ar unless otherwise stated. All catalytic reactions were conducted in a nitrogen-filled glovebox (Grade 5.0). Reactions were monitored by thin-layer chromatography (TLC) on EMD Silica Gel 60 F_{254} plates under UV light (254 μm) or gas chromatography (GC) on an Agilent 6890N Network

GC instrument equipped with a flame-ionization detector (FID) and HP-5 column (30 m length, 0.32 mm inner diameter, 0.25 μm film thickness). Organic solutions were concentrated under reduced pressure on a Büchi rotary evaporator.

^{1}H, ^{2}D, ^{13}C{^{1}H}, and ^{19}F NMR spectra were recorded on a Varian Mercury 300, Varian Mercury 400, VRX-S (Unity) 400, or Bruker AV-III 400 spectrometer at ambient temperature. All NMR spectra are referenced to TMS or the residual solvent signal. Data for ^{1}H NMR are reported as follows: chemical shift (δ ppm), multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet, br = broad), coupling constant (Hz), integration. Data for ^{13}C{^{1}H} NMR are reported as follows: chemical shift (δ ppm). Data for ^{19}F NMR are reported as follows: chemical shift (δ ppm), multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet, br = broad), coupling constant (Hz), integration.

Mass spectra (MS) were recorded on a Sciex Qstar Mass Spectrometer. High resolution mass spectra (HRMS) were recorded on a micromass 70S-250 spectrometer (EI) or an ABI/Sciex Qstar Mass Spectrometer (ESI). Infrared (IR) spectra were obtained on a Perkin-Elmer Spectrum 1000 FT-IR Systems. Melting point ranges were determined on a Gallenkamp melting point apparatus (uncorrected). Column chromatography was carried out on Silicycle Silica-P Flash Silica Gel (40-63 μm). Preparative layer chromatography was performed on EMD Silica Gel 60 F_{254} plates (254 μm).

All starting materials were synthesized from 2-chloropyridine, 2-chloropyrimidine, or 3,6-dichloropyridazine and the corresponding alcohols according to literature procedures.[1, 2] Starting materials **1a**,[1, 3] **1b**,[1] **e-f**,[1] **1g-h**,[4] **1i**,[4, 5] **1j**,[6] **1l**,[1, 3] **1m**,[1, 6] **1o**,[1] **1r**,[7] **1w**,[8] **1t**,[1] **1z**,[6] **1aa**,[1] **1gg**,[1] **1mm**,[9] **3d**,[10] **3g**,[10] **5b**,[1] **5c**,[1] and **5d**[1] are known compounds and were identified by NMR comparison to reported data. 3-(Benzyloxy)-2-chloropyridine is commercially available. Products **2a-b**,[1] **2e-f**,[1] **2l**,[1] **2m**,[1, 11] **2r**,[1] **2t**,[1] **2v**,[12] **2z**,[1] **4a**,[13] **6a**,[14] **6d**,[1] and **6f**[15] are known compounds.



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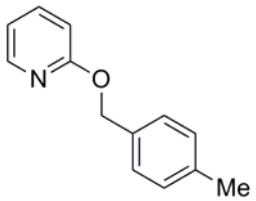

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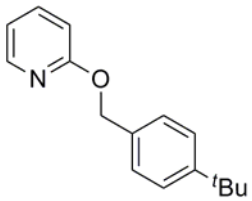

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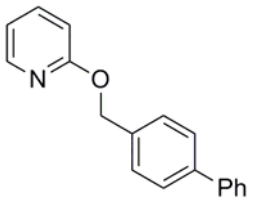

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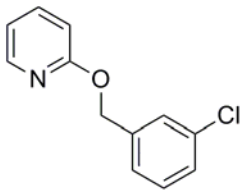

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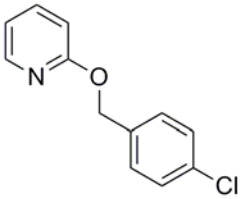

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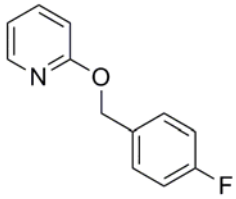

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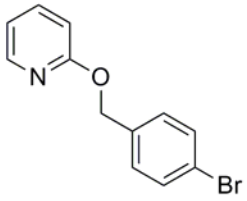

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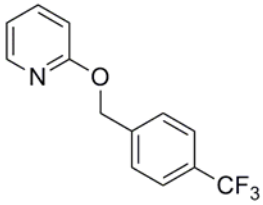

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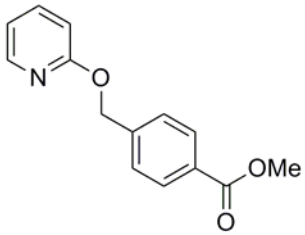

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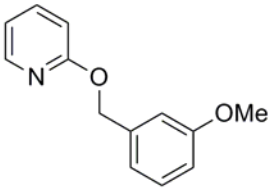

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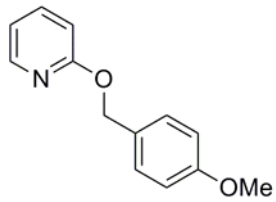

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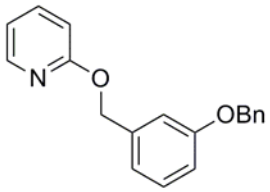

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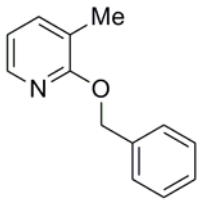

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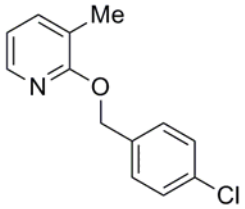

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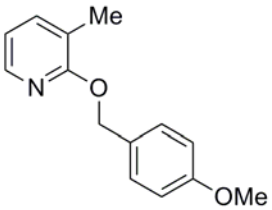

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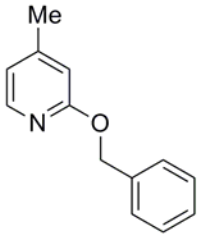

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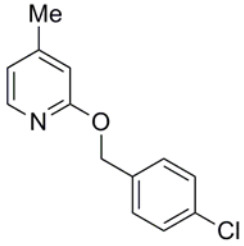

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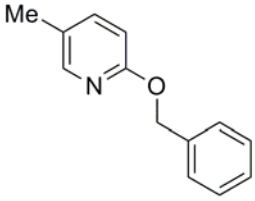

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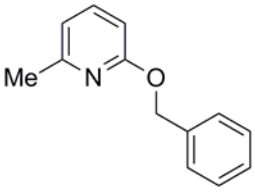

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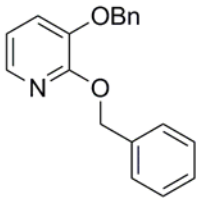

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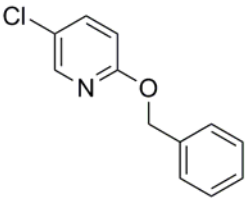

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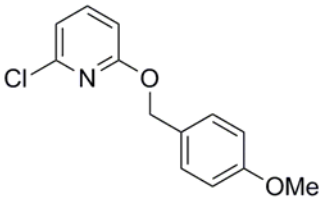

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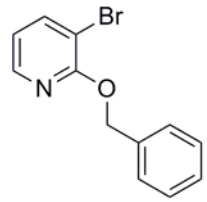

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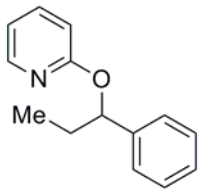

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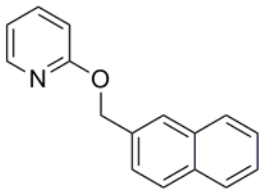

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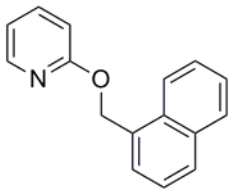

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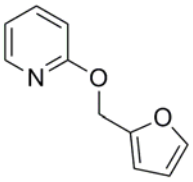

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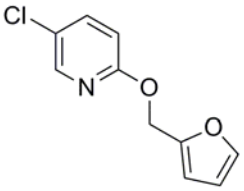

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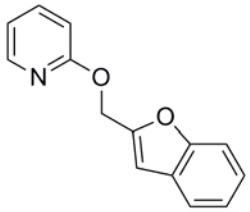

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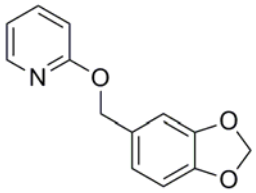

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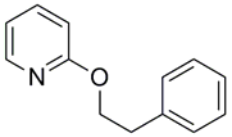

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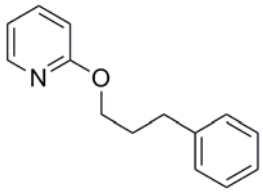

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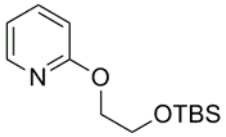

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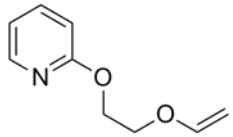

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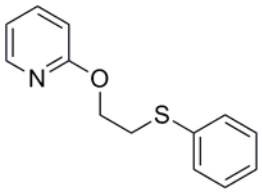

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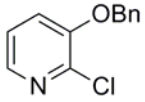

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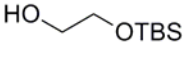

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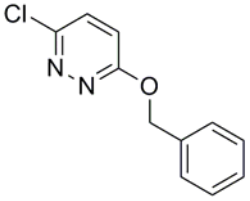

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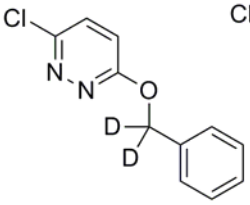

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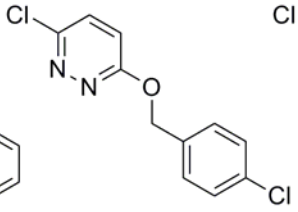

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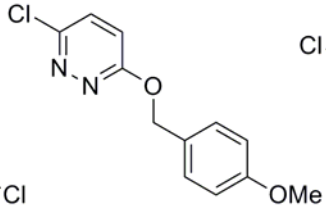

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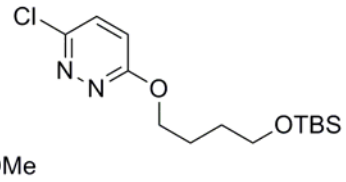

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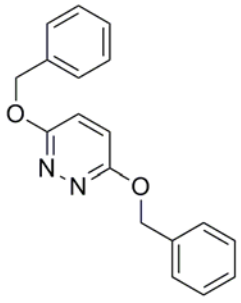

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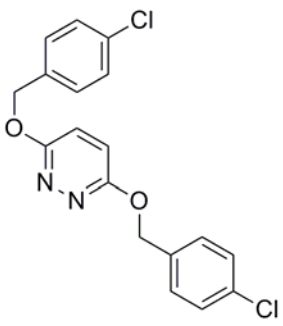

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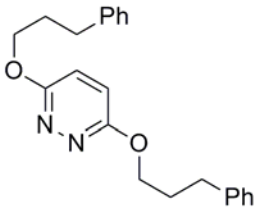

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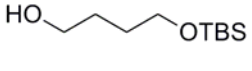

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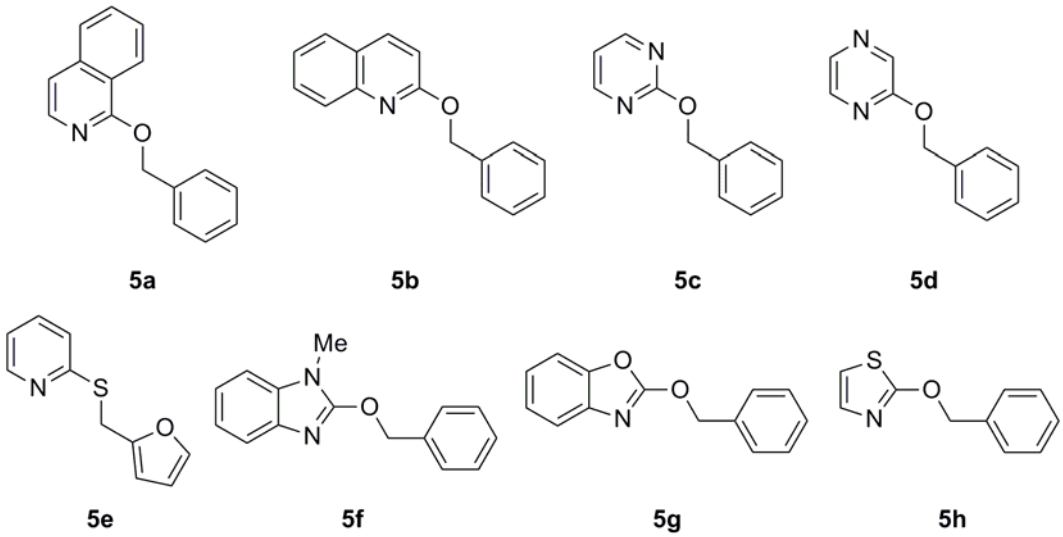
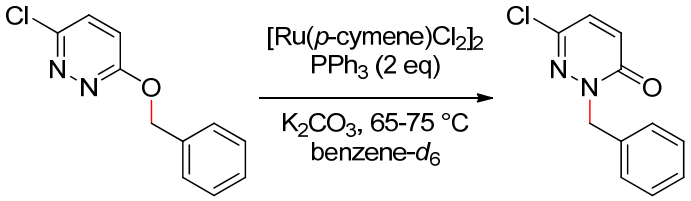


2. Experimental procedures

General procedure A: Catalytic O- to N-alkyl migration of 2-(benzyloxy)pyridine (1a)

In a one-dram vial equipped with a Teflon-coated cap was combined [Ru(*p*-cymene)Cl_2]$_2$ (6.1 mg, 0.01 mmol, 5 mol%) and PPh_3 (10.5 mg, 0.04 mmol, 20 mol%). The vial was brought into the glovebox and the catalyst was subsequently dissolved in toluene (2 mL). The suspension was allowed to stir until complete dissolution of the [Ru(*p*-cymene)Cl_2]$_2$ (~15 min.). In a separate one-dram vial equipped with a Teflon-coated cap was charged with 2-benzyloxypyridine (**1a**) (37.0 mg, 0.2 mmol) and also brought into the glovebox. The catalyst solution was transferred to the vial containing the substrate by pipette and K_2CO_3 was added (30.4 mg, 0.22 mmol, 1.1 eq.). The resulting mixture was brought outside of the glovebox and stirred on a heating block at 80 ºC for 24 h. After cooling to ambient temperature, ^{1}H-NMR analysis was conducted following concentration of an aliquot of the reaction mixture *in vacuo*. The target product **2a** was afforded quantitatively. The resulting mixture was passed through a pad of Celite, concentrated *in vacuo*, and purified by preparatory TLC (eluent: CH_2Cl_2/MeOH = 98:2, v/v) to afford 1-benzylpyridin-2(1H)-one (**2a**) as a thick yellow oil (33.7 mg, 91%).

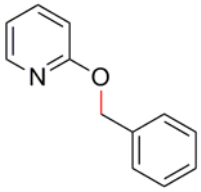
Stoichiometric studies: O- to N-alkyl migration of 3-(benzyloxy)-6-chloropyridazine (3a)



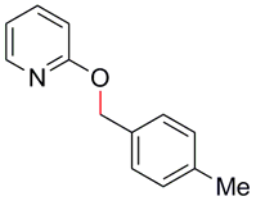
In a one-dram vial equipped with a Teflon-coated cap was combined [Ru(*p*-cymene)Cl_2]$_2$ (12.3 mg, 0.02 mmol, 0.5 eq.) and PPh_3 (21.0 mg, 0.08 mmol, 2 eq.). The vial was brought into the glovebox and the catalyst was subsequently dissolved in benzene-d_6 (3 mL). The suspension was allowed to stir for ~15 min. In a separate one-dram vial equipped with a Teflon-coated cap was charged with 3-(benzyloxy)-6-chloropyridazine (**3a**) (8.7 mg, 0.04 mmol) and also brought into the glovebox. The catalyst solution was transferred to the vial containing the substrate by pipette and K_2CO_3 was added (12.8 mg, 0.09 mmol, 2.3 eq.). The resulting mixture was stirred on a heating block in the glovebox at 65 °C for 24 h and then at 75 °C for an additional 24 h. The reaction was periodically monitored by ^{1}H NMR spectroscopy and complete conversion to 2-benzyl-6-chloropyridazin-3(2H)-one (**4a**) was observed. Diagnostic characterization data for Ru(**3a**): ^{1}H NMR (400 MHz, benzene-d_6) δ 4.86 (d, J = 6.2 Hz, 1H), 4.76 (d, J = 6.2 Hz, 1H). Diagnostic characterization data for Ru(**4a**): ^{1}H NMR (400 MHz, benzene-d_6) δ 4.81 (d, J = 6.0 Hz, 1H), 4.70 (d, J = 5.5 Hz, 1H). Identification of Ru(**3a**) was confirmed by stirring substrate **3a** with [Ru(*p*-cymene)Cl_2]$_2$ (0.5 eq.) and PPh_3 (2 eq.) in benzene-d_6 for 5 min at ambient temperature.

3. Analytical data

Starting materials

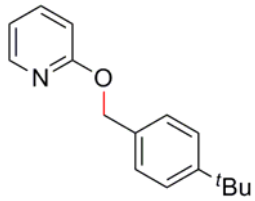


2-(Benzyloxy)pyridine (1a): Prepared by a known procedure.[2] To a 100 mL round-bottom flask equipped with a Dean-Stark apparatus was charged finely ground KOH (3.42 g, 61 mmol) and toluene (37 mL). To this suspension was added 2-chloropyridine (2.88 mL, 30.5 mmol), benzyl alcohol (1.91 mL, 18.5 mmol), and subsequently 18-crown-6 (24.4 mg, 0.9 mmol). The resulting mixture was heated to reflux over 2 h. The solution was diluted with 25 mL EtOAc, washed with 10 mL H_2O, then 10 mL brine. The organic fraction was dried over Na_2SO_4, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 95:5, v/v) to afford the title compound (94%). Colorless oil. All spectral data are in agreement with reported literature data.[1, 3] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (dd, J = 1.4Hz, J = 5.1Hz, 1H), 7.57 (ddd, J = 2.0Hz, J = 7.1Hz, J = 8.5Hz, 1H), 7.46 (d, J = 7.3Hz, 1H), 7.37 (t, J = 7.3Hz, 1H), 7.31 (t, J = 7.2Hz, 1H), 6.87 (ddd, J = 0.8Hz, J = 5.1Hz, J = 7.0Hz, 1H), 6.80 (d, J = 8.4Hz, 1H), 5.38 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 163.8, 147.0, 138.7, 137.5, 128.6, 128.1, 127.9, 117.0, 111.5, 67.6.



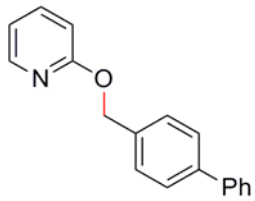
2-((4-Methylbenzyl)oxy)pyridine (1b): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (673 mg, 6.0 mmol) and dioxane. To this supension was added 4-methylbenzyl alcohol (514 mg, 4.2 mmol) and 2-chloropyridine (380 µL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with 3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over $MgSO_4$, concentrated *in*

vacuo and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (60%). Pale yellow oil. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.18 (d, *J* = 4.9Hz, 1H), 7.57 (dd, *J* = 8.3 and 7.1Hz, 1H), 7.36 (d, *J* = 7.9Hz, 2H), 7.19 (d, *J* = 7.9Hz, 2H), 6.88 (dd, *J* = 7.1 and 5.1Hz, 1H), 6.79 (d, *J* = 8.4Hz, 1H), 5.34 (s, 2H), 2.36 (s, 3H). $^{13}C\{^1H\}$ NMR (75 MHz, $CDCl_3$) δ 163.7, 146.8, 138.5, 137.5, 134.3, 129.1, 128.1, 116.8, 111.3, 67.4, 21.2. IR (neat) 2921, 1592, 1569, 1473, 1432, 1363, 1284, 1142, 987, 778 cm^{-1}. MS (EI) *m/z* 199 (M); HRMS (EI) *m/z* calc'd for $C_{13}H_{13}NO$ $[M]^+$: 199.0997; found: 199.0994.



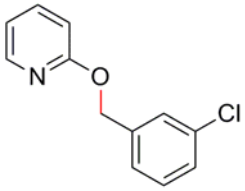
2-((4-(*tert*-Butyl)benzyl)oxy)pyridine (1c): Prepared in two steps from 4-*tert*-butylbenzaldehyde.[1, 16] To a 100 mL round-bottom flask was charged 4-*tert*-butylbenzaldehyde (2.51 mL, 15 mmol) and MeOH (30 mL). The solution was cooled to 0 ºC in an ice bath. Subsequently, $NaBH_4$ (624.2 mg, 16.5 mmol) was added portionwise. The reaction vessel was allowed to warm to room temperature over 3 h, upon which volatiles were removed *in vacuo.* The residue was redissolved in 50 mL EtOAc and 50 mL HCl and the layers were separated. The aqueous phase was extracted with 2 x 25 mL EtOAc. The combined organic extracts were washed with 25 mL sat'd $NaHCO_3$, dried over $MgSO_4$, filtered, and concentrated *in vacuo* to give the crude (4-(tert-butyl)phenyl)methanol (2.4742 g, 14.2 mmol, 95%). All spectral data are in agreement with reported literature data.[17, 18] ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.40 (d, *J* = 8.3Hz, 2H), 7.31 (d, *J* = 8.3Hz, 2H), 4.67 (s, 2H), 1.33 (s, 9H). The crude material was added to a suspension of potassium *tert*-butoxide (1.7527 g, 15.6 mmol) and dioxane (40 mL) in a 100 mL round-bottom flask. Subsequently, 2-chloropyridine (1.41 mL, 14.9 mmol) was added and the reaction mixture was heated to reflux over 16 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified

by column chromatography (eluent: hexane/EtOAc = 95:5, v/v) to afford the title compound (84%). White solid; m.p. 48-49 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.17 (dd, *J* = 2.0Hz, *J* = 5.0Hz, 1H), 7.54 (ddd, *J* = 2.0Hz, *J* = 7.2Hz, *J* = 8.9Hz, 1H), 7.40 (s, 4H), 6.85 (ddd, *J* = 0.6Hz, *J* = 5.1Hz, *J* = 6.8Hz, 1H), 6.79 (d, *J* = 8.4Hz, 1H), 5.35 (s, 2H), 1.32 (s, 9H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 163.9, 150.9, 146.9, 138.7, 134.4, 128.1, 125.5, 116.9, 111.5, 67.6, 34.7, 31.5. IR (neat) 3058, 2957, 2907, 2966, 1604, 1590, 1567, 1472, 1429, 1365, 1313, 1271, 1254, 983, 815, 778 cm^{-1}. MS (EI) *m/z* 226 (M–Me), 241 (M); HRMS (EI) *m/z* calc'd for $C_{16}H_{19}NO$ $[M]^+$: 241.1467; found: 241.1471.

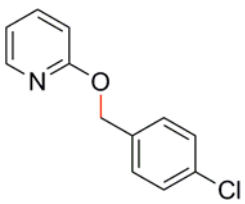


2-([1,1'-Biphenyl]-4-ylmethoxy)pyridine (1d): Prepared in two steps from 4-biphenylcarboxaldehyde.[1, 16] To a 100 mL round-bottom flask was charged 4-biphenylcarboxaldehyde (2.7333 mL, 15 mmol) and MeOH (30 mL). The solution was cooled to 0 ºC in an ice bath. Subsequently, $NaBH_4$ (624.2 mg, 16.5 mmol) was added portionwise. The reaction vessel was allowed to warm to room temperature over 3 h, upon which volatiles were removed *in vacuo*. The residue was redissolved in 50 mL EtOAc and 50 mL HCl and the layers were separated. The aqueous phase was extracted with 2 x 25 mL EtOAc. The combined organic extracts were washed with 25 mL sat'd $NaHCO_3$, dried over $MgSO_4$, filtered, and concentrated *in vacuo* to give the crude [1,1'-biphenyl]-4-ylmethanol (2.6350 g, 14.3 mmol, 95%). All spectral data are in agreement with reported literature data.[19] ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.60 (d, *J* = 7.1Hz, 4H), 7.45 (d, *J* = 7.4Hz, 4H), 7.36 (d, *J* = 6.5Hz, 1H), 4.75 (s, 2H). A portion of the crude material (2.0902 g, 11.3 mmol) was added to a suspension of potassium *tert*-butoxide (1.3948 g, 12.4 mmol) and dioxane (25 mL) in a 100 mL round-bottom flask. Subsequently, 2-chloropyridine (1.07 mL, 11.3 mmol) was added and the reaction mixture was heated to reflux over 18 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent:

hexane/EtOAc = 98:2, v/v) to afford the title compound (98%). White solid; m.p. 50-51 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (dd, *J* = 1.9Hz, *J* = 5.0Hz, 1H), 7.63-7.50 (m, 7H), 7.42 (t, *J* = 7.6Hz, 2H), 7.33 (t, *J* = 7.3Hz, 1H), 6.89-6.84 (m, 1H), 6.81 (d, *J* = 8.3Hz, 1H), 5.42 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 163.7, 147.0, 141.0, 140.9, 138.7, 136.5, 128.9, 128.6, 127.4, 127.4, 127.2, 117.1, 111.5, 67.4. IR (neat) 3056, 3026, 2934, 1593, 1568, 1471, 1432, 1304, 1271, 1252, 1007, 823, 780, 759, 736, 697 cm^{-1}. MS (EI) *m/z* 261 (M); HRMS (EI) *m/z* calc'd for $C_{18}H_{15}NO$ $[M]^+$: 261.1154; found: 261.1157.

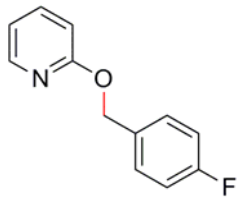


2-(3-Chlorobenzyloxy)pyridine (1e): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged potassium *tert*-butoxide (1.3454 g, 12.0 mmol) and dioxane (24 mL). To this supension was added 3-chlorobenzyl alcohol (1.28 mL, 10.9 mmol) and 2-chloropyridine (1 mL, 10.9 mmol). The resulting mixture was heated to reflux over 18 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 95:5, v/v) to afford the title compound (92%). Pale yellow oil. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.16 (dd, *J* = 1.5Hz, *J* = 5.0Hz, 1H), 7.59 (m, 1H), 7.46 (s, 1H), 7.34-7.31 (m, 1H), 7.29-7.27 (m, 2H), 6.89 (ddd, *J* = 0.7Hz, *J* = 5.1Hz, *J* = 7.0Hz, 1H), 6.82 (d, *J* = 8.4Hz, 1H), 5.36 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 163.4, 147.0, 139.7, 138.9, 134.5, 129.8, 128.0, 125.9, 117.3, 111.4, 66.7.



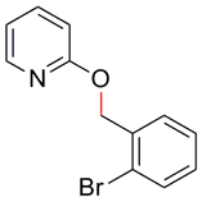
2-((4-Chlorobenzyl)oxy)pyridine (1f): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (673 mg, 6.0 mmol) and dioxane. To this

supension was added 4-chlorobenzyl alcohol (603 mg, 4.2 mmol) and 2-chloropyridine (380 µL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with 3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (61%). Pale yellow oil. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.17 (d, *J* = 5.1Hz, 1H), 7.59 (dd, *J* = 8.4 and 7.1Hz, 1H), 7.40 (d, *J* = 8.6Hz, 2H), 7.34 (d, *J* = 8.6Hz, 2H), 6.89 (dd, *J* = 7.1 and 5.1Hz, 1H), 6.80 (d, *J* = 8.4Hz, 1H), 5.35 (s, 2H). ^{13}C{^{1}H} NMR (75 MHz, $CDCl_3$) δ 163.3, 146.8, 138.7, 135.9, 133.5, 129.2, 128.6, 117.0, 111.2, 66.6. IR (neat) 3002, 1598, 1570, 1473, 1432, 1311, 1270, 1142, 1087, 988, 809, 778 cm^{-1}. MS (EI) *m/z* 219 (M); HRMS (ESI) *m/z* calc'd for $C_{12}H_{11}ClNO$ [M+H, ^{35}Cl]$^+$: 220.0523; found: 220.0525.

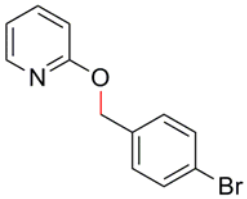


2-((4-Fluorobenzyl)oxy)pyridine (1g): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged potassium *tert*-butoxide (1.3454 g, 12.0 mmol) and dioxane (24 mL). To this supension was added 4-fluorobenzyl alcohol (1.18 mL, 10.9 mmol) and 2-chloropyridine (1 mL, 10.9 mmol). The resulting mixture was heated to reflux over 24 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 98:2, v/v) to afford the title compound (91%). Clear oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.21 (dd, *J* = 1.8Hz, *J* = 4.5Hz, 1H), 7.64-7.59 (m, 1H), 7.47 (dd, *J* = 5.5Hz, *J* = 8.7Hz, 2H), 7.09 (t, *J* = 8.7Hz, 2H), 6.92 (dd, *J* = 5.1Hz, *J* = 7.0Hz, 1H), 6.83 (d, *J* = 8.3Hz, 1H), 5.38 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 163.73 (d, *J* = 18.9Hz), 161.38, 146.98, 138.79, 133.37 (d, *J* = 3.4Hz), 129.95 (d, *J* = 8.1Hz), 117.14, 115.44 (d, *J* = 21.5Hz), 111.44, 66.90. ^{19}F NMR (376 MHz, $CDCl_3$) δ –113.65. IR (neat)

3056, 1592, 1570, 1511, 1474, 1433, 1285, 1271, 1223, 1157, 1143, 989, 822, 779 cm^{-1}. MS (ESI) *m/z* 204 (M+H); HRMS (ESI) *m/z* calc'd for $C_{12}H_{11}NOF$ $[M+H]^+$: 204.0819; found: 204.0822.

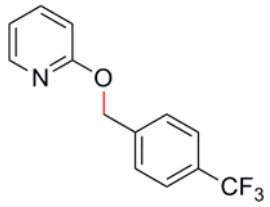


2-((2-Bromobenzyl)oxy)pyridine (1h): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged potassium *tert*-butoxide (1.7841 g, 15.9 mmol), 2-bromobenzyl alcohol (2.9652 g, 15.9 mmol) and dioxane (24 mL). To this supension was added 2-chloropyridine (1 mL, 10.9 mmol). The resulting mixture was heated to reflux over 15 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 95:5, v/v) to afford the title compound (99%). Pale yellow oil. All spectral data are in agreement with reported literature data.[4] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (dd, *J* = 1.5Hz, *J* = 4.8Hz, 1H), 7.59 (t, *J* = 8.4Hz, 2H), 7.53 (d, *J* = 7.6Hz, 1H), 7.31 (t, *J* = 7.4Hz, 1H), 7.17 (t, *J* = 7.5Hz, 1H), 6.92-6.87 (m, 1H), 6.84 (d, *J* = 8.3Hz, 1H), 5.46 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 163.5, 147.1, 138.8, 136.9, 132.8, 129.5, 129.3, 127.5, 123.1, 117.3, 111.3, 67.2.

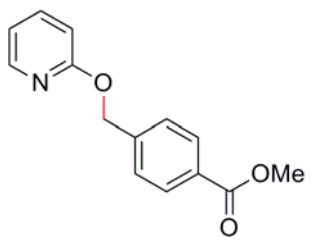


2-((4-Bromobenzyl)oxy)pyridine (1i): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged potassium *tert*-butoxide (1.7841 g, 15.9 mmol), 4-bromobenzyl alcohol (2.9652 g, 15.9 mmol) and dioxane (24 mL). To this supension was added 2-chloropyridine (1 mL, 10.9 mmol). The resulting mixture was heated to reflux over 17 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried

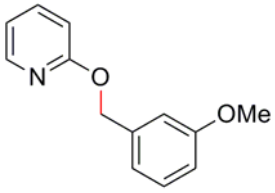
over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 95:5, v/v) to afford the title compound (91%). White solid. All spectral data are in agreement with reported literature data.[4, 5] ^1H NMR (400 MHz, $CDCl_3$) δ 8.15 (dd, *J* = 1.8Hz, *J* = 5.0Hz, 1H), δ 7.59-7.53 (m, 1H), 7.48 (d, *J* = 8.3Hz, 2H), 7.32 (d, *J* = 8.3Hz, 2H), 6.89-6.83 (m, 1H), 6.79 (d, *J* = 8.3Hz, 1H), 5.33 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 163.4, 146.9, 138.8, 136.6, 131.6, 129.7, 121.8, 117.2, 111.4, 66.7.



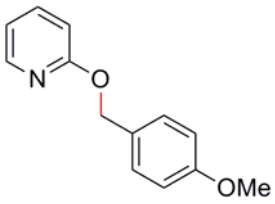
2-(4-(Trifluoromethyl)benzyloxy)pyridine (1j): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged potassium *tert*-butoxide (1.3454 g, 12.0 mmol) and dioxane (24 mL). To this supension was added 4-trifluoromethylbenzyl alcohol (1.49 mL, 10.9 mmol) and 2-chloropyridine (1 mL, 10.9 mmol). The resulting mixture was heated to reflux over 21 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 98:2, v/v) to afford the title compound (76%). White solid. All spectral data are in agreement with reported literature data.[6] ^1H NMR (400 MHz, $CDCl_3$) δ 8.17 (dd, *J* = 1.6Hz, *J* = 5.3Hz, 1H), 7.64-7.56 (m, 5H), 6.91 (ddd, *J* = 0.9Hz, *J* = 5.1Hz, *J* = 7.1Hz, 2H), 6.84 (d, *J* = 8.4Hz, 2H), 5.45 (s, 2H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 163.4, 147.0, 141.8, 138.9, 130.1 (q, *J* = 32.3Hz), 127.9, 125.5 (q, *J* = 3.8Hz), 124.3 (dd, *J* = 272.0Hz, *J* = 543.9Hz), 117.4, 111.4, 66.6. ^{19}F NMR (376 MHz, $CDCl_3$) δ –61.6.



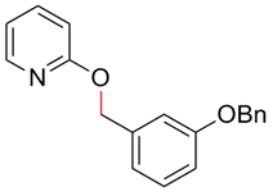
Methyl 4-((pyridin-2-yloxy)methyl)benzoate (1k): Prepared in two steps from 4-formylbenzoate.[1, 16] To a 100 mL round-bottom flask was charged 4-formylbenzoate (2.4624 g, 15 mmol) and MeOH (30 mL). The solution was cooled to 0 ºC in an ice bath. Subsequently, $NaBH_4$ (624.2 mg, 16.5 mmol) was added portionwise. The reaction vessel was allowed to warm to room temperature over 1 h, upon which volatiles were removed *in vacuo*. The residue was redissolved in 50 mL EtOAc and 50 mL HCl and the layers were separated. The aqueous phase was extracted with 2 x 25 mL EtOAc. The combined organic extracts were washed with 25 mL sat'd $NaHCO_3$, dried over $MgSO_4$, filtered, and concentrated *in vacuo* to give the crude methyl 4-(hydroxymethyl)benzoate (2.4742 g, 14.9 mmol, 99%). All spectral data are in agreement with reported literature data.[17, 20] ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.03 (d, *J* = 8.2Hz, 2H), 7.43 (d, *J* = 8.1Hz, 2H), 4.77 (s, 2H), 3.92 (s, 3H). The crude material was added to a suspension of potassium *tert*-butoxide (1.8391 g, 16.4 mmol) and dioxane (40 mL) in a 100 mL round-bottom flask. Subsequently, 2-chloropyridine (1.41 mL, 14.9 mmol) was added and the reaction mixture was heated to reflux over 19 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography to afford the title compound (25%). White solid; m.p. 43-44 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.16 (dd, *J* = 1.5Hz, *J* = 5.0Hz, 1H), 8.04 (d, *J* = 8.3Hz, 2H), 7.59 (ddd, *J* = 2.0Hz, *J* = 7.2Hz, *J* = 9.0Hz, 1H), 7.52 (d, *J* = 8.2Hz, 2H), 6.89 (dd, *J* = 5.1Hz, *J* = 7.0Hz, 1H), 6.83 (d, *J* = 8.4Hz, 1H), 5.44 (s, 2H), 3.91 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 167.0, 163.4, 147.0, 142.9, 138.9, 129.6, 127.4, 117.3, 111.4, 66.8, 52.2. IR (neat) 2951, 2916, 1711, 1596, 1568, 1474, 1432, 1411, 1277, 1115, 1046, 839, 785, 755 cm^{-1}. MS (ESI) *m/z* 244 (M+H); HRMS (ESI) *m/z* calc'd for $C_{14}H_{14}NO_3$ $[M+H]^+$: 244.0968; found: 244.0968.



2-(3-Methoxybenzyloxy)pyridine (1l): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged potassium *tert*-butoxide (1.3454 g, 12.0 mmol) and dioxane (24 mL). To this supension was added 3-methoxybenzyl alcohol (1.35 mL, 10.9 mmol) and 2-chloropyridine (1 mL, 10.9 mmol). The resulting mixture was heated to reflux over 14.5 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 95:5, v/v) to afford the title compound (96%). Colorless oil. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.17 (dd, *J* = 1.3Hz, *J* = 5.0Hz, 1H), 7.57 (ddd, *J* = 2.0Hz, *J* = 7.1Hz, *J* = 8.5Hz, 1H), 7.28 (t, *J* = 7.9Hz, 1H), 7.04 (d, *J* = 9.8Hz, 2H), 6.89-6.84 (m, 2H), 6.81 (d, *J* = 8.3Hz, 1H), 5.36 (s, 2H), 3.81 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 163.7, 159.9, 147.0, 139.1, 138.7, 129.6, 120.2, 117.1, 113.5, 111.4, 67.5, 55.3.

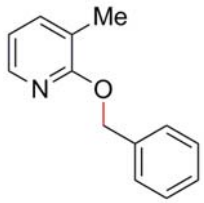


2-(4-Methoxybenzyloxy)pyridine (1m): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged potassium *tert*-butoxide (1.3454 g, 12.0 mmol) and dioxane (24 mL). To this supension was added 4-methoxybenzyl alcohol (1.36 mL, 10.9 mmol) and 2-chloropyridine (1 mL, 10.9 mmol). The resulting mixture was heated to reflux over 14 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 95:5, v/v) to afford the title compound (91%). White solid. All spectral data are in agreement with reported literature data.[1, 6] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (s, 1H), 7.54 (t, *J* = 7.7Hz, 1H), 7.40 (dd, *J* = 2.4Hz, *J* = 8.5Hz, 2H), 6.90 (d, *J* = 6.9Hz, 2H), 6.85 (dd, *J* = 5.6Hz, *J* = 6.6Hz, 1H), 6.77 (d, *J* = 8.4Hz, 1H), 5.31 (d, *J* = 5.5Hz, 2H), 3.79 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 163.8, 159.5, 146.9, 138.7, 129.9, 129.6, 116.9, 114.0, 111.4, 67.4, 55.4.

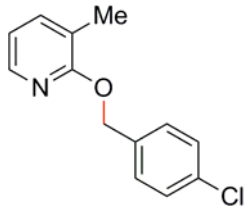


2-((3-(Benzyloxy)benzyl)oxy)pyridine (1n): Prepared in two steps from 3-benzyloxybenzaldehyde.[1, 16] To a 100 mL round-bottom flask was charged 3-benzyloxybenzaldehyde (2.1225 g, 10 mmol) and MeOH (25 mL). The solution was cooled to 0 ºC in an ice bath. Subsequently, $NaBH_4$ (416.1 mg, 11 mmol) was added portionwise. The reaction vessel was allowed to warm to room temperature over 12 h, upon which volatiles were removed *in vacuo*. The residue was redissolved in 50 mL EtOAc and 50 mL HCl and the layers were separated. The aqueous phase was extracted with 2 x 25 mL EtOAc. The combined organic extracts were washed with 25 mL sat'd $NaHCO_3$, dried over $MgSO_4$, filtered, and concentrated *in vacuo* to give the crude (3-(benzyloxy)phenyl)methanol (2.1059 g, 9.8 mmol, 98%). ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.46-7.27 (m, 6H), 7.02 (s, 1H), 6.96 (d, *J* = 7.6Hz, 1H), 6.91 (dd, *J* = 2.4Hz, *J* = 8.2Hz, 1H), 5.08 (s, 2H), 4.68 (s, 2H). The crude material (2.1059 g, 9.8 mmol) was added to a suspension of potassium *tert*-butoxide (1.2343 g, 11.0 mmol) and dioxane (25 mL) in a 100 mL round-bottom flask. Subsequently, 2-chloropyridine (946.2 μL, 10 mmol) was added and the reaction mixture was heated to reflux over 22.5 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 98:2, v/v) to afford the title compound (99%). Colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.19 (ddd, *J* = 0.6Hz, *J* = 1.9Hz, *J* = 5.1Hz, 1H), 7.59 (ddd, *J* = 2.0Hz, *J* = 7.1Hz, *J* = 8.4Hz, 1H), 7.45 (dd, *J* = 0.9Hz, *J* = 8.3Hz, 2H), 7.40 (t, *J* = 7.3Hz, 2H), 7.36-7.27 (m, 2H), 7.13 (s, 1H), 7.07 (d, *J* = 7.6Hz, 1H), 6.94 (dd, *J* = 2.2Hz, *J* = 8.0Hz, 1H), 6.89 (ddd, *J* = 0.9Hz, *J* = 5.1Hz, *J* = 7.1Hz, 1H), 6.83 (d, *J* = 8.4Hz, 1H), 5.38 (s, 2H), 5.09 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 163.7, 159.1, 147.0, 139.1, 138.7, 137.1, 129.6, 128.7, 128.1, 127.6, 120.5, 117.1, 114.4, 114.3, 111.4, 70.1, 67.4. IR (neat) 3031, 1595, 1569, 1473, 1431, 1311, 1267, 1285, 1156, 989, 779, 736,

696 cm^{-1}. MS (ESI) *m/z* 292 (M+H); HRMS (ESI) *m/z* calc'd for $C_{19}H_{18}NO_2$ $[M+H]^+$: 292.1332; found: 292.1342.

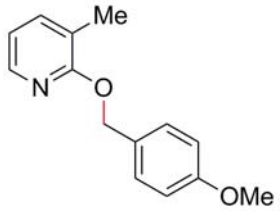


2-(Benzyloxy)-3-methylpyridine (1o): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (693 mg, 6.2 mmol) and dioxane. To this supension was added benzyl alcohol (435 µL, 4.2 mmol) and 2-chloro-3-picoline (435 µL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with 3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (86%). Pale yellow oil. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.01 (d, *J* = 5.0Hz, 1H), 7.47 (d, *J* = 7.4Hz, 2H), 7.43-7.35 (m, 3H), 7.31 (t, *J* = 7.3Hz, 1H), 6.81 (dd, *J* = 7.1 and 5.0Hz, 1H), 5.42 (s, 2H), 2.25 (s, 3H). $^{13}C\{^1H\}$ NMR (75 MHz, $CDCl_3$) δ 161.9, 143.9, 138.5, 137.8, 128.3, 127.5, 127.4, 120.9, 116.8, 67.2, 15.9. IR (neat) 3029, 1593, 1421, 1446, 1360, 1304, 1253, 1186, 1114, 991, 784, 732, 696 cm^{-1}. MS (EI) *m/z* 199 (M); HRMS (EI) *m/z* calc'd for $C_{13}H_{13}NO$ $[M]^+$: 199.0997; found: 199.0995.

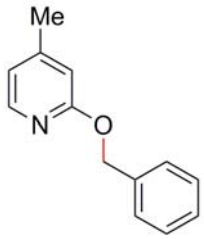


2-((4-Chlorobenzyl)oxy)-3-methylpyridine (1p): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (677 mg, 6.0 mmol) and dioxane. To this supension was added 4-chlorobenzyl alcohol (599 mg, 4.2 mmol) and 2-chloro-3-picoline (435 µL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with 3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over

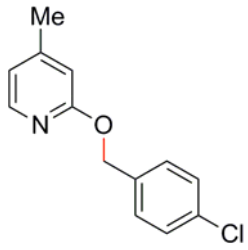
$MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (88%). Pale yellow solid; m.p. 35-36 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.00 (d, *J* = 5.0Hz, 1H), 7.43-7.38 (m, 3H), 7.34 (d, *J* = 8.5Hz, 2H), 6.81 (dd, *J* = 7.1 and 5.0Hz, 1H), 5.38 (s, 2H), 2.23 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 161.6, 143.9, 138.6, 136.4, 133.3, 128.8, 128.5 120.8, 116.9, 66.4, 15.8. IR (neat) 3051, 1589, 1428, 1355, 1303, 1253, 1188, 1115, 1092, 996, 880, 802, 776 cm^{-1}. MS (EI) *m/z* 233 (M); HRMS (EI) *m/z* calc'd for $C_{13}H_{12}ClNO$ [M, ^{35}Cl]$^+$: 233.0607; found: 233.0608.



2-((4-Methoxybenzyl)oxy)-3-methylpyridine (1q): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (673 mg, 6.0 mmol) and dioxane. To this supension was added 4-methoxybenzyl alcohol (525 µL, 4.2 mmol) and 2-chloro-3-picoline (435 µL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with 3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (87%). Pale yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.01 (d, *J* = 5.0Hz, 1H), 7.44-7.36 (m, 3H), 6.91 (d, *J* = 8.7Hz, 2H), 6.79 (dd, *J* = 7.1 and 5.0Hz, 1H), 5.34 (s, 2H), 3.82 (s, 3H), 2.21 (s, 3H). ^{13}C{^{1}H} NMR (75 MHz, $CDCl_3$) δ 162.0, 159.1, 143.9, 138.4, 129.9, 129.2, 120.9, 116.7, 113.7, 67.0, 55.2, 15.9. IR (neat) 2951, 1593, 1513, 1447, 1360, 1302, 1244, 1173, 1114, 1034, 989, 820, 785 cm^{-1}. MS (EI) *m/z* 229 (M); HRMS (ESI) *m/z* calc'd for $C_{14}H_{15}NO_2Na$ [M+Na]$^+$: 252.0995; found: 252.1007.

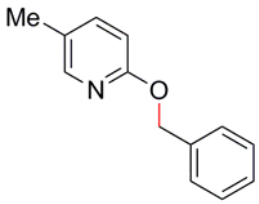


2-(Benzyloxy)-4-methylpyridine (1r): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (494 mg, 4.4 mmol) and dioxane. To this supension was added benzyl alcohol (435 µL, 4.2 mmol) and 2-chloro-4-methylpyridine (445 µL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with 3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (96%). Pale yellow oil. All spectral data are in agreement with reported literature data.[7] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.05 (d, *J* = 5.2Hz, 1H), 7.47 (d, *J* = 7.0Hz, 2H), 7.38 (t, *J* = 7.3Hz, 2H), 7.32 (t, *J* = 7.2Hz, 1H), 6.72 (d, *J* = 5.2Hz, 1H), 6.65 (s, 1H), 5.39 (s, 2H), 2.30 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 163.9, 149.9, 146.3, 137.5, 128.4, 127.8, 127.7, 118.5, 111.3, 67.4, 20.9. IR (neat) 3030, 1611, 1561, 1480, 1414, 1356, 1315, 1244, 1157, 1027, 991, 812, 733, 696 cm^{-1}. MS (EI) *m/z* 199 (M); HRMS (EI) *m/z* calc'd for $C_{13}H_{13}NO$ $[M]^+$: 199.0997; found: 199.1001.

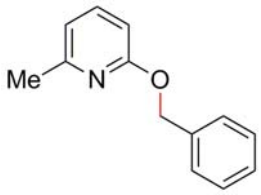


2-((4-Chlorobenzyl)oxy)-4-methylpyridine (1s): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (493 mg, 4.4 mmol) and dioxane. To this supension was added 4-chlorobenzyl alcohol (598 mg, 4.2 mmol) and 2-chloro-4-methylpyridine (445 µL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with

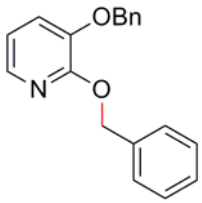
3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (97%). Pale yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.02 (d, *J* = 5.2Hz, 1H), 7.38 (d, *J* = 8.7Hz, 2H), 7.33 (d, *J* = 8.6Hz, 2H), 6.72 (d, *J* = 5.2Hz, 1H), 6.62 (s, 1H), 5.34 (s, 2H), 2.30 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 163.7, 150.0, 146.3, 136.0, 133.4, 129.2, 128.5, 118.6, 111.3, 66.5, 20.9. IR (neat) 2920, 1612, 1561, 1491, 1445, 1399, 1354, 1316, 1244, 1157, 1087, 1033, 1015, 992, 809 cm^{-1}. MS (EI) *m/z* 233 (M); HRMS (EI) *m/z* calc'd for $C_{13}H_{12}ClNO$ [M, ^{35}Cl]$^+$: 233.0607; found: 233.0610.



2-(Benzyloxy)-5-methylpyridine (1t): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (496 mg, 4.4 mmol) and dioxane. To this supension was added benzyl alcohol (435 µL, 4.2 mmol) and 2-chloro-5-methylpyridine (435 µL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with 3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (94%). Pale yellow oil. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.99 (s, 1H), 7.47 (d, *J* = 7.1Hz, 2H), 7.43-7.35 (m, 3H), 7.32 (t, *J* = 7.3Hz, 1H), 6.74 (d, *J* = 8.4Hz, 1H), 5.37 (s, 2H), 2.26 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 161.9, 146.2, 139.7, 137.5, 128.4, 127.8, 127.7, 125.8, 110.6, 67.4, 17.4. IR (neat) 2926, 1608, 1573, 1485, 1453, 1387, 1358, 1281, 1253, 1127, 1024, 822, 739, 696 cm^{-1}. MS (EI) *m/z* 199 (M); HRMS (EI) *m/z* calc'd for $C_{13}H_{13}NO$ [M]$^+$: 199.0997; found 199.1000.

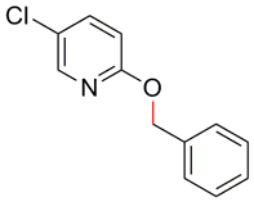


2-(Benzyloxy)-6-methylpyridine (1u): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (673 mg, 6.0 mmol) and dioxane. To this supension was added benzyl alcohol (435 μL, 4.2 mmol) and 2-chloro-6-methylpyridine (435 μL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with 3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (83%). Yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.46 (t, *J* = 7.8Hz, 3H), 7.38 (t, *J* = 7.3Hz, 2H), 7.32 (d, *J* = 7.2Hz, 1H), 6.73 (d, *J* = 7.2Hz, 1H), 6.59 (d, *J* = 8.2Hz, 1H), 5.37 (s, 2H), 2.46 (s, 3H). ^{13}C{^{1}H} NMR (75 MHz, $CDCl_3$) δ 163.1, 156.1, 138.8, 137.6, 128.4, 128.1, 127.7, 115.8, 107.6, 67.3, 24.1. IR (neat) 3032, 1598, 1575, 1447, 1302, 1256, 1231, 1027, 789, 729, 696 cm^{-1}. MS (EI) *m/z* 199 (M); HRMS (EI) *m/z* calc'd for $C_{13}H_{13}NO$ $[M]^+$: 199.0997; found: 199.0997.



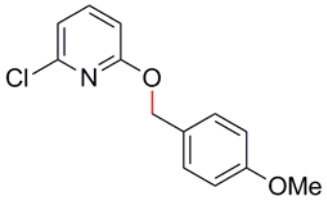
2,3-Bis(benzyloxy)pyridine (1v): Prepared in two steps from 2-chloro-3-pyridinol.[1, 21] To a 125 mL Erlenmeyer flask was charged 2-chloro-3-pyridinol (712.5 mg, 5.5 mmol), potassium carbonate (836.2 mg, 6.1 mmol) and *N*,*N*-dimethylformamide (12 mL). Subsequently, benzyl bromide (654.1 μL, 5.5 mmol) was added and the reaction mixture was allowed to stir at room temperature for 6.5 h. The suspension was diluted with 100 mL EtOAc and washed with 3 x 25 mL H_2O. The organic layer was dried over $MgSO_4$, filtered, and concentrated *in vacuo*, and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 90:10) to give 3-(benzyloxy)-2-chloropyridine (**1kk**) as a clear oil (1.1007

g, 5.0 mmol, 91%). All spectral data are in agreement with reported literature data.[22] ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.99 (dd, *J* = 1.5Hz, *J* = 4.6Hz, 1H), 7.44 (d, *J* = 7.4Hz, 2H), 7.39 (t, *J* = 7.3Hz, 2H), 7.34 (t, *J* = 7.0Hz, 1H), 7.22 (dd, *J* = 1.5Hz, *J* = 8.1Hz, 1H), 7.15 (dd, *J* = 4.6Hz, *J* = 8.1Hz, 1H), 5.17 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 150.9, 141.5, 141.0, 135.7, 128.9, 128.4, 127.2, 123.2, 121.1, 70.1. IR (neat) 3056, 3036, 1566, 1445, 1419, 1379, 1293, 1209, 1087, 1062, 1022, 797, 726, 706, 690 cm^{-1}. MS (EI) *m/z* 219 (M); HRMS (EI) *m/z* calc'd for $C_{12}H_{10}NOCl$ $[M]^+$: 219.0451; found: 219.0454. 3-(Benzyloxy)-2-chloropyridine (1.081 g, 4.9 mmol) was added to a suspension of potassium *tert*-butoxide (604.8 mg, 5.4 mmol) and dioxane (25 mL) in a 100 mL round-bottom flask. Subsequently, benzyl alcohol (507.6 μL, 4.9 mmol) was added and the reaction mixture was heated to reflux over 27.5 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography to afford the title compound (96%). Off-white solid; m.p. 47-48 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.74 (dd, *J* = 1.5Hz, *J* = 5.0Hz, 1H), 7.50 (d, *J* = 7.4Hz, 2H), 7.40 (d, *J* = 7.3Hz, 2H), 7.38-7.32 (m, 4H), 7.29 (t, *J* = 7.1Hz, 2H), 7.06 (dd, *J* = 1.5Hz, *J* = 7.8Hz, 1H), 6.76 (dd, *J* = 5.0Hz, *J* = 7.7Hz, 1H), 5.50 (s, 2H), 5.14 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 154.9, 143.3, 138.0, 137.7, 136.8, 128.7, 128.5, 128.1, 127.9, 127.7, 127.3, 121.3, 117.1, 71.2, 67.6. IR (neat) 3062, 2936, 1592, 1574, 1461, 1449, 1367, 1267, 1253, 1239, 1190, 1122, 975, 786, 743, 692 cm^{-1}. MS (ESI) *m/z* 292 (M+H), 314 (M+Na); HRMS (ESI) *m/z* calc'd for $C_{19}H_{18}NO_2$ $[M+H]^+$: 292.1332; found: 292.1345.

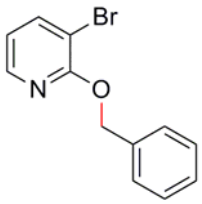


2-(Benzyloxy)-5-chloropyridine (1w): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged 2,5-dichloropyridine (0.99 g, 6.7 mmol), potassium *tert*-butoxide (827.0 mg, 7.4 mmol) and dioxane (15 mL). To this supension was added benzyl alcohol (694.0 μL, 6.7 mmol). The resulting mixture was heated to reflux over 13 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer

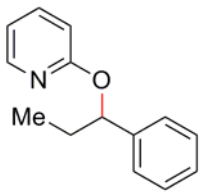
was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography to afford the title compound (95%).White solid; m.p. 44-45 °C. All spectral data are in agreement with reported literature data.[8] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.11 (d, *J* = 2.5Hz, 1H), 7.52 (dd, *J* = 2.5Hz, *J* = 8.8Hz, 1H), 7.44 (d, *J* = 7.4Hz, 2H), 7.37 (t, *J* = 7.3Hz, 2H), 7.31 (t, *J* = 7.1Hz, 1H), 6.75 (d, *J* = 8.8Hz, 1H), 5.34 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 162.2, 145.2, 138.7, 137.1, 128.6, 128.14, 128.11, 124.4, 112.4, 68.2. IR (neat) 3037, 2941, 1591, 1563, 1473, 1451, 1347, 1278, 1242, 1126, 1000, 825, 740, 703, 688 cm^{-1}. MS (ESI) *m/z* 220 (M+H); HRMS (ESI) *m/z* calc'd for $C_{12}H_{11}NOCl$ $[M+H]^+$: 220.0523; found: 220.0521.



2-Chloro-6-((4-methoxybenzyl)oxy)pyridine (1x): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (670 mg, 6.0 mmol) and dioxane. To this supension was added 4-methoxybenzyl alcohol (525 µL, 4.2 mmol) and 2,6-dichloropyridine (591 µL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with 3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (49%). Pale yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.51 (dd, *J* = 7.5Hz, *J* = 8.1Hz, 1H), 7.41 (d, *J* = 8.7Hz, 2H), 6.95-6.88 (m, 3H), 6.68 (dd, *J* = 0.6Hz, *J* = 8.2Hz, 1H), 5.30 (s, 2H), 3.82 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 163.3, 159.5, 148.2, 140.6, 130.1, 128.6, 116.3, 113.9, 109.4, 68.1, 55.2. IR (neat) 2958, 1587, 1559, 1514, 1439, 1366, 1295, 1247, 1159, 1034, 984, 914, 882, 787 cm^{-1}. MS (ESI) *m/z* 272 (M+Na); HRMS (ESI) *m/z* calc'd for $C_{13}H_{12}ClNO_2Na$ $[M+Na, ^{35}Cl]^+$: 272.0448; found 272.0454.

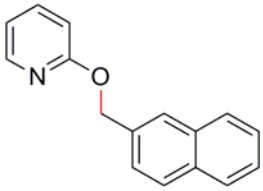


2-(Benzyloxy)-3-bromopyridine (1y): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged 3-bromo-2-chloropyridine (1.8575 g, 9.7 mmol), potassium *tert*-butoxide (1.1916 g, 10.6 mmol) and dioxane (25 mL). To this supension was added benzyl alcohol (1 mL, 9.7 mmol). The resulting mixture was heated to reflux over 17.5 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 3 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 97.5:2.5, v/v) to afford the title compound (75%). Colorless oil. All spectral data are in agreement with reported literature data.[23] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.09 (dd, *J* = 1.7Hz, *J* = 4.9Hz, 1H), 7.82 (dd, *J* = 1.7Hz, *J* = 7.6Hz, 1H), 7.50 (dd, *J* = 0.5Hz, *J* = 7.4Hz, 2H), 7.38 (t, *J* = 7.3Hz, 2H), 7.31 (t, *J* = 7.3Hz, 1H), 6.78 (dd, *J* = 4.9Hz, *J* = 7.6Hz, 1H), 5.47 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 159.7, 145.6, 141.9, 137.1, 128.6, 127.9, 127.6, 118.1, 107.5, 68.4. MS (ES) *m/z* 263 (M, ^{79}Br), 265 (M, ^{81}Br); HRMS (ESI) *m/z* calc'd for $C_{12}H_{10}BrNO$ [M, ^{79}Br]$^+$: 262.9946; found 262.9944.



