Supporting Information

Nickel-catalyzed C–O Activation of Phenol Derivatives with Potassium Heteroaryltrifluoroborates

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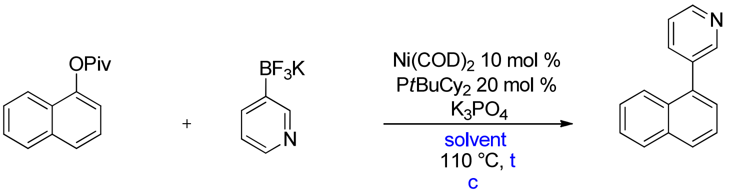
General Considerations

All commercially obtained reagents were used as received. Both solvents and deionized water were degassed with N_2 each time prior to use. Standard benchtop techniques were employed for handling air-sensitive reagents. Melting points (°C) are uncorrected. NMR spectra were recorded on a 500, 400, or 300 MHz spectrometer. ^{19}F NMR chemical shifts were referenced to external $CFCl_3$ (0.0 ppm). ^{11}B NMR spectra were obtained on a spectrometer equipped with the appropriate decoupling accessories. All ^{11}B NMR chemical shifts were referenced to external $BF_3 \cdot OEt_2$ (0.0 ppm) with a negative sign indicating an upfield shift. Data are presented as follows: chemical shift (ppm), multiplicity (*s* = singlet, *d* = doublet, *t* = triplet, *m* = multiplet, *br* = broad), coupling constant *J* (Hz) and integration. Analytical thin-layer chromatography (TLC) was performed on TLC silica gel plates (0.25 mm) precoated with a fluorescent indicator. Standard flash chromatography procedures were followed using 32–63 μm silica gel. Visualization was effected with ultraviolet light.

Importance of the solvent in the reaction



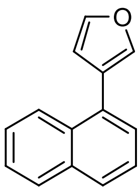
entry	solvent	c	t	yield[a]
1	Dioxane/H_2O (1/1)	0.05	1h	11%
2	Dioxane/H_2O (6/1)	0.05	1h	7%
3	THF/H_2O (1/1)	0.05	1h	/
4	EtOH	0.1	1h	/
5[b]	Tol/H_2O (1/1)	0.05	1h	/
6[b]	CPME/H_2O (1/1)	0.05	1h	/
7[b]	*s*-BuOH	0.05	1h	/
8[b]	*i*-PrOH	0.05	1h	/
9[b]	MeOH	0.05	1h	/
10[b]	*t*-amyl alcohol	0.05	1h	/
11	*t*-BuOH	0.1	1h	35%
12[b]	*t*-BuOH	0.1	1h	29%
13[b]	*t*-BuOH	0.05	1h	25%
14[b]	*t*-BuOH/H_2O (1/1)	0.05	1h	56%
15[b]	*t*-BuOH/H_2O (1/1)	0.1	1h	59%
16[b]	*t*-BuOH/H_2O (1/1)	0.2		30%

[a] Relative GC yield using dodecane as an internal standard

[b] PCy_3HBF_4

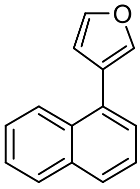
General Experimental Procedure for Nickel-catalyzed C-O Activation

(3-(naphthalen-1-yl)furan (2a) is used as an example)

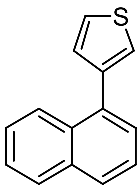


A Biotage microwave vial was charged with K_3PO_4 (1.80 mmol, 382.0 mg), potassium furan-3-yltrifluoroborate (57.4 mg, 0.33 mmol), **1a** (55.5 mg, 0.25 mmol) and $Cy_3P^{\cdot}HBF_4$ (50 µmol, 18.4 mg). In the glove box, $Ni(COD)_2$ (25 µmol, 6.9 mg) was added and the test tube was sealed with a cap lined with a disposable Teflon septum. Outside of the glove box, a mixture of *t*-BuOH/H_2O (1.25 mL/1.25 mL) was added under N_2. The reaction mixture was heated to 110 °C for 4 h before cooling to rt. The reaction mixture was extracted with EtOAc (3 x 2 mL) and then dried ($MgSO_4$). The solvent was removed *in vacuo,* and the crude product was purified by silica gel column chromatography (elution with hexanes/EtOAc 90:10) to yield **2a** in 93% yield (43.0 mg) as a yellow oil. ^1H NMR (300 MHz, acetone-d_6) δ 8.17-8.14 (m, 1H), 7.97-7.85 (m, 3H), 7.75 (t, J = 1.7 Hz, 1H), 7.56-7.44 (m, 4H), 6.80 (dd, J = 1.7, 0.8 Hz, 1H); ^{13}C NMR (125 MHz, acetone-d_6) δ 144.2, 141.6, 135.0, 132.5, 131.6, 129.3, 128.6, 127.7, 127.1, 126.8, 126.4, 126.2, 125.6, 113.1; FT-IR (neat) 3047, 1510, 1500, 1260 cm^{-1}; HRMS (ESI) *m/z* calcd. for $C_{14}H_{11}O$ (M+H)$^+$ 195.0810, found 195.0806.

1. Preparation of (naphthalen-1-yl)heteroaryl compounds

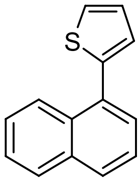


3-(Naphthalen-1-yl)furan (2a). Following the general procedure, the reaction was also carried out with **1d** (57.0 mg, 0.25 mmol) and potassium furan-3-yltrifluoroborate (57.4 mg, 0.33 mmol) to obtain **2a** (37.7 mg, 78%) as a yellow oil after silica gel column chromatography (elution with hexanes/EtOAc 90:10).



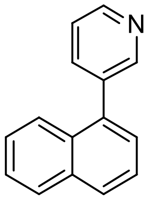
3-(Naphthalen-1-yl)thiophene (2b). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium thiophen-3-yltrifluoroborate (62.7 mg, 0.33 mmol) to obtain **2b** (47.4 mg, 90%) as a yellow oil after preparative silica gel chromatography (elution with hexanes). ^1H NMR (300 MHz, acetone-d_6) δ 8.04-7.89 (m, 3H), 7.64 (dd, J = 4.9, 3.0 Hz, 1H); 7.56 (dd, J = 3.0, 1.3 Hz, 1H); 7.54-7.46 (m, 4H), 7.34 (dd, J = 4.9, 1.3 Hz, 1H); ^{13}C NMR (125 MHz, acetone-d_6) δ 142.0, 135.8, 135.0, 132.7, 130.4, 129.3, 128.7, 127.8, 127.1, 126.8, 126.7, 126.5, 126.4, 124.5; FT-IR (neat) 3045, 1591, 1505, 1413; HRMS (ESI) *m/z* calcd. for $C_{14}H_{11}S$ (M+H)$^+$ 211.0591, found 211.0581.

Following the general procedure, the reaction was also carried out with **1d** (57.0 mg, 0.25 mmol) and potassium thiophen-3-yltrifluoroborate (62.7 mg, 0.33 mmol) using Cy_2Pt-Bu (12.7 mg, 50 µmol) in a mixture of dioxane/H_2O (2.5 mL/2.5 mL) at 110 °C for 1 h to obtain **2b** (39.6 mg, 75%) as a yellow oil after preparative silica gel chromatography (elution with hexanes).



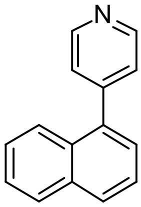
2-(Naphthalen-1-yl)thiophene (2c). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium thiophen-2-yltrifluoroborate (62.7 mg, 0.33 mmol) to obtain **2c** (33.8 mg, 64%) as a light yellow oil after silica gel chromatography (elution with hexanes). ^{1}H NMR (500 MHz, acetone-*d_6*) δ 8.22-8.19 (m, 1H), 8.00-7.94 (m, 2H), 7.61 (dd, *J* = 5.1, 1.0 Hz, 1H); 7.60-7.52 (m, 4H), 7.30 (dd, *J* = 3.5, 1.0 Hz, 1H); 7.24 (dd, *J* = 5.1, 3.5 Hz, 1H); ^{13}C NMR (125 MHz, acetone-*d_6*) δ 141.2, 140.0, 132.2, 131.6, 128.4, 128.3, 127.9, 127.4, 127.4, 126.5, 126.0, 125.9, 125.2, 125.2; FT-IR (neat) 3049, 1589, 1505, 1389; HRMS (ESI) *m/z* calcd. for $C_{14}H_{11}S$ $(M+H)^+$ 211.0574, found 211.0581.

A Biotage microwave vial was charged with K_3PO_4 (382.0 mg, 1.80 mmol), potassium thiophen-2-yltrifluoroborate (62.7 mg, 0.33 mmol) and **1d** (57.0 mg, 0.25 mmol). In the glove box, Cy_2Pt-Bu (12.7 mg, 50 µmol) and $Ni(COD)_2$ (6.9 mg, 25 µmol) were added, and the test tube was sealed with a cap lined with a disposable Teflon septum. Outside of the glove box, a mixture of dioxane/H_2O (2.5 mL/2.5 mL) was added under N_2. The reaction mixture was heated to 110 °C for 1 h before cooling to rt. Dodecane (42.6 mg, 0.25 mmol) was added, and the mixture was filtered through a thin pad of silica with EtOAc. The filtrate was analyzed by gas chromatography using dodecane as the internal standard to afford **2c** in 26% relative yield. H_2O



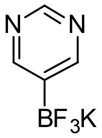
3-(Naphthalen-1-yl)pyridine (2d). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium pyridin-3-yltrifluoroborate (61.0 mg, 0.33 mmol) to obtain **2d** (41.9 mg, 82%) as a yellow oil after silica gel chromatography (elution with hexanes/EtOAc 80:20). ^{1}H NMR (300 MHz, acetone-*d_6*) δ 8.70-8.67 (m, 2H), 8.04-7.99 (m, 2H), 7.90 (dt, *J* = 7.7, 1.9 Hz, 1H); 7.79 (d, *J* = 8.2 Hz, 1H), 7.64-7.47 (m, 5H); ^{13}C NMR (125 MHz, acetone-*d_6*) δ 151.2, 149.6, 137.9, 137.3, 137.0, 134.9, 132.3, 129.4, 129.3, 128.3, 127.5, 127.0, 126.4, 125.9, 124.1; FT-IR (neat) 3034, 1605, 1408, 1394; HRMS (ESI) *m/z* calcd. for $C_{15}H_{12}N$ $(M+H)^+$ 206.0963, found 206.0970.

Following the general procedure, the reaction was also carried out with **1d** (57.0 mg, 0.25 mmol) and potassium pyridin-3-yltrifluoroborate (61.0 mg, 0.33 mmol) to obtain **2d** (30.8 mg, 60%) as a yellow oil after silica gel chromatography (elution with hexanes//EtOAc 80:20).



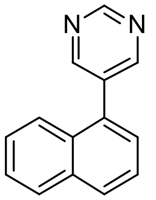
4-(Naphthalen-1-yl)pyridine (2e). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium pyridin-4-yltrifluoroborate (61.0 mg, 0.33 mmol) to obtain **2e** (35.2 mg, 69%) as a white solid after silica gel chromatography (elution with hexanes/EtOAc 80:20). mp: 93-95 °C; ^{1}H NMR (300 MHz, acetone-d_6) δ 8.74-8.72 (m, 2H), 8.03-8.00 (m, 2H), 7.84 (d, J = 8.8 Hz, 1H), 7.62-7.47 (m, 6H); ^{13}C NMR (125 MHz, acetone-d_6) δ 150.8, 149.1, 138.3, 134.8, 131.6, 129.7, 129.4, 127.8, 127.6, 127.0, 126.3, 125.8, 125.7; FT-IR (neat) 3059, 1588, 1410; HRMS (ESI) m/z calcd. for $C_{15}H_{12}N$ $(M+H)^+$ 206.0962, found 206.0970.

A Biotage microwave vial was charged with K_3PO_4 (382.0 mg, 1.80 mmol), potassium pyridin-4-yltrifluoroborate (61.0 mg, 0.33 mmol), **1d** (57.0 mg, 0.25 mmol) and $Cy_3P{\cdot}HBF_4$ (18.4 mg, 50 μmol). In the glove box, $Ni(COD)_2$ (25 μmol, 6.9 mg) was added, and the test tube was sealed with a cap lined with a disposable Teflon septum. Outside of the glove box, a mixture of *t*-BuOH/H_2O (1.25 mL/1.25 mL) was added under N_2. The reaction mixture was heated to 110 °C for 4 h before cooling to rt. Dodecane (42.6 mg, 0.25 mmol) was added and the mixture was filtered through a thin pad of silica with EtOAc. The filtrate was analyzed by gas chromatography using dodecane as the internal standard to afford **2e** in 32% relative yield.



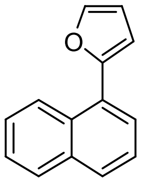
Potassium Pyrimidin-5-yltrifluoroborate. To a solution of pyrimidin-5-ylboronic acid (5.0 g, 40.0 mmol) in MeOH (11.5 mL, 3.5 M) under N_2 was added KHF_2 (9.5 g, 121.0 mmol) in one portion at 0 °C. To the suspension was added H_2O dropwise (8.9 mL, 4.5 M) at 0 °C. The ice-water bath was removed, and the reaction was stirred at rt for 1 h. The crude mixture was concentrated and dried overnight *in vacuo*. The crude solid was purified using continuous Soxhlet extraction (overnight) with acetone (250 mL). The collected solvent was concentrated and then redissolved in a minimal amount of acetone (20 mL). The addition of Et_2O (125 mL) led to the precipitation of the product. The product was filtered, concentrated, and dried *in vacuo* to afford the pure compound (3.86 g, 52%) as a white solid. mp > 250 °C. ^{1}H NMR (500 MHz, DMSO-d_6) δ 8.88 (s, 1H), 8.54 (s, 2H); ^{13}C NMR (125 MHz, DMSO-d_6) δ 159.5, 156.5; ^{19}F NMR (470.8 MHz, DMSO-d_6) δ -139.3; ^{11}B NMR (128.4 MHz, DMSO-d_6) δ

1.317; FT-IR (KBr) 3036, 1582, 1570, 1441 cm^{-1}; HRMS (ESI) *m*/*z* calcd. for $C_4H_3BF_3N_2^-$ (M-K)$^-$ 147.0341, found 147.0343.

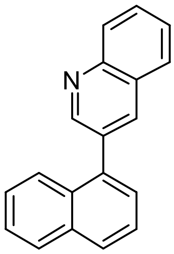


5-(Naphthalen-1-yl)pyrimidine (2f). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium pyrimidin-5-yltrifluoroborate (61.4 mg, 0.33 mmol) to obtain **2f** (42.9 mg, 83%) as an orange oil after silica gel chromatography (elution with hexanes/EtOAc 80:20). ^{1}H NMR (300 MHz, acetone-*d*$_6$) δ 9.25 (s, 1H), 8.91 (s, 2H), 8.06-8.02 (m, 2H), 7.80-7.77 (s, 1H), 7.67-7.53 (m, 4H); ^{13}C NMR (125 MHz, acetone-*d*$_6$) δ 158.5, 158.0, 135.1, 134.9, 133.7, 132.2, 130.1, 129.5, 128.8, 127.9, 127.2, 126.4, 125.5; FT-IR (neat) 3043, 1574, 1548, 1418, 1391; HRMS (ESI) *m*/*z* calcd. for $C_{14}H_{11}N$ (M+H)$^+$ 207.0922, found 207.0918.

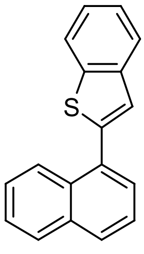
A Biotage microwave vial was charged with K_3PO_4 (382.0 mg, 1.80 mmol), potassium pyrimidin-5-yltrifluoroborate (61.4 mg, 0.33 mmol), **1d** (57.0 mg, 0.25 mmol) and $Cy_3P{\cdot}HBF_4$ (18.4 mg, 50 µmol). In the glove box, Ni(COD)$_2$ (25 µmol, 6.9 mg) was added, and the test tube was sealed with a cap lined with a disposable Teflon septum. Outside of the glove box, a mixture of *t*-BuOH/H_2O (1.25 mL/1.25 mL) was added under N_2. The reaction mixture was heated to 110 °C for 4 h before cooling to rt. Dodecane (42.6 mg, 0.25 mmol) was added and the mixture was filtered through a thin pad of silica with EtOAc. The filtrate was analyzed by gas chromatography using dodecane as the internal standard to afford **2f** in 26% relative yield.



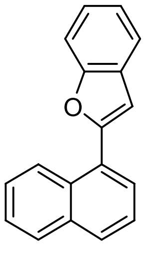
2-(Naphthalen-1-yl)furan (2g). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium furan-2-yltrifluoroborate (57.4 mg, 0.33 mmol) to obtain **2g** (38.2 mg, 79%) as a brown oil after silica gel chromatography (elution with hexanes). ^{1}H NMR (500 MHz, acetone-*d*$_6$) δ 8.42 (d, *J* = 8.3 Hz, 1H), 7.96 (d, *J* = 7.6 Hz, 1H), 7.92 (d, *J* = 8.3 Hz, 1H), 7.79-7.75 (m, 2H), 7.60-7.53 (m, 3H), 6.85 (d, *J* = 3.2 Hz, 1H), 6.67 (dd, *J* = 3.2, 1.7 Hz, 1H); ^{13}C NMR (125 MHz, acetone-*d*$_6$) δ 154.2, 143.7, 135.0, 131.1, 129.4, 129.4, 129.4, 127.5, 126.9, 126.9, 126.3, 126.2, 112.4, 110.2; FT-IR (neat) 3043, 1509, 1238; HRMS (ESI) *m*/*z* calcd. for $C_{14}H_{10}O$ (M)$^+$ 194.0732, found 194.0738.



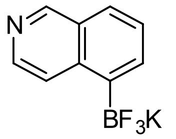
3-(Naphthalen-1-yl)quinoline (2h). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium quinolin-3-yltrifluoroborate (77.6 mg, 0.33 mmol) to obtain **2h** (60.6 mg, 95%) as a colorless oil after silica gel chromatography (elution with hexanes/EtOAc 80:20). ^{1}H NMR (300 MHz, acetone-d_6) δ 9.02 (d, J = 2.1 Hz, 1H), 8.39 (d, J = 2.1 Hz, 1H), 8.17 (d, J = 8.4 Hz, 1H), 8.04-8.01 (m, 3H), 7.86 (d, J = 8.4 Hz, 1H), 7.83-7.80 (m, 1H), 7.68-7.62 (m, 2H), 7.59 (d, J = 6.7 Hz, 1H), 7.54 (d, J = 7.8 Hz, 1H), 7.52-7.49 (m, 1H); ^{13}C NMR (125 MHz, acetone-d_6) δ 152.5, 148.4, 137.3, 137.3, 136.8, 134.9, 134.5, 132.5, 130.3, 130.1, 129.4, 129.4, 129.1, 128.7, 127.8, 127.5, 127.0, 126.4, 126.0; FT-IR (neat) 3057, 1567, 1508, 1490; HRMS (ESI) *m*/*z* calcd. for $C_{19}H_{14}N$ $(M+H)^+$ 256.1126, found 256.1115.



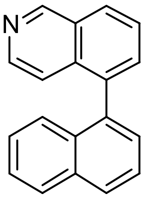
2-(Naphthalen-1-yl)benzothiophene (2i). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium benzothiophen-2-yltrifluoroborate (79.2 mg, 0.33 mmol) to obtain **2i** (27.4 mg, 42%) as a white solid after silica gel chromatography (elution with hexanes). mp: 104-106 °C; ^{1}H NMR (500 MHz, acetone-d_6) δ 8.31-8.27 (m, 1H), 8.03-7.90 (m, 3H), 7.94 (dd, J = 7.3, 1.7 Hz, 1H), 7.70 (dd, J = 7.1, 1.2 Hz, 1H), 7.61-7.54 (m, 4H), 7.45 (td, J = 7.1, 1.2 Hz, 1H), 7.41 (td, J = 7.1, 1.5 Hz, 1H); ^{13}C NMR (125 MHz, acetone-d_6) δ 142.6, 141.3, 141.0, 135.0, 133.1, 132.5, 129.9, 129.4, 129.3, 127.7, 127.2, 126.2, 126.2, 125.5, 125.4, 125.2, 124.7, 122.9; FT-IR (neat) 3052, 1504, 1455, 1435, 1390; HRMS (ESI) *m*/*z* calcd. for $C_{18}H_{12}S$ $(M)^+$ 260.0660, found 260.0658.



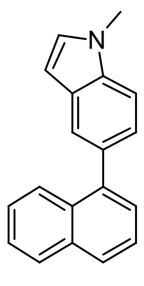
2-(Naphthalen-1-yl)benzofuran (2j). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium benzofuran-2-yltrifluoroborate (74.0 mg, 0.33 mmol) to obtain **2j** (49.7 mg, 81%) as a light yellow oil after silica gel chromatography (elution with hexanes/EtOAc 80:20). ^{1}H NMR (500 MHz, acetone-d_6) δ 8.51 (d, J = 8.3 Hz, 1H), 8.03-8.00 (m, 2H), 7.95 (dd, J = 7.2, 0.9 Hz, 1H), 7.74 (d, J = 7.7 Hz, 1H), 7.65-7.58 (m, 4H), 7.38 (t, J = 8.3 Hz, 1H), 7.31 (t, J = 7.7 Hz, 1H), 7.28 (s, 1H); ^{13}C NMR (125 MHz, acetone-d_6) δ 156.4, 155.9, 135.0, 131.4, 130.5, 130.0, 129.6, 128.9, 128.2, 127.9, 127.1, 126.3, 126.2, 125.4, 124.0, 122.1, 111.9, 106.9; FT-IR (neat) 3044, 1452, 1258; HRMS (ESI) *m*/*z* calcd. for $C_{18}H_{12}O$ $(M)^+$ 244.0888, found 244.0889.



