Electronic Supplementary Information

Iridium-Catalysed Hydrosilylation of Cyclopropanes via Regioselective Carbon–Carbon Bond Cleavage

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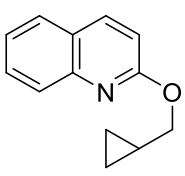
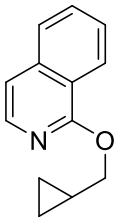
1. General Methods. All reactions were carried out in dry solvent under an argon atmosphere. 1,4-Dioxane was purchased from Wako Pure Chemical Industries, and degassed with an argon gas for 20 min before use. $[IrCl(cod)]_2$ and Et_3SiH were purchased from Tokyo Chemical Industry. Et_3SiD (97%-*d*) was purchased from Sigma-Aldrich. Unless otherwise noted, other chemicals obtained from commercial suppliers were used without further purification. 2-(Cyclopropylmethoxy)pyridine **1a**,[1] 2-(1-cyclopropylethyl)pyridine **1f**,[2] 2-cyclopropylquinoline **1j**,[3] 2-[1-(naphthalen-2-yl)ethoxy)]pyridine **1l**,[4] and (phenoxymethyl)cyclopropane **3**[5] were prepared according to the reported methods. Column chromatography was performed with silica gel 60N (neutral, 40-50 μm) purchased from Kanto Chemical. ^1H (400 MHz) and ^{13}C (100 MHz) NMR spectra were recorded on a JEOL ECS-400 spectrometer. Proton chemical shifts are reported in ppm based on the solvent resonance resulting from incomplete deuteration ($CDCl_3$ at 7.26 ppm) as the internal standard. ^{13}C NMR was recorded with complete proton decoupling and the chemical shifts are reported relative to $CDCl_3$ at 77.00 ppm. The following abbreviations are used; s: singlet, d: doublet, t: triplet, q: quartet, quint: quintet, sept: septet, m: multiplet. IR spectra were recorded on a SHIMADZU IRAFFINITY-1 100V J. High-resolution mass spectra (HRMS) was measured with JEOL JMS-700 MStation FAB-MS. Melting points were measured on a Yanaco micromelting point apparatus and are uncorrected.

2. Preparation of Cyclopropanes Having Nitrogen-Based Directing Groups

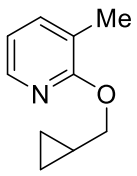


2-(Cyclopropylmethoxy)quinoline (1b): A solution of cyclopropane-methanol (1.05 g, 14.5 mmol) in DMF (26.7 mL) was added NaH (60% oil suspension, 0.59 g, 14.8 mmol) at 0 °C, and the mixture was stirred for 1 h. A solution of 2-chloroquinoline (1.83 g, 11.2 mmol) in DMF (3.0 mL) was added dropwise, and the resultant mixture was stirred at 80 °C for 4 h. The reaction mixture was

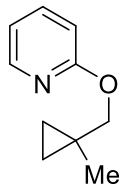
quenched with saturated NH_4Cl solution (10 mL), and extracted with EtOAc (20 mL × 3). The combined organic extracts were dried over $MgSO_4$, and the organic solvent was removed under reduced pressure. The residue was purified by flash column chromatography on silica gel with hexane / EtOAc = 30 / 1 as the eluent to afford **1b** (2.01 g, 10.1 mmol, 90% yield) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.39-0.43 (m, 2H), 0.62-0.67 (m, 2H), 1.30-1.40 (m, 1H), 4.31 (d, J = 7.2 Hz, 2H), 6.93 (d, J = 9.2 Hz, 1H), 7.36 (dt, J = 1.2, 7.6 Hz, 1H), 7.60 (dt, J = 1.2, 7.6 Hz, 1H), 7.70 (dd, J = 1.2, 8.4 Hz, 1H), 7.81 (d, J = 8.8 Hz, 1H), 7.98 (d, J = 8.4 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 3.2, 10.1, 70.7, 113.3, 123.8, 125.0, 127.2, 127.4, 129.4, 138.6, 146.6, 162.2. IR (neat / cm^{-1}): 3080, 3005, 2940, 1618, 1605, 1429, 1391, 1310, 1277, 1240, 999, 822. HRMS (FAB^+): calcd for $C_{14}H_{14}NO$ ($[M+H]^+$) 200.1075; found. 200.1082.



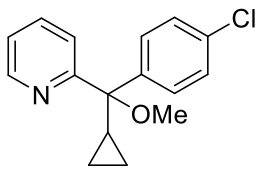
1-(Cyclopropylmethoxy)isoquinoline: Following the procedure for the synthesis of **1b** using cyclopropanemethanol (1.05 g, 14.5 mmol) and 1-chloroisoquinoline (1.83 g, 11.2 mmol), 1.84 g (9.3 mmol, 83% yield) of the title compound was obtained as a colorless oil after purification by flash chromatography (eluent: hexane / EtOAc = 30 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.41-0.45 (m, 2H), 0.62-0.67 (m, 2H), 1.37-1.44 (m, 1H), 4.35 (d, J = 6.8 Hz, 2H), 7.19 (d, J = 6.0 Hz, 1H), 7.54 (t, J = 7.2 Hz, 1H), 7.65 (dt, J = 1.2, 7.2 Hz, 1H), 7.72 (d, J = 8.0 Hz, 1H), 7.96 (d, J = 6.0 Hz, 1H), 8.32 (d, J = 8.0 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 3.2, 10.1, 70.9, 114.7, 119.9, 124.3, 126.0, 126.4, 130.3, 137.9, 139.7, 160.8. HRMS (FAB^+): calcd for $C_{13}H_{14}NO$ ($[M+H]^+$) 200.1075; found. 200.1081.



2-(Cyclopropylmethoxy)-3-picoline (1c): Following the procedure for the synthesis of **1b** using cyclopropanemethanol (1.05 g, 14.5 mmol) and 2-chloro-3-picoline (1.43 g, 11.2 mmol), 1.27 g (7.8 mmol, 69% yield) of **1c** was obtained as a colorless oil after purification by flash chromatography (eluent: hexane / EtOAc = 30 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.33-0.37 (m, 2H), 0.56-0.60 (m, 2H), 1.25-1.32 (m, 1H), 2.21 (s, 3H), 4.15 (d, J = 7.2 Hz, 2H), 6.75 (dd, J = 4.8, 6.8 Hz, 1H), 7.37 (dd, J = 1.2, 6.8 Hz, 1H), 7.96(dd, J = 1.2, 4.8 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 3.0, 10.2, 15.9, 70.3, 116.3, 120.8, 138.3, 143.9, 162.3. IR (neat / cm^{-1}): 3080, 3007, 2940, 1595, 1449, 1427, 1395, 1308, 1252, 1003, 783. HRMS (FAB^+): calcd for $C_{10}H_{14}NO$ ($[M+H]^+$) 164.1075; found. 164.1081.

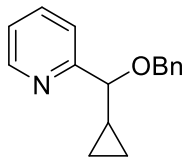


2-[(1-Methylcyclopropyl)methoxy]pyridine (1e): Following the procedure for the synthesis of **1b** using 1-methylcyclopropanemethanol (1.62 g, 18.8 mmol) and 2-chloropyridine (1.64 g, 14.5 mmol), 0.64 g (3.9 mmol, 27% yield) of **1e** was obtained as a colorless oil after purification by flash chromatography (eluent: hexane / EtOAc = 30 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.41 (t, J = 5.0 Hz, 2H), 0.55 (t, J = 5.0 Hz, 2H), 1.22 (s, 3H), 4.07 (s, 2H), 6.78 (d, J = 8.0 Hz, 1H), 6.82-6.85 (dd, J = 5.2, 6.8 Hz, 1H), 7.56 (dt, J = 2.0, 8.0 Hz, 1H), 8.11 (dd, J = 2.0, 5.2 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 11.3, 15.4, 21.1, 73.7, 111.2, 116.5, 138.4, 146.7, 164.3. IR (neat / cm^{-1}): 3076, 3003, 2955, 2878, 1603, 1591, 1570, 1474, 1433, 1285, 1271, 779. HRMS (FAB^+): calcd for $C_{10}H_{14}NO$ ($[M+H]^+$) 164.1075; found. 164.1078.

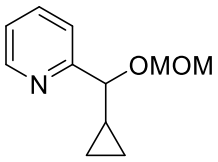


2-[(4-Chlorophenyl)cyclopropylmethoxymethyl]pyridine (1g): A solution of 4-chlorophenyl cyclopropyl ketone (2.71 g, 15.0 mmol) in THF (30 mL) was added THF solution of 2-pyridyl magnesium bromide, which was prepared by the reaction of 2-bromopyridine (2.42 mL, 25.0 mmol),

Mg (668 mg, 27.5 mmol), and a piece of iodine in THF (25 mL), at room temperature. After stirring for 15 h, the reaction mixture was quenched with saturated NH_4Cl solution (20 mL), and extracted with EtOAc (30 mL × 3). The combined organic extracts were dried over $MgSO_4$, and the organic solvent was removed under reduced pressure. The residue was purified by flash column chromatography on silica gel with hexane / EtOAc = 10 / 1 as the eluent to afford (4-chlorophenyl)cyclopropyl(2-pyridyl)methanol (0.77 g, 3.0 mmol, 20% yield) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.34-0.41 (m, 1H), 0.45-0.51 (m, 1H), 0.58-0.68 (m, 2H), 1.58-1.65 (m, 1H), 5.74 (s, 1H), 7.20-7.29 (m, 4H), 7.47-7.50 (m, 2H), 7.66 (dt, J = 1.7, 7.7 Hz, 1H), 8.51 (d, J = 4.4 Hz, 1H). A solution of (4-chlorophenyl)cyclopropyl(2-pyridyl)methanol (327 mg, 1.3 mmol) in DMF (3.5 mL) and THF (1.0 mL) was added NaH (60% oil suspension, 90.3 mg, 2.3 mmol) at 0 ^{o}C, and the mixture was stirred for 1 h. Iodomethane (140 μL, 2.3 mmol) in THF (0.50 mL) was added dropwise, and the resultant mixture was stirred at room temperature for 15 h. The reaction mixture was quenched with saturated NH_4Cl solution (10 mL), and extracted with EtOAc (20 mL × 3). The combined organic extracts were dried over $MgSO_4$, and the organic solvent was removed under reduced pressure. The residue was purified by flash column chromatography on silica gel with hexane / EtOAc = 10 / 1 as the eluent to afford **1g** (0.31 g, 1.1 mmol, 87% yield) as a colorless solid. mp 58.8-59.8 ^{o}C. ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.20-0.27 (m, 1H), 0.29-0.35 (m, 1H), 0.54-0.61 (m, 1H), 0.63-0.70 (m, 1H), 1.74-1.81 (m, 1H), 3.24 (s, 3H), 7.13-7.16 (m, 1H), 7.24-7.26 (m, 2H), 7.33 (d, J = 8.4 Hz, 2H), 7.54 (dt, J = 1.2, 8.4 Hz, 1H), 7.65 (dt, J = 2.0, 8.0 Hz, 1H), 8.57 (d, J = 4.4 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 1.7, 3.0, 17.1, 51.1, 84.2, 121.9, 122.6, 127.7, 129.7, 132.9, 136.0, 141.6, 148.4, 162.8. IR (KBr / cm^{-1}): 3009, 2934, 2901, 2824, 1584, 1487, 1076, 1015, 978, 822, 781, 752. HRMS (FAB$^+$): calcd for $C_{16}H_{17}ClNO$ ($[M+H]^+$) 274.0999; found. 274.1012.

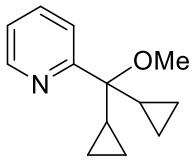


2-[(Benzyloxy)cyclopropylmethyl)pyridine (1h): Following the similar procedure for the synthesis of 2-[cyclopropyl(methoxymethoxy)methyl]-pyridine using cyclopropyl(2-pyridinyl)methanol[6] (597 mg, 4.0 mmol) and benzylbromide (523 μL, 4.4 mmol), 447 mg (1.9 mmol, 47% yield) of **1h** was obtained as a pale yellow oil after purification by flash chromatography (eluent: hexane / EtOAc = 2 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.41-0.50 (m, 3H), 0.59-0.64 (m, 1H), 1.22-1.26 (m, 1H), 3.96 (d, J = 8.0 Hz, 1H), 4.41 (d, J = 12.0 Hz, 1H), 4.52 (d, J = 12.0 Hz, 1H), 7.20-7.23 (m, 1H), 7.26-7.33 (m, 5H), 7.50 (d, J = 7.6 Hz, 1H), 7.72 (dt, J = 1.6, 7.7 Hz, 1H), 8.56-8.58 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 1.8, 3.9, 16.8, 70.9, 85.7, 120.8, 122.5, 127.5, 127.7, 128.3, 136.6, 138.4, 148.9, 162.0. IR (neat / cm^{-1}): 3084, 3028, 3007, 2864, 1589, 1570, 1435, 1329, 1096, 1069, 698. HRMS (FAB^+): calcd for $C_{16}H_{18}NO$ ($[M+H]^+$) 240.1388; found. 240.1377.



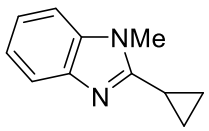
2-[Cyclopropyl(methoxymethoxy)methyl]pyridine: A solution of cyclopropyl(2-pyridinyl)methanol[6] (597 mg, 4.0 mmol) in DMF (9.0 mL) and THF (3.0 mL) was added NaH (60% oil suspension, 178 g, 4.4 mmol) at 0 ^{o}C, and the mixture was stirred for 1 h. A solution of 2-chloroquinoline (1.83 g, 11.2 mmol) in DMF (1.0 mL) was added dropwise, and the resultant mixture was stirred at room temperature for 15 h. The reaction mixture was quenched with saturated NH_4Cl solution (10 mL), and extracted with EtOAc (20 mL × 3). The combined organic extracts were dried over $MgSO_4$, and the organic solvent was removed under reduced pressure. The residue was purified by flash column chromatography on silica gel with hexane / EtOAc = 2 / 1 as the eluent to afford the title compound (0.28 g, 1.5 mmol, 36% yield) as a pale yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.39-0.57 (m, 3H), 0.62-0.69 (m, 1H), 1.24-1.30 (m, 1H), 3.36 (s, 3H), 4.11 (d, J = 8.4 Hz, 1H), 4.58 (d, J = 7.2 Hz, 1H), 4.75 (d, J = 7.2 Hz , 1H), 7.18-7.21 (dd, J = 4.8, 7.2 Hz, 1H), 7.40 (d, J = 7.6 Hz, 1H), 7.69

(td, J = 2.0, 7.6 Hz, 1H), 8.57-8.58 (d, J = 4.8 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 1.9, 4.1, 16.3, 55.5, 82.7, 94.5, 121.1, 122.5, 136.5, 149.1, 161.3. IR (neat / cm^{-1}): 3007, 2887, 1589, 1474, 1435, 1144, 1101, 1040, 920, 750. HRMS (FAB^+): calcd for $C_{11}H_{16}NO_2$ ($[M+H]^+$) 194.1181; found. 194.1179.

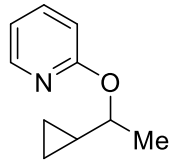


2-[(Dicyclopropyl)methoxymethyl]pyridine (1i): A solution of bicyclopropyl ketone (2.20 g, 20.0 mmol) in THF (40 mL) was added THF solution of 2-pyridyl magnesium bromide, which was prepared by the reaction of 2-bromopyridine (2.42 mL, 33.0 mmol), Mg (668 mg, 36.7 mmol), and a small piece of iodine in THF (33 mL), at room temperature. After stirring for 15 h, the reaction mixture was quenched with saturated NH_4Cl solution (20 mL), and extracted with EtOAc (30 mL × 3). The combined organic extracts were dried over $MgSO_4$, and the organic solvent was removed under reduced pressure. The residue was purified by flash column chromatography on silica gel with hexane / EtOAc = 10 / 1 as the eluent to afford dicyclopropyl(2-pyridinyl)methanol (1.14 g, 6.0 mmol, 30% yield) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.16-0.23 (m, 2H), 0.31-0.37 (m, 2H), 0.43-0.50 (m, 2H), 0.64-0.70 (m, 2H), 1.14-1.21 (m, 2H), 5.06 (s, 1H), 7.19-7.22 (m, 1H), 7.54 (dd, J = 0.8, 9.2 Hz, 1H), 7.65 (dt, J = 2.0, 8.4 Hz, 1H), 8.45-8.46 (m, 1H). A solution of dicyclopropyl(2-pyridinyl)methanol (662 mg, 3.5 mmol) in DMF (7.9 mL) and THF (2.6 mL) was added NaH (60% oil suspension, 210 mg, 5.3 mmol) at 0 ^{o}C, and the mixture was stirred for 1 h. Iodomethane (327 μL, 5.3 mmol) in THF (0.50 mL) was added dropwise, and the resultant mixture was stirred at room temperature for 15 h. The reaction mixture was quenched with saturated NH_4Cl solution (10 mL), and extracted with EtOAc (20 mL × 3). The combined organic extracts were dried over $MgSO_4$, and the organic solvent was removed under reduced pressure. The residue was purified by flash column chromatography on silica gel with hexane / EtOAc = 10 / 1 as the eluent to afford **1i** (0.62

g, 3.1 mmol, 87% yield) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.32-0.39 (m, 2H), 0.45-0.51 (m, 2H), 0.57-0.64 (m, 2H), 0.69-0.76 (m, 2H), 1.10-1.17 (m, 2H), 3.31 (s, 3H), 7.13-716 (m, 1H), 7.51-7.54 (d, J = 7.6 Hz, 1H), 7.65 (dt, J = 2.0, 7.6 Hz, 1H), 8.62-8.64 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 0.3, 2.7, 17.0, 50.6, 80.3, 121.6 (two peaks overlapped), 135.7, 148.7, 163.9. IR (neat / cm^{-1}): 3009, 2945, 1587, 1568, 1466, 1429, 1084, 1026, 907, 750. HRMS (FAB^+): calcd for $C_{13}H_{13}NO$ ($[M+H]^+$) 204.1388; found. 204.1387.

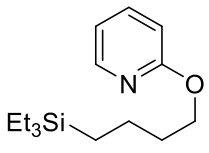


2-Cyclopropyl-1-methyl-1*H*-benzimidazole (1k): A solution of 2-cyclopropyl-1*H*-benzimidazole[7] (0.74 g, 4.7 mmol) in THF (24 mL) was added NaH (60% oil suspension, 0.28 g, 7.0 mmol) at 0 ^{o}C, and the mixture was stirred for 30 min. Iodomethane (0.80 g, 5.6 mmol) was added dropwise, and the resultant mixture was stirred for 15 h. The reaction mixture was quenched with saturated NH_4Cl solution (10 mL), and extracted with EtOAc (20 mL × 3). The combined organic extracts were dried over $MgSO_4$, and the organic solvent was removed under reduced pressure. The residue was purified by flash column chromatography on silica gel with hexane / EtOAc = 30 / 1 as the eluent to afford **1k** (0.56 g, 3.2 mmol, 70% yield) as a pale yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$): δ 1.08-1.13 (m, 2H), 1.21-1.25 (m, 2H), 3.83 (s, 3H), 7.19-7.23 (m, 2H), 7.26-7.29 (m, 1H), 7.63-7.69 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 7.4, 7.9, 29.5, 108.5, 118.8, 121.6, 121.7, 136.0, 142.3, 156.6. IR (neat / cm^{-1}): 3053, 3009, 2943, 1614, 1518, 1456, 1412, 1315, 1283, 1080, 922, 741. HRMS (FAB^+): calcd for $C_{11}H_{13}N_2$ ($[M]^+$) 173.1079; found. 173.1077.



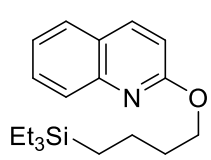
2-(1-Cyclopropylethoxy)pyridine: Following the procedure for the synthesis of **1b** using 1-cyclopropylethanol (1.88 g, 21.8 mmol) and 2-chloropyridine (1.93 g, 16.8 mmol), 2.12 g (13.0 mmol, 76% yield) of the title compound was obtained as a colorless oil after purification by flash chromatography (eluent: hexane / EtOAc = 30 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.28-0.33 (m, 1H), 0.40-0.46 (m, 1H), 0.48-0.58 (m, 2H), 1.08-1.17 (m, 1H), 1.39 (d, J = 6.0 Hz, 3H), 4.66 (dq, J = 4.1, 13.4 Hz, 1H), 6.71 (d, J = 8.0 Hz, 1H), 6.79-6.82 (dd, J = 5.2, 6.8 Hz, 1H), 7.52-7.56 (dt, J = 1.6, 8.0 Hz, 1H), 8.10 (dd, J = 2.0, 5.2 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 2.2, 3.5, 16.6, 19.6, 75.2, 111.6, 116.1, 138.4, 146.6, 163.6. IR (neat / cm^{-1}): 3007, 2974, 1591, 1568, 1468, 1429, 1308, 1287, 1271, 1063, 943, 777. HRMS (FAB^+): calcd for $C_{10}H_{13}NO$ ($[M]^+$) 163.0997; found. 163.1004.

3. General Procedure for Iridium-Catalysed Hydrosilylation of Cyclopropanes with Silanes. A flame-dried sealed tube was charged with $[IrCl(cod)]_2$ (6.7 mg, 0.010 mmol), cyclopropanes (0.20 mmol), silanes (1.0 mmol), diethyl ether or toluene (0.20 or 0.020 mL), and stirred at the temperature specified in the main text for 15 h. The solvent was removed under the reduced pressure, and the residue was subjected to flash column chromatography on silica gel with hexane / EtOAc as the eluent to afford the corresponding alkylsilanes.

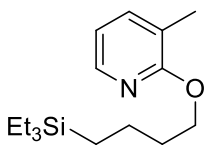


2-[4-(Triethylsilyl)butoxy]pyridine (2a): Following the general procedure using 2-(cyclopropylmethoxy)pyridine **1a** (29.8 mg, 0.20 mmol) and Et_3SiH (116.3 mg, 1.0 mmol) provided 47.8 mg (0.18 mmol, 90% yield) of the desired product as a yellow oil after purification by flash chromatography (eluent: hexane / EtOAc = 30 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.52 (q, J = 8.0 Hz, 6H), 0.58-0.60 (m, 2H), 0.92 (t, J = 8.0 Hz, 9H), 1.42-1.50 (m, 2H), 1.80

(quint, J = 7.2 Hz, 2H), 4.28 (t, J = 6.8 Hz, 2H), 6.72 (d, J = 7.8 Hz, 1H), 6.82-6.85 (dd, J = 4.8, 6.8 Hz, 1H), 7.53-7.57 (dt, J = 2.0, 7.8 Hz, 1H), 8.14 (dd, J = 1.6, 4.8 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 3.3, 7.4, 11.1, 20.4, 33.1, 65.6, 111.1, 116.4, 138.4, 146.9, 164.1. IR (neat / cm^{-1}): 2951, 2911, 2874, 1595, 1466, 1433, 1287, 1015, 779, 725. HRMS (FAB^+): calcd for $C_{15}H_{28}NOSi$ ($[M+H]^+$) 266.1940; found. 266.1950.

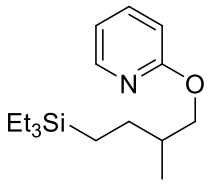


2-[4-(Triethylsilyl)butoxy]quinoline (2b): Following the general procedure using 2-(cyclopropylmethoxy)quinoline **1b** (39.9 mg, 0.20 mmol) and Et_3SiH (116.3 mg, 1.0 mmol) provided 39.1 mg (0.12 mmol, 62% yield) of the desired product as a pale yellow oil after purification by flash chromatography (eluent: hexane / EtOAc = 30 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.52 (q, J = 8.0 Hz, 6H), 0.58-0.63 (m, 2H), 0.93 (t, J = 8.0 Hz, 9H), 1.47-1.53 (m, 2H), 1.86 (quint, J = 6.8, Hz, 2H), 4.48 (t, J = 6.8 Hz, 2H), 6.89 (d, J = 8.8 Hz, 1H), 7.36 (dt, J = 1.2, 8.0 Hz, 1H), 7.58-7.63 (dt, J = 1.2, 7.2 Hz, 1H), 7.70 (dd, J = 1.2, 7.6 Hz, 1H), 7.83 (d, J = 7.6 Hz, 1H), 7.96 (d, J = 8.8 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 3.3, 7.5, 11.2, 20.5, 33.0, 65.6, 113.3, 123.8, 125.0, 127.2, 127.4, 129.4, 138.5, 146.7, 162.4. IR (neat / cm^{-1}): 2951, 2911, 2874, 1717, 1699, 1506, 1314, 1277, 822, 754. HRMS (FAB^+): calcd for $C_{19}H_{29}NOSi$ ($[M]^+$) 315.2018; found. 315.2023.

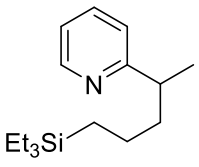


2-[4-(Triethylsilyl)butoxy]-3-picoline (2c): Following the general procedure using 2-(cyclopropylmethoxy)-3-picoline **1c** (32.6 mg, 0.20 mmol) and Et_3SiH (116.3 mg, 1.0 mmol) provided 41.9 mg (0.15 mmol, 75% yield) of the desired product as a pale yellow oil after purification by flash chromatography (eluent: hexane / EtOAc = 30 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.51 (q, J = 8.0 Hz, 6H), 0.56-0.61 (m, 2H), 0.93 (t, J = 8.0 Hz, 9H), 1.45-1.53 (m, 2H), 1.77-1.85 (m, 2H), 2.18 (s, 3H), 4.31 (t, J = 6.4 Hz, 2H), 6.75 (dd, J = 5.2, 7.6 Hz, 1H),

7.35-7.37 (m, 1H), 7.98 (dd, J = 0.8, 5.2 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 3.3, 7.4, 11.1, 15.9, 20.4, 33.1, 65.3, 116.2, 120.8, 138.2, 144.0, 162.4. IR (neat / cm^{-1}): 2951, 2911, 2874, 1717, 1699, 1684, 1558, 1506, 1420, 725. HRMS (FAB$^+$): calcd for $C_{16}H_{29}NOSi$ ([M]$^+$) 279.2018; found. 279.2019.