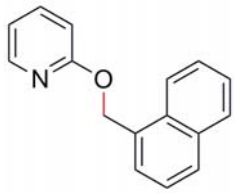
2-(1-Phenylpropoxy)pyridine (1z): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged potassium *tert*-butoxide (1.7841 g, 15.9 mmol) and dioxane (48 mL). To this supension was added 1-phenylethanol (2.18 mL, 15.9 mmol) and 2-chloropyridine (1 mL, 10.9 mmol). The resulting mixture was heated to reflux over 20.5 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column

chromatography (eluent: hexane/EtOAc = 95:5, v/v) to afford the title compound (99%). White solid. All spectral data are in agreement with reported literature data.[6] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.05 (d, *J* = 4.4Hz, 1H), 7.48-7.44 (m, 2H), 7.40 (d, *J* = 7.6Hz, 2H), 7.29 (t, *J* = 7.5Hz, 2H), 7.22-7.19 (m, 1H), 6.73 (dd, *J* = 4.9Hz, *J* = 10.5Hz, 2H), 6.00 (t, *J* = 6.6Hz, 1H), 2.03 (qd, *J* = 7.3Hz, *J* = 14.6Hz, 1H), 1.94-1.87 (m, 1H), 0.94 (t, *J* = 7.4Hz, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 163.5, 147.0, 142.1, 138.6, 128.3, 127.3, 126.6, 116.6, 111.5, 30.2, 10.1.

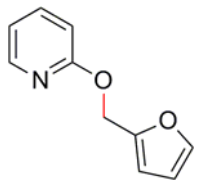


2-(Naphthalen-2-ylmethoxy)pyridine (1aa): Prepared in two steps from 2-naphthaldehyde.[1, 16] To a 100 mL round-bottom flask was charged 2-naphthaldehyde (935 mg, 6 mmol) and MeOH (15 mL). The solution was cooled to 0 ºC in an ice bath. Subsequently, $NaBH_4$ (249.7 mg, 6.6 mmol) was added portionwise. The reaction vessel was allowed to warm to room temperature over 3 h, upon which volatiles were removed *in vacuo.* The residue was redissolved in 50 mL EtOAc and 50 mL HCl and the layers were separated. The aqueous phase was extracted with 2 x 25 mL EtOAc. The combined organic extracts were washed with 25 mL sat'd $NaHCO_3$, dried over $MgSO_4$, filtered, and concentrated *in vacuo* to give the crude naphthalen-2-ylmethanol (920 mg, 5.8 mmol, 97%). All spectral data are in agreement with reported literature data.[17, 24] ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.87-7.82 (m, 4H), 7.50-7.47 (m, 3H), 4.87 (s, 2H). The crude material was added to a suspension of potassium *tert*-butoxide (715.9 mg, 6.4 mmol) and dioxane (15 mL) in a 50 mL round-bottom flask. Subsequently, 2-chloropyridine (550.2 μL, 5.8 mmol) was added and the reaction mixture was heated to reflux over 23 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 98:2, v/v) to afford the title compound (89%). White solid. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.27-8.26 (m, 1H), 7.98 (s, 1H), 7.90

(d, *J* = 6.8Hz, 2H), 7.62 (dd, *J* = 8.4Hz, *J* = 15.7Hz, 2H), 7.52 (dd, *J* = 3.0Hz, *J* = 5.2Hz, 2H), 6.91 (t, *J* = 6.9Hz, 2H), 5.62 (s, 2H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 163.7, 146.9, 138.7, 134.9, 133.4, 133.1, 128.2, 128.0, 127.8, 126.8, 126.2, 126.0, 125.9, 117.0, 111.4, 67.7.

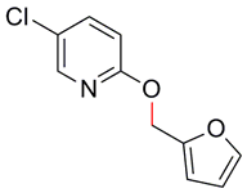


2-(Naphthalen-1-ylmethoxy)pyridine (1bb): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (673 mg, 6.0 mmol) and dioxane. To this supension was added 1-naphthalenemethanol (667 mg, 4.2 mmol) and 2-chloropyridine (380 μL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with 3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (74%). Pale yellow oil. ^1H NMR (300 MHz, $CDCl_3$) δ 8.24 (d, *J* = 5.1Hz, 1H), 8.15-8.07 (m, 1H), 7.94-7.82 (m, 2H), 7.67 (d, *J* = 6.9Hz, 1H), 7.64-7.45 (m, 4H), 6.92 (dd, *J* = 7.0 and 5.2Hz, 1H), 6.82 (d, *J* = 8.3Hz, 1H), 5.83 (s, 2H). $^{13}C\{^1H\}$ NMR (75 MHz, $CDCl_3$) δ 163.6, 146.8, 138.6, 133.7, 132.8, 131.8, 128.8, 128.6, 126.9, 126.3, 125.8, 125.3, 123.9, 117.0, 111.4, 65.9. IR (neat) 3050, 1593, 1569, 1467, 1430, 1308, 1284, 1142, 1059, 988, 774 cm^{-1}. MS (EI) *m/z* 235 (M); HRMS (ESI) *m/z* calc'd for $C_{16}H_{14}NO$ $[M+H]^+$: 236.1069; found: 236.1081.

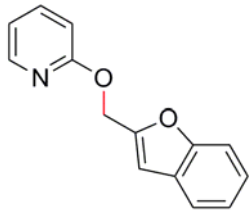


2-(Furan-2-ylmethoxy)pyridine (1cc): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged potassium *tert*-butoxide (1.3454 g, 10.9 mmol) and dioxane (24 mL). To this supension was added furfuryl alcohol (942 μL, 10.9 mmol) and 2-chloropyridine (1 mL, 10.9 mmol). The resulting mixture was heated to reflux over 20 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer

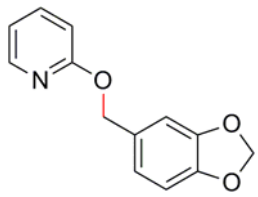
was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 92:8, v/v) to afford the title compound (89%). Orange oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.17 (dd, *J* = 1.8Hz, *J* = 5.0Hz, 1H), 7.56 (ddd, *J* = 2.0Hz, *J* = 7.1Hz, *J* = 8.5Hz, 1H), 7.44 (dd, *J* = 0.7Hz, *J* = 1.8Hz, 1H), 6.88 (ddd, *J* = 0.8Hz, *J* = 5.1Hz, *J* = 7.1Hz, 1H), 6.78 (d, *J* = 8.4Hz, 1H), 6.45 (d, *J* = 3.1Hz, 1H), 6.37 (dd, *J* = 1.9Hz, *J* = 3.2Hz, 1H), 5.34 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 163.3, 150.9, 146.8, 143.1, 138.8, 117.2, 111.5, 110.6, 110.1, 59.7. IR (neat) 2939, 1598, 1570, 1472, 1431, 1310, 1284, 1269, 1248, 1150, 988, 919, 779, 737 cm^{-1}. MS (ESI) *m/z* 176 (M+H); HRMS (ESI) *m/z* calc'd for $C_{10}H_{10}NO_2$ $[M+H]^+$: 176.0706; found: 176.0170.



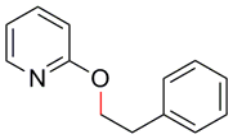
5-Chloro-2-(furan-2-ylmethoxy)pyridine (1dd): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged 2,5-dichloropyridine (0.99 g, 6.7 mmol), potassium *tert*-butoxide (827.0 mg, 7.4 mmol) and dioxane (15 mL). To this supension was added furfuryl alcohol (582.7 μL, 6.7 mmol). The resulting mixture was heated to reflux over 15 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 98:2, v/v) to afford the title compound (90%). Orange solid; m.p. 33-34 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.11 (d, *J* = 2.5Hz, 1H), 7.52 (dd, *J* = 2.5Hz, *J* = 8.8Hz, 1H), 7.44 (s, 1H), 6.73 (d, *J* = 8.8Hz, 1H), 6.44 (d, *J* = 3.1Hz, 1H), 6.37 (s, 1H), 5.30 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 161.7, 150.5, 145.1, 143.3, 138.8, 124.6, 112.4, 110.6, 110.4, 60.1. IR (neat) 3087, 1591, 1566, 1471, 1344, 1277, 1245, 1224, 1151, 1110, 974, 921, 822, 812, 731 cm^{-1}. MS (EI) *m/z* 209 (M, ^{35}Cl), 211 (M, ^{37}Cl); HRMS (EI) *m/z* calc'd for $C_{10}H_8NO_2Cl$ [M, ^{35}Cl]$^+$: 209.0244; found: 209.0240.



2-(Benzofuran-2-ylmethoxy)pyridine (1ee): Prepared in two steps from 2-benzofurancarboxaldehyde.[1, 16] To a 100 mL round-bottom flask was charged 2-benzofurancarboxaldehyde (1.0 mL, 8.2 mmol) and EtOH (20 mL). The solution was cooled to 0 ºC in an ice bath. Subsequently, $NaBH_4$ (365 mg, 9.6 mmol) was added portionwise. The solution was stirred for 3 min at 0 ºC and then quenched with 20 mL water. The aqueous phase was extracted with 3 x 20 mL CH_2Cl_2 and the combined organic extracts were washed with 25 mL brine, dried over $MgSO_4$, filtered, and concentrated *in vacuo* to give the crude benzofuran-2-ylmethanol (1.2 g, 8.1 mmol, 98%). All spectral data are in agreement with reported literature data.[25] MS (EI) *m/z* 148 (M). To a vial with a Teflon cap was charged potassium *tert*-butoxide (1.03 g, 9.4 mmol) and dioxane. To this supension was added the crude benzofuran-2-ylmethanol (1.2 g, 8.1 mmol) and 2-chloropyridine (595 µL, 6.3 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with 3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (80%). Pale yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.19 (d, *J* = 5.1Hz, 1H), 7.63-7.54 (m, 2H), 7.49 (d, *J* = 8.0Hz, 1H), 7.29 (t, *J* = 7.3Hz, 1H), 7.22 (t, *J* = 7.4Hz, 1H), 6.91 (dd, *J* = 7.1 and 5.1Hz, 1H), 6.85-6.80 (m, 2H), 5.50 (s, 2H). ^{13}C{^{1}H} NMR (75 MHz, $CDCl_3$) δ 162.9, 155.1, 153.4, 146.7, 138.7, 128.1, 124.4, 122.7, 121.1, 117.2, 111.4, 111.3, 106.3, 60.0. IR (neat) 3057, 1599, 1570, 1471, 1453, 1431, 1308, 1269, 1182, 1142, 1041, 988, 943, 877, 810, 778, 751 cm^{-1}. MS (EI) *m/z* 225 (M); HRMS (EI) *m/z* calc'd for $C_{14}H_{11}NO_2$ $[M]^+$: 225.0790; found: 225.0796.

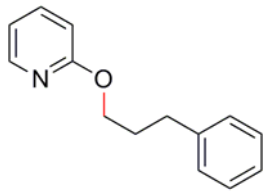


2-(Benzo[d][1,3]dioxol-5-ylmethoxy)pyridine (1ff): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged potassium *tert*-butoxide (1.3454 g, 12.0 mmol), piperonyl alcohol (1.6584 g, 10.9 mmol) and dioxane (24 mL). To this supension was added 2-chloropyridine (1 mL, 10.9 mmol). The resulting mixture was heated to reflux over 15 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 95:5, v/v) to afford the title compound (96%). Pale yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.21 (dd, *J* = 1.4Hz, *J* = 5.0Hz, 1H), 7.60 (ddd, *J* = 2.0Hz, *J* = 7.2Hz, *J* = 9.0Hz, 1H), 7.01 (d, *J* = 1.2Hz, 1H), 6.97 (d, *J* = 7.9Hz, 1H), 6.93-6.90 (m, 1H), 6.85-6.81 (m, 2H), 5.99 (s, 2H), 5.31 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 163.7, 147.9, 147.4, 146.9, 138.7, 131.3, 121.9, 117.0, 111.5, 109.0, 108.3, 101.2, 67.6. IR (neat) 2885, 1597, 1567, 1491, 1474, 1445, 1431, 1247, 1039, 987, 931, 779 cm^{-1}. MS (ESI) *m/z* 230 (M+H), 252 (M+Na); HRMS (ESI) *m/z* calc'd for $C_{13}H_{12}NO_3$ $[M+H]^+$: 230.0811; found: 230.0817.

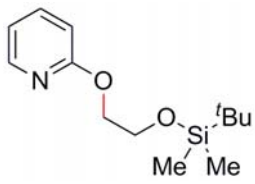


2-Phenethoxypyridine (1gg): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged potassium *tert*-butoxide (1.3454 g, 10.9 mmol) and dioxane (24 mL). To this supension was added 2-phenylethanol (1.31 mL, 10.9 mmol) and 2-chloropyridine (1 mL, 10.9 mmol). The resulting mixture was heated to reflux over 16 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 98:2, v/v) to afford the title compound (59%). Pale yellow oil. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (ddd, *J* = 0.7Hz, *J* = 2.0Hz, *J* = 5.0Hz, 1H), 7.58 (ddd, *J* = 2.0Hz, *J* = 7.1Hz, *J* = 8.4Hz, 1H), 7.36-7.31 (m, 4H), 7.25 (m, 1H), 6.88 (ddd, *J* = 0.9Hz, *J* = 5.1Hz, *J* = 7.1Hz, 1H), 6.75 (td, *J* = 0.8Hz, *J* = 8.4Hz, 1H), 4.55 (t, *J* = 7.1Hz, 2H), 3.13 (t, *J* = 7.1Hz, 2H).

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 147.1, 138.6, 129.2, 128.5, 126.5, 116.8, 111.3, 66.5, 35.7.

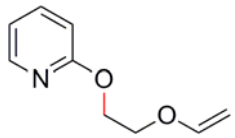


2-(3-Phenylpropoxy)pyridine (1hh): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged potassium *tert*-butoxide (1.3454 g, 10.9 mmol) and dioxane (24 mL). To this supension was added 3-phenyl-1-propanol (1.47 mL, 10.9 mmol) and 2-chloropyridine (1 mL, 10.9 mmol). The resulting mixture was heated to reflux over 14.5 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 98:2, v/v) to afford the title compound (94%). Pale yellow oil. ^1H NMR (400 MHz, $CDCl_3$) δ 8.18 (dd, J = 1.9Hz, J = 5.0Hz, 1H), 7.60 (ddd, J = 2.0Hz, J = 7.1Hz, J = 8.4Hz, 1H), 7.34-7.21 (m, 8H), 6.88 (ddd, J = 0.9Hz, J = 5.1Hz, J = 7.1Hz, 1H), 6.77 (d, J = 8.4Hz, 1H), 4.35 (t, J = 6.5Hz, 2H), 2.85-2.81 (m, 2H), 2.14 (td, J = 6.5Hz, J = 14.1Hz, 2H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 147.1, 141.9, 138.6, 128.6, 128.5, 126.0, 116.7, 111.2, 65.3, 32.5, 30.9. IR (neat) 3025, 2948, 1595, 1570, 1477, 1467, 1432, 1311, 1286, 1270, 1021, 779, 737, 699 cm^{-1}. MS (ESI) *m/z* 214 (M+H); HRMS (ESI) *m/z* calc'd for $C_{14}H_{16}NO$ $[M+H]^+$: 214.1226; found: 214.1231.



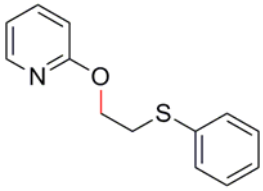
2-(2-((*tert*-Butyldimethylsilyl)oxy)ethoxy)pyridine (1ii): Prepared in two steps from ethylene glycol.[1, 26] A solution of *tert*-butyldimethylsilyl chloride (1.53 g, 10 mmol) in CH_2Cl_2 (6 mL) was added to a stirring solution of ethylene glycol (5.6 mL, 100 mmol) and pyridine (8.1 mL, 100 mmol) in CH_2Cl_2 (14 mL). The resulting pale yellow solution was stirred at ambient temperature for 16 h and then concentrated *in vacuo*. The residue was extracted with 4 x 20 mL hexanes. The combined organic layers were washed with 20 mL

water, 20 mL brine, dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 90:10 to 70:30, v/v) to afford 2-((*tert*-butyldimethylsilyl)oxy)ethanol (**1mm**) as a clear oil (1.11 g, 6.3 mmol, 63%). All spectral data are in agreement with reported literature data.[9] ^{1}H NMR (400 MHz, $CDCl_3$) δ 3.74-3.69 (m, 2H), 3.67-3.61 (m, 2H), 2.04 (t, *J* = 6.2Hz, 1H), 0.91 (s, 9H), 0.09 (s, 6H). To a vial with a Teflon cap was charged potassium *tert*-butoxide (125 mg, 1.1 mmol) and dioxane. To this supension was added the 2-((*tert*-butyldimethylsilyl)oxy)ethanol (188 mg, 1.1 mmol) and 2-chloropyridine (95 μL, 1.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with 3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (52%). Clear oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.13 (dd, *J* = 1.4Hz, *J* = 5.0Hz, 1H), 7.54 (tdd, *J* = 1.7Hz, *J* = 6.9Hz, 1H), 6.83 (ddd, *J* = 0.8Hz, *J* = 5.1Hz, *J* = 7.0Hz, 1H), 6.74 (d, *J* = 8.4Hz, 1H), 4.37 (t, *J* = 5.2Hz, 2H), 3.96 (t, *J* = 5.2Hz, 2H), 0.89 (s, 9H), 0.08 (s, 6H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 163.7, 146.8, 138.4, 116.6, 111.2, 67.0, 61.9, 25.9, 18.4, –5.2. IR (neat) 2929, 2857, 1585, 1489, 1460, 1400, 1308, 1187, 1140, 1085, 1010, 847, 799, 713 cm^{-1}. MS (ESI) *m/z* 254 (M+H); HRMS (ESI) *m/z* calc'd for $C_{13}H_{24}NO_2Si$ $[M+H]^+$: 254.1570; found: 254.1562.

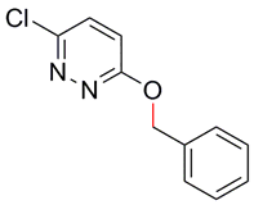


2-(2-(Vinyloxy)ethoxy)pyridine (1jj): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (493 mg, 4.4 mmol) and dioxane. To this supension was added ethylene glycol vinyl ether (380 μL, 4.2 mmol) and 2-chloropyridine (380 μL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (96%). Pale yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.13 (dd,

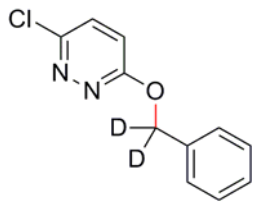
J = 1.4Hz, *J* = 5.0Hz, 1H), 7.56 (ddd, *J* = 2.0Hz, *J* = 7.1Hz, *J* = 8.6Hz, 1H), 6.86 (ddd, *J* = 0.8Hz, *J* = 5.1Hz, *J* = 7.0Hz, 1H), 6.78 (d, *J* = 8.4Hz, 1H), 6.53 (dd, *J* = 6.8Hz, *J* = 14.4Hz, 1H), 4.56 (t, *J* = 4.7Hz, 2H), 4.23 (dd, *J* = 2.2Hz, *J* = 14.3Hz, 1H), 4.07-4.00 (m, 3H). $^{13}C\{^1H\}$ NMR (75 MHz, $CDCl_3$) δ 163.3, 151.7, 146.6, 138.6, 116.9, 111.3, 86.8, 66.3, 63.9. IR (neat) 2937, 1596, 1571, 1474, 1432, 1311, 1287, 1198, 1059, 980, 819, 779, 737 cm^{-1}. MS (ESI) *m/z* 166 (M+H); HRMS (ESI) *m/z* calc'd for $C_9H_{12}NO_2$ $[M+H]^+$: 166.0862; found: 166.0865.



2-(2-(Phenylthio)ethoxy)pyridine (1kk): Prepared by a known procedure.[1] To a 100 mL round-bottom flask was charged potassium *tert*-butoxide (1.3454 g, 10.9 mmol) and dioxane (24 mL). To this supension was added 2-phenylthioethanol (1.47 mL, 10.9 mmol) and 2-chloropyridine (1 mL, 10.9 mmol). The resulting mixture was heated to reflux over 13 h. The solution was diluted with 25 mL EtOAc and washed with 25 mL H_2O. The aqueous layer was extracted with 2 x 25 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 95:5, v/v) to afford the title compound (42%). Pale yellow oil. ^1H NMR (400 MHz, $CDCl_3$) δ 8.12 (dd, *J* = 1.8Hz, *J* = 5.0Hz, 1H), 7.57-7.52 (m, 1H), 7.43 (dd, *J* = 0.9Hz, *J* = 8.3Hz, 2H), 7.28 (t, *J* = 7.7Hz, 2H), 7.18 (t, *J* = 7.4Hz, 1H), 6.85 (dd, *J* = 5.1Hz, *J* = 7.0Hz, 1H), 6.70 (d, *J* = 8.4Hz, 1H), 4.50 (t, *J* = 7.0Hz, 2H), 3.31 (t, *J* = 7.0Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 163.4, 146.9, 138.8, 136.0, 129.5, 120.1, 126.3, 117.1, 111.3, 64.4, 32.6. IR (neat) 3057, 1593, 1570, 1474, 1431, 1286, 1269, 1004, 778, 737, 691 cm^{-1}. MS (ESI) *m/z* 232 (M+H), 254 (M+Na); HRMS (ESI) *m/z* calc'd for $C_{13}H_{14}NOS$ $[M+H]^+$: 232.0790; found: 232.0796.



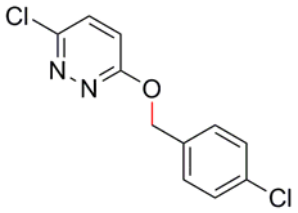
3-(Benzyloxy)-6-chloropyridazine (3a): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (4.06 g, 36.1 mmol) and dioxane. To this supension was added benzyl alcohol (3.40 mL, 32.8 mmol) and 3,6-dichloropyridazine (5.0 g, 33.5 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (76%). White solid; m.p. 69-70 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.49 (d, J = 8.0Hz, 2H), 7.43-7.34 (m, 4H), 7.00 (d, J = 9.1Hz, 1H), 5.54 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 163.9, 151.1, 135.8, 130.8, 128.5, 128.4, 128.3, 120.1, 69.5. IR (neat) 3046, 1587, 1498, 1420, 1375, 1313, 1142, 1017, 843, 730, 698 cm^{-1}. MS (ESI) *m/z* 221 (M+H); HRMS (ESI) *m/z* calc'd for $C_{11}H_9ClN_2O$ [M+H, ^{35}Cl]$^+$: 221.0476; found: 221.0472.



(3a-d_2): Prepared in two steps from methyl benzoate.[27] To a round-bottom flask was charged methyl benzoate (0.25 mL, 2 mmol) and Et_2O (20 mL). The solution was cooled to –5 ºC in an ice bath. Subsequently, $LiAlD_4$ (96 mg, 2.28 mmol) was added. The reaction vessel was stirred for 10 min and allowed to warm to room temperature for 30 min. The suspension was cooled to –5 ºC and quenched with 10% sat'd NH_4Cl and the layers were separated. The aqueous phase was extracted with 2 x 20 mL Et_2O. The combined organic extracts were washed with 20 mL 1M HCl, 20 mL 10% $NaHCO_3$, 20 mL brine, dried over Na_2SO_4, filtered and concentrated *in vacuo* to give the crude benzyl alcohol-α,α-d_2 as a pale yellow oil (216 mg, 1.98 mmol, 98%). All spectral data are in agreement with reported literature data.[28] ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.38-7.28 (m, 5H). MS (EI) *m/z* 110 (M). The crude material was dissolved in dioxane (1 mL) and added to a homogeneous solution of 3,6-dichloropyridazine in dioxane (4 mL) in a scintillation vial. The reaction vessel was immersed in a room temperature water bath. To this solution was added potassium *tert*-butoxide (445 mg, 3.97

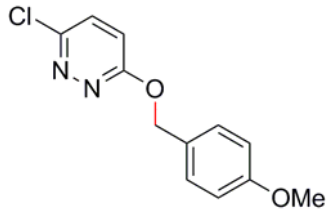
mmol) and stirred for 1 h. The solution was diluted with 5 mL EtOAc and washed with 5 mL H_2O. The aqueous layer was extracted with 3 x 5 mL EtOAc. The combined organic layers were dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 97.5:2.5 to 96:4, v/v) to afford the title compound (79%). White solid; m.p. 64-65 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.49 (dd, *J* = 1.5Hz, *J* = 8.1Hz, 2H), 7.42-7.33 (m, 4H), 7.00 (d, *J* = 9.2Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 164.2, 151.3, 135.8, 131.0, 128.7, 128.6, 121.8, 120.4, 69.13 (td, *J* = 22.6Hz, *J* = 45.7Hz, 1H). ^{2}D NMR (61 MHz, $CDCl_3$) δ 5.54 (s, 2D). IR (neat) 3056, 1590, 1425, 1314, 1252, 1189, 1148, 1089, 1074, 1051, 1022, 975, 853 cm^{-1}. MS (EI) *m/z* 222 (M); HRMS (EI) *m/z* calc'd for $C_{11}N_2OClH_7D_2$ $[M]^+$: 222.0529; found: 222.0523.

Subjecting **3a-*d*$_2$** to general procedure A at 90 ºC for 8 h gave recovered starting material **3a**/**3a-*d*$_1$**/**3a-*d*$_2$** in 57% (**3a**:**3a-*d*$_1$**:**3a-*d*$_2$** = 0.01 : 0.19 : 0.80, based on ^{1}H NMR integration; 0.01 : 0.15 : 0.84, based on MS (ESI) integration) and isolated product **4a**/**4a-*d*$_1$**/**4a-*d*$_2$** in 35% (**4a**/**4a-*d*$_1$**/**4a-*d*$_2$** = 0.05 : 0.73 : 0.22, based on ^{1}H NMR integration; 0.04 : 0.69 : 0.27, based on MS (ESI) integration). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.49 (d, *J* = 8.0Hz, 2H), 7.43-7.34 (m, 4H), 7.00 (d, *J* = 9.1Hz, 1H), 5.54 (s, 0.03H, **3a**), 5.52 (m, 0.19H, **3a-*d*$_1$**). MS (ESI) *m/z* 221 (M+H, **3a**), 222 (M+H, **3a-*d*$_1$**), 223 (M+H, **3a-*d*$_2$**).

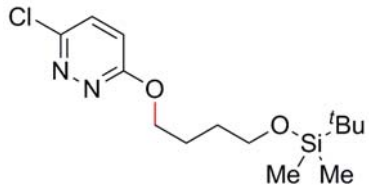


3-Chloro-6-((4-chlorobenzyl)oxy)pyridazine (3b): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (693 mg, 6.2 mmol) and dioxane. To this supension was added 4-chlorobenzyl alcohol (598 mg, 4.2 mmol) and 3,6-dichloropyridazine (598 mg, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (25%). White solid; m.p. 118-119 ºC. ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.38 (td, *J* = 8.5Hz, *J* = 10.3Hz, 5H), 6.99

(d, J = 9.2Hz, 1H), 5.50 (s, 2H). $^{13}C\{^1H\}$ NMR (75 MHz, $CDCl_3$) δ 163.8, 151.3, 134.3, 134.2, 130.9, 129.8, 128.7, 120.1, 68.7. IR (neat) 3048, 2933, 1585, 1489, 1400, 1308, 1187, 1140, 1085, 1010, 847, 799, 731 cm^{-1}. MS (ESI) *m/z* 255 (M+H); HRMS (ESI) *m/z* calc'd for $C_{11}H_9Cl_2N_2O$ $[M+H, {}^{35}Cl]^+$: 255.0086; found: 255.0079.

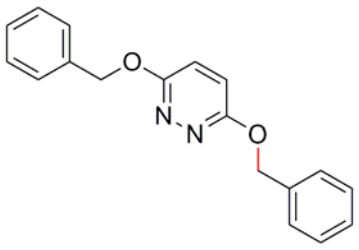


3-Chloro-6-((4-methoxybenzyl)oxy)pyridazine (3c): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (690 mg, 6.2 mmol) and dioxane. To this supension was added 4-methoxybenzyl alcohol (525 μL, 4.2 mmol) and 3,6-dichloropyridazine (598 mg, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (33%). White solid; m.p. 100-102 ºC. ^1H NMR (400 MHz, $CDCl_3$) δ 7.42 (d, J = 8.6Hz, 2H), 7.36 (d, J = 9.1Hz, 1H), 6.96 (d, J = 9.1Hz, 1H), 6.92 (d, J = 8.6Hz, 2H), 5.47 (s, 2H), 3.82 (s, 3H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 164.0, 159.8, 151.0, 130.8, 130.4, 127.9, 120.2, 113.9, 69.4, 55.3. IR (neat) 3016, 1617, 1586, 1516, 1435, 1372, 1299, 1245, 1173, 1147, 1028, 1002, 851, 814, 695 cm^{-1}. MS (ESI) *m/z* 273 (M+Na); HRMS (ESI) *m/z* calc'd for $C_{12}H_{11}ClN_2O_2Na$ $[M+Na, {}^{35}Cl]^+$: 273.0401; found: 273.0397.



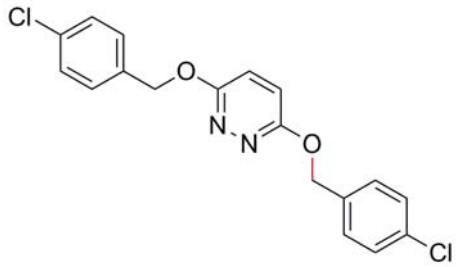
3-(4-((*tert*-Butyldimethylsilyl)oxy)butoxy)-6-chloropyridazine (3d): Prepared in two steps from butane-1,4-diol.[1, 26] A solution of *tert*-butyldimethylsilyl chloride (1.53 g, 10 mmol) in CH_2Cl_2 (6 mL) was added to a stirring solution of butane-1,4-diol (4.4 mL, 50 mmol) and pyridine (8.1 mL, 100 mmol) in CH_2Cl_2 (12 mL). The resulting pale yellow solution was

stirred at ambient temperature for 24 h and then concentrated *in vacuo*. The solution was quenched with 20 mL water. The aqueous layer was extracted with 4 x 20 mL hexanes. The combined organic layers were washed with 2 x 25 mL water, dried over $MgSO_4$, filtered, and concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 90:10 to 70:30, v/v) to afford 4-((*tert*-butyldimethylsilyl)oxy)butan-1-ol (**3h**) as a clear oil (1.47 g, 7.2 mmol, 71%). All spectral data are in agreement with reported literature data.[10] ^{1}H NMR (400 MHz, $CDCl_3$) δ 3.71-3.60 (m, 4H), 2.44 (br s, 1H), 1.71-1.59 (m, 4H), 0.90 (s, 9H), 0.07 (s, 6H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 63.3, 62.8, 30.3, 29.9, 25.9, 18.3, –5.4. To a vial with a Teflon cap was charged potassium *tert*-butoxide (135 mg, 1.2 mmol) and dioxane. To this supension was added the 4-((*tert*-butyldimethylsilyl)oxy)butan-1-ol (202 mg, 1.0 mmol) and 3,6-dichloropyridazine (225 mg, 1.5 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with 6 mL H_2O. The aqueous layer was extracted with 3 x 6 mL EtOAc. The combined organic layers were washed with 10 mL brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (85%). Clear oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.35 (d, J = 9.2Hz, 1H), 6.93 (d, J = 9.2Hz, 1H), 4.50 (t, J = 6.6Hz, 2H), 3.67 (t, J = 6.3Hz, 2H), 1.93-1.83 (m, 2H), 1.73- 1.63 (m, 2H), 0.89 (s, 9H), 0.05 (s, 6H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 164.4, 150.8, 130.7, 120.1, 67.9, 62.6, 29.2, 25.9, 25.4, 18.3, –5.3. IR (neat) 3056, 2955, 2857, 1587, 1436, 1382, 1310, 1251, 1191, 1087, 1050, 1005, 972, 830, 772, 700 cm^{-1}. MS (ESI) *m/z* 339 (M+Na); HRMS (ESI) *m/z* calc'd for $C_{14}H_{25}ClN_2O_2SiNa$ [M+Na, $^{35}Cl]^+$: 339.1266; found: 339.1270.

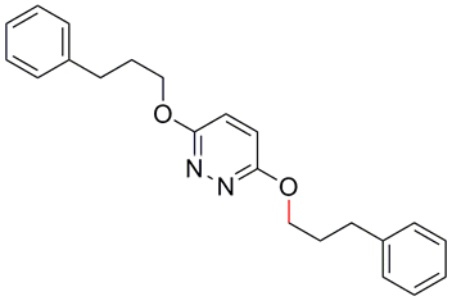


3,6-bis(Benzyloxy)pyridazine (3e): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (564 mg, 5.0 mmol) and dioxane. To this supension was added benzyl alcohol (435 µL, 4.2 mmol) and 3,6-dichloropyridazine (301 mg, 2.0

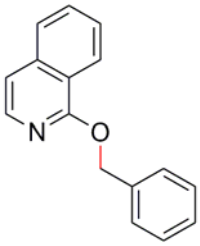
mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (69%). White solid; m.p. 126-128 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.49 (d, *J* = 8.5Hz, 4H), 7.43-7.31 (m, 6H), 7.00 (s, 2H), 5.49 (s, 4H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 161.7, 136.6, 128.5, 128.3, 128.1, 121.6, 68.9. IR (neat) 3038, 1470, 1439, 1359, 1266, 1094, 1011, 903, 852, 729, 691 cm^{-1}. MS (ESI) *m/z* 293 (M+H); HRMS (ESI) *m/z* calc'd for $C_{18}H_{17}N_2O_2$ $[M+H]^+$: 293.1284; found: 293.1289.



3,6-Bis((4-chlorobenzyl)oxy)pyridazine (3f): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (300 mg, 2.7 mmol) and dioxane. To this supension was added 4-chlorobenzyl alcohol (350 mg, 2.5 mmol) and 3-chloro-6-(4-chlorobenzyloxy)pyridazine (**3b**) (500 mg, 2.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (53%). White solid; m.p. 156-157 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.41 (d, *J* = 8.5Hz, 4H), 7.35 (d, *J* = 8.5Hz, 4H), 6.99 (s, 2H), 5.44 (s, 4H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 161.5, 135.0, 133.9, 129.6, 128.7, 121.7, 68.0. IR (neat) 3034, 2922, 1489, 1437, 1359, 1267, 1087, 1011, 861, 802, 666 cm^{-1}. MS (ESI) *m/z* 361 (M+H); HRMS (ESI) *m/z* calc'd for $C_{18}H_{15}Cl_2N_2O_2$ $[M+H, ^{35}Cl]^+$: 361.0505; found: 361.0507.

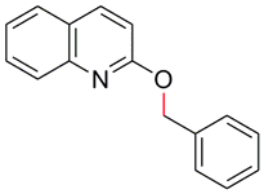


3,6-Bis(3-phenylpropoxy)pyridazine (3g): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (1.01 g, 9.0 mmol) and dioxane. To this supension was added 3-phenylpropanol (1.14 mL, 8.4 mmol) and 3,6-dichloropyridazine (598 mg, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (84%). White solid; m.p. 88-89 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.32-7.25 (m, 4H), 7.20 (dd, J = 7.1Hz, J = 14.6Hz, 6H), 6.91 (s, 2H), 4.44 (t, J = 6.5Hz, 4H), 2.83-2.76 (m, 4H), 2.14 (tt, J = 6.5Hz, J = 13.1Hz, 4H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 161.7, 141.5, 128.4, 128.3, 125.9, 121.4, 66.4, 32.2, 30.5. IR (neat) 3028, 2950, 1605, 1496, 1437, 1379, 1264, 1082, 1026, 999, 908, 851, 759, 726, 694 cm^{-1}. MS (ESI) *m/z* 349 (M+H); HRMS (ESI) *m/z* calc'd for $C_{22}H_{25}N_2O_2$ $[M+H]^+$: 349.1910; found: 349.1903.

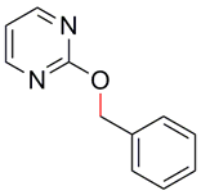


1-(Benzyloxy)isoquinoline (5a): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (123 mg, 1.1 mmol) and dioxane. To this supension was added benzyl alcohol (109 μL, 1.1 mmol) and 1-chloroisoquinoline (164 mg, 1.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title

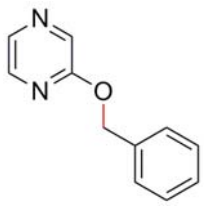
compound (92%). Pale yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.33 (d, *J* = 8.3Hz, 1H), 8.03 (d, *J* = 5.9Hz, 1H), 7.75 (d, *J* = 8.1Hz, 1H), 7.71-7.61 (m, 1H), 7.60-7.50 (m, 3H), 7.47-7.31 (m, 3H), 7.25 (d, *J* = 5.6Hz, 1H), 5.61 (s, 2H). ^{13}C{^{1}H} NMR (75 MHz, $CDCl_3$) δ 160.3, 139.6, 137.9, 137.4, 130.4, 128.4, 127.8, 127.7, 126.6, 126.0, 124.2, 119.8, 115.1, 67.8. IR (neat) 3056, 1627, 1569, 1498, 1454, 1400, 1325, 1205, 1158, 1091, 967, 812, 741, 696, 673 cm^{-1}. MS (ESI) *m/z* 236 (M+H); HRMS (ESI) *m/z* calc'd for $C_{16}H_{14}NO$ $[M+H]^+$: 236.1069; found: 236.1081.



2-Benzyloxyquinoline (5b). Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (134 mg, 1.2 mmol) and dioxane. To this supension was added benzyl alcohol (113 μL, 1.1 mmol) and 2-chloroquinoline (165 mg, 1.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (95%). Pale yellow oil. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.01 (d, *J* = 8.8Hz, 1H), 7.91 (d, J=8.4Hz, 1H), 7.74 (dd, J=1.1Hz, J=8.0Hz, 1H), 7.66 (ddd, J=1.5Hz, J=7.0Hz, J=8.4Hz, 1H), 7.57 (d, J=8.3Hz, 2H), 7.47-7.32 (m, 4H), 6.99 (d, J=8.8Hz, 1H), 5.59 (s, 2H). ^{13}C{^{1}H} NMR (75 MHz, $CDCl_3$) δ 161.8, 146.5, 138.8, 137.3, 129.5, 128.4, 128.3, 127.8, 127.4, 127.3, 125.2, 124.0, 113.2, 67.6. IR (neat) 3030, 1604, 1573, 1506, 1475, 1427, 1393, 1309, 1257, 1111, 999, 821, 755, 695 cm^{-1}. MS (ESI) *m/z* 236 (M+H); HRMS (ESI) *m/z* calc'd for $C_{16}H_{14}NO$ $[M+H]^+$: 236.1069; found: 236.1077.

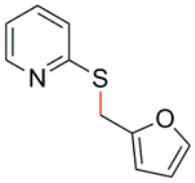


2-(Benzyloxy)pyrimidine (5c): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (678 mg, 6.0 mmol) and dioxane. To this supension was added benzyl alcohol (435 μL, 4.2 mmol) and 2-chloropyrimidine (453 mg, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (34%). Pale yellow oil. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.53 (d, *J* = 4.8Hz, 2H), 7.49 (d, *J* = 6.9Hz, 2H), 7.40-7.28 (m, 3H), 6.94 (t, *J* = 4.8Hz, 1H), 6.45 (s, 2H). $^{13}C\{^1H\}$ NMR (75 MHz, $CDCl_3$) δ 165.0, 159.2, 136.4, 128.3, 127.9, 126.9, 115.1, 68.9. IR (neat) 3034, 1576, 1562, 1418, 1365, 1317, 1005, 808, 736, 697 cm^{-1}. LRMS (EI) *m/z* 186 (M); HRMS (EI) *m/z* calc'd for $C_{11}H_{10}N_2O$ $[M]^+$: 186.0793; found: 186.0796.

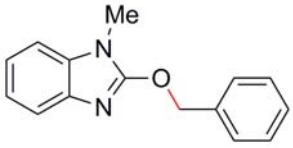


2-(Benzyloxy)pyrazine (5d): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (250 mg, 2.2 mmol) and dioxane. To this supension was added benzyl alcohol (217 μL, 2.1 mmol) and 2-chloropyrazine (178 μL, 2.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (93%). Pale yellow oil. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.30 (d, *J* = 1.3Hz, 1H), 8.14 (d, *J* = 2.8Hz, 1H), 8.10 (dd, *J* = 1.4Hz, *J* = 2.8Hz, 1H), 7.46 (d, *J* = 7.2Hz, 2H), 7.43-7.31 (m, 3H), 5.40 (s, 2H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 160.0, 140.4, 136.7, 136.3, 136.1, 128.5, 128.1, 128.0, 67.8. IR (neat) 3062, 1580, 1531, 1468, 1412, 1361, 1284, 1192, 1152, 1060, 1005, 837, 735,

697 cm^{-1}. MS (EI) *m/z* 186 (M); HRMS (EI) *m/z* calc'd for $C_{11}H_{10}N_2O$: 186.0793 (M); found: 186.0789.

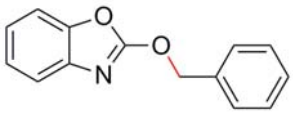


2-((Furan-2-ylmethyl)thio)pyridine (5e): Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (680 mg, 6.1 mmol) and dioxane. To this supension was added furfuryl mercaptan (425 µL, 4.2 mmol) and 2-chloropyridine (380 µL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (53%). Dark red oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.46 (d, *J* = 4.9Hz, 1H), 7.48 (dt, *J* = 7.6 and 1.9Hz, 1H), 7.33 (d, *J* = 1.9Hz, 1H), 7.18 (d, *J* = 7.9Hz, 1H), 7.00 (dd, *J* = 7.4 and 4.9Hz, 1H), 6.28 (d, *J* = 3.1Hz, 1H), 6.24 (d, *J* = 3.1Hz, 1H), 4.48 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 157.9, 151.4, 149.4, 141.9, 136.0, 122.3, 119.7, 110.5, 107.6, 26.6. IR (neat) 2963, 1577, 1556, 1453, 1414, 1149, 1122, 1009, 934, 757, 733 cm^{-1}. MS (ESI) *m/z* 192 (M+H); HRMS (ESI) *m/z* calc'd for $C_{10}H_{10}NOS$ $[M+H]^+$: 192.0477; found: 192.0480.

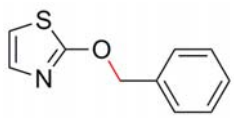


2-(Benzyloxy)-1-methyl-1H-benzo[d]imidazole (5f). Prepared in two steps from 2-chloroimidazole.[1, 21] To a flask was charged 2-chloroimidazole (503 mg, 3.3 mmol), potassium carbonate (620 mg, 4.5 mmol) and *N*,*N*-dimethylformamide (12 mL). Subsequently, methyl iodide (225 µL, 3.6 mmol) was added and the reaction mixture was allowed to stir at room temperature for 5 h. The suspension was diluted with 40 mL H_2O and extracted with 4 x 40 mL EtOAc. The combined organic layers was washed with 5 x 40 mL H_2O and 40 mL brine. The organic layer was dried over $MgSO_4$, filtered, and concentrated *in vacuo* to afford 2-chloro-1-methyl-1H-benzoimidazole (503 mg, 3.0 mmol, 92%). ^{1}H NMR

(400 MHz, $CDCl_3$) δ 7.73-7.66 (m, 1H), 7.34-7.27 (m, 3H), 3.79 (s, 3H). MS (EI) *m/z* 166 (M). To a vial with a Teflon cap was charged potassium *tert*-butoxide (145 mg, 1.3 mmol) and dioxane. To this supension was added benzyl alcohol (114 μL, 1.1 mmol) and 2-chloro-1-methyl-1H-benzoimidazole (166 mg, 1.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (53%). Colorless oil. ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.59 (dd, *J* = 3.5Hz, *J* = 5.2Hz, 1H), 7.52 (dd, *J* = 1.4Hz, *J* = 7.7Hz, 2H), 7.46-7.34 (m, 3H), 7.24-7.12 (m, 3H), 5.60 (s, 2H), 3.57 (s, 3H). ^{13}C{^{1}H} NMR (75 MHz, $CDCl_3$) δ 157.4, 140.0, 135.7, 134.3, 128.6, 128.5, 128.1, 121.5, 120.9, 117.6, 107.9, 71.6. IR (neat) 3010, 2940, 1622, 1531, 1452, 1360, 1284, 1208, 1123, 996, 739, 699 cm^{-1}. MS (ESI) *m/z* 239 (M+H); HRMS (ESI) *m/z* calc'd for $C_{15}H_{15}N_2O$ $[M+H]^+$: 239.1178; found: 239.1177.

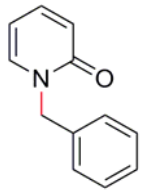


2-(Benzyloxy)benzo[d]oxazole (5g). Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (268 mg, 2.4 mmol) and dioxane. To this supension was added benzyl alcohol (226 μL, 2.2 mmol) and 2-chlorobenzoxazole (228 μL, 2.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (71%). White solid; m.p. 47-48 ºC. ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.52 (d, *J* = 7.9Hz, 3H), 7.46-7.32 (m, 4H), 7.26 (t, *J* = 7.6Hz, 1H), 7.19 (t, *J* = 7.7Hz, 1H), 5.58 (s, 2H). ^{13}C{^{1}H} NMR (75 MHz, $CDCl_3$) δ 163.4, 148.5, 141.0, 134.4, 128.9, 128.7, 128.4, 124.2, 122.8, 117.9, 109.7, 73.5. IR (neat) 3055, 2933, 1778, 1630, 1571, 1498, 1448, 1389, 1351, 1322, 1247, 1168, 1110, 1009, 976, 728 cm^{-1}. MS (ESI) *m/z* 226 (M+H); HRMS (ESI) *m/z* calc'd for $C_{14}H_{12}NO_2$ $[M+H]^+$: 226.0862; found: 226.0863.

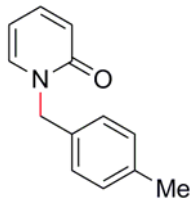


2-Benzyloxythiazole (5h). Prepared by a known procedure.[1] To a vial with a Teflon cap was charged potassium *tert*-butoxide (496 mg, 4.4 mmol) and dioxane. To this supension was added benzyl alcohol (435 µL, 4.2 mmol) and 2-bromothiazole (355 µL, 4.0 mmol). The resulting mixture was heated to reflux overnight. The solution was quenched with H_2O. The aqueous layer was extracted with EtOAc. The combined organic layers were washed with brine, dried over $MgSO_4$, concentrated *in vacuo* and the resulting residue was purified by column chromatography (eluent: hexane/EtOAc = 99:1 to 80:20, v/v) to afford the title compound (81%). Pale yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.49-7.44 (m, 2H), 7.43-7.32 (m, 3H), 7.16 (d, *J* = 3.8Hz, 1H), 6.69 (d, *J* = 3.8Hz, 1H), 5.46 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 174.8, 136.8, 135.5, 128.6, 128.5, 128.2, 111.3, 73.0. IR (neat) 3033, 1519, 1475, 1370, 1307, 1215, 1161, 1060, 952, 863, 696 cm^{-1}. MS (ESI) *m/z* 192 (M+H); HRMS (ESI) *m/z* calc'd for $C_{10}H_{10}NOS$ $[M+H]^+$: 192.0477; found: 192.0483.

Migratory rearrangement products

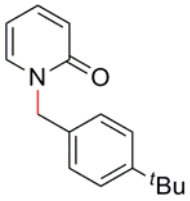


1-Benzylpyridin-2(1H)-one (2a): Prepared from **1a** according to general procedure A (91%). All spectral data are in agreement with reported literature data.[1] Thick yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.25-7.17 (m, 7H), 6.52 (d, *J* = 8.9Hz, 1H), 6.05 (dt, *J* = 1.3Hz, *J* = 6.7Hz, 1H), 5.06 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 162.7, 139.5, 137.3, 136.4, 128.9, 128.2, 128.0, 121.3, 106.3, 51.9.

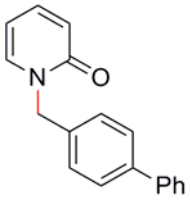


1-(4-Methylbenzyl)pyridin-2(1H)-one (2b): Prepared from **1b** according to general procedure A at 80 ºC (76%). Light brown solid; m.p. 63-65 ºC. All spectral data are in

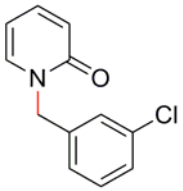
agreement with reported literature data.[1] ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.37-7.10 (m, 6H), 6.60 (d, *J* = 9.1Hz, 1H), 6.12 (t, *J* = 6.7Hz, 1H), 5.10 (s, 2H), 2.33 (s, 3H). ^{13}C{^{1}H} NMR (75 MHz, $CDCl_3$) δ 162.6, 139.2, 137.7, 137.0, 133.3, 129.4, 128.1, 121.0, 106.0, 51.5, 21.0. IR (neat) 3026, 1655, 1586, 1537, 1346, 1141, 1021, 766 cm^{-1}. MS (EI) *m/z* 199 (M); HRMS (EI) *m/z* calc'd for $C_{13}H_{13}NO$ $[M]^+$: 199.0997; found: 199.1000.



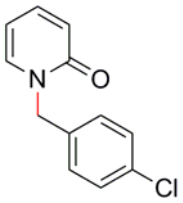
1-(4-(*tert*-Butyl)benzyl)pyridin-2(1H)-one (2c): Prepared from **1c** according to general procedure A at 90 ºC (99%). White solid, m.p. 123-125 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.35 (d, *J* = 8.1Hz, 2H), 7.32-7.21 (m, 4H), 6.59 (d, *J* = 9.0Hz, 1H), 6.12 (t, *J* = 6.5Hz, 1H), 5.10 (s, 2H), 1.29 (s, 9H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 162.7, 151.0, 139.4, 137.4, 133.4, 128.0, 125.8, 121.2, 106.1, 51.6, 34.6, 31.4. IR (neat) 2961, 1654, 1582, 1537, 1267, 1140, 1023, 839, 767 cm^{-1}. MS (EI) *m/z* 241 (M); HRMS (EI) *m/z* calc'd for $C_{16}H_{19}NO$ $[M]^+$: 241.1467; found: 241.1462.



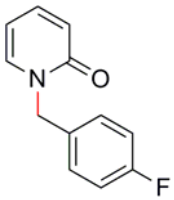
1-([1,1'-Biphenyl]-4-ylmethyl)pyridin-2(1H)-one (2d): Prepared from **1d** according to general procedure A at 90 ºC (99%). White solid; 128-130 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.54 (d, *J* = 7.9Hz, 4H), 7.41 (t, *J* = 7.5Hz, 2H), 7.38-7.26 (m, 5H), 6.61 (d, *J* = 9.0Hz, 1H), 6.13 (t, *J* = 6.6Hz, 1H), 5.16 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 162.7, 141.0, 140.6, 139.5, 137.3, 135.5, 128.8, 128.6, 127.6, 127.5, 127.1, 121.3, 106.2, 51.7. IR (neat) 2926, 1645, 1586, 1535, 1154, 761, 751, 693 cm^{-1}. MS (EI) *m/z* 261 (M), HRMS (EI) *m/z* calc'd for $C_{18}H_{15}NO$ $[M]^+$: 261.1154; found: 261.1161.



1-(3-Chlorobenzyl)pyridin-2(1H)-one (2e): Prepared from **1e** according to general procedure A (95%). All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.27-7.23 (m, 1H), 7.20-7.18 (m, 4H), 7.11-7.09 (m, 1H), 6.53 (d, *J* = 8.8Hz, 1H), 6.09 (dt, *J* = 1.4Hz, *J* = 6.7Hz, 1H), 5.02 (s, 2H). ^{13}C{^{1}H} NMR 162.6, 139.7, 138.5, 137.3, 134.8, 130.2, 128.3, 128.1, 126.2, 121.4, 106.5, 51.5.

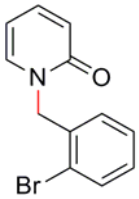


1-(4-chlorobenzyl)pyridin-2(1H)-one (2f): Prepared from **1f** according to general procedure A at 80 ºC (89%). White solid; m.p. 68-70 ºC. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.36-7.22 (m, 6H), 6.61 (d, *J* = 6.7Hz, 1H), 6.16 (t, *J* = 6.7Hz, 1H), 6.10 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.4, 139.5, 137.0, 134.9, 133.8, 129.4, 128.9, 121.3, 106.3, 51.3. IR (neat) 2921, 1646, 1582, 1534, 1490, 1435, 1343, 1244, 1152, 1088, 1016, 860, 802, 763, 734 cm^{-1}. MS (EI) *m/z* 219 (M); HRMS (EI) *m/z* calc'd for $C_{12}H_{10}ClNO$ $[M]^+$: 219.0451; found: 219.0449.

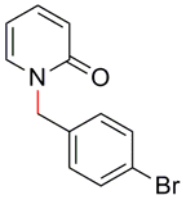


1-(4-Fluorobenzyl)pyridin-2(1H)-one (2g): Prepared from **1g** according to general procedure A at 90 ºC (88%). White solid; m.p. 80-82 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.34-7.24 (m, 4H), 7.02 (t, *J* = 8.6Hz, 2H). 6.60 (d, *J* = 9.1Hz, 1H), 6.15 (dt, *J* = 1.1Hz, *J* = 6.7Hz, 1H), 5.10 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 163.8, 162.7, 161.3, 139.6, 137.2, 132.3 (*J* = 3.0Hz), 115.8 (*J* = 21.7Hz), 106.4, 51.4. ^{19}F NMR (376 MHz, $CDCl_3$) δ –113.15. IR (neat) 2958, 1653, 1581, 1506, 1435, 1352, 1221, 1151, 1087, 831, 758, 721 cm^{-1}. MS

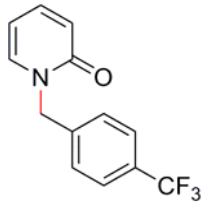
(ESI) *m/z* 204 (M+H), 226 (M+Na); HRMS (ESI) *m/z* calc'd for $C_{12}H_{11}FNO$ $[M+H]^+$: 204.0819; found: 204.0825.



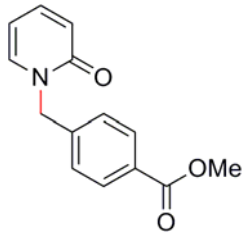
1-(2-Bromobenzyl)pyridin-2(1H)-one (2h): Prepared from **1h** according to general procedure A at 120 ºC (66%). Off-white solid; m.p. 98-100 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.58 (dd, *J* = 1.1Hz, *J* = 8.4Hz, 1H), 7.38-7.32 (m, 1H), 7.29 (dd, *J* = 2.1Hz, *J* = 6.9Hz, 1H), 7.24 (dd, *J* = 1.6Hz, *J* = 7.4Hz, 1H), 7.19-7.14 (m, 2H), 6.63 (d, *J* = 8.9Hz, 1H), 6.17 (dt, *J* = 1.4Hz, *J* = 6.7Hz, 1H), 5.25 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 162.8, 139.7, 137.5, 135.5, 133.1, 129.9, 129.6, 128.1, 123.6, 121.3, 106.4, 51.9. Peaks from a minor rotamer are also observed. IR (neat) 3068, 2923, 1655, 1582, 1533, 1463, 1438, 1415, 1390, 1347, 1146, 1022, 753 cm^{-1}. MS (EI) *m/z* 263 (M, ^{79}Br), 265 (M, ^{81}Br); HRMS (EI) *m/z* calc'd for $C_{12}H_{10}NOBr$ $[M]^+$: 262.9946; found: 262.9951.



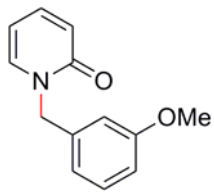
1-(4-Bromobenzyl)pyridin-2(1H)-one (2i): Prepared from **1i** according to general procedure A at 100 ºC (83%). White solid; m.p. 86-88 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.45 (d, *J* = 8.4Hz, 1H), 7.32 (ddd, *J* = 2.1Hz, *J* = 6.6Hz, *J* = 9.0Hz, 1H), 7.25 (dd, *J* = 1.8Hz, *J* = 6.8Hz, 1H), 7.18 (d, *J* = 8.4Hz, 2H), 6.60 (d, *J* = 9.1Hz, 1H), 6.15 (dt, *J* = 1.3Hz, *J* = 6.7Hz, 1H), 5.08 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 162.6, 140.0, 137.2, 135.5, 132.0, 129.9, 122.1, 121.4, 106.5, 51.6. IR (neat) 2923, 1656, 1587, 1487, 1344, 1140, 1010, 845, 770, 760 cm^{-1}. MS (EI) *m/z* 263 (M, ^{79}Br), 265 (M, ^{81}Br); HRMS (EI) *m/z* calc'd for $C_{12}H_{10}NOBr$ $[M]^+$: 262.9946; found: 262.9944.



1-(4-(Trifluoromethyl)benzyl)pyridin-2(1H)-one (2j): Prepared from **1j** according to general procedure A at 100 ºC (96%). White solid; 101-103 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.59 (d, *J* = 8.1Hz, 2H), 7.40 (d, *J* = 8.1Hz, 2H), 7.34 (ddd, *J* = 2.0Hz, *J* = 6.6Hz, *J* = 8.9Hz, 1H), 7.29 (dd, *J* = 1.6Hz, *J* = 6.7Hz, 1H), 6.62 (d, *J* = 9.1Hz, 1H), 6.18 (dt, *J* = 1.3Hz, *J* = 6.7Hz, 1H), 5.19 (s, 1H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.6, 140.5 (d, *J* = 1.3Hz), 139.8, 137.3, 130.3 (q, *J* = 32.4Hz), 128.2, 125.9 (q, *J* = 3.7Hz), 124.1 (q, *J* = 272.2Hz), 121.5, 106.6, 51.8. ^{19}F NMR (376 MHz, $CDCl_3$) δ –61.7. IR (neat) 2926, 1660, 1587, 1539, 1416, 1322, 1099, 1012, 817, 766, 730 cm^{-1}. MS (ESI) *m/z* 254 (M+H), 276 (M+Na); HRMS (ESI) *m/z* calc'd for $C_{13}H_{11}NOF_3$ $[M+H]^+$: 254.0787; found: 254.0775.

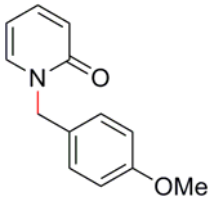


Methyl 4-((2-oxopyridin-1(2H)-yl)methyl)benzoate (2k): Prepared from **1k** according to general procedure A at 90 ºC (99%). Off-white solid; m.p. 127-128 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.00 (d, *J* = 8.2Hz, 2H), 7.34 (d, *J* = 8.2Hz, 3H), 7.29 (d, *J* = 8.4Hz, 1H), 6.62 (d, *J* = 9.2Hz, 1H), 6.17 (t, *J* = 6.6Hz, 1H), 5.19 (s, 2H), 3.90 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 166.7, 162.6, 141.5, 139.7, 137.3, 130.2, 129.8, 127.8, 121.4, 106.5, 52.2, 51.8. IR (neat) 2956, 1715, 1651, 1580, 1532, 1438, 1278, 1115, 1022, 843, 765, 746, 730 cm^{-1}. MS (ESI) *m/z* 244 (M+H), 266 (M+Na); HRMS (ESI) *m/z* calc'd for $C_{14}H_{14}NO_3$ $[M+H]^+$: 244.0968; found: 244.0974.