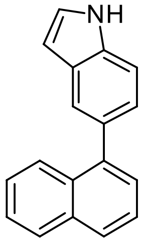
Potassium Isoquinolin-5-yltrifluoroborate. To a solution of isoquinolin-5-ylboronic acid (5.0 g, 28.91 mmol) in MeOH (8.5 mL, 3.5 M) under N_2 was added KHF_2 (6.8 g, 86.7 mmol) in one portion at 0 °C. To the suspension was added H_2O dropwise (6.4 mL, 4.5M) at 0 °C. The ice-water bath was removed, and the reaction was stirred at rt for 1 h. The crude mixture was concentrated and dried overnight *in vacuo*. The crude solid was purified using continuous Soxhlet extraction (overnight) with acetone (200 mL). The collected solvent was concentrated and then redissolved in a minimal amount of acetone (15 mL). The addition of Et_2O (100 mL) led to the precipitation of the product. The product was filtered, concentrated, and dried *in vacuo* to afford the pure compound (2.89 g, 43%) as a white solid. mp > 250 °C. ^{1}H NMR (500 MHz, DMSO-d_6) δ 9.13 (s, 1H), 8.32 (d, J = 5.9 Hz, 1H), 8.18 (d, J = 5.9 Hz, 1H), 7.80-7.76 (m, 2H), 7.48-7.44 (m, 1H); ^{13}C NMR (125 MHz, DMSO-d_6) δ 152.0, 140.8, 138.7, 132.7, 132.7, 128.5, 126.4, 124.8, 122.8; ^{19}F NMR (470.8 MHz, DMSO-d_6) δ -135.8. ^{11}B NMR (128.4 MHz, DMSO-d_6) δ 2.435. FT-IR (KBr) 3032, 1613, 1572 cm^{-1}. HRMS (ESI) *m/z* calcd. for $C_9H_6OBF_3N^-$ $(M-K)^-$ 196.0545, found 196.0536.



5-(Naphthalen-1-yl)isoquinoline (2k). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium isoquinolin-5-yltrifluoroborate (77.6 mg, 0.33 mmol) to obtain **2k** (58.1 mg, 91%) as a white powder after silica gel chromatography (elution with petroleum ether/EtOAc 80:20). mp: 121-123 °C. ^{1}H NMR (500 MHz, acetone-d_6) δ 9.41 (s, 1H), 8.35 (d, J = 5.9 Hz, 1H), 8.23 (d, J = 8.1 Hz, 1H), 8.06 (d, J = 8.3 Hz, 1H), 8.04 (d, J = 8.3 Hz, 1H), 7.83 (dd, J = 8.1, 7.1 Hz, 1H), 7.77 (dd, J = 7.1, 1.2 Hz, 1H), 7.66 (dd, J = 8.3, 7.1 Hz, 1H), 7.54-7.49 (m, 2H), 7.36-7.33 (m, 1H), 7.27 (d, J = 8.3 Hz, 1H), 7.11 (d, J = 5.9 Hz, 1H); ^{13}C NMR (125 MHz, acetone-d_6) δ 153.8, 144.3, 138.3, 137.5, 135.9, 134.7, 133.4, 132.7, 129.7, 129.3, 129.3, 128.8, 128.4, 127.9, 127.2, 126.9, 126.6, 126.4, 119.3; FT-IR (neat) 3046, 1732, 1616, 1586; HRMS (ESI) *m/z* calcd. for $C_{19}H_{14}N$ $(M+H)^+$ 256.1126, found 256.1120.

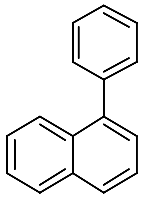


***N*-Methyl-5-(naphthalen-1-yl)indole (2l).** Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium *N*-methyl-indol-5-yltrifluoroborate (78.2 mg, 0.33 mmol) to obtain **2l** (47.5 mg, 74%) as a colorless oil after silica gel chromatography (elution with hexanes/EtOAc 90:10). ^{1}H NMR (500 MHz, acetone-d_6) δ 7.99-7.96 (m, 2H), 7.91 (d, J = 8.2 Hz, 1H), 7.68-7.67 (m, 1H), 7.58-7.43 (m, 5H), 7.33-7.30 (m, 2H), 6.53 (dd, J = 3.1, 0.7 Hz, 1H), 3.02 (s, 3H); ^{13}C NMR (125 MHz, acetone-d_6) δ 142.5, 137.2, 135.0, 133.1, 132.4, 130.7, 129.7, 129.1, 128.0, 127.8, 127.1, 126.6, 126.5, 126.3, 124.4, 122.6, 110.0, 101.7, 33.0; FT-IR (neat) 3042, 1513, 1490, 1394, 1243; HRMS (ESI) *m*/*z* calcd. for $C_{19}H_{15}N$ (M)$^+$ 257.1204, found 257.1200.



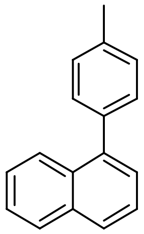
5-(Naphthalen-1-yl)-1*H*-indole (2m). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium 1*H*-indol-5-yltrifluoroborate (73.6 mg, 0.33 mmol) to obtain **2m** (54.5 mg, 90%) as a yellow oil contaminated with 10% of impurities that cannot be separated after silica gel chromatography (elution with hexanes/CH_2Cl_2 70:30). ^{1}H NMR (500 MHz, acetone-d_6) δ 10.38 (br s, 1H, NH), 7.98 (d, J = 8.3 Hz, 1H), 7.94 (d, J = 8.1 Hz, 1H), 7.87 (d, J = 8.1 Hz, 1H), 7.70-7.69 (m, 1H), 7.59-7.62 (m, 2H), 7.50-7.46 (m, 2H), 7.44-7.40 (m, 2H), 7.25 (dd, J = 8.3, 1.7 Hz, 1H), 6.58-6.56 (m, 1H); ^{13}C NMR (125 MHz, acetone-d_6) δ 142.6, 136.6, 135.0, 133.1, 132.5, 129.2, 129.1, 128.0, 127.7, 127.1, 126.6, 126.4, 126.4, 126.3, 124.5, 122.3, 111.9, 102.7; FT-IR (neat) 3419, 3045, 1574, 1506, 1262; HRMS (ESI) *m*/*z* calcd. for $C_{18}H_{13}N$ (M)$^+$ 243.1048, found 243.1048.

2. Preparation of (naphthalen-1-yl)aryl compounds



1-Phenylnaphthalene (3a). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium phenyltrifluoroborate (60.7 mg, 0.33 mmol) to obtain **3a** (36.1 mg, 71%) as a white solid after silica gel chromatography (elution with hexanes). mp: 40-41 °C (lit. 41-43 °C). ^{1}H NMR (500 MHz, acetone-d_6) δ 7.97 (d, J = 8.3 Hz, 1H), 7.93 (d, J = 8.3 Hz, 1H), 7.86 (d, J = 8.6 Hz, 1H), 7.58-7.42 (m, 9H).

^{1}H NMR is comparable to the literature.[1]



1-(*p*-Tolyl)naphthalene (3b). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium *p*-tolyltrifluoroborate (65.3 mg, 0.33 mmol) to obtain **3b** (41.4 mg, 76%) as a white solid after silica gel chromatography (elution with hexanes). mp: 51-52 °C (lit. 52-54 °C). ^{1}H NMR (500 MHz, acetone-d_6) δ 7.96 (d, J = 8.1 Hz, 1H), 7.91-7.88 (m, 2H), 7.56-7.49 (m, 2H), 7.47-7.44 (m, 1H), 7.40 (dd, J = 7.1, 1.2 Hz,

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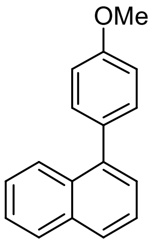
[1] Quasdorf, K. W.; Tian, X.; Garg, N. K. *J. Am. Chem. Soc.* **2008**, *130*, 14422-14423.

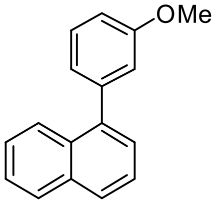
1H), 7.37 (d, *J* = 8.1 Hz, 2H), 7.33 (d, *J* = 8.1 Hz, 2H), 2.43 (s, 3H).

^{1}H NMR is comparable to the literature.[1]



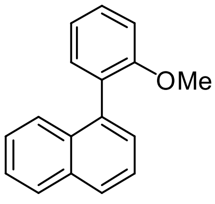
1-(4-Methoxyphenyl)naphthalene (3c). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium *p*-methoxyphenyltrifluoroborate (70.6 mg, 0.33 mmol) to obtain **3c** (53.1 mg, 91%) as a white solid after silica gel chromatography (elution with hexanes/EtOAc 80/20). mp: 112-113 °C (lit. 113-115 °C). ^{1}H NMR (500 MHz, acetone-*d*$_6$) δ 7.96 (dd, *J* = 8.1, 1.5 Hz, 1H), 7.89 (d, *J* = 8.3 Hz, 2H), 7.56-7.44 (m, 3H), 7.43-7.39 (m, 3H), 7.11-7.07 (m, 2H), 3.89 (s, 3H).

^{1}H NMR is comparable to the literature.[2]



1-(3-Methoxyphenyl)naphthalene (3d). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium *m*-methoxyphenyltrifluoroborate (70.6 mg, 0.33 mmol) to obtain **3d** (57.5 mg, 98%) as a colorless oil after silica gel chromatography (elution with hexanes/EtOAc 80/20). ^{1}H NMR (500 MHz, acetone-*d*$_6$) δ 7.96 (d, *J* = 8.8 Hz, 1H), 7.91 (dd, *J* = 8.3, 3.2 Hz, 2H), 7.56-7.50 (m, 2H), 7.48-7.40 (m, 3H), 7.06-7.01 (m, 3H), 3.85 (s, 3H).

^{1}H NMR is comparable to the literature.[2]



1-(2-Methoxyphenyl)naphthalene (3e). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium *o*-methoxyphenyltrifluoroborate (70.6 mg, 0.33 mmol) to obtain **3e** (49.8 mg, 85%) as a yellow powder after silica gel chromatography (elution with hexanes/EtOAc 80/20). mp: 96-98 °C (lit. 98-99 °C). ^{1}H NMR (500 MHz, acetone-*d*$_6$) δ 7.93 (d, *J* = 8.3 Hz, 1H), 7.90 (d, *J* = 8.3 Hz, 1H), 7.55-7.25 (m, 2H), 7.49-7.43 (m, 2H), 7.41-7.36 (m, 2H), 7.25 (dd, *J* = 7.3, 1.7 Hz, 1H), 7.16 (d, *J* = 8.3 Hz, 1H), 7.09 (td, *J* = 7.3, 1.0 Hz, 1H), 3.66 (s, 3H).

^{1}H NMR is comparable to the literature.[3]

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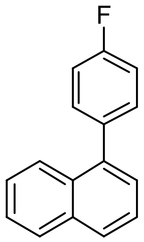
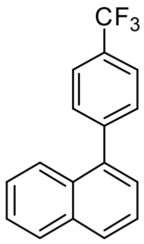
[2] Cella, R.; Cunha, R.; Reis, A. E. S.; Pimenta, D. C.; Klitzke, C. F.; Stefani, H. A. *J. Org. Chem.* **2006**, *71*, 244-250.

[3] Hatakeyama, T.; Nakamura, M. *J. Am. Chem. Soc.* **2007**, *129*, 9844-9845.



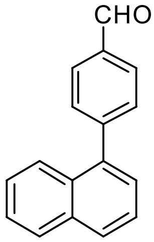
1-(4-Fluorophenyl)naphthalene (3f). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium *p*-fluorophenyltrifluoroborate (66.7 mg, 0.33 mmol) to obtain **3f** (49.9 mg, 90%) as a white powder after preparative silica gel chromatography (elution with hexanes). mp: 71-72 °C (lit. 71-72 °C). ^{1}H NMR (500 MHz, acetone-d_6) δ 7.97 (d, J = 8.1 Hz, 1H), 7.93 (d, J = 8.1 Hz, 1H), 7.82 (d, J = 8.3 Hz, 1H), 7.57-7.45 (m, 5H), 7.41 (dd, J = 7.1 Hz J = 1.2 Hz, 1H), 7.31-7.26 (m, 2H).

^{1}H NMR is comparable to the literature.[4]



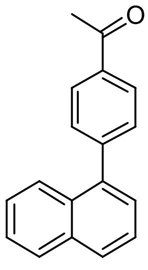
1-(4-(Trifluoromethyl)phenyl)naphthalene (3g). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium *p*-trifluorophenyltrifluoroborate (83.2 mg, 0.33 mmol) to obtain **3g** (48.6 mg, 71%) as a white powder after preparative silica gel chromatography (elution with hexanes/EtOAc 95/5). mp: 45-46 °C (lit. 47-49 °C). ^{1}H NMR (500 MHz, acetone-d_6) δ 8.01-7.97 (m, 2H), 7.87 (d, J = 8.3 Hz, 2H), 7.80 (d, J = 8.6 Hz, 1H), 7.70 (d, J = 8.3 Hz, 2H), 7.60-7.53 (m, 2H), 7.51-7.46 (m, 2H).

^{1}H NMR is comparable to the literature.[1]



4-(Naphthalen-1-yl)benzaldehyde (3h). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium *p*-formylphenyltrifluoroborate (70.0 mg, 0.33 mmol) to obtain **3h** (12.3 mg, 21%) as a yellow powder after preparative silica gel chromatography (elution with hexanes/EtOAc 80/20). mp: 79-81 °C (lit. 84 °C). ^{1}H NMR (500 MHz, acetone-d_6) δ 10.16 (s, 1H), 8.08 (d, J = 8.3 Hz, 2H), 8.02-7.98 (m, 2H), 7.83 (d, J = 8.6 Hz, 1H), 7.72 (d, J = 8.3 Hz, 2H), 7.62-7.54 (m, 2H), 7.52-7.49 (m, 2H).

^{1}H NMR is comparable to the literature.[5]



1-(4-(Naphthalen-1-yl)phenyl)ethanone (3i). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium *p*-acetylphenyltrifluoroborate (74.6 mg, 0.33 mmol) to obtain **3i** (57.6 mg, 94%) as a white powder after preparative silica gel chromatography (elution with hexanes/EtOAc 80/20). mp: 103-104 °C (lit. 102-103 °C). ^{1}H NMR (500 MHz, acetone-d_6) δ 8.13 (d, J = 8.3 Hz,

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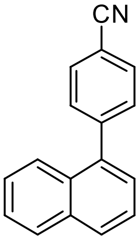
[4] Glass, A. C.; Morris, B. B.; Zakharov, L. N.; Liu, S. Y. *Org. Lett.* **2008**, *10*, 4855-4857.

[5] Saha, D.; Chattopadhyay, K.; Ranu, B. C. *Tetrahedron Lett.* **2009**, *50*, 1003-1006.

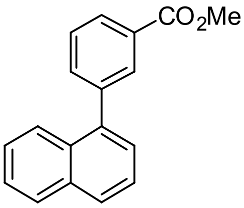
2H), 7.99 (d, *J* = 8.1 Hz, 1H), 7.97 (d, *J* = 8.3 Hz, 1H), 7.83 (d, *J* = 8.3 Hz, 1H), 7.61 (d, *J* = 8.3 Hz, 2H), 7.60-7.52 (m, 2H), 7.50-7.44 (m, 2H), 2.66 (s, 3H).

^{1}H NMR is comparable to the literature.[6]



4-(Naphthalen-1-yl)benzonitrile (3j). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium *p*-cyanophenyltrifluoroborate (69.0 mg, 0.33 mmol) to obtain **3j** (40.5 mg, 71%) as a colorless oil after preparative silica gel chromatography (elution with hexanes/EtOAc 95/5). ^{1}H NMR (500 MHz, acetone-d_6) δ 8.03-8.00 (m, 2H), 7.95 (d, *J* = 8.6 Hz, 2H), 7.80 (d, *J* = 8.6 Hz, 1H), 7.72 (d, *J* = 8.6 Hz, 2H), 7.63-7.55 (m, 2H), 7.54-7.48 (m, 2H).

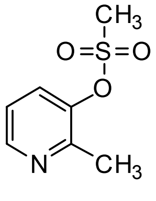
^{1}H NMR is comparable to the literature.[7]



Methyl 3-(Naphthalen-1-yl)benzoate (3k). Following the general procedure, the reaction was carried out with **1a** (55.5 mg, 0.25 mmol) and potassium *m*-methoxycarbonylphenyltrifluoroborate (79.9 mg, 0.33 mmol) to obtain **3k** (30.2 mg, 46%) as a yellow powder after preparative silica gel chromatography (elution with hexanes/EtOAc 80/20). mp: 69-71 °C (lit. 70-70.5 °C). ^{1}H NMR (500 MHz, acetone-d_6) δ 8.12-8.10 (m, 2H), 8.00 (d, *J* = 7.6 Hz, 1H), 7.98 (d, *J* = 8.3 Hz, 1H), 7.80 (d, *J* = 8.3 Hz, 1H), 7.75 (dt, *J* = 7.6, 1.5 Hz, 1H), 7.70-7.66 (m, 1H), 7.61-7.53 (m, 2H), 7.51-7.46 (m, 2H), 3.91 (s, 3H).

^{1}H NMR is comparable to the literature.[8]

3. Preparation of heteroarylmethanesulfonate compounds



2-Methylpyridin-3-yl Methanesulfonate (4b). To a stirred solution of 2-methylpyridin-3-ol (360.0 mg, 3.3 mmol) in 0.5 mL of 2,6-lutidine and 4.5 mL of $CHCl_3$ at 0 °C was slowly added CH_3SO_2Cl (378.0 mg, 3.3 mmol). The reaction mixture was allowed to warm to rt and then refluxed overnight before cooling down. The reaction mixture was washed with

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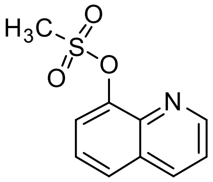
[6] So, C. M.; Lau, C. P.; Kwong, F. Y. *Org. Lett.* **2007**, *9*, 2795-2798.

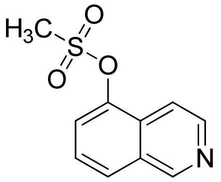
[7] Kuroda, J. I.; Inamoto, K.; Hiroya, K.; Doi, T. *Eur. J. Org. Chem.* **2009**, 2251-2261.

[8] House, H. O.; Bashe, R. W. *J. Org. Chem.* **1967**, *32*, 784-791.

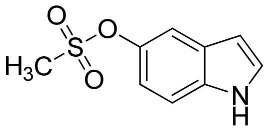
H_2O (3 x 3 mL) and then dried ($MgSO_4$). The solvent was concentrated and the residue fractionated under vacuum, yielding **4b** as a brown oil (400 mg, 65%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.46 (dd, *J* = 4.9, 1.5 Hz, 1H), 7.65 (dd, *J* = 8.1, 1.5 Hz, 1H), 7.21 dd, *J* = 8.1, 4.9 Hz, 1H), 3.24 (s, 3H), 2.61 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 152.4, 147.7, 144.5, 130.2, 122.4, 38.7, 19.9; FT-IR (neat) 3636, 3034, 1598, 1499, 1470, 1361, 1179; HRMS (ESI) *m/z* calcd. for $C_7H_{10}NO_3S$ $(M+H)^+$ 188.0381, found 188.0380.



Quinolin-8-yl Methanesulfonate (4d). To a stirred solution of quinolin-8-ol (363.0 mg, 2.50 mmol) in 2.5 mL of CH_2Cl_2 was added Et_3N (507 µL, 3.75 mmol). The reaction mixture was cooled to 0 °C and CH_3SO_2Cl (378.0 mg, 3.3 mmol) was slowly added. The reaction mixture was allowed to warm to rt for 1 h and then quenched with H_2O (3 mL). The aqueous layer was extracted with CH_2Cl_2 (3 x 3 mL) and then dried ($MgSO_4$). The solvent was concentrated and the product was purified by silica gel column chromatography (elution with hexanes/EtOAc 70:30) to yield **4d** in 94% yield (524.3 mg) as a yellow powder. mp: 46-48 °C. ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.99 (dd, *J* = 4.2, 1.7 Hz, 1H), 8.22 (dd, *J* = 8.3, 1.5 Hz, 1H), 7.81 (dd, *J* = 8.3, 1.2 Hz, 1H), 7.73 (dd, *J* = 7.6, 1.5 Hz, 1H), 7.57 (t, *J* = 7.6 Hz, 1H), 7.50 (dd, *J* = 8.3, 4.2 Hz, 1H), 3.46 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 150.9, 145.5, 141.3, 136.1, 129.7, 127.1, 126.3, 123.7, 122.0, 39.1; FT-IR (neat) 3635, 3034, 1744, 1598, 1499, 1471, 1362, 1180; HRMS (ESI) *m/z* calcd. for $C_{10}H_{10}NO_3S$ $(M+H)^+$ 224.0381, found 224.0386.