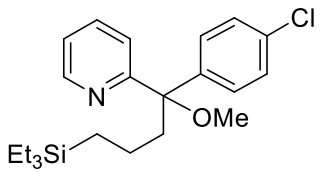


2-[4-(Triethylsilyl)-2-methylbutoxy]pyridine (2e): Following the general procedure using 2-[(1-methylcyclopropyl)methoxy]pyridine **1e** (32.6 mg, 0.20 mmol) and Et_3SiH (116.3 mg, 1.0 mmol) provided 50.9 mg (0.18 mmol, 91% yield) of the desired product as a pale yellow oil after purification by flash chromatography (eluent: hexane / EtOAc = 30 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.50 (q, J = 7.6 Hz, 6H), 0.51-0.63 (m, 2H), 0.92 (t, J = 7.6 Hz, 9H), 1.01 (d, J = 6.4 Hz, 3H), 1.19-1.28 (m, 1H), 1.47-1.56 (m, 1H), 1.82-1.90 (m, 1H), 4.07 (dd, J = 7.0, 10.2 Hz, 1H), 4.17 (dd, J = 6.4, 10.0 Hz, 1H), 6.72 (d, J = 8.8 Hz, 1H), 6.81-6.84 (m, 1H), 7.52-7.57 (m, 1H), 8.14 (dd, J = 2.0, 4.8 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 3.2, 7.4, 7.9, 16.6, 27.4, 35.9, 70.4, 111.1, 116.3, 138.4, 146.9, 164.3. IR (neat / cm^{-1}): 2953, 2911, 2874, 1593, 1570, 1433, 1287, 1015, 780, 735. HRMS (FAB$^+$): calcd for $C_{16}H_{30}NOSi$ ([M+H]$^+$) 280.2097; found. 280.2093.

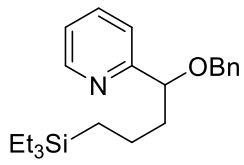


2-[1-(Triethylsilyl)pentan-4-yl]pyridine (2f): Following the general procedure using 2-(1-cyclopropylethyl)pyridine **1f** (29.4 mg, 0.20 mmol) and Et_3SiH (116.3 mg, 1.0 mmol) provided 36.9 mg (0.14 mmol, 70% yield) of the desired product as a pale yellow oil after purification by flash chromatography (eluent: hexane / EtOAc = 30 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.44 (q, J = 8.0 Hz, 6H), 0.45-0.52 (m, 8H), 0.87 (t, J = 8.0 Hz, 9H), 1.12-1.32 (m, 5H), 1.56-1.63 (m, 1H), 1.72-1.80 (m, 1H), 2.90 (sextet, J = 7.0 Hz, 1H), 7.06-7.12 (m, 2H), 7.58 (td, J = 1.9, 7.6 Hz, 1H), 8.53 (d, J = 3.6 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 3.3, 7.4, 11.3, 20.7,

21.7, 41.3, 41.5, 120.9, 121.4, 136.2, 149.1, 166.7. IR (neat / cm^{-1}): 2953, 2913, 2874, 1734, 1717, 1699, 1558, 1506, 1456, 746, 725. HRMS (FAB^+): calcd for $C_{16}H_{29}NSi$ ($[M]^+$) 263.2069; found. 263.2064.

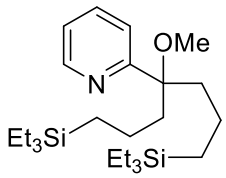


2-[1-(4-chlorophenyl)-1-methoxy-4-(triethylsilyl)butyl] pyridine (2g): Following the general procedure using 2-[(4-chlorophenyl)cyclopropylmethoxymethyl]pyridine **1g** (54.8 mg, 0.20 mmol) and Et_3SiH (116.3 mg, 1.0 mmol) provided 63.2 mg (0.16 mmol, 81% yield) of the desired product as a pale yellow oil after purification by flash chromatography (eluent: hexane / EtOAc = 10 / 1). ^1H NMR (400 MHz, $CDCl_3$): δ 0.42 (q, J = 8.0, Hz, 6H), 0.48-0.53 (m, 2H), 0.85 (t, J = 8.0 Hz, 9H), 0.97-1.05 (m, 1H), 1.06-1.18 (m, 1H), 2.34-2.42 (m, 1H), 2.58-2.66 (m, 1H), 3.13 (s, 3H), 7.08 (dd, J = 1.2, 5.2 Hz, 1H), 7.22-7.25 (m, 2H), 7.34 (d, J = 8.4 Hz, 2H), 7.55 (d, J = 8.0 Hz, 1H), 7.62 (dt, J = 1.6, 7.8 Hz, 1H), 8.51-8.52 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 3.3, 7.4, 11.7, 16.9, 37.8, 50.3, 83.7, 121.2, 121.6, 126.6, 128.1, 132.4, 136.2, 143.3, 148.6, 164.0. IR (neat / cm^{-1}): 2951, 2909, 2874, 1506, 1489, 1456, 1082, 1015, 764, 725. HRMS (FAB^+): calcd for $C_{22}H_{32}ClNOSi$ ($[M]^+$) 389.1942; found. 389.1941.

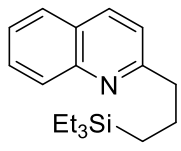


2-[1-(Benzyloxy)-4-(triethylsilyl)butyl]pyridine (2h): Following the general procedure using 2-[(benzyloxy)cyclopropylmethyl)pyridine **1h** (47.9 mg, 0.20 mmol) and Et_3SiH (116.3 mg, 1.0 mmol) provided 55.5 mg (0.16 mmol, 78% yield) of the desired product as a pale yellow oil after purification by flash chromatography (eluent: hexane / EtOAc = 2 / 1). ^1H NMR (400 MHz, $CDCl_3$): δ 0.47 (q, J = 8.0 Hz, 6H), 0.48-0.53 (m, 2H), 0.89 (t, J = 8.0 Hz, 9H), 1.31-1.43 (m, 1H), 1.44-1.56 (m, 1H), 1.71-1.79 (m, 1H), 1.82-1.91 (m, 1H), 4.37 (d, J = 12.0 Hz, 1H), 4.50 (d, J = 12.0 Hz, 1H), 4.51 (dd, J = 4.8, 8.8 Hz, 1H), 7.19 (ddd, J = 0.8,

4.8, 7.6 Hz, 1H), 7.26-7.33 (m, 5H), 7.47 (d, J = 7.6 Hz, 1H), 7.71 (td, J = 1.6, 7.6 Hz, 1H), 8.56-8.57 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 3.3, 7.4, 11.2, 20.1, 41.2, 71.3, 82.5, 120.3, 122.2, 127.5, 127.8, 128.3, 136.7, 138.4, 149.0, 163.0. IR (neat / cm^{-1}): 2949, 2911, 2874, 1589, 1472, 1456, 1435, 1099, 748, 731. HRMS (FAB$^+$): calcd for $C_{22}H_{33}NOSi$ ([M]$^+$) 355.2331; found. 355.2301.

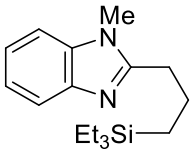


2-(4-Methoxy-1,7-bis(triethylsilyl)heptan-4-yl)pyridine (2i): Following the general procedure using 2-[(dicyclopropyl)methoxy-methyl]pyridine **1i** (40.7 mg, 0.20 mmol) and Et_3SiH (116.3 mg, 1.0 mmol) provided 36.6 mg (0.084 mmol, 42% yield) of the desired product as a pale yellow oil after purification by flash chromatography (eluent: hexane / EtOAc = 10 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.38-0.46 (m, 4H), 0.41 (q, J = 8.0 Hz, 12H), 0.84-0.87 (m, 2H), 0.85 (t, J = 8.0 Hz, 18H), 1.08-1.19 (m, 2H), 1.92-1.97 (m, 4H), 3.17 (s, 3H), 7.10 (ddd, J = 1.2, 4.8, 7.4 Hz, 1H), 7.53 (d, J = 8.0 Hz, 1H), 7.64 (dt, J = 1.6, 8.0 Hz, 1H), 8.53-8.56 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 3.3, 7.4, 11.7, 17.2, 40.1, 49.5, 82.8, 121.2, 121.3, 135.7, 148.4, 164.2. IR (neat / cm^{-1}): 2951, 2911, 2874, 1587, 1468, 1456, 1431, 1238, 1175, 1088, 1016, 760, 729. HRMS (FAB$^+$): calcd for $C_{25}H_{49}NOSi_2$ ([M]$^+$) 435.3353; found. 435.3358.

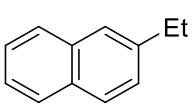


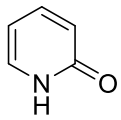
2-[3-(Triethylsilyl)propyl]quinoline (2j): Following the general procedure using 2-cyclopropylquinoline **1j** (33.8 mg, 0.20 mmol) and Et_3SiH (116.3 mg, 1.0 mmol) provided 40.0 mg (0.14 mmol, 70% yield) of the desired product as a pale yellow oil after purification by flash chromatography (eluent: hexane / EtOAc = 30 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.51 (q, J = 8.0 Hz, 6H), 0.62-0.66 (m, 2H), 0.91 (t, J = 8.0 Hz, 9H), 1.78-1.86 (m, 2H), 3.00 (t, J = 7.6 Hz, 2H), 7.30 (d, J = 8.0 Hz, 1H), 7.48 (t, J = 7.4 Hz, 1H), 7.68 (t, J = 8.0 Hz, 1H), 7.78 (d, J = 8.0

Hz, 1H), 8.06 (t, J = 8.0 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 3.2, 7.4, 11.6, 24.7, 43.4, 121.4, 125.6, 126.7, 127.5, 128.9, 129.3, 136.1, 147.9, 162.9. IR (neat / cm^{-1}): 2951, 2909, 2874, 1601, 1504, 1015, 826, 750, 729. HRMS (FAB$^+$): calcd for $C_{18}H_{27}NSi$ ([M]$^+$) 286.1991; found. 286.1972.



2-[3-(Triethylsilyl)propyl]-1-methyl-1*H*-benzimidazole (2k): Following the general procedure using 2-cyclopropyl-1-methyl-1*H*-benzimidazole **1k** (34.4 mg, 0.20 mmol) and Et_3SiH (116.3 mg, 1.0 mmol) provided 37.5 mg (0.13 mmol, 65% yield) of the desired product as a pale yellow oil after purification by flash chromatography (eluent: hexane / EtOAc = 30 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 0.52 (q, J = 8.0 Hz, 6H), 0.65-0.70 (m, 2H), 0.92 (t, J = 8.0 Hz, 9H), 1.81-1.89 (m, 2H), 2.91 (t, J = 8.0 Hz, 2H), 3.73 (s, 3H), 7.21-7.30 (m, 3H), 7.69-7.74 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ -3.2, 7.4, 11.8, 22.6, 29.7, 31.8, 108.8, 119.1, 121.7, 121.9, 135.7, 142.6, 155.3. IR (neat / cm^{-1}): 2951, 2909, 2874, 1508, 1466, 1439, 1398, 1329, 1275, 1234, 1007, 739. HRMS (FAB$^+$): calcd for $C_{17}H_{28}N_2Si$ ([M]$^+$) 288.2022; found. 288.2044.





2-Ethylnaphthalene and 2(1*H*)-Pyridone: Following the general procedure using 2-[1-(naphthalen-2-yl)ethoxy)]-pyridine **1l** (49.9 mg, 0.20 mmol) and Et_3SiH (116.3 mg, 1.0 mmol) provided 28.7 mg (0.18 mmol, 92% yield) of 2-ethylnaphthalene as a colorless oil after purification by flash chromatography (eluent: hexane / EtOAc = 99 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 1.33 (t, J = 7.4 Hz, 3H), 2.82 (q, J = 7.7 Hz, 2H), 7.35 (dd, J = 1.2, 8.4 Hz, 1H), 7.39-7.46 (m, 3H), 7.63 (s, 1H), 7.76-7.81 (m, 3H). 2(1*H*)-Pyridone (14.0 mg (0.15 mmol, 74% yield) was also obtained as a colorless solid after purification by flash chromatography (eluent: hexane / EtOAc = 5 / 1). ^{1}H NMR (400 MHz, $CDCl_3$): δ 6.26 (t, J = 6.8 Hz, 1H), 6.58 (d,

J = 9.2 Hz, 1H), 7.34 (dd, J = 2.0, 6.8 Hz, 1H), 7.45 (ddd, J = 2.0, 6.8, 9.2 Hz, 1H). The analytical data for these compounds match those reported in the literature.[8,9]

4. References

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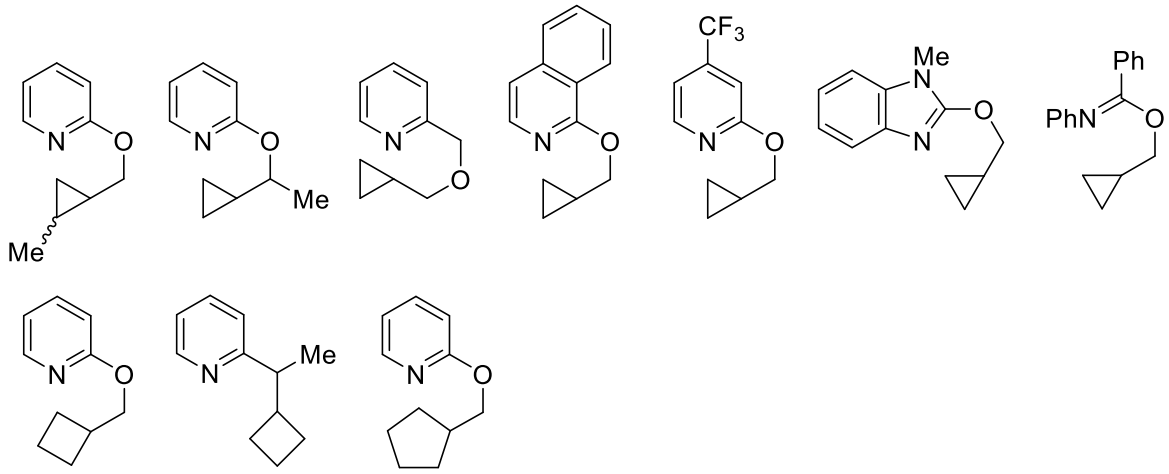


Figure S1. Representative unsuccessful substrates for the current iridium-catalyzed ring-opening hydrosilylation

5. Deuterium-Labeling Experiments

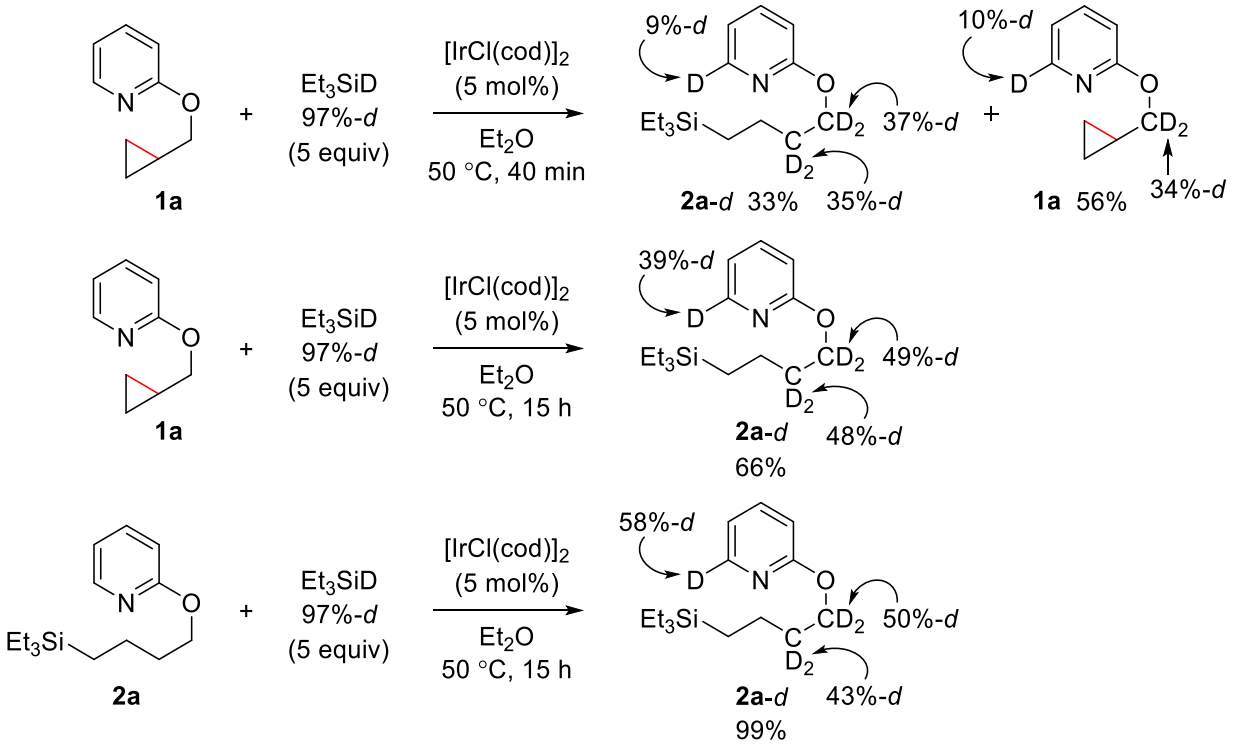
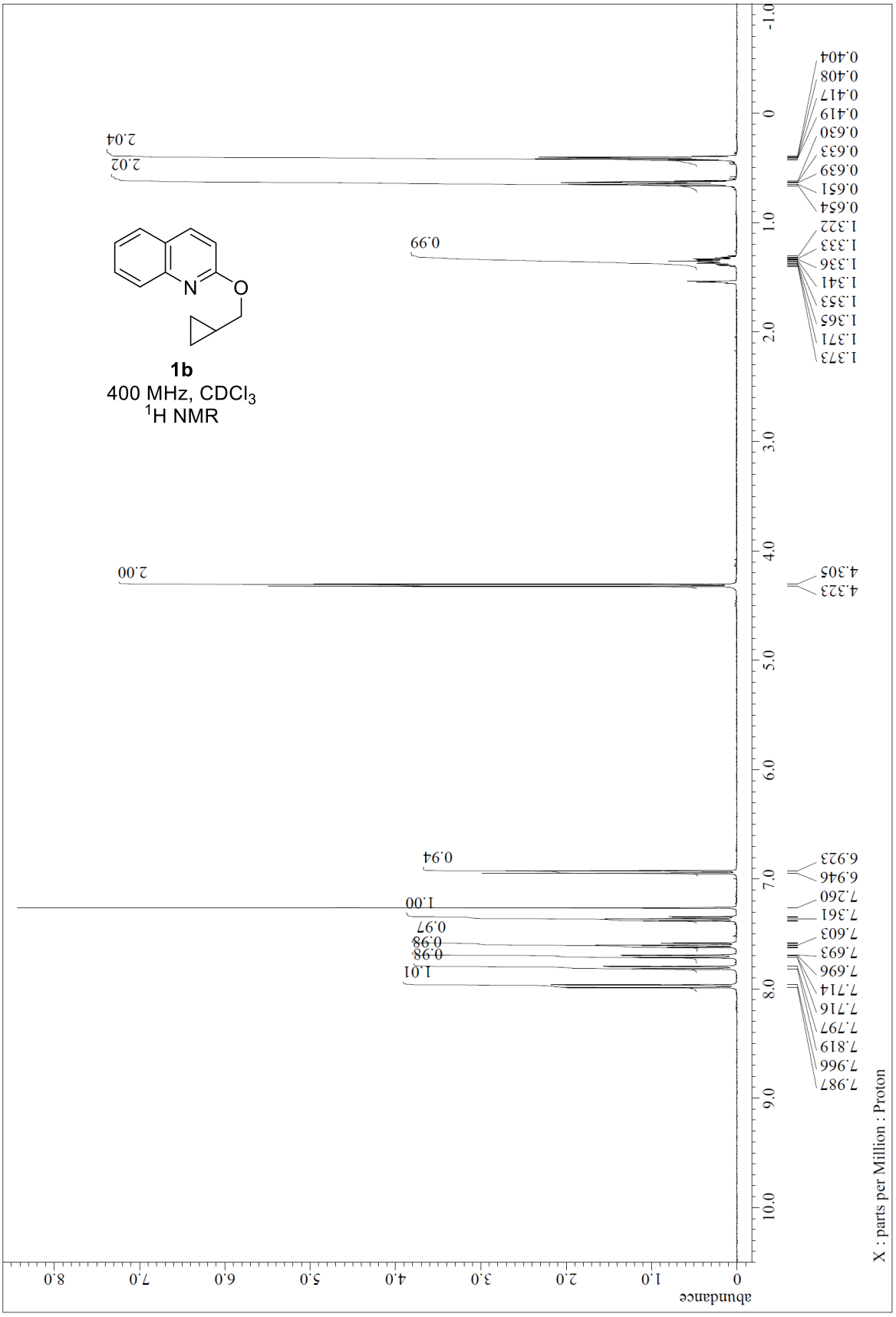
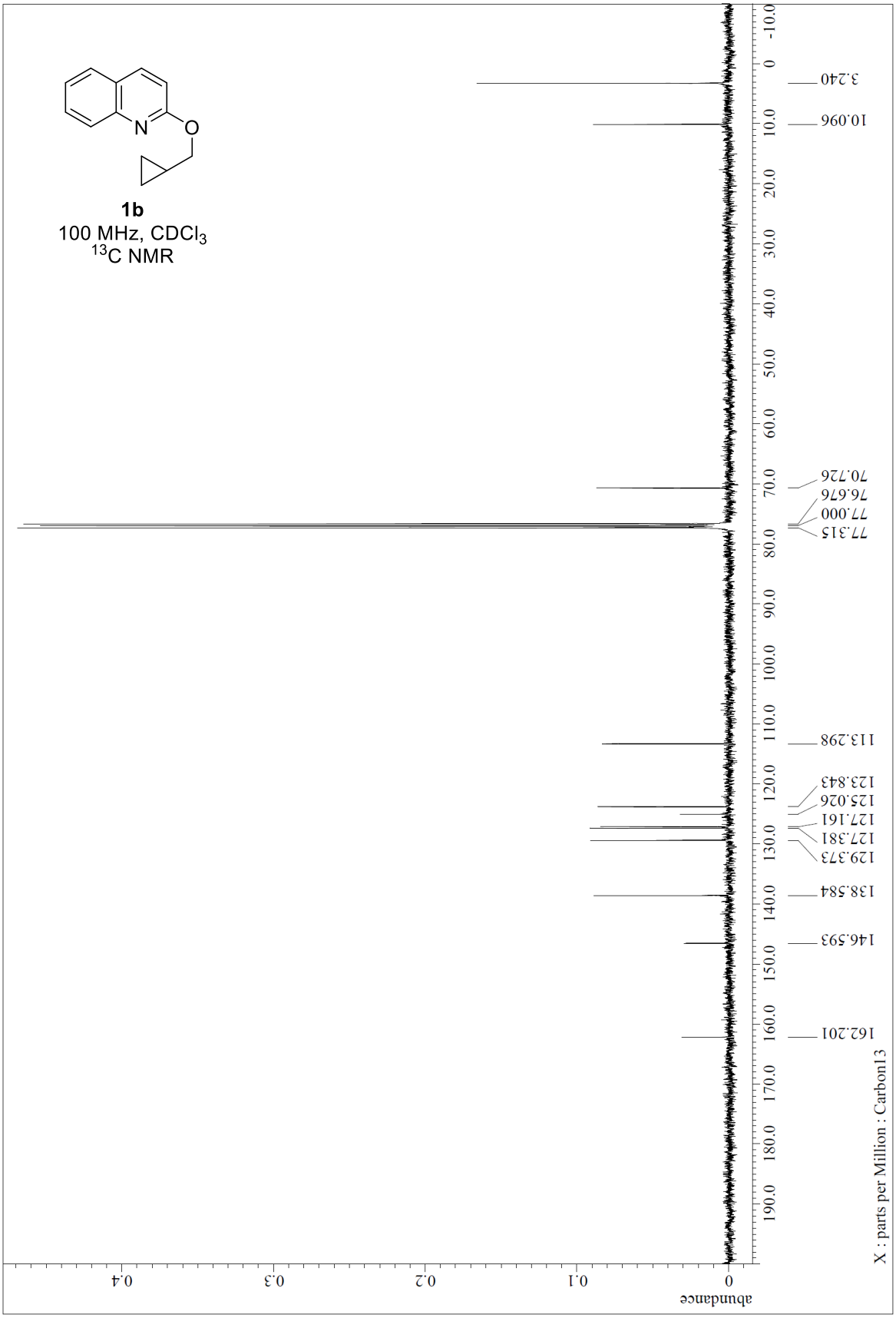
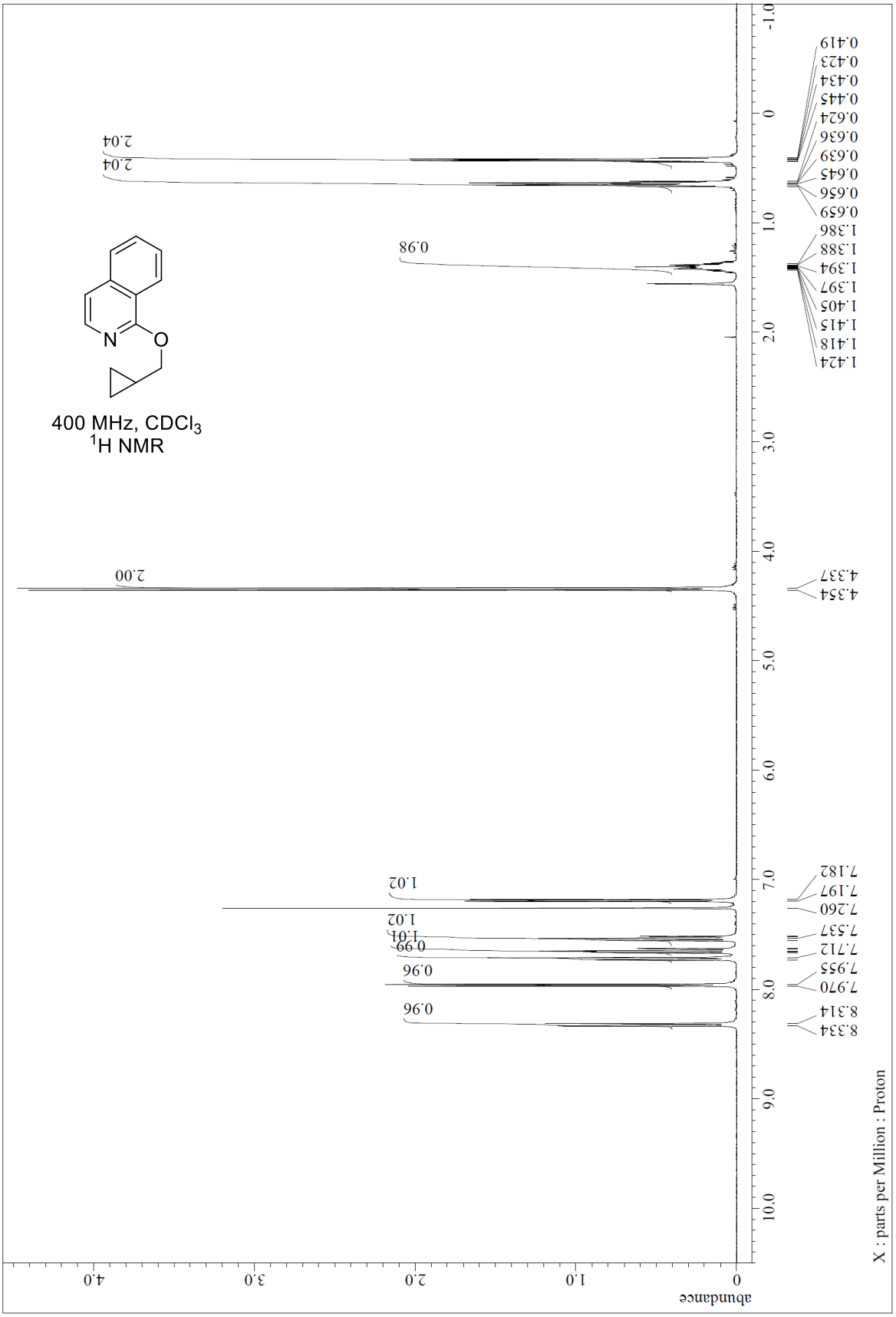