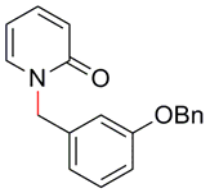
1-(3-Methoxybenzyl)pyridin-2(1H)-one (2l): Prepared from **1l** according to general

procedure A at 90 ºC (78%).[1] All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.24-7.15 (m, 3H), 6.79-6.74 (m, 3H), 6.52 (d, *J* = 9.1Hz, 1H), 6.05 (dt, *J* = 1.4Hz, *J* = 6.7Hz, 1H), 5.03 (s, 2H), 3.69 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.7, 160.1, 139.5, 138.0, 137.3, 130.0, 121.3, 120.4, 113.9, 106.2, 55.3, 51.8.

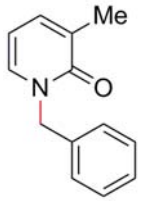


1-(4-Methoxybenzyl)pyridin-2(1H)-one (2m): Prepared from **1m** according to general procedure A at 90 ºC (99%). White solid. All spectral data are in agreement with reported literature data.[1, 11] ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.30-7.24 (m, 4H), 6.86 (d, *J* = 8.7Hz, 2H), 6.58 (d, *J* = 9.1Hz, 1H), 6.11 (dt, *J* = 1.3Hz, *J* = 6.7Hz, 1H), 5.06 (s, 2H), 3.78 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.7, 159.5, 139.3, 137.1, 129.8, 121.2, 114.3, 106.1, 55.3, 51.4.

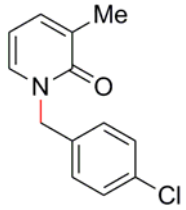
In a competition experiment, **1m** (0.1 mmol) and **1p** (0.1 mmol) were subjected to general procedure A at 90 ºC. No crossover was observed. **2m** was isolated in 99% yield.



1-(3-(Benzyloxy)benzyl)pyridin-2(1H)-one (2n): Prepared from **1n** according to general procedure A at 90 ºC (88%). Off-white solid; 79-81 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.42-7.33 (m, 4H), 7.32-7.27 (m, 1H), 7.25 (d, *J* = 3.3Hz, 1H), 7.21 (d, *J* = 5.7Hz, 1H), 6.92-6.85 (m, 3H), 6.59 (d, *J* = 9.1Hz, 1H), 6.10 (t, *J* = 6.6Hz, 1H), 5.09 (s, 2H), 5.01 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 162.7, 159.2, 139.5, 138.0, 137.3, 136.8, 130.0, 128.6, 128.0, 127.6, 121.2, 120.6, 114.7, 114.3, 106.2, 70.0, 51.7. IR (neat) 2922, 1663, 1580, 1531, 1280, 1145, 1021, 849, 783, 761, 727, 700 cm^{-1}. MS (ESI) *m/z* 292 (M+H), 214 (M+Na), 330 (M+K); HRMS (ESI) *m/z* calc'd for $C_{19}H_{18}NO_2$ $[M+H]^+$: 292.1332; found: 292.1339.

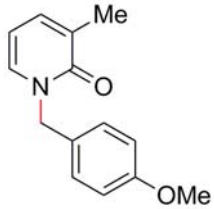


1-Benzyl-3-methylpyridin-2(1H)-one (2o): Prepared from **1o** according to general procedure A at 80 ºC (90%). Light brown viscous oil. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.37-7.27 (m, 5H), 7.17 (t, *J* = 7.7Hz, 2H), 6.07 (t, *J* = 6.8Hz, 1H), 5.15 (s, 2H), 2.17 (s, 3H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 162.9, 136.6, 136.5, 134.5, 130.1, 128.7, 128.0, 127.8, 105.7, 52.1, 17.3. IR (neat) 2920, 1649, 1594, 1559, 1495, 1454, 1382, 1215, 1082, 865, 760, 703 cm^{-1}. MS (EI) *m/z* 199 (M); HRMS (EI) *m/z* calc'd for $C_{13}H_{13}NO$: 199.0997; found: 199.0993.



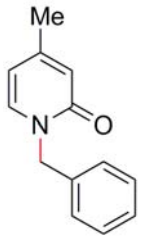
1-(4-Chlorobenzyl)-3-methylpyridin-2(1H)-one (2p): Prepared from **1p** according to general procedure A at 80 ºC (90%). Off-white solid; m.p. 66-68 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.32-7.22 (m, 4H), 7.19 (d, *J* = 6.7Hz, 1H), 7.16 (d, *J* = 6.8Hz, 1H), 6.09 (t, *J* = 6.8Hz, 1H), 5.10 (s, 2H), 2.17 (s, 3H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 162.9, 136.7, 135.1, 134.4, 133.7, 130.3, 129.4, 128.9, 105.9, 51.8, 17.3. IR (neat) 2921, 1651, 1588, 1555, 1486, 1418, 1374, 1227, 1090, 1009, 799, 760 cm^{-1}. MS (EI) *m/z* 233 (M); HRMS (EI) *m/z* calc'd for $C_{13}H_{12}ClNO$ $[M]^+$: 233.0607; found: 233.0605.

In a competition experiment, **1m** (0.1 mmol) and **1p** (0.1 mmol) were subjected to general procedure A at 90 ºC. No crossover was observed. **2p** was isolated in 95% yield.

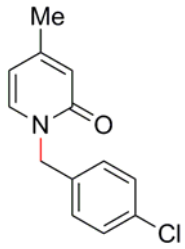


1-(4-Methoxybenzyl)-3-methylpyridin-2(1H)-one (2q): Prepared from **1q** according to general procedure A at 80 ºC (85%). Light brown viscous oil. ^{1}H NMR (300 MHz, $CDCl_3$) δ

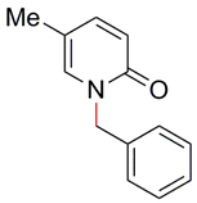
7.27 (d, *J* = 8.6Hz, 2H), 7.16 (d, *J* = 6.7Hz, 2H), 6.86 (d, *J* = 8.6Hz, 2H), 6.06 (t, *J* = 6.7Hz, 1H), 5.08 (s, 2H), 3.78 (s, 3H), 2.17 (s, 3H). $^{13}C\{^1H\}$ NMR (75 MHz, $CDCl_3$) δ 162.9, 159.2, 136.4, 134.3, 129.9, 129.6, 128.6, 114.1, 105.7, 55.2, 51.6, 17.3. IR (neat) 2936, 1648, 1593, 1558, 1512, 1442, 1382, 1300, 1247, 1176, 1032, 818, 757 cm^{-1}. MS (EI) *m/z* 229 (M); HRMS (EI) *m/z* calc'd for $C_{14}H_{15}NO_2$ $[M]^+$: 229.1103; found: 229.1099.



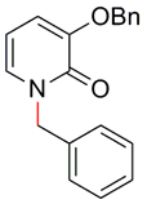
1-Benzyl-4-methylpyridin-2(1H)-one (2r): Prepared from **1r** according to general procedure A at 80 ºC (92%). Pale brown oil. All spectral data are in agreement with reported literature data.[1] ^1H NMR (300 MHz, $CDCl_3$) δ 7.40-7.23 (m, 5H), 7.15 (d, *J* = 7.0Hz, 1H), 6.42 (s, 1H), 5.99 (dd, *J* = 1.8Hz, *J* = 7.0Hz, 1H), 5.11 (s, 2H), 2.17 (s, 3H). $^{13}C\{^1H\}$ NMR (75 MHz, $CDCl_3$) δ 162.5, 150.9, 136.5, 136.0, 128.7, 127.9, 127.7, 119.4, 108.7, 51.3, 21.1. IR (neat) 3030, 1660, 1582, 1494, 1454, 1327, 1248, 1179, 1074, 855, 729 cm^{-1}. MS (EI) *m/z* 199 (M); HRMS (EI) *m/z* calc'd for $C_{13}H_{13}NO$ $[M]^+$: 199.0997; found: 199.0994.



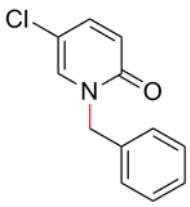
1-(4-Chlorobenzyl)-4-methylpyridin-2(1H)-one (2s): Prepared from **1s** according to general procedure A at 80 ºC (94%). Off-white solid; m.p. 79-81 ºC. ^1H NMR (400 MHz, $CDCl_3$) δ 7.30 (d, *J* = 8.5Hz, 2H), 7.23 (d, *J* = 8.5Hz, 2H), 7.14 (d, *J* = 7.0Hz, 1H), 6.40 (s, 1H), 6.01 (dd, *J* = 1.8Hz, *J* = 7.0Hz, 1H), 5.07 (s, 2H), 2.17 (s, 3H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 162.4, 151.1, 135.9, 135.1, 133.7, 129.3, 128.9, 119.5, 108.8, 50.8, 21.1. IR (neat) 2923, 1655, 1588, 1534, 1482, 1433, 1360, 1245, 1174, 1144, 1092, 1014, 973, 848, 771 cm^{-1}. MS (EI) *m/z* 233 (M); HRMS (EI) *m/z* calc'd for $C_{13}H_{12}ClNO$ $[M]^+$: 233.0607; found: 233.0601.



1-Benzyl-5-methylpyridin-2(1H)-one (2t): Prepared from **1t** according to general procedure A at 100 ºC (98%). Off-white solid, m.p. 64-65 °C. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.37-7.26 (m, 5H), 7.17 (dd, *J* = 2.5Hz, *J* = 9.3Hz, 1H), 7.03 (s, 1H), 6.57 (d, *J* = 9.3Hz, 1H), 5.12 (s, 2H), 2.02 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 161.8, 141.9, 136.6, 134.5, 128.7, 127.9, 127.8, 120.8, 115.1, 51.6, 17.0. IR (neat) 3036, 1663, 1583, 1537, 1495, 1429, 1345, 1266, 1207, 1144, 1073, 916, 827, 716, 698 cm^{-1}. MS (EI) *m/z* 199 (M); HRMS (EI) *m/z* calc'd for $C_{13}H_{13}NO$ $[M]^+$: 199.0997; found: 199.1001.

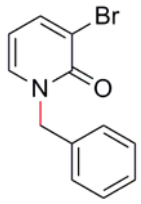


1-Benzyl-3-(benzyloxy)pyridin-2(1H)-one (2v): Prepared from **1v** according to general procedure A at 90 ºC (99%). Off-white solid. All spectral data are in agreement with reported literature data.[12] ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.43 (d, *J* = 7.2Hz, 2H), 7.37-7.24 (m, 8H), 6.88 (d, *J* = 6.6Hz, 1H), 6.61 (d, *J* = 7.1Hz, 1H), 5.97 (t, *J* = 7.1Hz, 1H), 5.15 (s, 2H), 5.10 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 158.3, 149.0, 136.5, 136.3, 128.8, 128.7, 128.5, 128.3, 127.9, 127.4, 115.5, 104.9, 52.0. IR (neat) 3064, 2922, 1648, 1595, 1452, 1253, 1057, 764, 723, 691 cm^{-1}. MS (ESI) *m/z* 292 (M+H), 214 (M+Na), 330 (M+K); HRMS (ESI) *m/z* calc'd for $C_{19}H_{18}NO_2$ $[M+H]^+$: 292.1332; found: 292.1332.

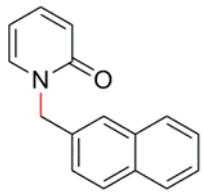


1-Benzyl-5-chloropyridin-2(1H)-one (2w): Prepared from **1w** according to general procedure A at 110 ºC (87%). Off-white solid; m.p. 80-82 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ

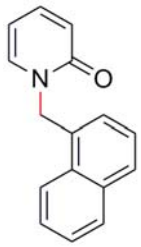
7.39-7.22 (m, 7H), 6.58 (d, J = 9.6Hz, 1H), 5.09 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 161.1, 140.5, 135.8, 134.7, 129.1, 128.44, 128.37, 122.1, 112.5, 52.2. IR (neat) 3050, 1655, 1582, 1529, 1435, 1154, 828, 746, 701, 669 cm^{-1}. MS (EI) *m/z* 219 (M, ^{35}Cl), 221 (M, ^{37}Cl); HRMS (EI) *m/z* calc'd for $C_{12}H_{10}NOCl$ [M, ^{35}Cl]$^+$: 219.0451; found: 219.0450.



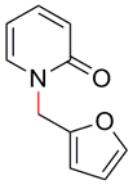
1-Benzyl-3-bromopyridin-2(1H)-one (2y): Prepared from **1y** according to general procedure A (99%). Yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.71 (dd, J = 1.9Hz, J = 7.2Hz, 1H), 7.38-7.28 (m, 6H), 6.06 (t, J = 7.0Hz, 1H), 5.18 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 159.2, 141.5, 136.7, 135.8, 129.1, 128.6, 128.5, 117.1, 106.3, 53.6. IR (neat) 3062, 1647, 1596, 1523, 1455, 1373, 1215, 1117, 1079, 1059, 845, 752, 699 cm^{-1}. MS (EI) *m/z* 263 (M, ^{79}Br), 265 (M, ^{81}Br); HRMS (EI) *m/z* calc'd for $C_{12}H_{10}NOBr$ [M, ^{79}Br]$^+$: 262.9946; found: 262.9945.



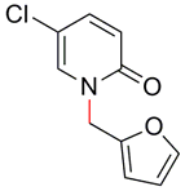
1-(Naphthalen-2-ylmethyl)pyridin-2(1H)-one (2aa): Prepared from **1aa** according to general procedure A (99%). White solid. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.79 (dd, J = 4.6Hz, J = 8.3Hz, 3H), 7.71 (s, 1H), 7.47-7.45 (m, 2H), 7.40 (dd, J = 1.6Hz, J = 8.5Hz, 1H), 7.31-7.25 (m, 3H), 6.62 (d, J = 9.0Hz, 1H), 6.10 (dt, J = 1.3Hz, J = 6.7Hz, 1H), 5.27 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.8, 139.5, 137.3, 134.0, 133.3, 133.0, 128.9, 127.9, 127.8, 127.2, 126.5, 126.3, 125.9, 121.3, 106.3, 51.9.



1-(Naphthalen-1-ylmethyl)pyridin-2(1H)-one (2bb): Prepared from **1bb** according to general procedure A at 90 ºC (92%). White solid; m.p. 145-147 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.99 (d, *J* = 6.7Hz, 1H), 7.92-7.84 (m, 2H), 7.59-7.41 (m, 3H), 7.35 (d, *J* = 7.0Hz, 1H), 7.31 (t, *J* = 6.7Hz, 1H), 7.12 (d, *J* = 7.0Hz, 1H), 6.68 (d, *J* = 8.8Hz, 1H), 6.05 (t, *J* = 6.7Hz, 1H), 5.62 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.6, 139.2, 136.3, 133.6, 131.5, 131.3, 129.2, 128.7, 127.6, 127.0, 126.2, 125.3, 123.4, 120.9, 106.2, 48.8. IR (neat) 3064, 1654, 1585, 1536, 1422, 1393, 1253, 1174, 1145, 946, 844, 795, 764 cm^{-1}. MS (ESI) *m/z* 258 (M+Na); HRMS (ESI) *m/z* calc'd for $C_{16}H_{13}NONa$: 258.0889; found: 258.0884.

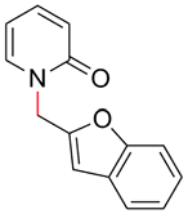


1-(Furan-2-ylmethyl)pyridin-2(1H)-one (2cc): Prepared from **1cc** according to general procedure A at 90 °C (99%). Orange oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.30 (dd, *J* = 0.8Hz, *J* = 1.8Hz, 1H), 7.27-7.24 (m, 1H), 7.22-7.20 (m, 1H), 6.49 (d, *J* = 8.9Hz, 1H), 6.34 (dd, *J* = 0.5Hz, *J* = 3.3Hz, 1H), 6.27 (dd, *J* = 1.9Hz, *J* = 3.2Hz, 1H), 6.07 (dt, *J* = 1.4Hz, *J* = 6.7Hz, 1H), 5.03 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.4, 149.1, 143.1, 139.6, 136.9, 121.1, 110.8, 110.1, 106.1, 44.5. IR (neat) 3126, 1654, 1582, 1538, 1503, 1144, 1010, 762 cm^{-1}. MS (ESI) m/z 176 (M+H), 198 (M+Na); HRMS (ESI) m/z calc'd for $C_{10}H_{10}NO_2$ $[M+H]^+$: 176.0706; found: 176.0707.

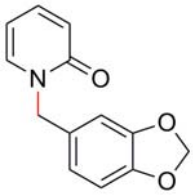


5-Chloro-1-(furan-2-ylmethyl)pyridin-2(1H)-one (2dd): Prepared from **1dd** according to general procedure A at 90 ºC (95%). Off-white solid; m.p. 76-76 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.41 (dd, *J* = 0.5Hz, *J* = 1.7Hz, 1H), 7.37 (d, *J* = 2.8Hz, 1H), 7.25 (dd, *J* = 2.8Hz, *J* = 9.7Hz, 1H), 6.54 (d, *J* = 9.7Hz, 1H), 6.45 (d, *J* = 3.1Hz, 1H), 6.37 (dd, *J* = 1.9Hz, *J* = 3.2Hz, 1H), 5.08 (s, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 160.7, 148.3, 143.4, 140.6, 134.4, 121.9, 112.4, 110.9, 110.6, 44.7. IR (neat) 2923, 1655, 1582, 1527, 1432, 1257, 1147, 1012,

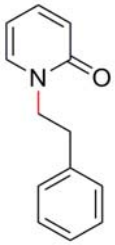
825, 748, 669 cm^{-1}. MS (EI) *m/z* 209 (M, ^{35}Cl), 211 (M, ^{37}Cl); HRMS (EI) *m/z* calc'd for $C_{10}H_8NO_2Cl$ [M, $^{35}Cl]^+$: 209.0244; found: 209.0247.



1-(Benzofuran-2-ylmethyl)pyridin-2(1H)-one (2ee): Prepared from **1ee** according to general procedure A at 90 ºC (81%). Light green solid; m.p. 85-87 ºC. ^1H NMR (300 MHz, $CDCl_3$) δ 7.53 (d, *J* = 7.7Hz, 1H), 7.44 (d, *J* = 7.1Hz, 2H), 7.32 (t, *J* = 6.8Hz, 1H), 7.29 (d, *J* = 7.3Hz, 1H), 7.21 (t, *J* = 7.4Hz, 1H), 6.79 (s, 1H), 6.60 (d, *J* = 8.9Hz, 1H), 6.18 (t, *J* = 6.7Hz, 1H), 5.26 (s, 2H). $^{13}C\{^1H\}$ NMR (75 MHz, $CDCl_3$) δ 162.1, 155.0, 151.6, 139.6, 137.0, 127.9, 124.5, 122.9, 121.2, 121.0, 111.2, 106.5, 106.1, 45.0. IR (neat) 3062, 1653, 1583, 1537, 1455, 1422, 1336, 1245, 1139, 1100, 1010, 930, 847, 812, 737 cm^{-1}. MS (EI) *m/z* 225 (M); HRMS (EI) *m/z* calc'd for $C_{14}H_{11}NO_2$ $[M]^+$: 225.0790; found: 225.0793.

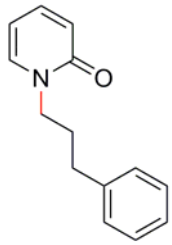


1-(Benzo[d][1,3]dioxol-5-ylmethyl)pyridin-2(1H)-one (2ff): Prepared from **1ff** according to general procedure A at 90 ºC (99%). White solid; m.p. 106-108 °C. ^1H NMR (400 MHz, $CDCl_3$) δ 7.32-7.25 (m, 2H), 6.82-6.74 (m, 3H), 6.58 (d, *J* = 9.1Hz, 1H), 6.13 (dt, *J* = 1.3Hz, *J* = 6.7Hz, 1H), 5.93 (s, 2H), 5.03 (s, 2H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 162.7, 148.2, 147.5, 139.4, 137.1, 130.2, 121.9, 121.2, 108.8, 108.4, 106.2, 101.2, 51.7. IR (neat) 2914, 1651, 1577, 1496, 1448, 1243, 1037, 925, 758, 728 cm^{-1}. MS (ESI) *m/z* 230 (M+H), 252 (M+Na); HRMS (ESI) *m/z* calc'd for $C_{13}H_{12}NO_3$ $[M+H]^+$: 230.0811; found: 230.0817.

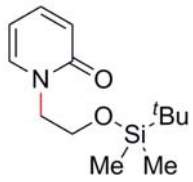


1-Phenethylpyridin-2(1H)-one (2gg): Prepared from **1gg** according to general procedure A

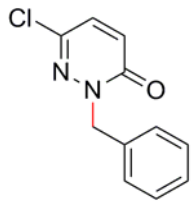
at 120 ºC (64%). White solid, m.p. 95-96 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.30-7.20 (m, 4H), 7.15 (d, *J* = 6.8Hz, 2H), 6.89 (dd, *J* = 1.8Hz, *J* = 6.7Hz, 1H), 6.58 (d, *J* = 9.1Hz, 1H), 5.98 (dt, *J* = 1.3Hz, *J* = 6.7Hz, 1H), 4.14 (t, *J* = 7.1Hz, 2H), 3.06 (t, *J* = 7.1Hz, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.6, 139.6, 138.1, 138.0, 129.1, 128.7, 126.8, 121.1, 105.5, 52.1, 35.1. IR (neat) 2943, 1653, 1589, 1534, 1160, 1140, 885, 846, 761, 746, 702 cm^{-1}. MS (ESI) m/z 200 (M+H), 222 (M+Na); HRMS (ESI) m/z calc'd for $C_{13}H_{14}NO$ $[M+H]^+$: 200.1069; found: 200.1071.



1-(3-Phenylpropyl)pyridin-2(1H)-one (2hh): Prepared from **1hh** according to general procedure A at 110 ºC (92%). White solid; m.p. 42-44 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.30-7.25 (m, 4H), 7.19-7.16 (td, *J* = 2.2Hz, *J* = 6.7Hz, 4H), 6.54 (d, *J* = 9.2Hz, 1H), 6.11 (dt, *J* = 1.3Hz, *J* = 6.7Hz, 1H), 3.93 (dd, *J* = 7.2Hz, 2H), 2.67 (dd, *J* = 7.6Hz, 2H), 2.08 (td, *J* = 7.6Hz, *J* = 15.0Hz, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 140.9, 139.3, 137.6, 128.5, 128.4, 126.2, 121.2, 105.9, 49.5, 32.8, 30.5. IR (neat) 3024, 2947, 1656, 1587, 1538, 1143, 831, 762, 741, 698 cm^{-1}. MS (ESI) *m/z* 214 (M+H), 236 (M+Na); HRMS (ESI) *m/z* calc'd for $C_{14}H_{16}NO$ $[M+H]^+$: 214.1226; found: 214.1229.

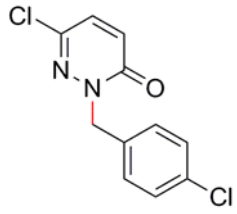


1-(2-((*tert*-Butyldimethylsilyl)oxy)ethyl)pyridin-2(1H)-one (2ii): Prepared from **1ii** according to general procedure A at 120 ºC (65%). Yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.35-7.29 (m, 2H), 6.55 (dd, *J* = 1.2Hz, *J* = 9.7Hz, 1H), 6.11 (dt, *J* = 1.3Hz, *J* = 6.7Hz, 1H), 4.05 (m, 2H), 3.90 (m, 2H), 0.83 (s, 9H), –0.08 (s, 6H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.6, 139.6, 139.5, 120.6, 104.9, 60.8, 52.3, 25.8, 18.1, –5.7. IR (neat) 2928, 2856, 1654, 1574, 1539, 1463, 1360, 1252, 1103, 1057, 935, 834, 772 cm^{-1}. MS (ESI) *m/z* 254 (M+H); HRMS (ESI) *m/z* calc'd for $C_{13}H_{24}NO_2Si$ $[M+H]^+$: 254.1570; found: 254.1571.

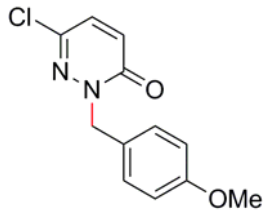


2-Benzyl-6-chloropyridazin-3(2H)-one (4a): Prepared from **3a** according to general procedure A at 90 ºC (70%). Light brown solid; m.p. 85-87 ºC. All spectral data are in agreement with reported literature data.[13] ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.44 (d, *J* = 6.6Hz, 2H), 7.37-7.29 (m, 3H), 7.15 (d, *J* = 9.7Hz, 1H), 6.91 (d, *J* = 9.7Hz, 1H), 5.25 (s, 2H). ^{13}C{^{1}H} NMR (75 MHz, $CDCl_3$) δ 158.7, 137.4, 135.5, 133.6, 132.1, 128.8, 128.6, 128.1, 55.4. IR (neat) 3032, 1654, 1574, 1493, 1438, 1396, 1294, 1207, 1128, 1061, 937, 900, 838, 748, 697 cm^{-1}. MS (EI) *m/z* 220 (M); HRMS (EI) *m/z* calc'd for $C_{11}H_9ClN_2O$ $[M]^+$: 220.0403; found: 220.0402.

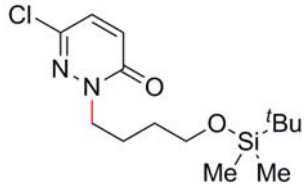
Subjecting **3a-*d*$_2$** to general procedure A at 90 ºC for 8 h gave recovered starting material **3a**/**3a-*d*$_1$**/**3a-*d*$_2$** in 57% (**3a**:**3a-*d*$_1$**:**3a-*d*$_2$** = 0.01 : 0.19 : 0.80, based on ^{1}H NMR integration; 0.01 : 0.15 : 0.84, based on MS (ESI) integration) and isolated product **4a**/**4a-*d*$_1$**/**4a-*d*$_2$** in 35% (**4a**/**4a-*d*$_1$**/**4a-*d*$_2$** = 0.05 : 0.73 : 0.22, based on ^{1}H NMR integration; 0.04 : 0.69 : 0.27, based on MS (ESI) integration). ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.44 (d, *J* = 6.6Hz, 2H), 7.37-7.29 (m, 3H), 7.15 (d, *J* = 9.7Hz, 1H), 6.91 (d, *J* = 9.7Hz, 1H), 5.25 (s, 0.10H, **4a**), 5.23 (m, 0.73H, **4a-*d*$_1$**). MS (ESI) *m/z* 221 (M+H, **4a**), 222 (M+H, **4a-*d*$_1$**), 223 (M+H, **4a-*d*$_2$**).



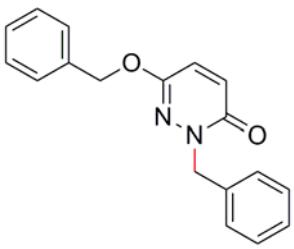
6-Chloro-2-(4-chlorobenzyl)pyridazin-3(2H)-one (4b): Prepared from **3b** according to general procedure A at 90 ºC (92%). Off-white solid; m.p. 77-78 ºC. ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.38 (d, *J* = 8.5Hz, 2H), 7.29 (d, *J* = 8.5Hz, 2H), 7.15 (d, *J* = 9.7Hz, 1H), 6.90 (d, *J* = 9.7Hz, 1H), 5.19 (s, 2H). ^{13}C{^{1}H} NMR (75 MHz, $CDCl_3$) δ 158.6, 137.6, 134.2, 133.9, 133.7, 132.2, 130.3, 128.8, 54.7. IR (neat) 3032, 1660, 1575, 1491, 1426, 1332, 1296, 1138, 1071, 1016, 904, 842, 803, 654 cm^{-1}. MS (ESI) *m/z* 255 (M+H); HRMS (ESI) *m/z* calc'd for $C_{11}H_9Cl_2N_2O$ $[M]^+$: 255.0086; found: 255.0072.



6-Chloro-2-(4-methoxybenzyl)pyridazin-3(2H)-one (4c): Prepared from **3c** according to general procedure A at 120 ºC (64%). Light brown solid; m.p. 78-79 ºC. ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.40 (d, *J* = 8.7Hz, 2H), 7.13 (d, *J* = 9.7Hz, 1H), 6.89 (d, *J* = 9.7Hz, 1H), 6.86 (d, *J* = 8.7Hz, 2H), 5.18 (s, 2H), 3.79 (s, 3H). ^{13}C{^{1}H} NMR (75 MHz, $CDCl_3$) δ 159.5, 158.6, 137.3, 133.5, 132.1, 130.4, 127.7, 113.9, 55.2, 54.9. IR (neat) 2963, 1661, 1610, 1576, 1510, 1437, 1290, 1248, 1173, 1135, 1074, 1031, 933, 901, 839, 779 cm^{-1}. MS (ESI) *m/z* 273 (M+Na); HRMS (ESI) *m/z* calc'd for $C_{12}H_{11}ClN_2O_2Na$: 273.0401; found: 273.0413.

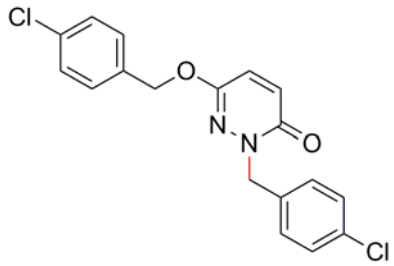


2-(4-((*tert*-Butyldimethylsilyl)oxy)butyl)-6-chloropyridazin-3(2H)-one (4d): Prepared from **3d** according to general procedure A at 120 ºC (60%). Pale yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.14 (d, *J* = 9.6Hz, 1H), 6.88 (d, *J* = 9.6Hz, 1H), 4.11 (t, *J* = 7.3Hz, 2H), 3.63 (t, *J* = 6.3Hz, 2H), 1.90-1.79 (m, 2H), 1.60-1.50 (m, 2H), 0.87 (s, 9H), 0.03 (s, 6H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 158.9, 137.1, 133.3, 131.9, 62.5, 51.7, 29.7, 25.9, 24.9, 18.3, –5.4. IR (neat) 2928, 2856, 1669, 1582, 1471, 1300, 1253, 1099, 1043, 834, 775 cm^{-1}. MS (ESI) *m/z* 317 (M+H); HRMS (ESI) *m/z* calc'd for $C_{14}H_{26}ClN_2O_2Si$ $[M+H]^+$: 317.1446; found: 317.1445.

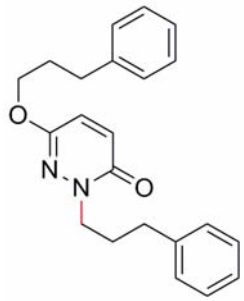


2-Benzyl-6-(benzyloxy)pyridazin-3(2H)-one (4e): Prepared from **3e** according to general procedure A at 120 ºC (94%). Off-white solid; m.p. 58-59 ºC. ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.44-7.27 (m, 10H), 6.92 (s, 2H), 5.20 (s, 2H), 5.16 (s, 2H). ^{13}C{^{1}H} NMR (75 MHz, $CDCl_3$)

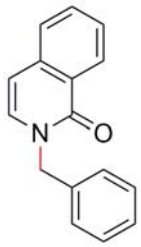
δ 158.8, 152.1, 136.4, 135.9, 133.1, 128.7, 128.5, 128.4, 128.3, 128.2, 127.7, 126.5, 68.8, 54.3. IR (neat) 3045, 1660, 1577, 1537, 1494, 1448, 1424, 1283, 1151, 1079, 1024, 996, 935, 871, 812, 729, 693 cm^{-1}. MS (ESI) *m/z* 293 (M+H); HRMS (ESI) *m/z* calc'd for $C_{18}H_{17}N_2O_2$ $[M+H]^+$: 293.1284; found: 293.1283.



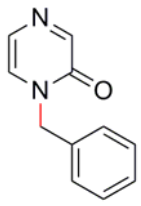
2-(4-Chlorobenzyl)-6-((4-chlorobenzyl)oxy)pyridazin-3(2H)-one (4f): Prepared from **3f** according to general procedure A at 80 ºC (94%). Off-white solid; m.p. 104-106 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.35-7.25 (m, 8H), 6.92 (d, *J* = 1.7Hz, 2H), 5.12 (s, 2H), 5.11 (s, 2H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 158.7, 151.9, 134.8, 134.4, 134.1, 133.7, 133.2, 130.1, 129.4, 128.7, 128.6, 126.6, 68.0, 53.6. IR (neat) 3071, 2958, 1666, 1593, 1543, 1490, 1430, 1281, 1136, 1077, 1003, 914, 810, 746 cm^{-1}. MS (ESI) *m/z* 361 (M+H); HRMS (ESI) *m/z* calc'd for $C_{18}H_{15}Cl_2N_2O_2$ $[M+H]^+$: 361.0505; found: 361.0502.



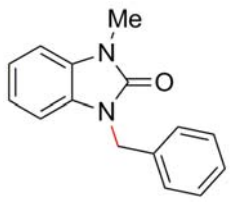
6-(3-Phenylpropoxy)-2-(3-phenylpropyl)pyridazin-3(2H)-one (4g): Prepared from **3g** according to general procedure A at 110 ºC (64%). Pale brown oil. ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.34-7.13 (m, 10H), 6.88 (s, 2H), 4.14 (t, *J* = 6.4Hz, 2H), 4.06 (t, *J* = 7.2Hz, 2H), 2.76 (t, *J* = 7.7Hz, 2H), 2.68 (t, *J* = 7.8Hz, 2H), 2.17-2.01 (m, 4H). $^{13}C\{^1H\}$ NMR (75 MHz, $CDCl_3$) δ 159.0, 152.5, 141.4, 141.2, 132.8, 128.4, 128.3, 128.2, 126.2, 126.0, 125.9, 66.2, 50.4, 32.9, 32.1, 30.2, 29.6. IR (neat) 3025, 2942, 1667, 1593, 1496, 1442, 1283, 1137, 1028, 839, 746, 699 cm^{-1}. MS (ESI) *m/z* 349 (M+H); HRMS (ESI) *m/z* calc'd for $C_{22}H_{25}N_2O_2$ $[M+H]^+$: 349.1910; found: 349.1910.



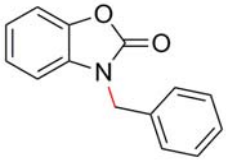
2-Benzylisoquinolin-1(2H)-one (6a): Prepared from **5a** according to general procedure A at 80 ºC (96%). Pale brown solid; m.p. 63-65 ºC. All spectral data are in agreement with reported literature data.[14] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.48 (d, *J* = 8.1Hz, 1H), 7.62 (t, *J* = 8.1Hz, 1H), 7.48 (m, 2H), 7.35-7.27 (m, 5H), 7.08 (d, *J* = 7.4Hz, 1H), 6.47 (d, *J* = 7.4Hz, 1H), 5.22 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.2, 136.9, 136.8, 132.1, 131.2, 128.7, 128.0, 127.9, 127.7, 126.8, 126.3, 125.9, 106.3, 51.6. IR (neat) 3022, 1647, 1595, 1489, 1453, 1366, 1288, 1178, 979, 787, 734, 690 cm^{-1}. MS (ESI) *m/z* 236 (M+H); HRMS (ESI) *m/z* calc'd for $C_{16}H_{14}NO$ $[M+H]^+$: 236.4069; found: 236.1075.



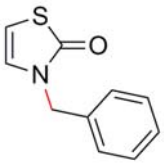
1-Benzylpyrazin-2(1H)-one (6b): Prepared from **5b** according to general procedure A at 120 ºC (33%). Orange solid; m.p. 81-83 ºC. All spectral data are in agreement with reported literature data.[1] ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (d, *J* = 1.1Hz, 1H), 7.40-7.29 (m, 5H), 7.27 (d, *J* = 4.4Hz, 1H), 7.05 (dd, *J* = 1.1Hz, *J* = 4.4Hz, 1H), 5.07 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 156.1, 149.8, 134.6, 129.1, 128.6, 128.5, 127.9, 123.9, 51.6. IR (neat) 3066, 1644, 1576, 1493, 1455, 1350, 1213, 1171, 1108, 1076, 1029, 920, 813, 733, 691 cm^{-1}. MS (ESI) *m/z* 187 (M+H); HRMS (ESI) *m/z* calc'd for $C_{11}H_{11}N_2O$ $[M+H]^+$: 187.0875; found: 187.0865.



1-Benzyl-3-methyl-1H-benzo[d]imidazol-2(3H)-one (6f): Prepared from **5f** according to general procedure A at 100 ºC (95%). Pale brown solid; m.p. 73-74 ºC. All spectral data are in agreement with reported literature data.[15] ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.39-7.23 (m, 5H), 7.12-6.95 (m, 3H), 6.88 (d, *J* = 7.1Hz, 1H), 5.08 (s, 2H), 3.46 (s, 3H). $^{13}C\{^1H\}$ NMR (75 MHz, $CDCl_3$) δ 154.5, 136.3, 130.0, 129.0, 128.6, 127.6, 127.4, 121.2, 121.1, 108.1, 107.3, 44.8, 27.1. IR (neat) 3029, 2922, 1702, 1618, 1498, 1435, 1398, 1358, 1247, 1121, 1003, 837, 731 cm^{-1}. MS (ESI) *m/z* 239 (M+H); HRMS (ESI) *m/z* calc'd for $C_{15}H_{14}N_2O$ $[M+H]^+$: 239.1178; found: 239.1187.



3-Benzylbenzo[d]oxazol-2(3H)-one (6g): Prepared from **5g** according to general procedure A at 100 ºC (55%). White solid; m.p. 113-114 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.40-7.27 (m, 5H), 7.23-7.17 (m, 1H), 7.12-7.05 (m, 2H), 6.88-6.81 (m, 1H), 5.01 (s, 2H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 154.7, 142.6, 134.7, 130.8, 128.9, 128.2, 127.6, 123.8, 122.5, 109.9, 108.9, 46.0. IR (neat) 3036, 1757, 1615, 1484, 1363, 1239, 1151, 1075, 1016, 924, 737 cm^{-1}. MS (ESI) *m/z* 226 (M+H); HRMS (ESI) *m/z* calc'd for $C_{14}H_{12}NO_2$ $[M+H]^+$: 226.0862; found: 226.0852.



3-Benzylthiazol-2(3H)-one (6h): Prepared from **5h** according to general procedure A at 110 ºC (55%). Pale brown oil. ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.41-7.23 (m, 5H), 6.49 (d, *J* = 5.4Hz, 1H), 6.10 (d, *J* = 5.4Hz, 1H), 4.88 (s, 2H). $^{13}C\{^1H\}$ NMR (75 MHz, $CDCl_3$) δ 172.0, 135.9, 128.9, 128.1, 127.8, 124.1, 101.5, 48.5. IR (neat) 3111, 1645, 1564, 1495, 1454, 1335, 1222, 1077, 940, 825, 702 cm^{-1}. MS (EI) *m/z* 191 (M); HRMS (EI) *m/z* calc'd for $C_{10}H_9NOS$ $[M]^+$: 191.0405; found: 191.0405.

4. References

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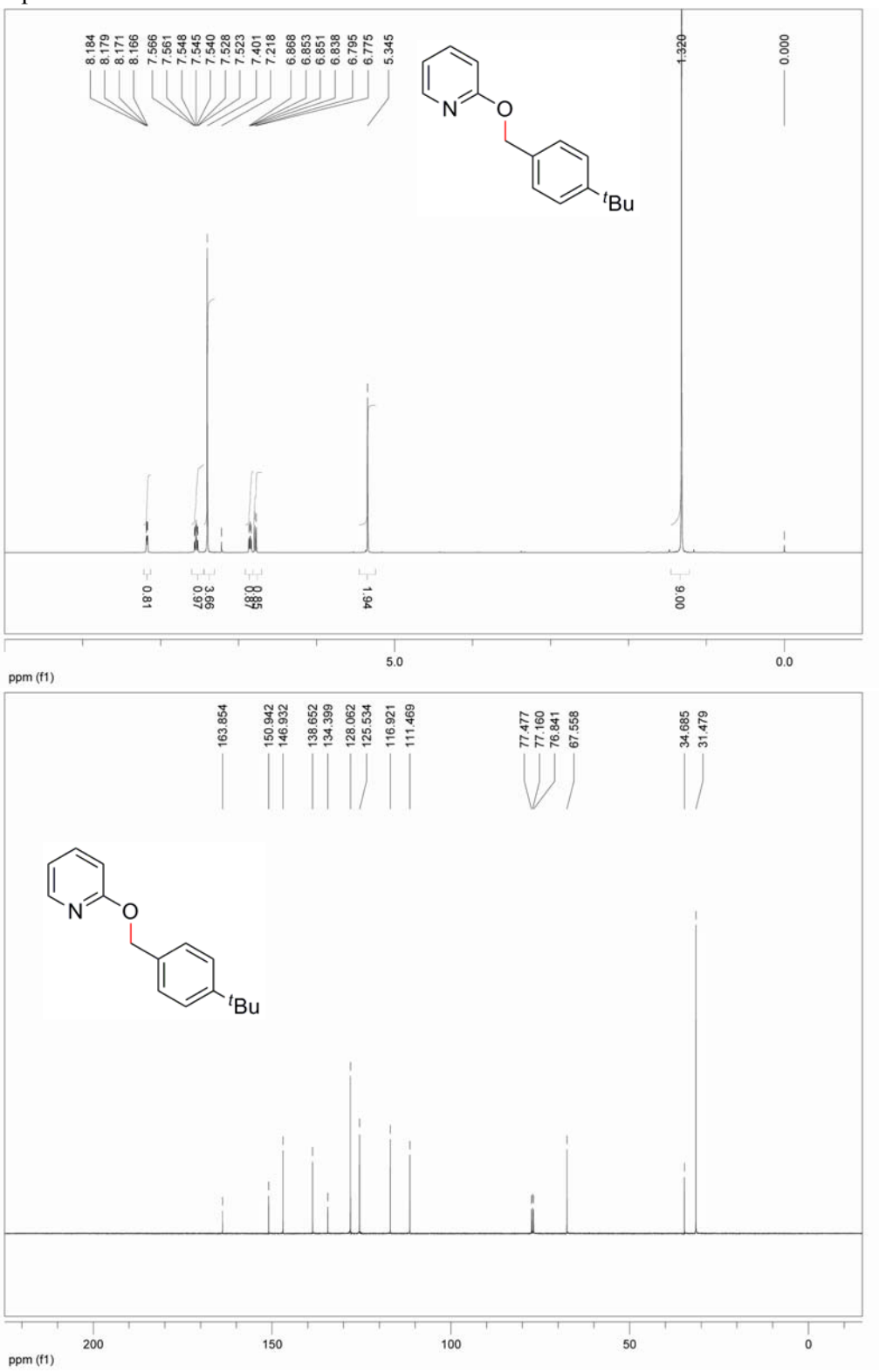
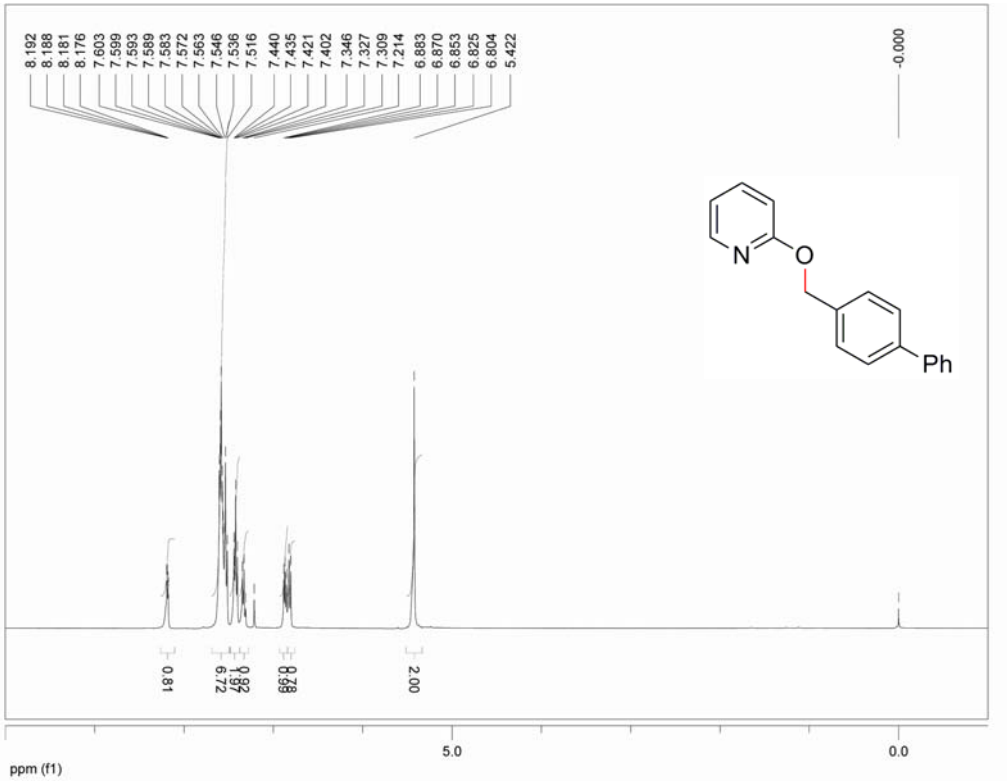
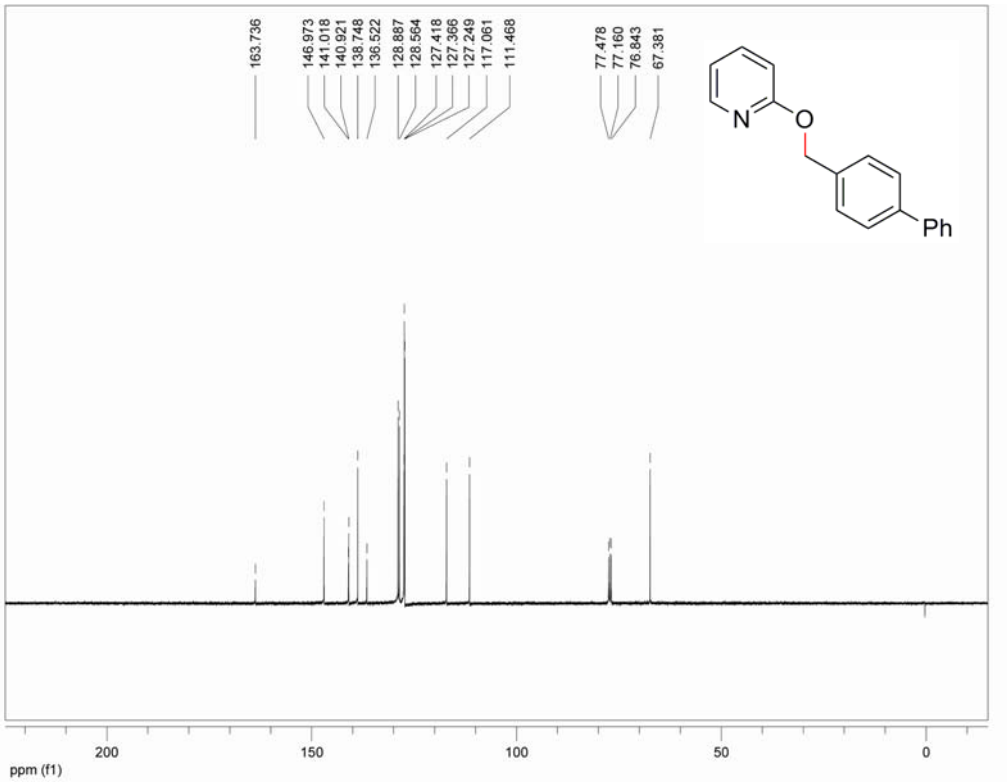
5. NMR Spectra for New Compounds

NMR spectra for **1c**

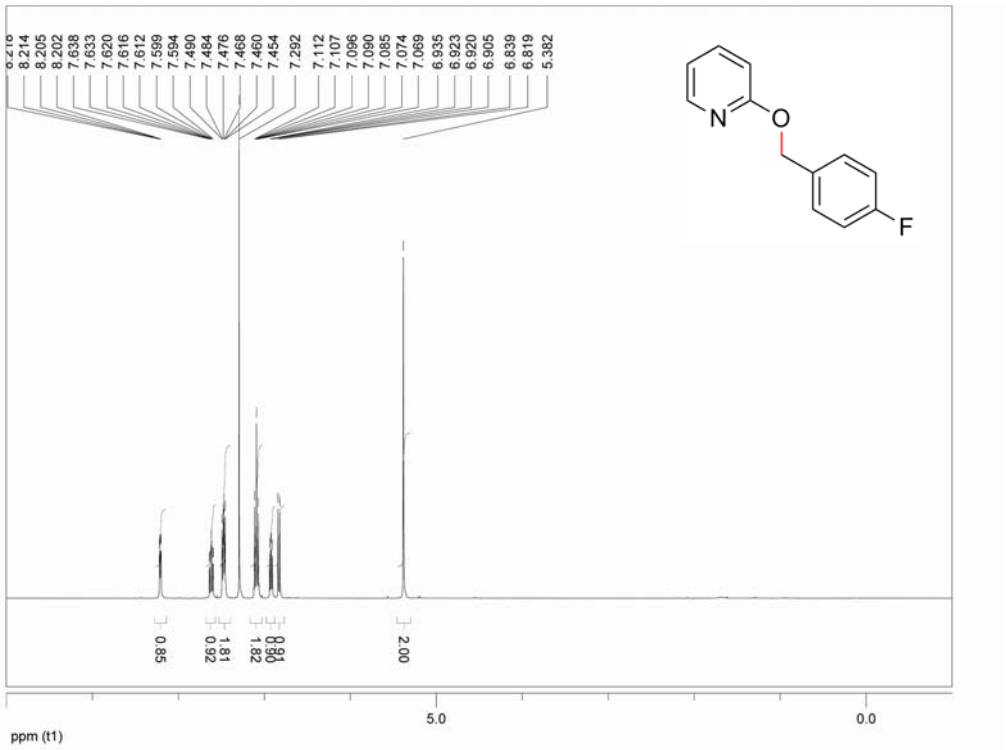


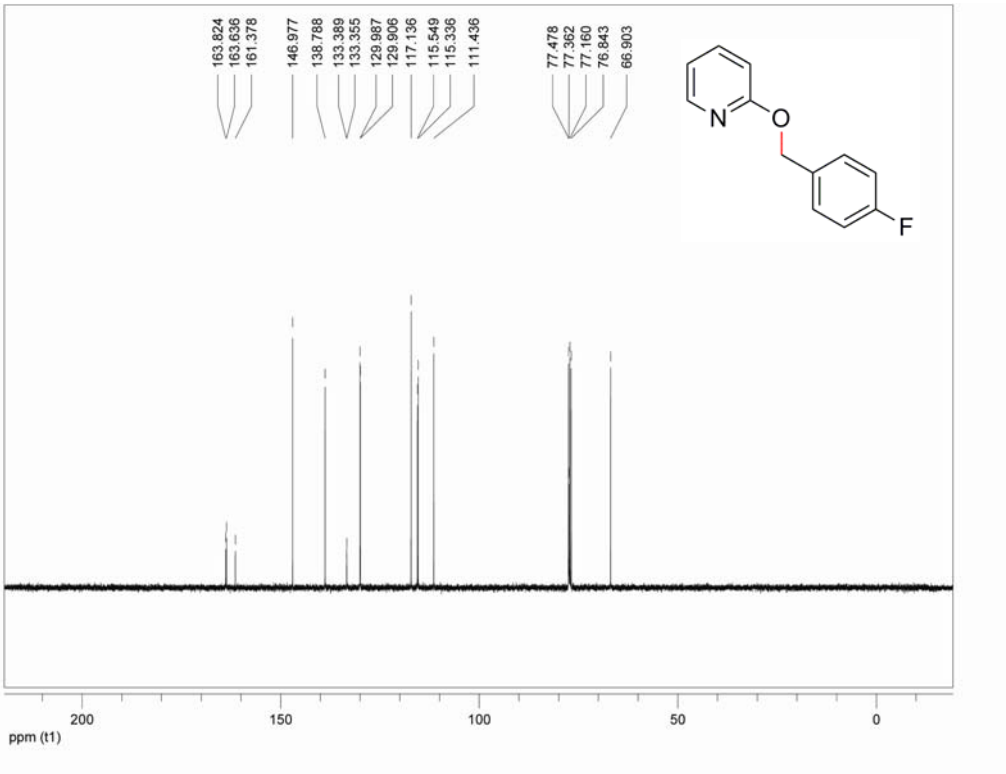
NMR spectra for **1d**

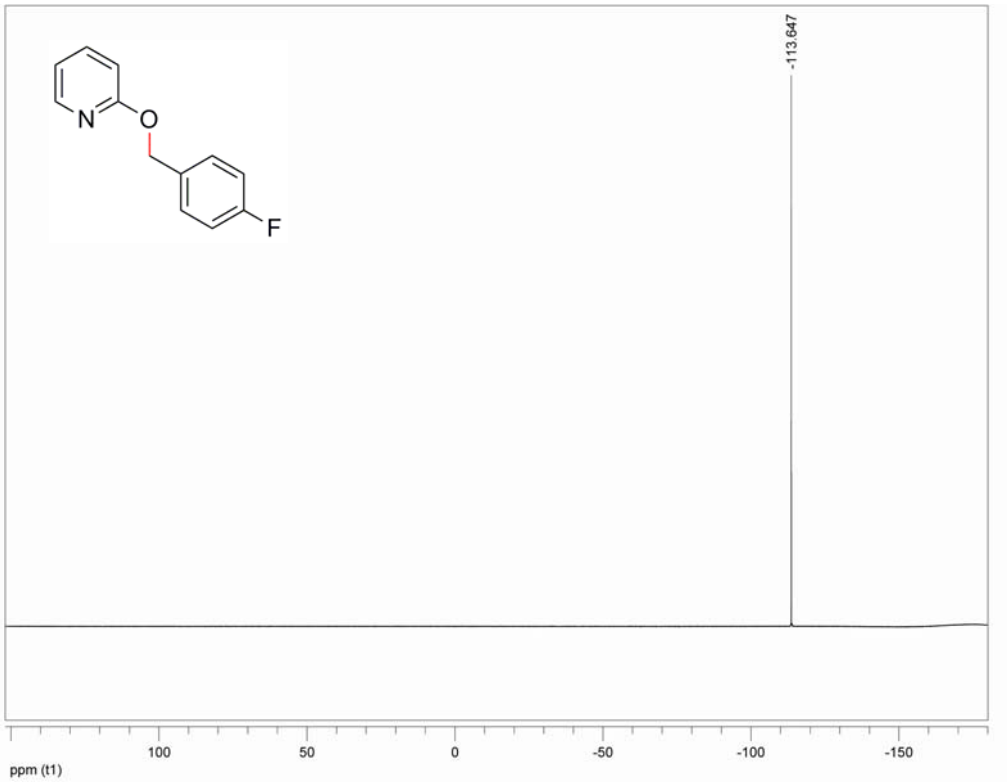




NMR spectra for **1g**



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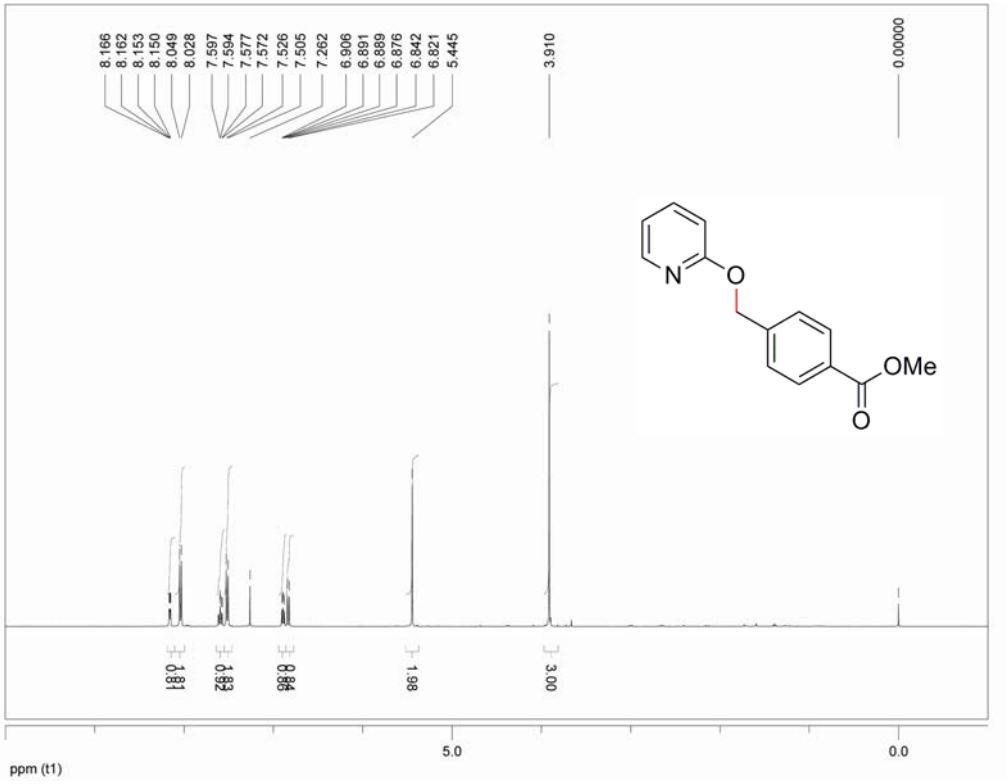
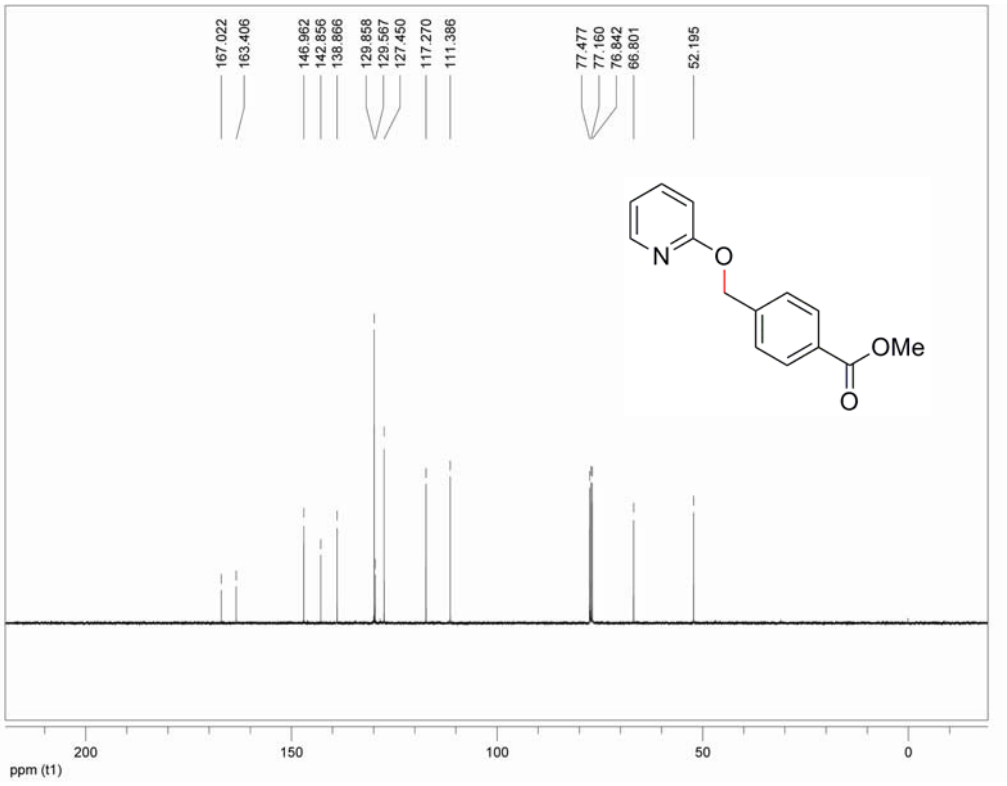
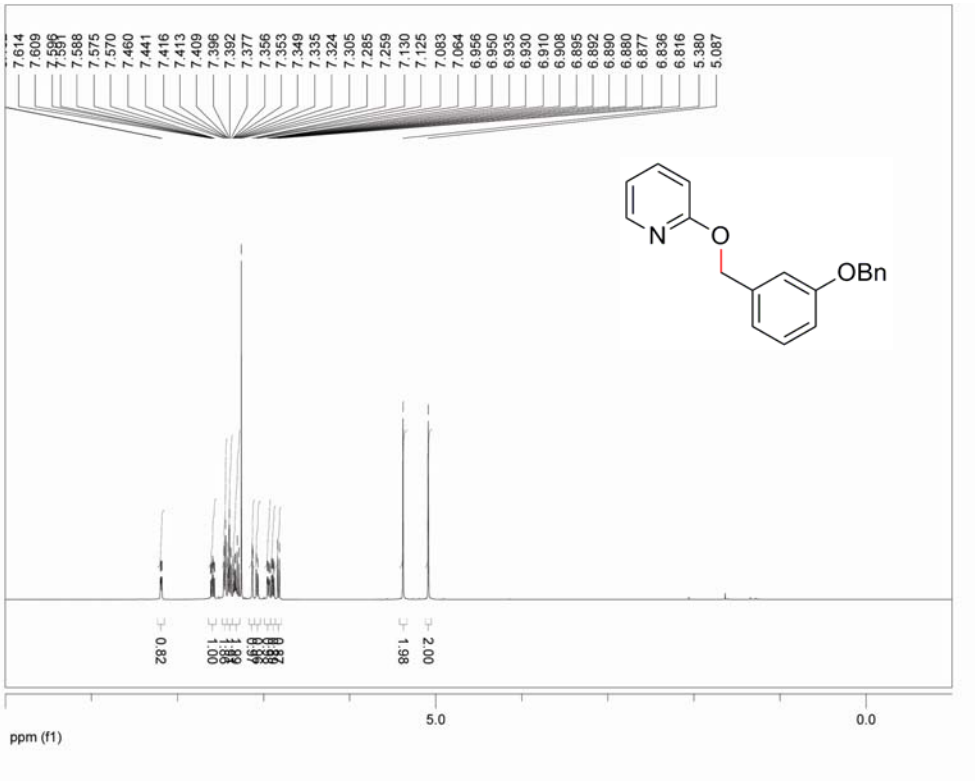
N
O
F
100
50
0
-50
-100
-150
ppm (t1)