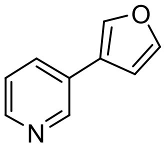


Isoquinolin-5-yl Methanesulfonate (4e). To a stirred solution of isoquinolin-5-ol (363.0 mg, 2.50 mmol) in 2.5 mL of CH_2Cl_2 was added Et_3N (507 µL, 3.75 mmol). The reaction mixture was cooled to 0 °C and CH_3SO_2Cl (378.0 mg, 3.3 mmol) was slowly added. The reaction mixture was allowed to warm to rt for 1 h and then quenched with H_2O (3 mL). The aqueous layer was extracted with CH_2Cl_2 (3 x 3 mL) and then dried ($MgSO_4$). The solvent was concentrated and the product was purified by silica gel column chromatography (elution with hexanes/EtOAc 50:50) to yield **4e** in 57% yield (315.6 mg) as a yellow powder. mp: 92-94 °C. ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.32 (s, 1H), 8.65 (d, *J* = 5.9 Hz, 1H), 7.96 (d, *J* = 8.1 Hz, 1H), 7.91 (d, *J* = 5.9 Hz, 1H), 7.73 (d, *J* = 7.8 Hz, 1H), 7.65-7.61 (m, 1H), 3.28 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 152.5, 144.4, 144.1, 130.1, 129.8, 127.2, 127.1, 123.0, 114.4, 38.4; FT-IR (neat) 3005, 1586, 1338, 1165; HRMS (ESI) *m/z* calcd. for $C_{10}H_8NO_3S$ $(M-H)^-$ 222.0225, found 222.0216.



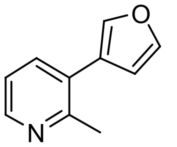
1*H*-Indol-5-yl Methanesulfonate (4g). To a stirred solution of 1*H*-indol-5-ol (166.0 mg, 1.25 mmol) in 1.25 mL of CH_2Cl_2 was added Et_3N (186 µL, 1.37 mmol). The reaction mixture was cooled to 0 °C and CH_3SO_2Cl (178.0 mg, 1.56 mmol) was slowly added. The reaction mixture was allowed to warm to rt for 1 h and then quenched with H_2O (1.5 mL). The aqueous layer was extracted with CH_2Cl_2 (3 x 3 mL) and then dried ($MgSO_4$). The solvent was concentrated and the product was purified by silica gel column chromatography (elution with hexanes/EtOAc 70:30) to yield **4g** in 83% yield (219.3 mg) as an off-white powder. mp: 96-98 °C. ^{1}H NMR (500 MHz, acetone-*d*$_6$) δ 10.47 (br s, 1H), 7.56 (d, *J* = 2.2 Hz, 1H), 7.49 (d, *J* = 8.8 Hz, 1H), 7.45 (d, *J* = 2.7 Hz, 1H), (dd, *J* = 8.8, 2.2 Hz, 1H), 6.55-6.54 (m, 1H), 3.21 (s, 3H); ^{13}C NMR (125 MHz, acetone-*d*$_6$) δ 144.3, 135.7, 129.2, 127.9, 116.6, 114.1, 112.9, 103.0, 37.0; FT-IR (neat) 3397, 3038, 1622, 1576, 1374, 1171; HRMS (ESI) *m*/*z* calcd. for $C_9H_{10}NO_3S$ $(M+H)^+$ 212.0381, found 212.0387.

4. Preparation of (furan-3-yl)heteroaryl compounds



3-(Furan-3-yl)pyridine (5a). Following the general procedure, the reaction was carried out with **4a** (43.3 mg, 0.25 mmol) and potassium furan-3-yltrifluoroborate (57.4 mg, 0.33 mmol) to obtain **5a** (28.9 mg, 80%) as a yellow oil after silica gel chromatography (elution with hexanes/EtOAc 50:50). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.75 (d, *J* = 2.2 Hz, 1H), 8.49 (dd, *J* = 4.9, 1.2 Hz, 1H), 7.77 (s, 1H), 7.74 (dt, *J* = 7.8, 2.2 Hz, 1H), 7.51 (s, 1H), 7.30-7.26 (m, 1H), 6.71-6.70 (m, 1H).

^{1}H NMR is comparable to the literature.[9]



3-(Furan-3-yl)-2-methylpyridine (5b). Following the general procedure, the reaction was carried out with **4b** (46.8 mg, 0.25 mmol) and potassium furan-3-yltrifluoroborate (57.4 mg, 0.33 mmol) to obtain **5b** (27.7 mg, 70%) as a brown oil after silica gel chromatography (elution with hexanes/EtOAc 65:35). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.44-8.43 (m, 1H), 7.59 (dd, *J* = 4.9, 1.2 Hz, 1H), 7.55 (s, 1H), 7.51-7.50 (m, 1H), 7.14 (dd, *J* = 7.6, 4.9 Hz, 1H), 6.58 (s 1H), 2.62 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 156.1, 147.8, 143.2, 140.4, 136.7, 127.9, 124.0, 121.3, 111.2, 24.1; FT-IR (neat) 3401, 3050, 1578, 1505, 1434; HRMS (ESI) *m*/*z* calcd. for $C_{10}H_9NO$ $(M)^+$ 159.0684, found 159.0685.

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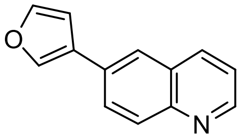
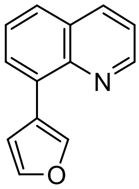
[9] Bhayana, B.; Fors, B. P.; Buchwald, S. L. *Org. Lett.* **2009**, *11*, 3954-3957.

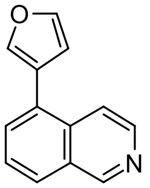


6-(Furan-3-yl)quinoline (5c). Following the general procedure, the reaction was carried out with **4c** (55.8 mg, 0.25 mmol) and potassium furan-3-yltrifluoroborate (57.4 mg, 0.33 mmol) to obtain **5c** (48.1 mg, 99%) as a yellow powder after silica gel chromatography (elution with hexanes/EtOAc 60:40). mp: 88-90 °C. ^{1}H NMR (500 MHz, acetone-*d$_6$*) δ 8.86 (dd, *J* = 4.2, 1.5 Hz, 1H), 8.27 (dd, *J* = 8.3, 1.5 Hz, 1H), 8.20-8.19 (m, 1H), 8.13 (d, *J* = 2.0 Hz, 1H), 8.06-8.00 (m, 2H), 7.70 (t, *J* = 1.7 Hz, 1H), 7.47 (dd, *J* = 8.3, 4.2 Hz, 1H), 7.04 (dd, *J* = 2.0, 1.0 Hz, 1H).

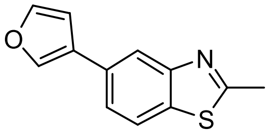
^{1}H NMR is comparable to the literature.[9]



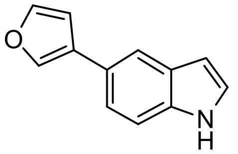
8-(Furan-3-yl)quinoline (5d). Following the general procedure, the reaction was carried out with **4d** (55.8 mg, 0.25 mmol) and potassium furan-3-yltrifluoroborate (57.4 mg, 0.33 mmol) to obtain **5d** (44.9 mg, 92%) as a brown oil after silica gel chromatography (elution with hexanes/EtOAc 85:15). ^{1}H NMR (500 MHz, acetone-*d$_6$*) δ 9.00 (dd, *J* = 4.2, 2.0 Hz, 1H), 8.83-8.82 (m, 1H), 8.34 (dd, *J* = 8.3, 2.0 Hz, 1H), 8.05 (dd, *J* = 7.3, 1.2 Hz, 1H), 7.84 (dd, *J* = 8.3, 1.2 Hz, 1H), 7.67 (t, *J* = 1.7 Hz, 1H), 7.60 (dd, *J* = 8.3, 7.3 Hz, 1H), 7.54 (dd, *J* = 8.3, 4.2 Hz, 1H), 7.18 (dd, *J* = 2.0, 0.7 Hz, 1H); ^{13}C NMR (125 MHz, acetone-*d$_6$*) δ 150.6, 146.4, 144.6, 143.2, 137.4, 132.1, 129.8, 128.3, 127.8, 127.3, 123.7, 122.2, 111.0; FT-IR (neat) 3047, 1732, 1614, 1597, 1514; HRMS (ESI) *m*/*z* calcd. for $C_{13}H_9NO$ (M)$^+$ 195.0684, found 195.0689.



5-(Furan-3-yl)isoquinoline (5e). Following the general procedure, the reaction was carried out with **4e** (55.8 mg, 0.25 mmol) and potassium furan-3-yltrifluoroborate (57.4 mg, 0.33 mmol) to obtain **5e** (42.4 mg, 87%) as a yellow oil after silica gel chromatography (elution with hexanes/EtOAc 85:15). ^{1}H NMR (500 MHz, acetone-*d$_6$*) δ 9.33 (s, 1H), 8.53 (d, *J* = 5.9 Hz, 1H), 8.07 (d, *J* = 8.3 Hz, 1H), 7.97 (d, *J* = 5.9 Hz, 1H), 7.95-7.94 (m, 1H), 7.79-7.77 (m, 2H), 7.69 (dd, *J* = 8.1, 7.1 Hz, 1H), 6.85 (dd, *J* = 1.7, 0.7 Hz, 1H); ^{13}C NMR (125 MHz, acetone-*d$_6$*) δ 153.8, 144.6, 144.5, 141.8, 134.7, 131.4, 130.6, 130.0, 128.0, 127.9, 124.3, 118.7, 112.6; FT-IR (neat) 3418, 3031, 1732, 1615, 1602, 1505; HRMS (ESI) *m*/*z* calcd. for $C_{13}H_{10}NO$ (M+H)$^+$ 196.0762, found 196.0765.

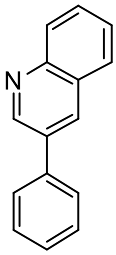


5-(Furan-3-yl)-2-methylbenzo[d]thiazole (5f). Following the general procedure, the reaction was carried out with **4f** (60.8 mg, 0.25 mmol) and potassium furan-3-yltrifluoroborate (57.4 mg, 0.33 mmol) to obtain **5f** (41.2 mg, 77%) as a white powder after silica gel chromatography (elution with hexanes/EtOAc 70:30). mp: 105-106 °C; ^{1}H NMR (500 MHz, acetone-d_6) δ 8.12-8.11 (m, 2H), 7.93 (d, *J* = 8.3 Hz, 1H), 7.67 (t, *J* = 1.7 Hz, 1H), 7.63 (dd, *J* = 8.3, 1.7 Hz, 1H), 6.99 (dd, *J* = 2.0, 1.0 Hz, 1H), 2.79 (s, 3H); ^{13}C NMR (125 MHz, acetone-d_6) δ 168.2, 155.3, 145.0, 140.1, 135.1, 131.5, 127.1, 123.6, 122.7, 119.9, 109.7, 20.0; FT-IR (neat) 3049, 1749, 1590, 1543, 1530; HRMS (ESI) *m*/*z* calcd. for $C_{12}H_9NO$ $(M)^+$ 215.0405, found 215.0400.



5-(Furan-3-yl)-1*H*-indole (5g). Following the general procedure, the reaction was carried out with **4g** (52.8 mg, 0.25 mmol) and potassium furan-3-yltrifluoroborate (57.4 mg, 0.33 mmol) to obtain **5g** (20.1 mg, 44%) as an off-white powder after silica gel chromatography (elution with hexanes/EtOAc 70:30). mp: 89-91 °C; ^{1}H NMR (500 MHz, acetone-d_6) δ 10.24 (br s, 1H), 7.91-7.90 (m, 1H), 7.79-7.78 (m, 1H), 7.59 (t, *J* = 1.7 Hz, 1H), 7.43 (td, *J* = 8.3, 0.7 Hz, 1H), 7.36 (dd, *J* = 8.3, 1.7 Hz, 1H), 7.33 (t, *J* = 2.7 Hz, 1H), 6.88 (dd, *J* = 1.7, 0.7 Hz, 1H), 6.48-6.46 (m, 1H); ^{13}C NMR (125 MHz, acetone-d_6) δ 144.4, 138.5, 136.6, 129.5, 128.7, 126.2, 124.5, 120.8, 118.2, 112.5, 109.9, 102.5; FT-IR (neat) 3426, 3023, 1728, 1469; HRMS (ESI) *m*/*z* calcd. for $C_{12}H_{10}NO$ $(M+H)^+$ 184.0762, found 184.0761.

5. Preparation of (substituted phenyl)heteroaryl compounds



3-Phenylquinoline (6a). Following the general procedure, the reaction was carried out with phenyl methanesulfonate (43.0 mg, 0.25 mmol) and potassium quinolin-3-yltrifluoroborate (77.6 mg, 0.33 mmol) to obtain **6a** (38.4 mg, 75%) as a brown oil after silica gel chromatography (elution with hexanes/EtOAc 80:20). ^{1}H NMR (500 MHz, acetone-d_6) δ 9.22 (d, *J* = 2.4 Hz, 1H), 8.51 (d, *J* = 2.4 Hz, 1H), 8.09 (d, *J* = 8.6 Hz, 1H), 8.01 (d, *J* = 8.1 Hz, 1H), 7.85-7.83 (m, 2H), 7.77-7.73 (m, 1H), 7.64-7.60 (m, 1H), 7.57-7.53 (m, 2H), 7.47-7.43 (m, 1H).

^{1}H NMR is comparable to the literature.[10]

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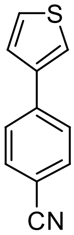
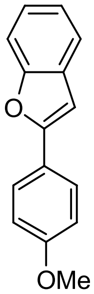
[10] Wang, Y.; Xin, X.; Liang, Y. J.; Lin, Y. J.; Zhang, R.; Dong, D. W. *Eur. J. Org. Chem.* **2009**, 4165-4169.



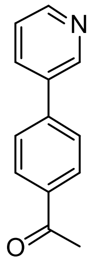
4-(Thiophen-3-yl)benzonitrile (6b). Following the general procedure, the reaction was carried out with 4-cyanophenyl methanesulfonate (49.3 mg, 0.25 mmol) and potassium thiophen-3-yltrifluoroborate (62.0 mg, 0.33 mmol) to obtain **6b** (31.2 mg, 68%) as a white solid after silica gel chromatography (elution with hexanes/EtOAc 80:20). mp: 106-108 °C (lit. 100-101 °C). ^{1}H NMR (500 MHz, CDCl$_3$) δ 7.68 (s, 4H), 7.57 (dd, J = 2.9, 1.5 Hz, 1H), 7.44 (dd, J = 5.1, 2.9 Hz, 1H), 7.40 (dd, J = 5.1, 1.5 Hz, 1H).

^{1}H NMR is comparable to the literature.[11]



2-(4-Methoxyphenyl)benzofuran (6c). Following the general procedure, the reaction was carried out with 4-methoxyphenyl methanesulfonate (50.5 mg, 0.25 mmol) and potassium benzofuran-2-yltrifluoroborate (74.0 mg, 0.33 mmol) to obtain **6c** (39.0 mg, 70%) as a white solid after silica gel chromatography (elution with hexanes/EtOAc 80:20). mp: 149-151 °C (lit. 148-150 °C). ^{1}H NMR (500 MHz, CDCl$_3$) δ 8.17 (d, J = 8.8 Hz, 2H), 7.93 (dd, J = 7.3, 1.0 Hz, 1H), 7.88 (d, J = 7.8 Hz, 1H), 7.65-7.57 (m, 2H), 7.35 (d, J = 8.8 Hz, 2H), 7.26 (s, 1H), 4.23 (s, 3H).

^{1}H NMR is comparable to the literature.[12]



1-(4-(Pyridin-3-yl)phenyl)ethanone (6d). Following the general procedure, the reaction was carried out with 4-acetylphenyl methanesulfonate (53.5 mg, 0.25 mmol) and potassium pyridin-3-yltrifluoroborate (61.0 mg, 0.33 mmol) to obtain **6d** (44.5 mg, 90%) as an off-white powder after silica gel chromatography (elution with hexanes/EtOAc 70:30). mp: 77-79 °C (lit. 80-81 °C). ^{1}H NMR (500 MHz, CDCl$_3$) δ 8.88 (d, J = 1.7 Hz, 1H), 8.64 (dd, J = 4.9, 1.2 Hz, 1H), 8.06 (d, J = 8.3 Hz, 2H), 7.91 (dd, J = 7.8, 2.0 Hz, 1H), 7.68 (d, J = 8.3 Hz, 2H), 7.40 (dd, J = 7.8, 4.9 Hz, 1H), 2.65 (s, 3H).

^{1}H NMR is comparable to the literature.[13]

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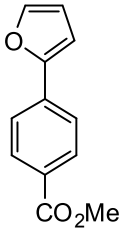
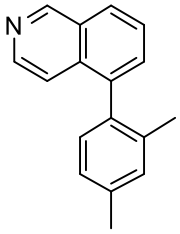
[11] Molander, G. A.; Canturk, B.; Kennedy, L. E. *J. Org. Chem.* **2009**, *74*, 973-980.
[12] Geary, L. M.; Hultin, P. G. *Org. Lett.* **2009**, *11*, 5478-5481.
[13] Cioffi, C. L.; Spencer, W. T.; Richards, J. J.; Herr, R. J. *J. Org. Chem.* **2004**, *69*, 2210-2212.



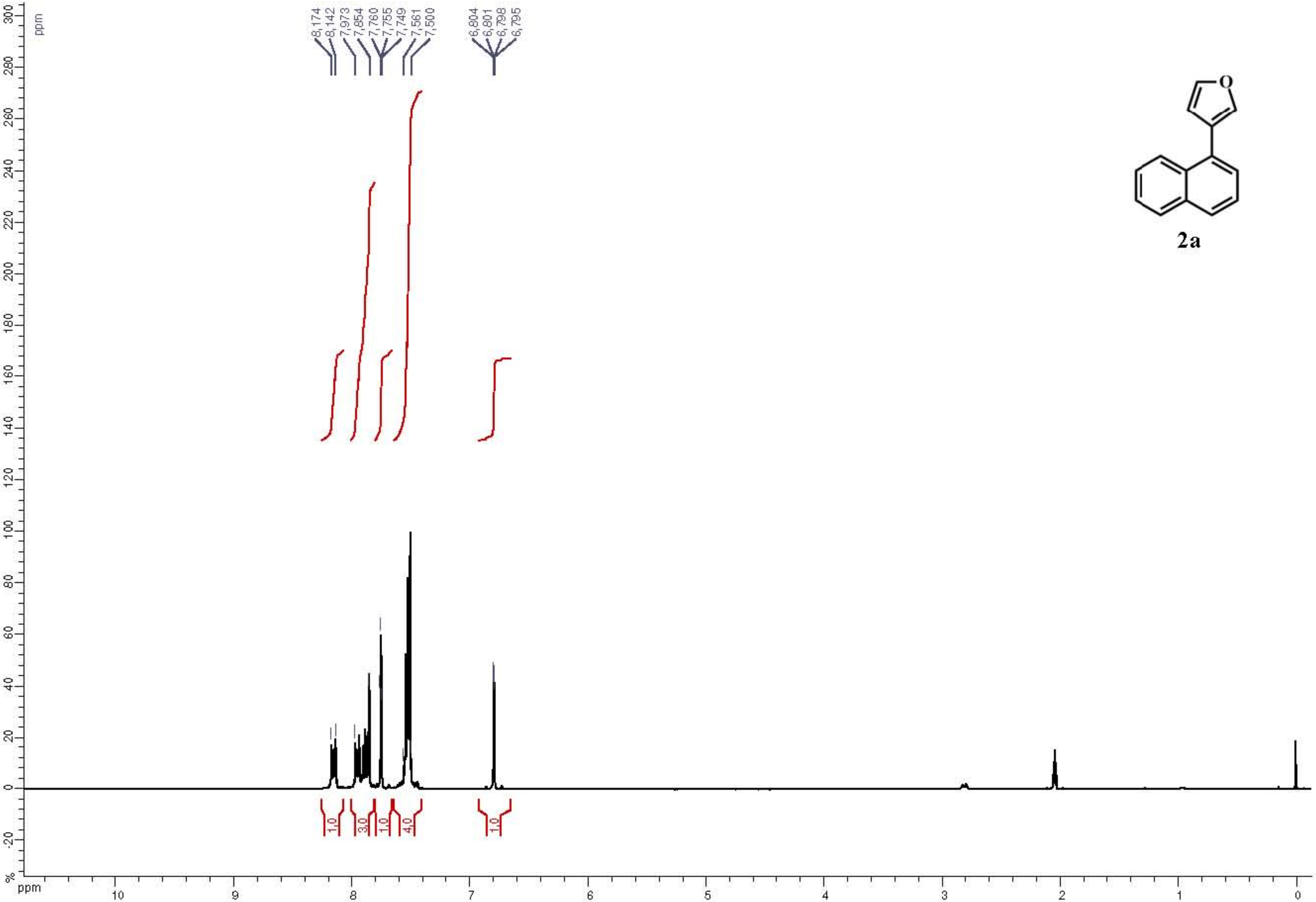
Methyl 4-(Furan-2-yl)benzoate (6e). Following the general procedure, the reaction was carried out with methyl 4-((methylsulfonyl)oxy)benzoate (57.5 mg, 0.25 mmol) and potassium furan-2-yltrifluoroborate (57.4 mg, 0.33 mmol) to obtain **6e** (41.1 mg, 81%) as an orange powder after silica gel chromatography (elution with hexanes/EtOAc 85:15). mp: 117-118 °C (lit. 116-117 °C). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.05 (d, *J* = 8.6 Hz, 2H), 7.72 (d, *J* = 8.6 Hz, 2H), 7.51 (dd, *J* = 1.7, 0.5 Hz, 1H), 6.78 (d, *J* = 3.4 Hz, 1H), 6.50 (dd, *J* = 3.4, 1.7 Hz, 1H), 3.92 (s, 3H).