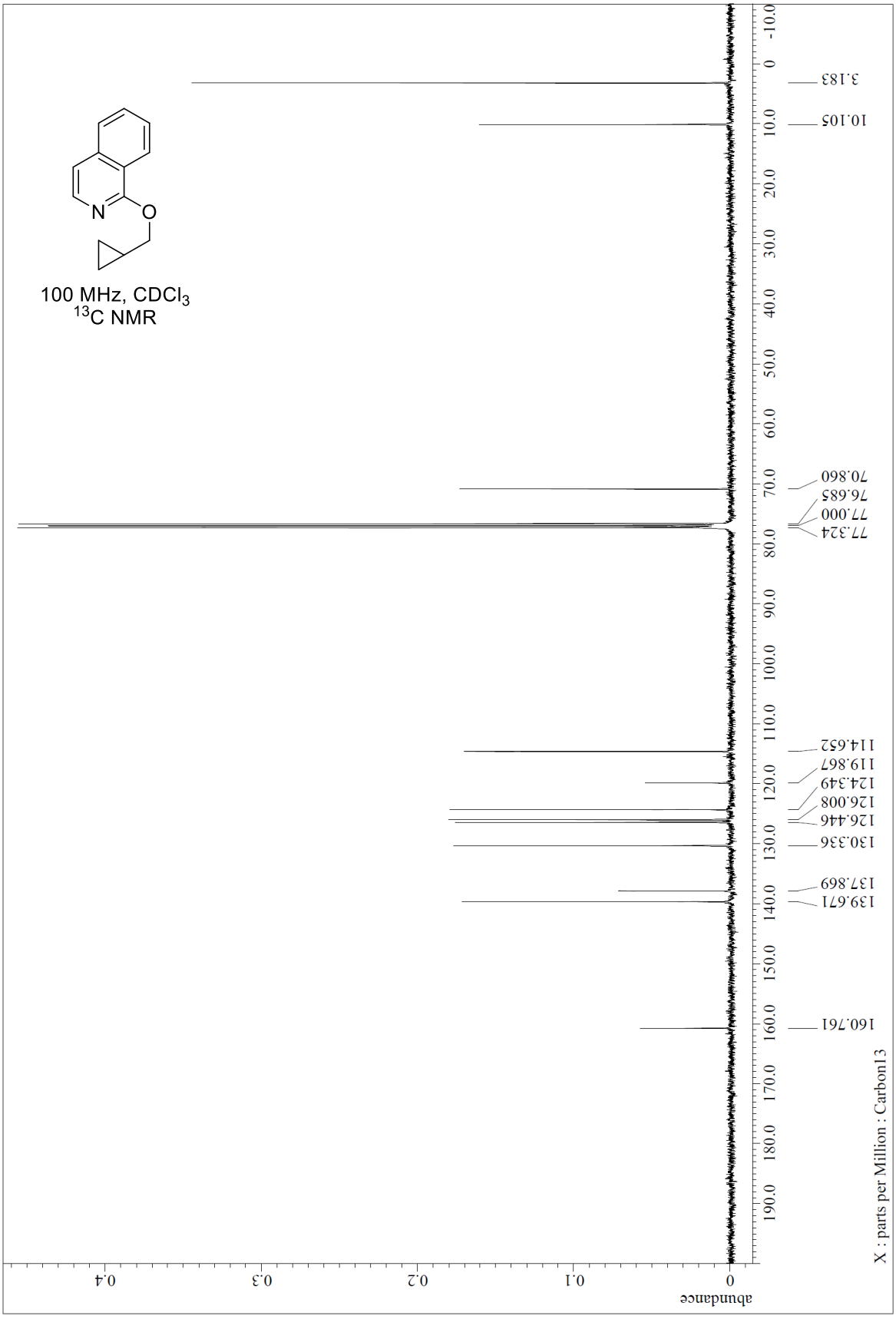
Figure S2. Deuterium-Labeling Experiments with Et_3SiD

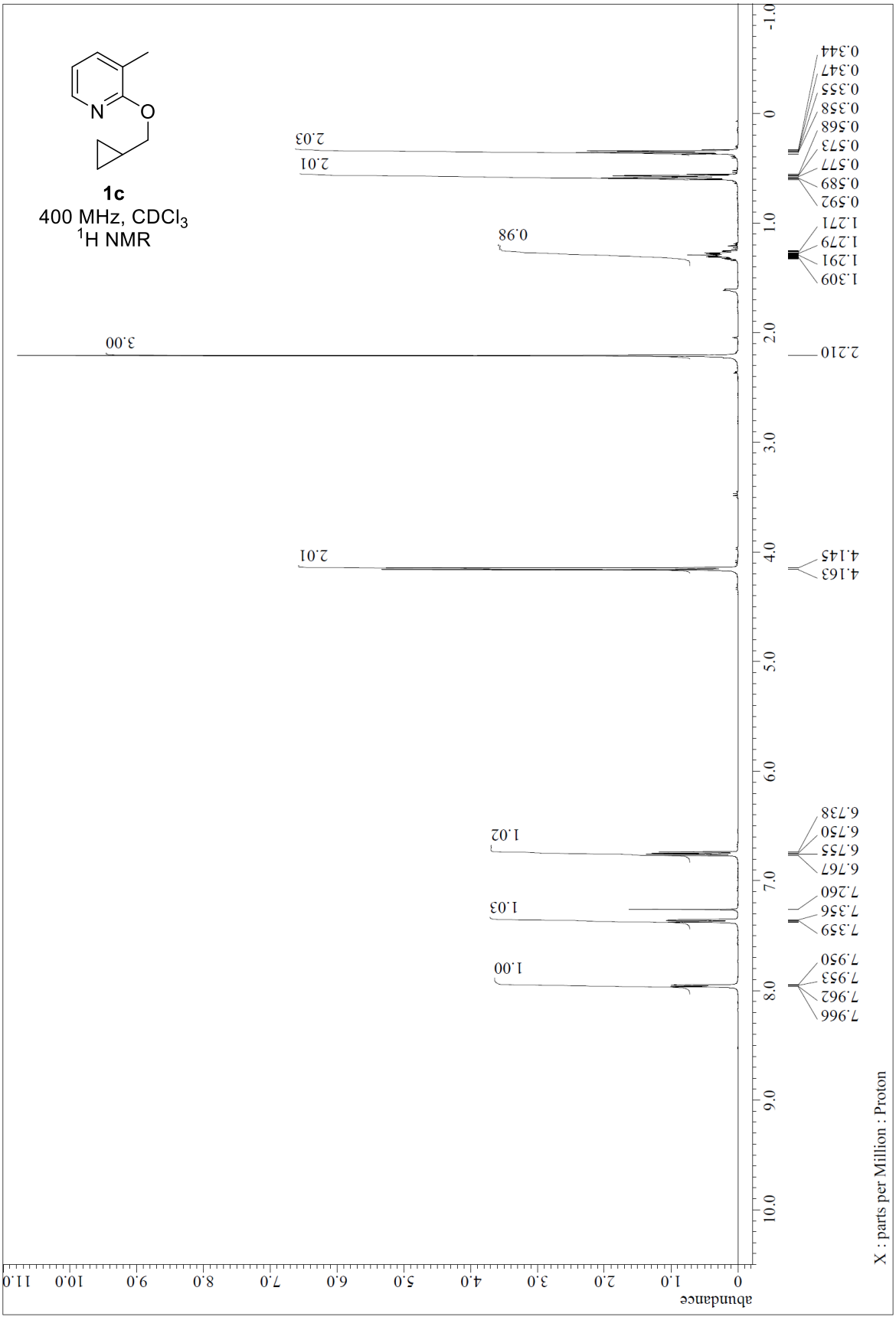
6. ^{1}H NMR and ^{13}C NMR Spectra of New Compounds

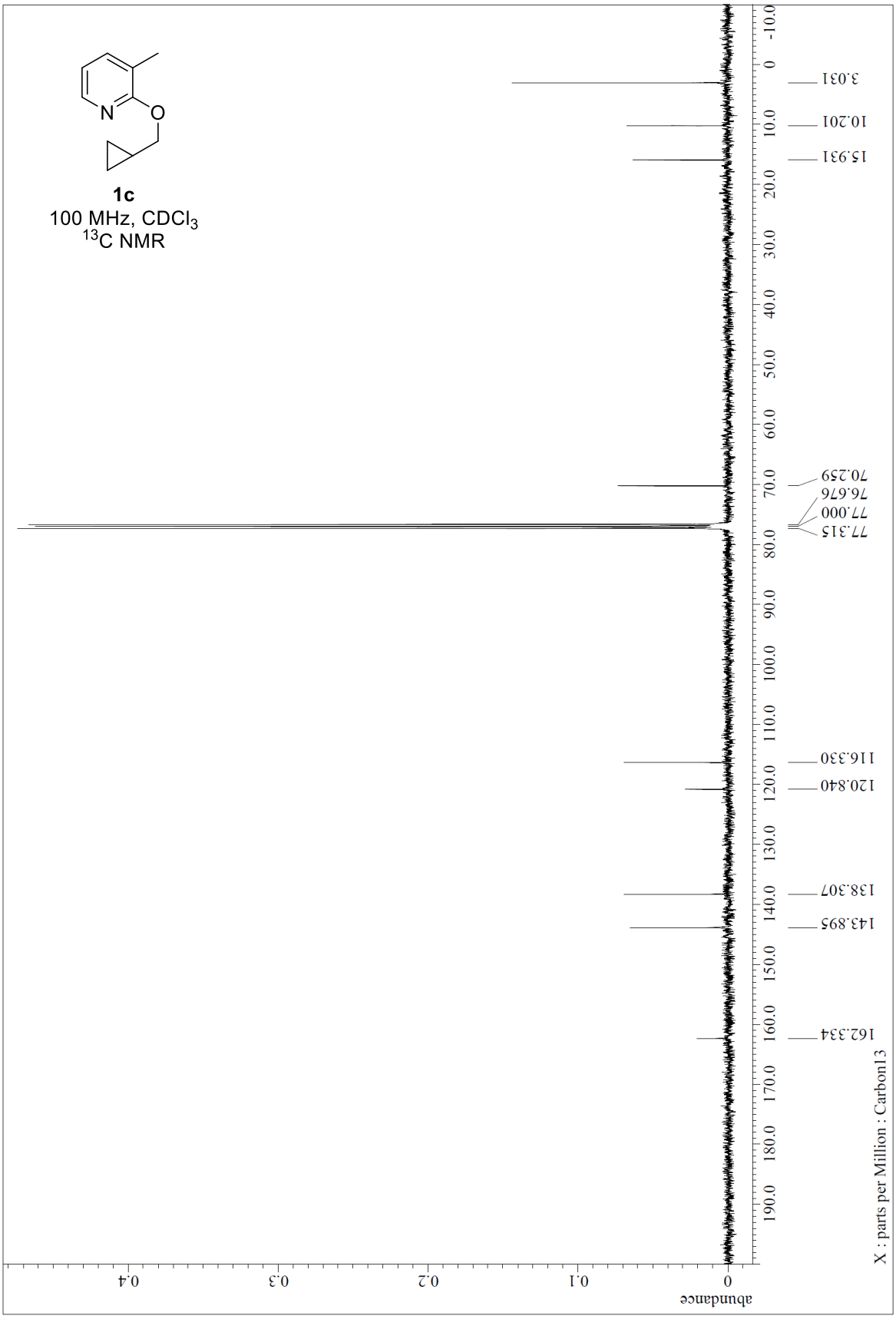


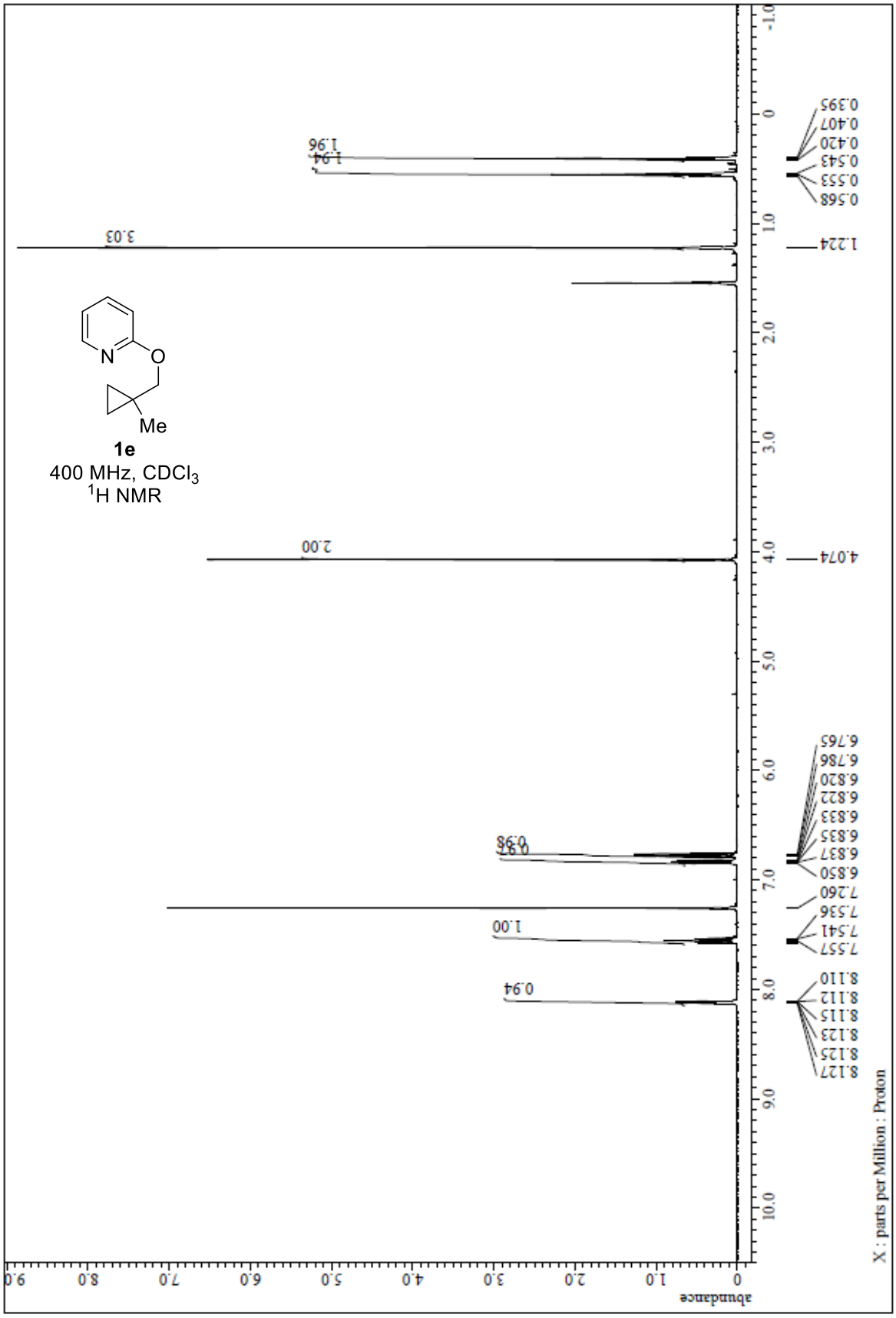

1b
100 MHz, CDCl3
13C NMR
3.240
10.096
70.726
76.676
77.000
77.315
113.298
123.843
125.026
127.161
127.381
129.373
138.584
146.593
162.201
X : parts per Million : Carbon13
abundance

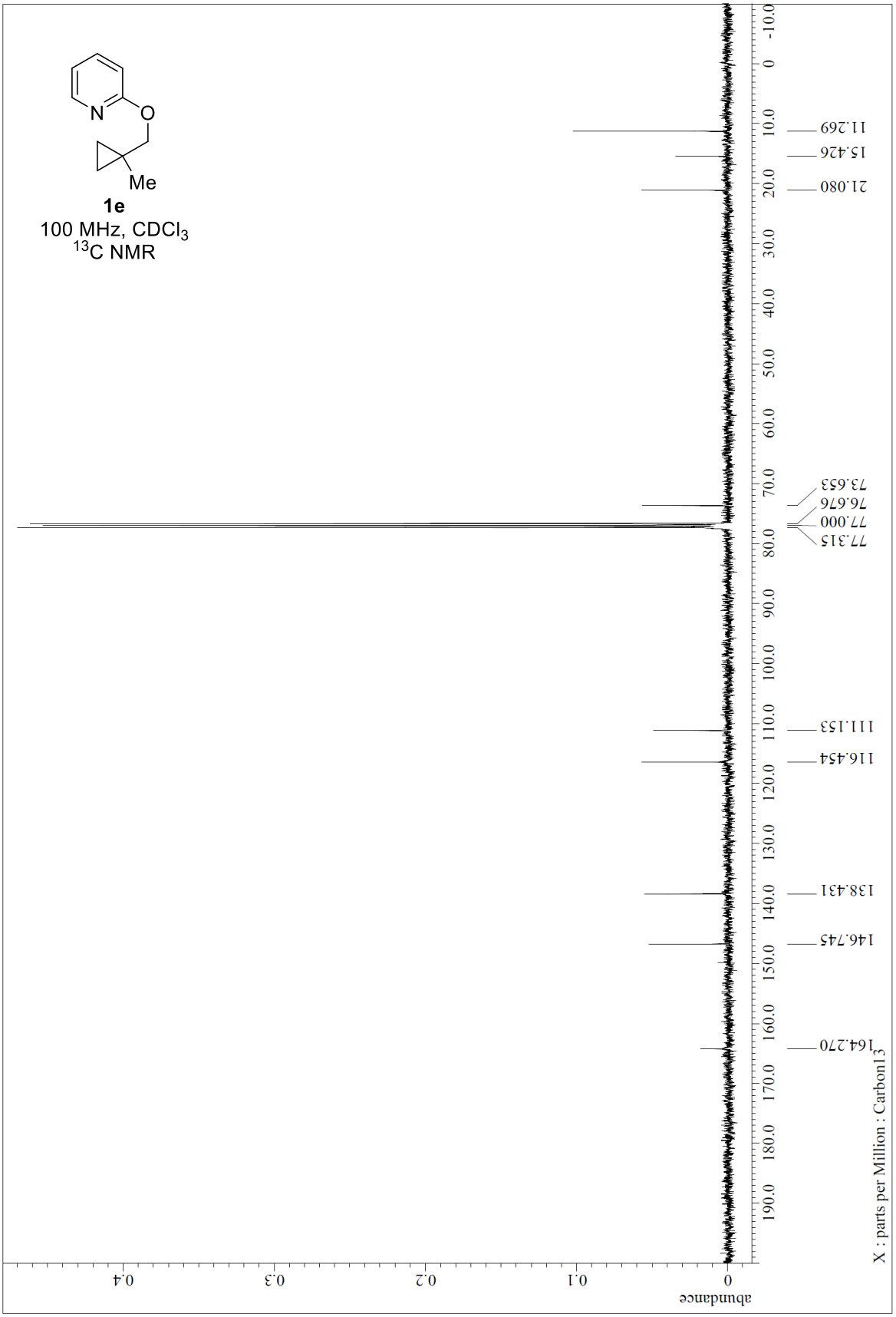

400 MHz, CDCl3
1H NMR
N
O
X : parts per Million : Proton
abundance

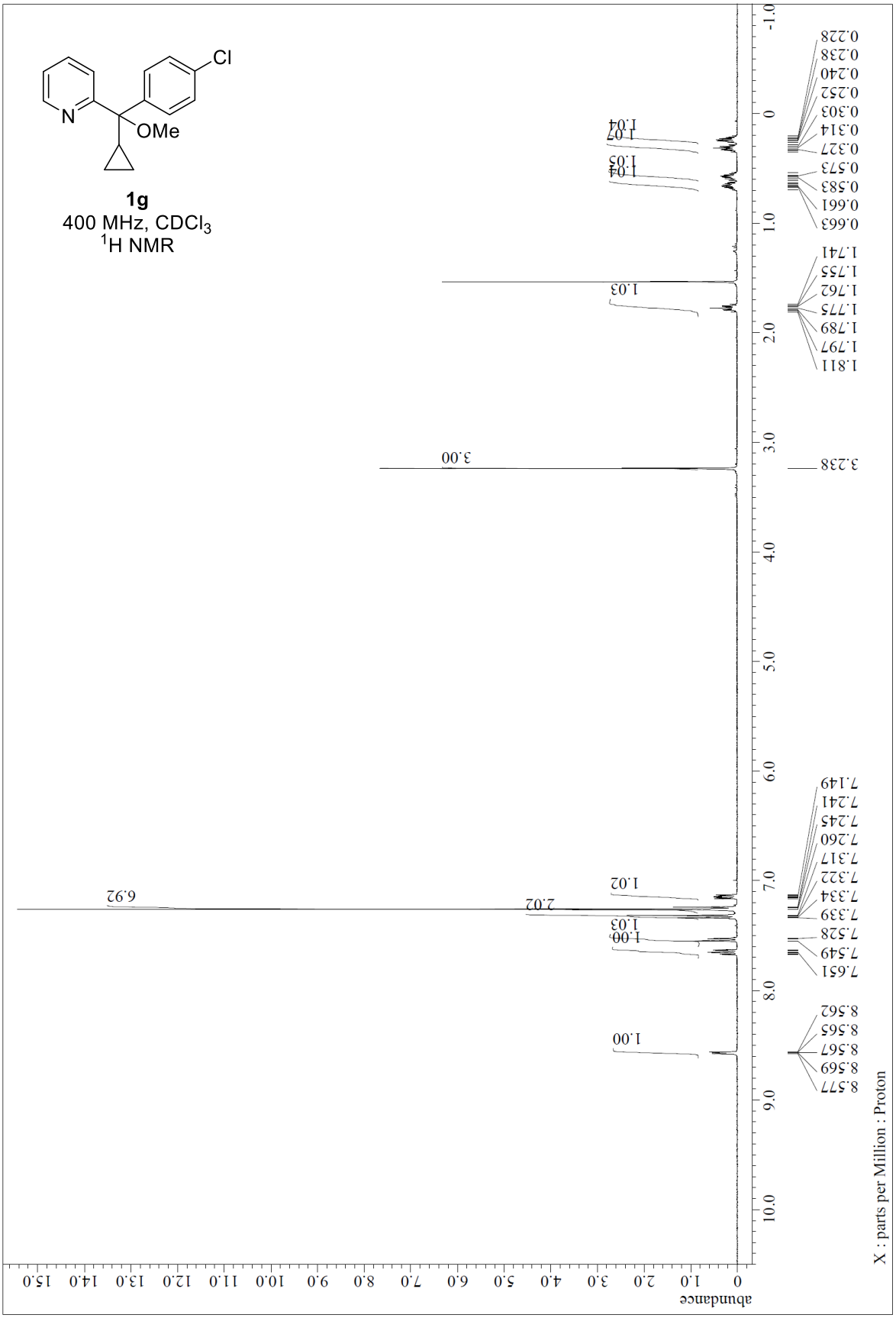

100 MHz, CDCl3
13C NMR
N
O
3.183
10.105
70.860
76.685
77.000
77.324
114.652
119.867
124.349
126.008
126.446
130.336
137.869
139.671
160.761
X : parts per Million : Carbon13
abundance