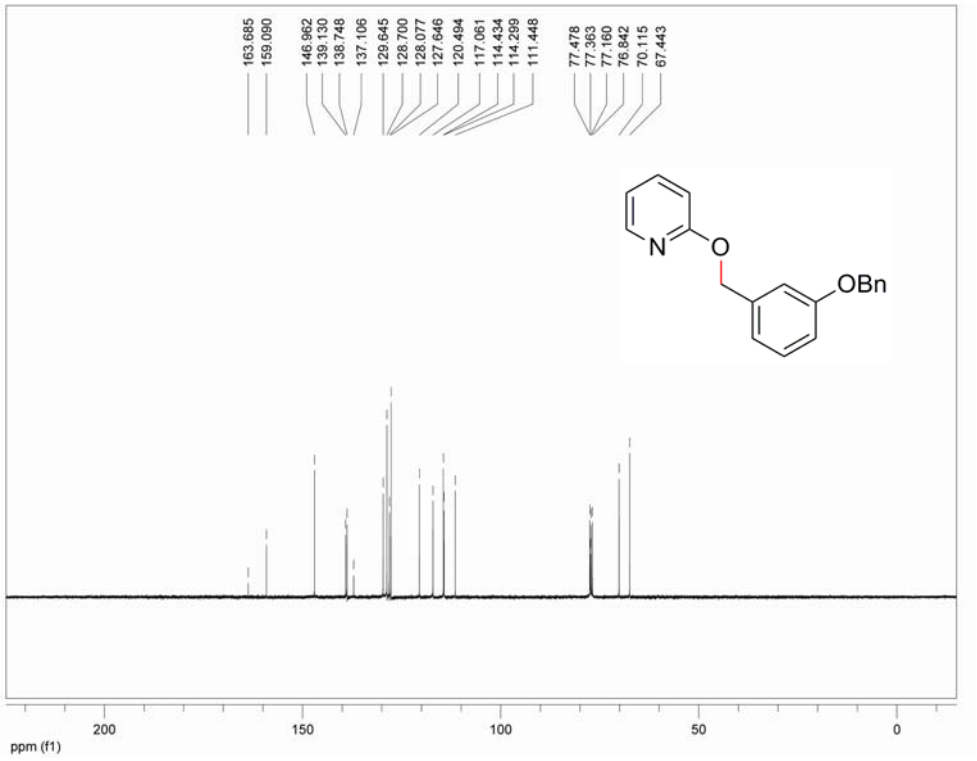
NMR spectra for **1k**



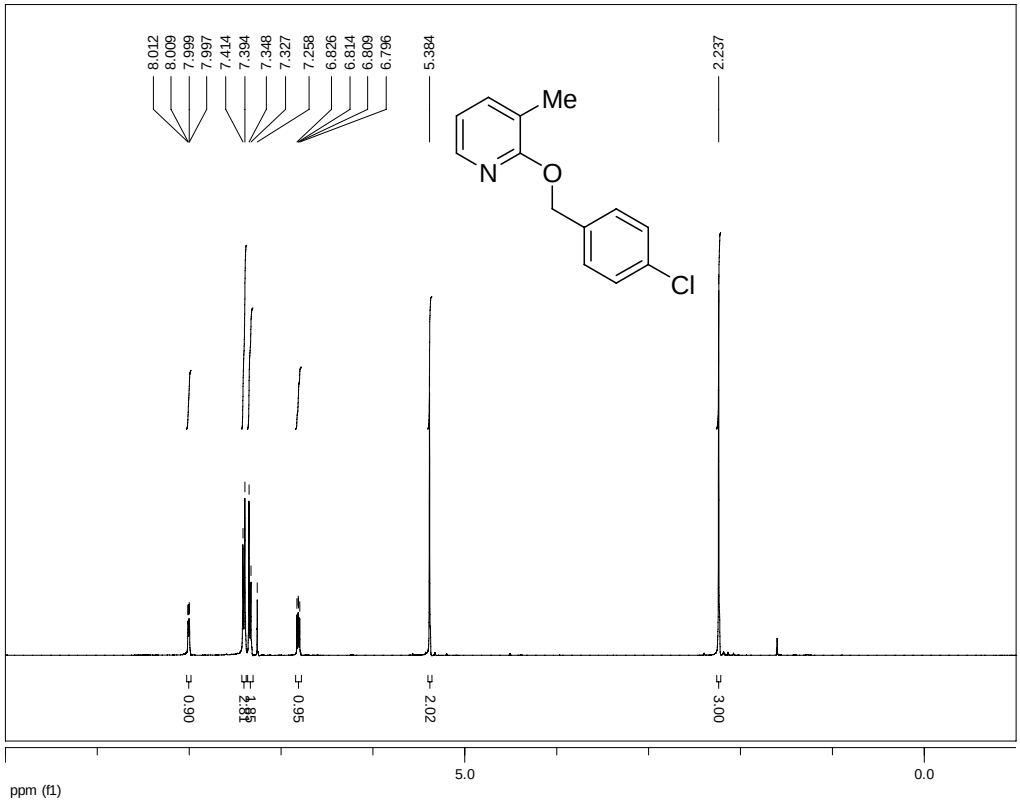


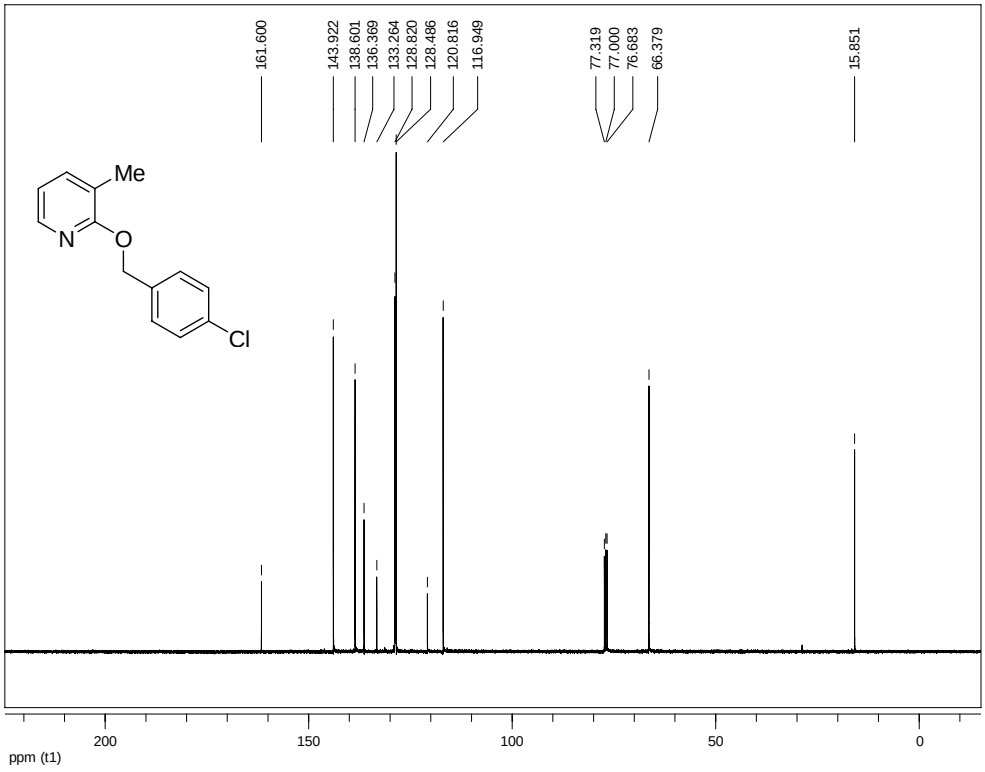
NMR spectra for **1n**



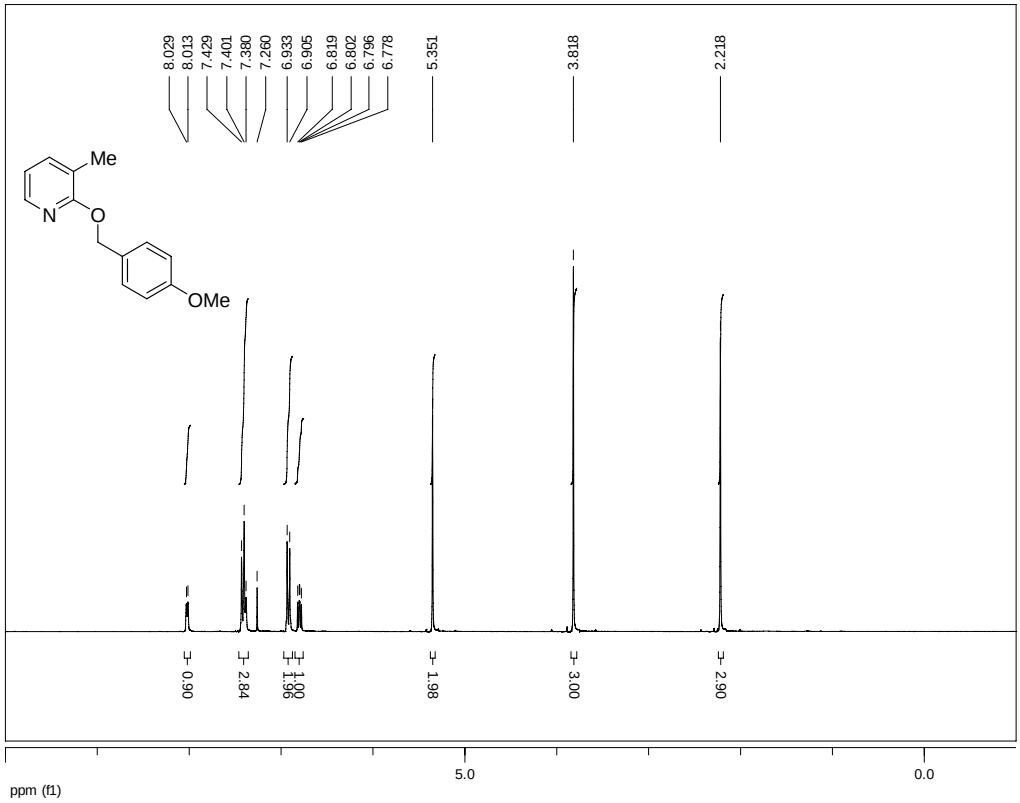


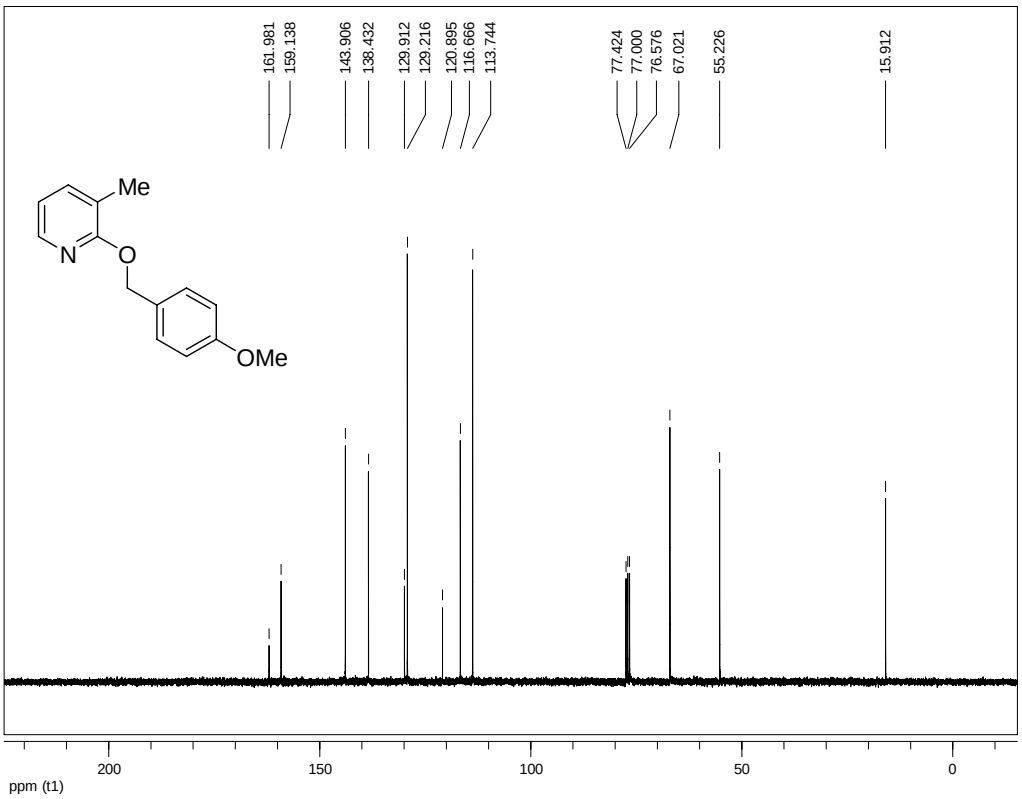
NMR spectra for **1p**



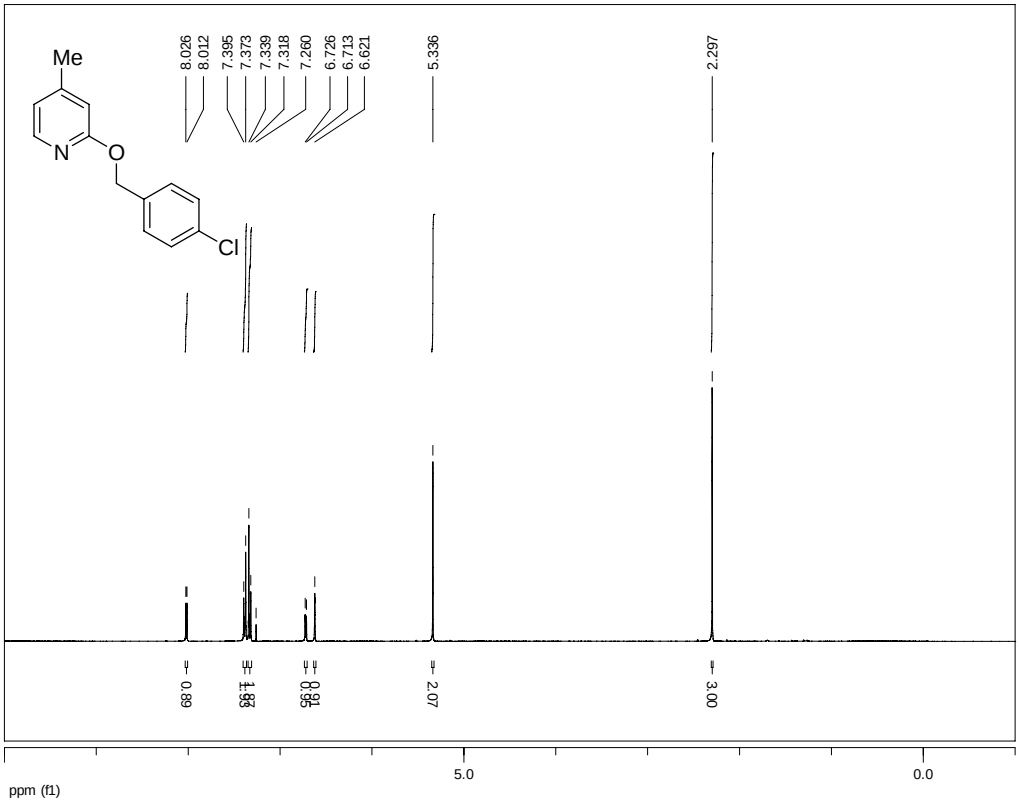


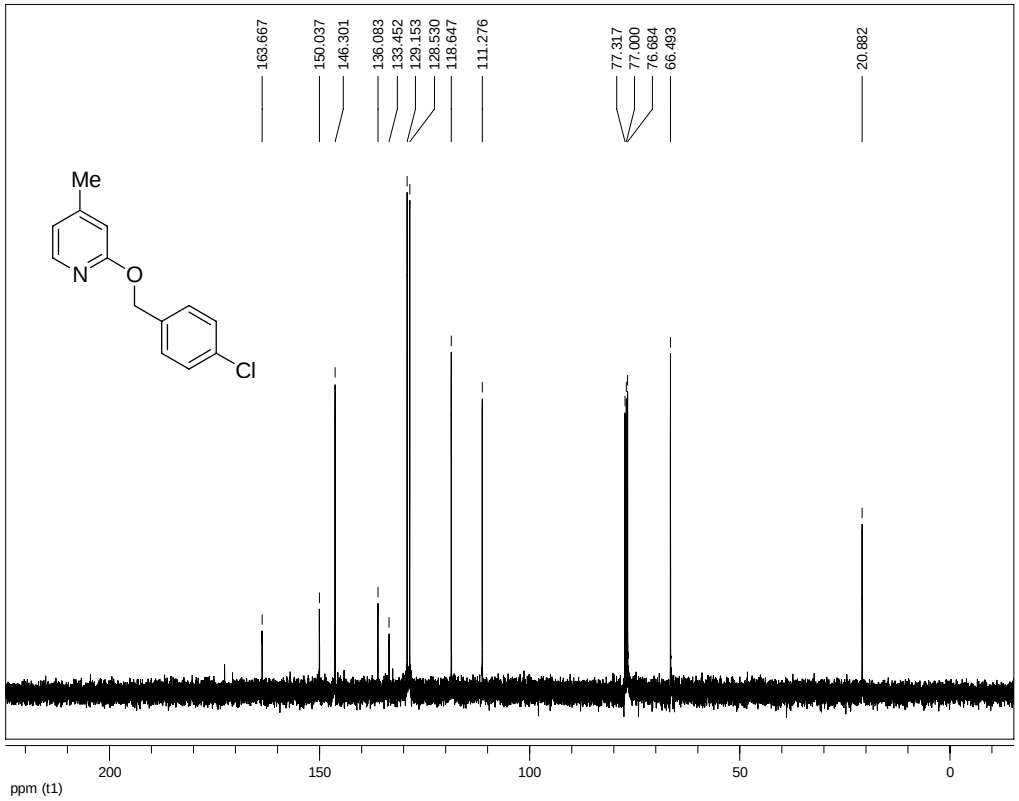
NMR spectra for **1q**



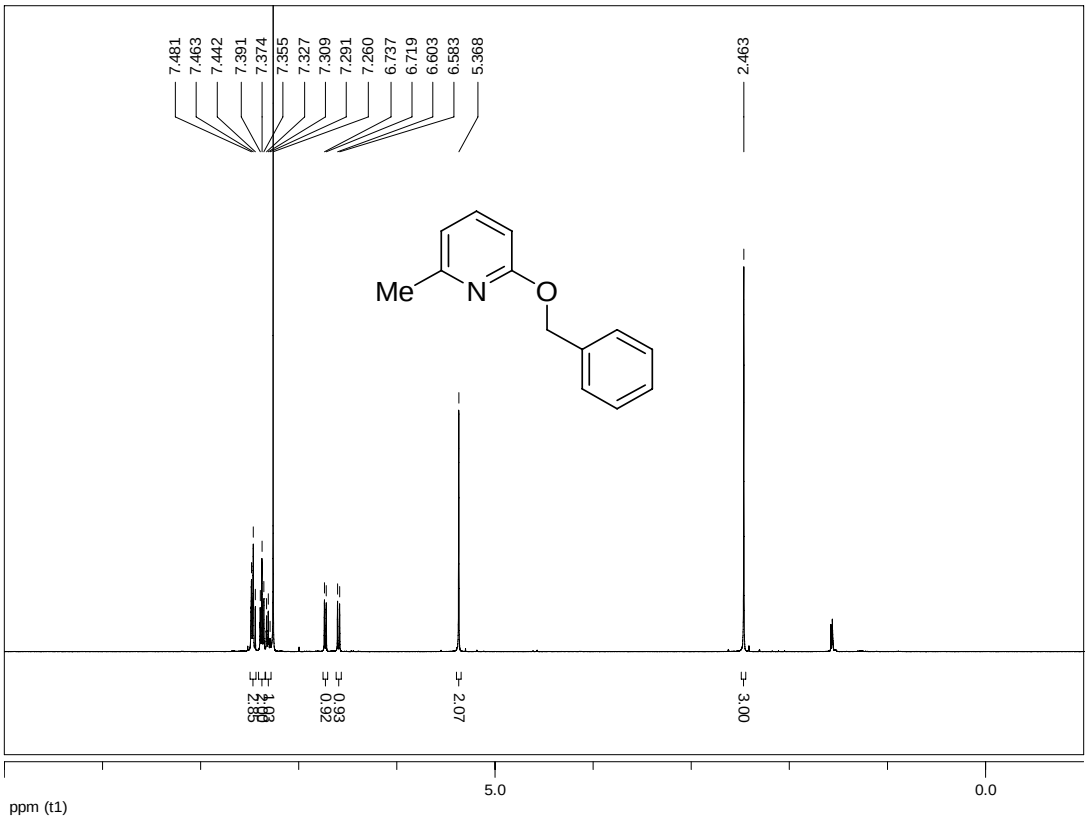


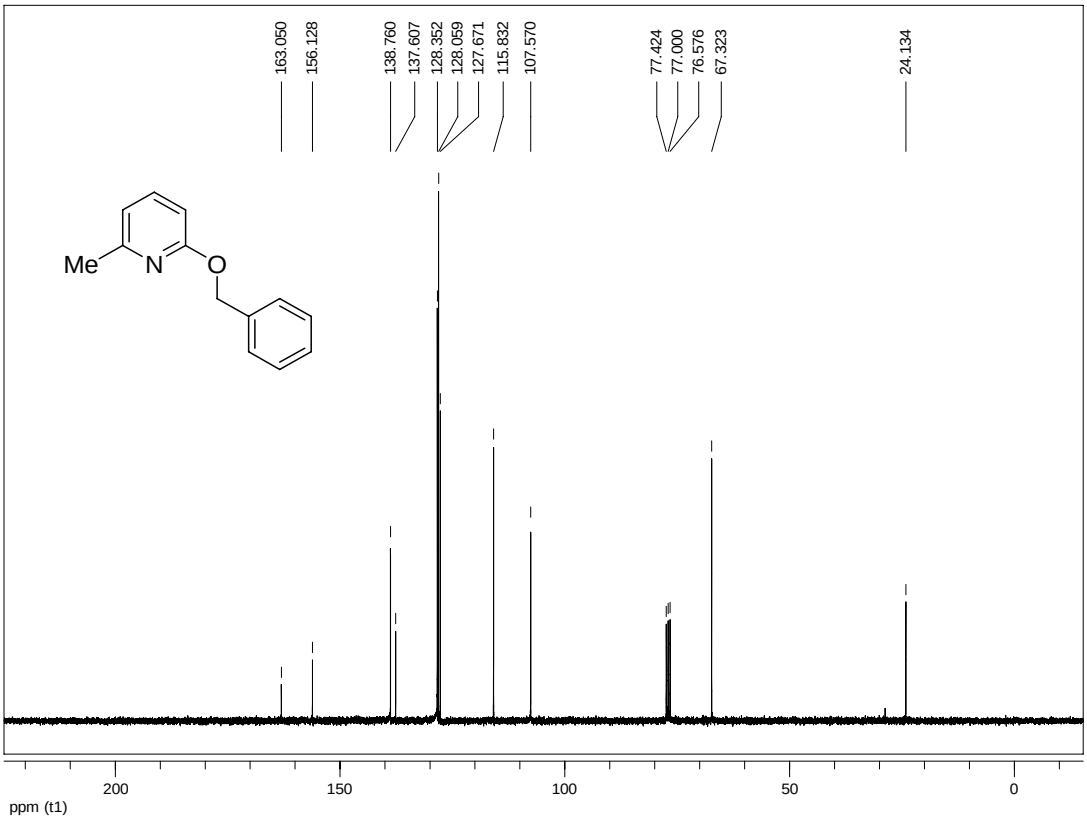
NMR spectra for **1s**



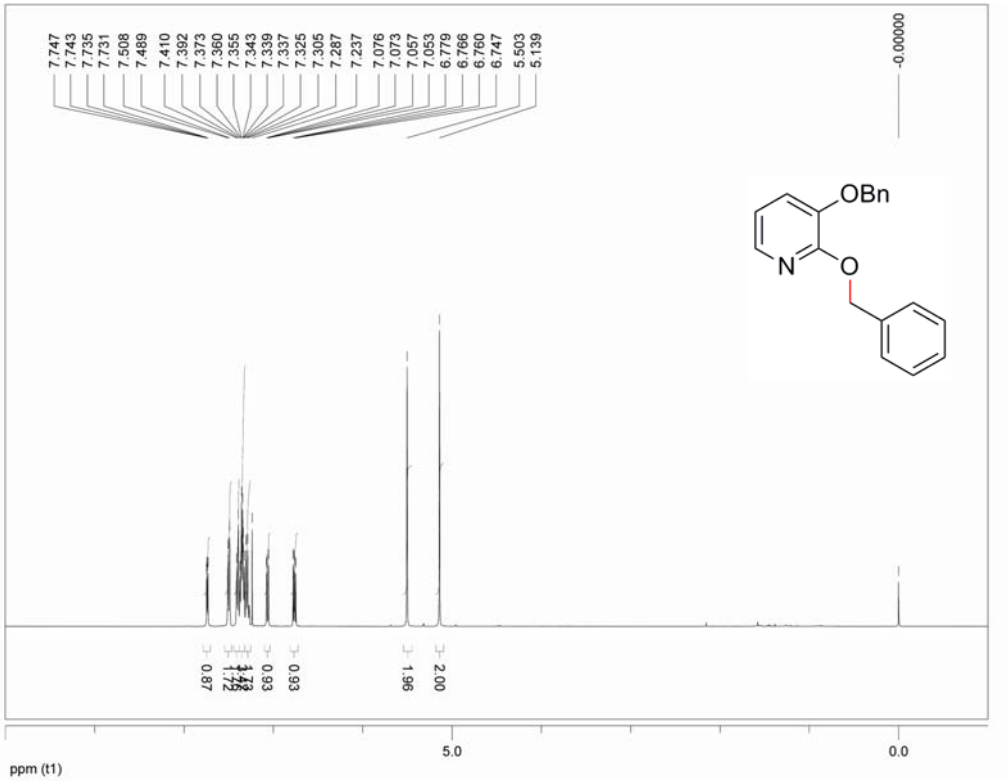


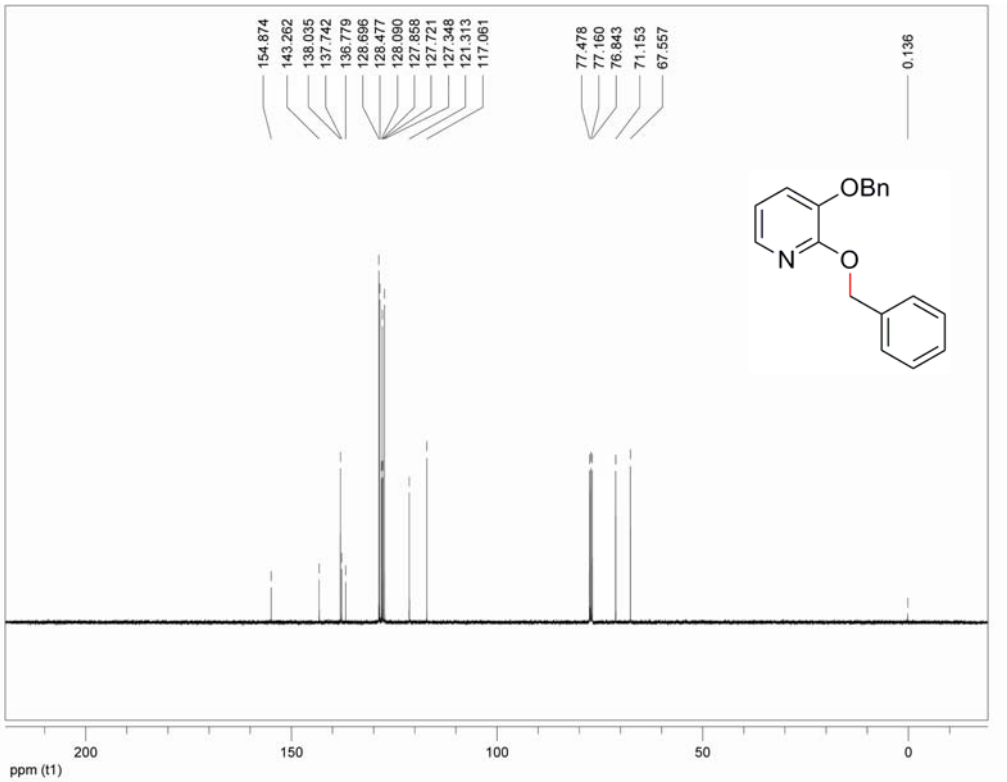
NMR spectra for **1u**



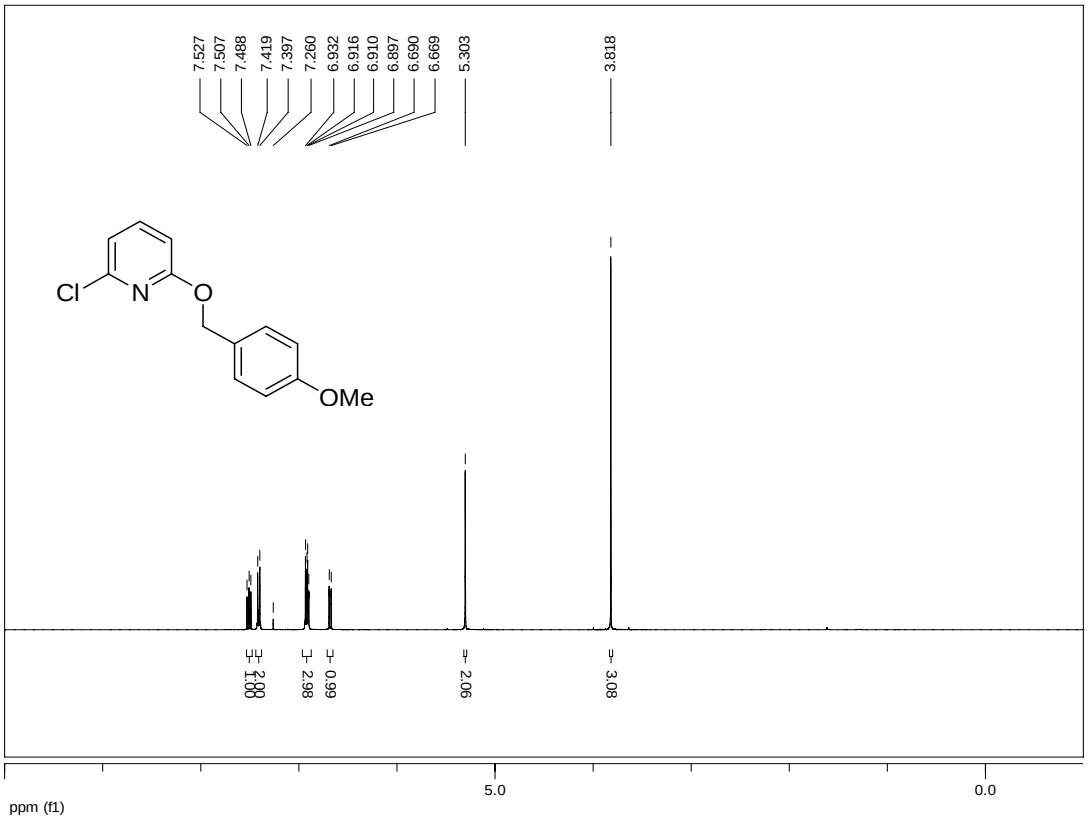


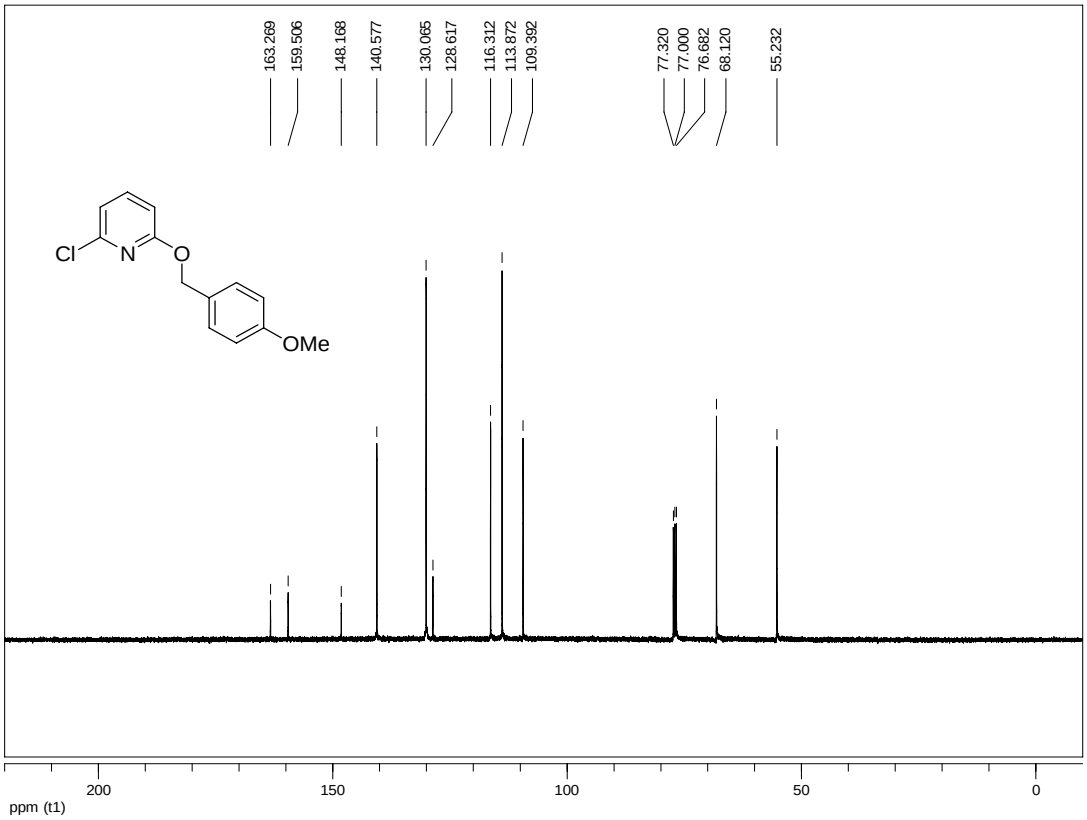
NMR spectra for **1v**



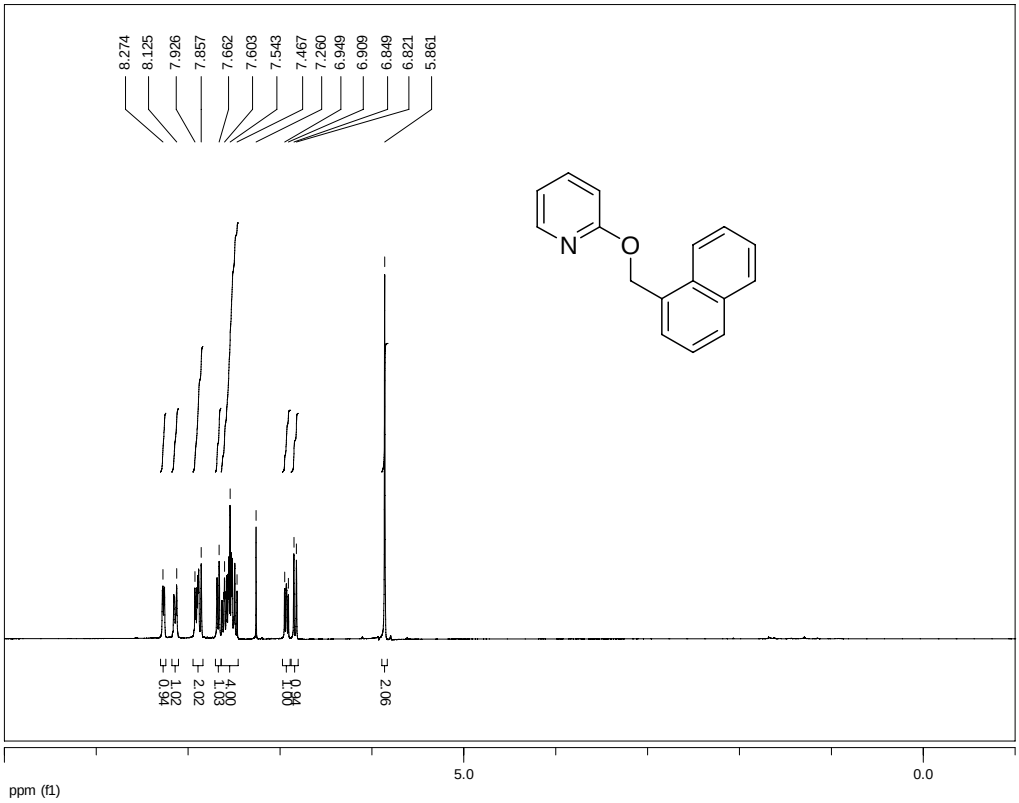


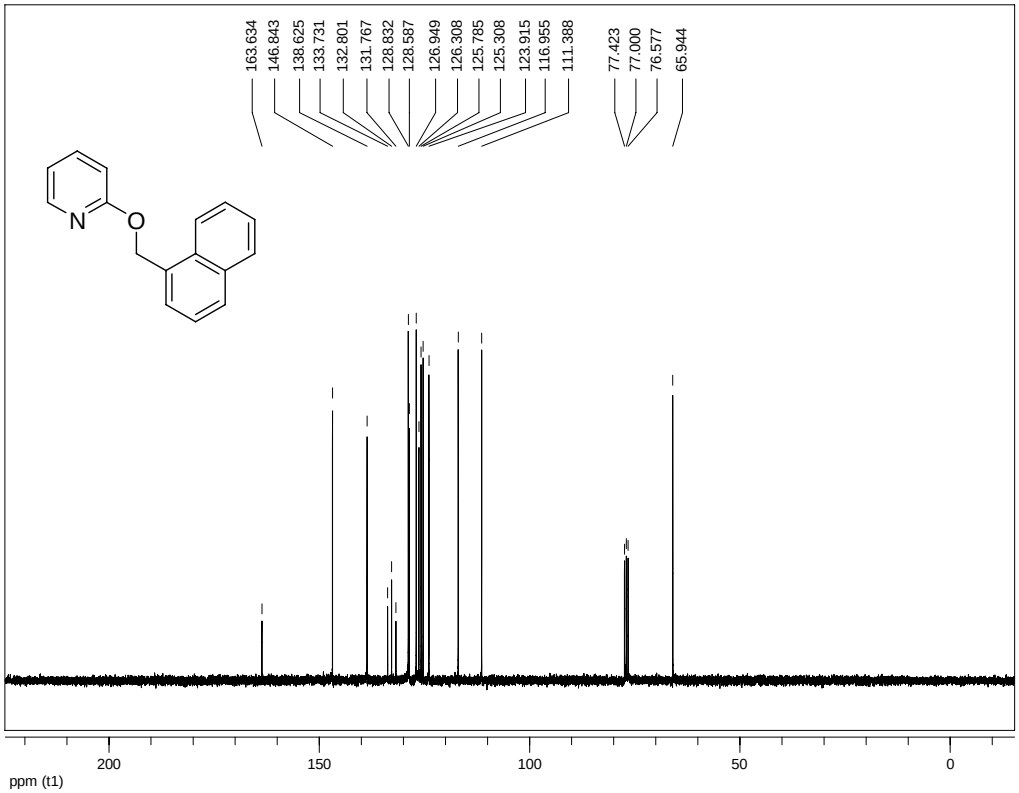
NMR spectra for **1x**



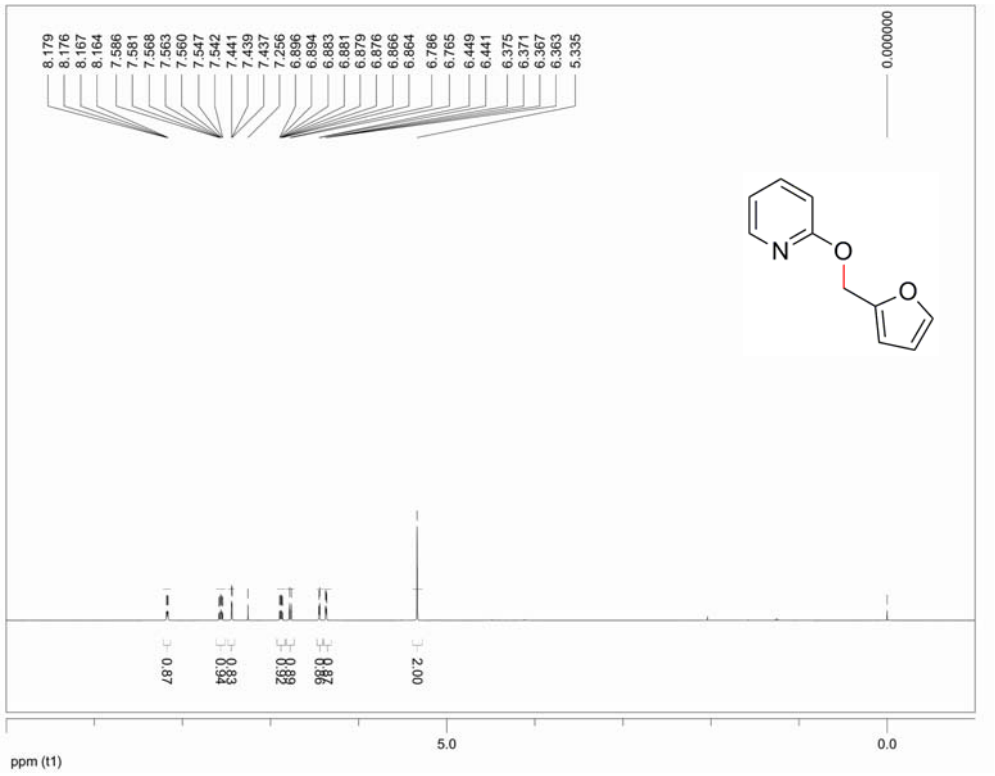


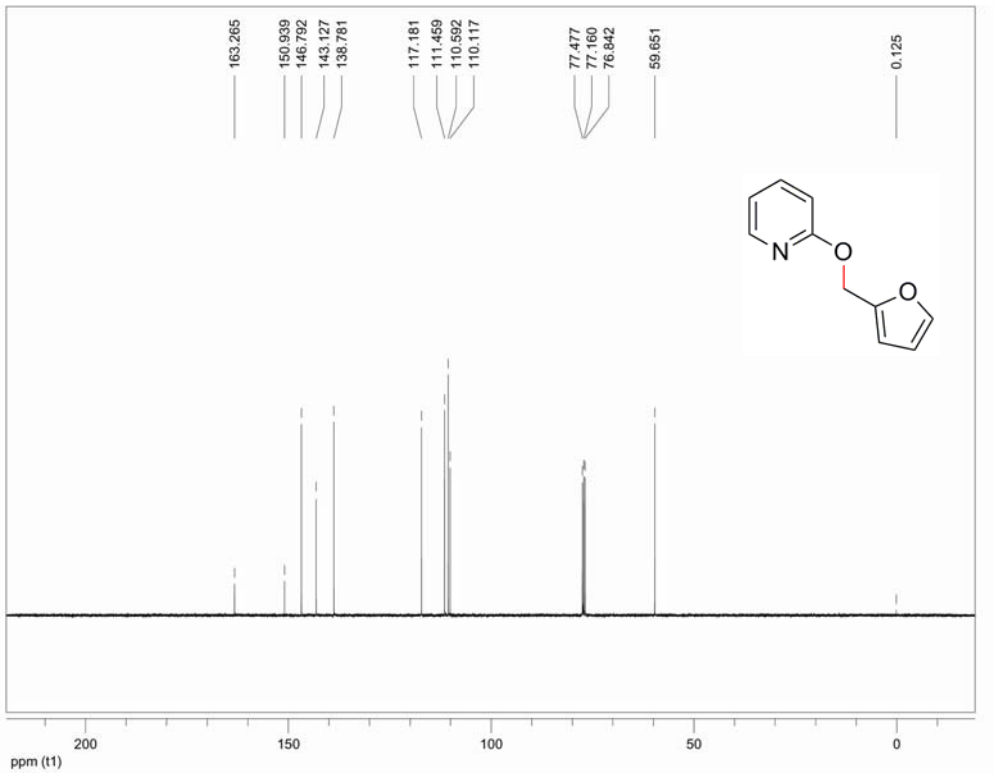
NMR spectra for **1bb**



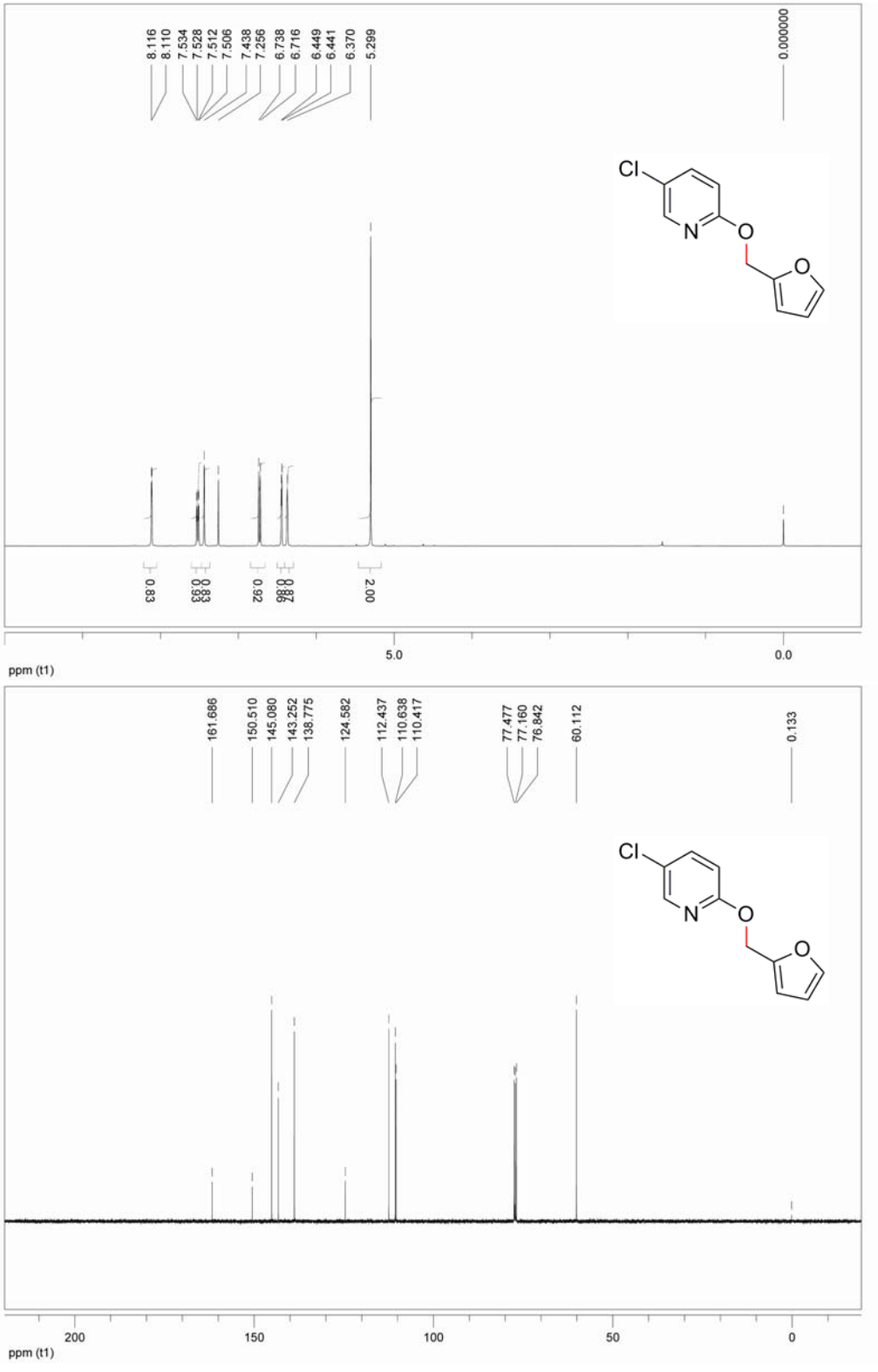


NMR spectra for **1cc**





NMR spectra for **1dd**



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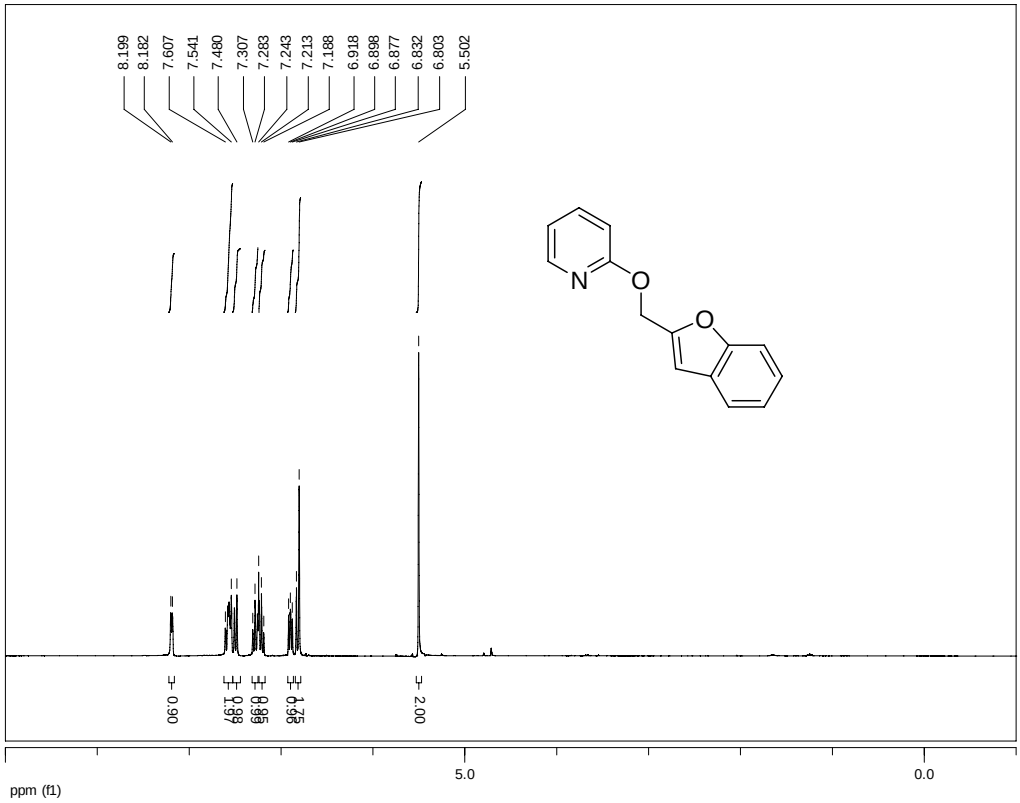
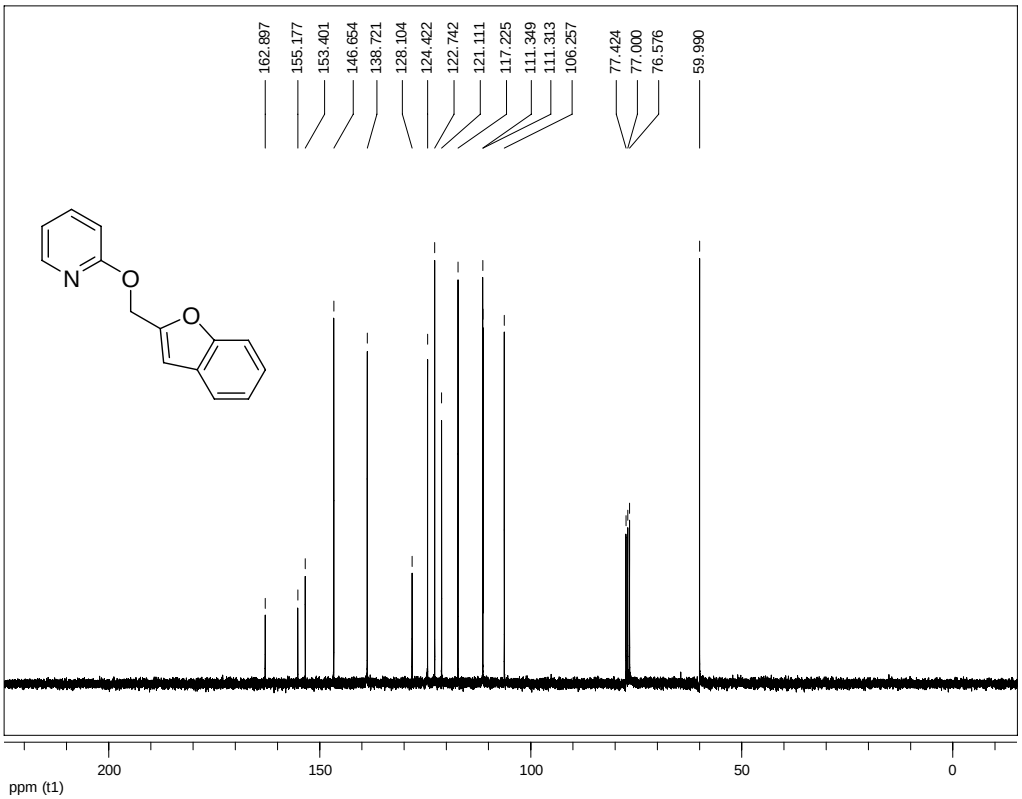
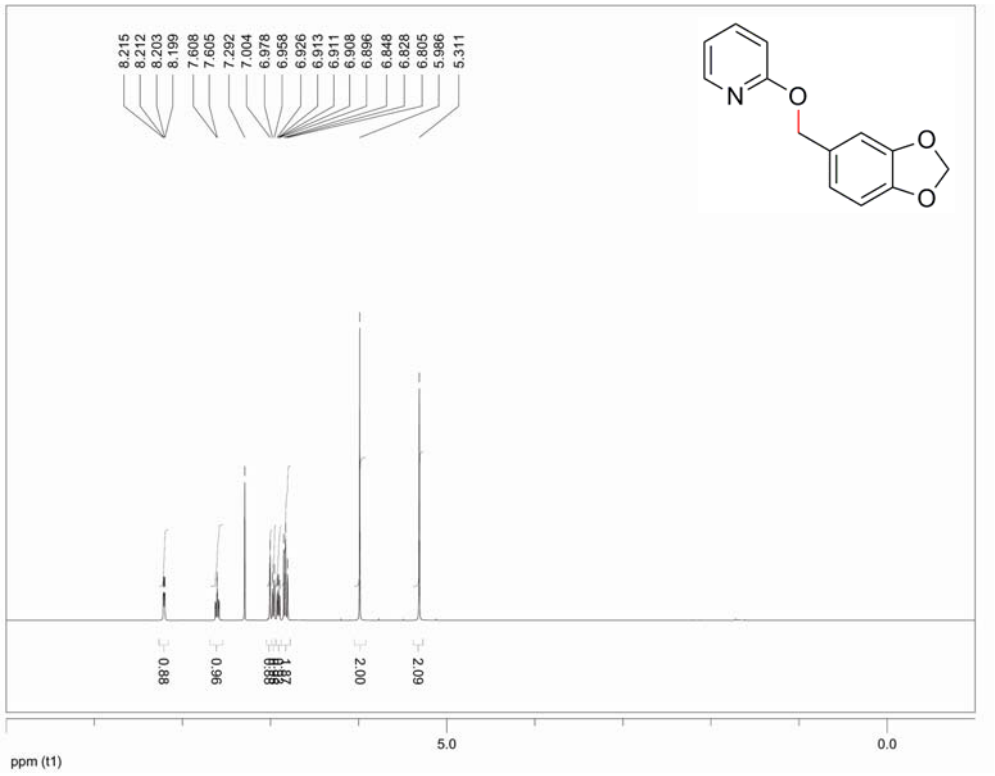
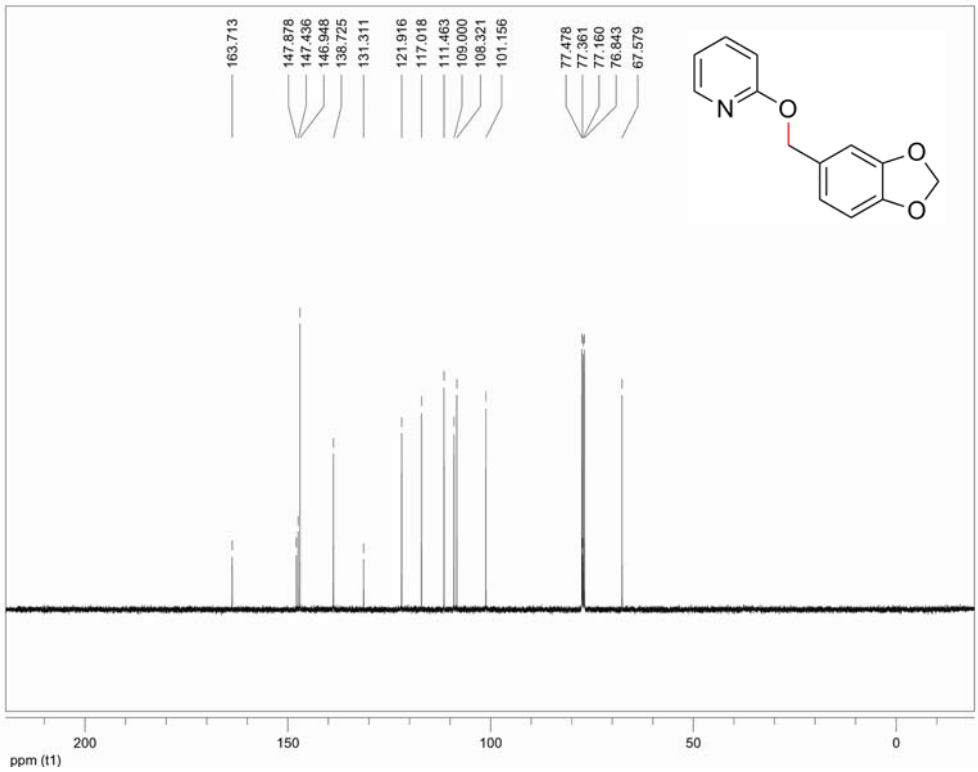