^{1}H NMR is comparable to the literature.[11]

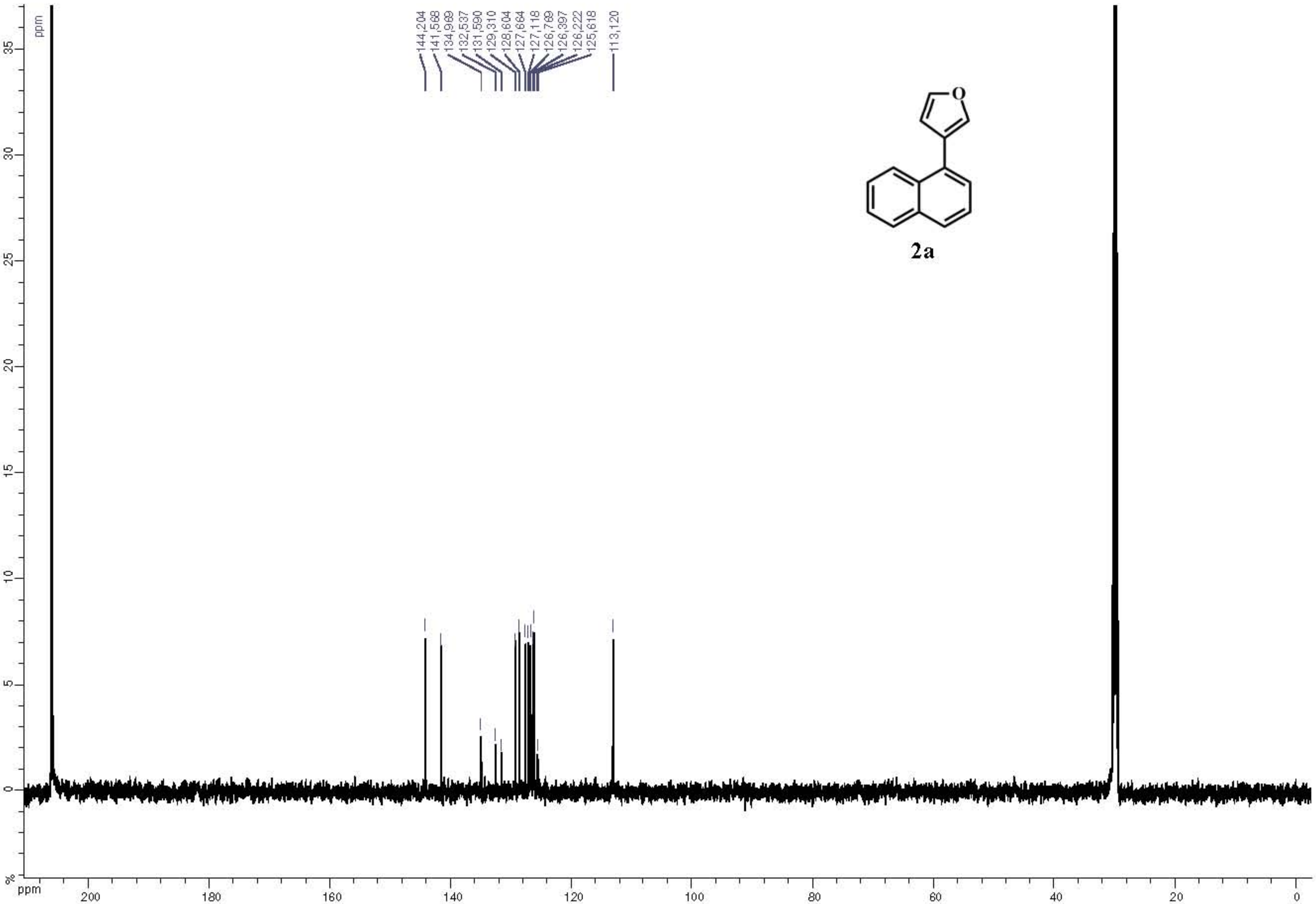


5-(2,4-Dimethylphenyl)isoquinoline (6f). Following the general procedure, the reaction was carried out with 2,4-dimethylphenyl methanesulfonate (50.0 mg, 0.25 mmol) and potassium isoquinolin-5-yltrifluoroborate (77.6 mg, 0.33 mmol) to obtain **6f** (22.9 mg, 39%) as a colorless oil after silica gel chromatography (elution with hexanes/EtOAc 85:15). ^{1}H NMR (500 MHz, acetone-d_6) δ 9.34 (s, 1H), 8.43 (d, *J* = 5.9 Hz, 1H), 8.12 (dd, *J* = 8.3, 1.0 Hz, 1H), 7.74 (dd, *J* = 8.3, 7.1 Hz, 1H), 7.59 (dd, *J* = 7.1, 1.2 Hz, 1H), 7.23 (dd, *J* = 5.9, 1.0 Hz, 1H), 7.21-7.20 (m, 1H), 7.15 (d, *J* = 7.6 Hz, 1H), 7.10 (d, *J* = 7.6 Hz, 1H), 2.40 (s, 3H), 1.96 (s, 3H); ^{13}C NMR (125 MHz, acetone-d_6) δ 152.7, 143.3, 138.7, 137.5, 136.0, 135.5, 134.3, 130.7, 130.7, 129.9, 128.7, 126.8, 126.8, 126.4, 118.1, 20.2, 19.0; FT-IR (neat) 3008, 1615, 1587; HRMS (ESI) *m*/*z* calcd. for $C_{17}H_{15}N$ $(M)^+$ 233.1204, found 233.1200.

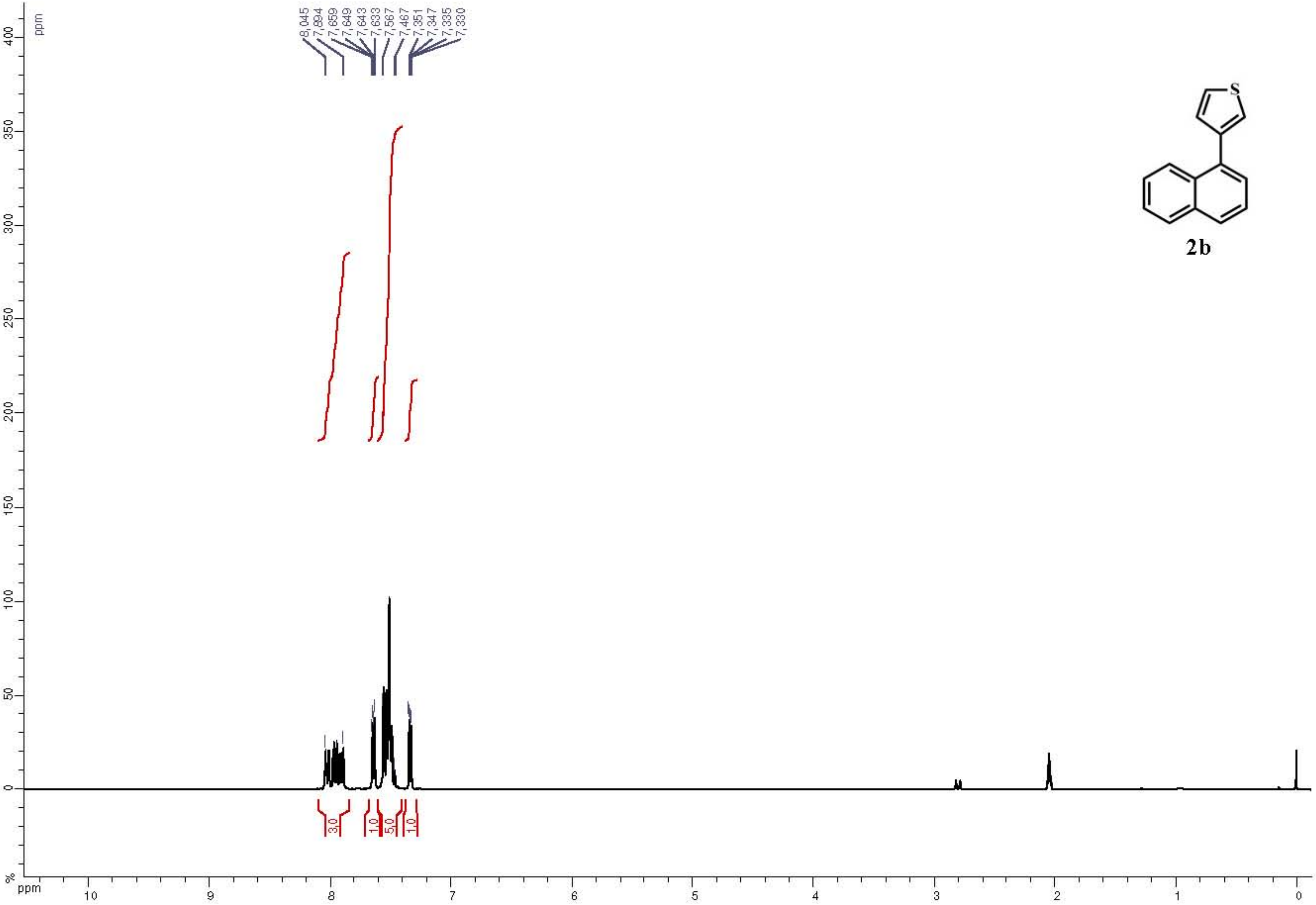
NMR Spectra



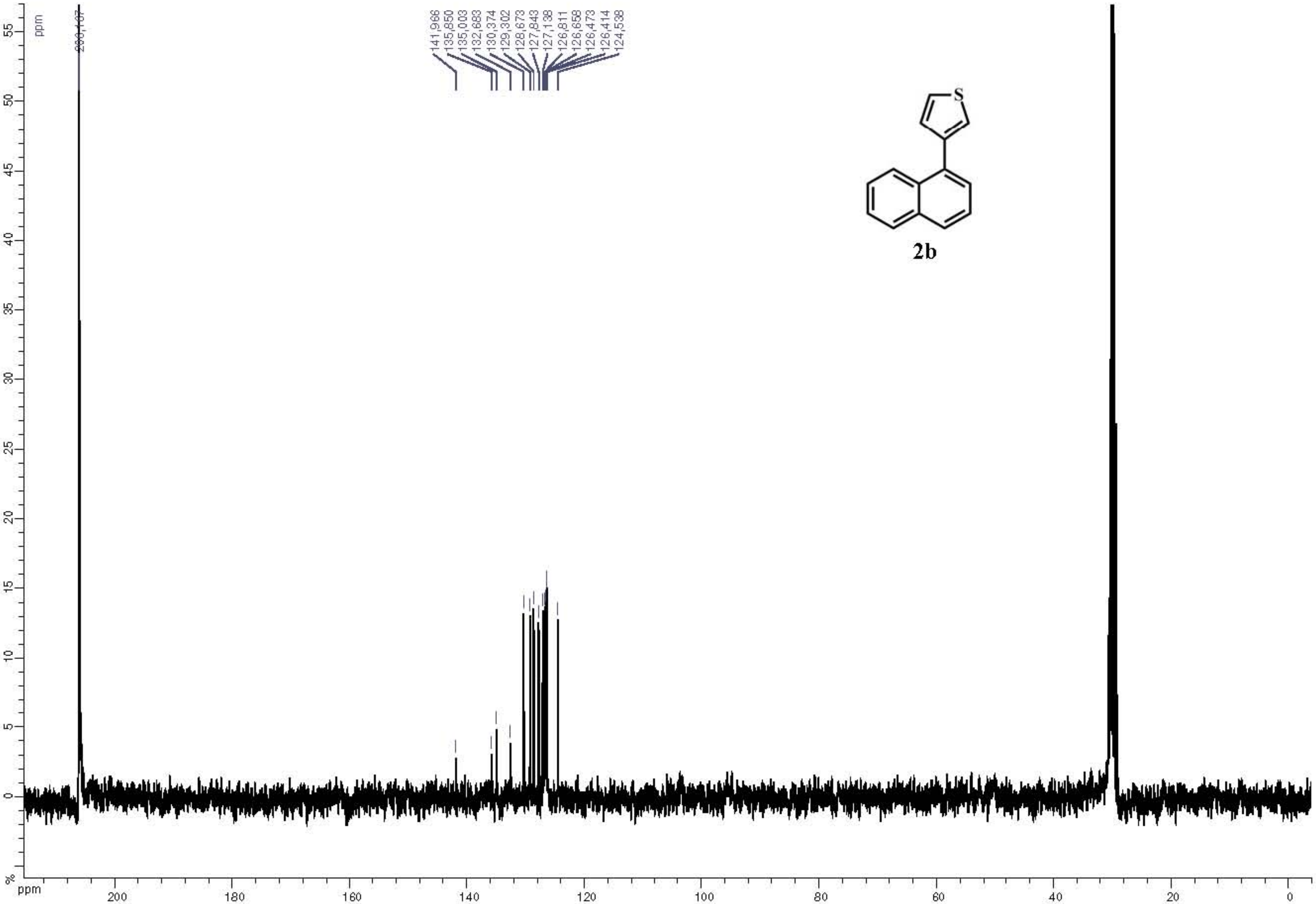
^{1}H NMR (300 MHz, C_3D_6O) Spectrum of 3-(naphthalen-1-yl)furan **2a** (Table 2, entry 1)



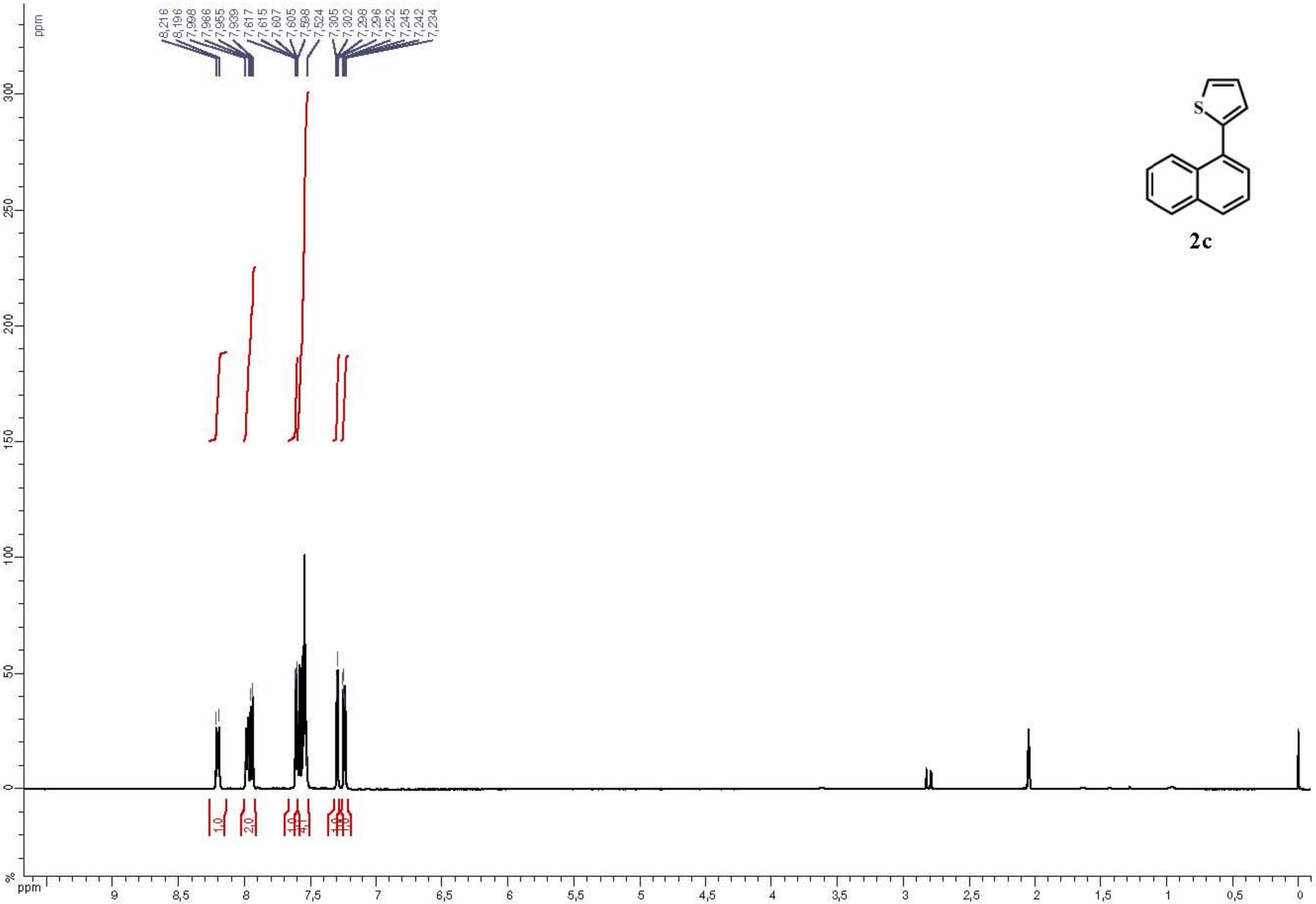
^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 3-(naphthalen-1-yl)furan **2a** (Table 2, entry 1)



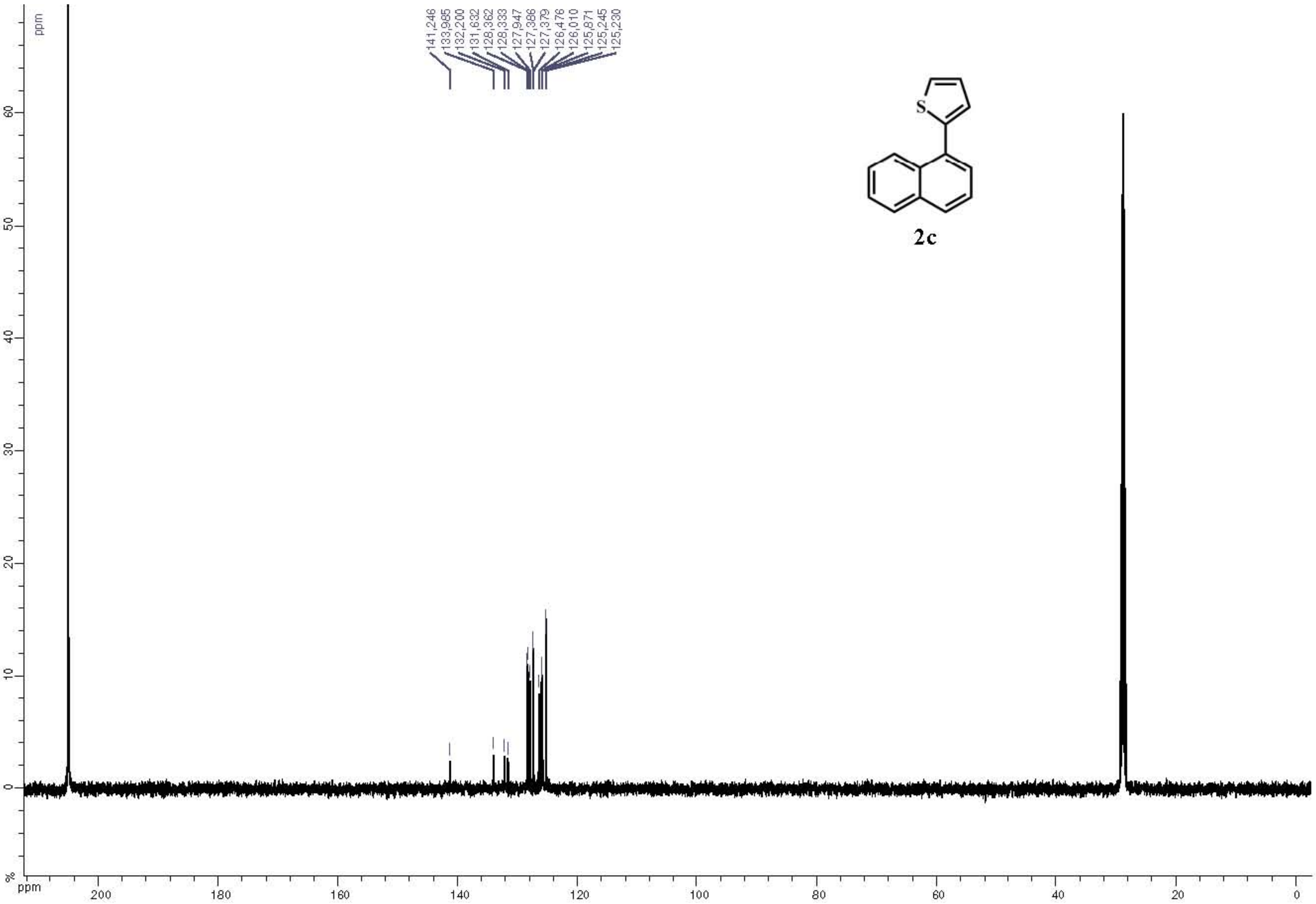
^{1}H NMR (300 MHz, C_3D_6O) Spectrum of 3-(naphthalen-1-yl)thiophene **2b** (Table 2, entry 2)