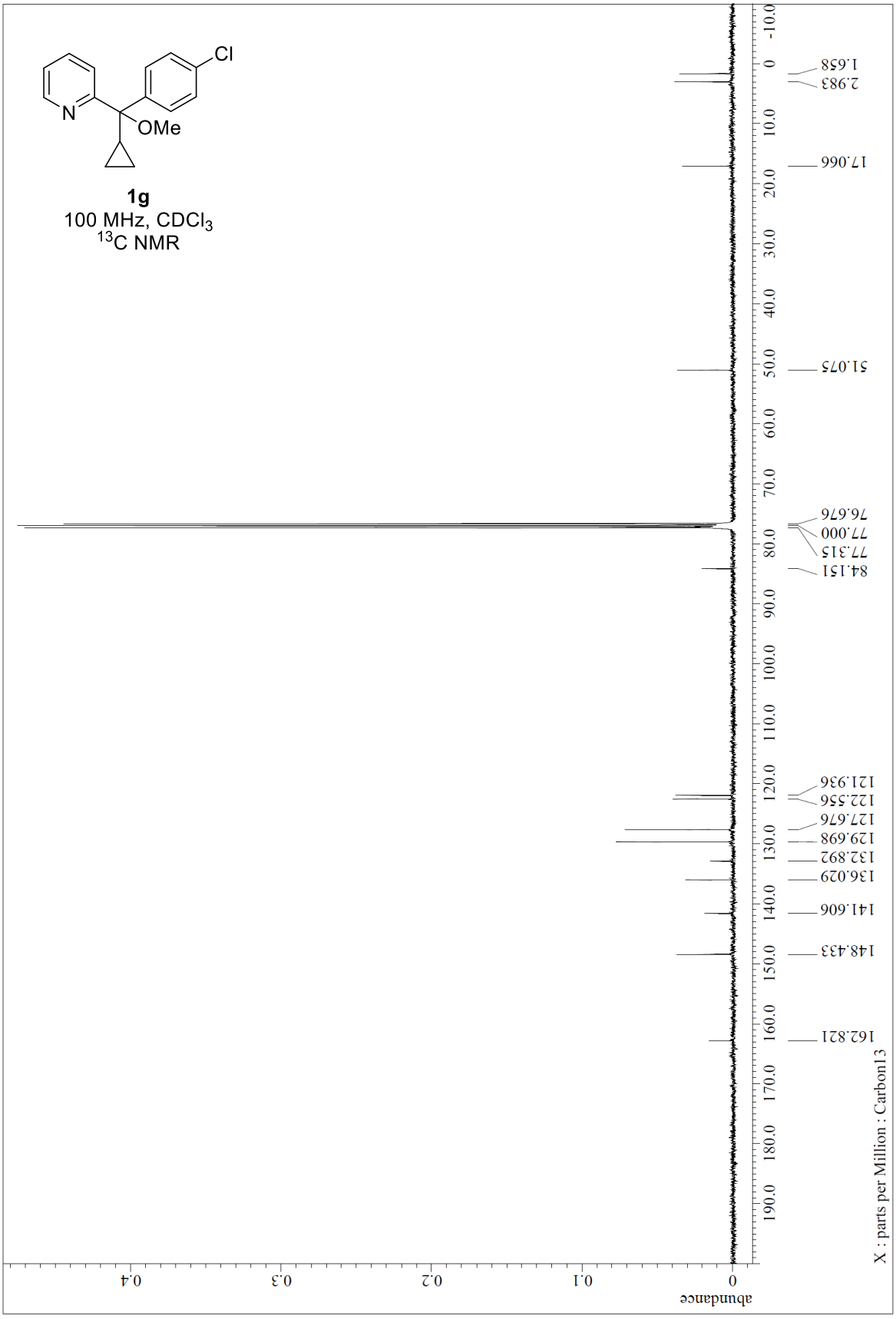

1c
400 MHz, CDCl3
1H NMR
N
O
2.03
2.01
0.98
3.00
2.01
1.02
1.03
1.00
7.966
7.962
7.953
7.950
7.359
7.356
7.260
6.767
6.755
6.750
6.738
4.163
4.145
2.210
1.309
1.291
1.279
1.271
0.592
0.589
0.577
0.573
0.568
0.558
0.555
0.547
0.344
abundance
X : parts per Million : Proton

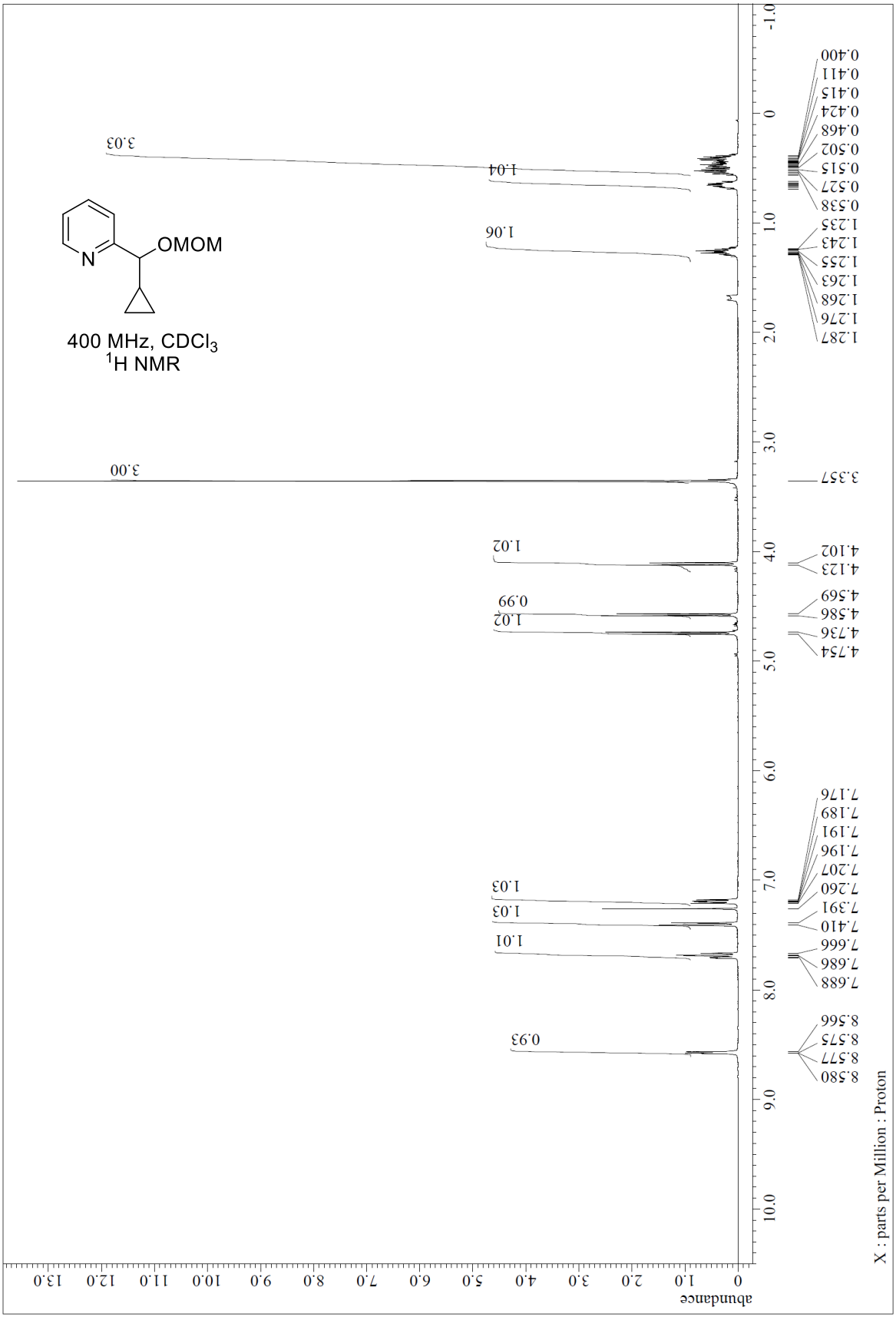

1c
100 MHz, CDCl3
13C NMR
3.031
10.201
15.931
70.259
76.676
77.000
77.315
116.330
120.840
138.307
143.895
162.334
X : parts per Million : Carbon13
abundance

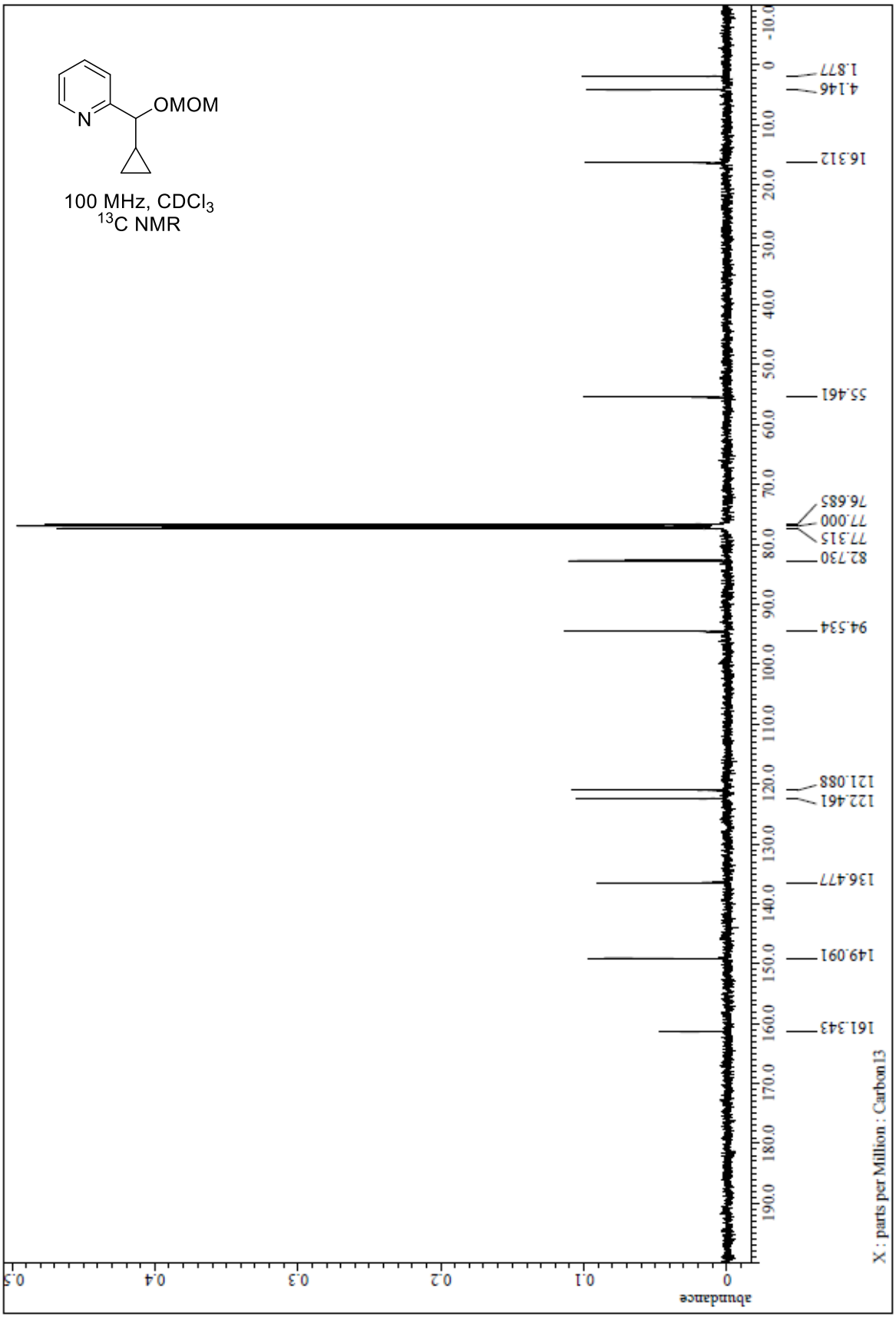

N
O
Me
1e
400 MHz, CDCl3
1H NMR
abundance
X : parts per Million : Proton

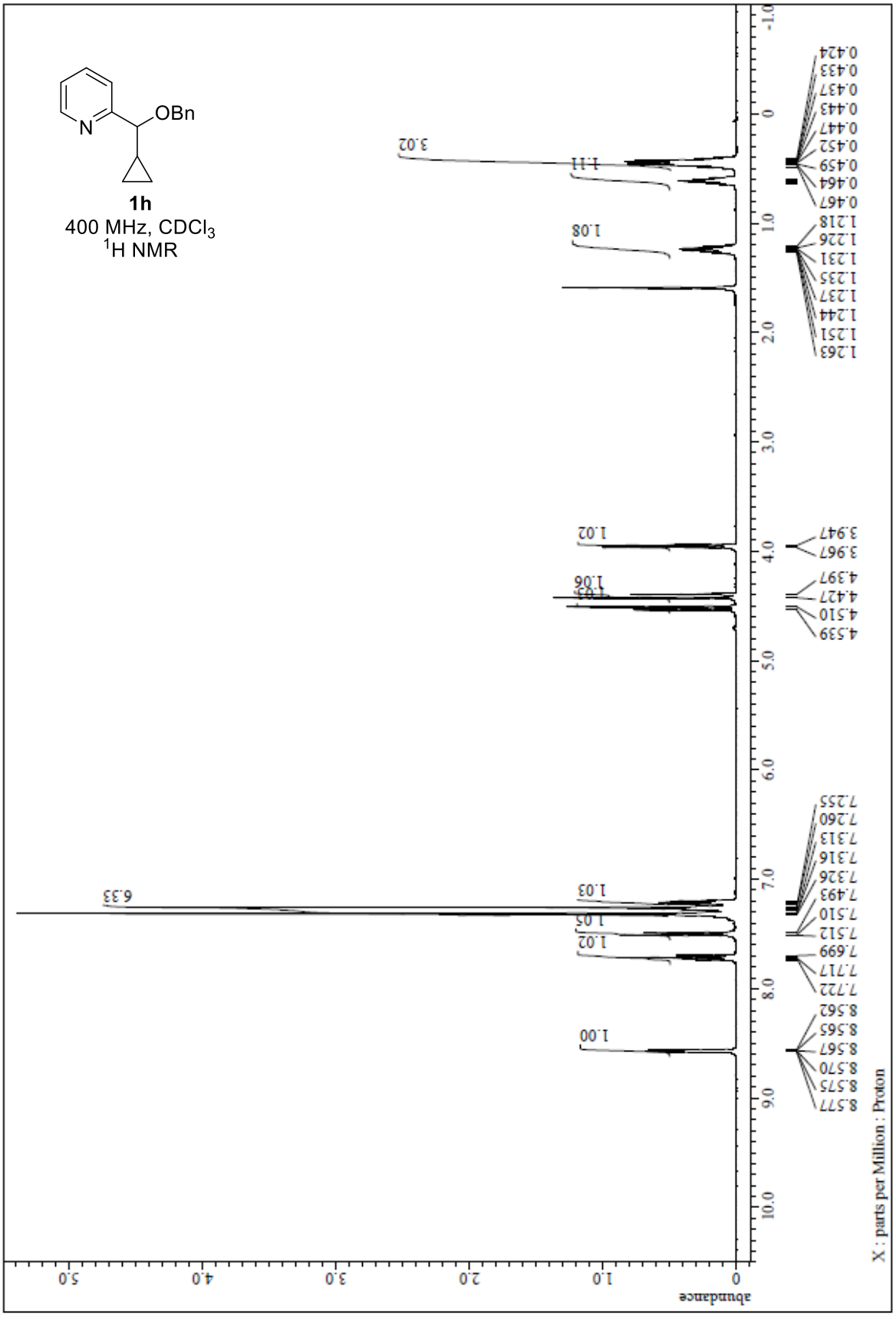

1e
100 MHz, CDCl3
13C NMR
Me
N
O
11.269
15.426
21.080
73.653
76.676
77.000
77.315
111.153
116.454
138.431
146.745
164.270
X : parts per Million : Carbon13
abundance

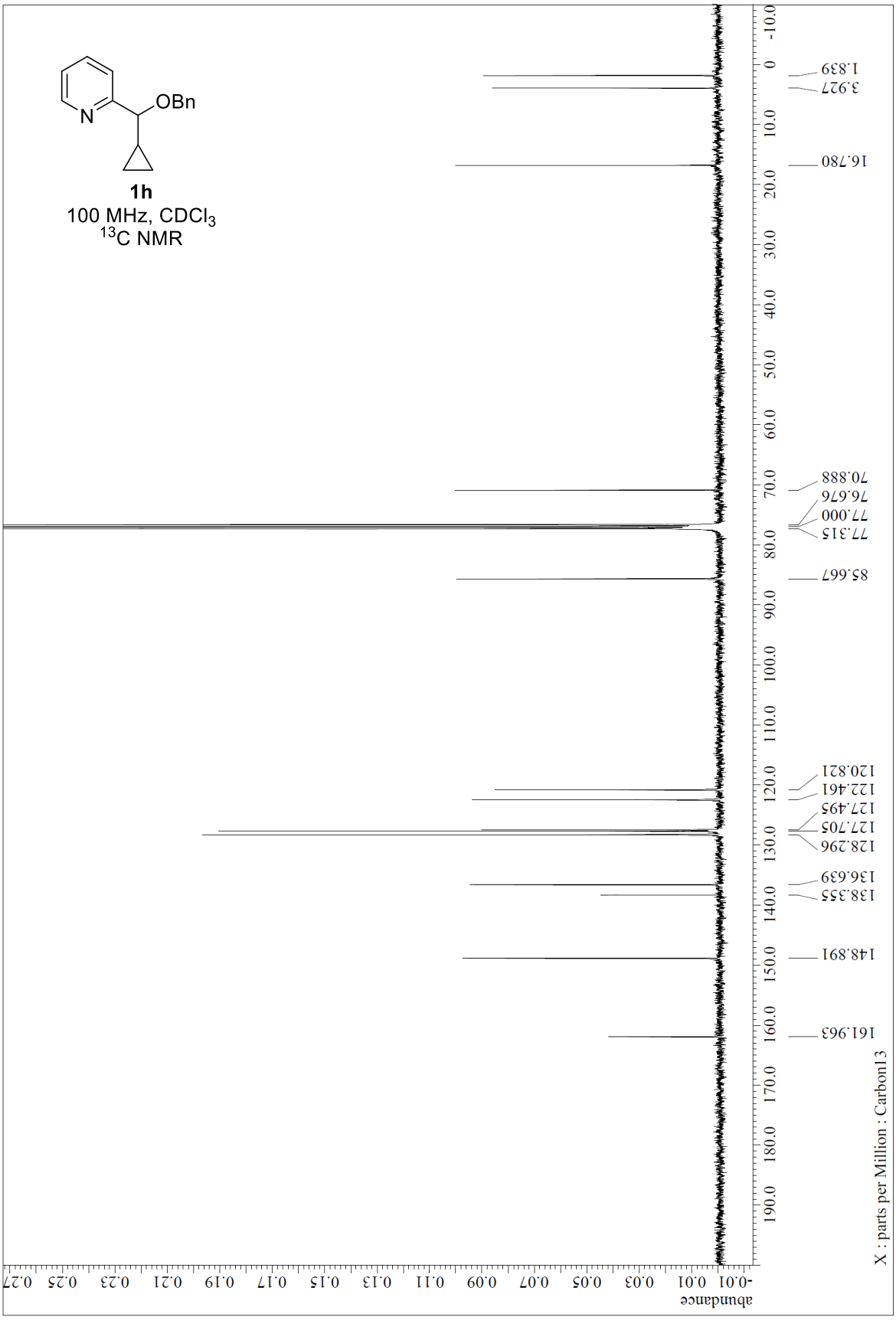

Cl
N
OMe
1g
400 MHz, CDCl3
1H NMR
X : parts per Million : Proton
abundance

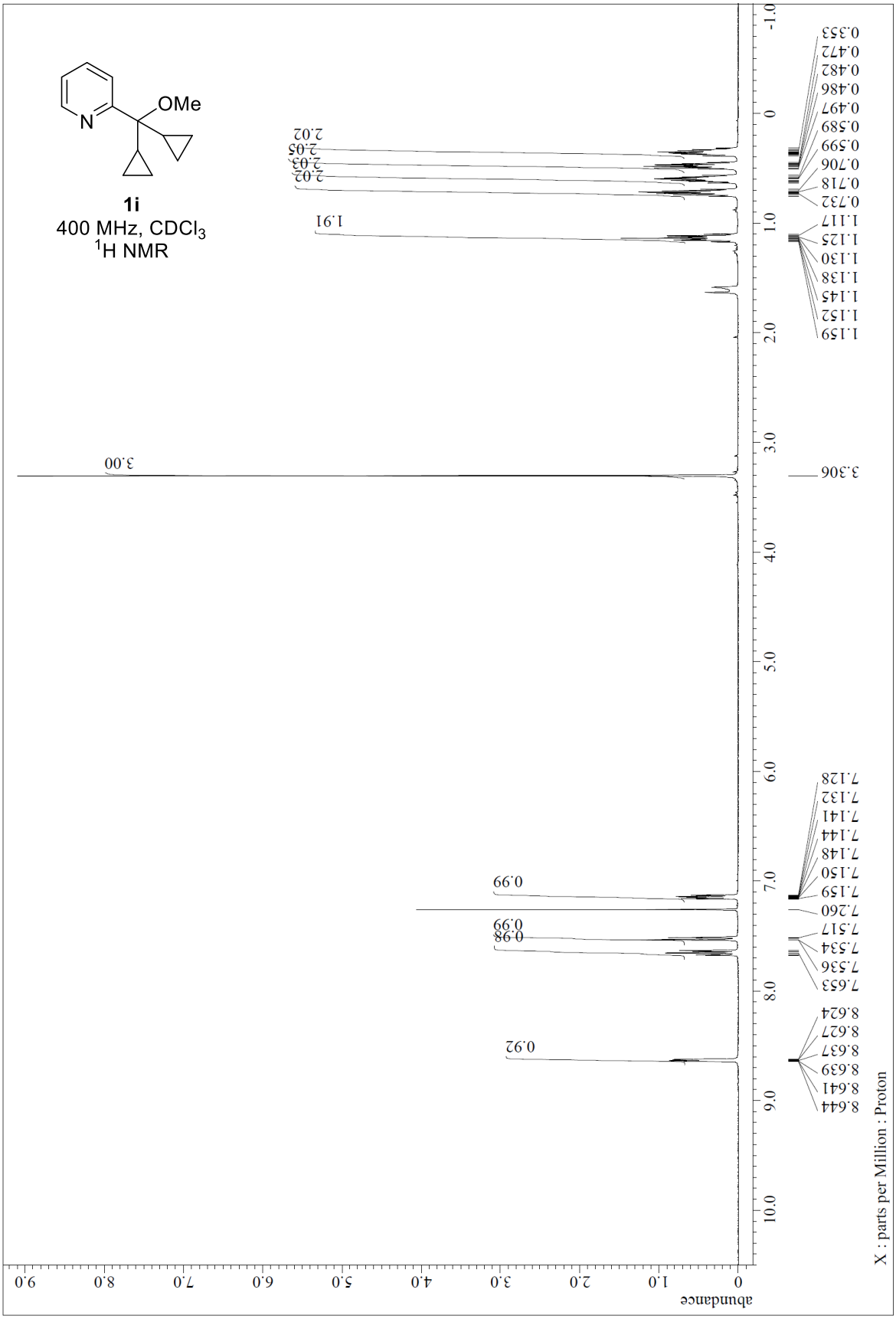

Cl
N
OMe
1g
100 MHz, CDCl3
13C NMR
1.658
2.983
17.066
51.075
76.676
77.000
77.315
84.151
121.936
122.556
127.676
129.698
132.892
136.029
141.606
148.433
162.821
X : parts per Million : Carbon13
abundance