NMR spectra for **1ff**





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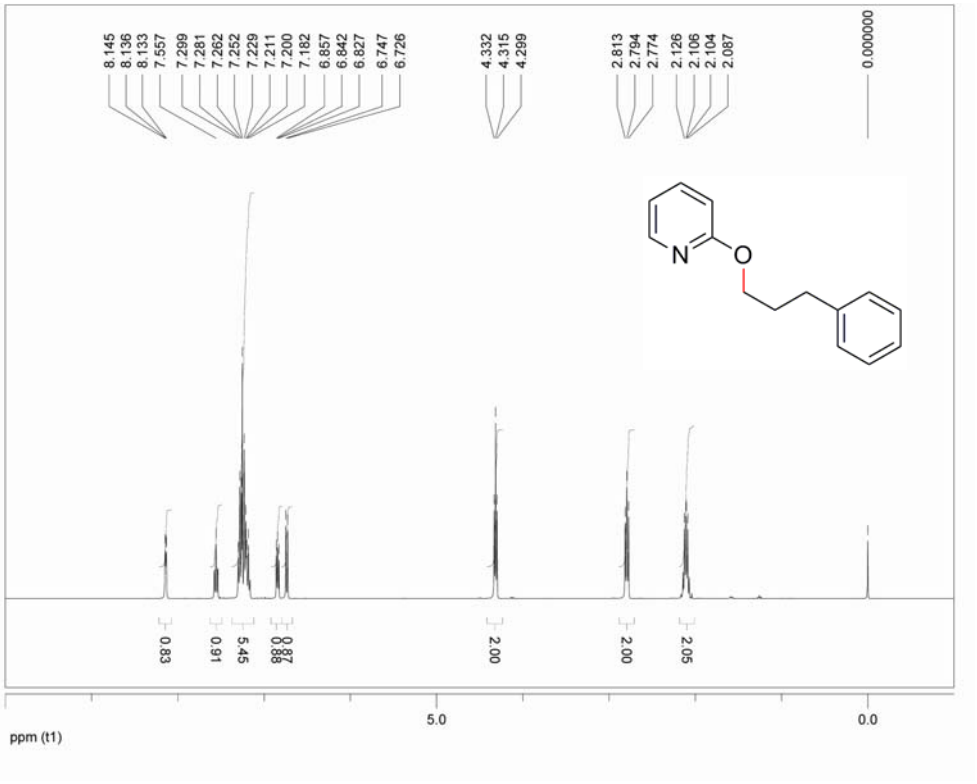
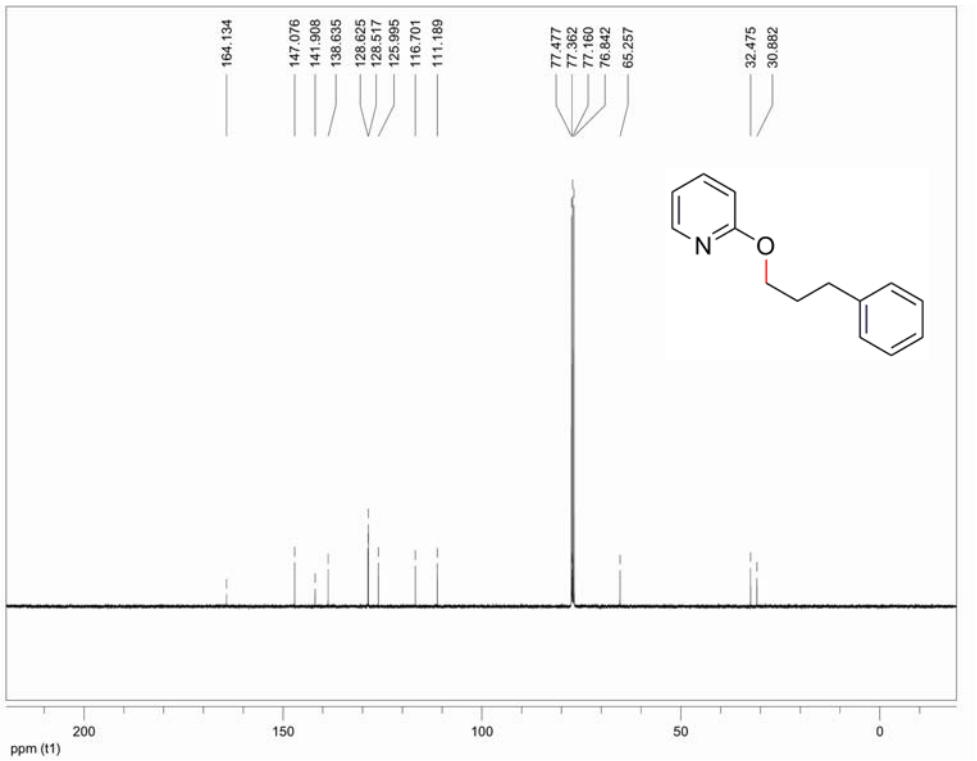
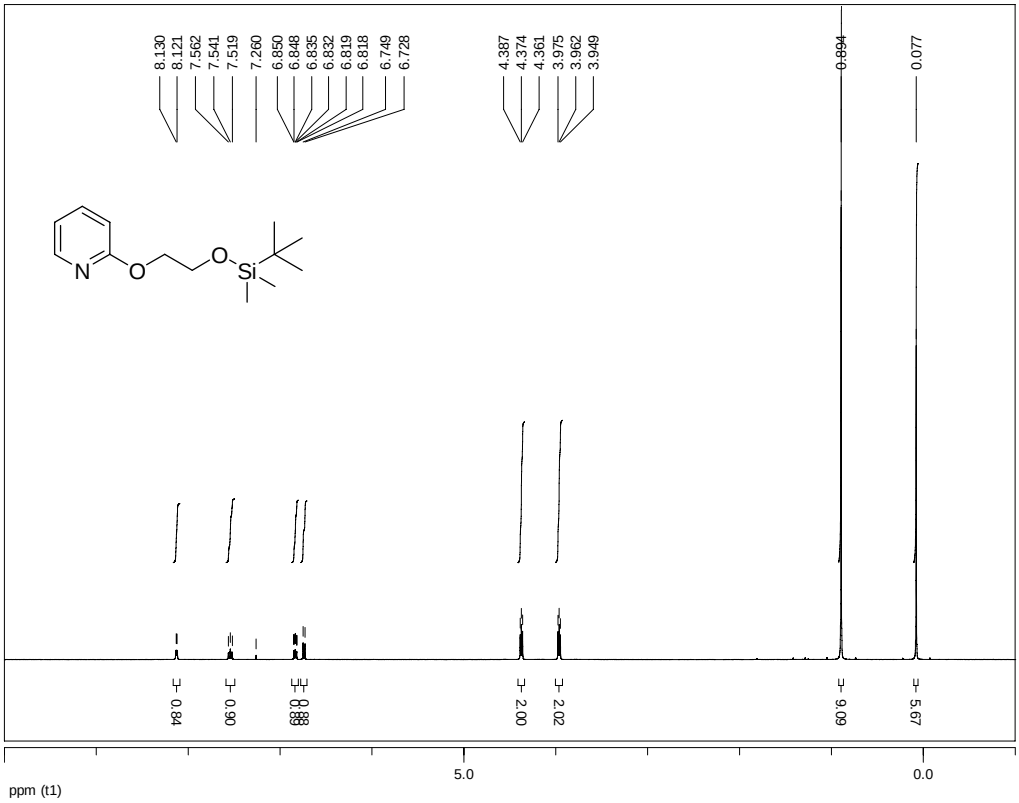
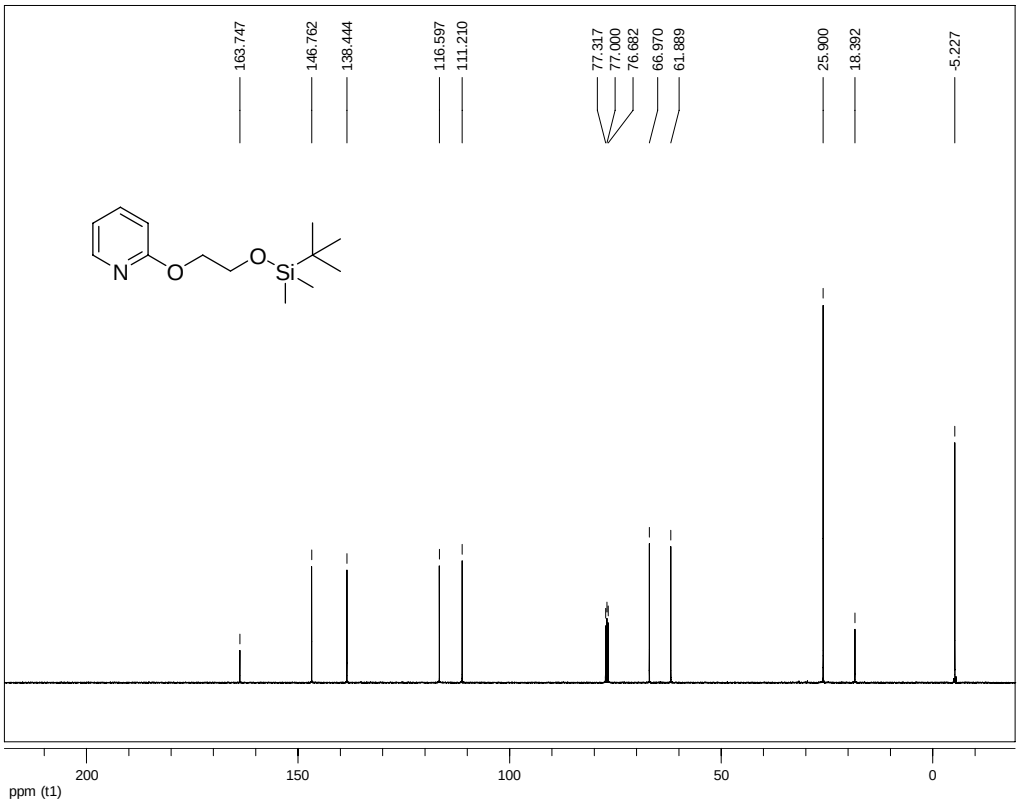




NMR spectra for **1ii**





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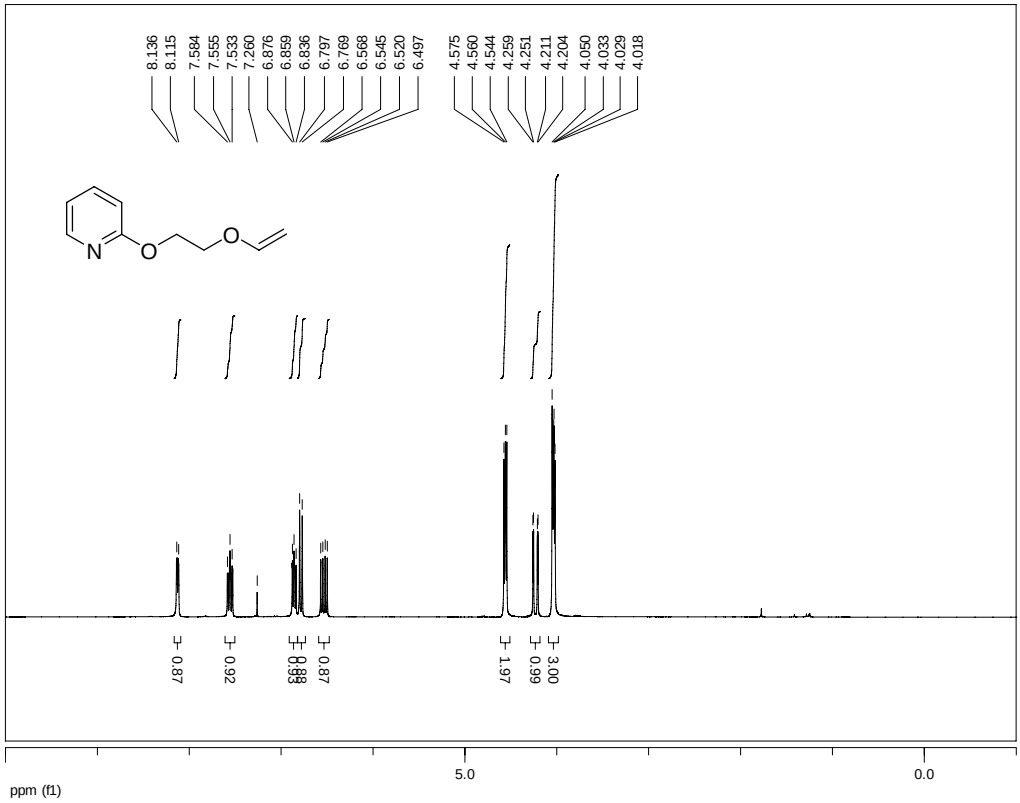
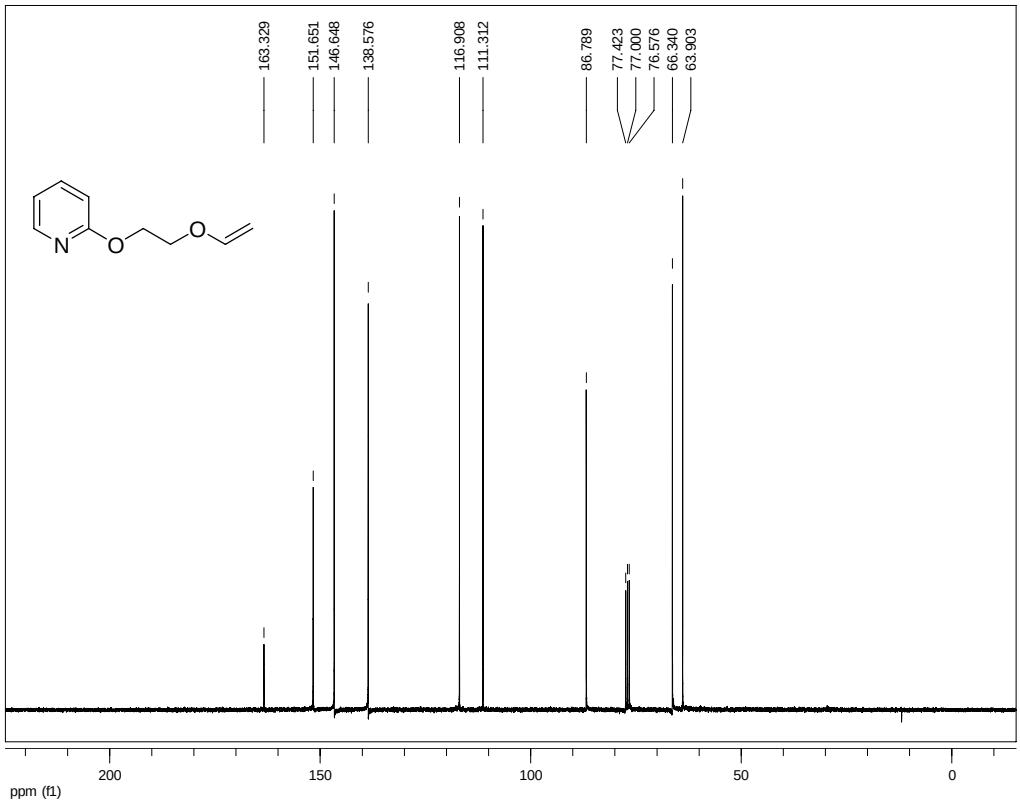
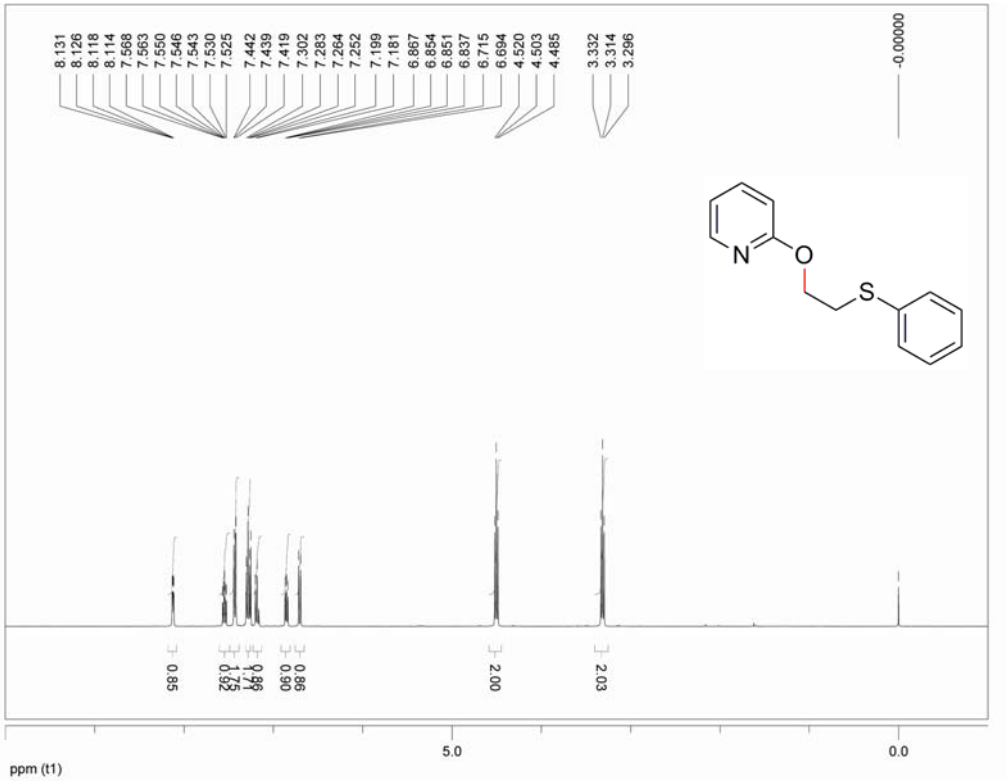
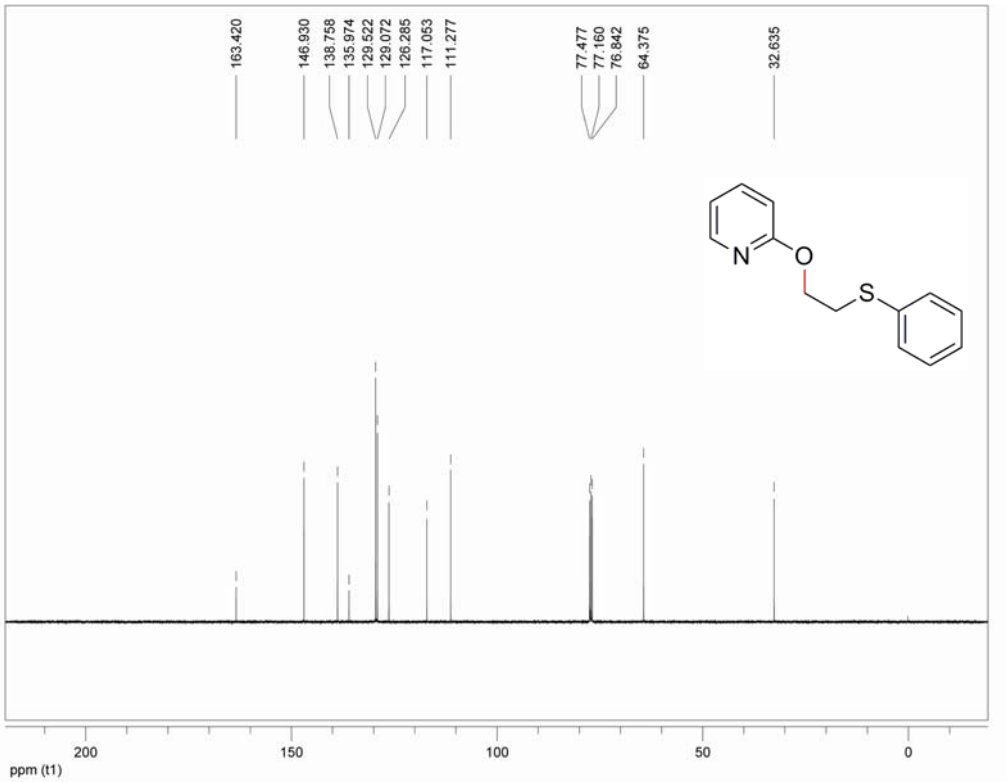




NMR spectra for **1kk**





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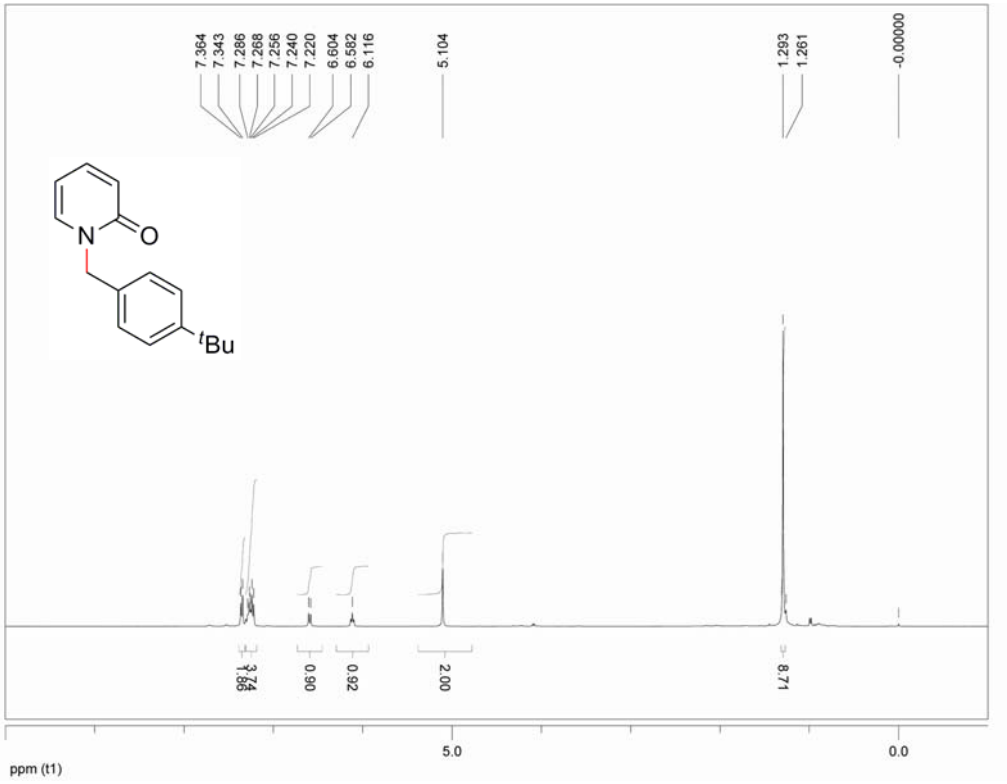
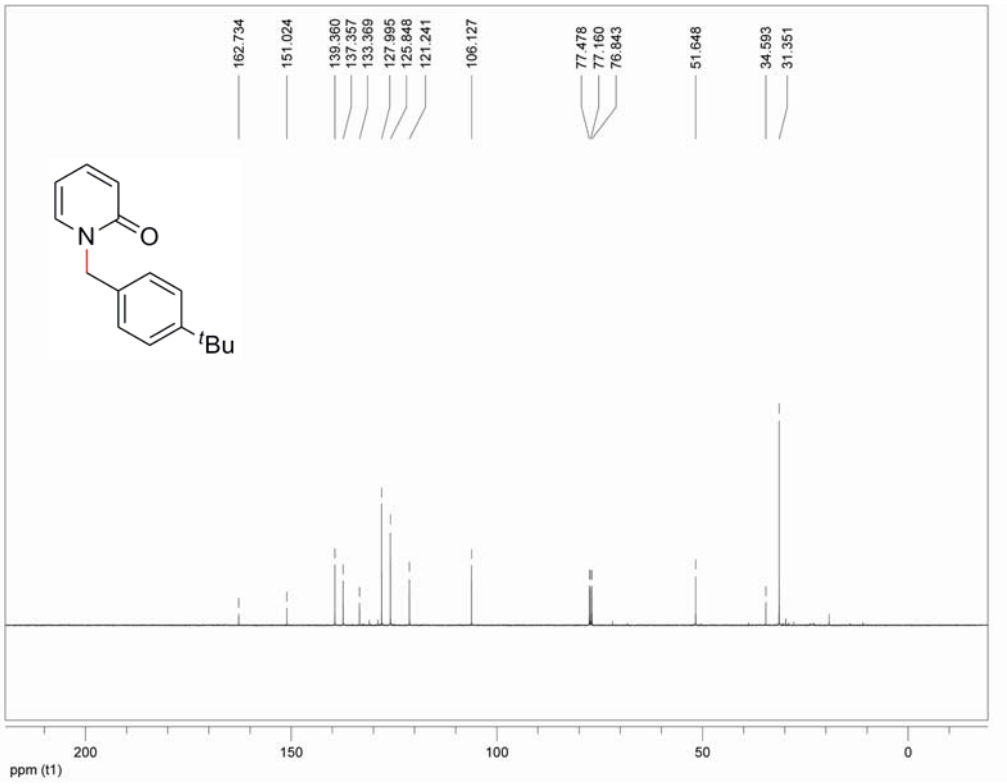
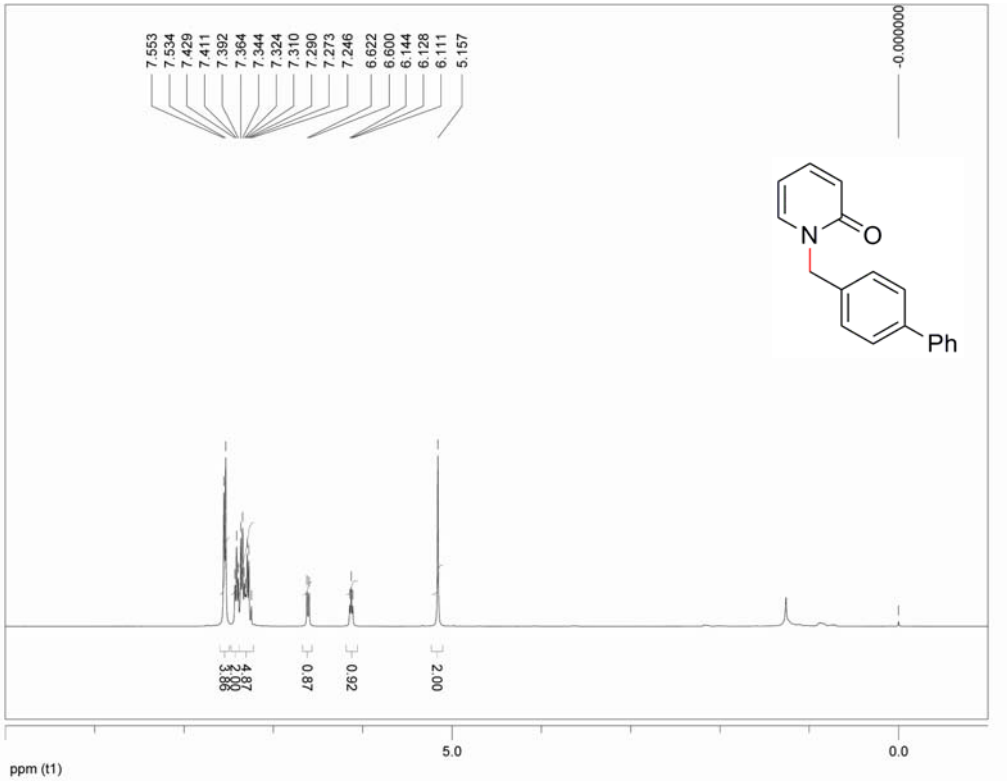
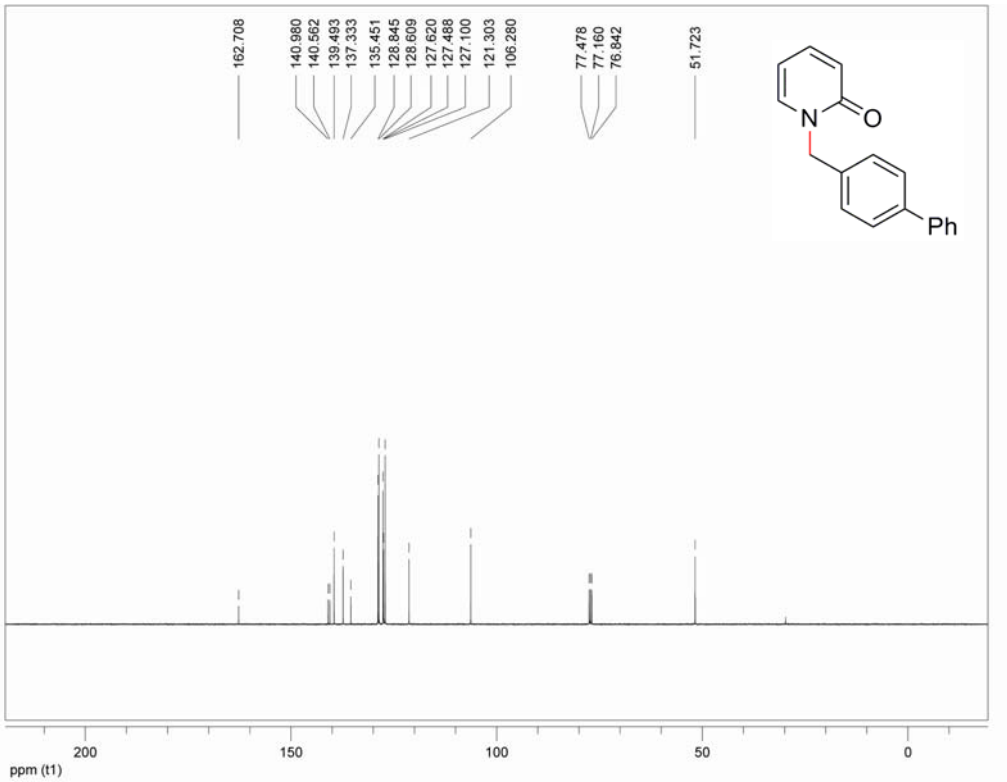


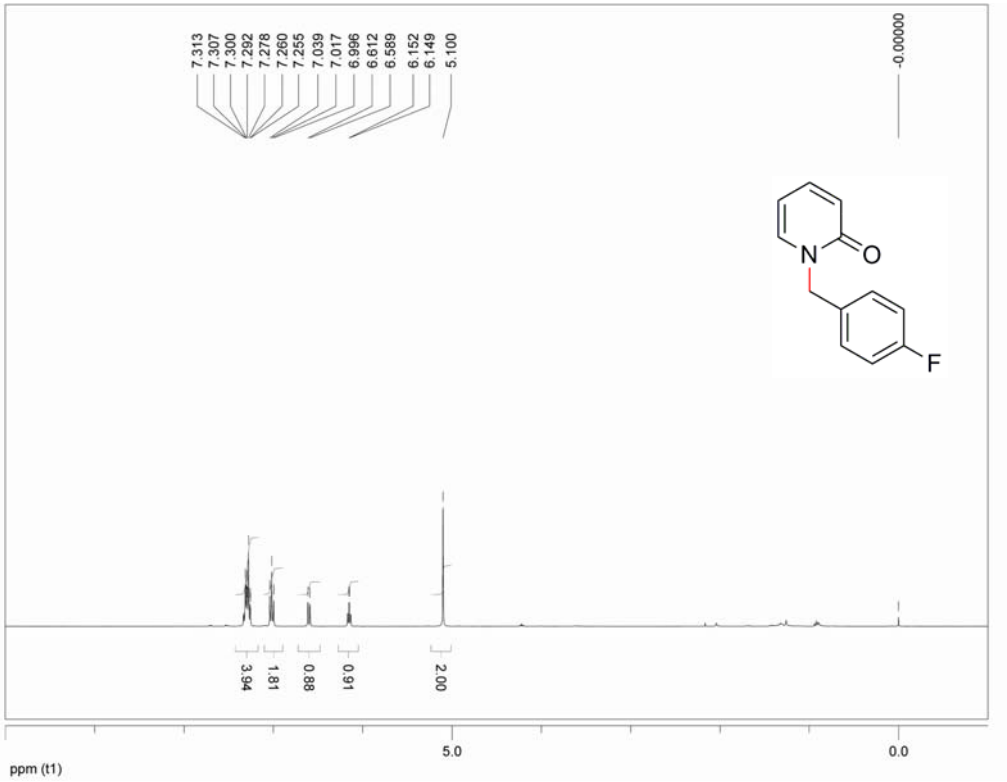


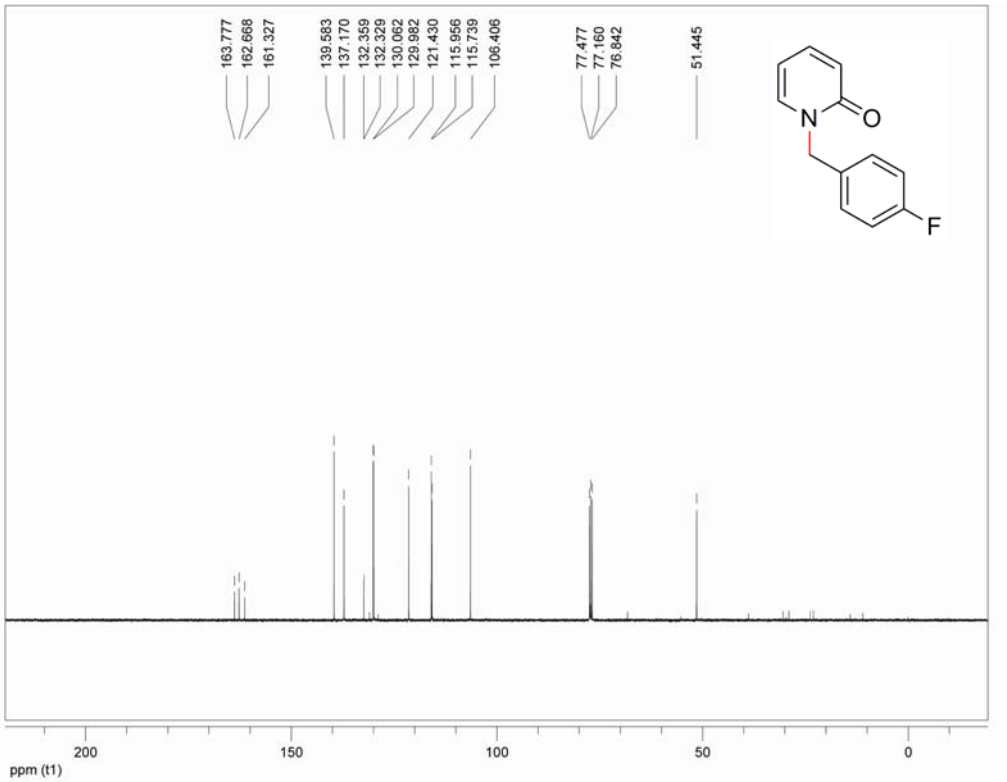
NMR spectra for **2d**

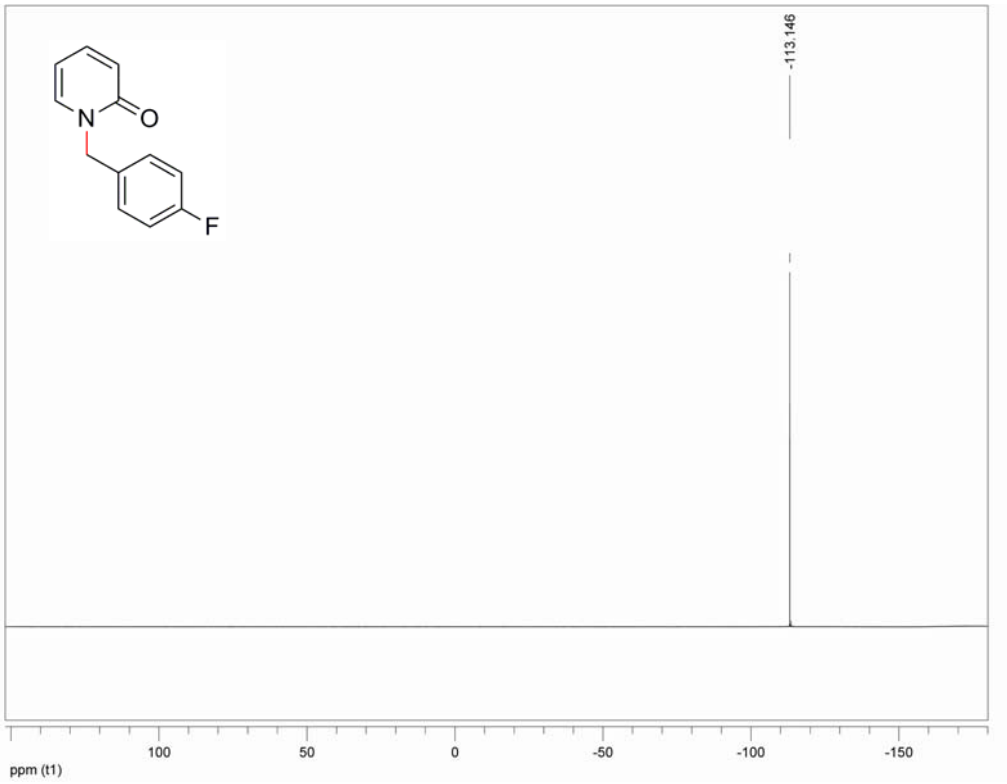




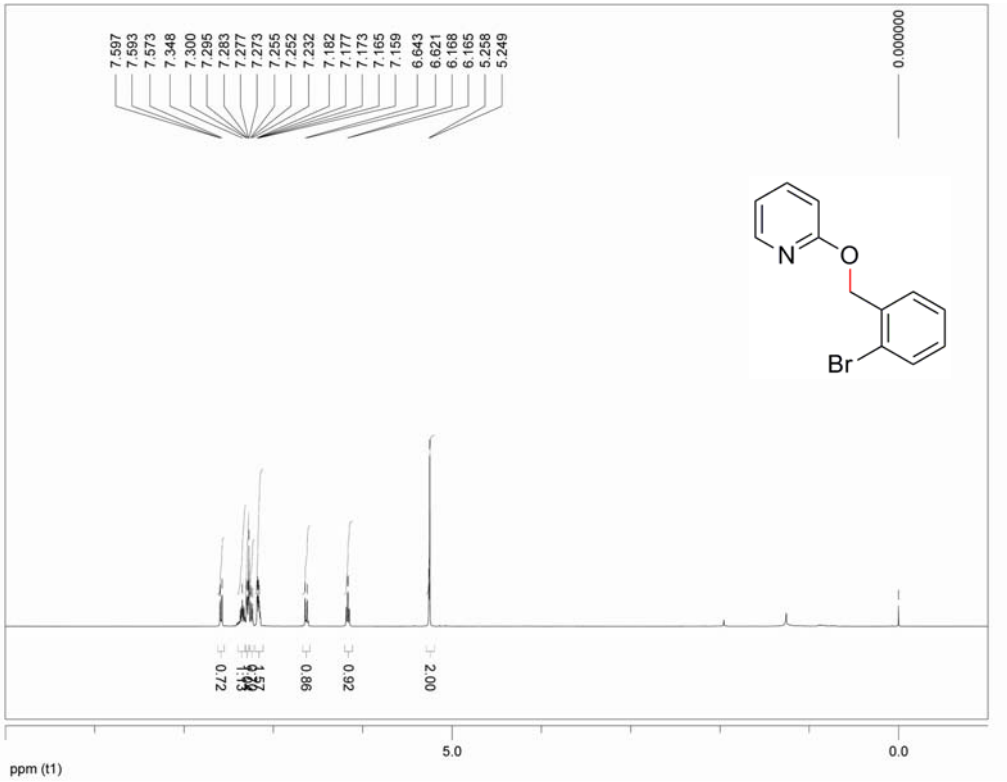
NMR spectra for **2g**

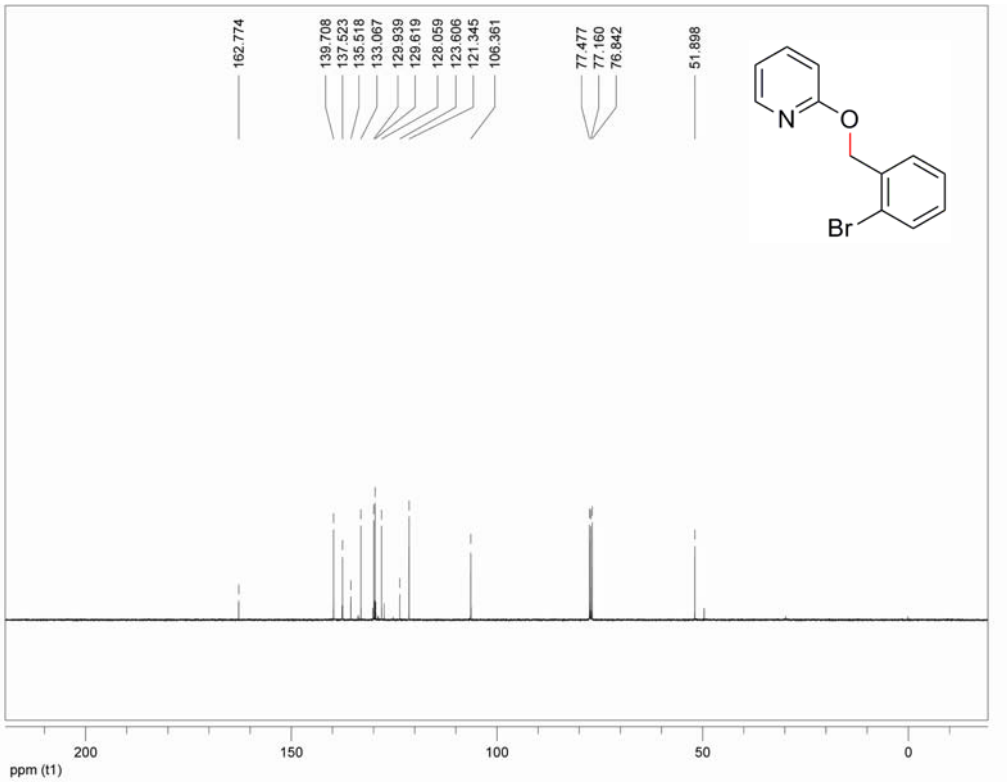




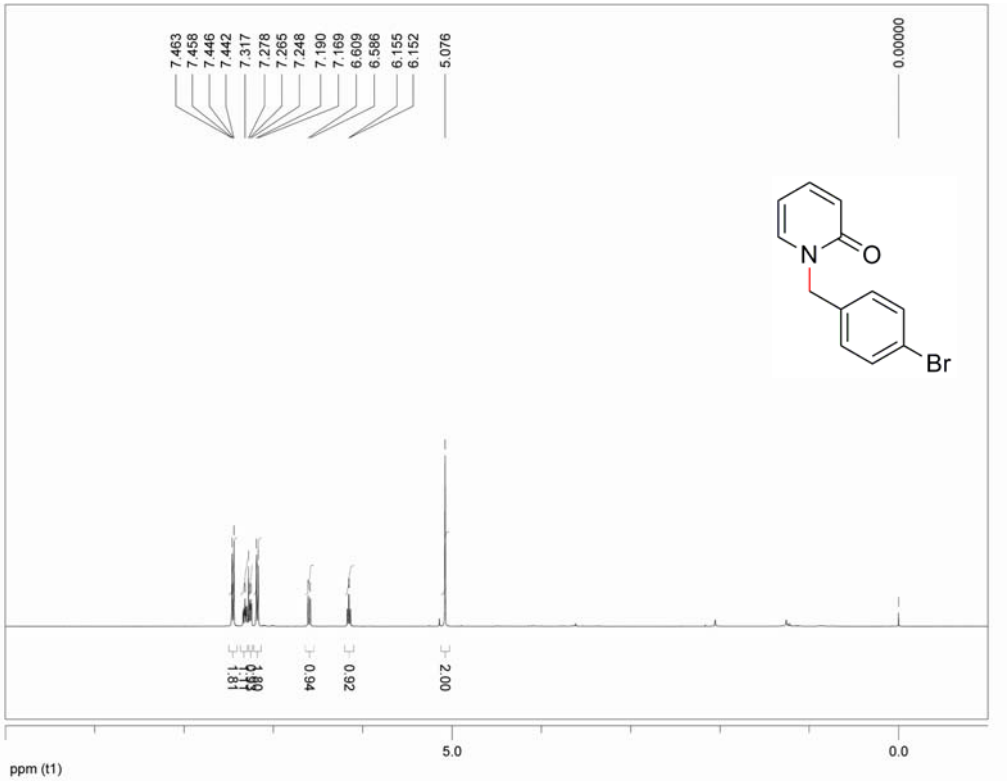

-113.146
N
O
F
100
50
0
-50
-100
-150
ppm (t1)

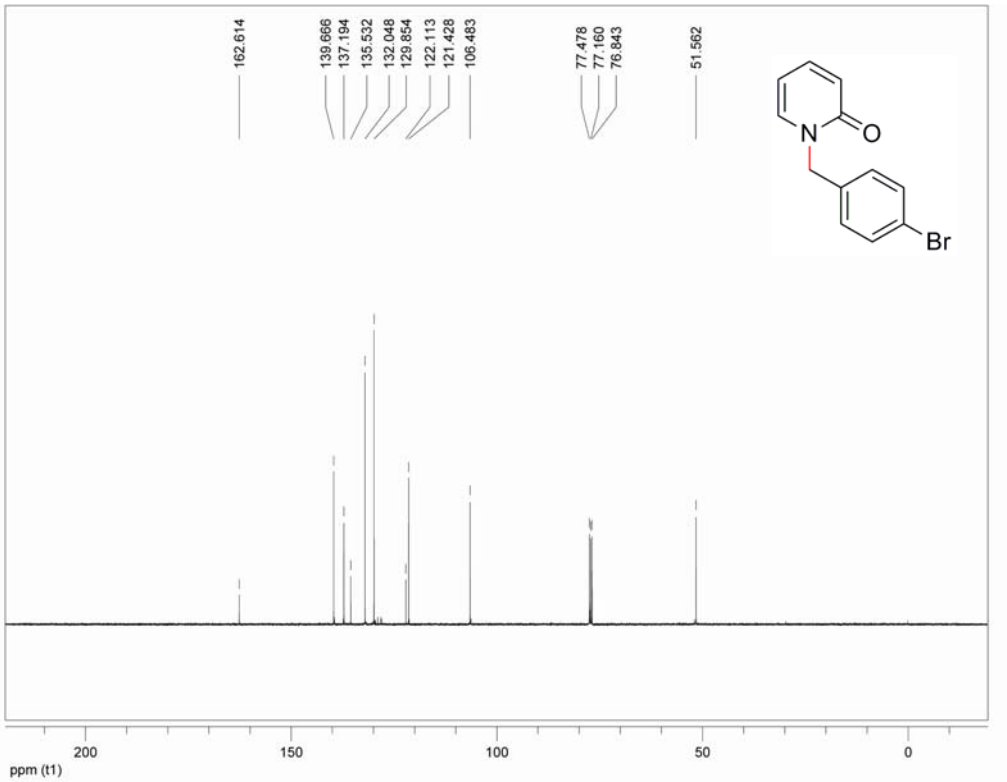
NMR spectra for **2h**



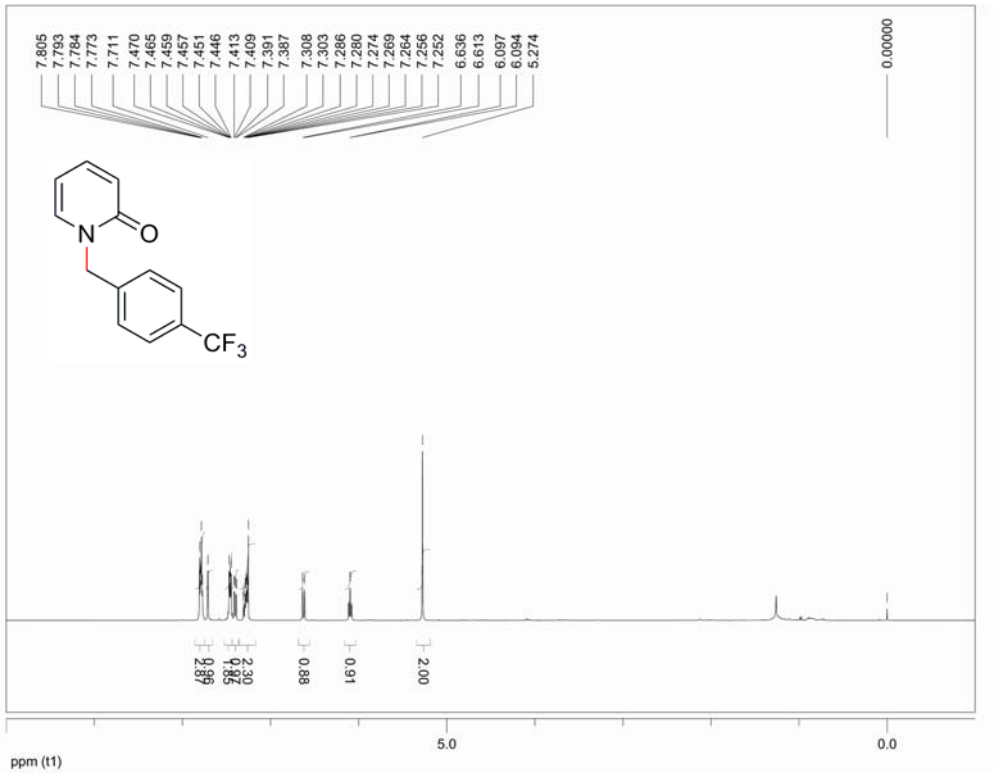


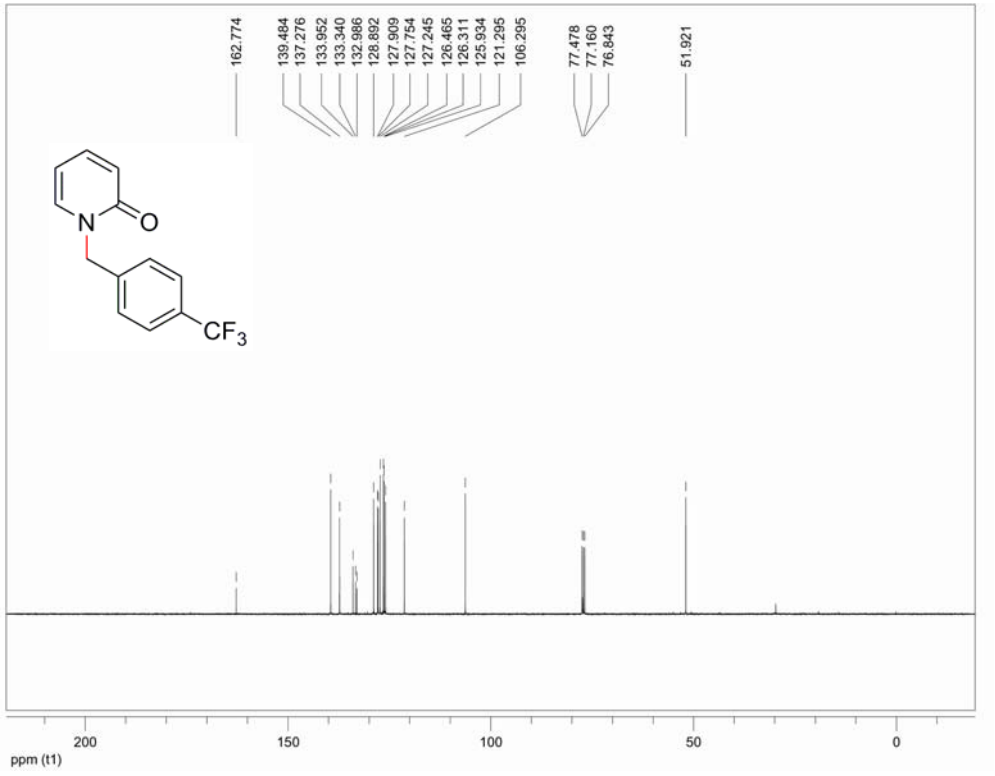
NMR spectra for **2i**

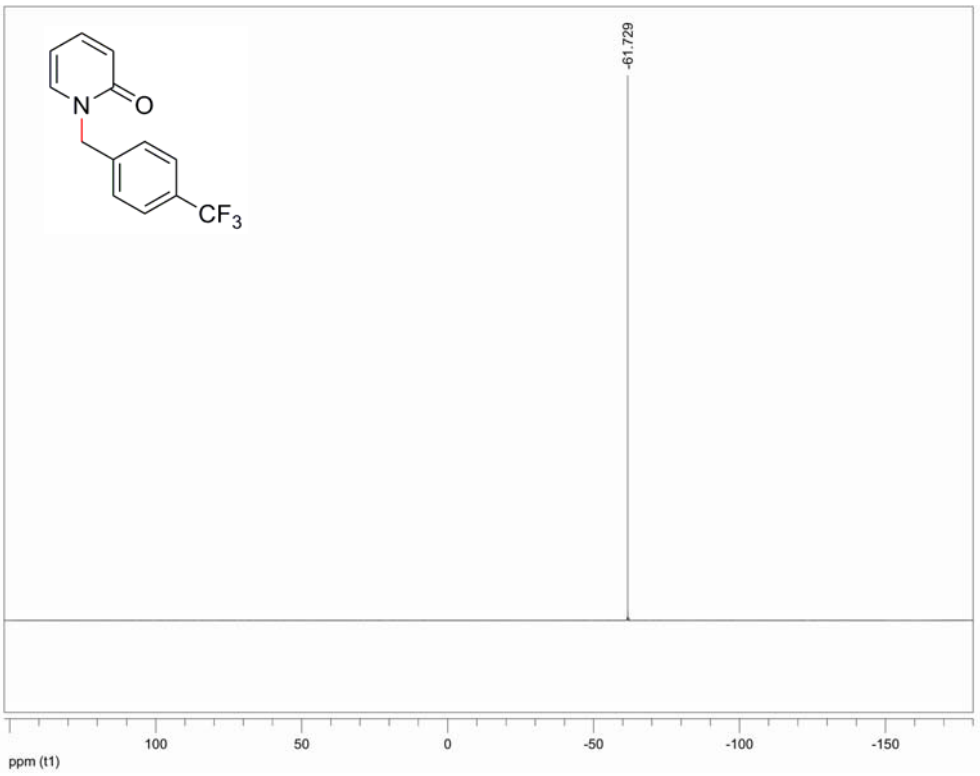




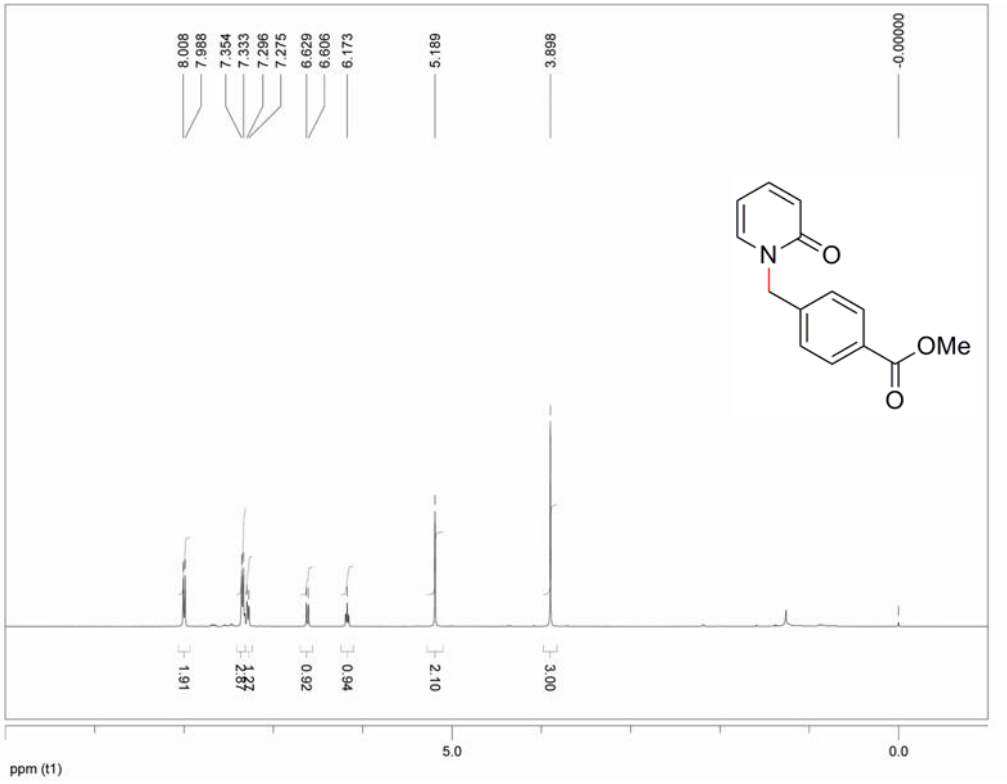
NMR spectra for **2j**

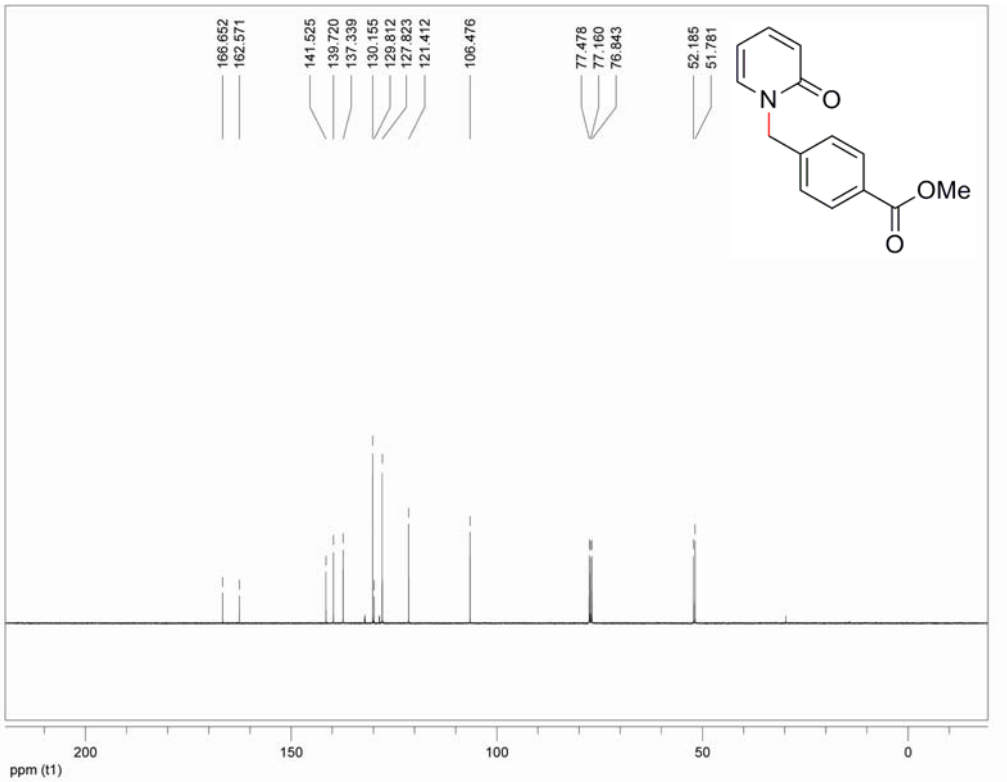




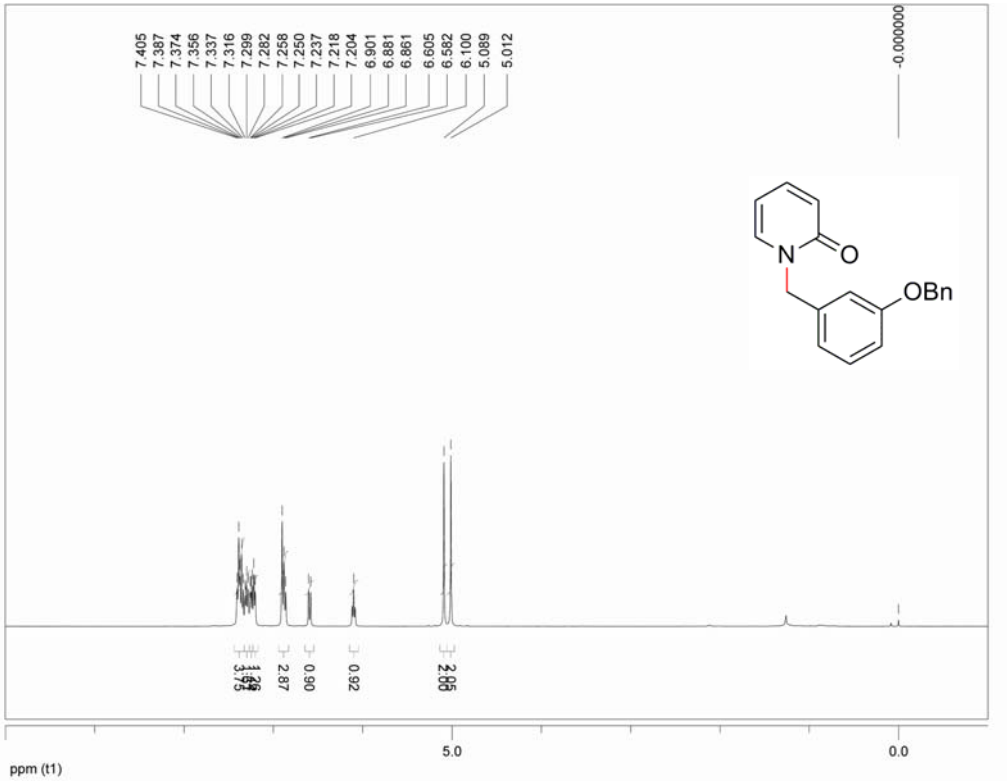

-61.729
N
O
CF3
100
50
0
-50
-100
-150
ppm (t1)