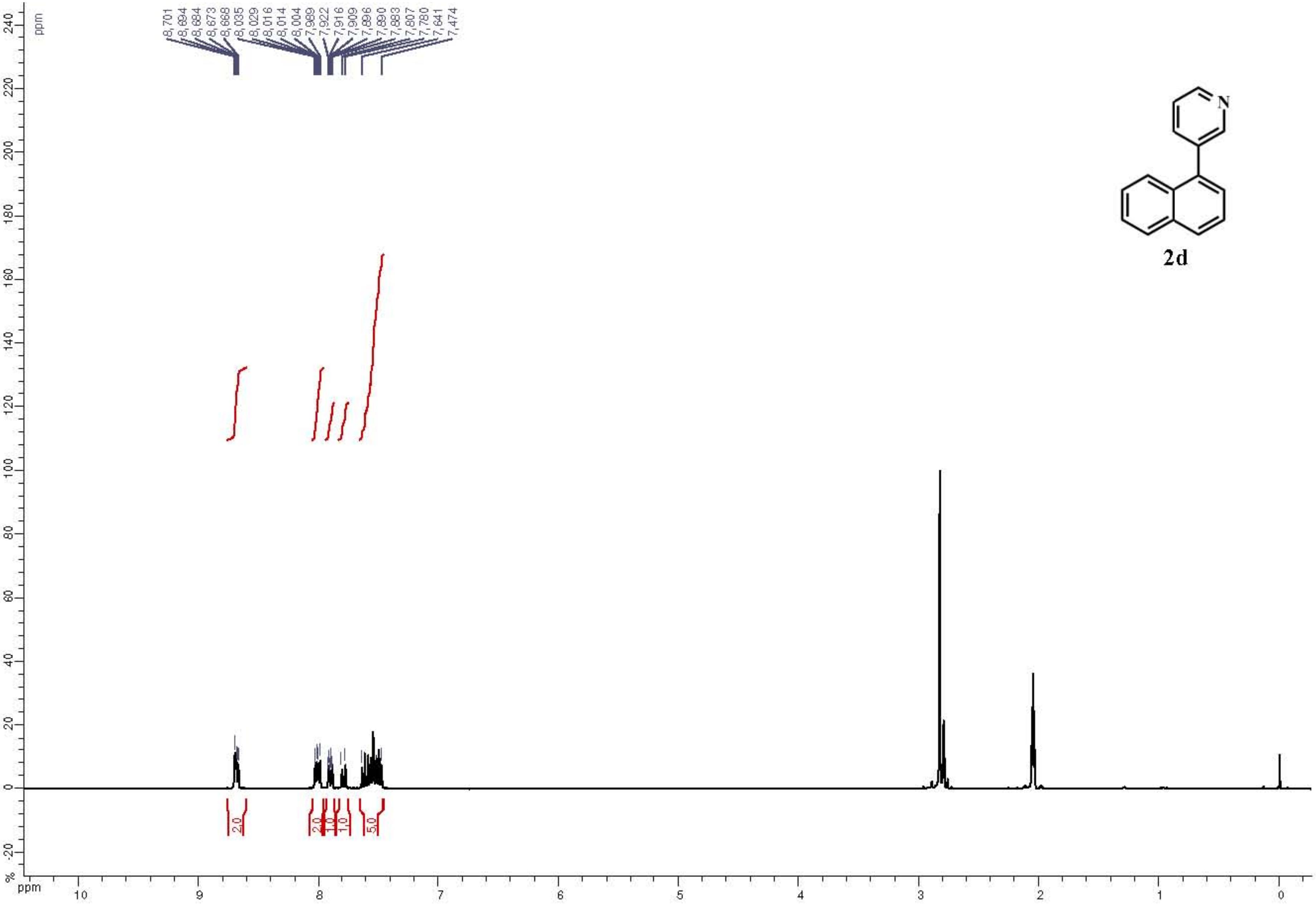
^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 3-(naphthalen-1-yl)thiophene **2b** (Table 2, entry 2)



^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 2-(naphthalen-1-yl)thiophene **2c** (Table 2, entry 3)

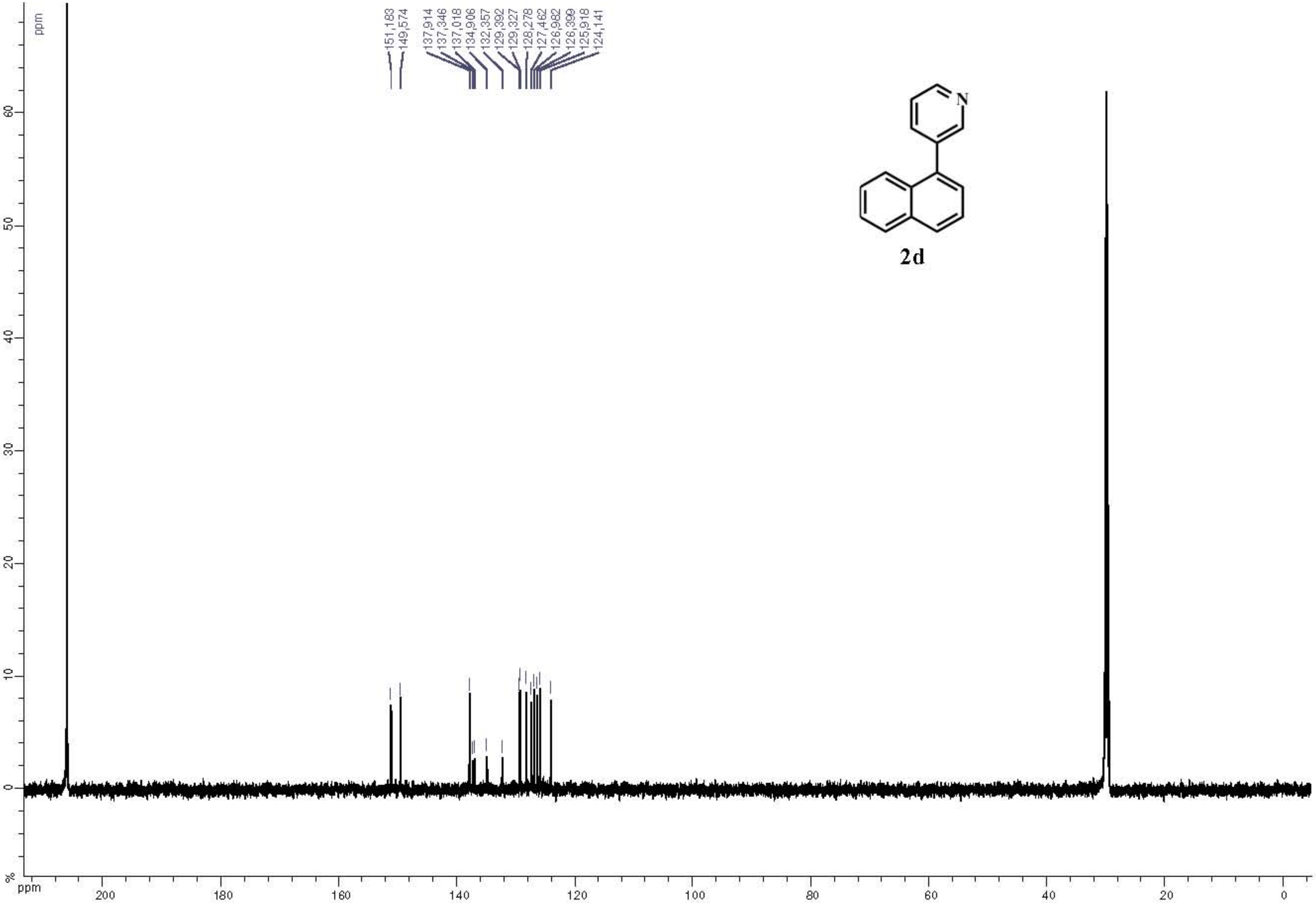


^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 2-(naphthalen-1-yl)thiophene **2c** (Table 2, entry 3)

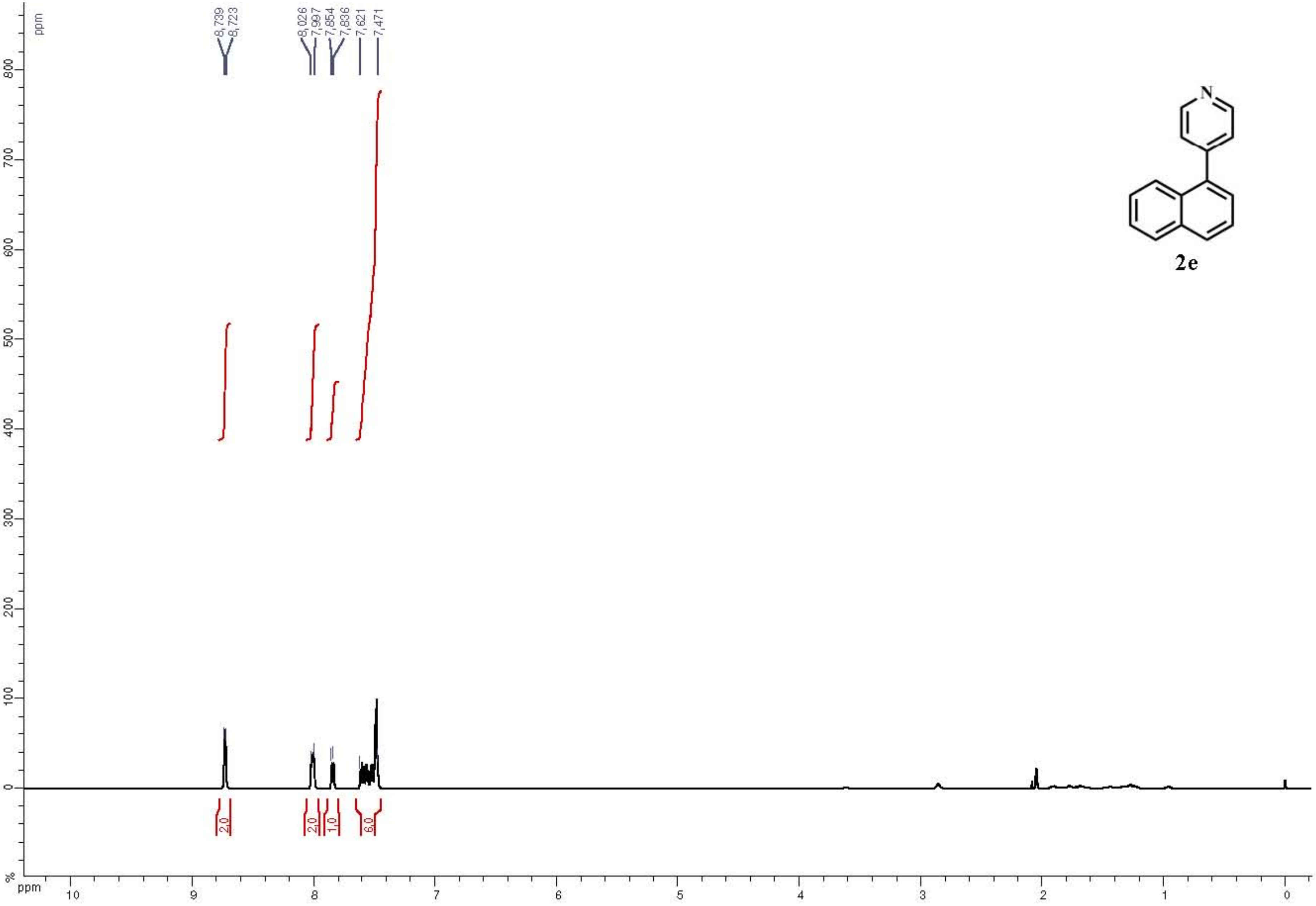


2d

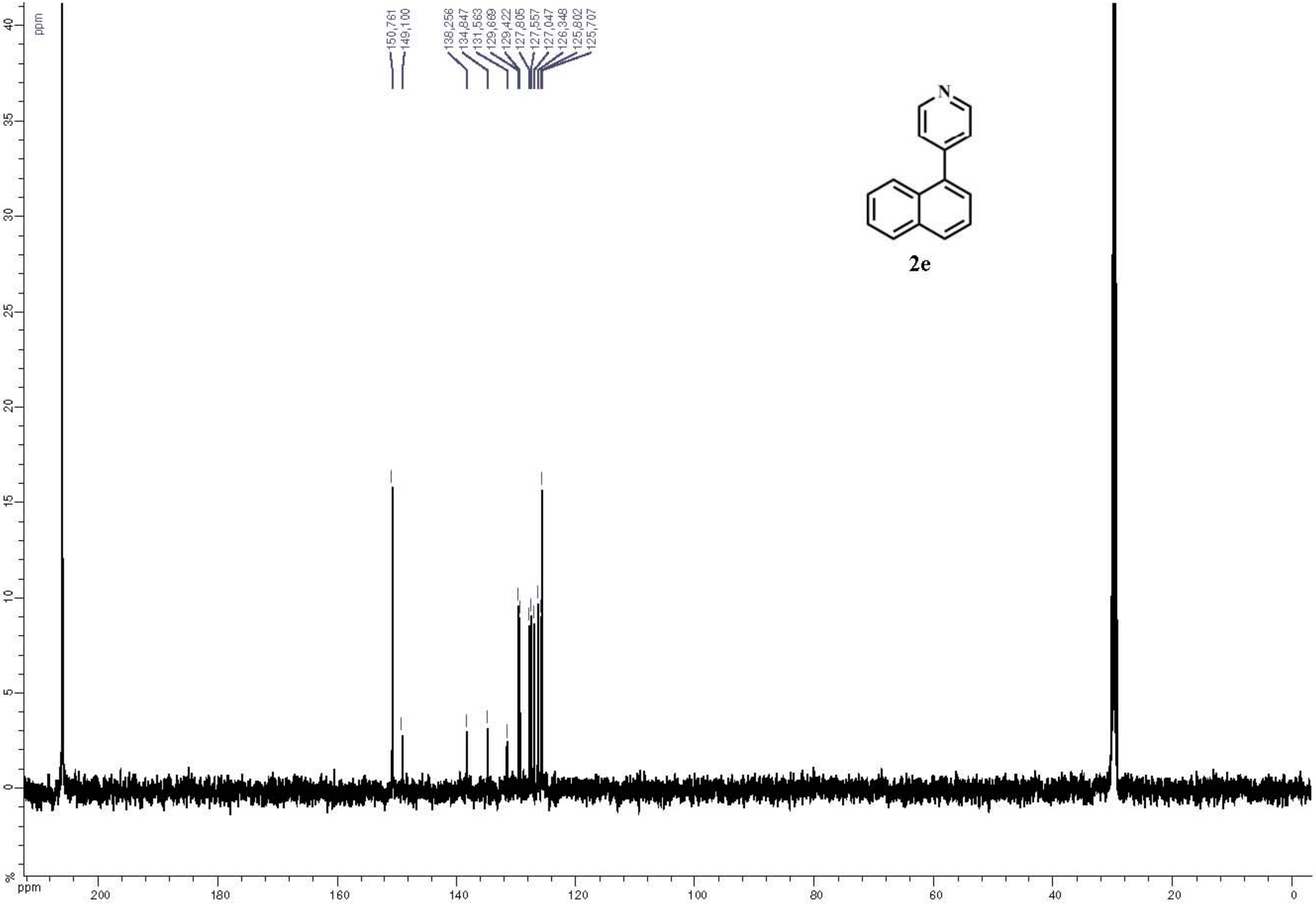
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 3-(naphthalen-1-yl)pyridine **2d** (Table 2, entry 4)



^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 3-(naphthalen-1-yl)pyridine **2d** (Table 2, entry 4)

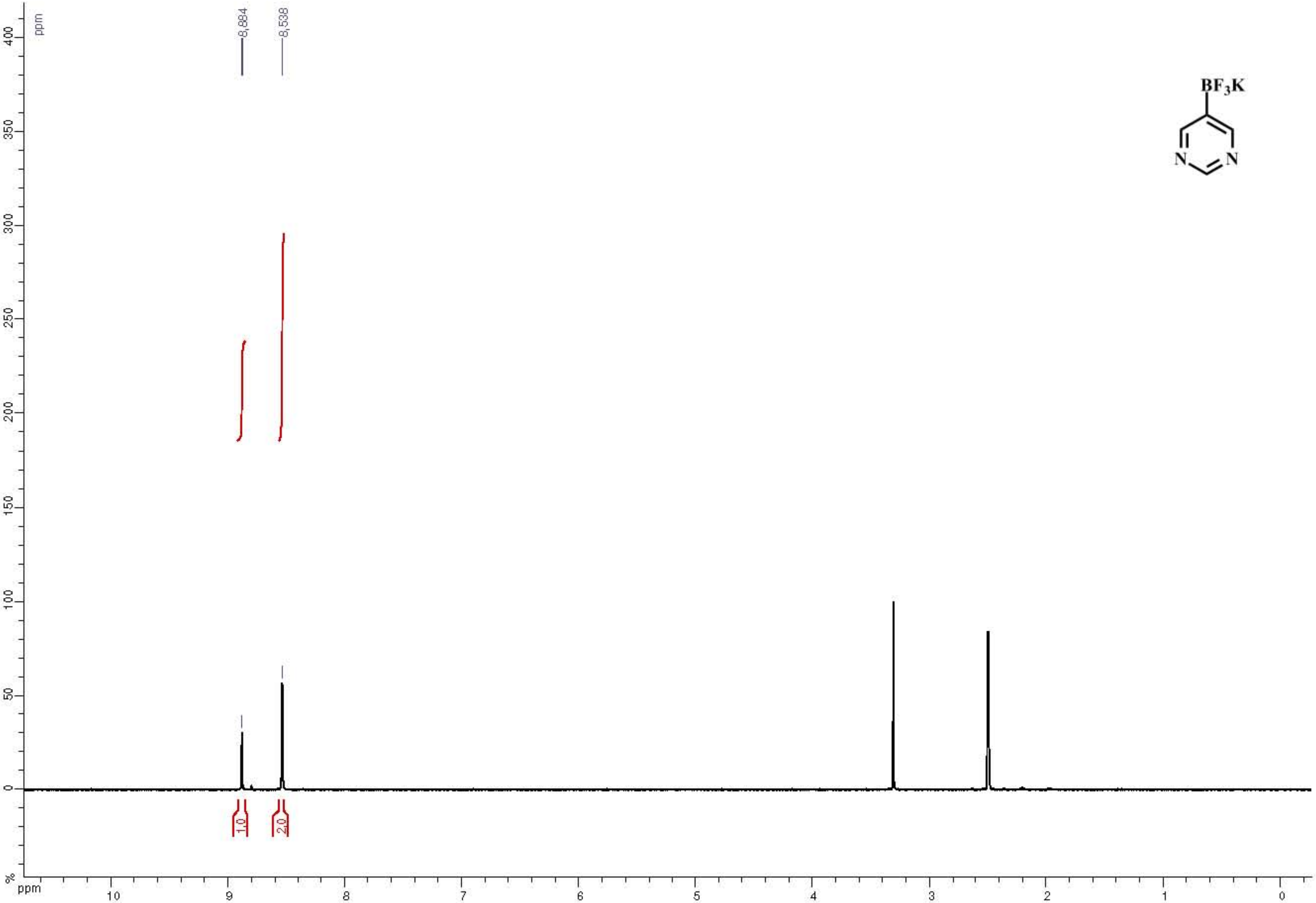


^{1}H NMR (300 MHz, C_3D_6O) Spectrum of 4-(naphthalen-1-yl)pyridine **2e** (Table 2, entry 5)