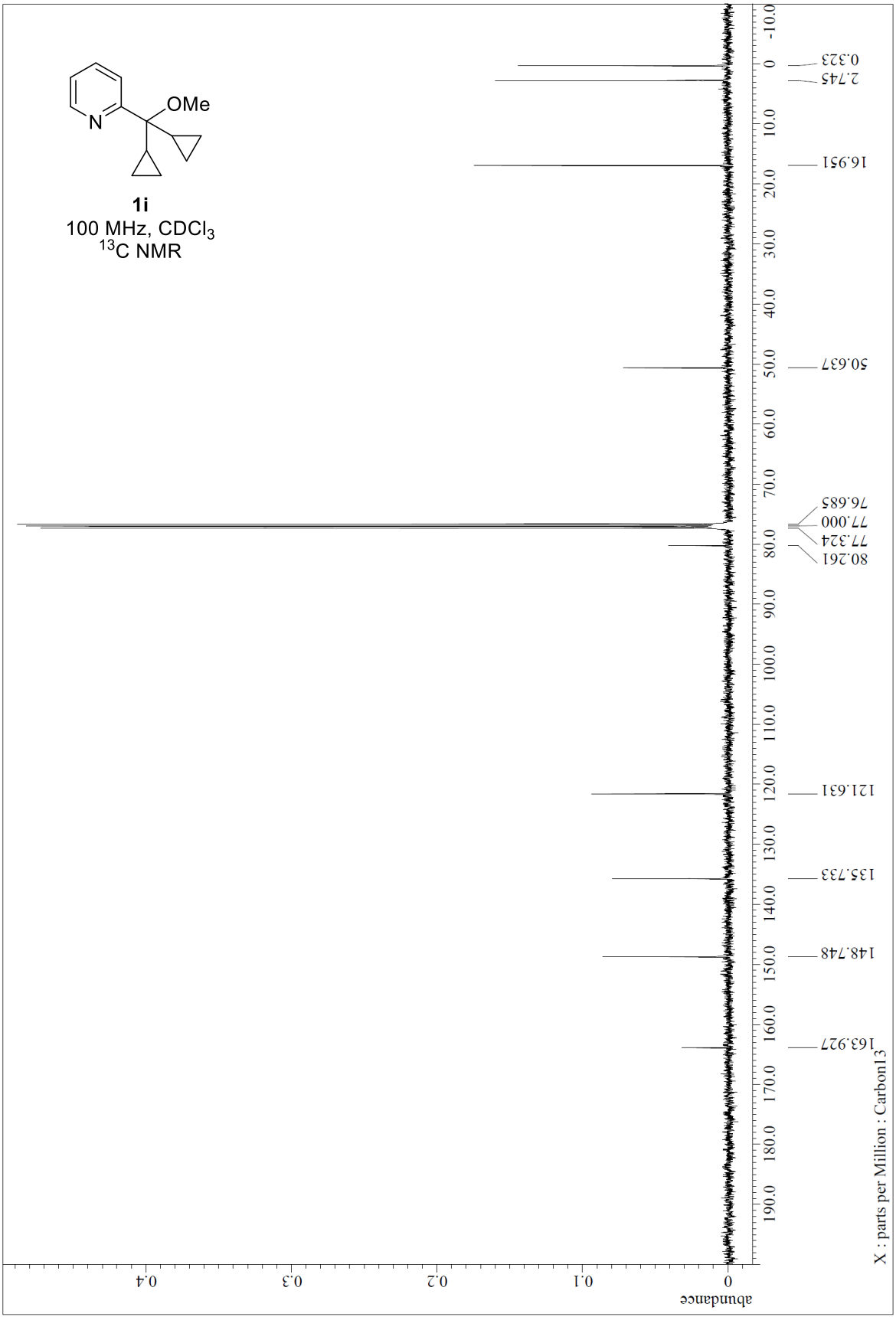

OMOM
N
400 MHz, CDCl3
1H NMR
X : parts per Million : Proton
abundance

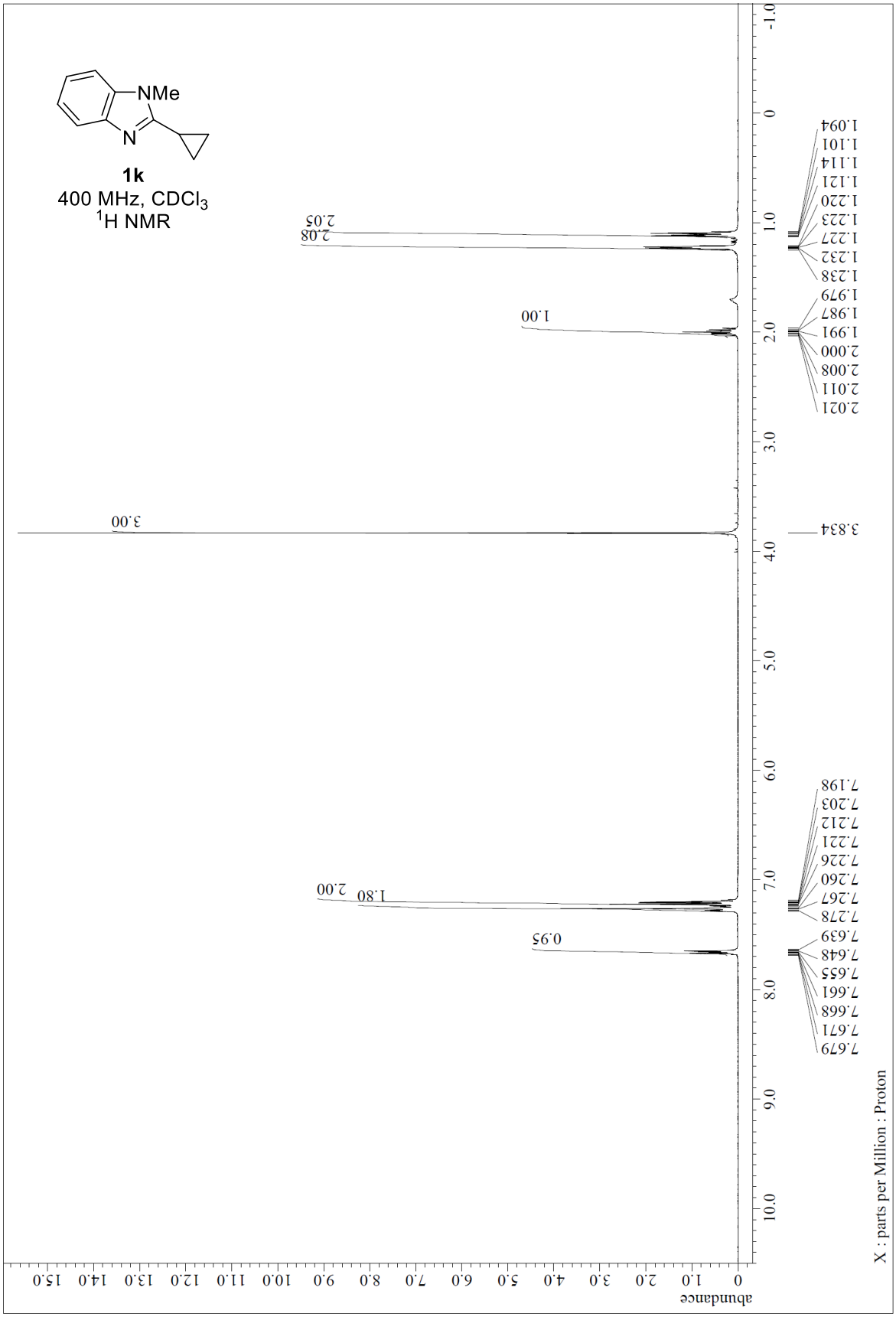

OMOM
N
100 MHz, CDCl3
13C NMR
1.877
4.146
16.312
55.461
76.685
77.000
77.315
82.730
94.534
121.088
122.461
136.477
149.091
161.343
X : parts per Million : Carbon13
abundance

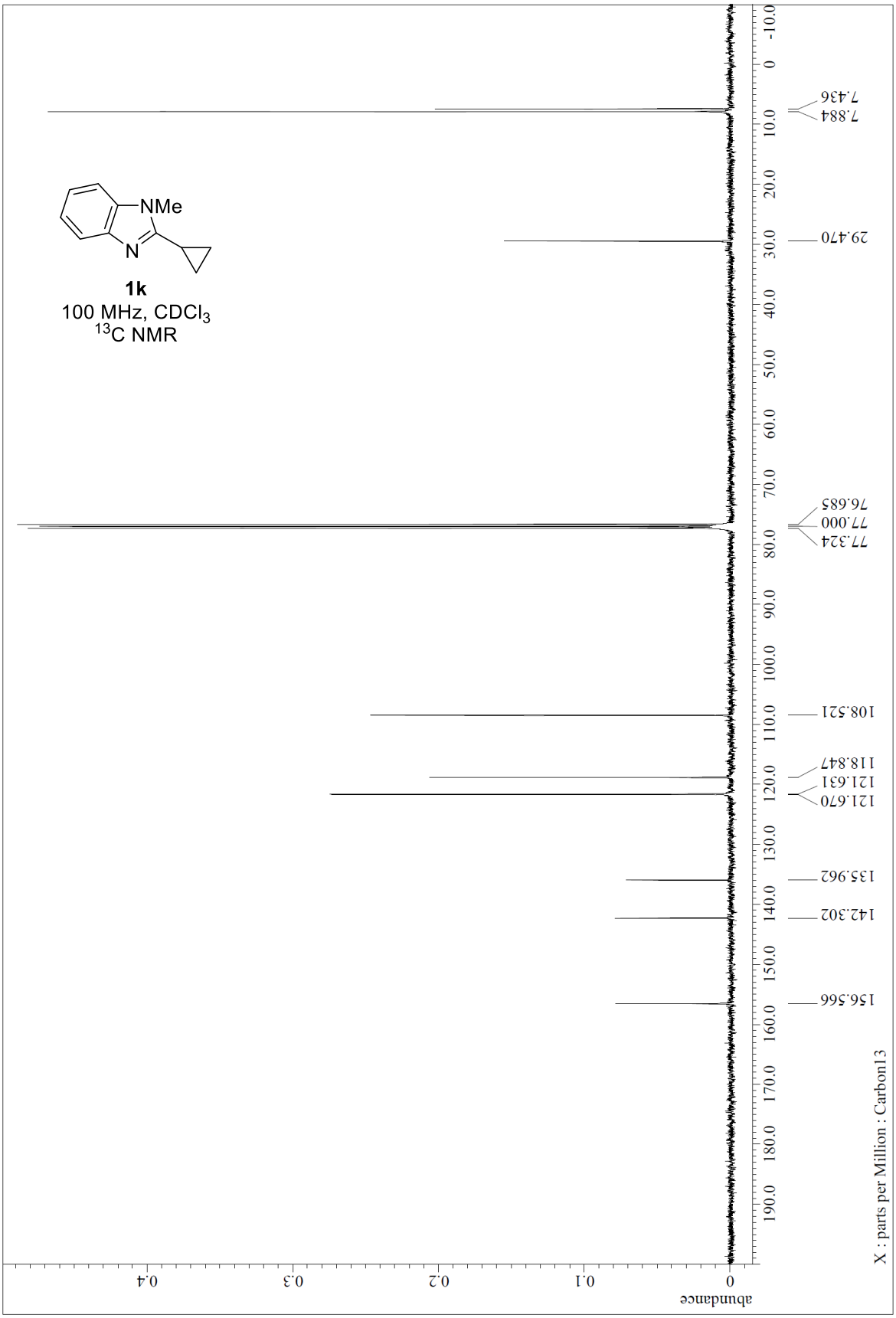

OBn
N
1h
400 MHz, CDCl3
1H NMR
X : parts per Million : Proton
abundance

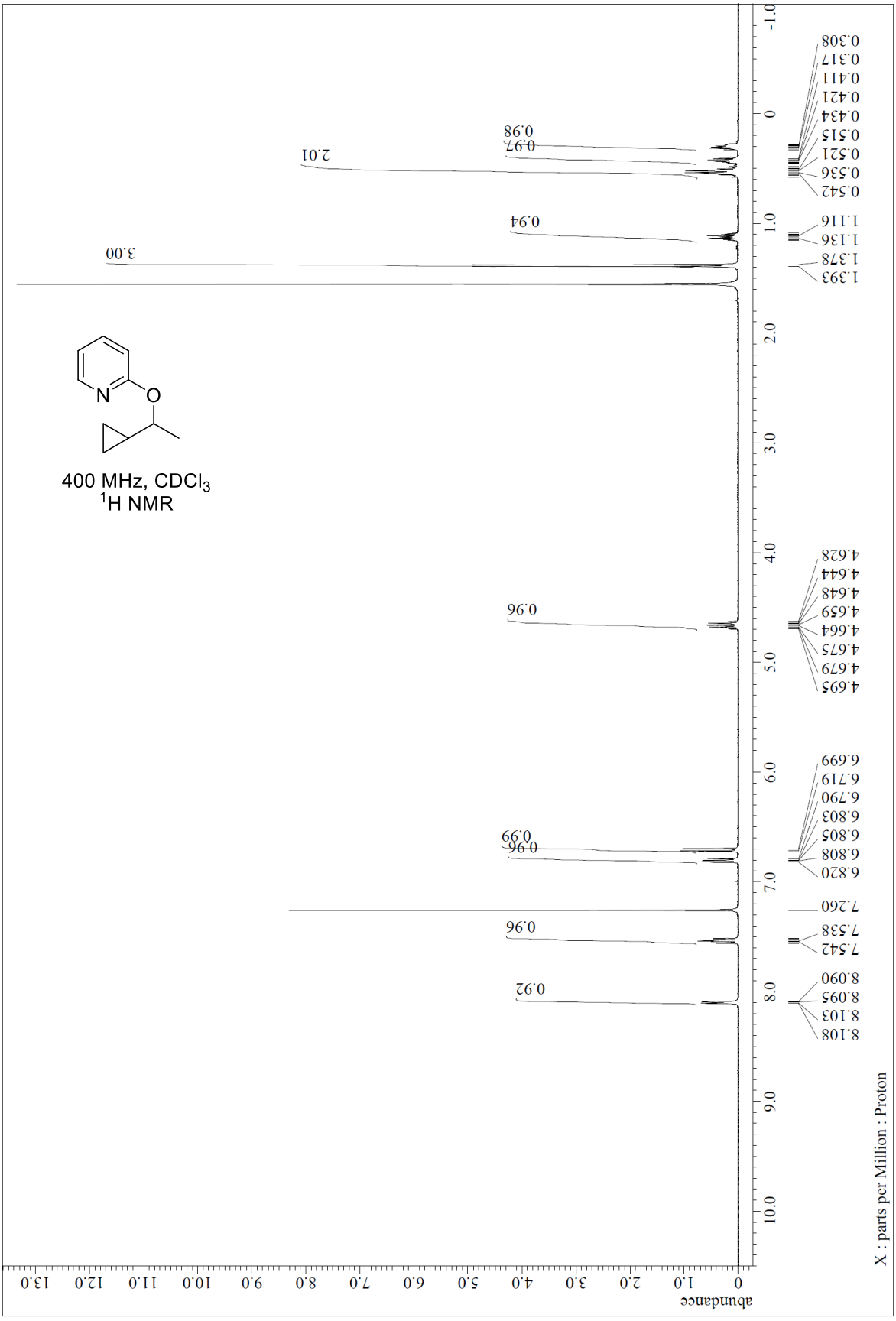

OBn
N
1h
100 MHz, CDCl3
13C NMR
1.839
3.927
16.780
70.888
76.676
77.000
77.315
85.667
120.821
122.461
127.495
127.705
128.296
136.639
138.355
148.891
161.963
X : parts per Million : Carbon13
abundance

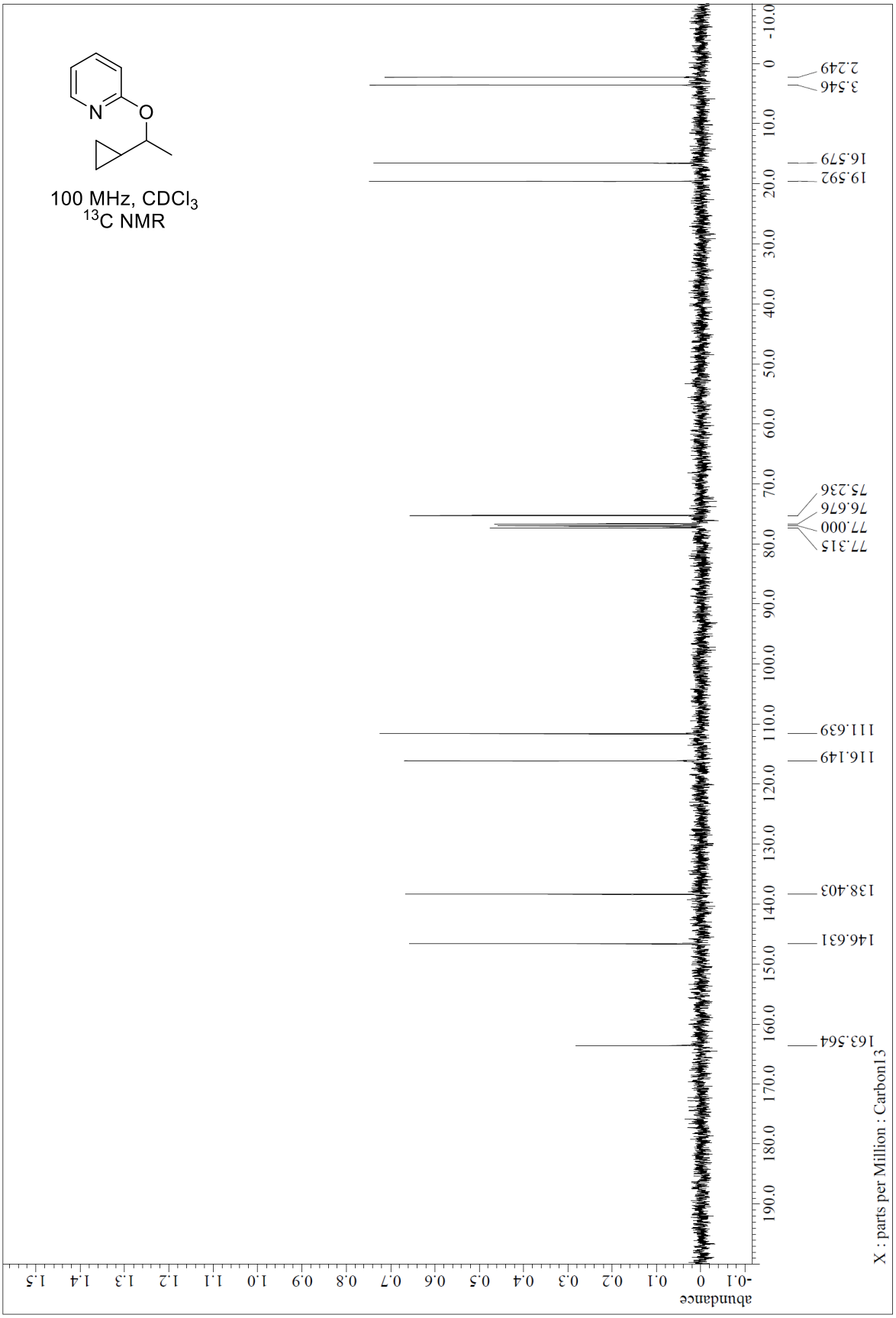

OMe
N
1i
400 MHz, CDCl3
1H NMR
X : parts per Million : Proton
abundance

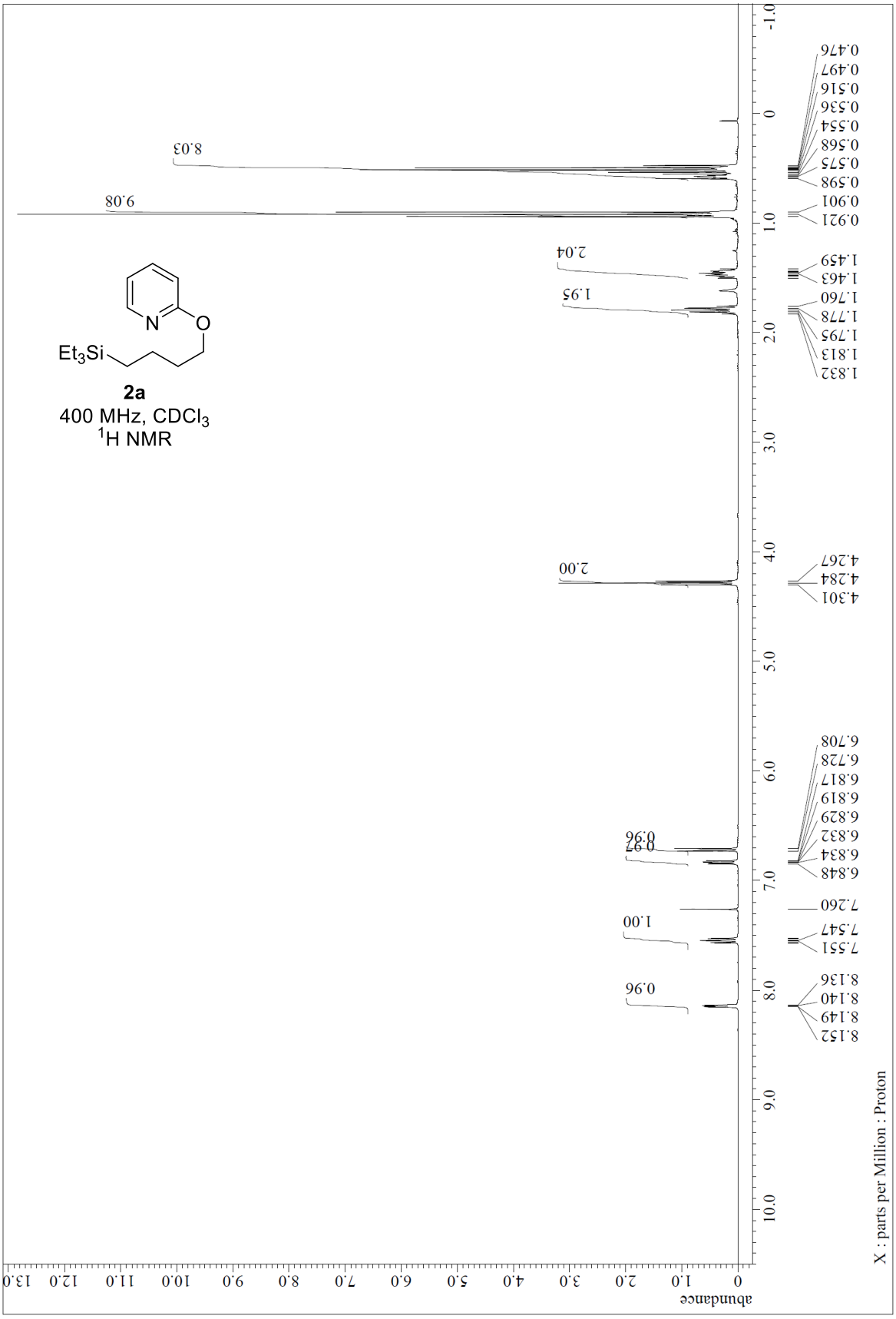

OMe
N
1i
100 MHz, CDCl3
13C NMR
0.323
2.745
16.951
50.637
76.685
77.000
77.324
80.261
121.631
135.733
148.748
163.927
X : parts per Million : Carbon13
abundance

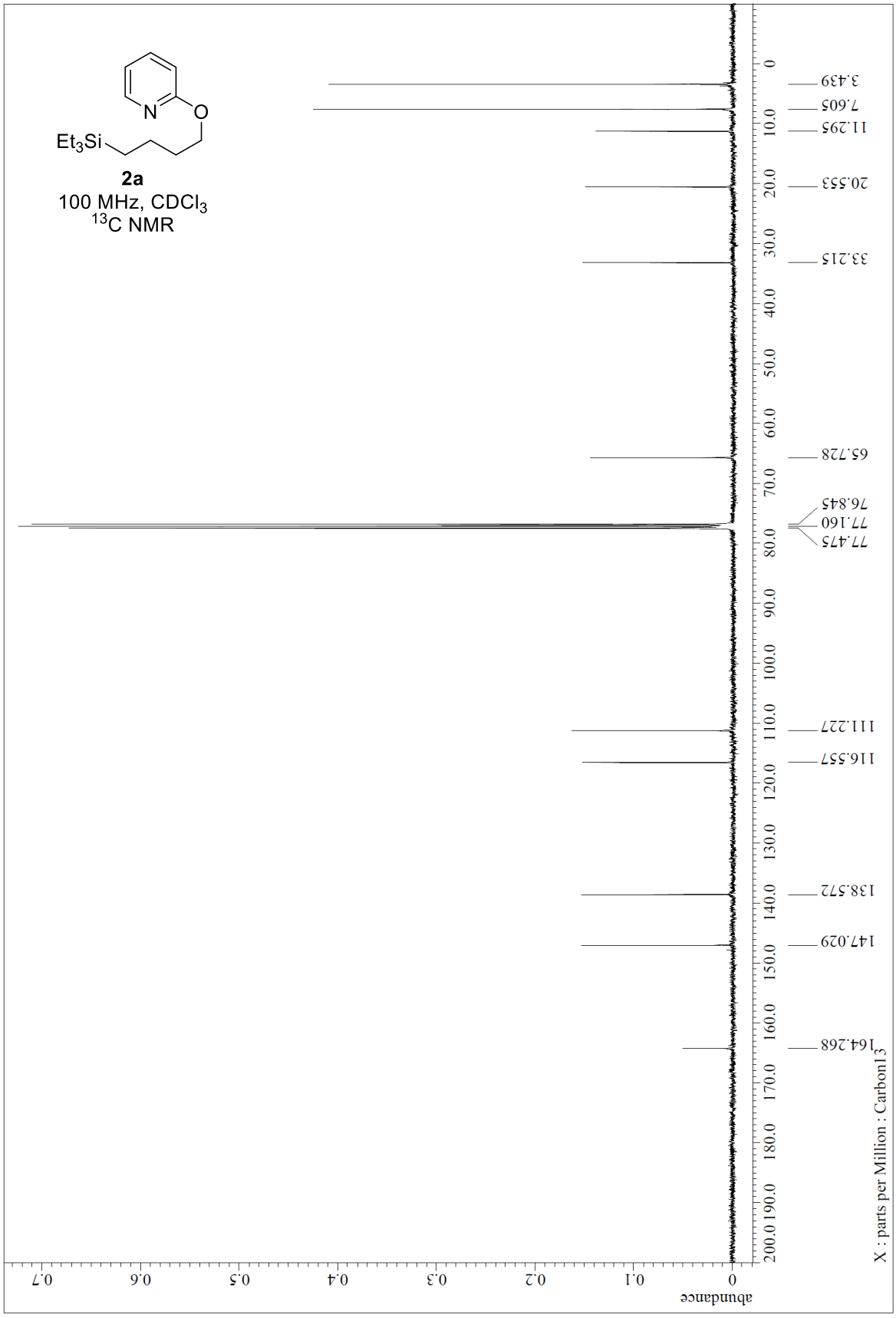

NMe
N
1k
400 MHz, CDCl3
1H NMR
abundance
X : parts per Million : Proton
3.00
2.08
2.05
1.00
1.80
2.00
0.95
3.834