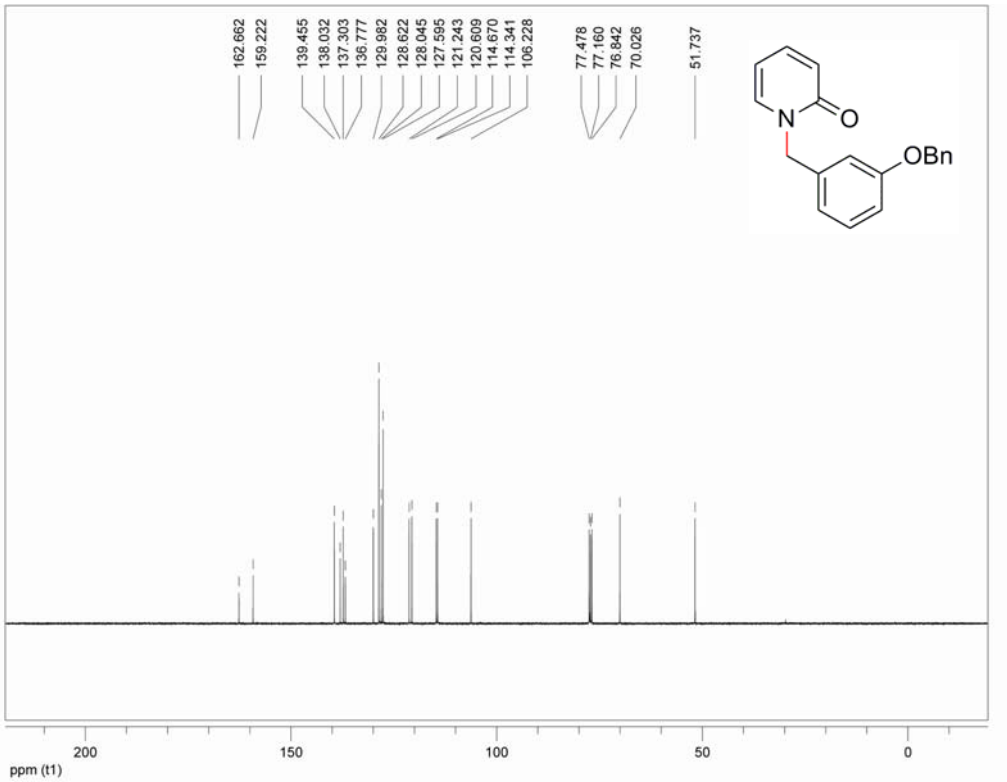
NMR spectra for **2k**



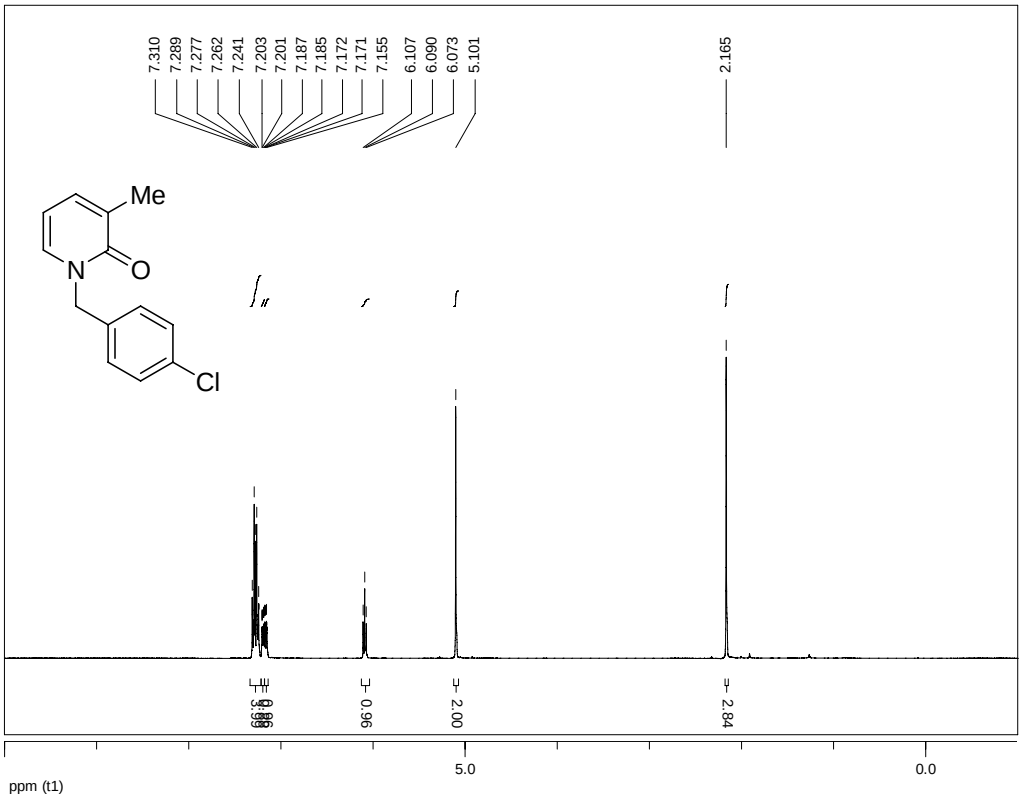


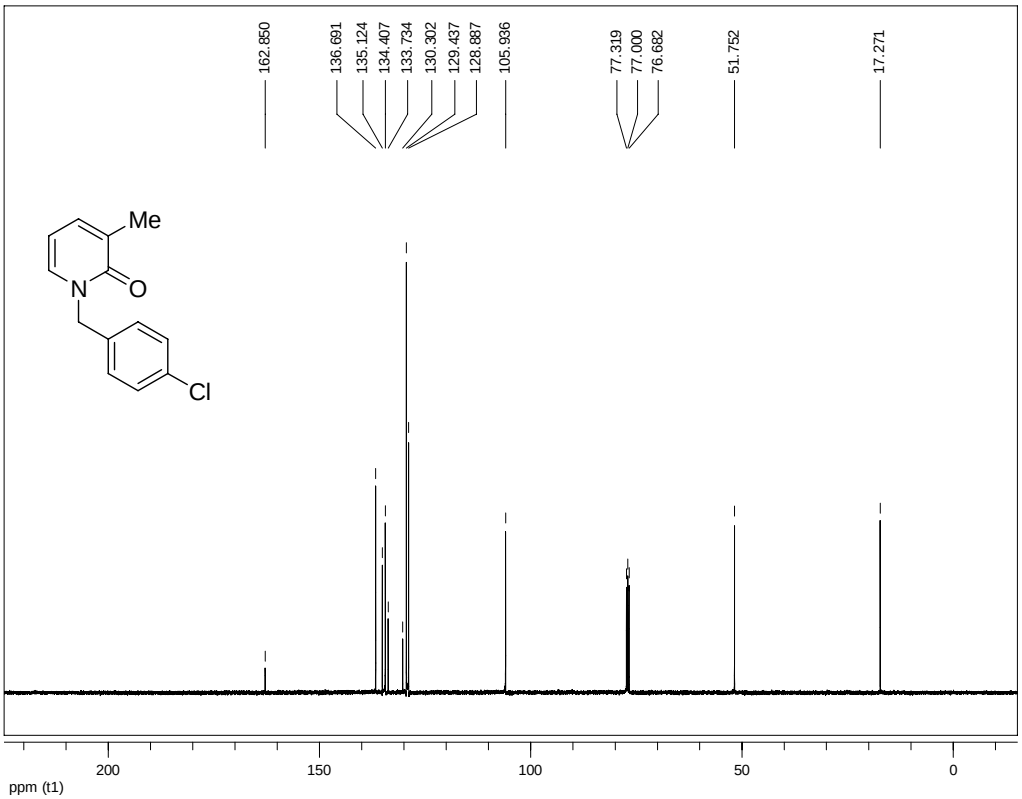
NMR spectra for **2n**



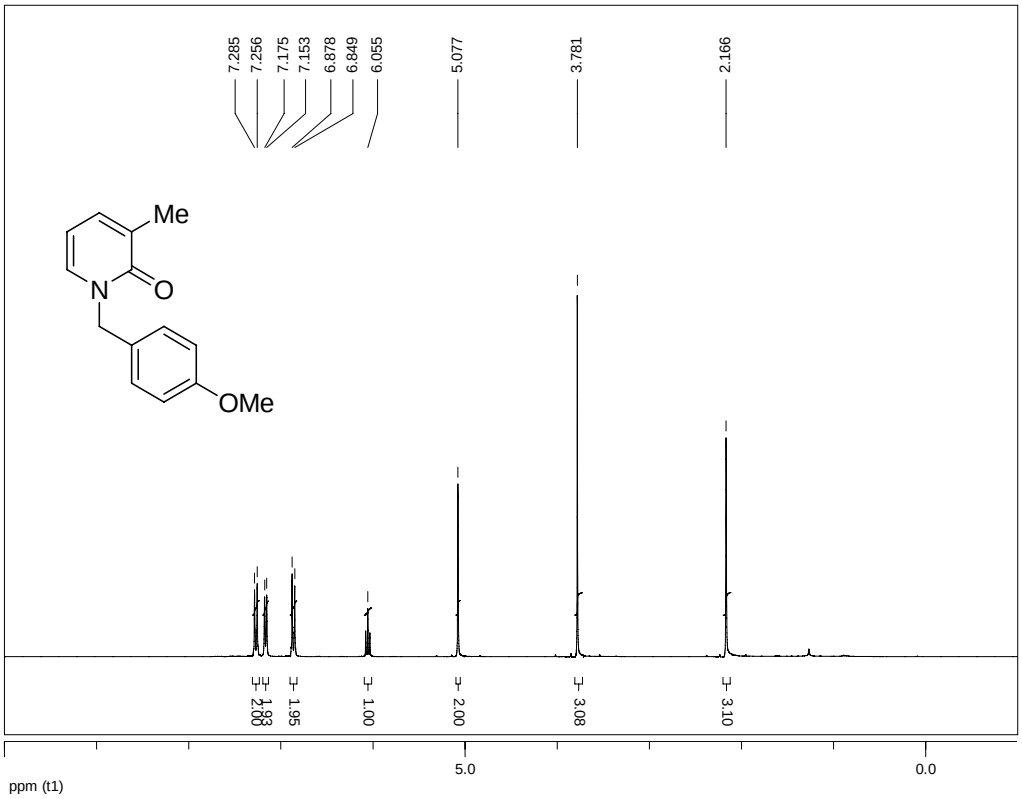


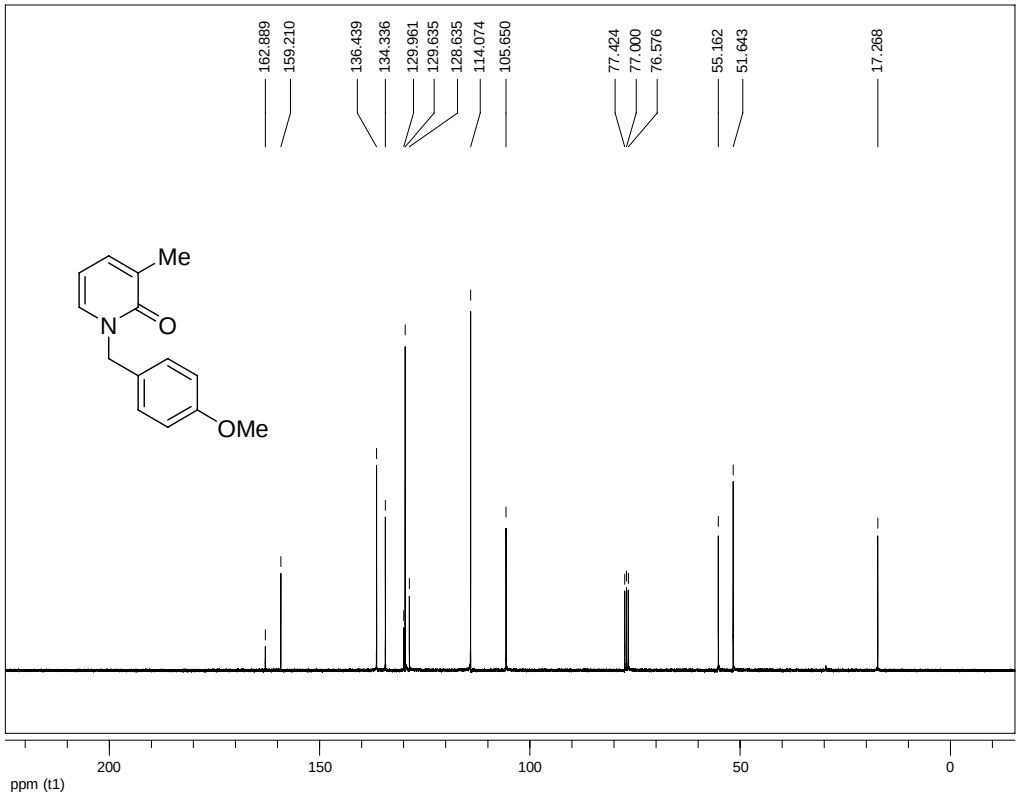
NMR spectra for **2p**



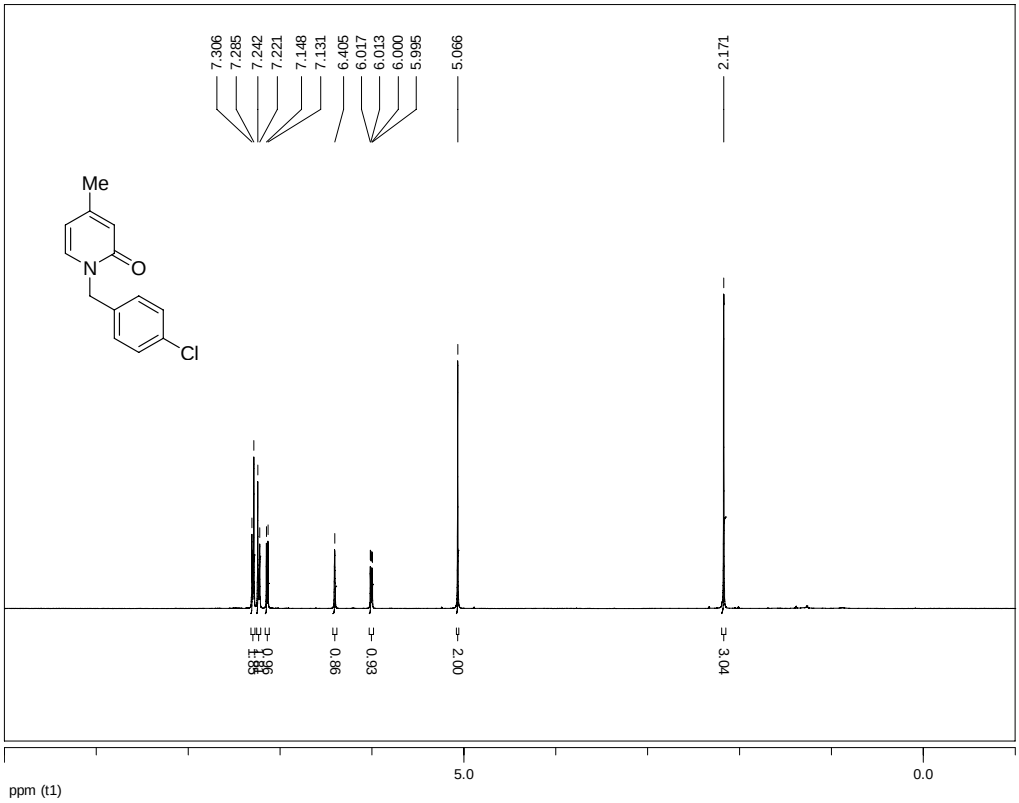


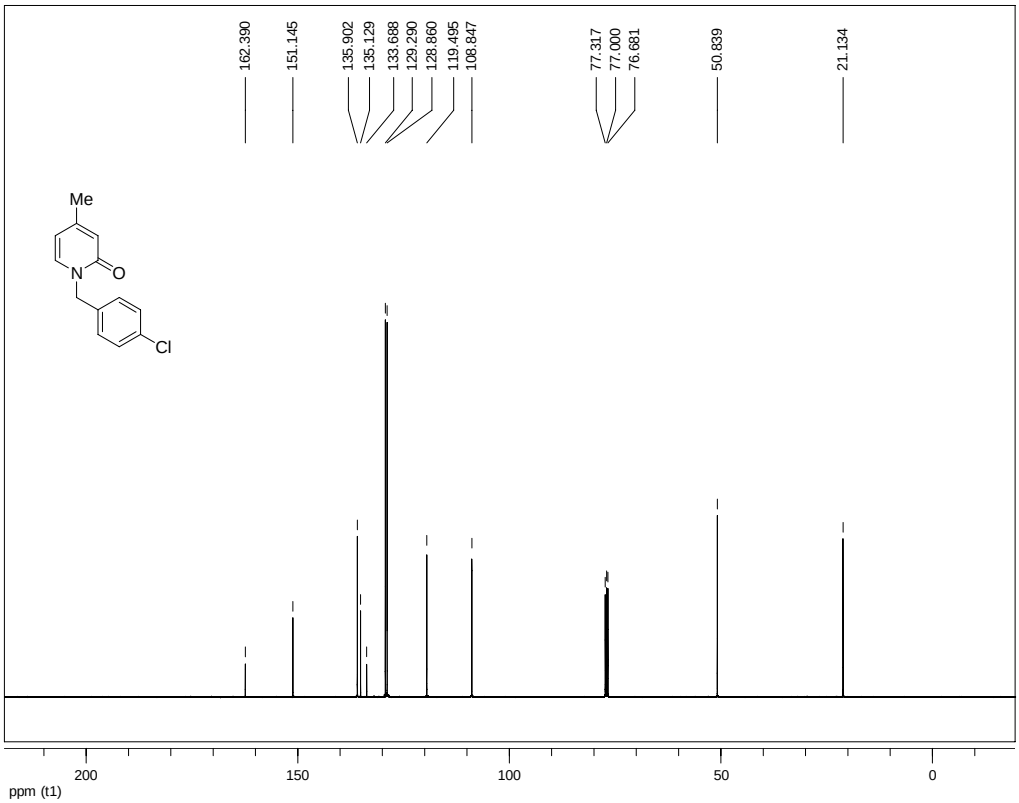
NMR spectra for **2q**



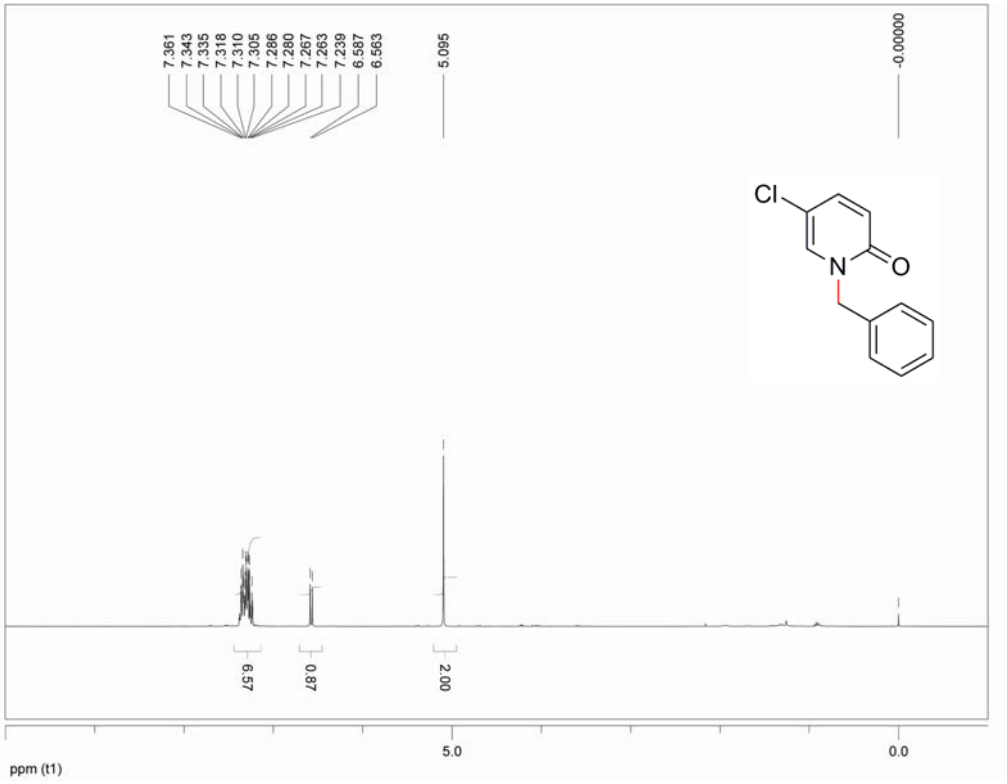


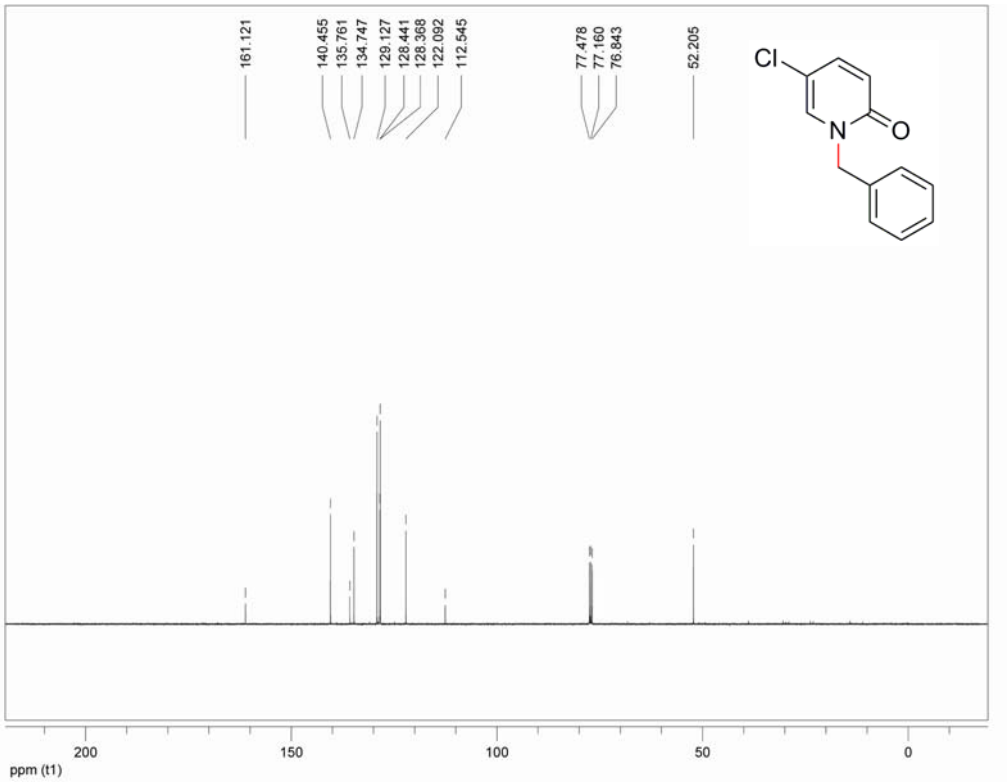
NMR spectra for **2s**



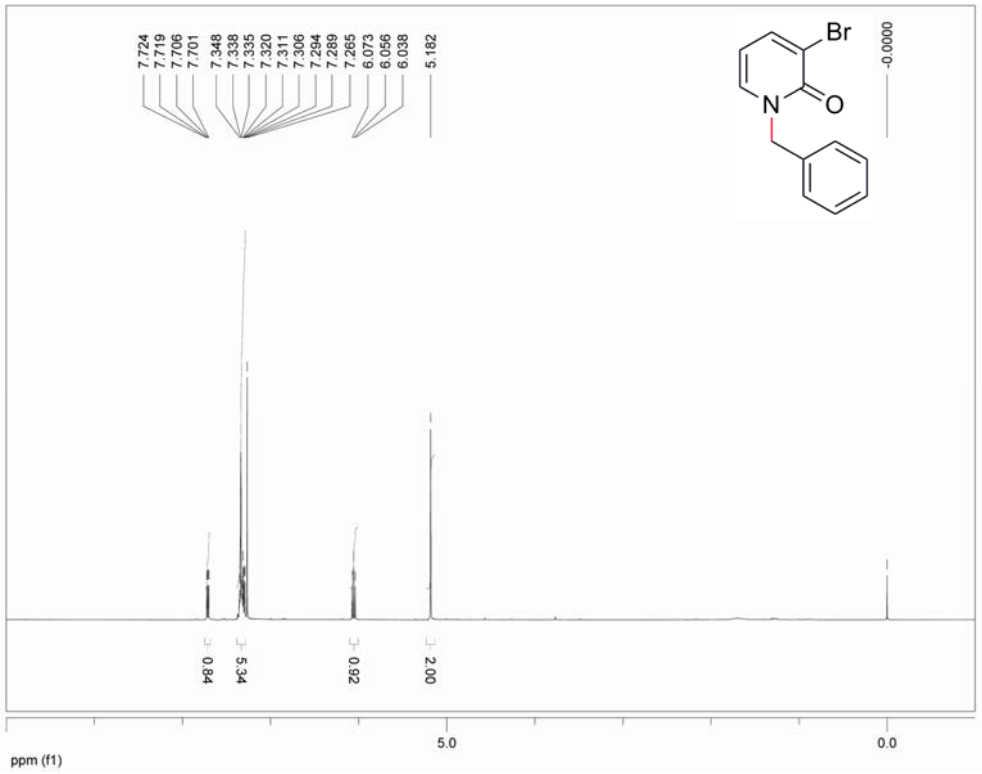


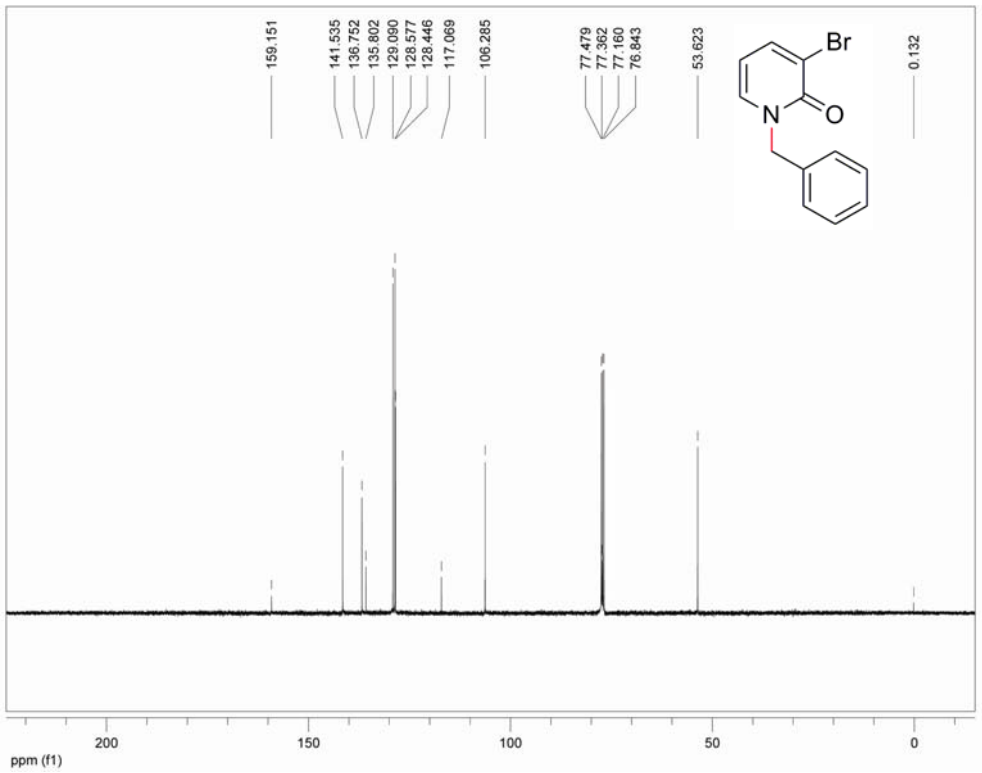
NMR spectra for **2w**



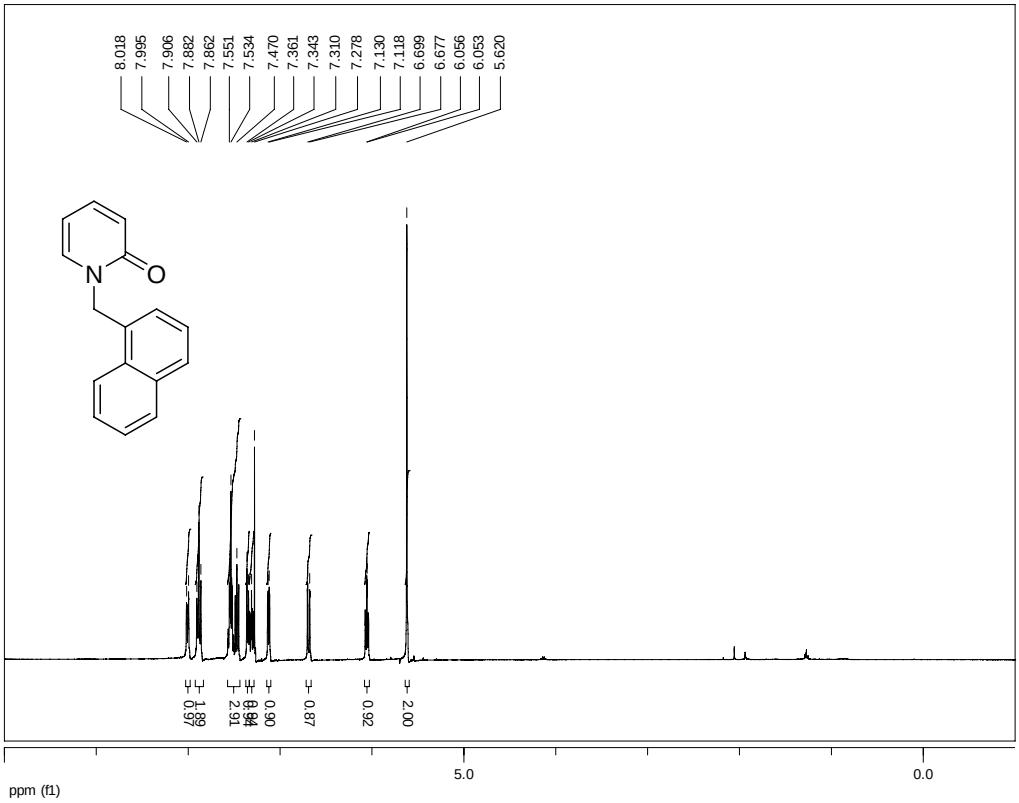


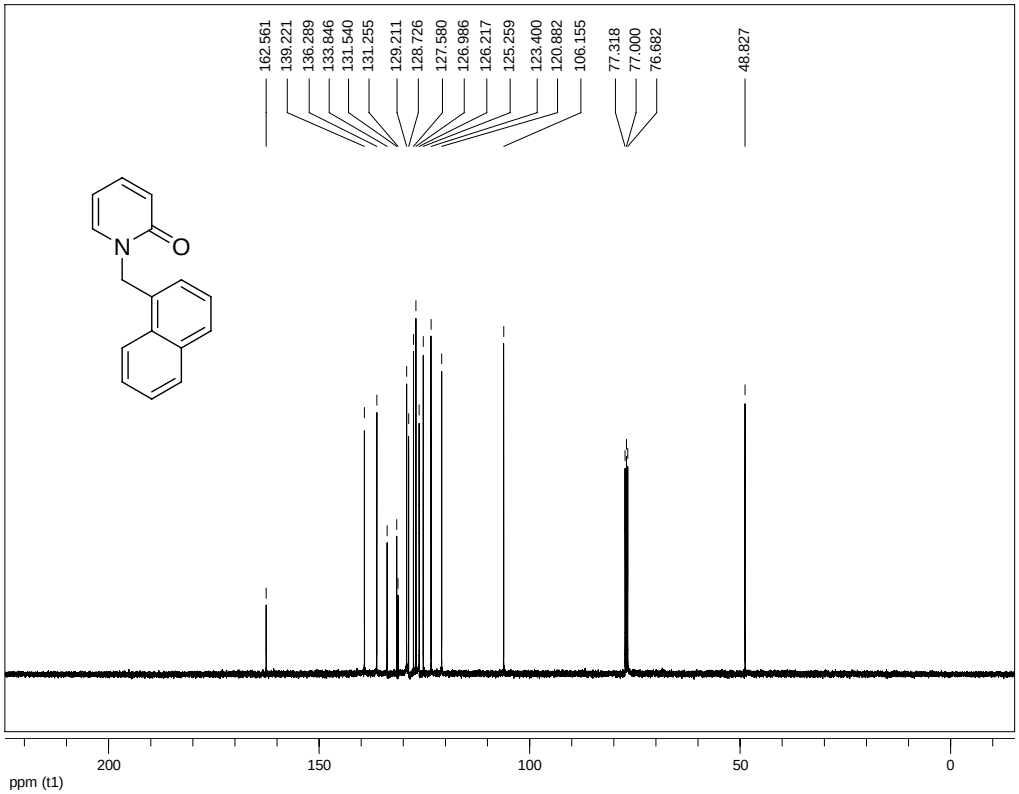
NMR spectra for **2y**



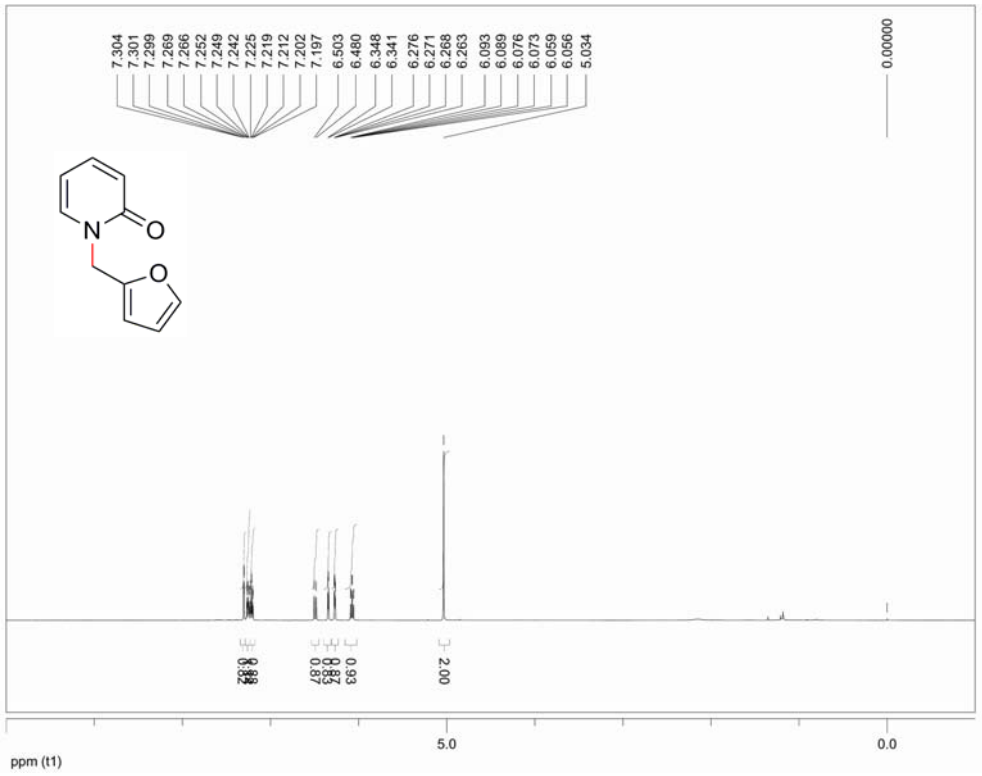


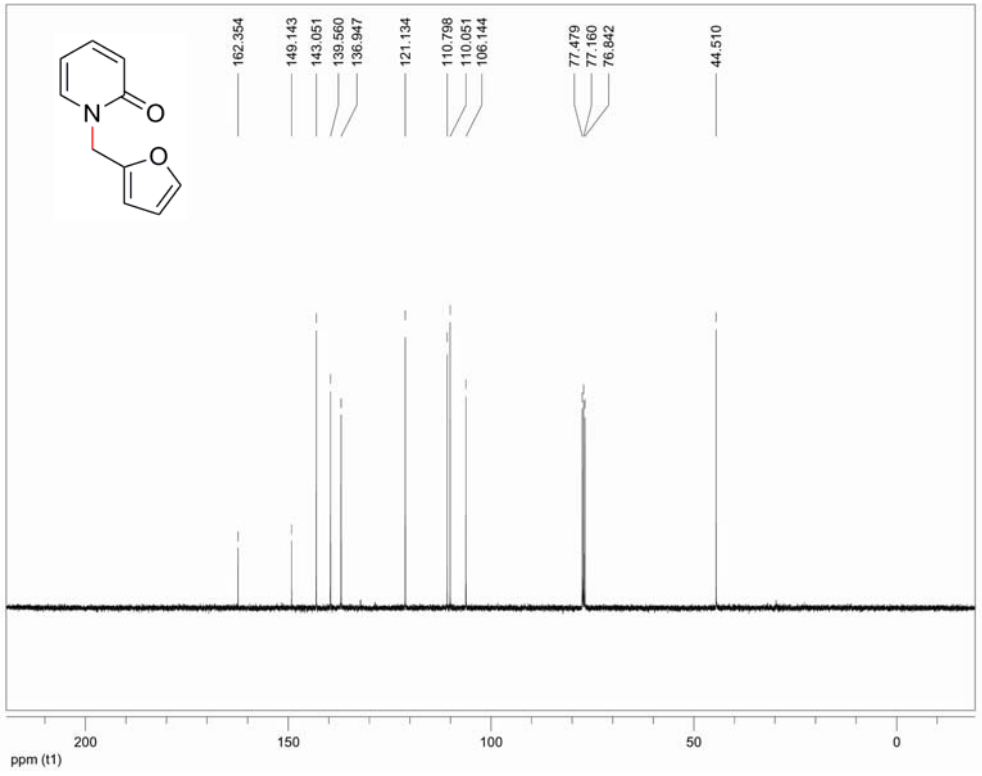
NMR spectra for **2bb**



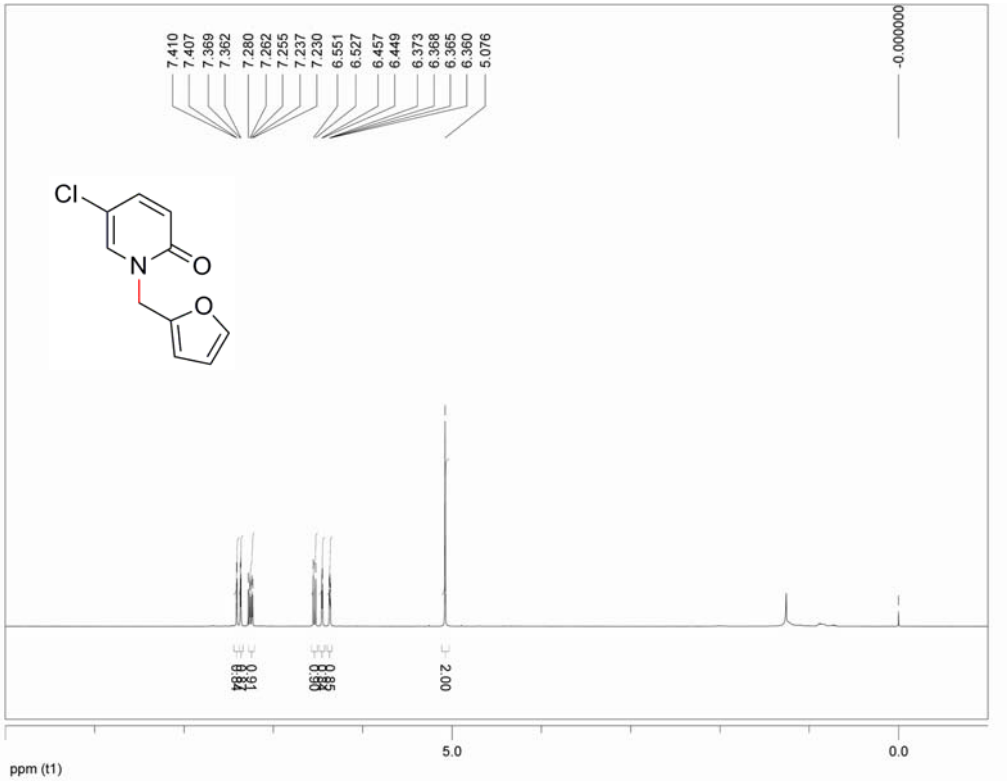


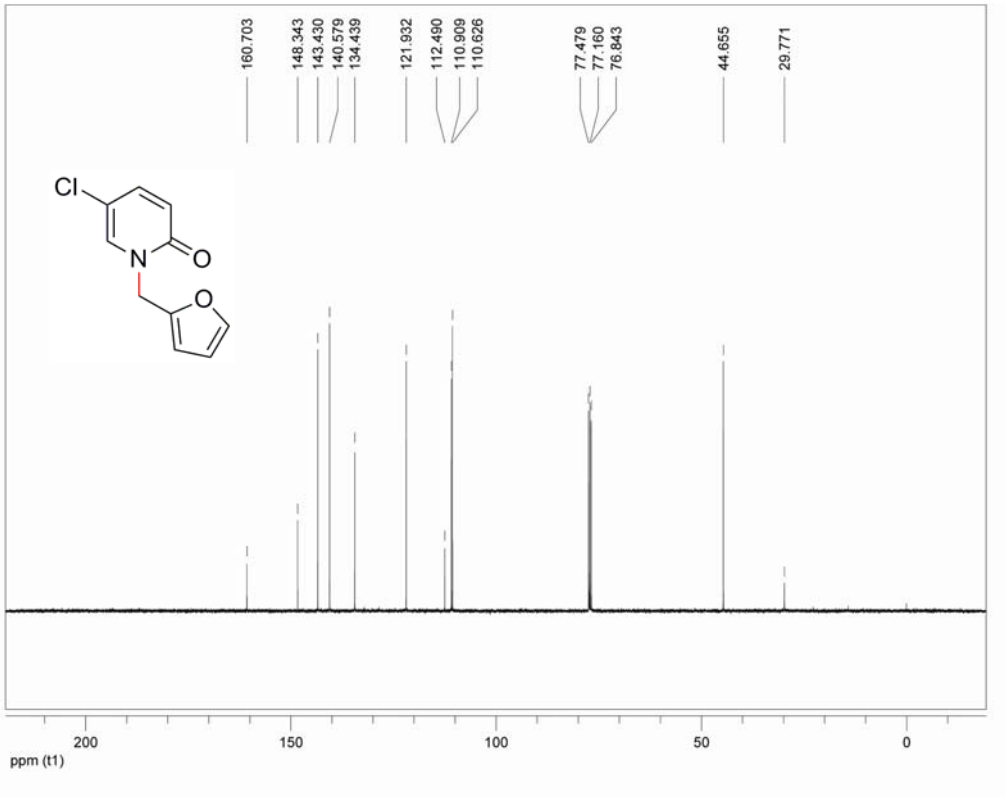
NMR spectra for **2cc**



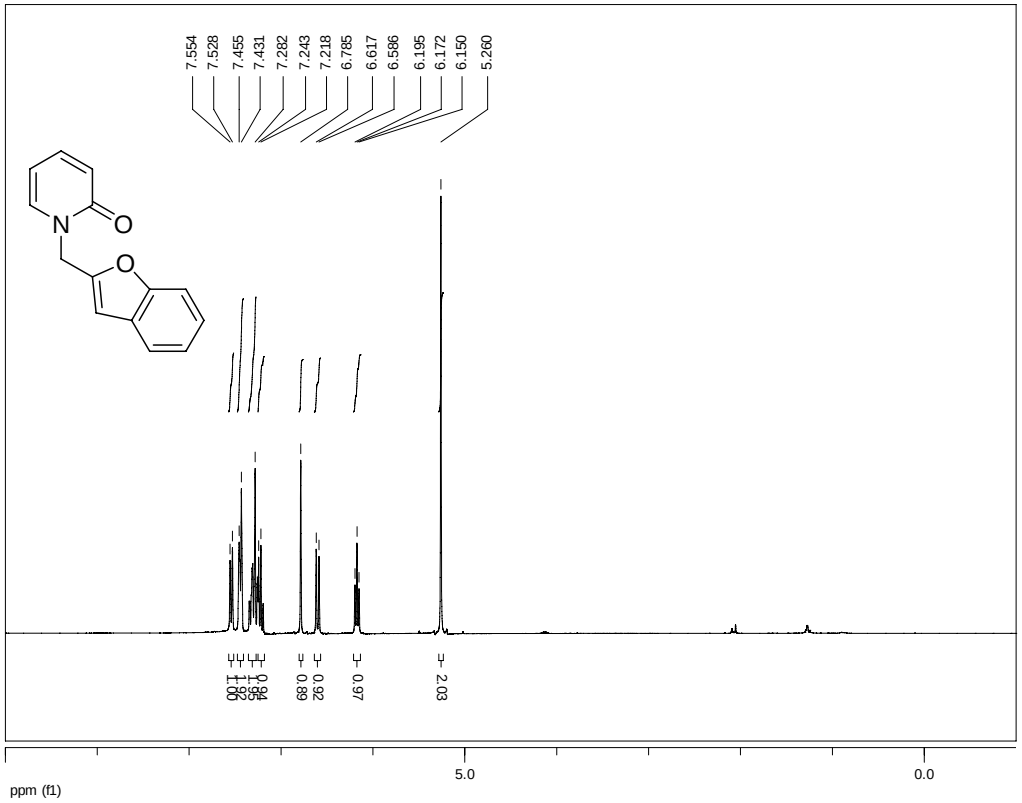


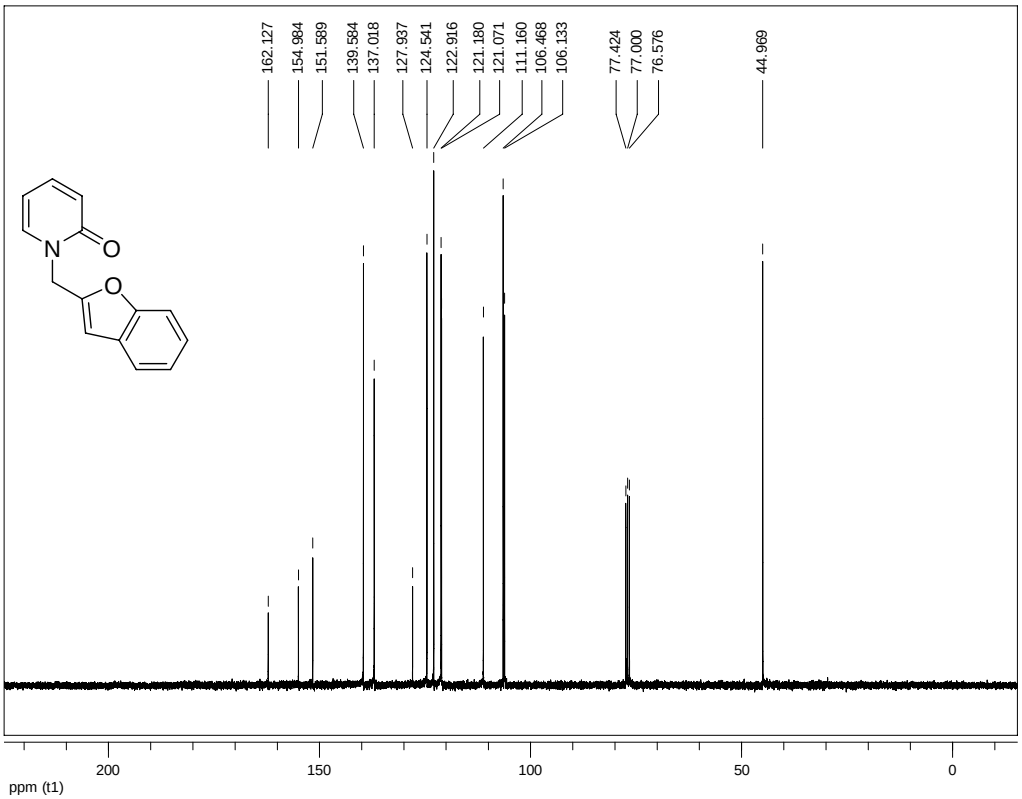
NMR spectra for **2dd**



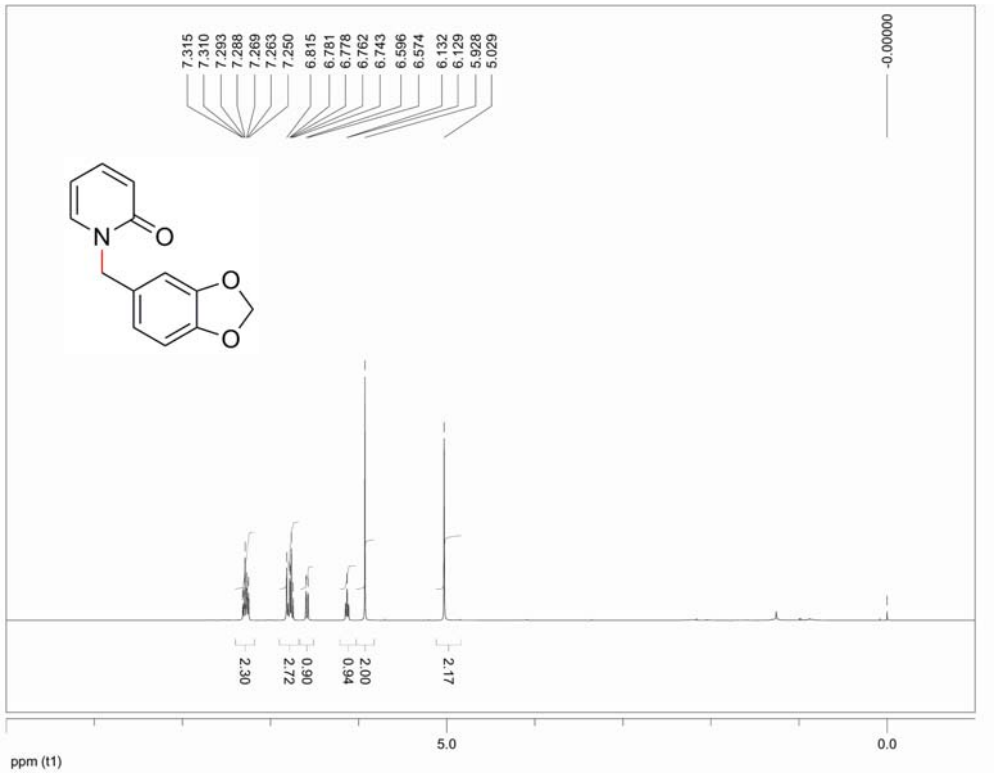


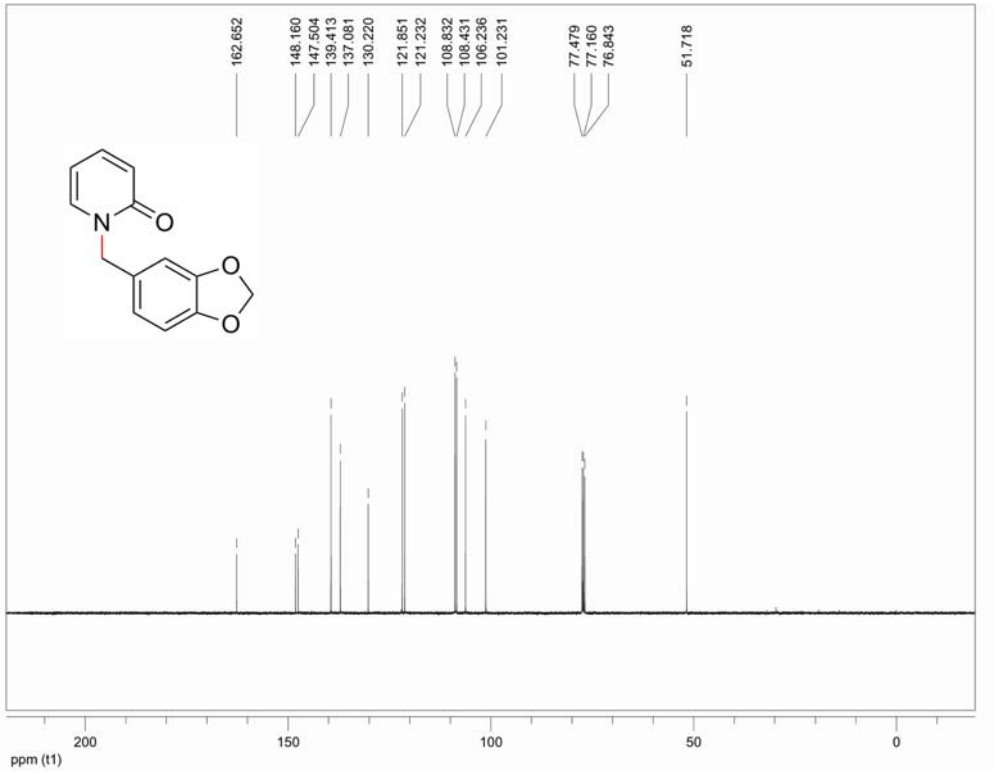
NMR spectra for **2ee**



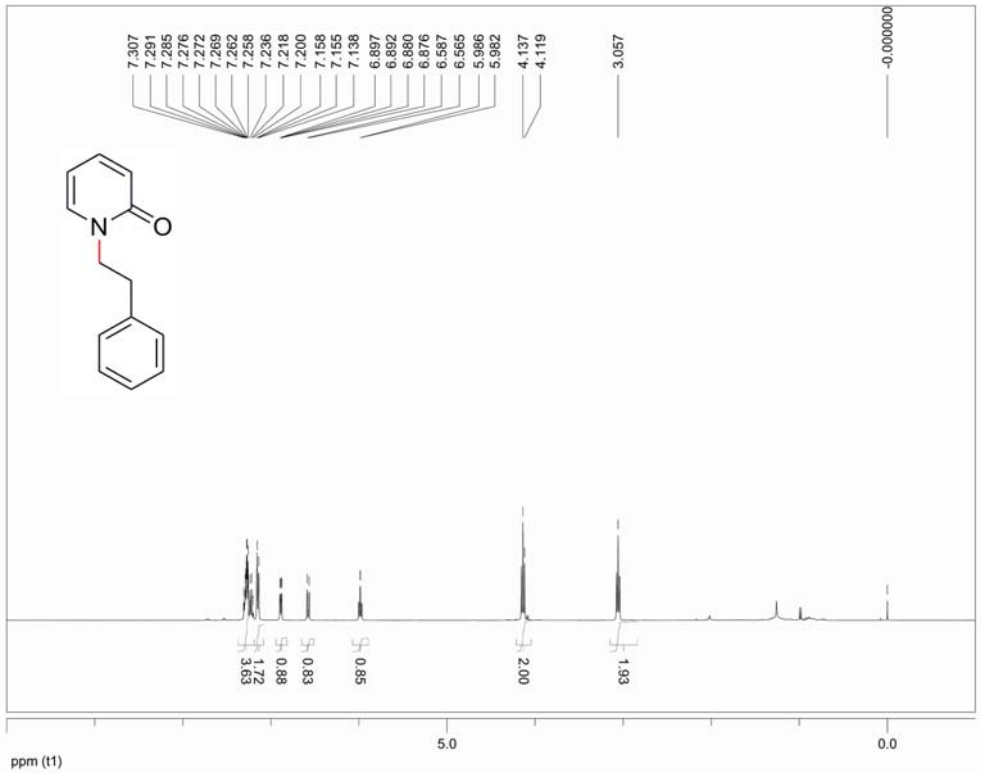


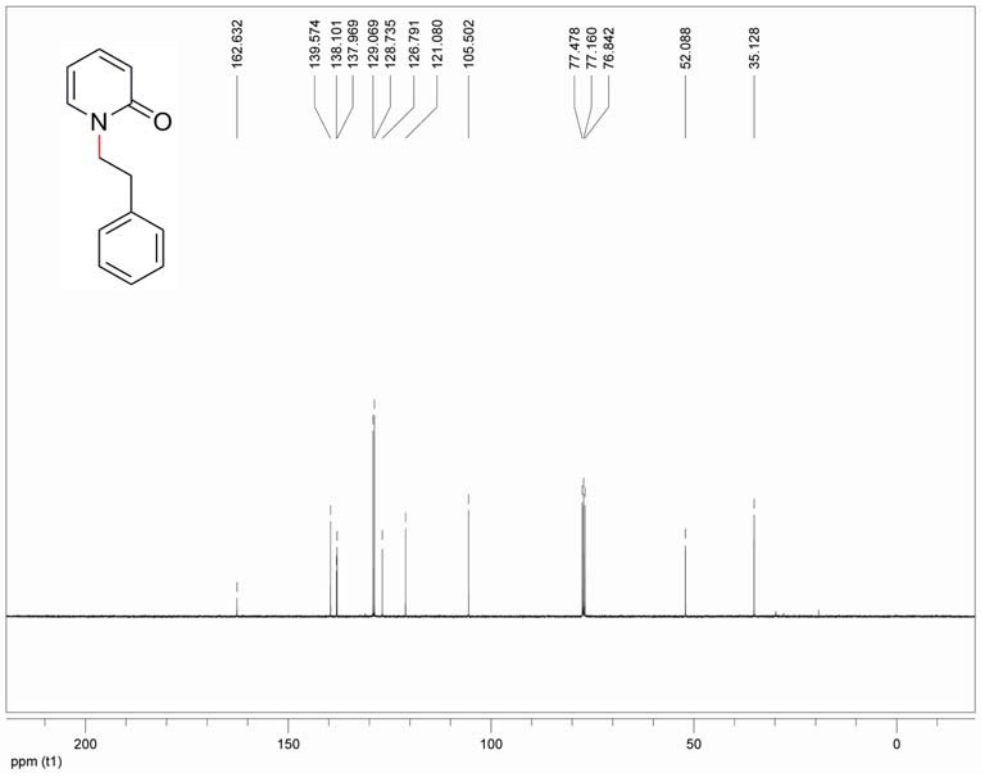
NMR spectra for **2ff**



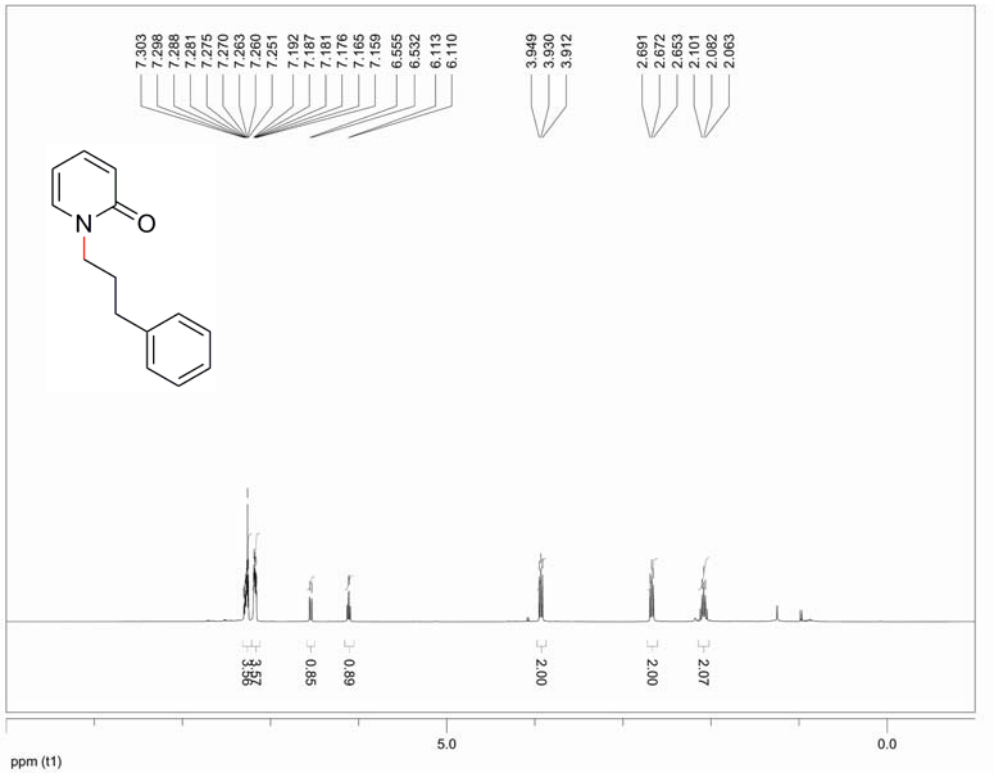


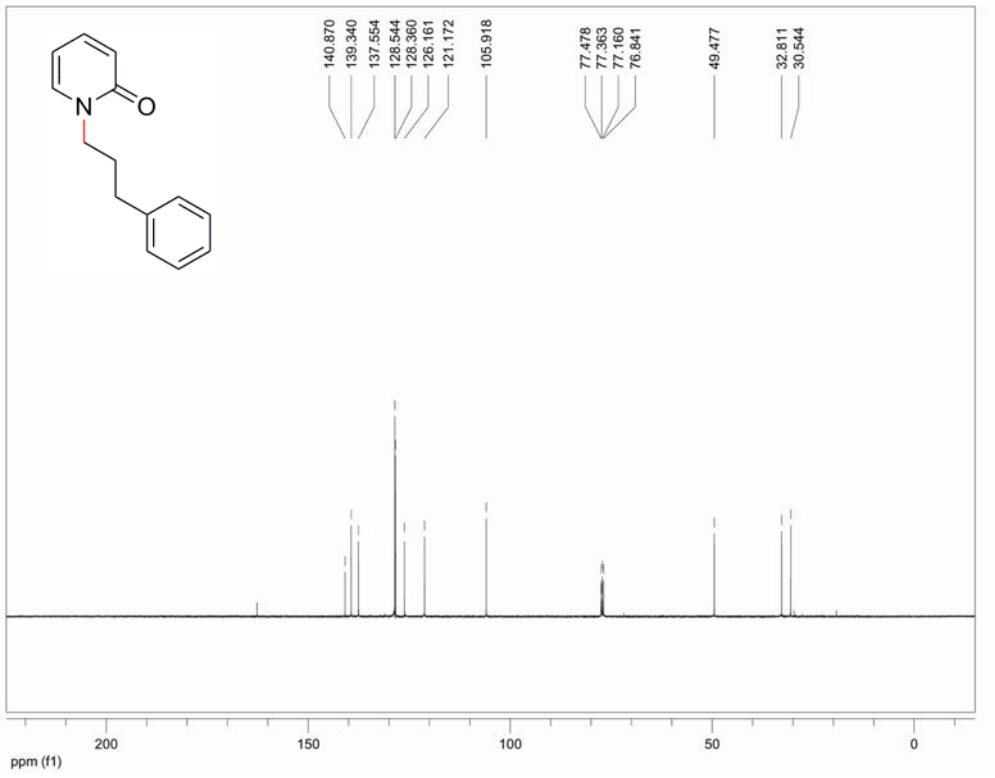
NMR spectra for **2gg**



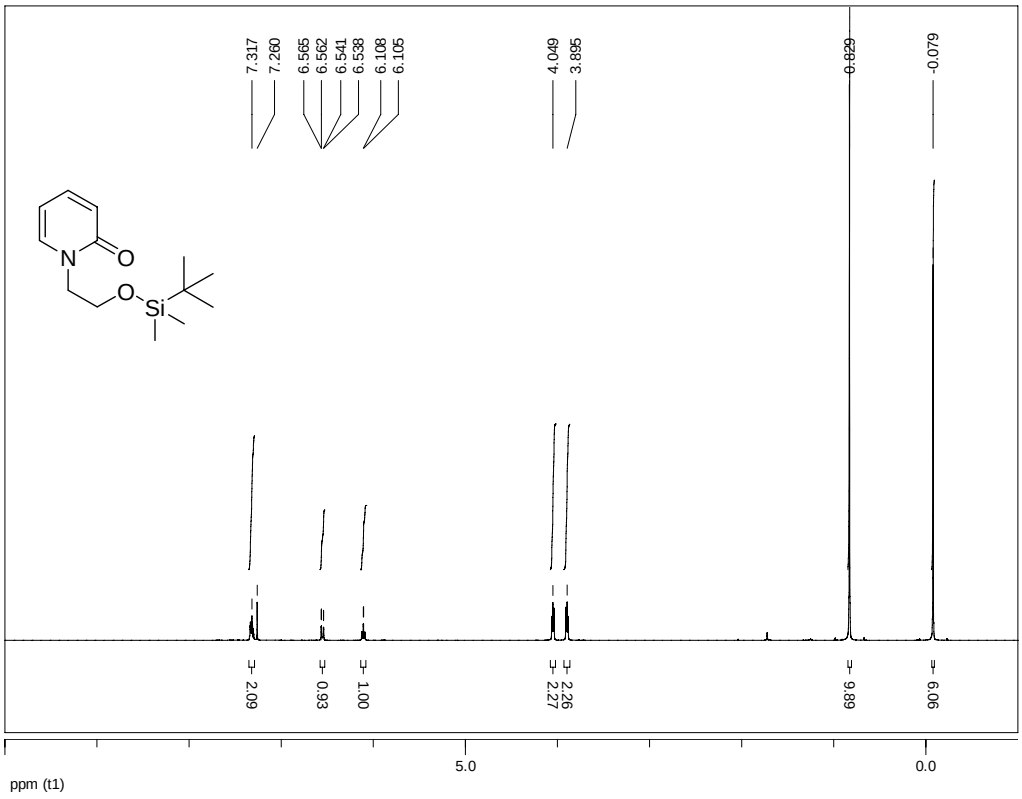


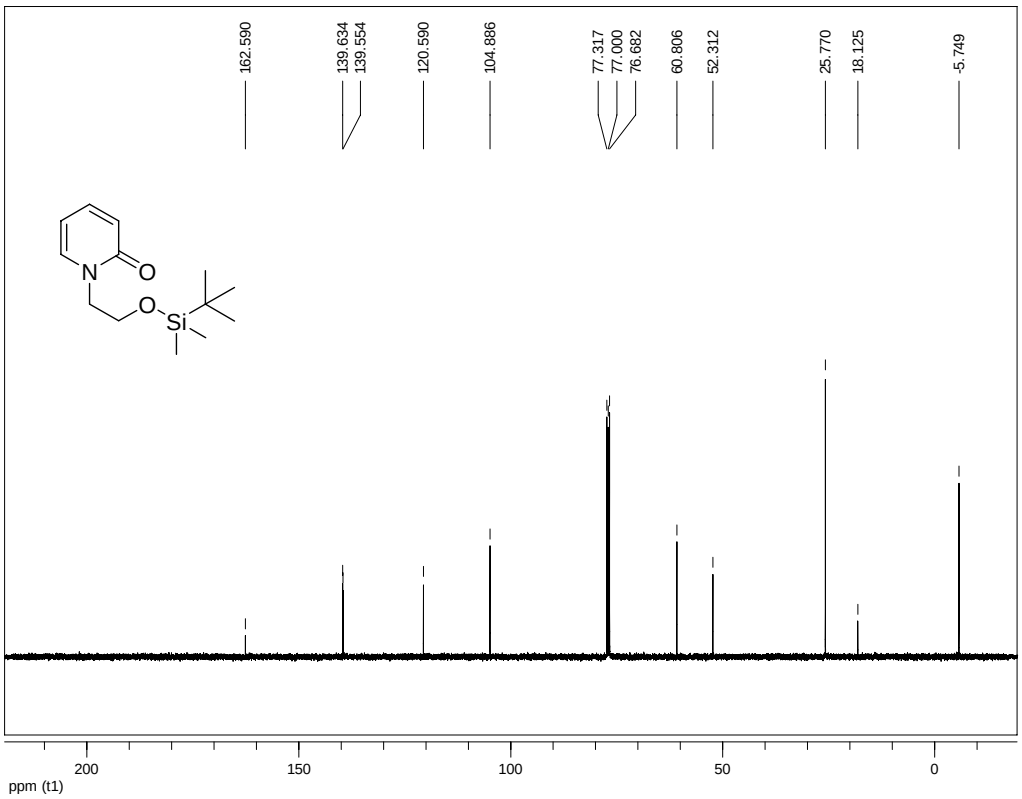
NMR spectra for **2hh**



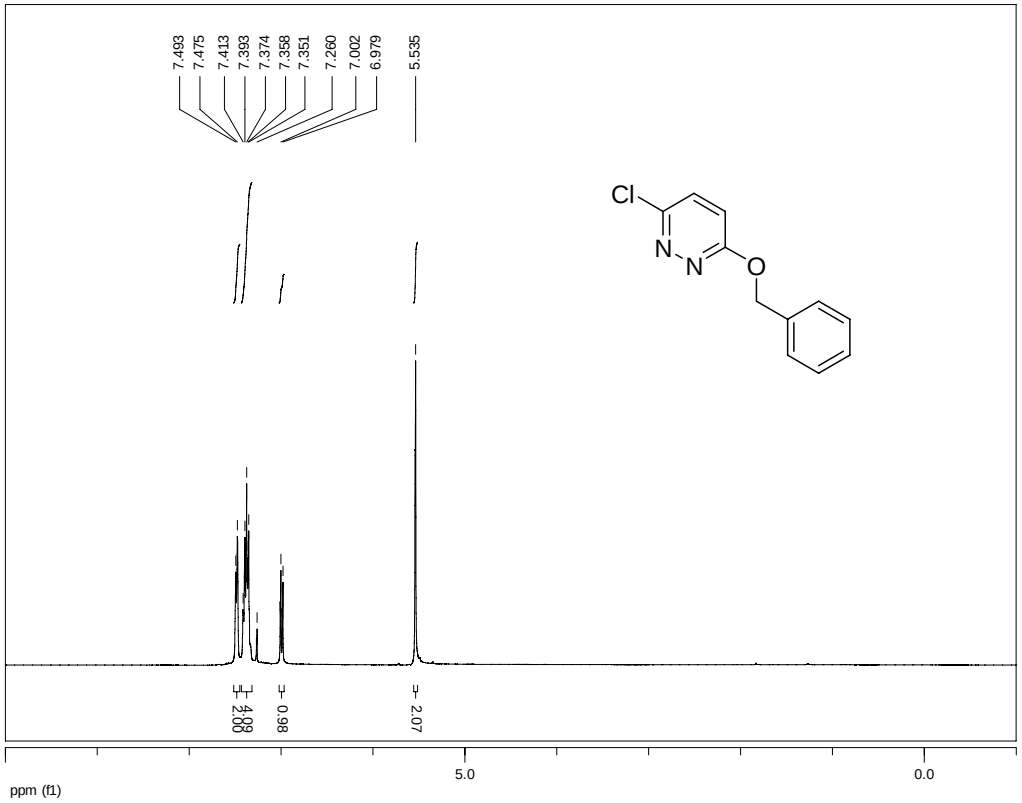


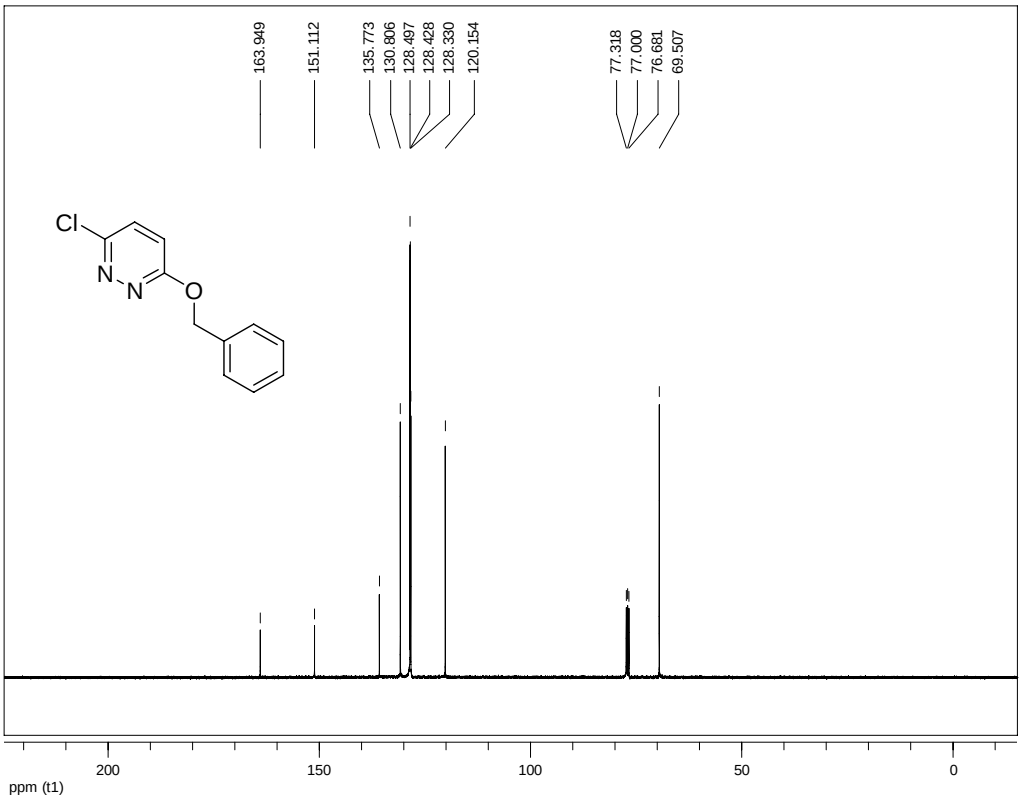
NMR spectra for **2ii**



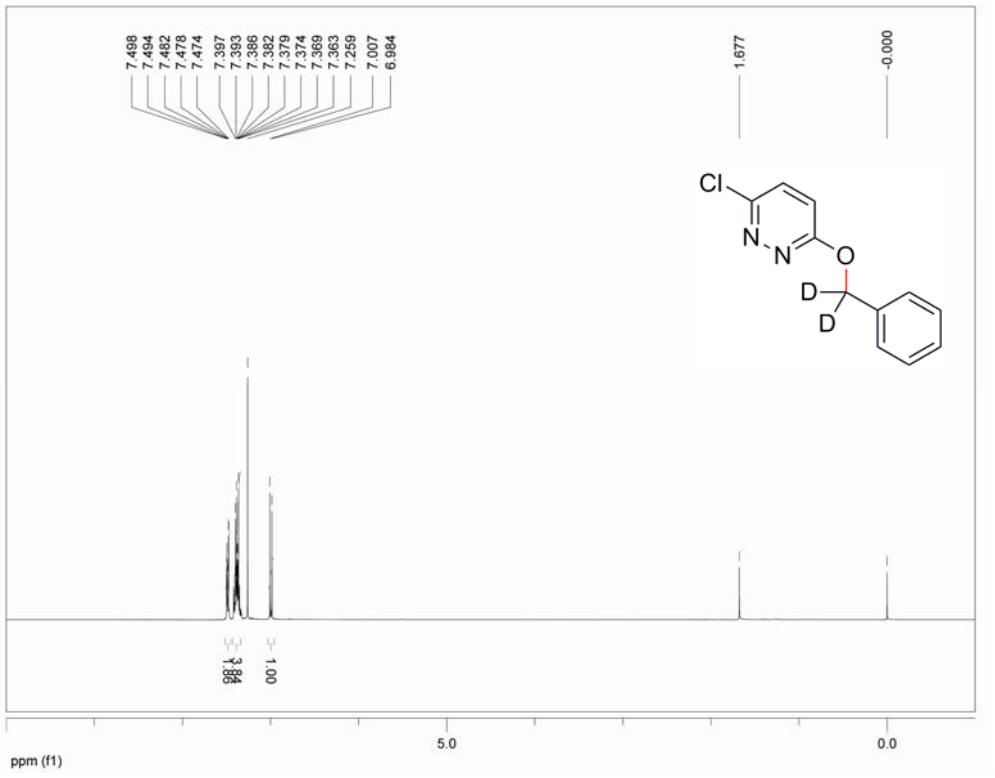


NMR spectra for **3a**





NMR spectra for **3a-d_2**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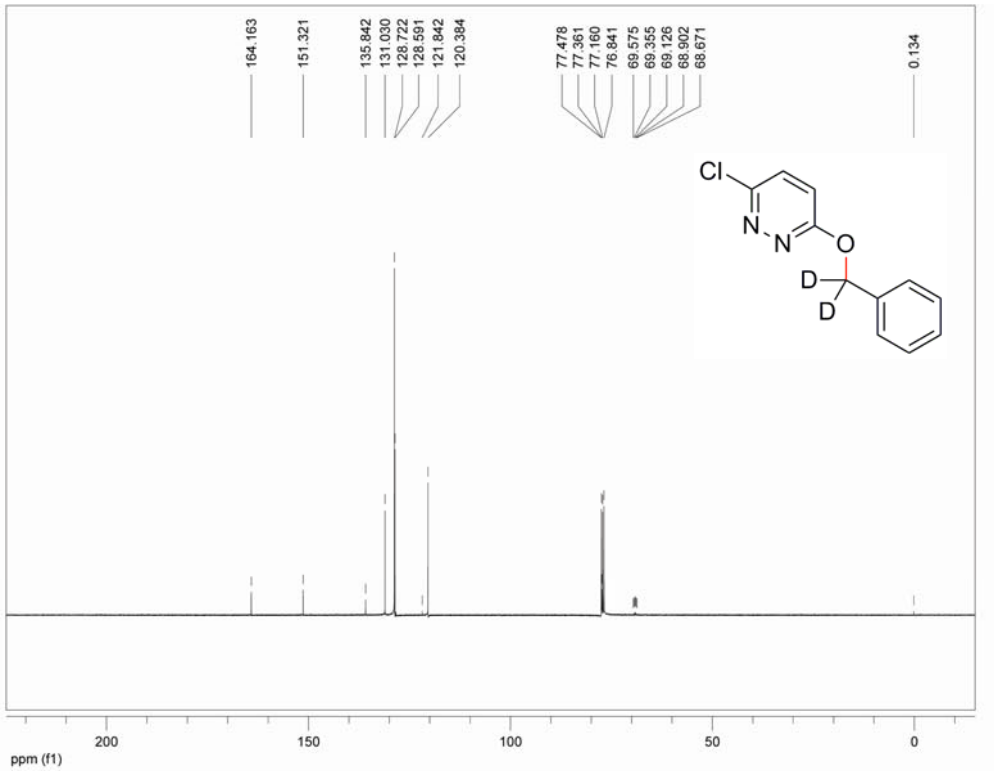
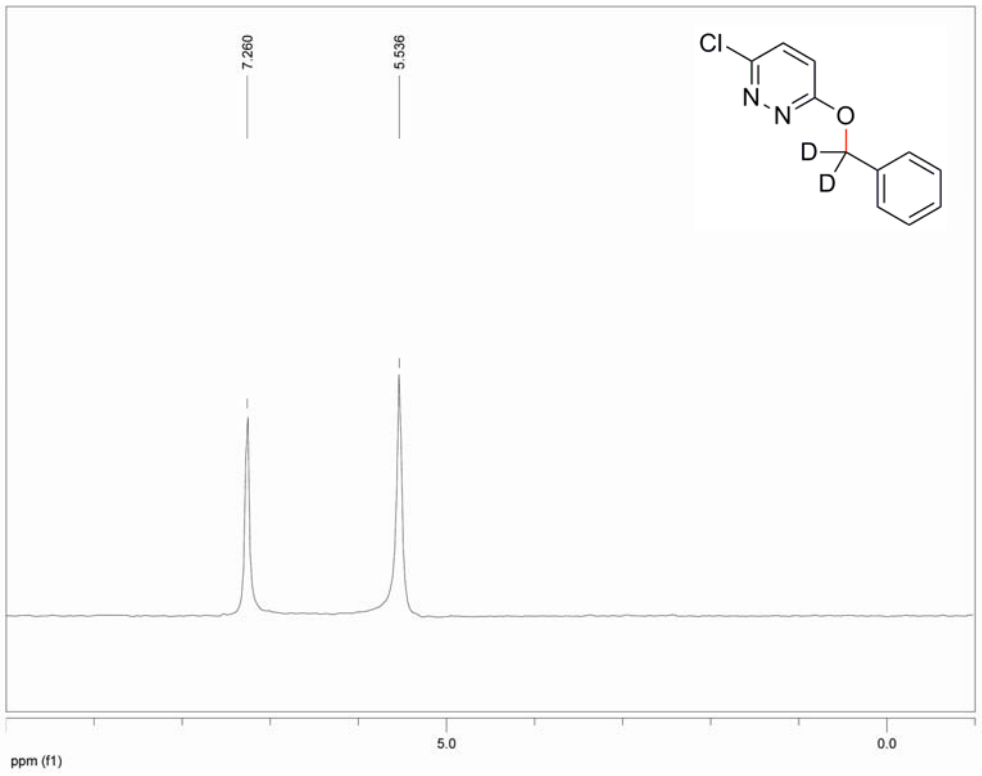
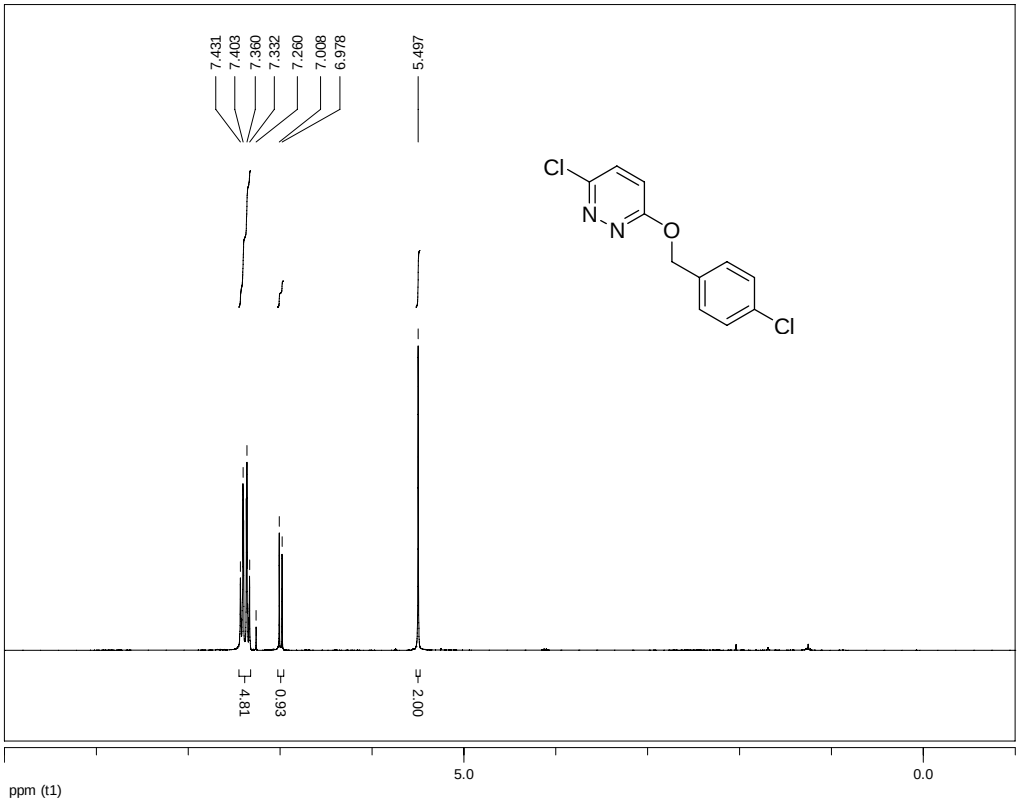
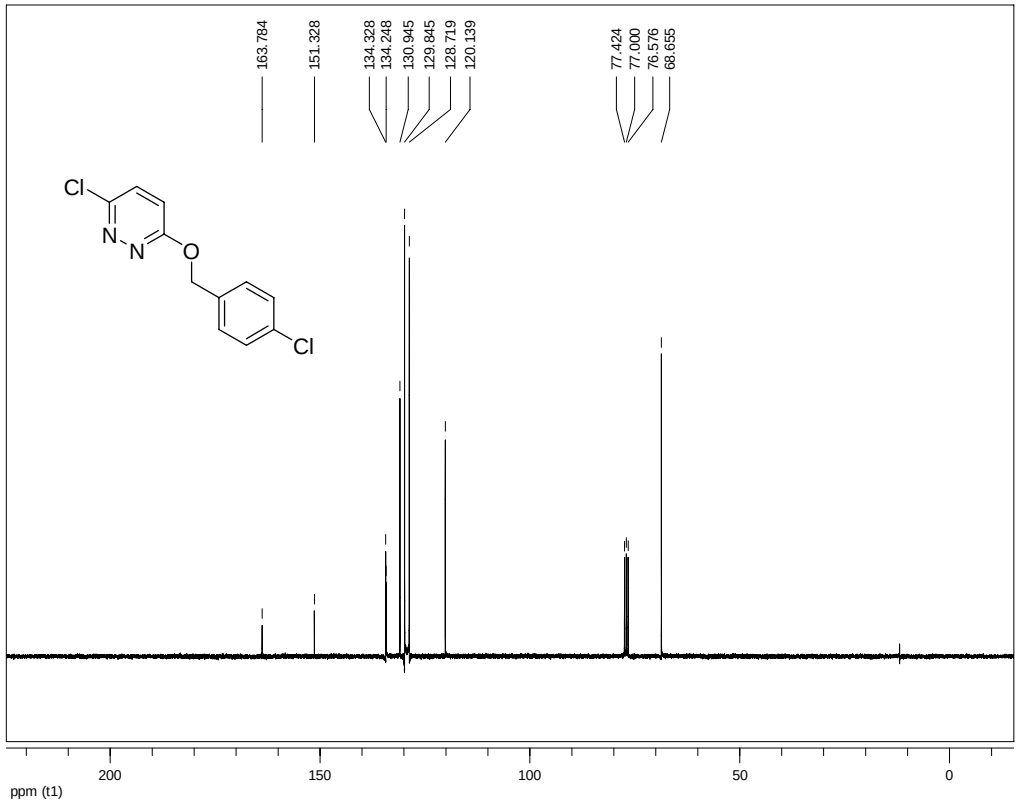
7.494
7.482
7.478
7.474
7.397
7.393
7.386
7.382
7.379
7.374
7.369
7.363
7.259
7.007
6.984
1.677
-0.000
Cl
N
N
O
D
D
3.88
1.00
5.0
0.0
ppm (f1)


164.163
151.321
135.842
131.030
128.722
128.591
121.842
120.384
77.478
77.361
77.160
76.841
69.575
69.355
69.126
68.902
68.671
0.134
Cl
N
N
O
D
D
200
150
100
50
0
ppm (f1)