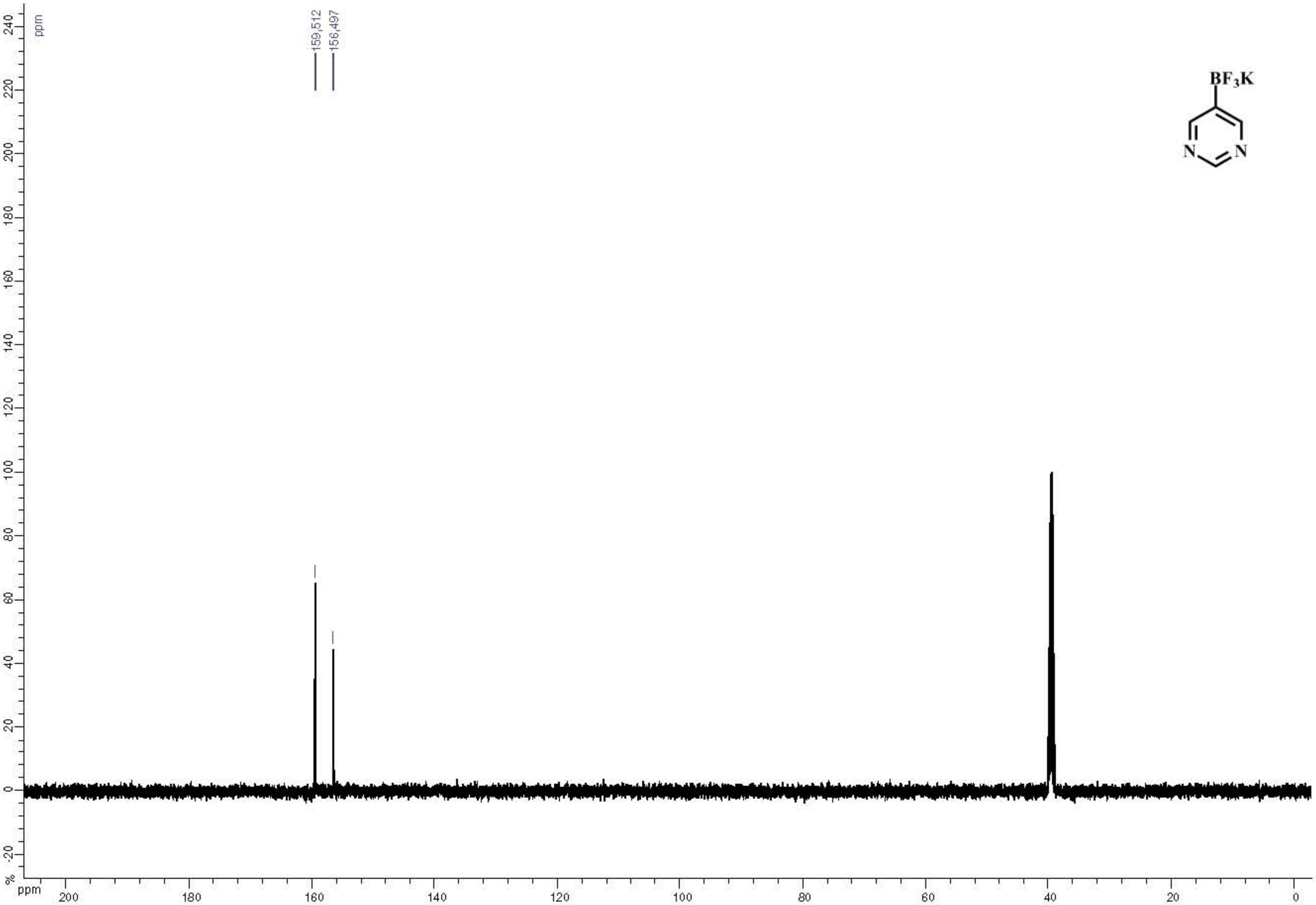


2e

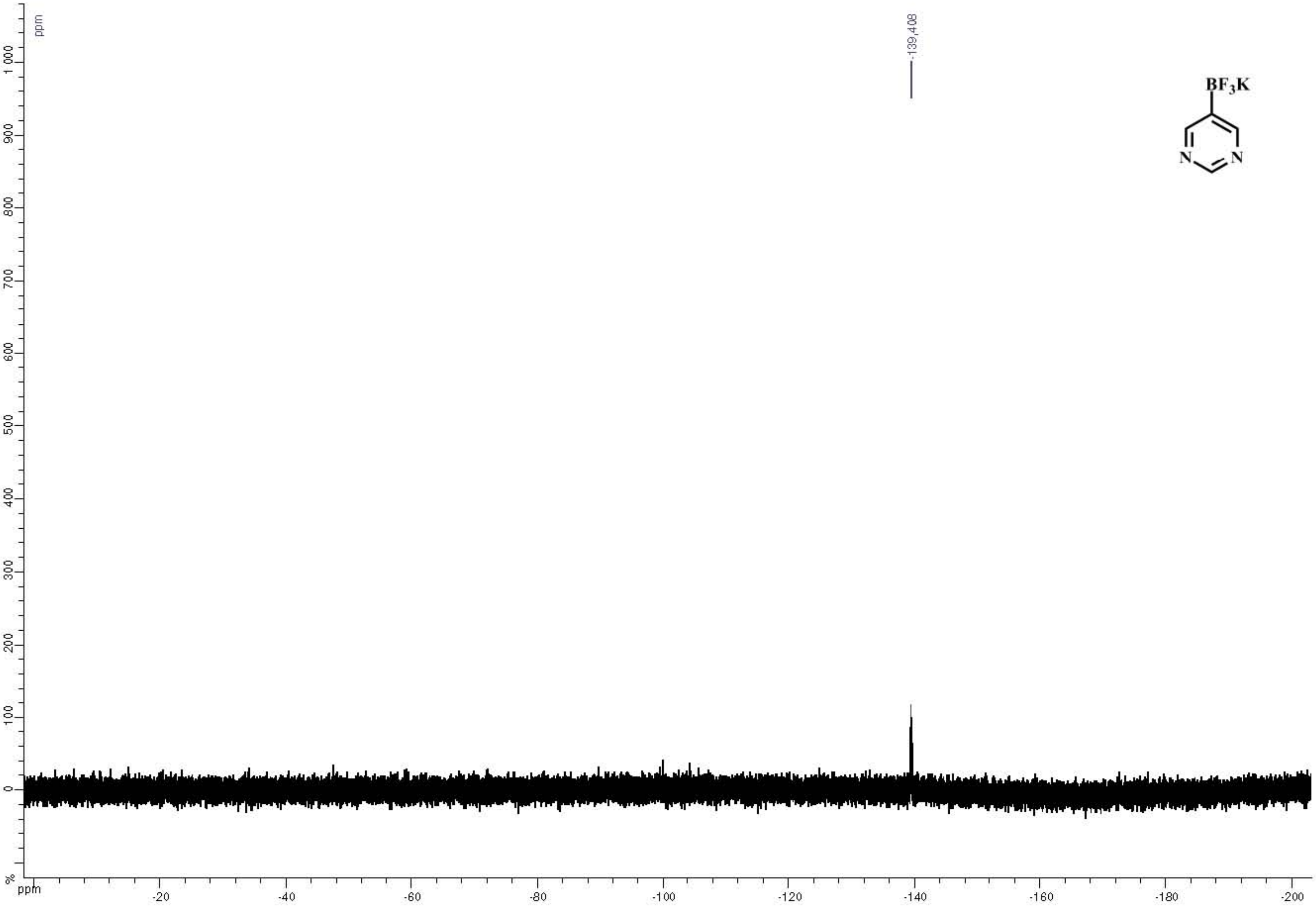
^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 4-(naphthalen-1-yl)pyridine **2e** (Table 2, entry 5)



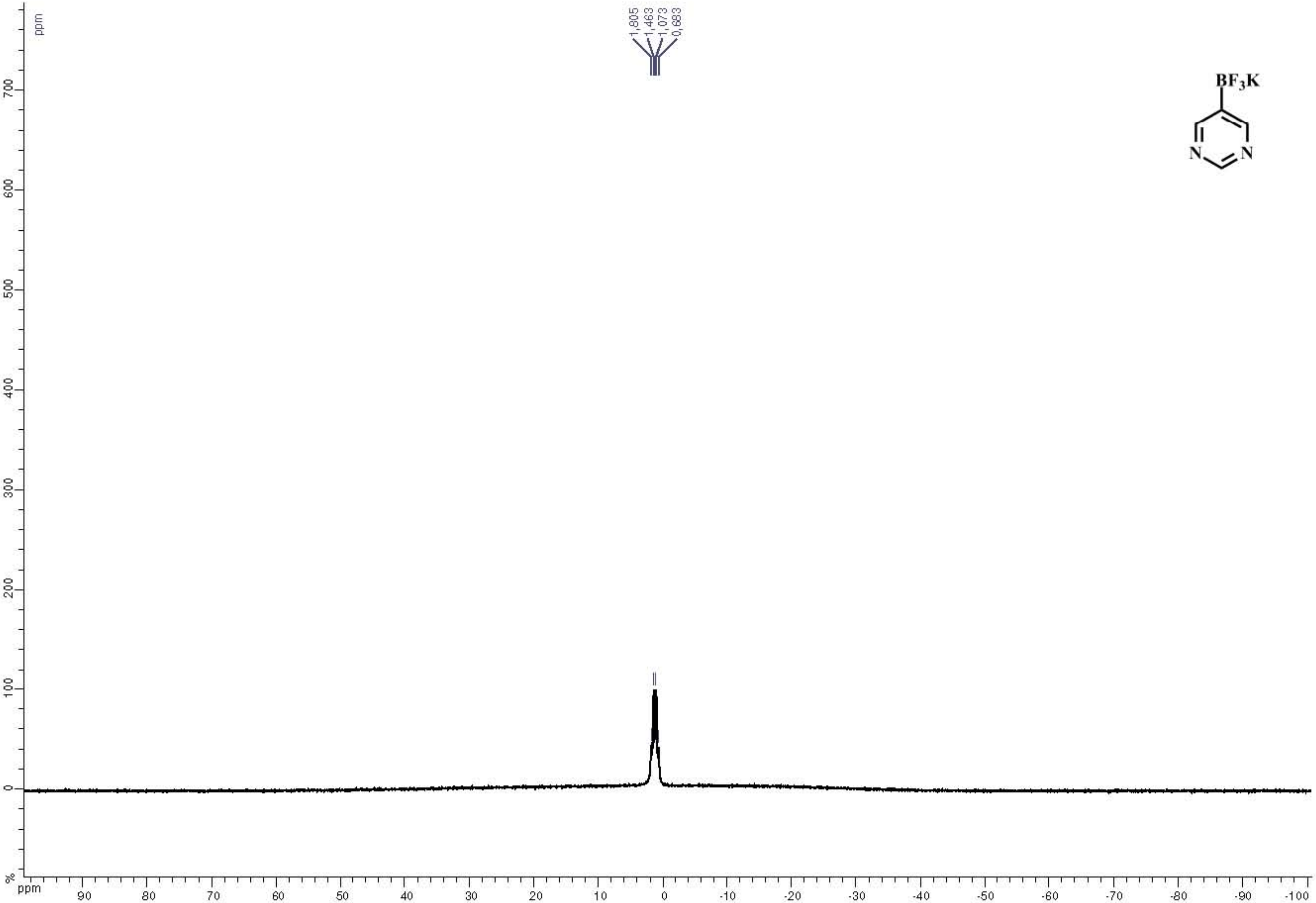
^{1}H NMR (500 MHz, DMSO-d_6) Spectrum of potassium pyrimidin-5-yltrifluoroborate



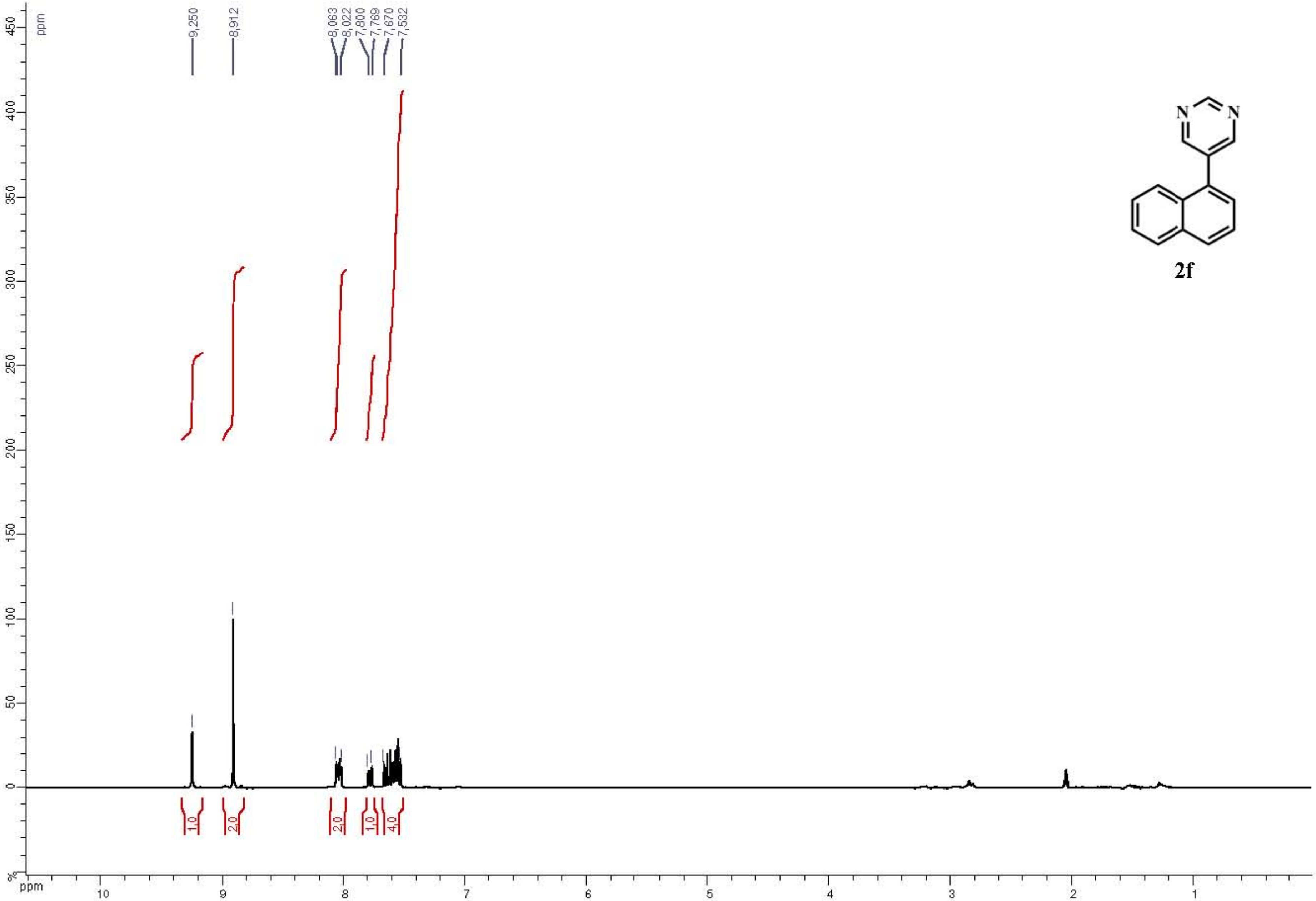
^{13}C NMR (125 MHz, DMSO-d_6) Spectrum of potassium pyrimidin-5-yltrifluoroborate



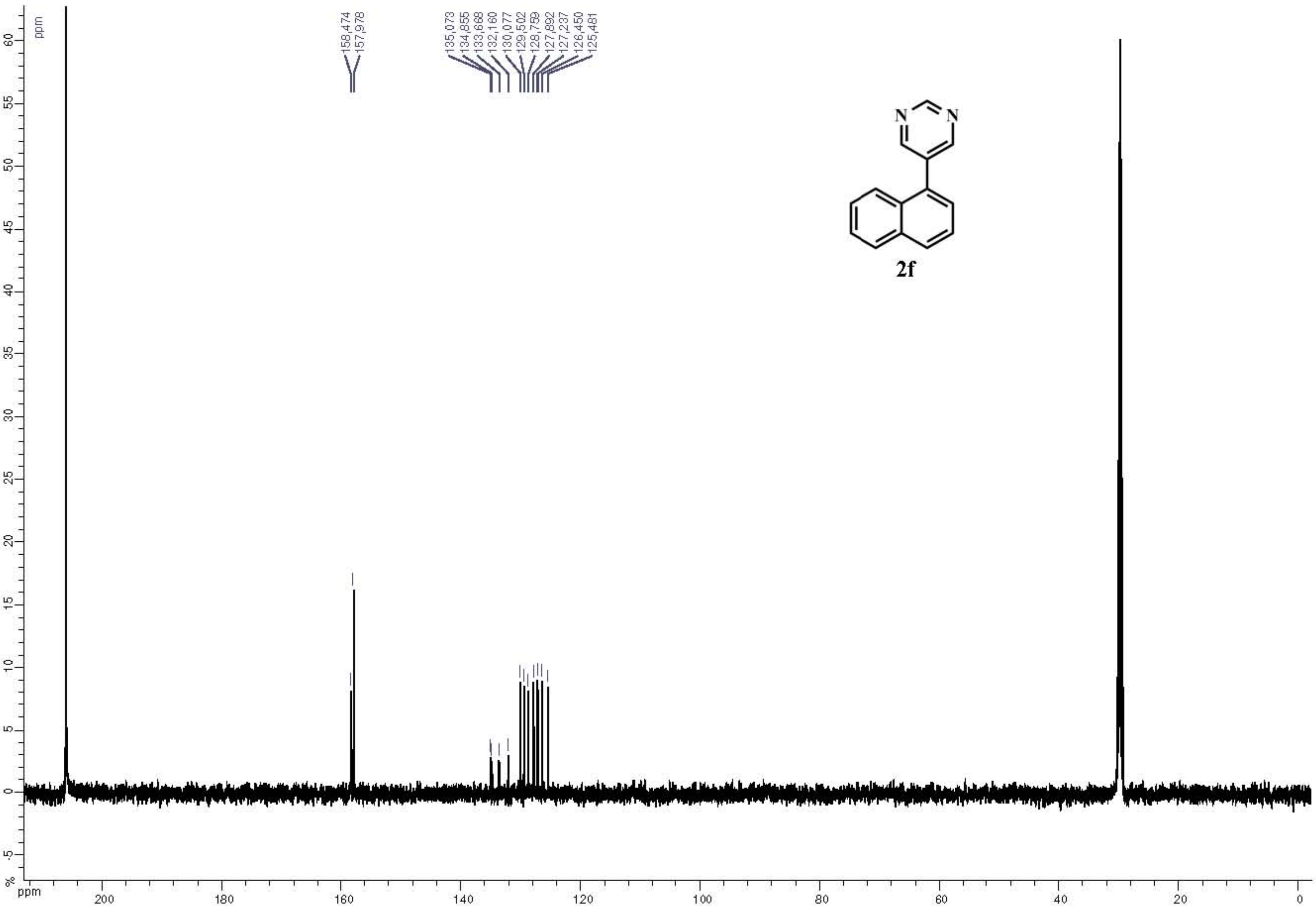
^{19}F NMR (471 MHz, DMSO-d_6) Spectrum of potassium pyrimidin-5-yltrifluoroborate



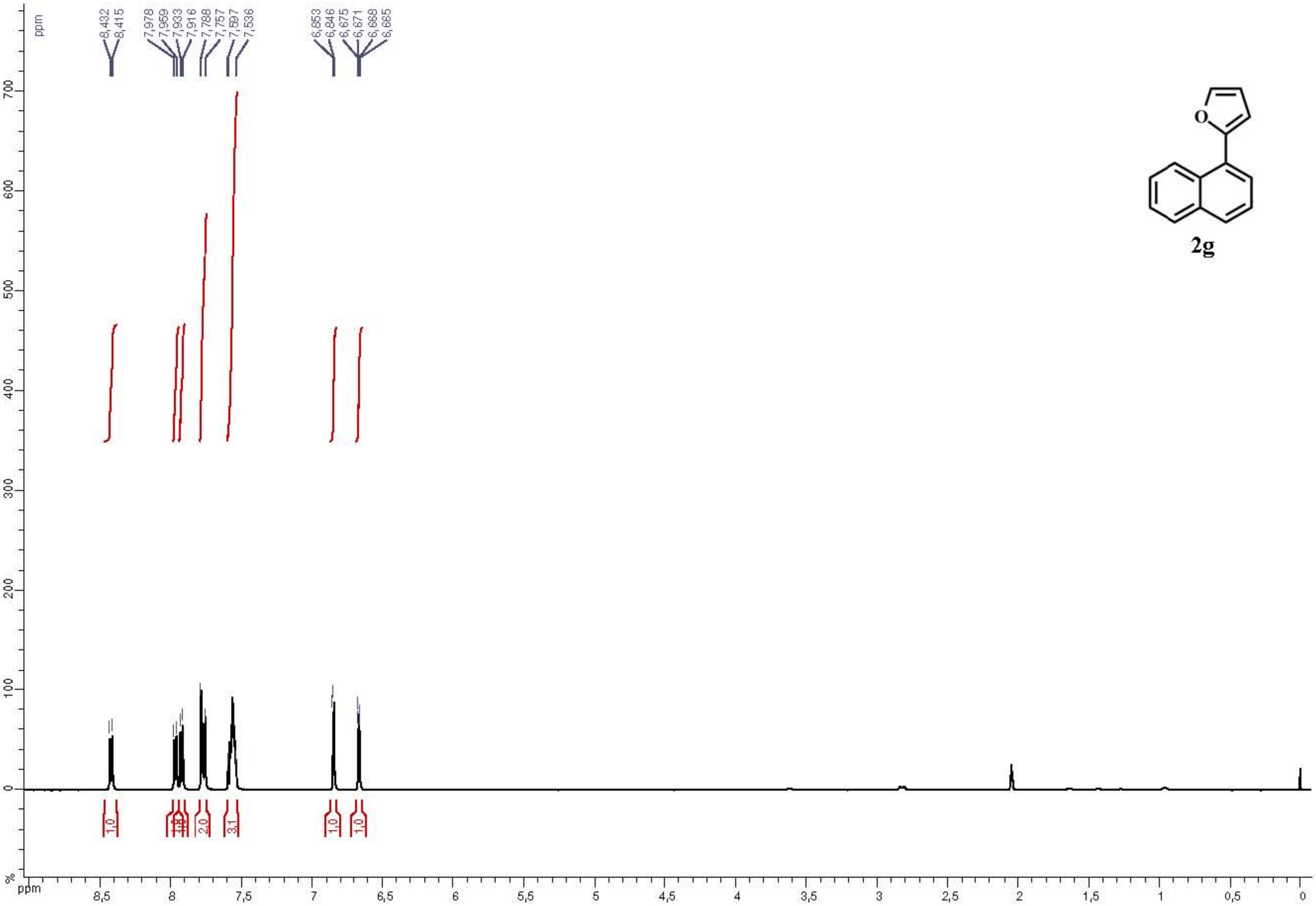
^{11}B NMR (128 MHz, DMSO-d_6) Spectrum of potassium pyrimidin-5-yltrifluoroborate