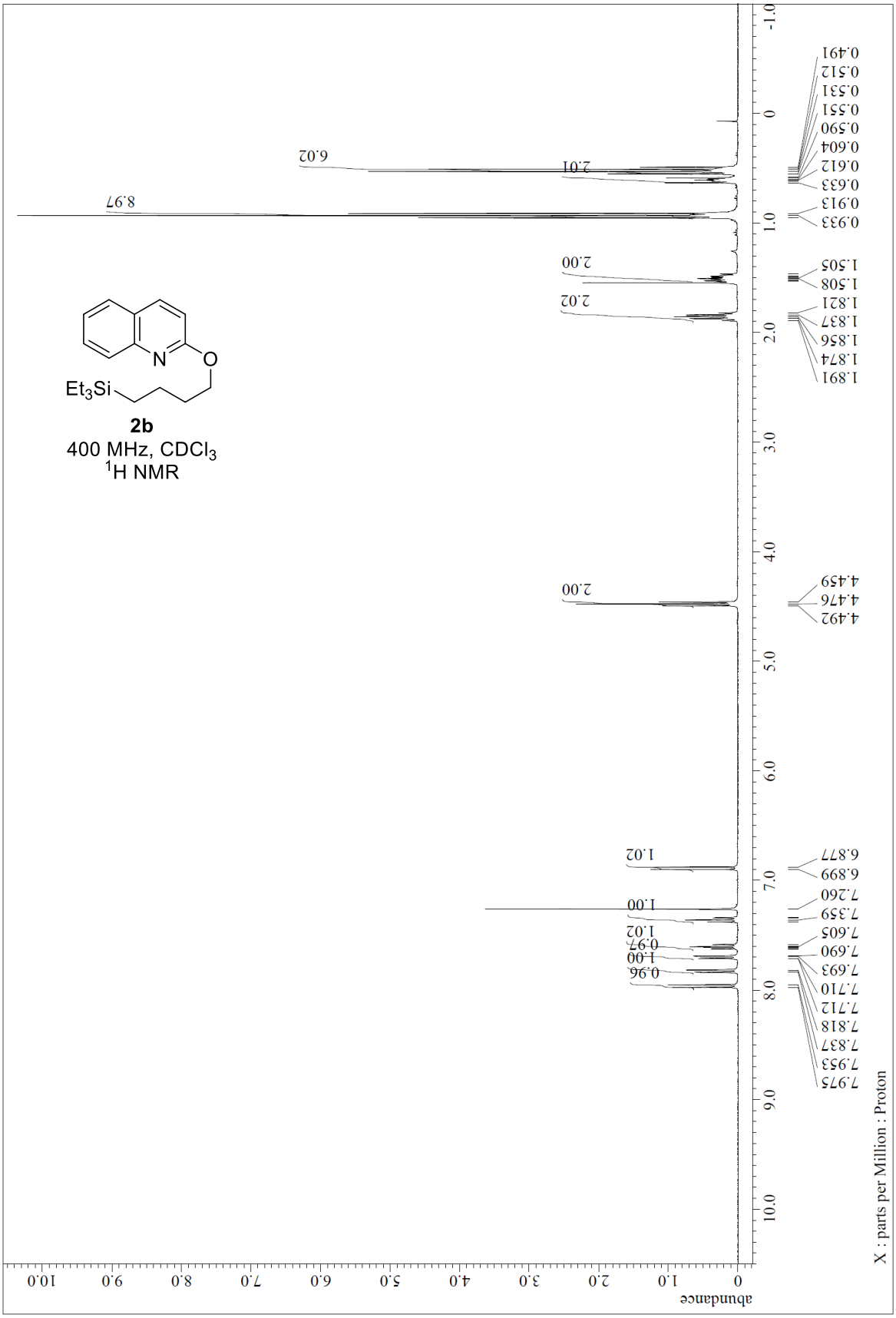

NMe
N
1k
100 MHz, CDCl3
13C NMR
7.436
7.884
29.470
76.685
77.000
77.324
108.521
118.847
121.631
121.670
135.962
142.302
156.566
X : parts per Million : Carbon13
abundance

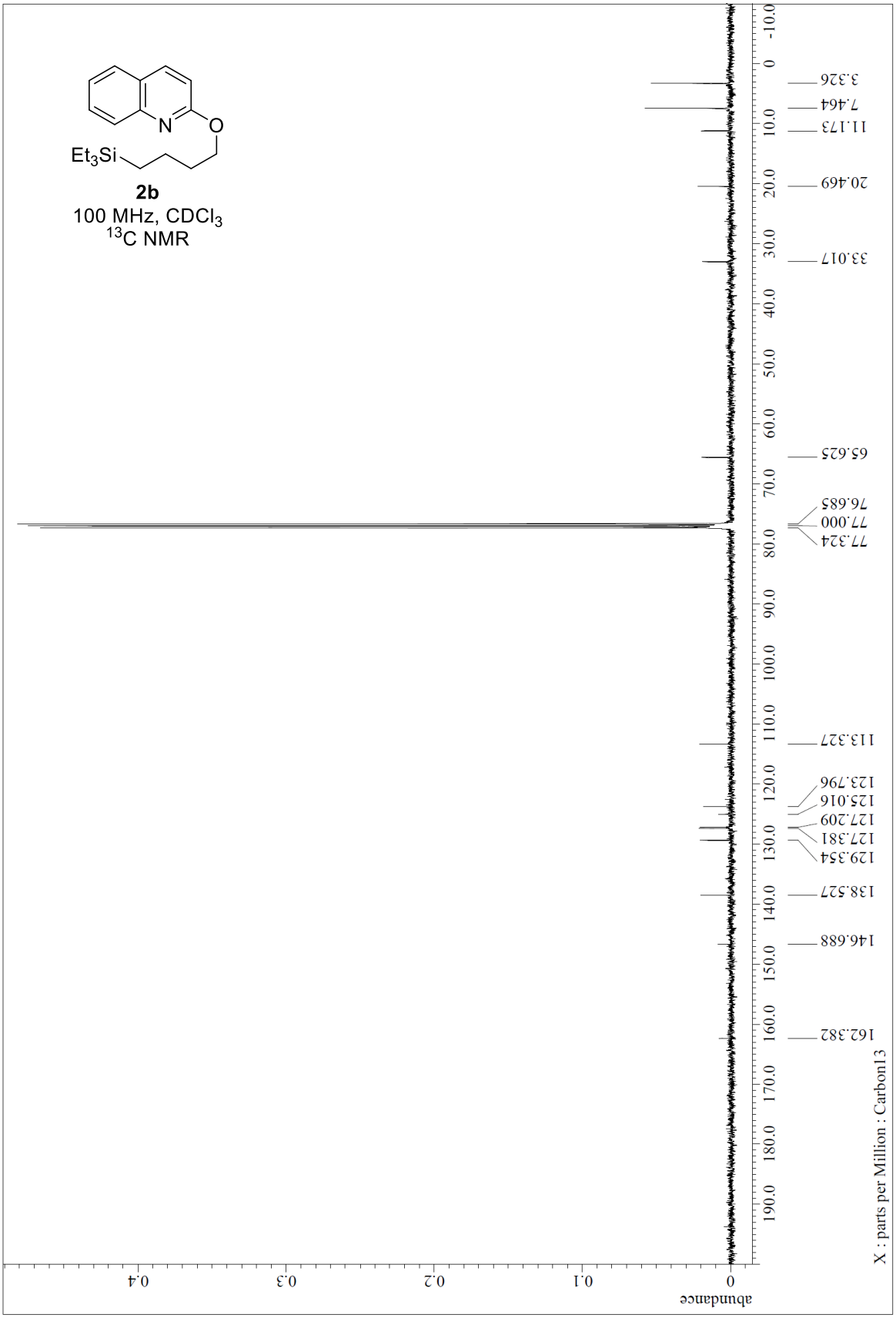

400 MHz, CDCl3
1H NMR
N
O
X : parts per Million : Proton
abundance

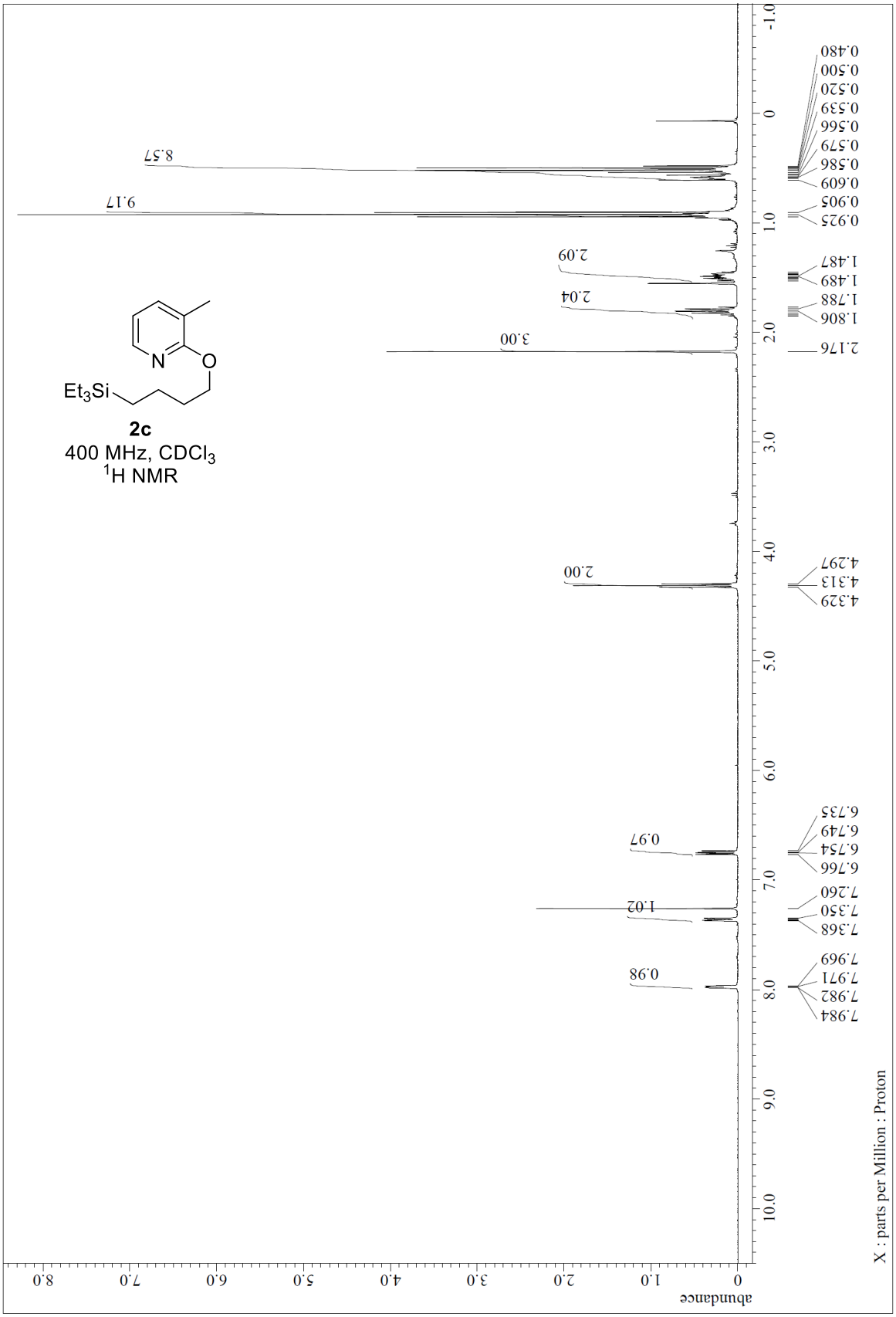

100 MHz, CDCl3
13C NMR
2.249
3.546
16.579
19.592
75.236
76.676
77.000
77.315
111.639
116.149
138.403
146.631
163.564
X : parts per Million : Carbon13
abundance

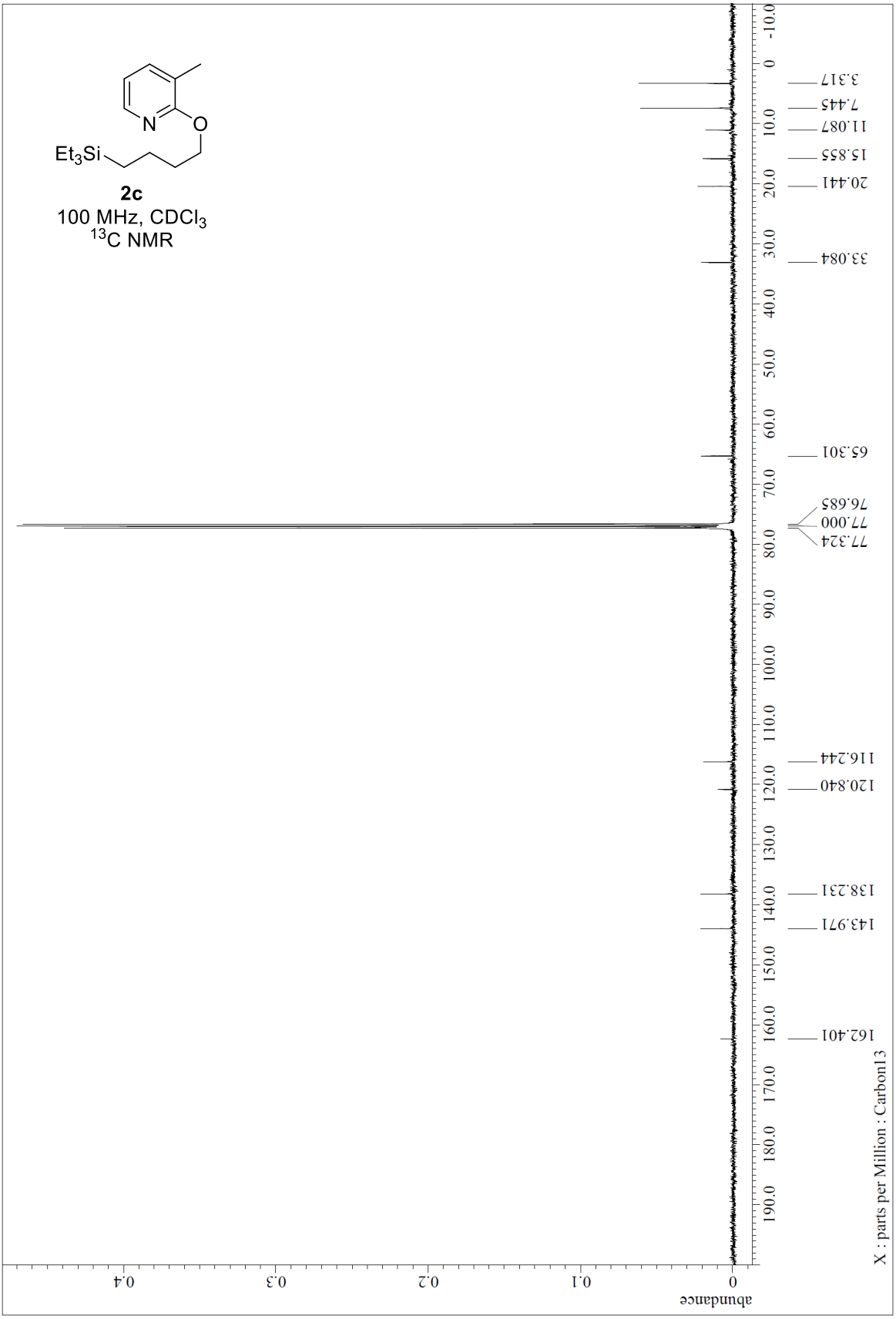

Et3Si
O
N
2a
400 MHz, CDCl3
1H NMR
X : parts per Million : Proton
abundance

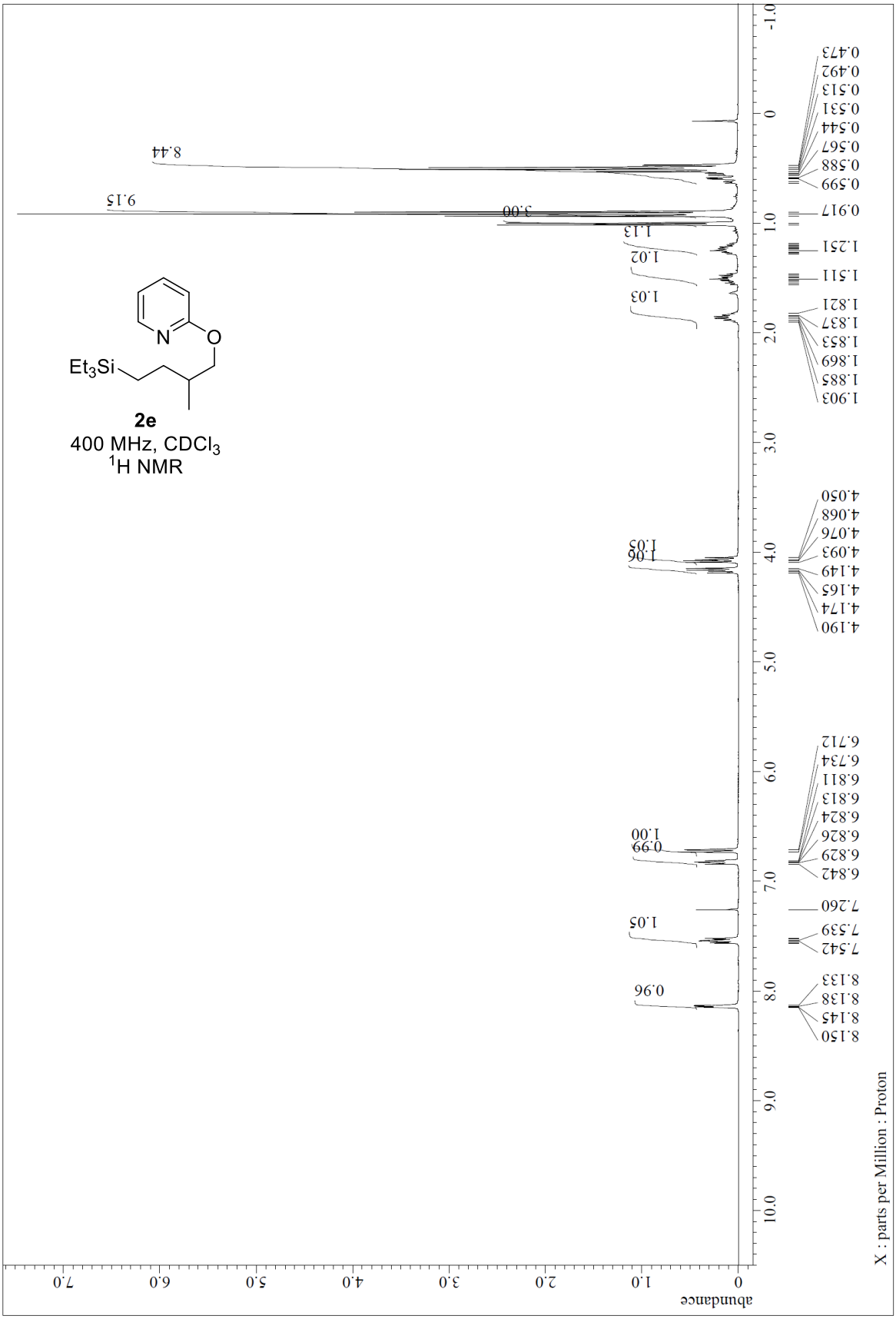

Et3Si
N
O
2a
100 MHz, CDCl3
13C NMR
3.439
7.605
11.295
20.553
33.215
65.728
76.845
77.160
77.475
111.227
116.557
138.572
147.029
164.268
X : parts per Million : Carbon13
abundance

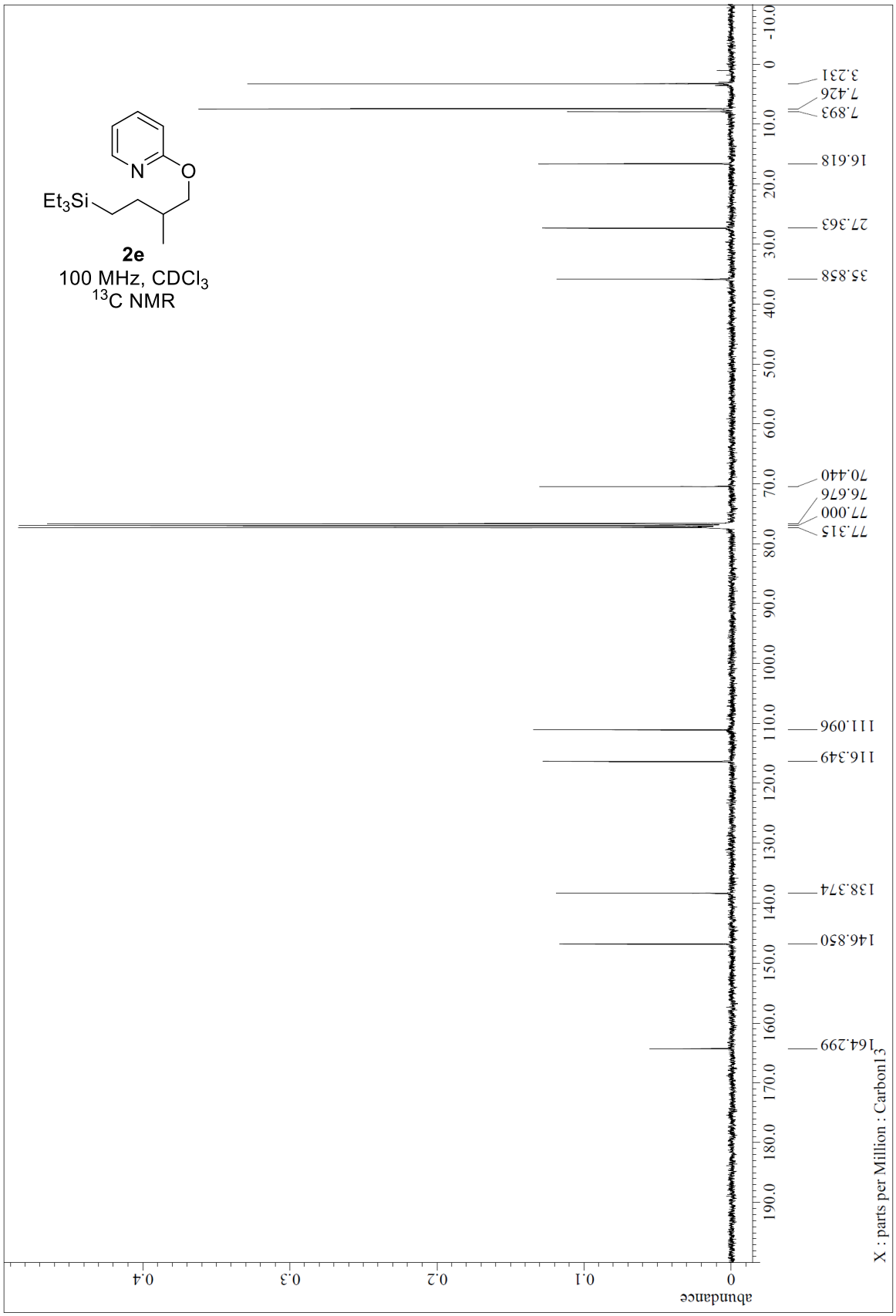

Et3Si
N
O
2b
400 MHz, CDCl3
1H NMR
X : parts per Million : Proton
abundance

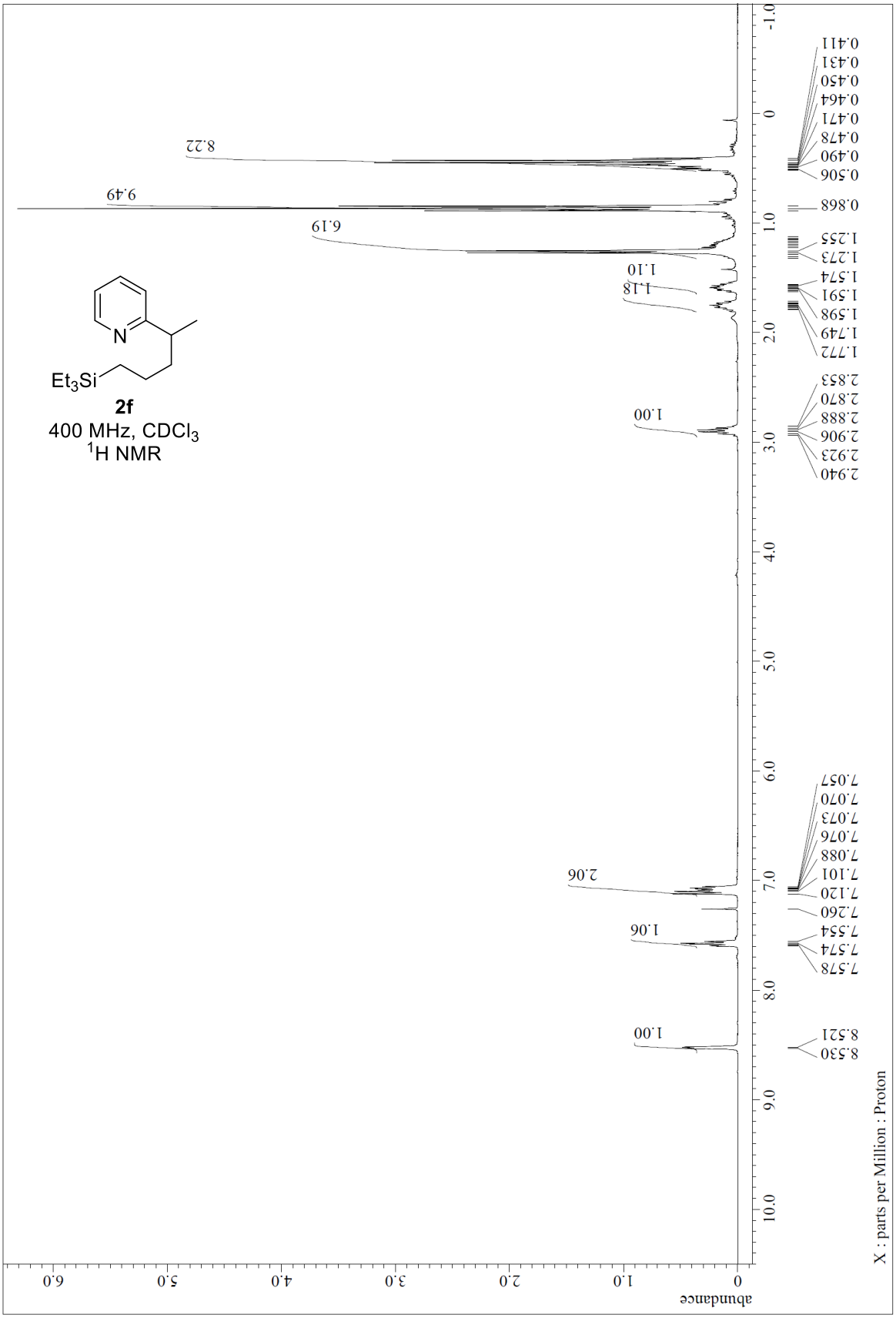

Et3Si
2b
100 MHz, CDCl3
13C NMR
3.326
7.464
11.173
20.469
33.017
65.625
76.685
77.000
77.324
113.327
123.796
125.016
127.209
127.381
129.354
138.527
146.688
162.382
X : parts per Million : Carbon13
abundance