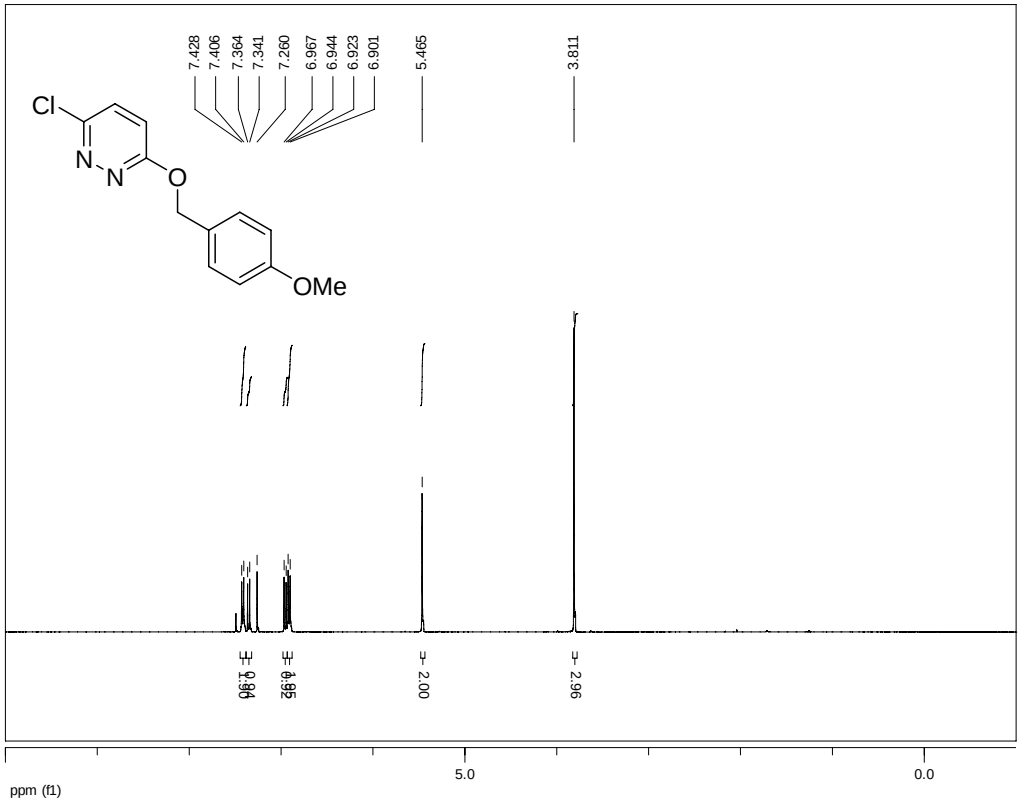


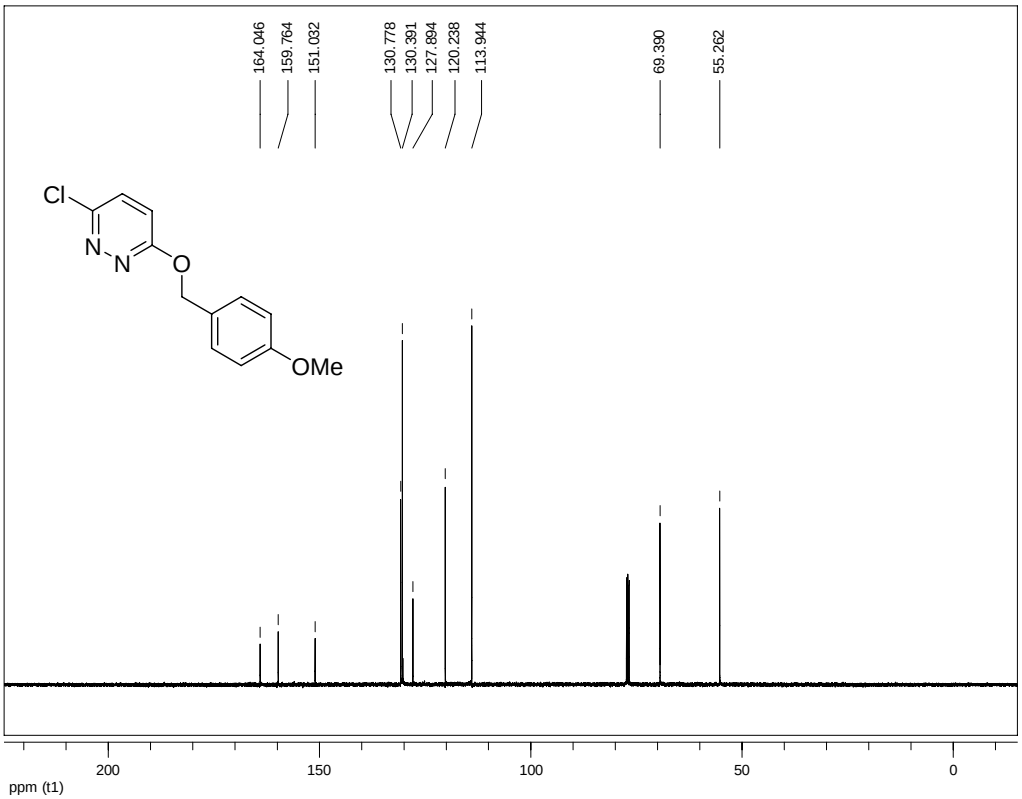
NMR spectra for **3b**



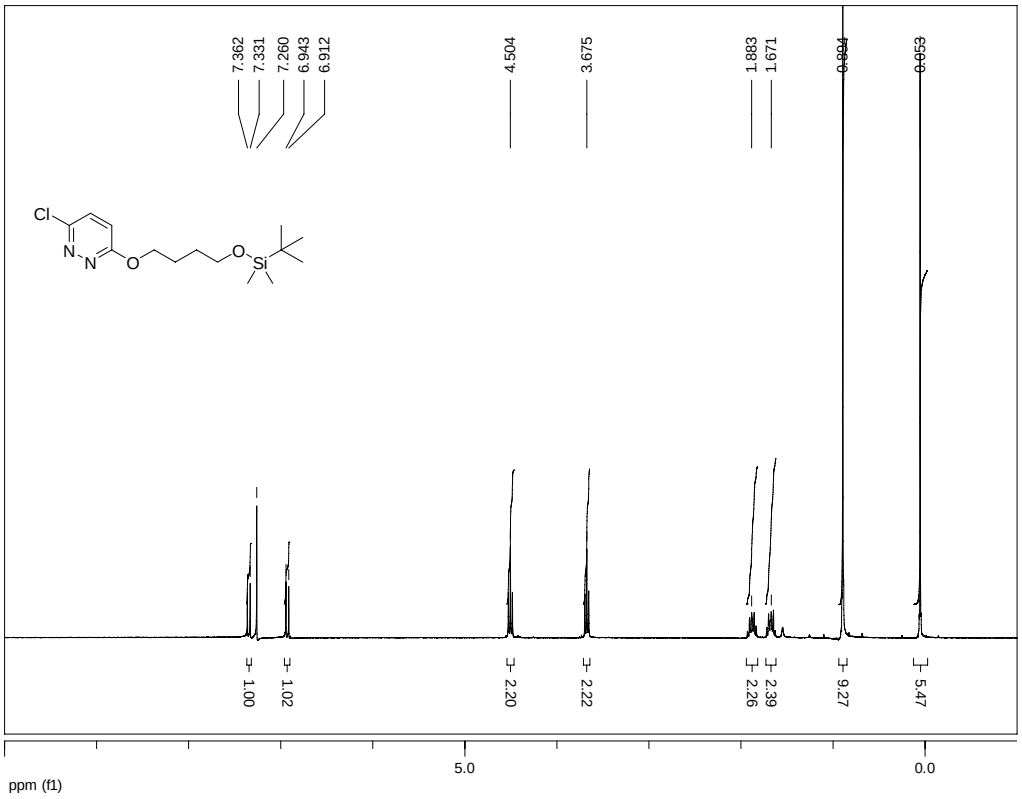


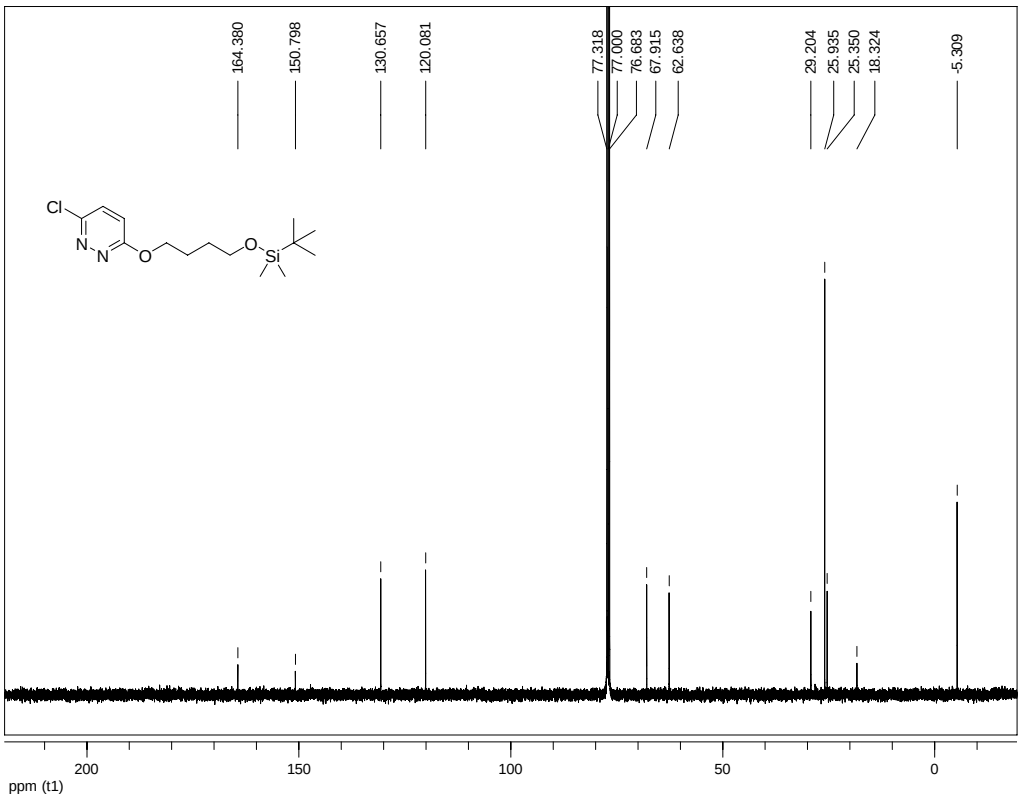
NMR spectra for **3c**



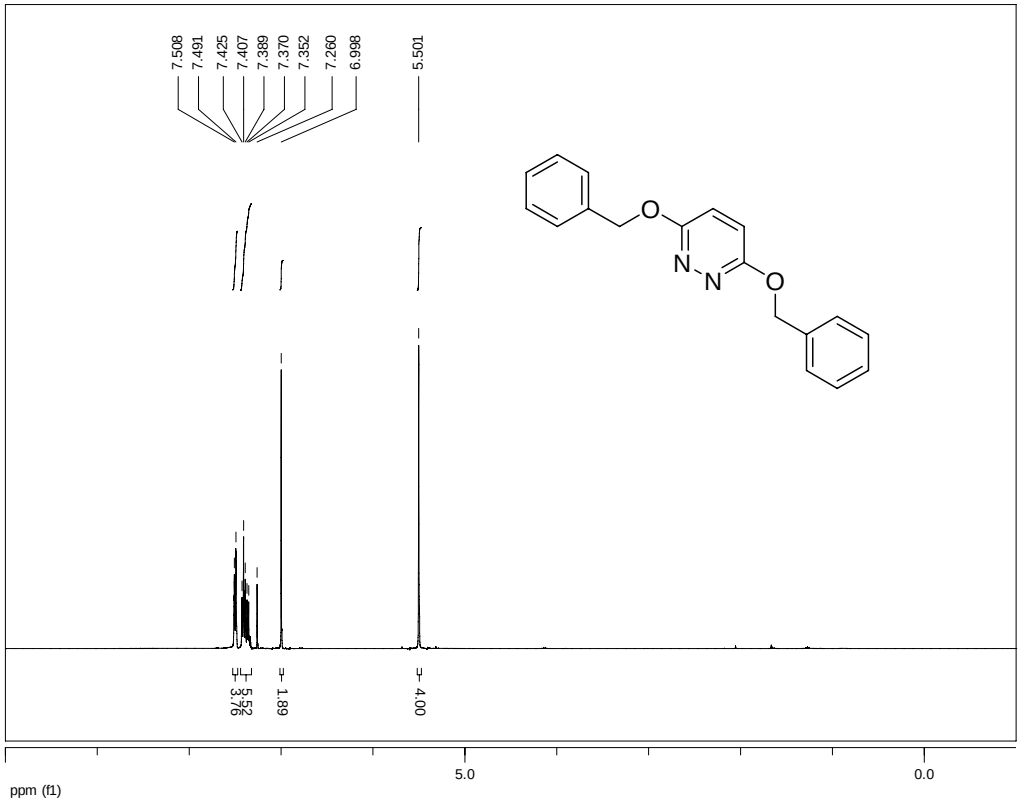


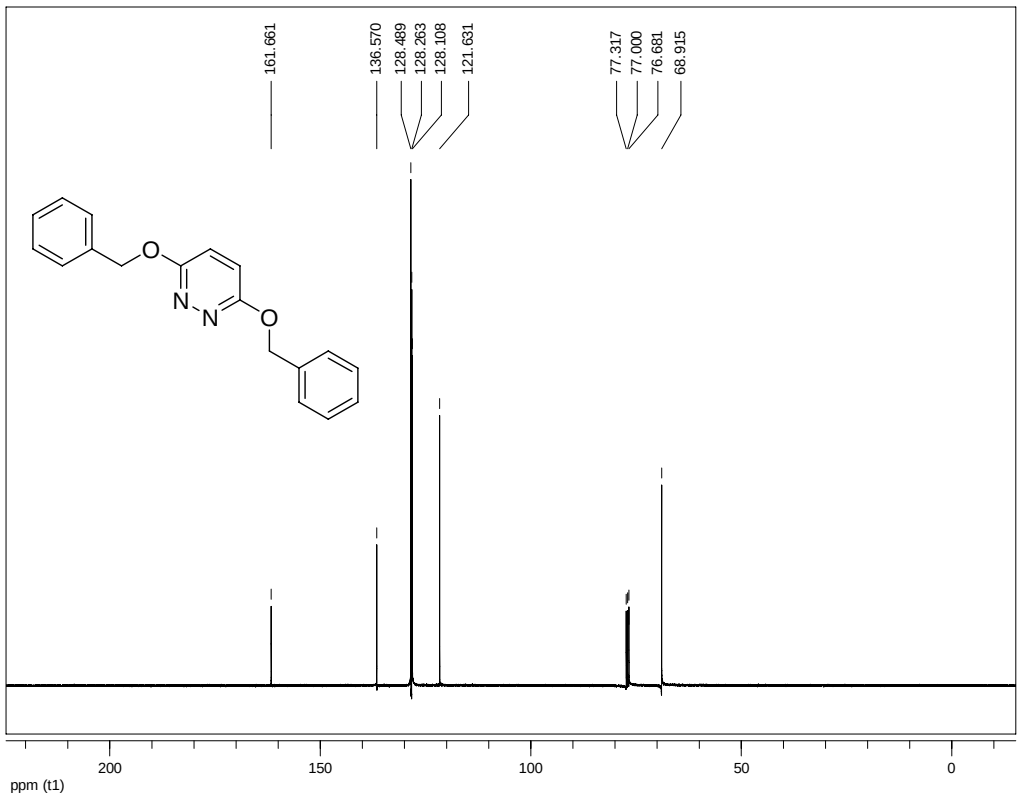
NMR spectra for **3d**



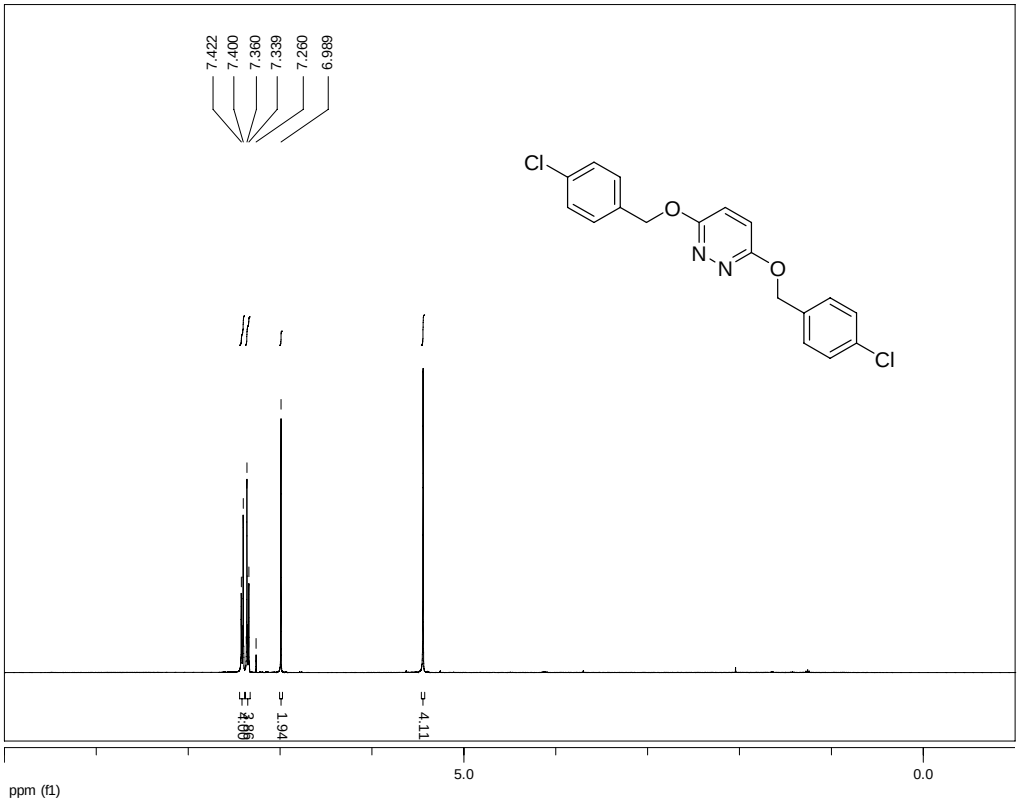


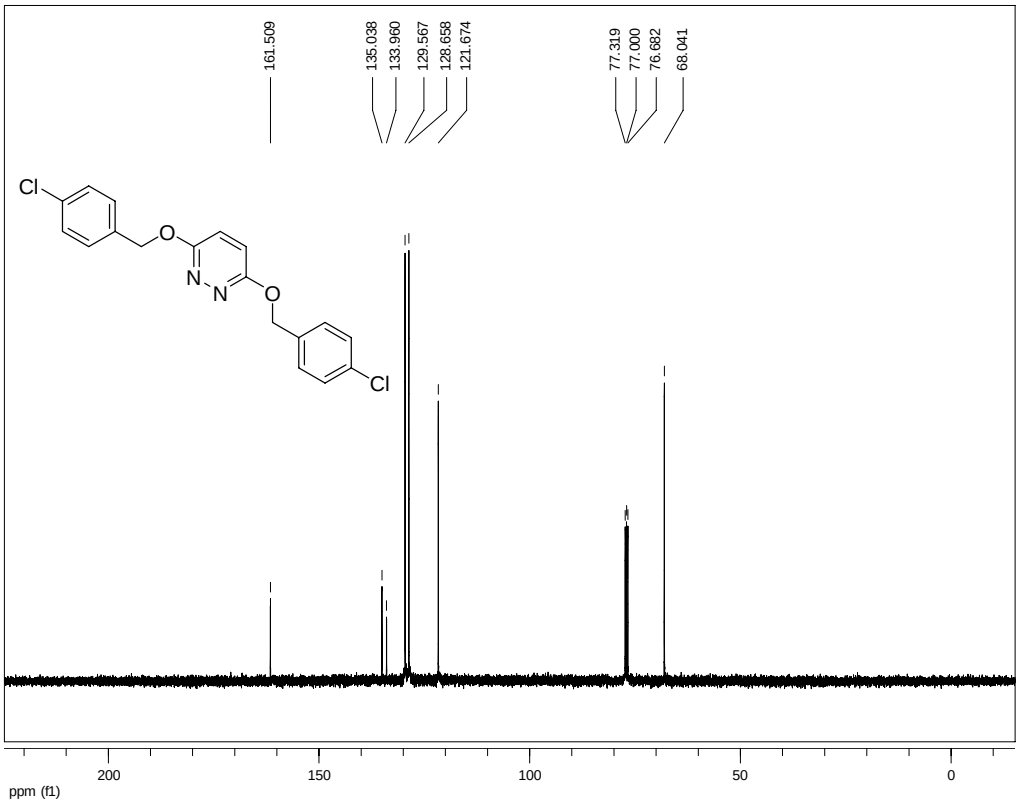
NMR spectra for **3e**



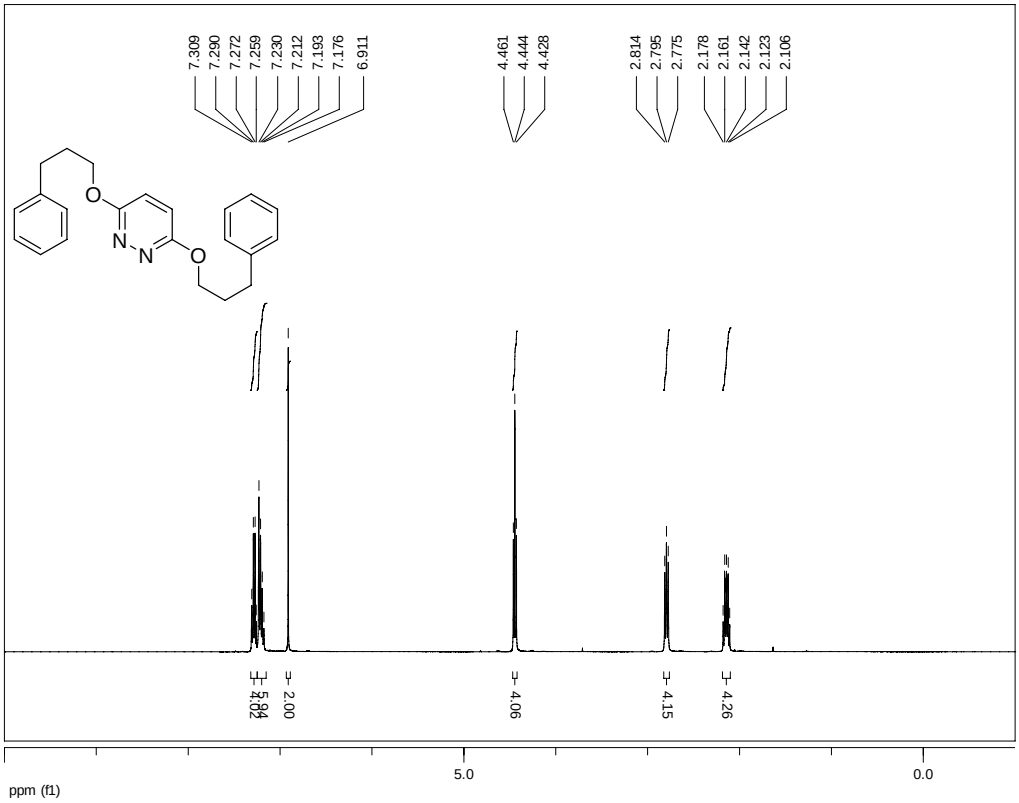


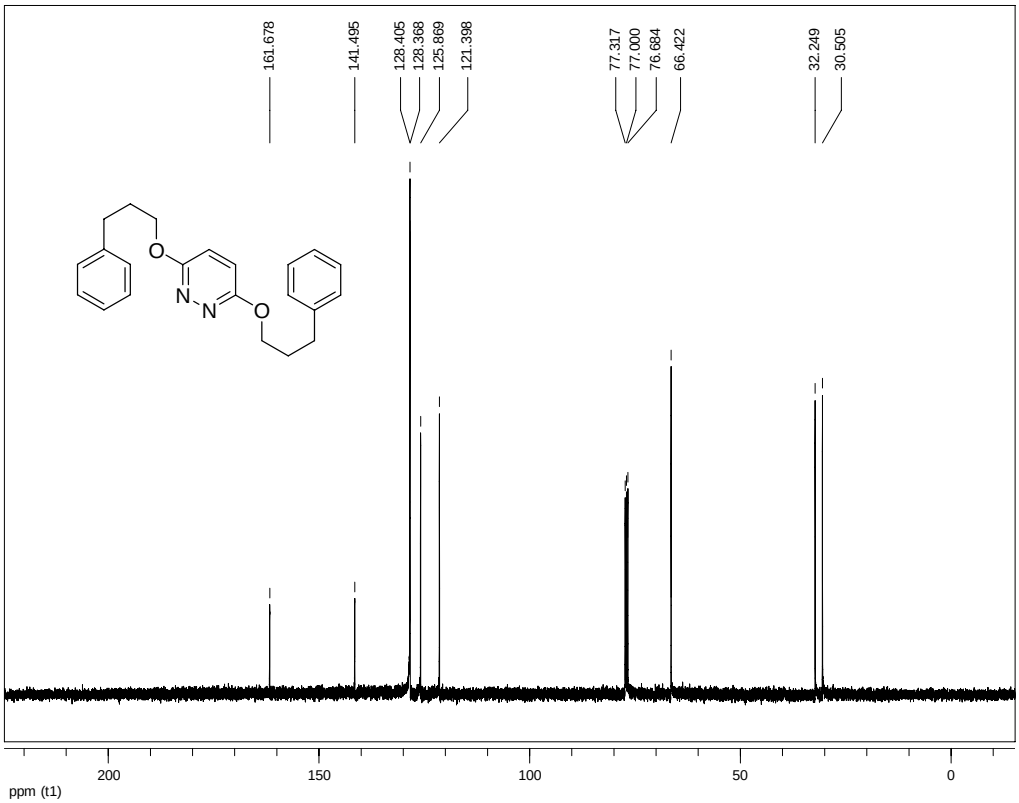
NMR spectra for **3f**



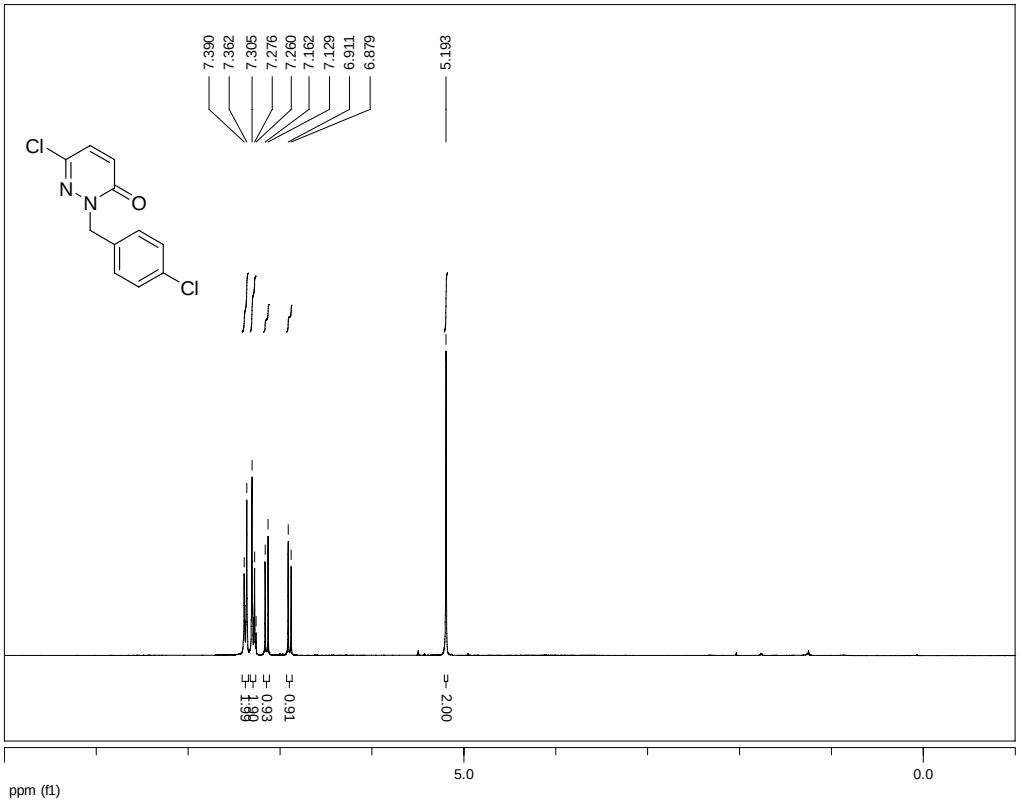


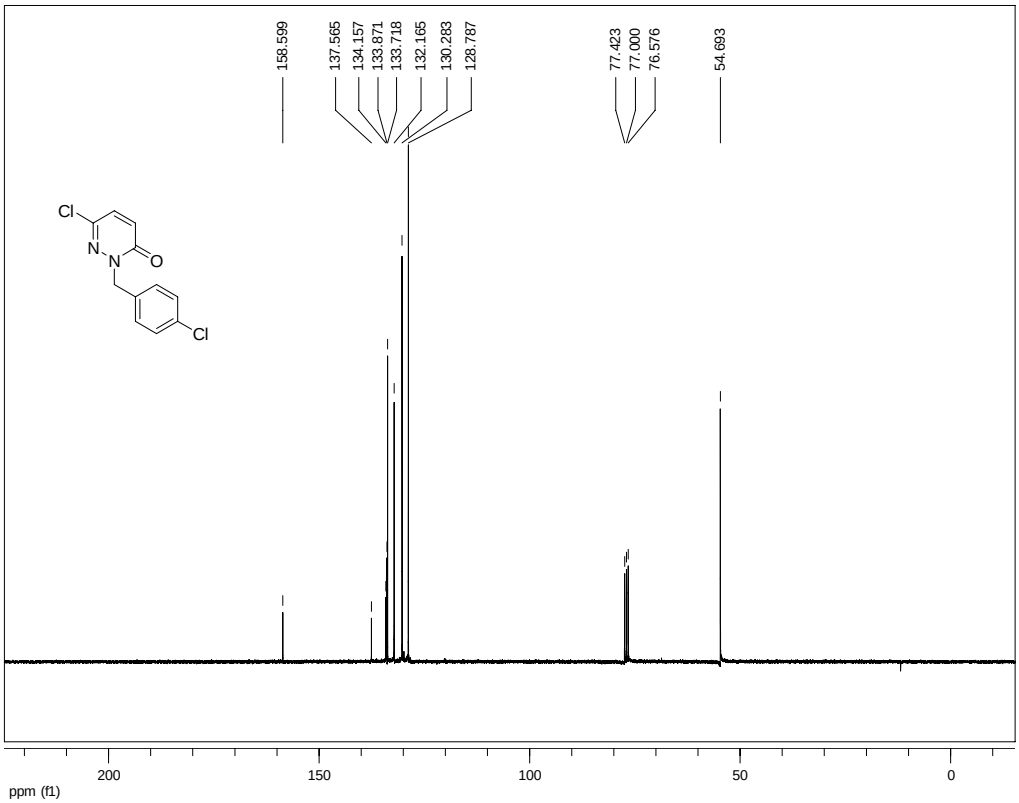
NMR spectra for **3g**



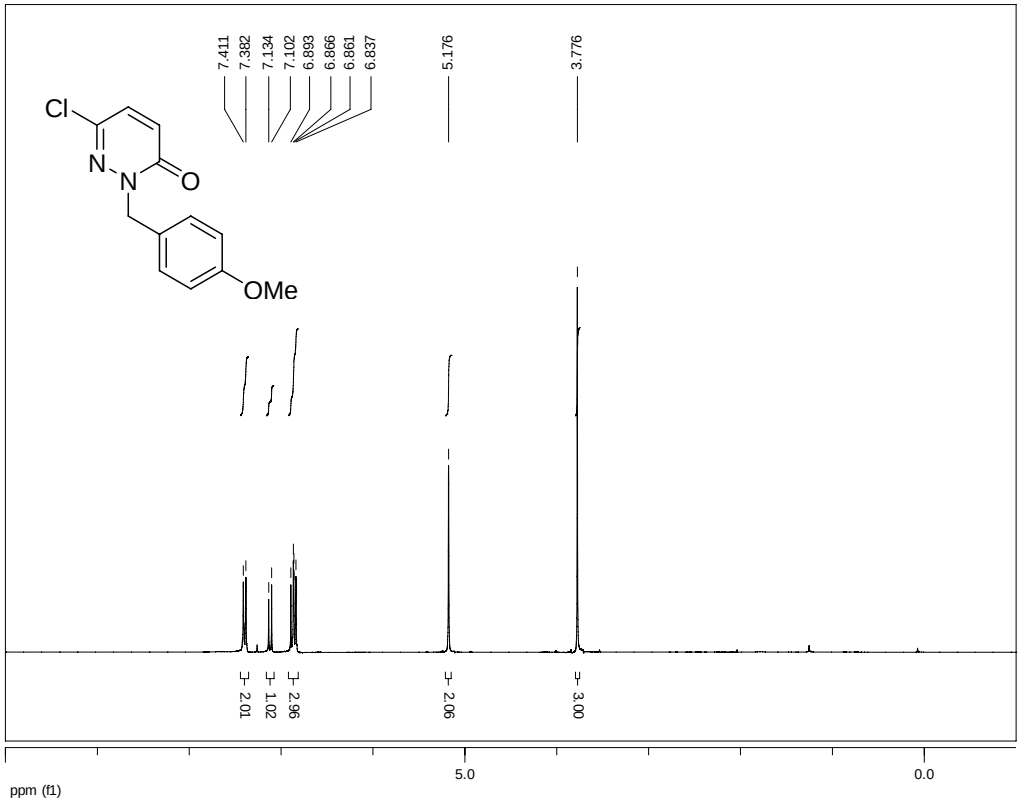


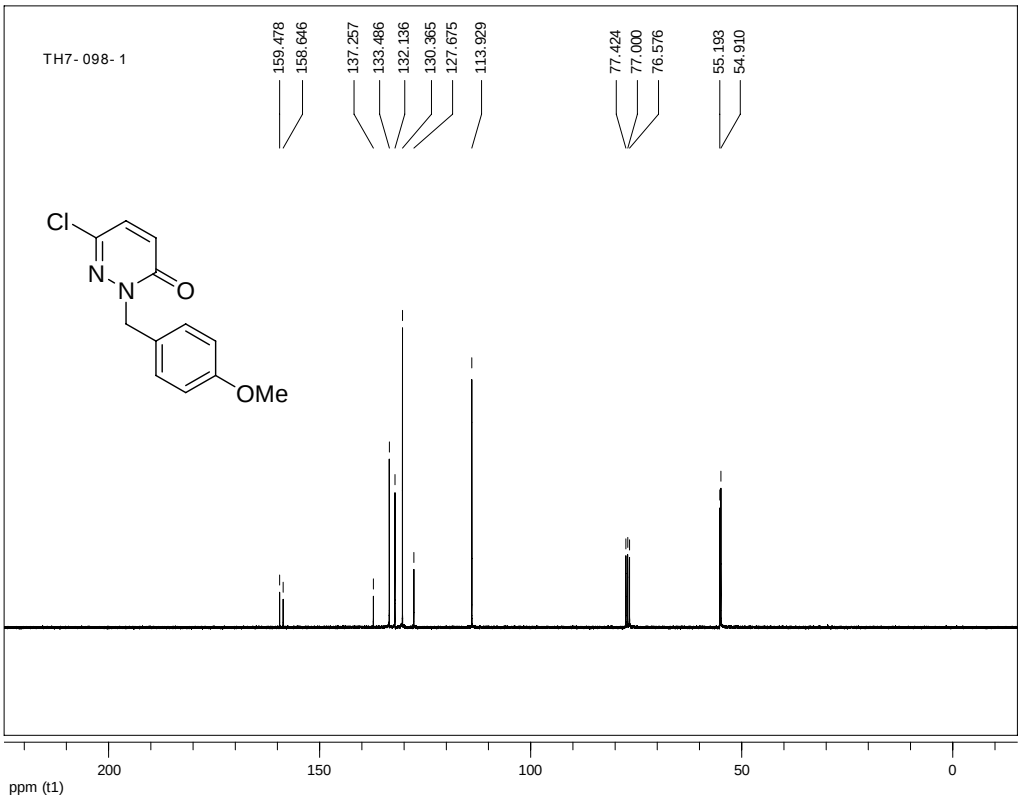
NMR spectra for **4b**



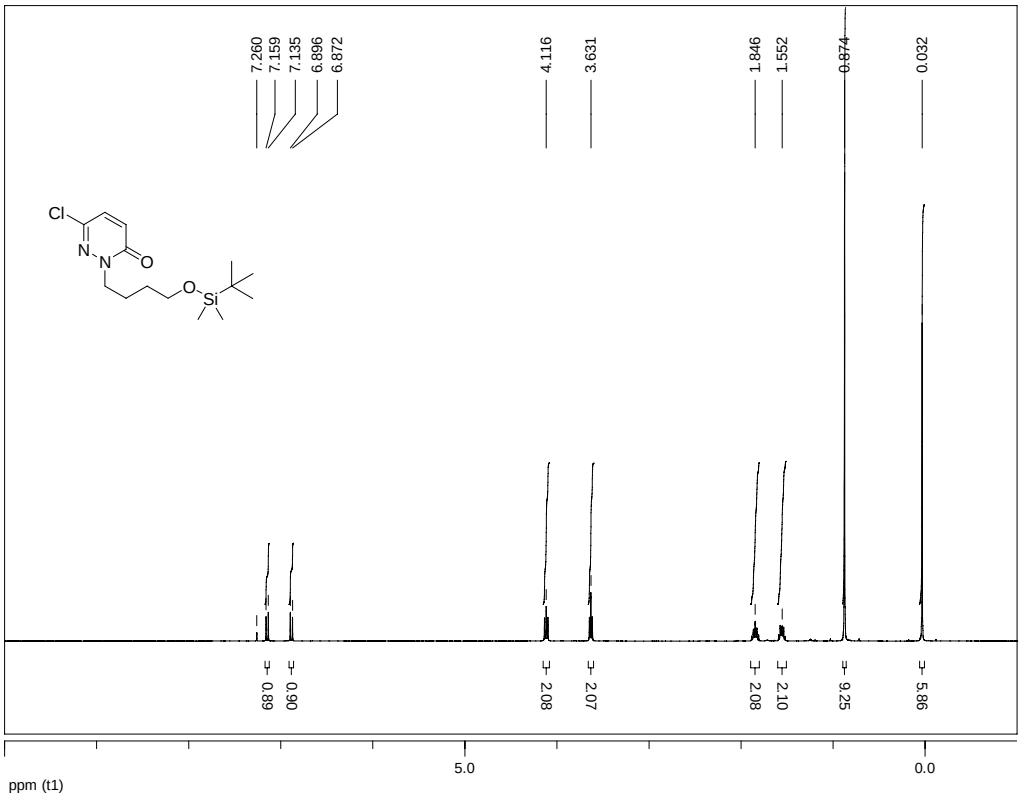


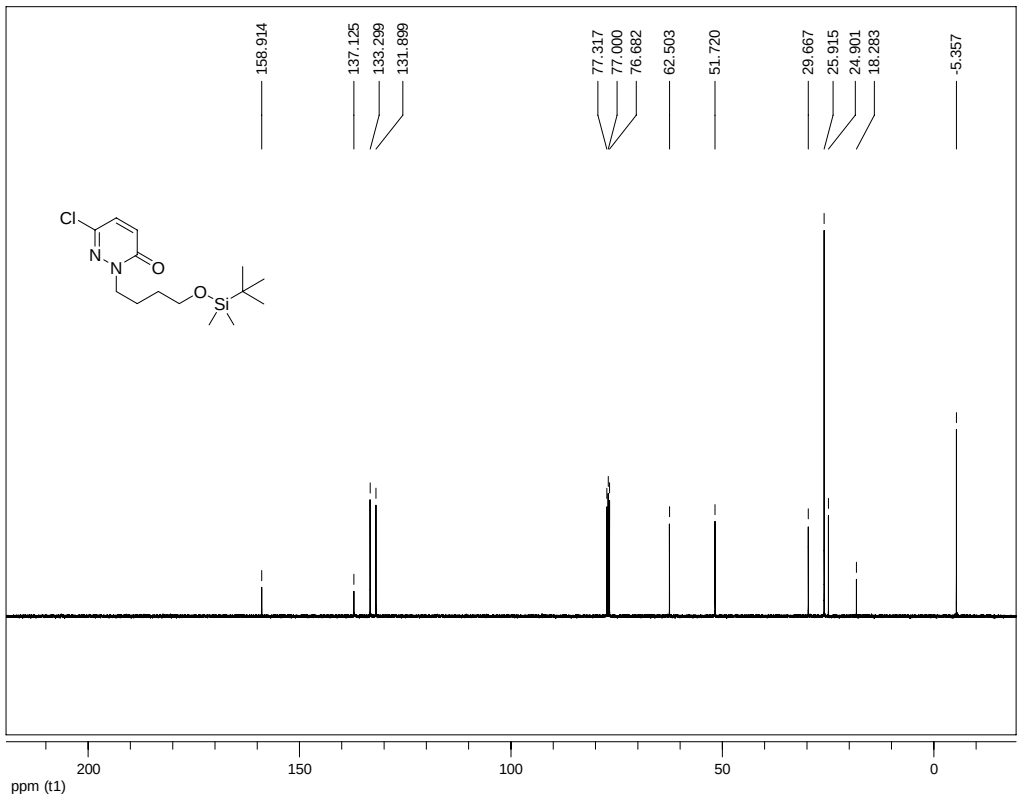
NMR spectra for **4c**



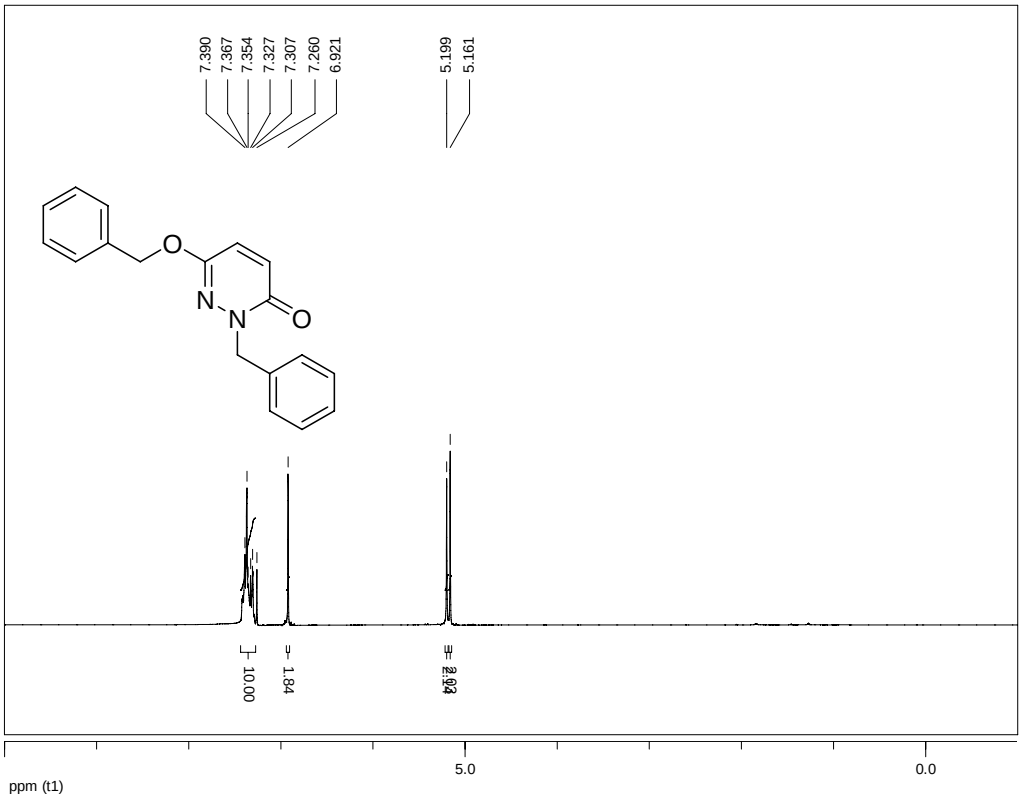


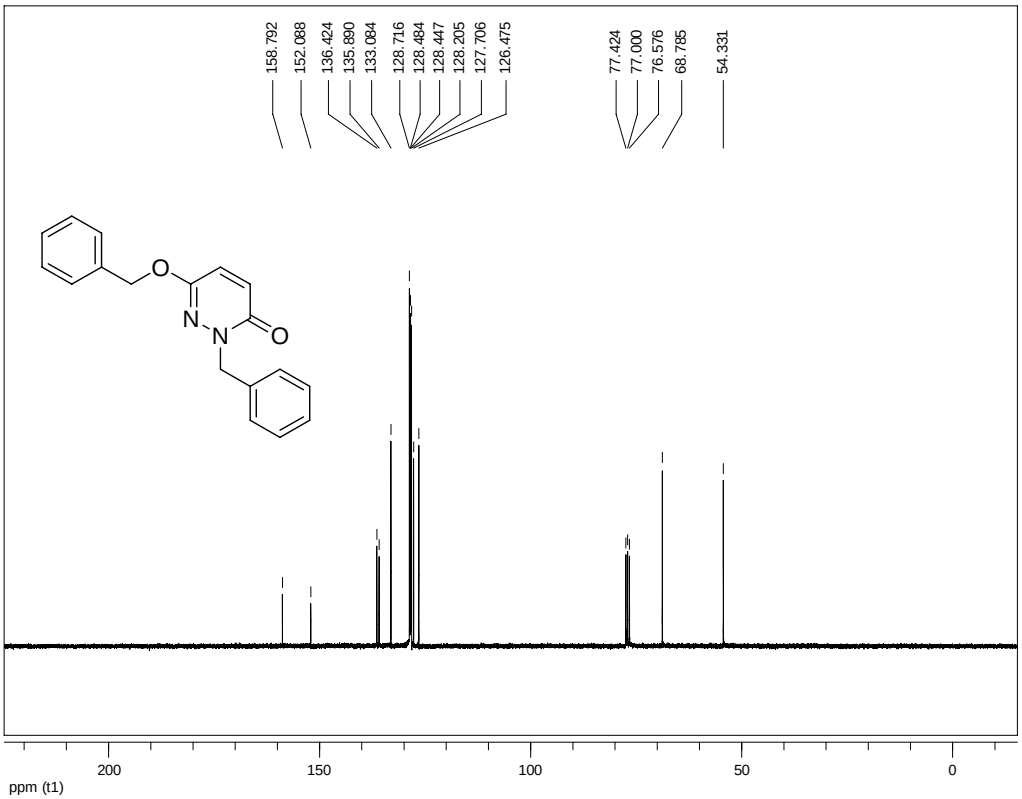