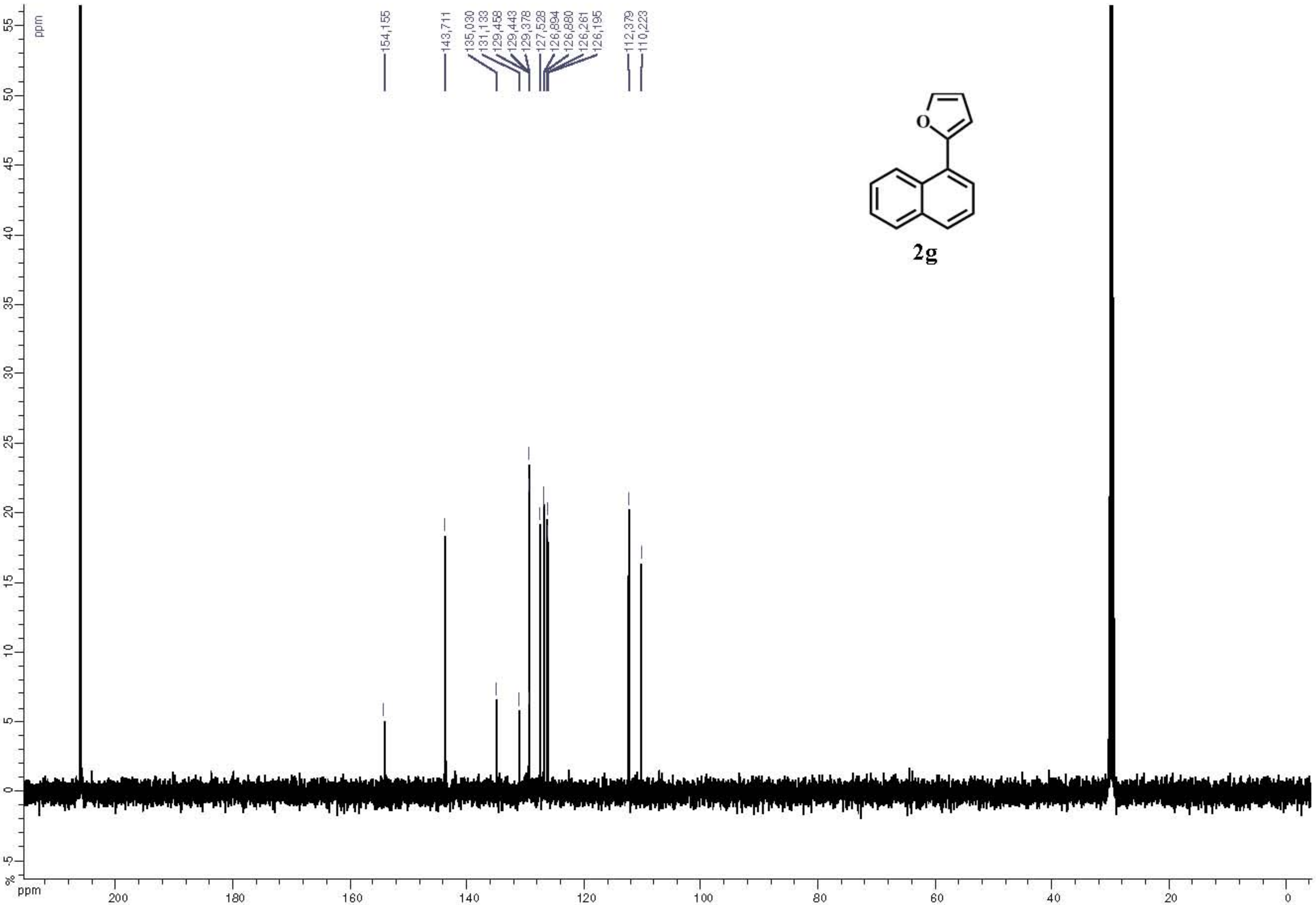
^{1}H NMR (300 MHz, C_3D_6O) Spectrum of 5-(naphthalen-1-yl)pyrimidine **2f** (Table 2, entry 6)



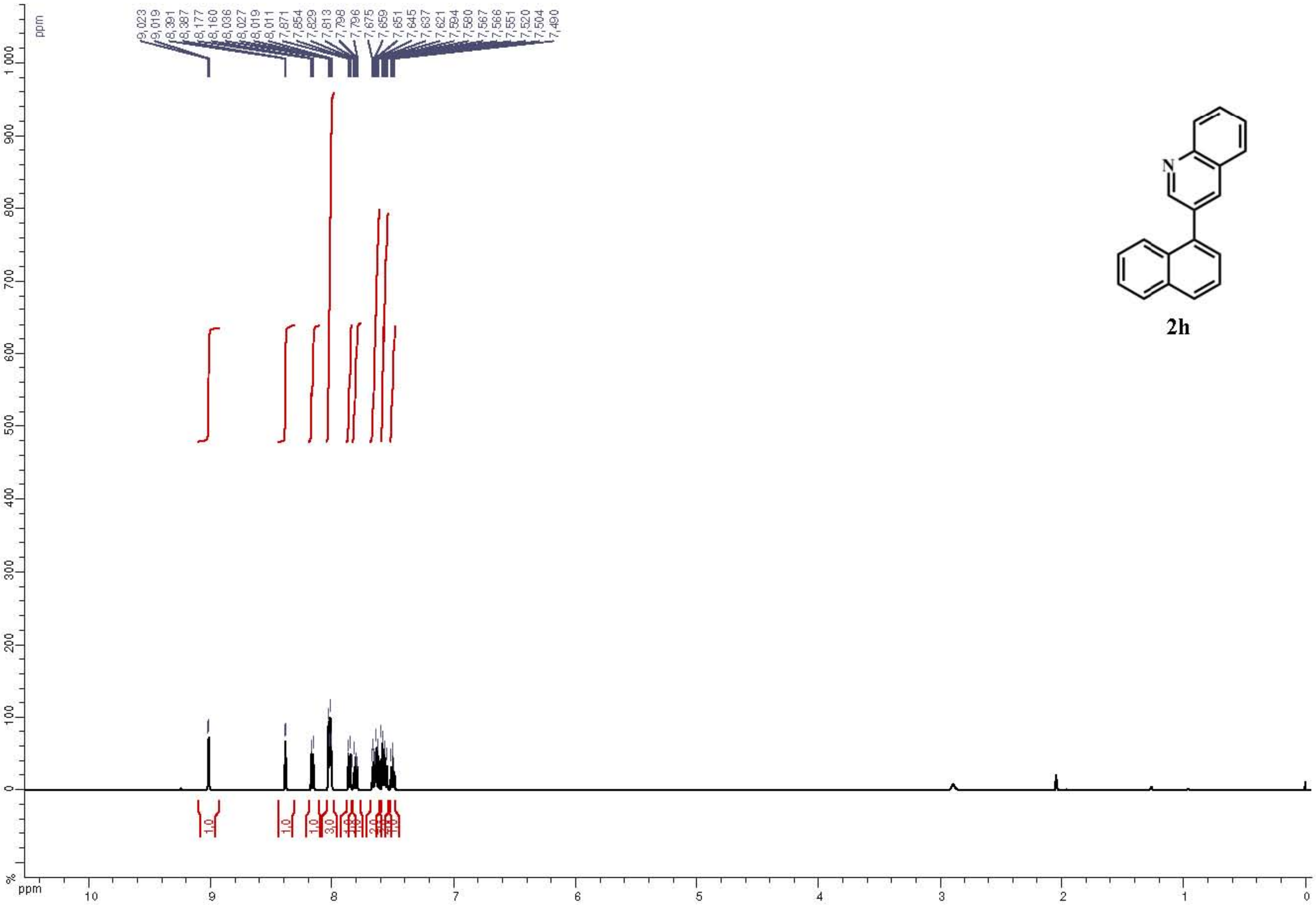
^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 5-(naphthalen-1-yl)pyrimidine **2f** (Table 2, entry 6)



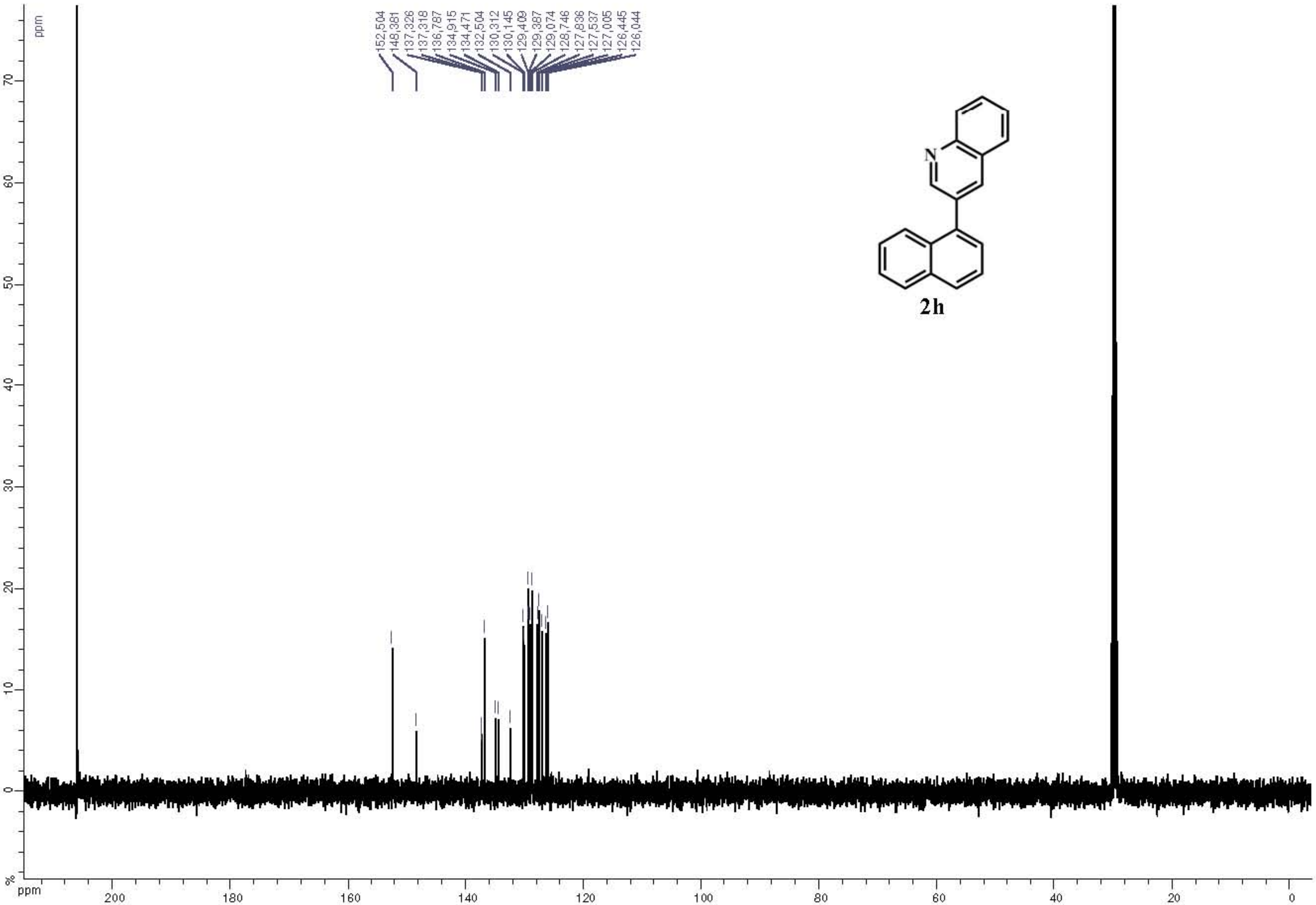
^{1}H NMR (300 MHz, C_3D_6O) Spectrum of 2-(naphthalen-1-yl)furan **2g** (Table 2, entry 7)



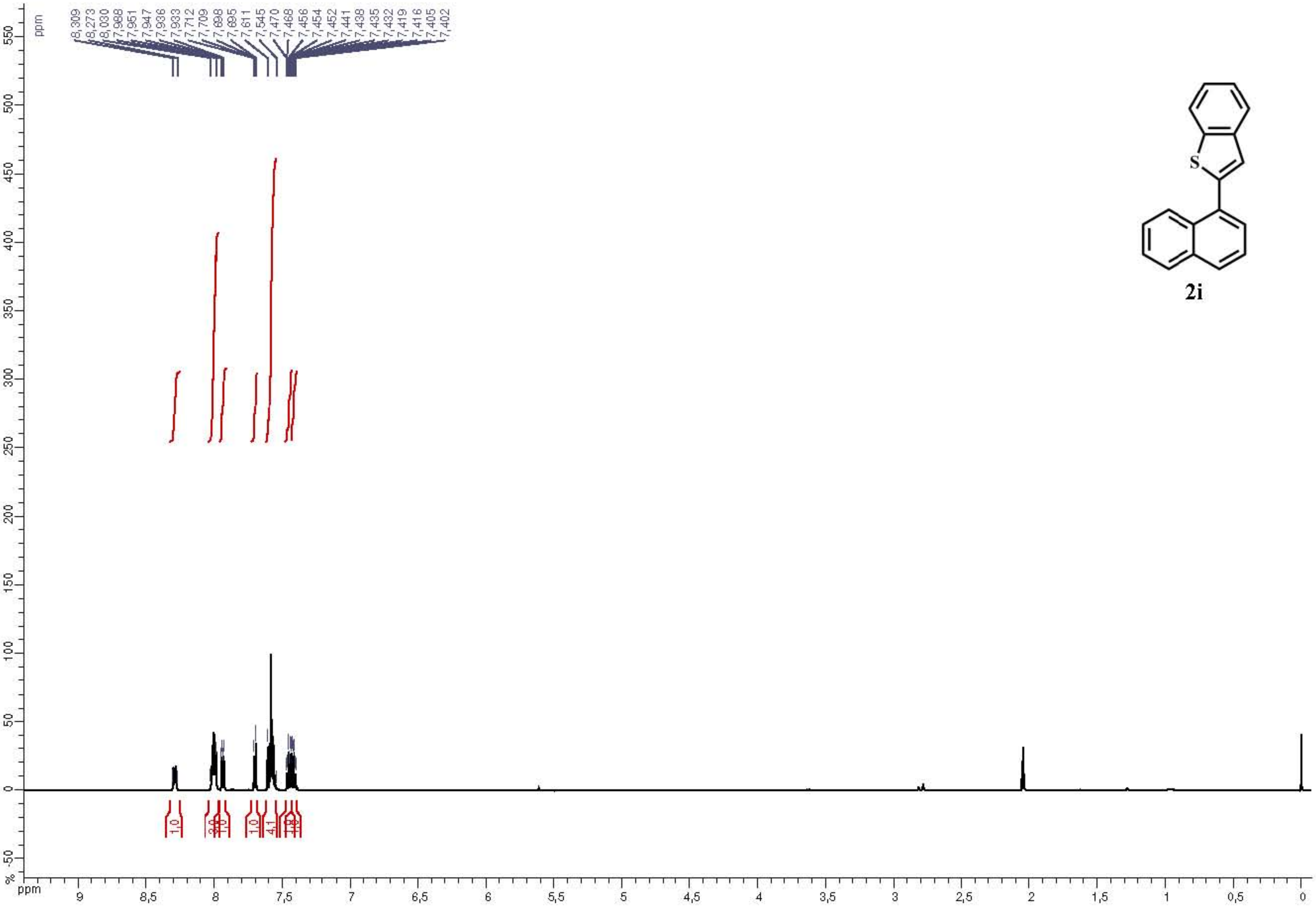
^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 2-(naphthalen-1-yl)furan **2g** (Table 2, entry 7)



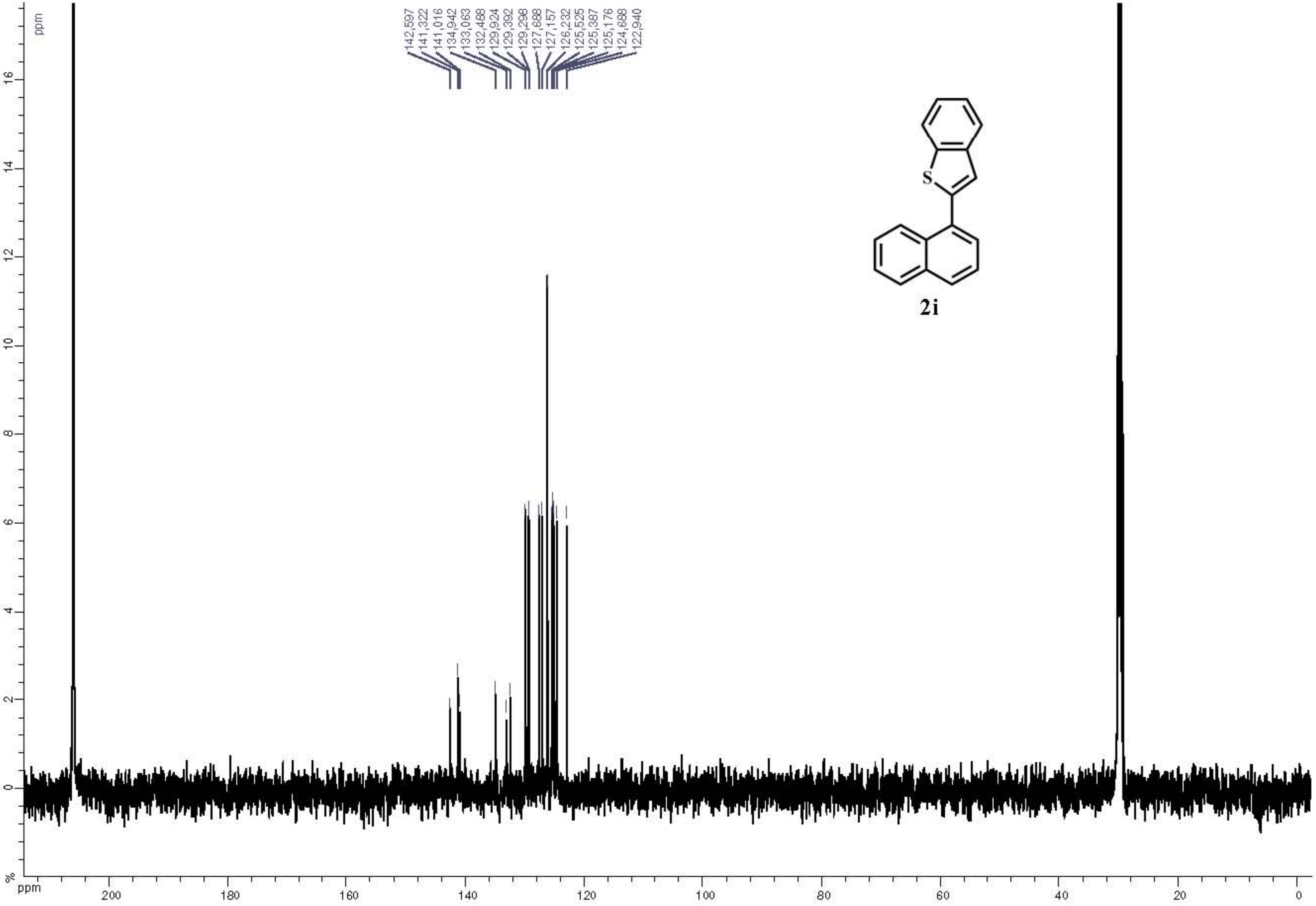
^{1}H NMR (300 MHz, C_3D_6O) Spectrum of 3-(naphthalen-1-yl)quinoline **2h** (Table 2, entry 8)



^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 3-(naphthalen-1-yl)quinoline **2h** (Table 2, entry 8)