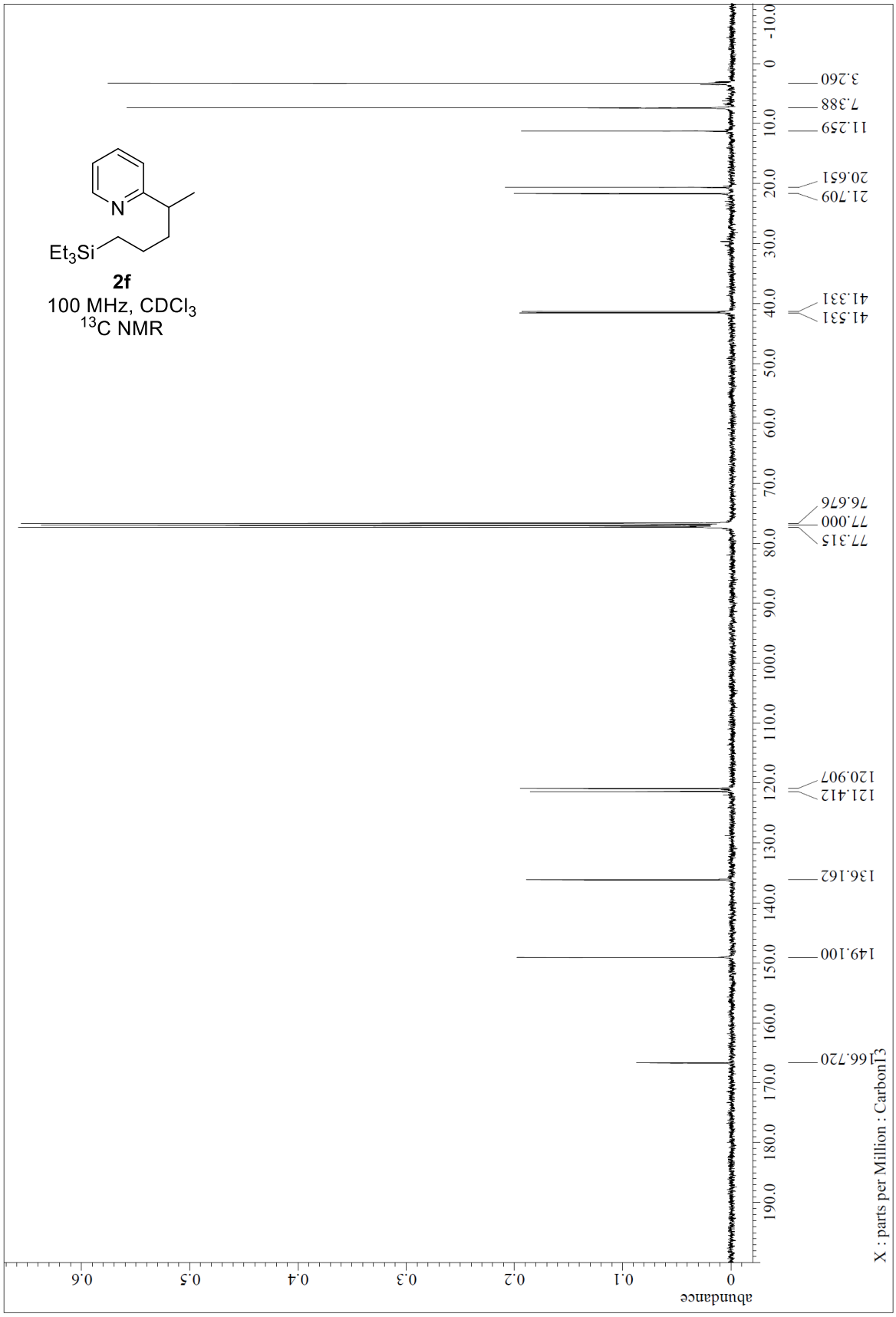

2c
400 MHz, CDCl3
1H NMR
Et3Si
N
O
X : parts per Million : Proton
abundance

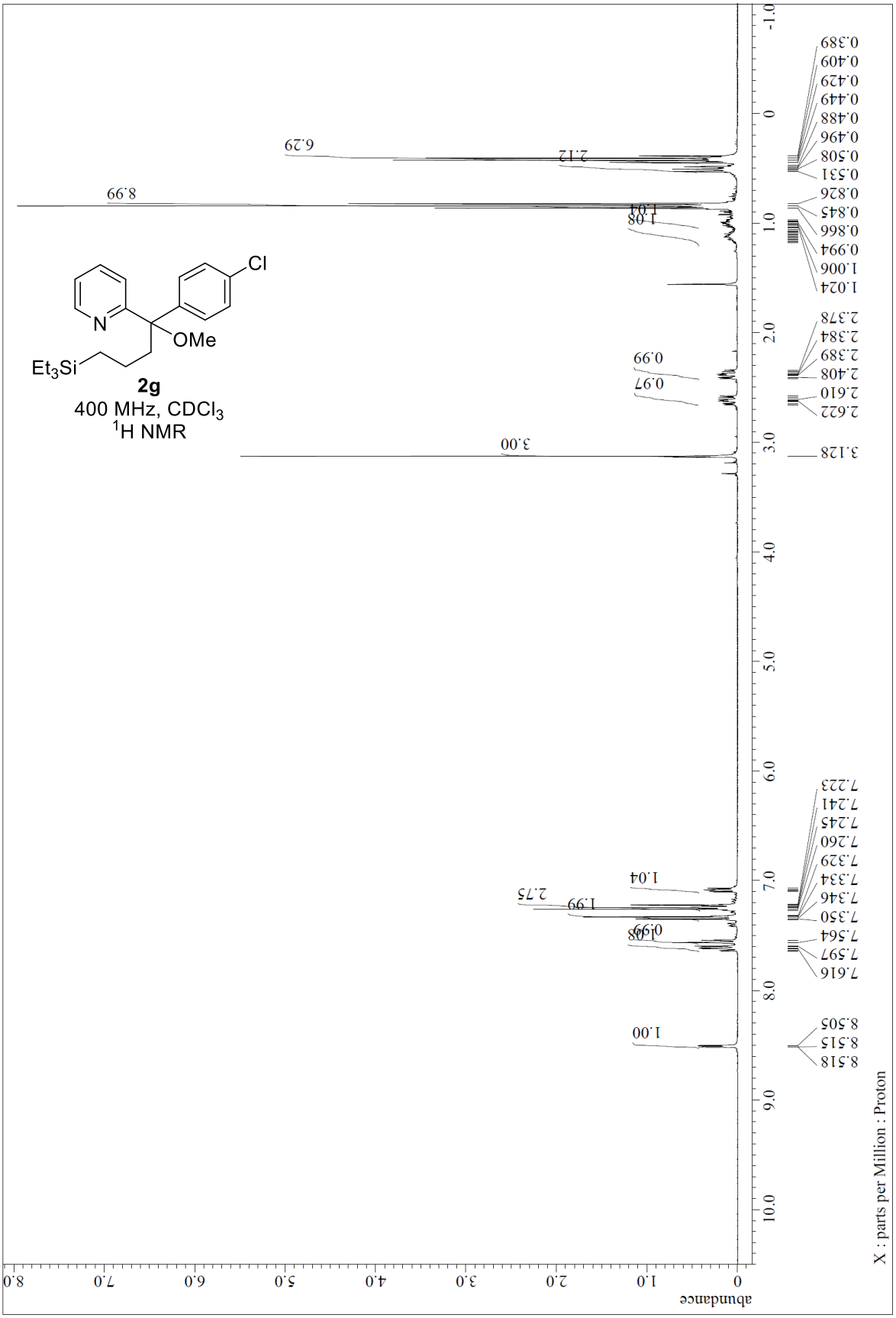

Et3Si
N
O
2c
100 MHz, CDCl3
13C NMR
3.317
7.445
11.087
15.855
20.441
33.084
65.301
76.685
77.000
77.324
116.244
120.840
138.231
143.971
162.401
X : parts per Million : Carbon13
abundance

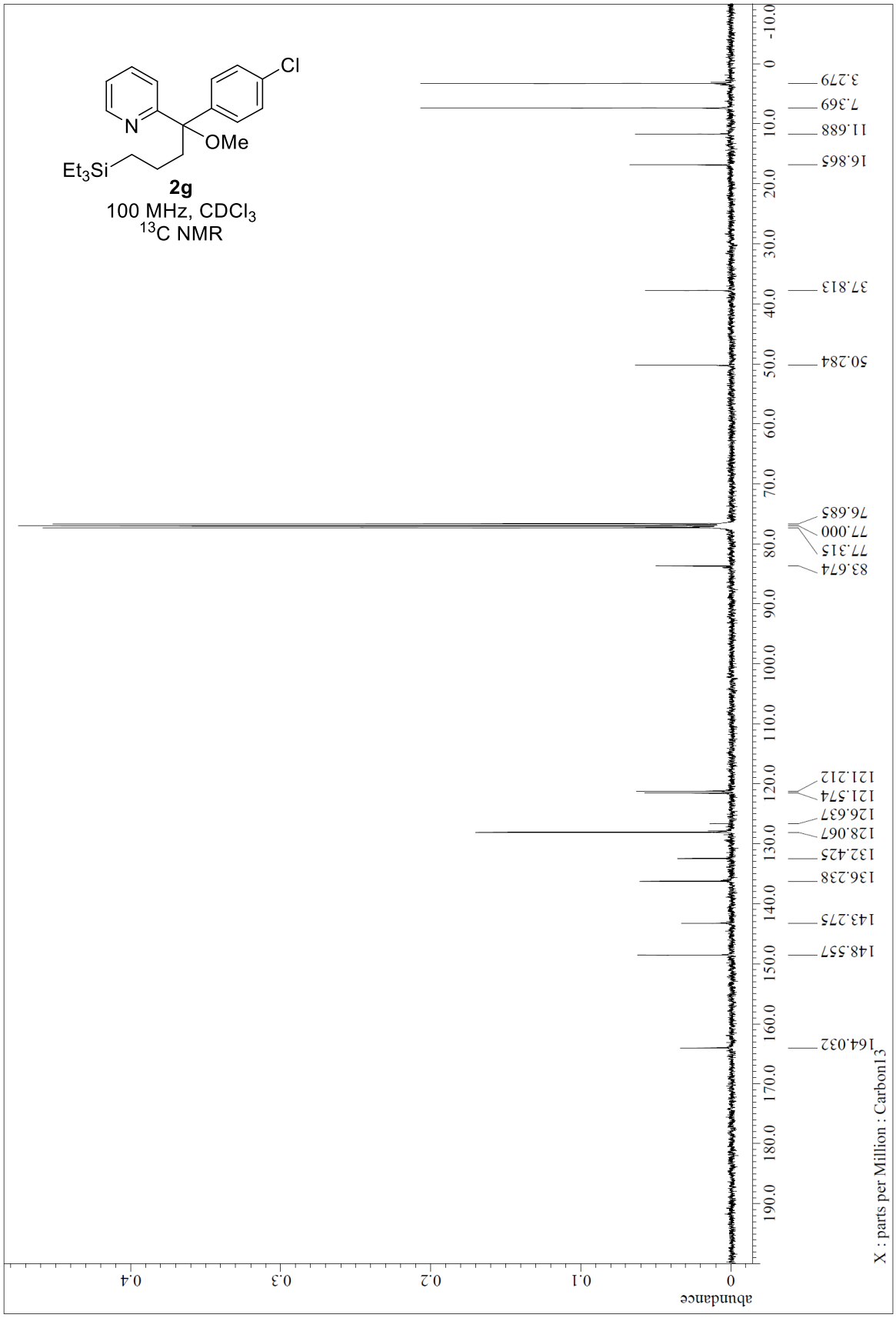

N
O
Et3Si
2e
400 MHz, CDCl3
1H NMR
X : parts per Million : Proton
abundance

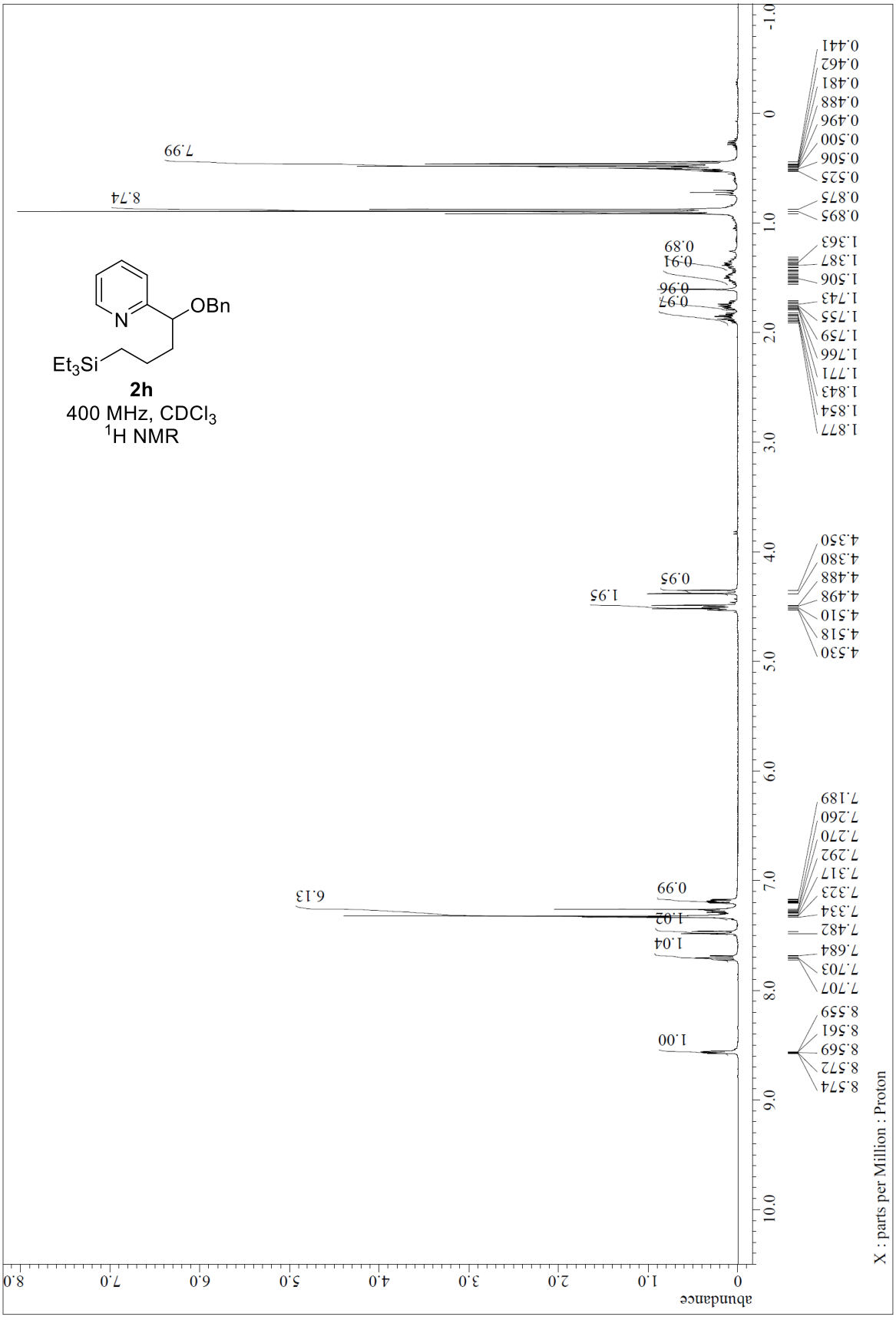

Et3Si
N
O
2e
100 MHz, CDCl3
13C NMR
3.231
7.426
7.893
16.618
27.363
35.858
70.440
76.676
77.000
77.315
111.096
116.349
138.374
146.850
164.299
X : parts per Million : Carbon13
abundance

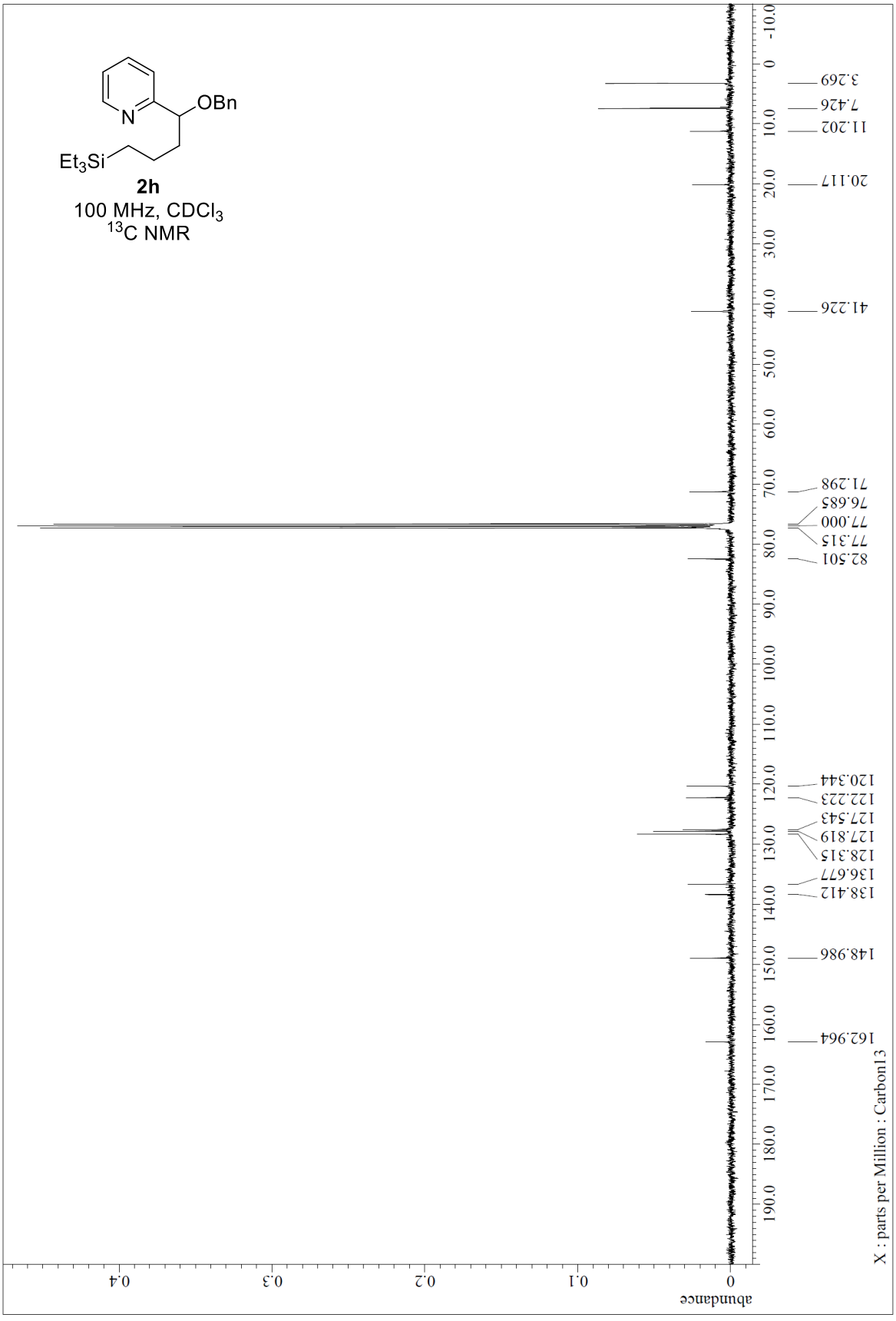

2f
400 MHz, CDCl3
1H NMR
Et3Si
N
X : parts per Million : Proton
abundance

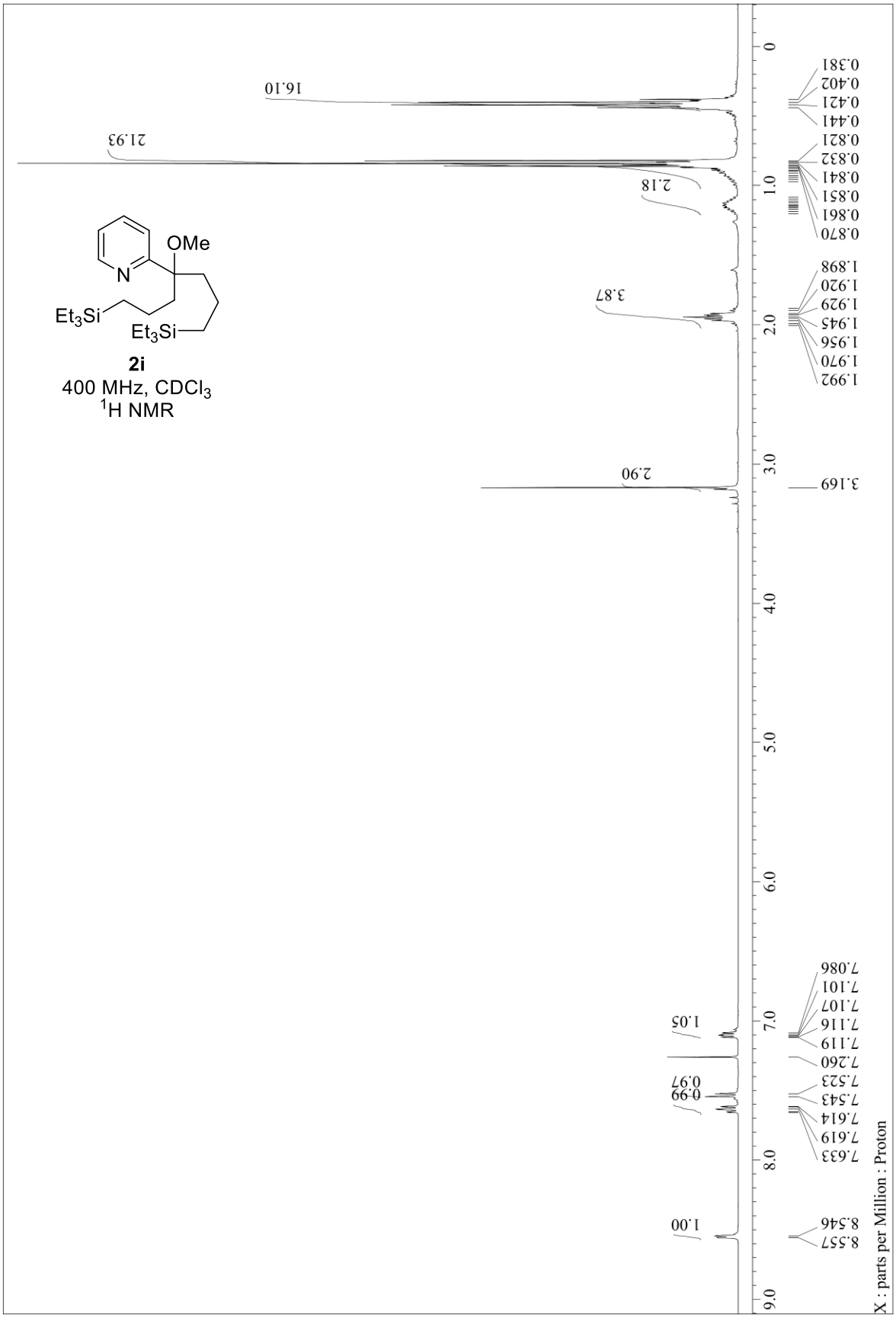

N
Et3Si
2f
100 MHz, CDCl3
13C NMR
3.260
7.388
11.259
20.651
21.709
41.331
41.531
76.676
77.000
77.315
120.907
121.412
136.162
149.100
166.720
X : parts per Million : Carbon13
abundance