NMR spectra for **4d**



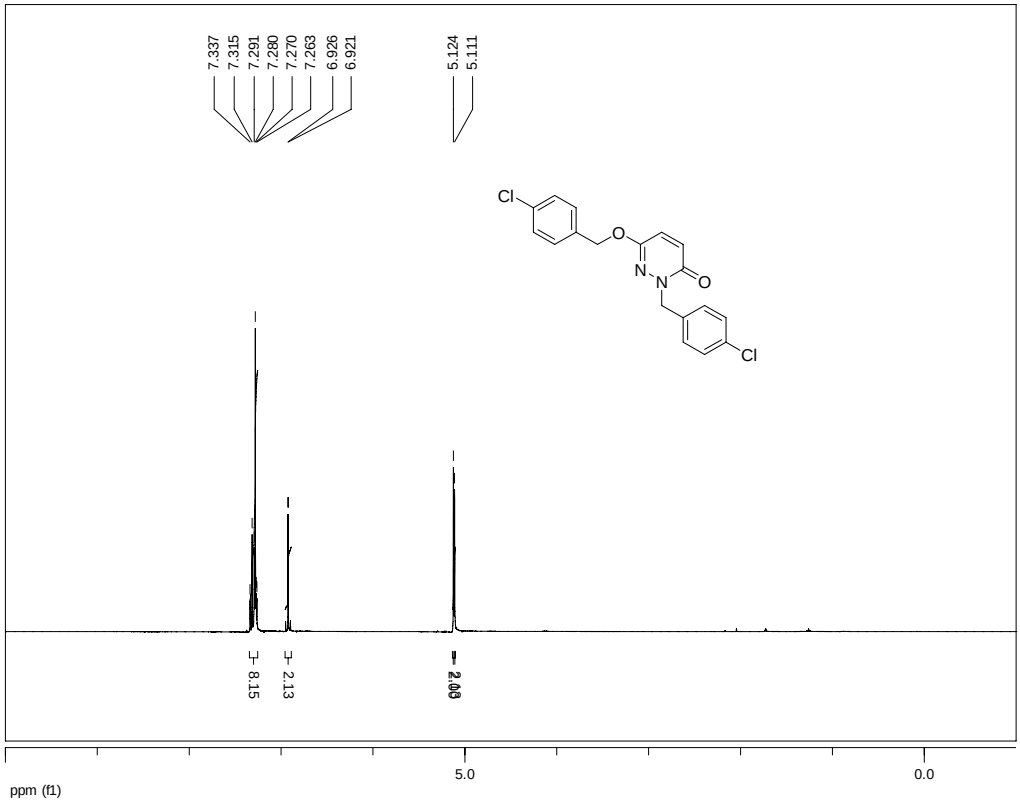


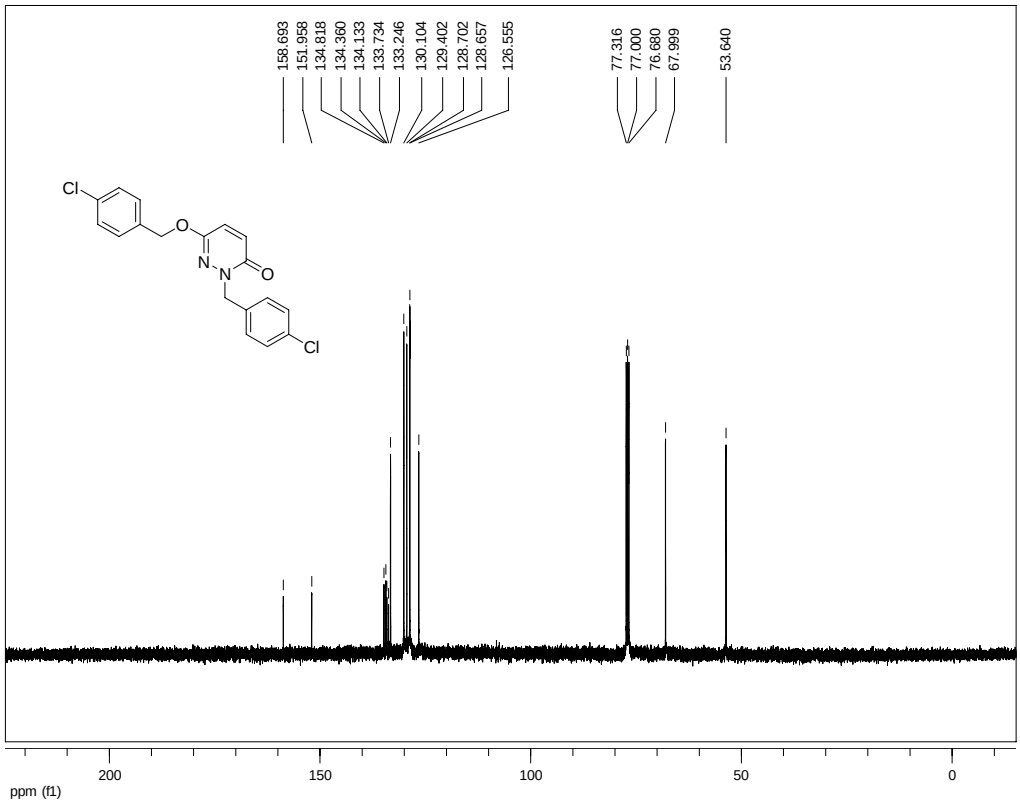
NMR spectra for **4e**



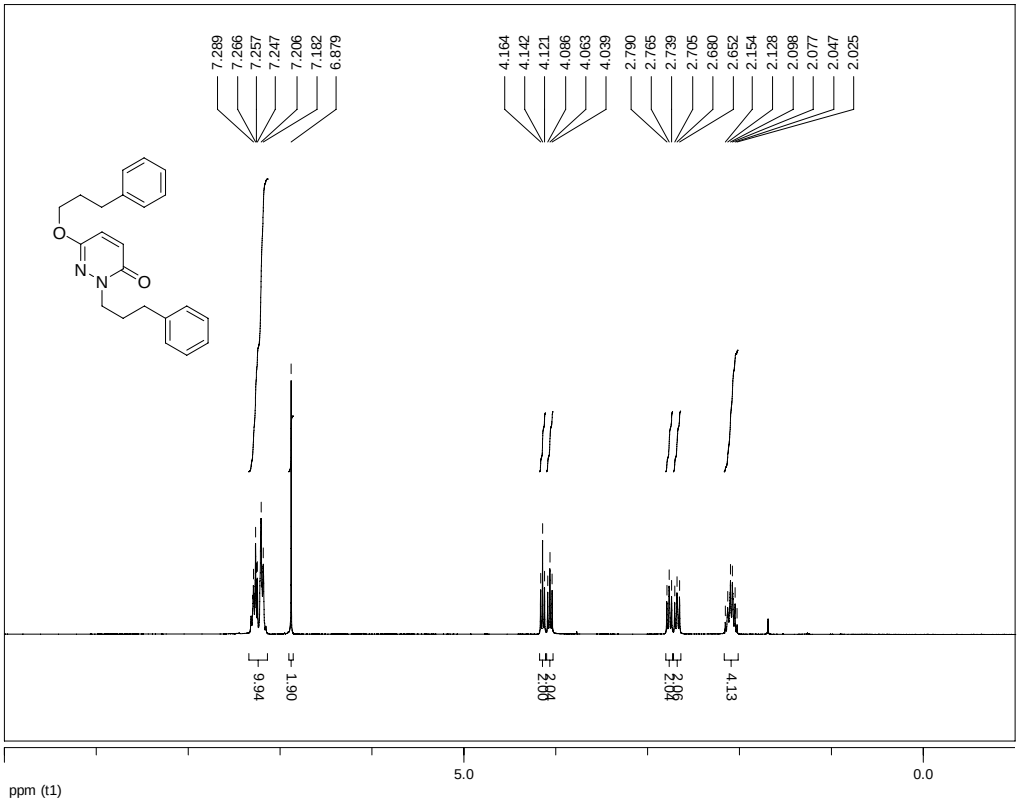


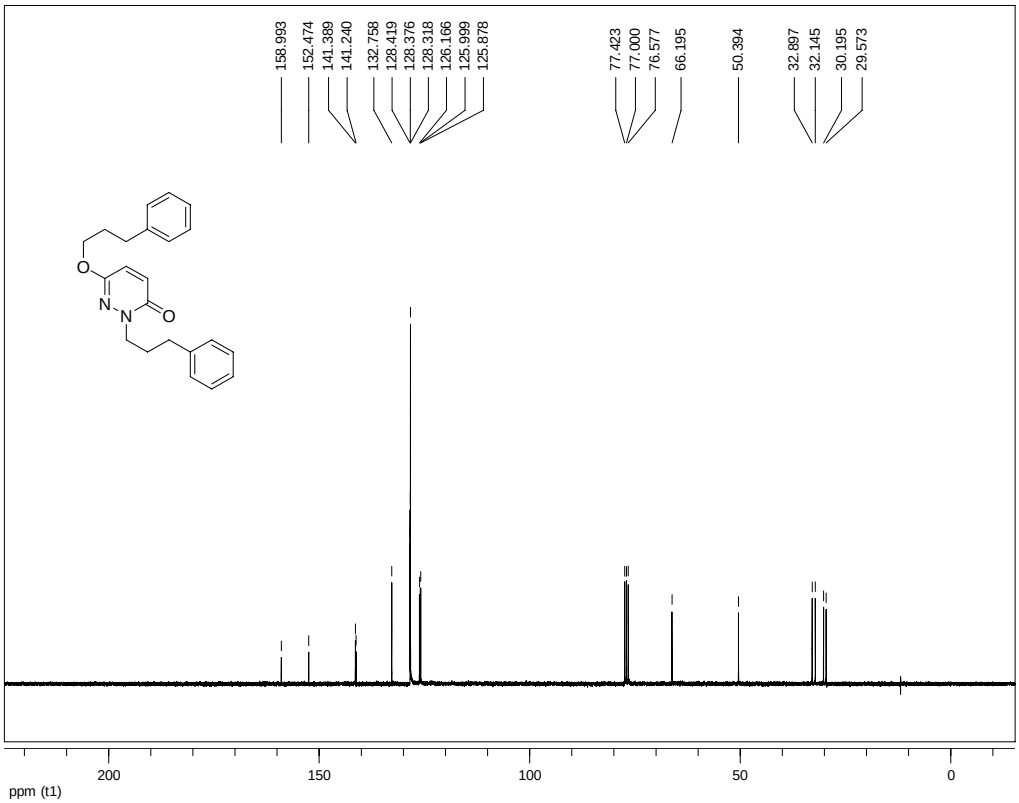
NMR spectra for **4f**



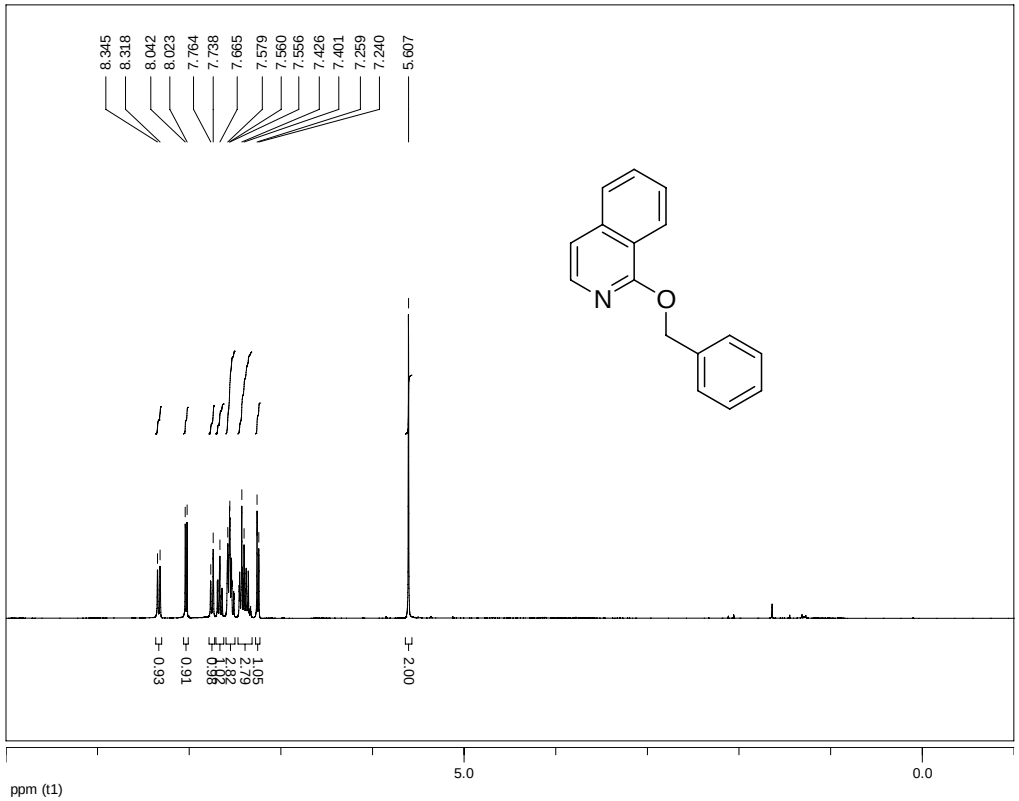


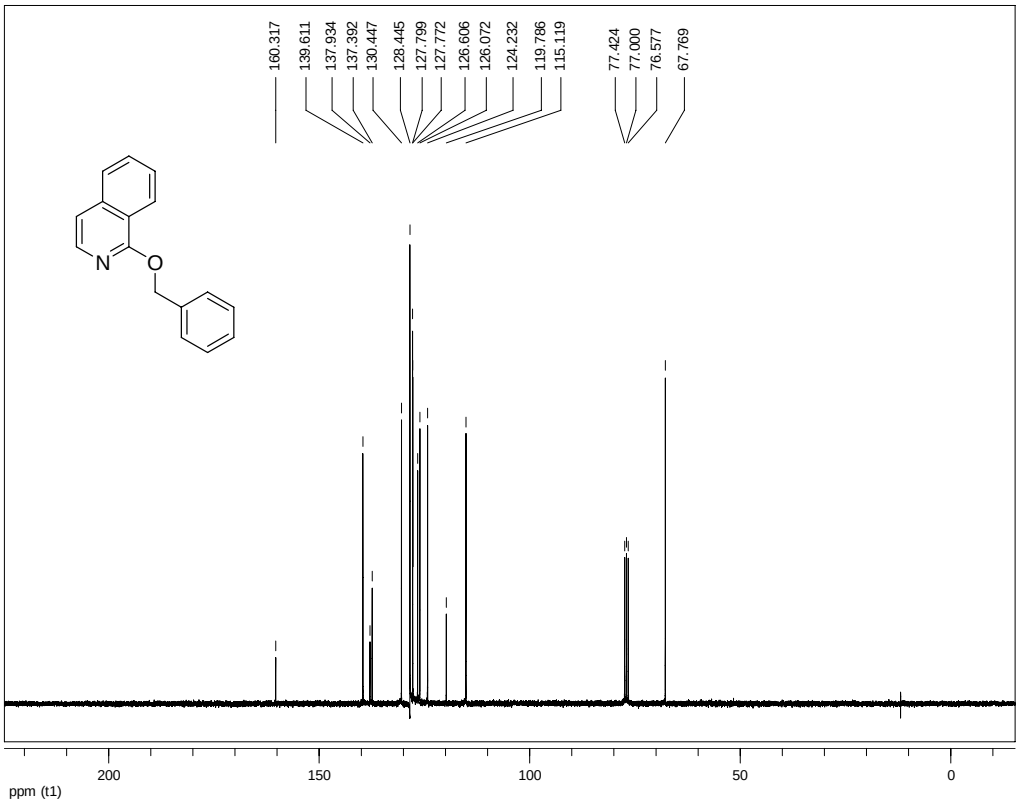
NMR spectra for **4g**



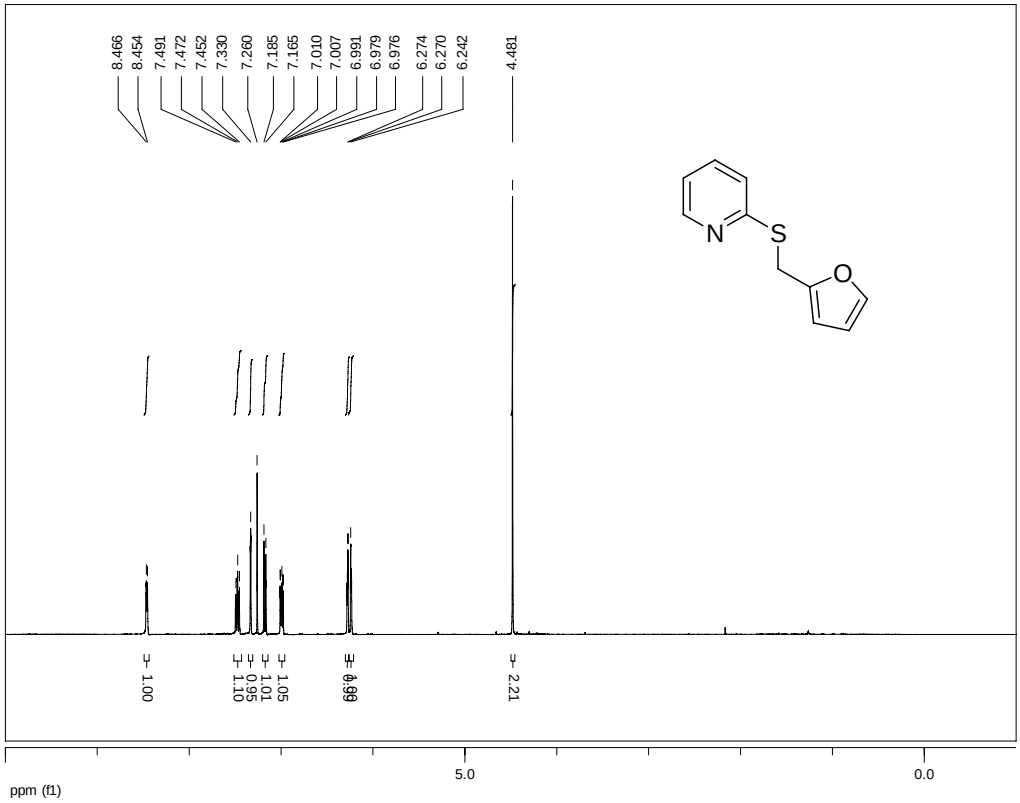


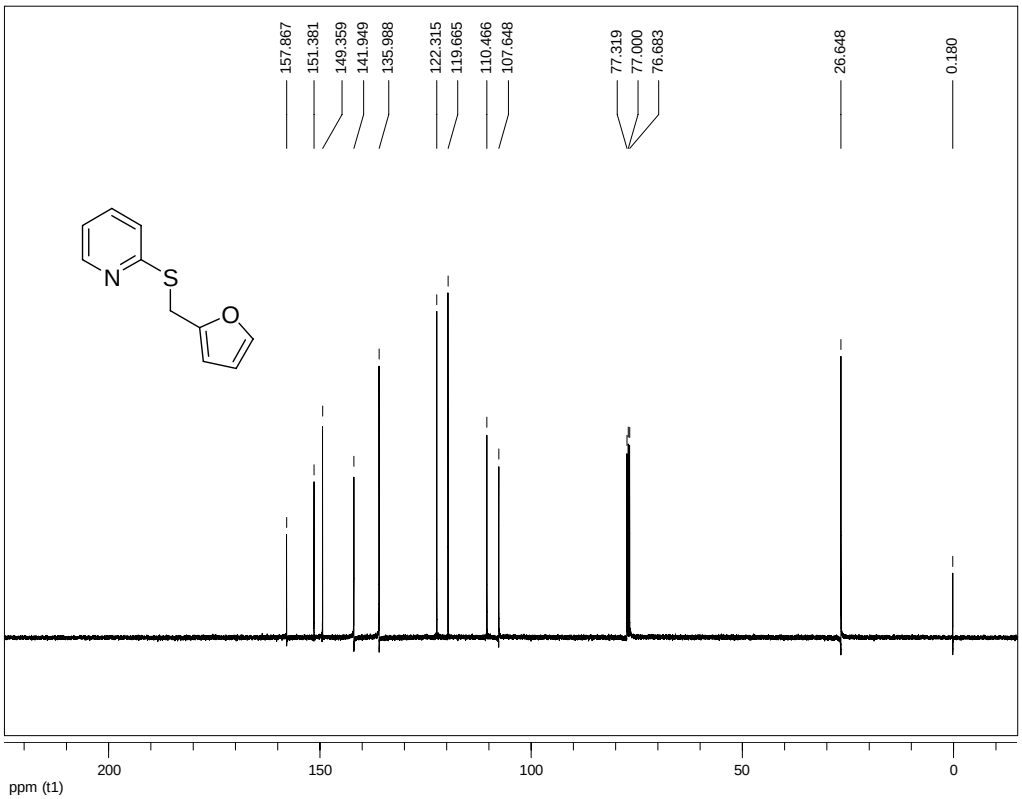
NMR spectra for **5a**



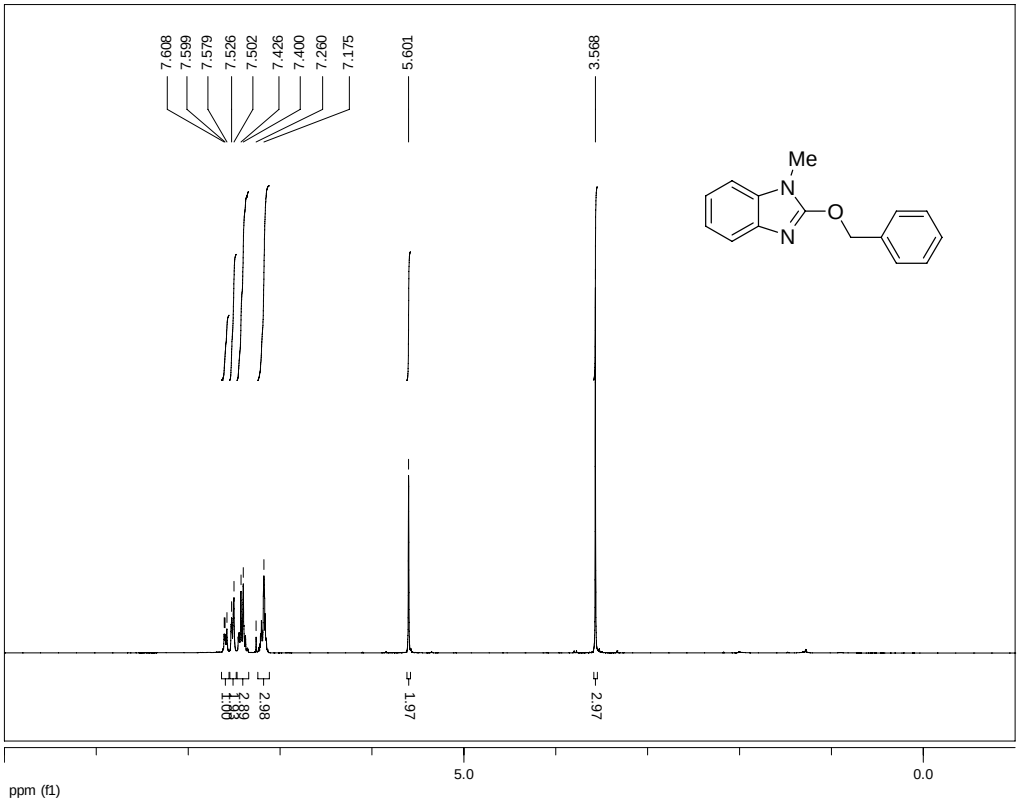


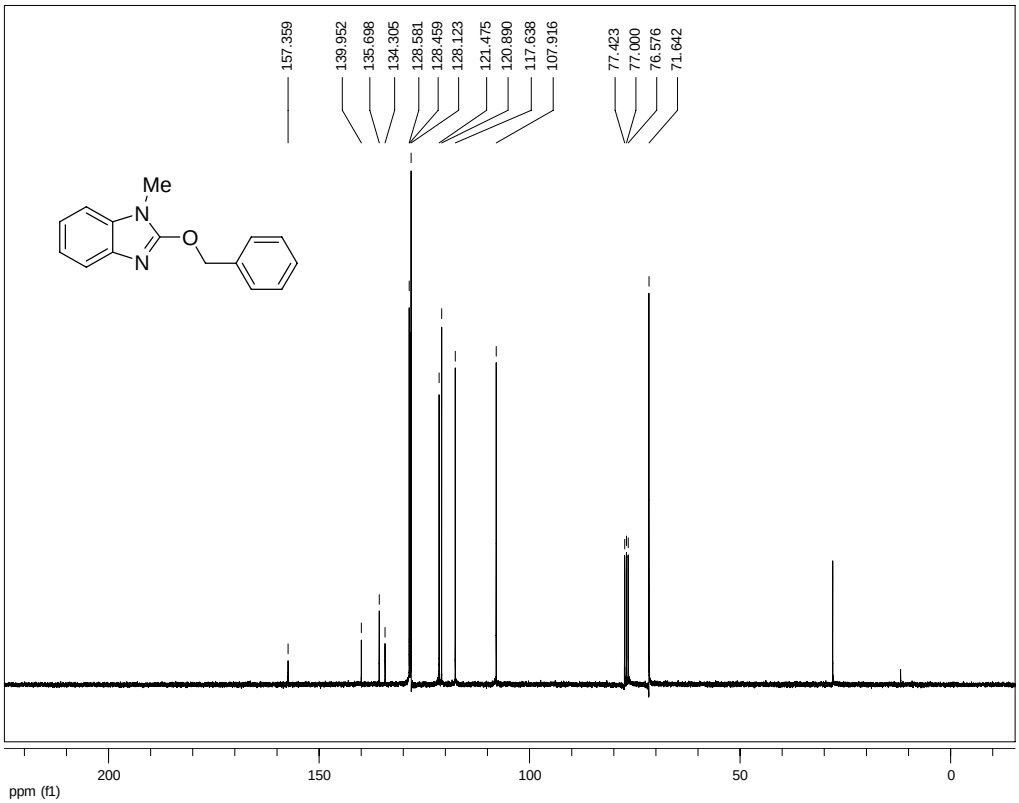
NMR spectra for **5e**



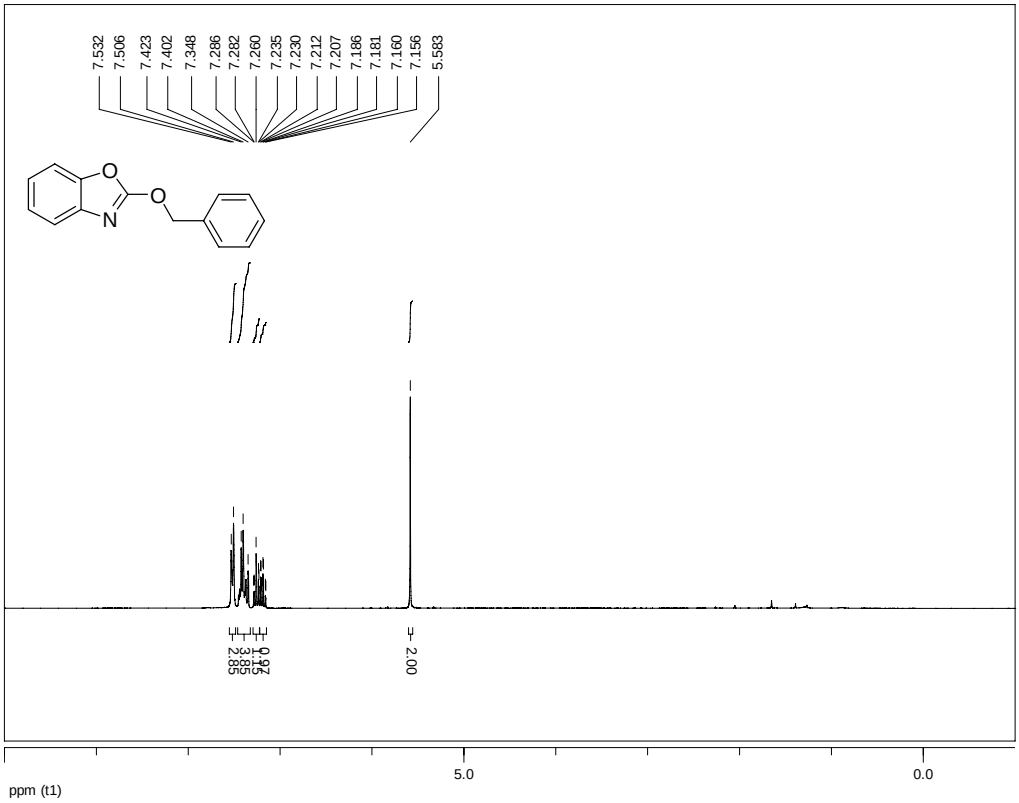


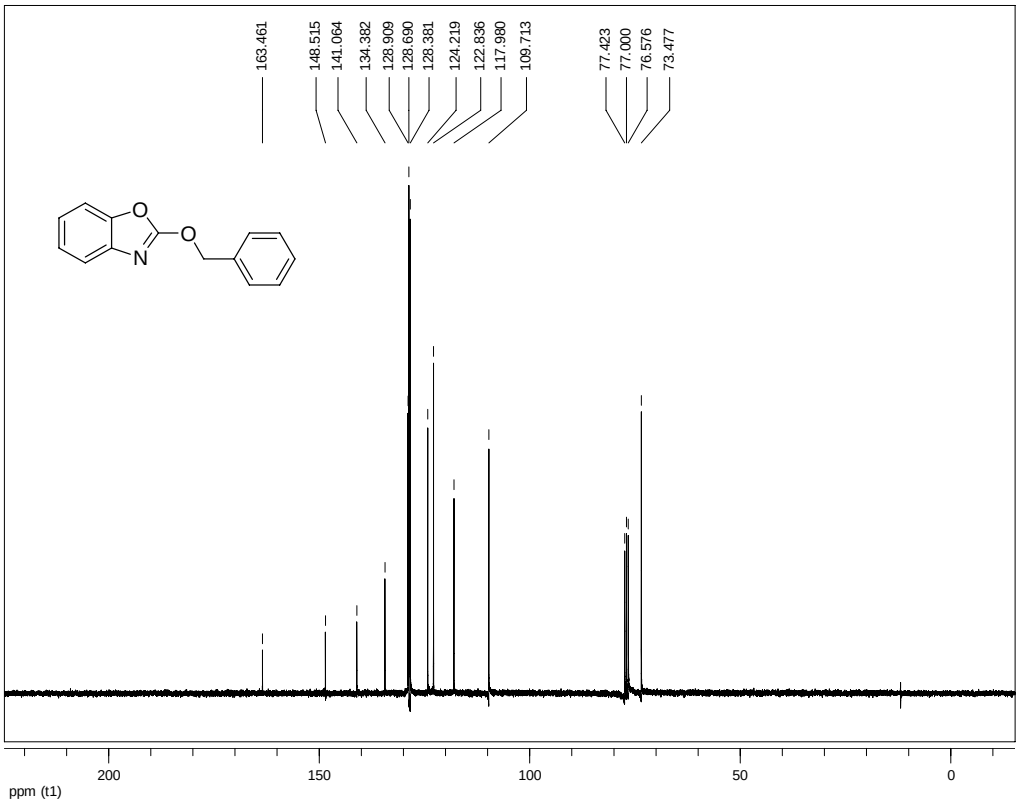
NMR spectra for **5f**



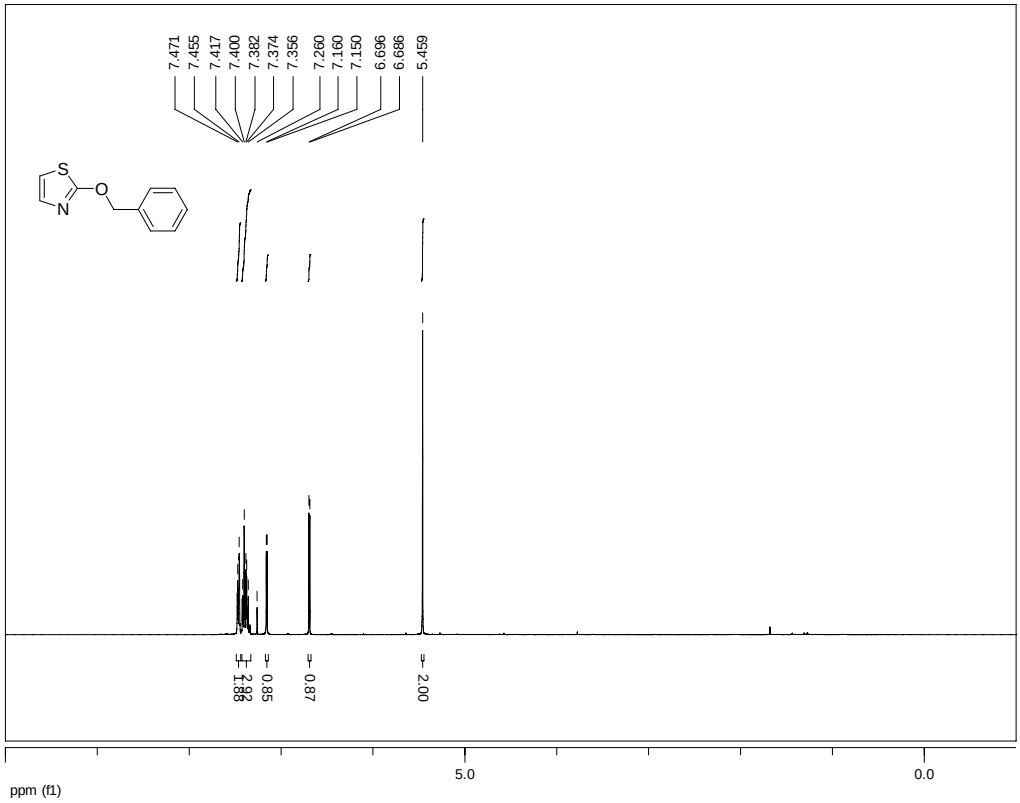


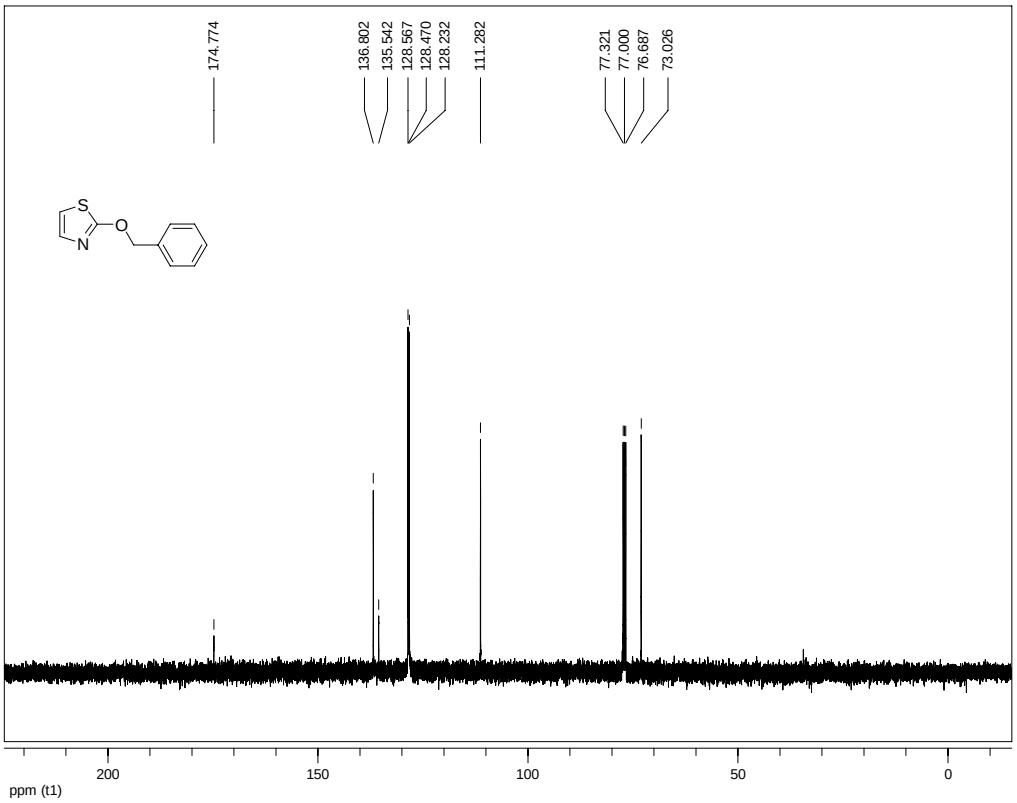
NMR spectra for **5g**



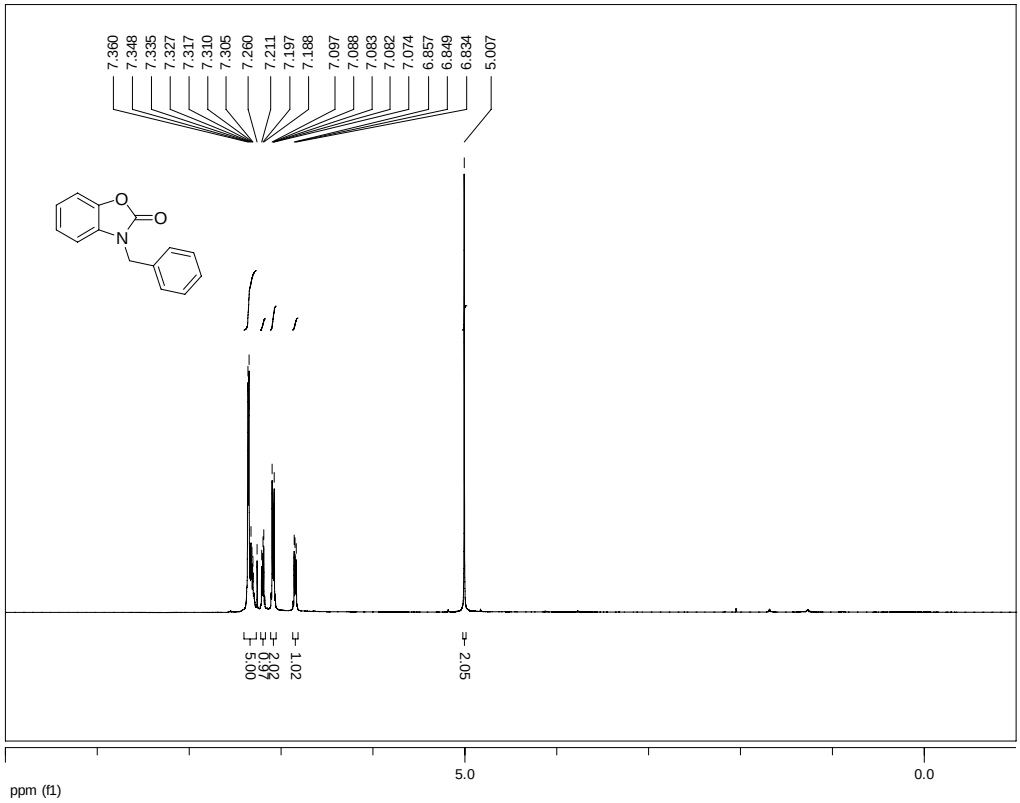


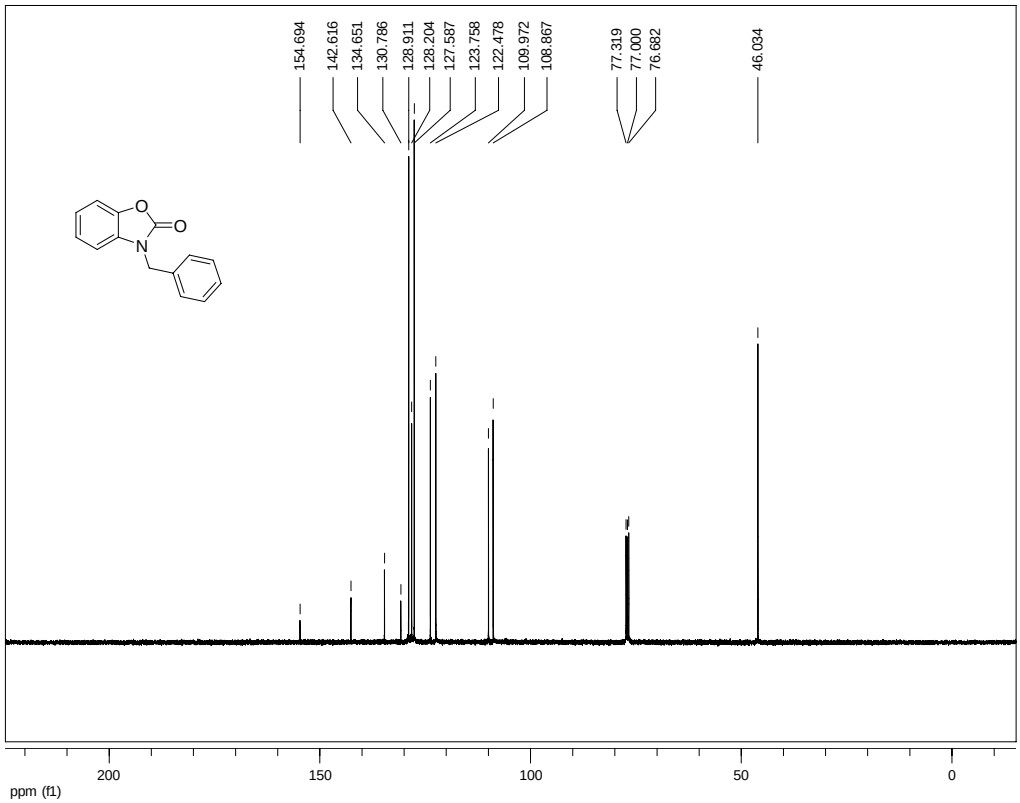
NMR spectra for **5h**





NMR spectra for **6g**





NMR spectra for **6h**