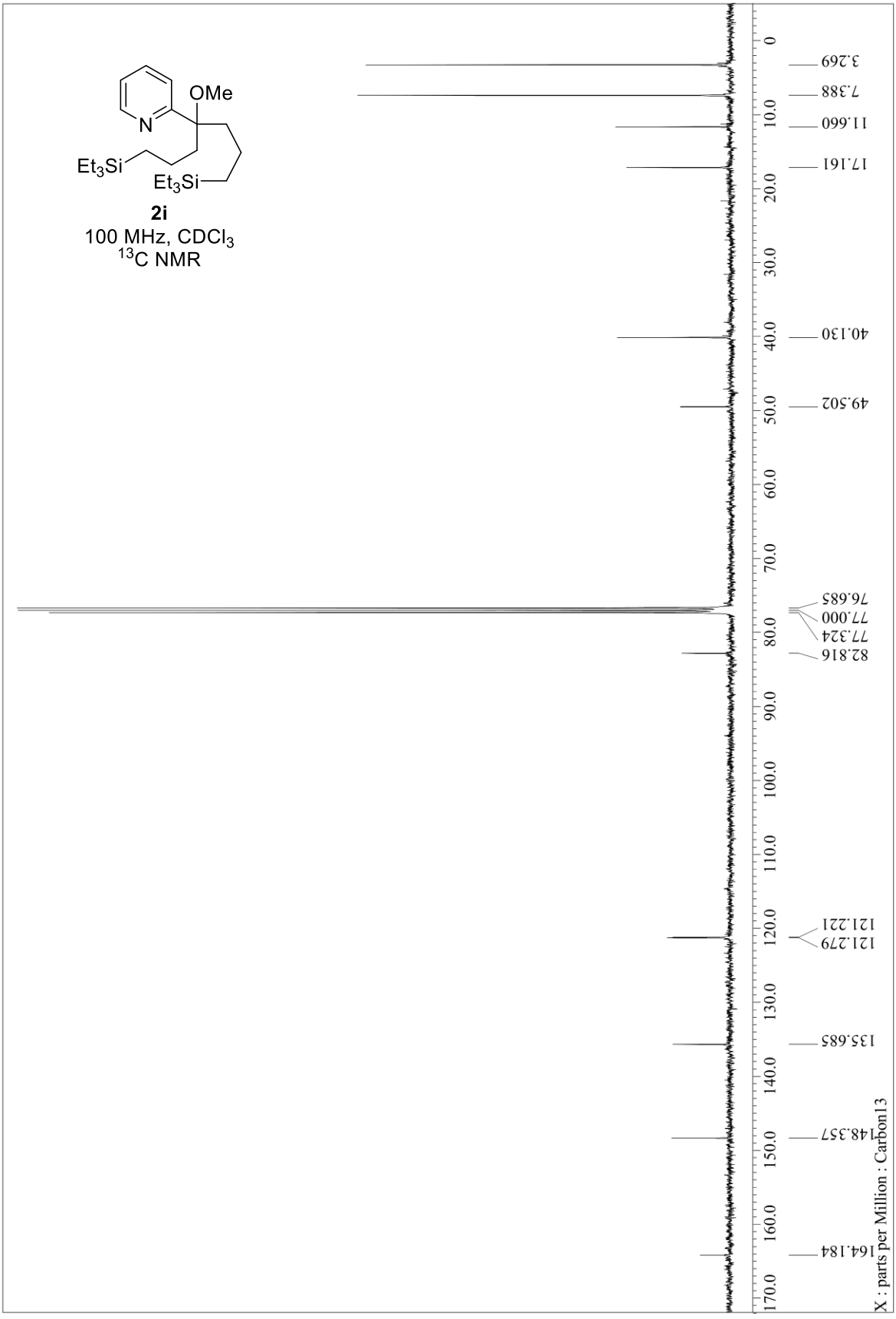

Cl
N
OMe
Et3Si
2g
400 MHz, CDCl3
1H NMR
X : parts per Million : Proton
abundance

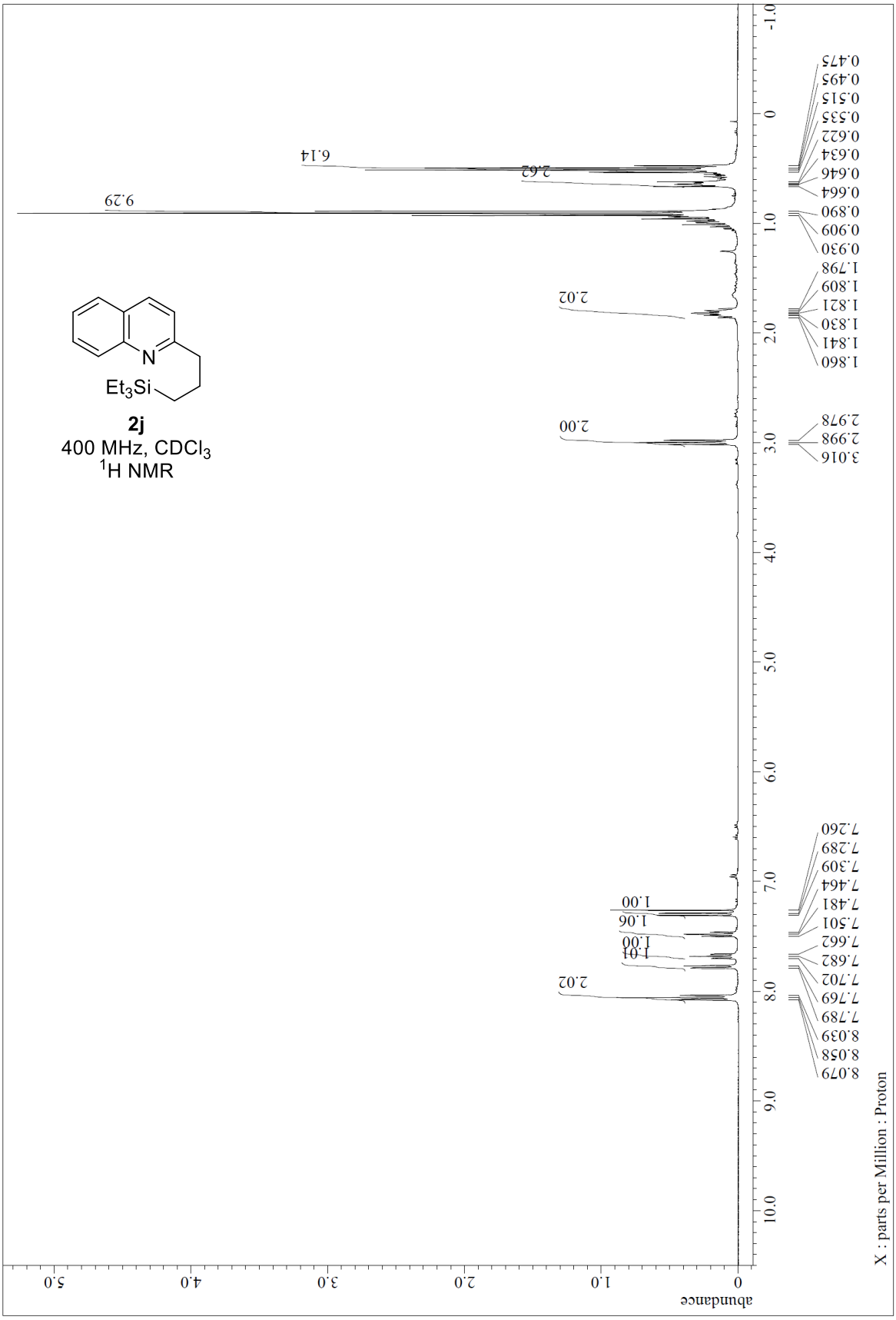

Cl
N
OMe
Et3Si
2g
100 MHz, CDCl3
13C NMR
3.279
7.369
11.688
16.865
37.813
50.284
76.685
77.000
77.315
83.674
121.212
121.574
126.637
128.067
132.425
136.238
143.275
148.557
164.032
abundance
X : parts per Million : Carbon13

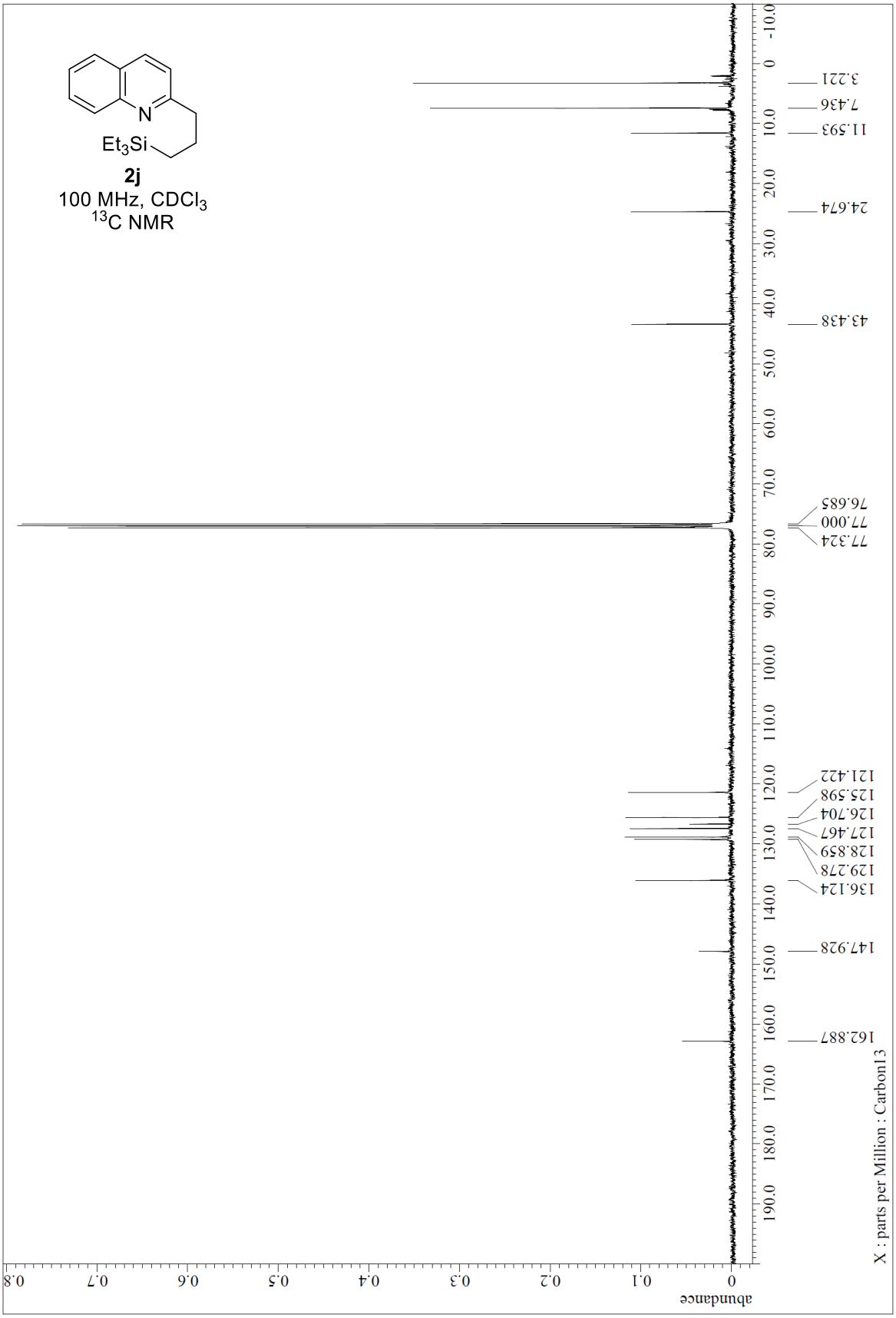

OBn
N
Et3Si
2h
400 MHz, CDCl3
1H NMR
X : parts per Million : Proton
abundance

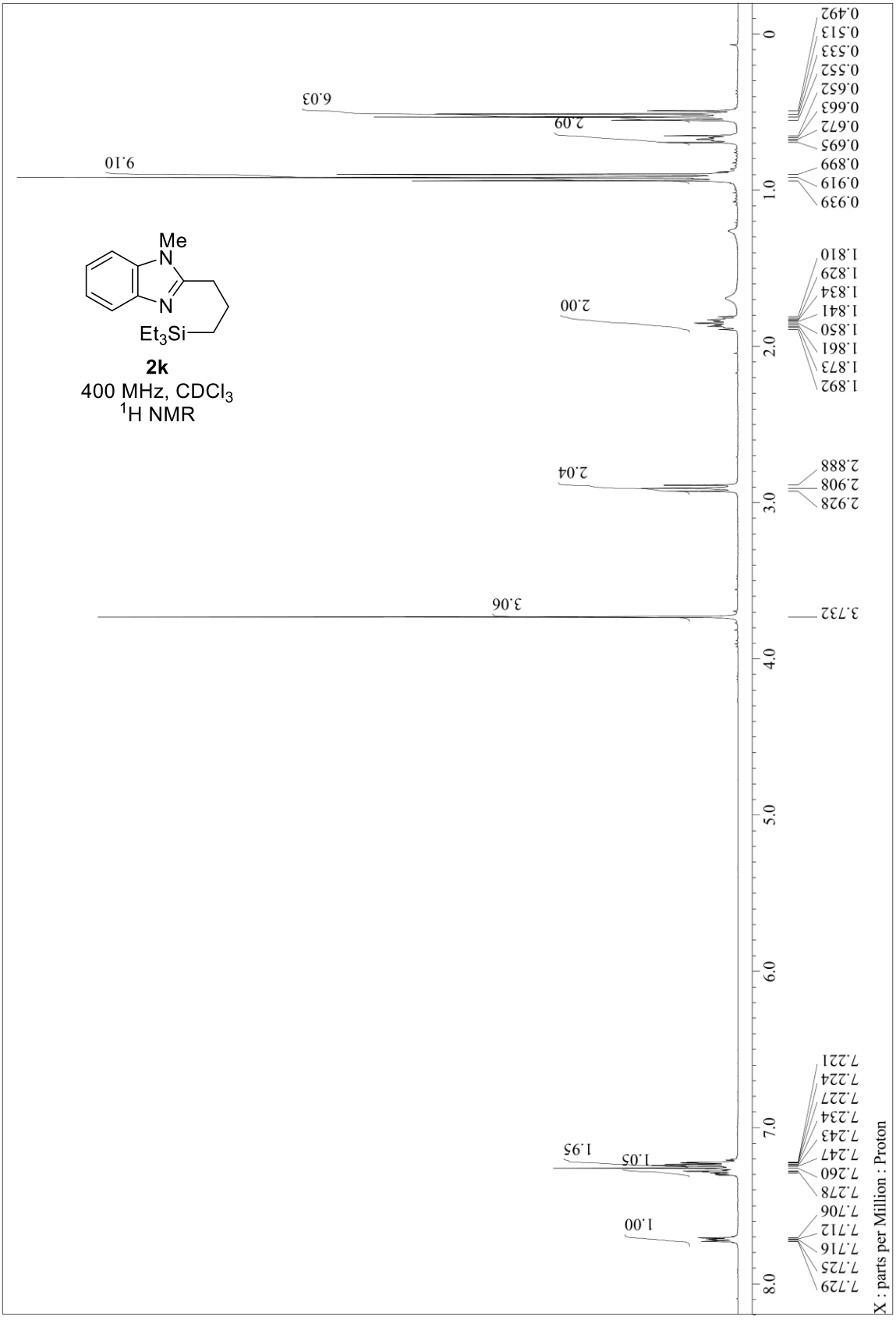

OBn
N
Et3Si
2h
100 MHz, CDCl3
13C NMR
3.269
7.426
11.202
20.117
41.226
71.298
76.685
77.000
77.315
82.501
120.344
122.223
127.543
127.819
128.315
136.677
138.412
148.986
162.964
abundance
X : parts per Million : Carbon13

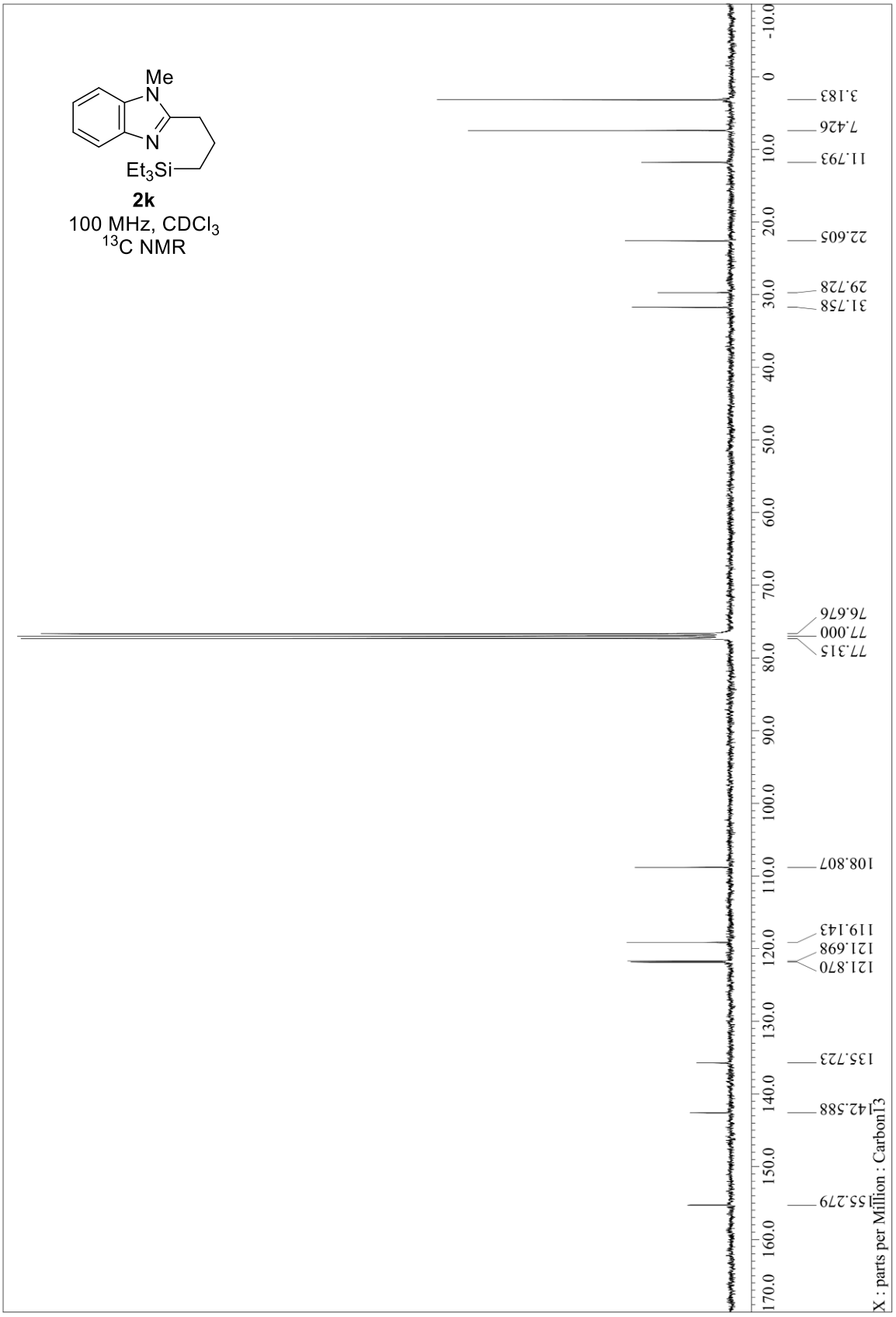

OMe
N
Et3Si
Et3Si
2i
400 MHz, CDCl3
1H NMR
16.10
21.93
2.18
3.87
2.90
3.169
1.05
0.99
0.97
1.00
0.381
0.402
0.421
0.441
0.821
0.832
0.841
0.851
0.861
0.870
1.898
1.920
1.929
1.945
1.956
1.970
1.992
7.086
7.101
7.107
7.116
7.119
7.260
7.523
7.543
7.614
7.619
7.633
8.546
8.557
0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
X : parts per Million : Proton

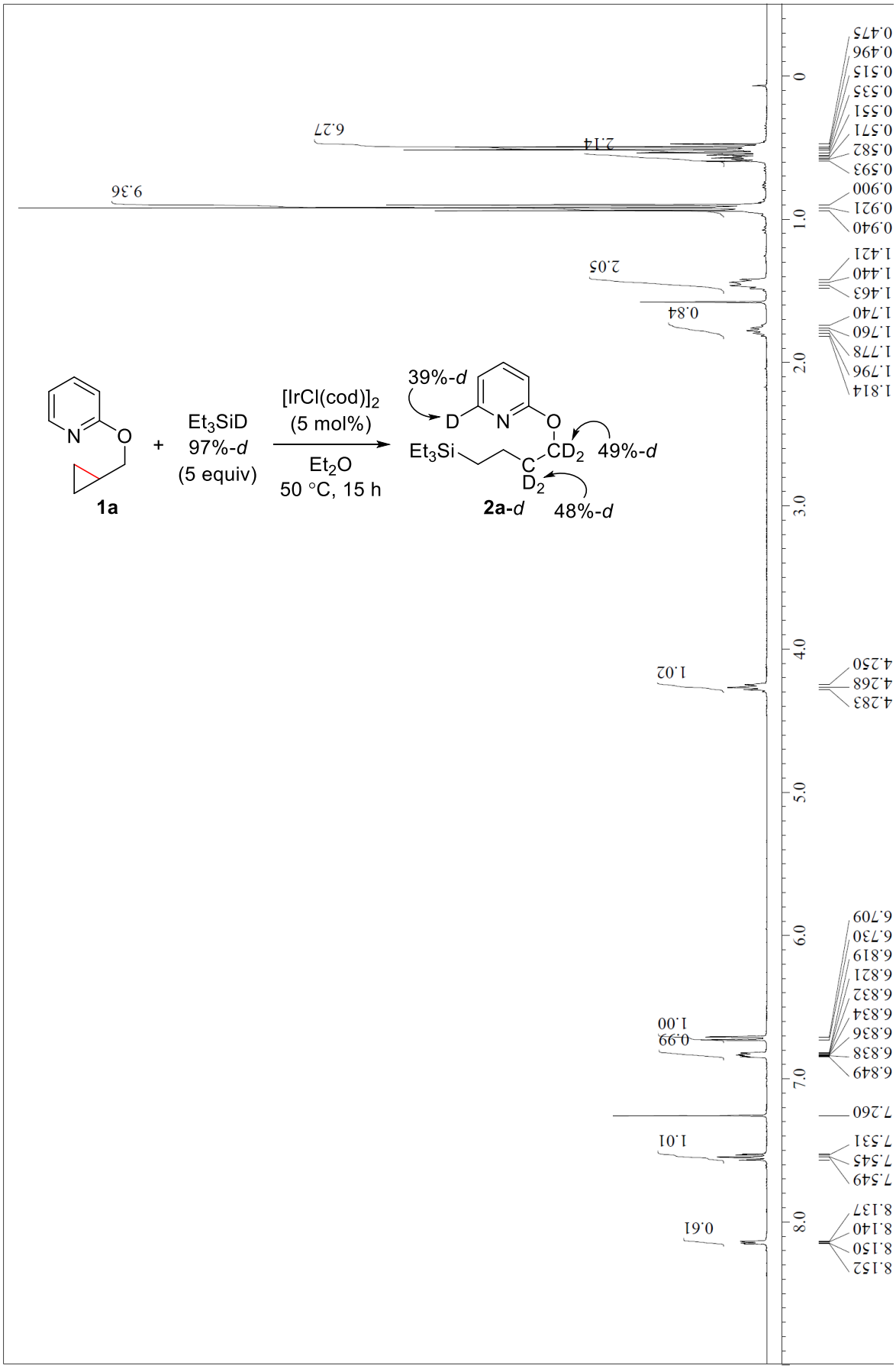

OMe
N
Et3Si
Et3Si
2i
100 MHz, CDCl3
13C NMR
3.269
7.388
11.660
17.161
40.130
49.502
76.685
77.000
77.324
82.816
121.221
121.279
135.685
148.357
164.184
X : parts per Million : Carbon13


N
Et3Si
2j
400 MHz, CDCl3
1H NMR
X : parts per Million : Proton
abundance


2j
100 MHz, CDCl3
13C NMR
Et3Si
N
3.221
7.436
11.593
24.674
43.438
76.685
77.000
77.324
121.422
125.598
126.704
127.467
128.859
129.278
136.124
147.928
162.887
X : parts per Million : Carbon13
abundance


Me
N
N
Et3Si
2k
400 MHz, CDCl3
1H NMR
9.10
6.03
2.09
2.00
2.04
3.06
1.95
1.05
1.00
3.732
X : parts per Million : Proton


Me
N
N
Et3Si
2k
100 MHz, CDCl3
13C NMR
3.183
7.426
11.793
22.605
29.728
31.758
76.676
77.000
77.315
108.807
119.143
121.698
121.870
135.723
142.588
155.279
X : parts per Million : Carbon13


1a
Et3SiD
97%-d
(5 equiv)
[IrCl(cod)]2
(5 mol%)
Et2O
50 °C, 15 h
39%-d
49%-d
48%-d
2a-d
9.36
6.27
2.14
2.05
0.84
1.02
0.99
1.00
1.01
0.61