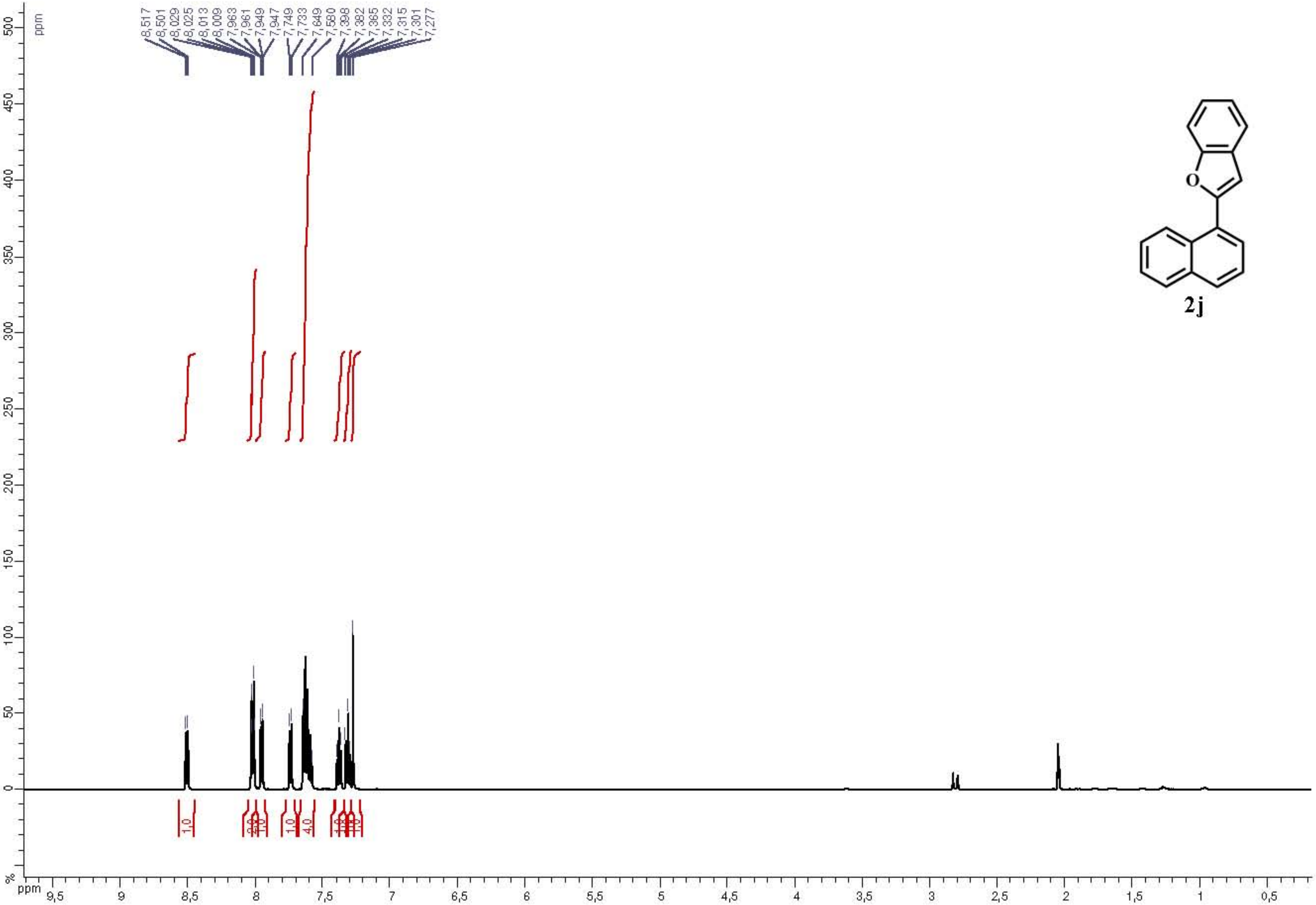


^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 2-(naphthalen-1-yl)benzothiophene **2i** (Table 2, entry 9)



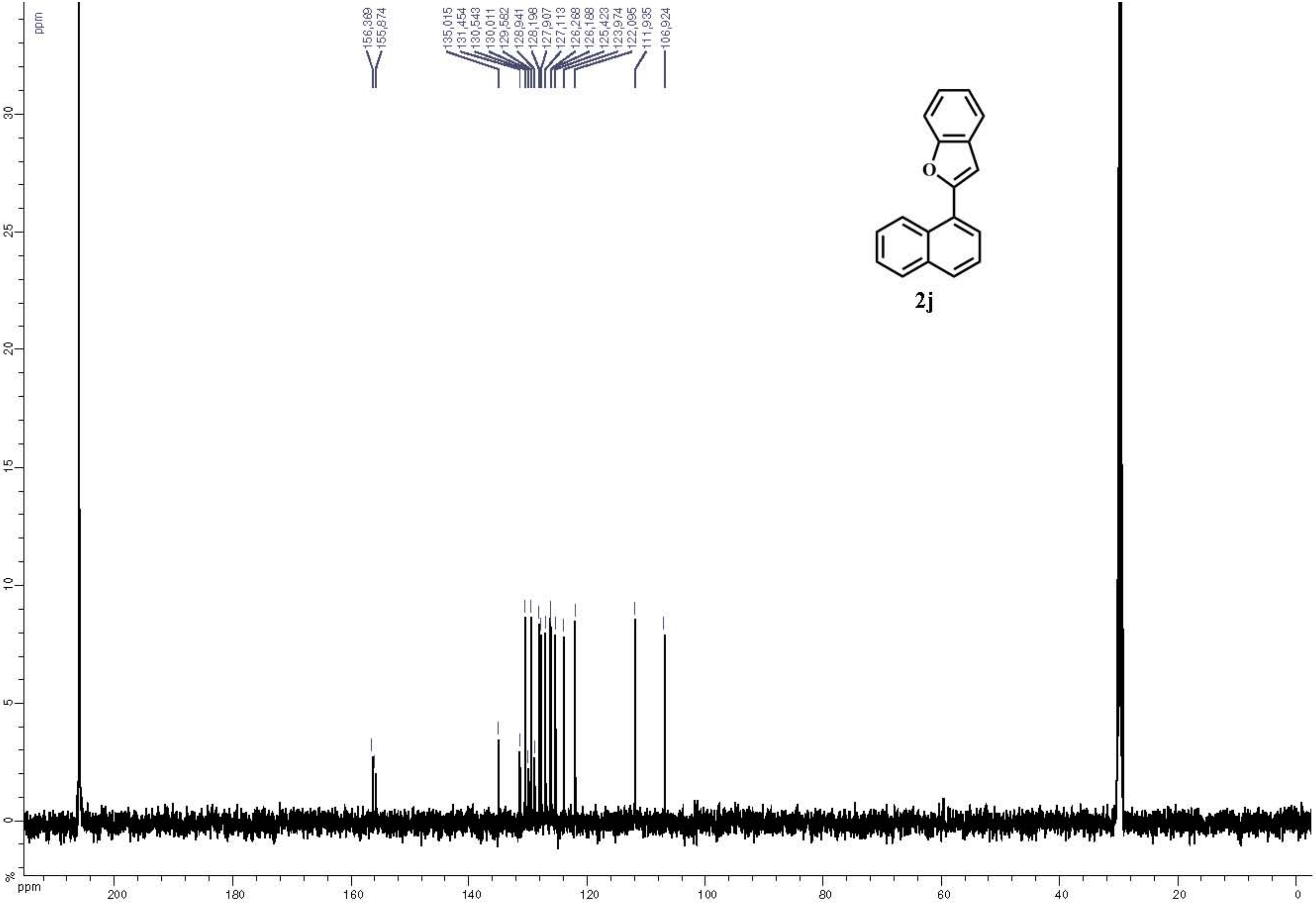
2i

^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 2-(naphthalen-1-yl)benzothiophene **2i** (Table 2, entry 9)

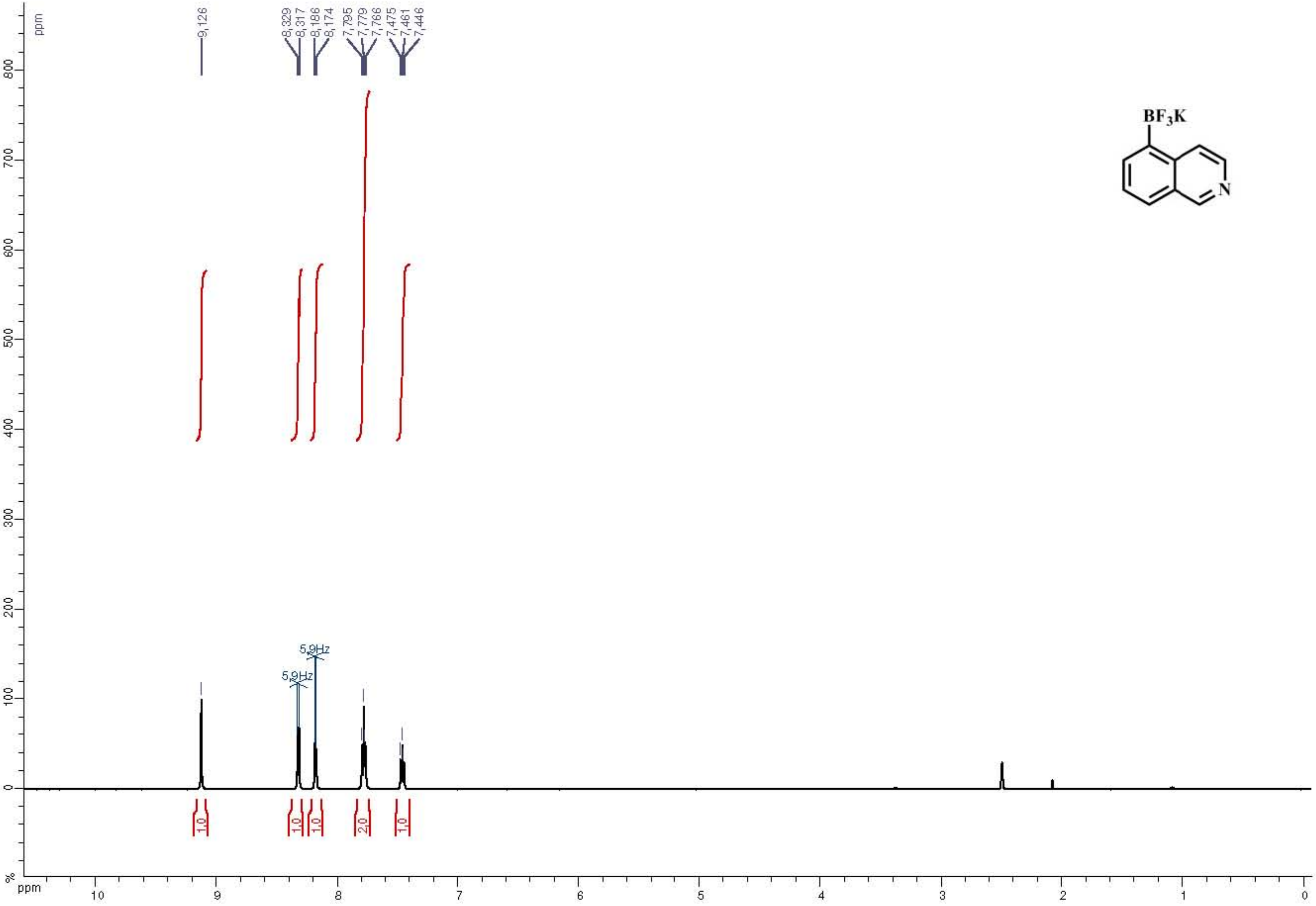


2j

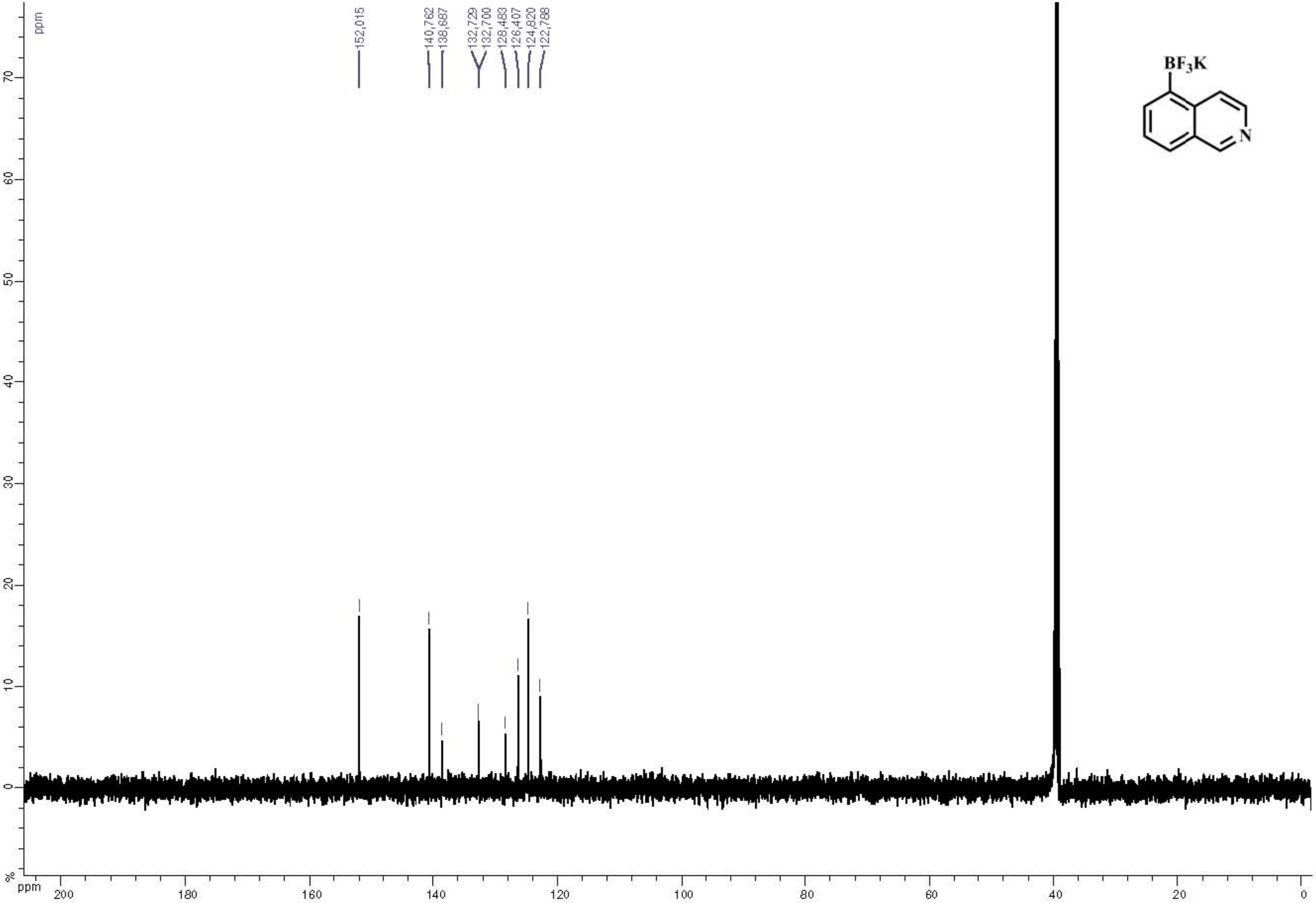
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 2-(naphthalen-1-yl)benzofuran **2j** (Table 2, entry 10)



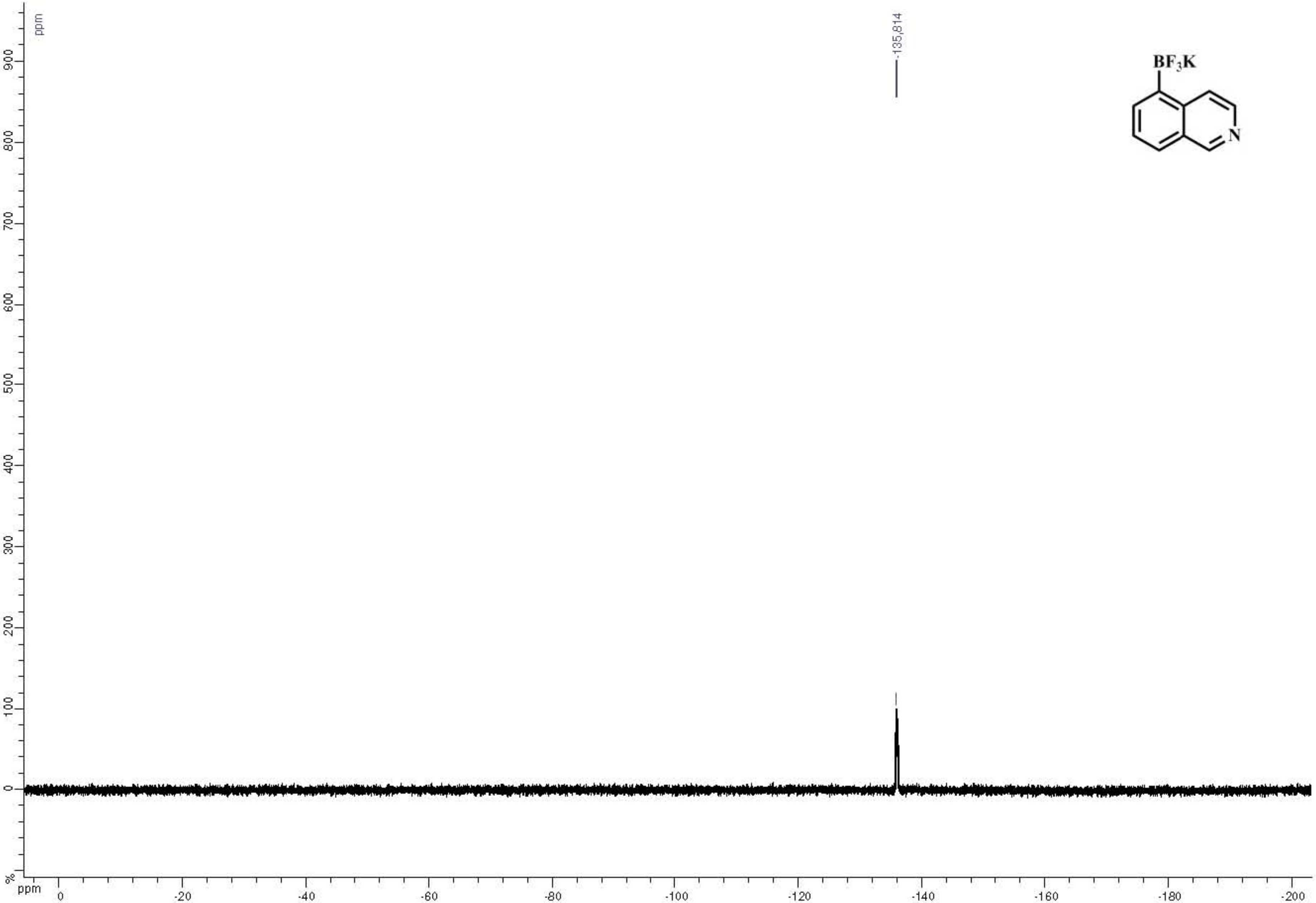
^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 2-(naphthalen-1-yl)benzofuran **2j** (Table 2, entry 10)



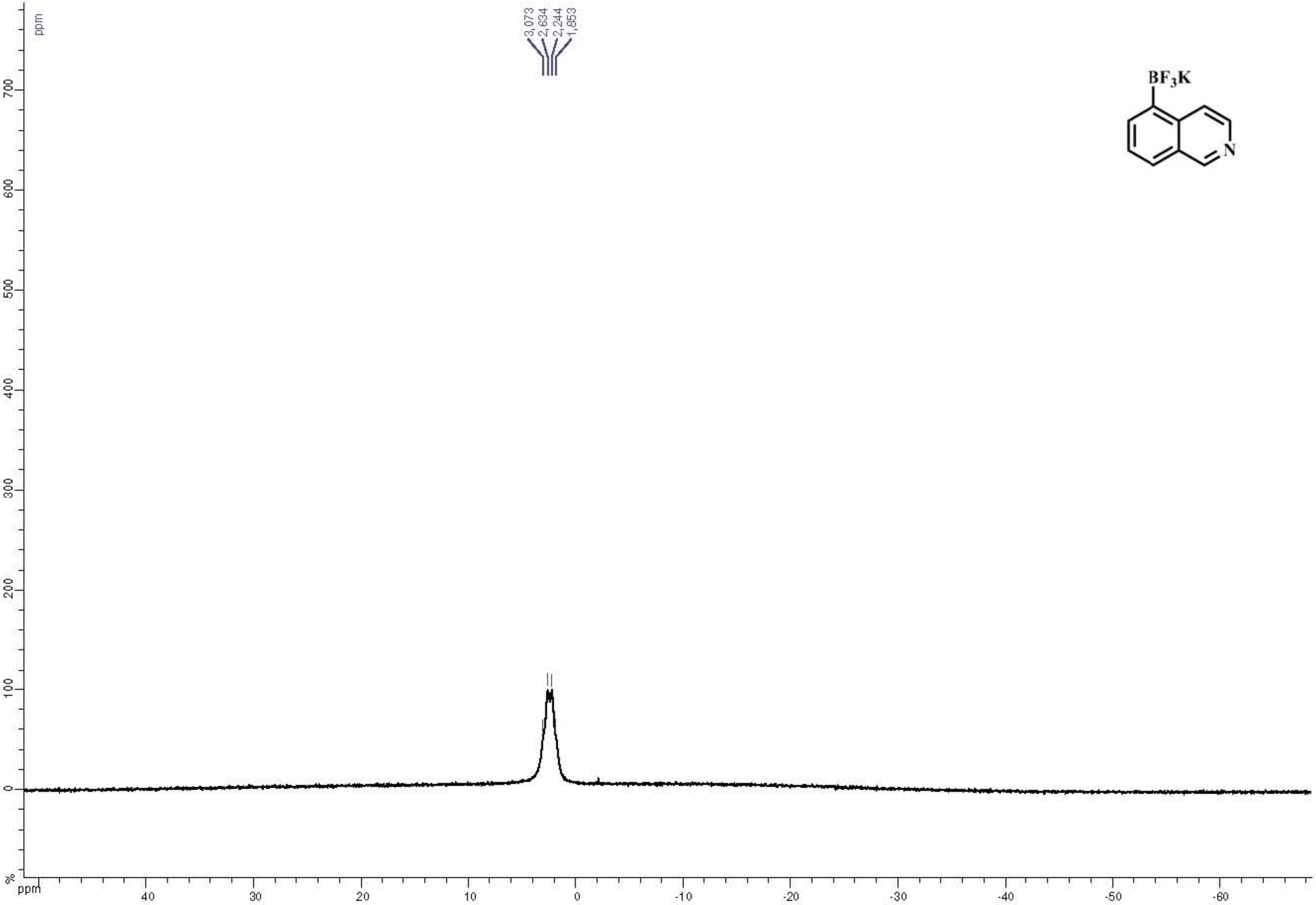
^{1}H NMR (500 MHz, DMSO-d_6) Spectrum of potassium isoquinolin-5-yltrifluoroborate



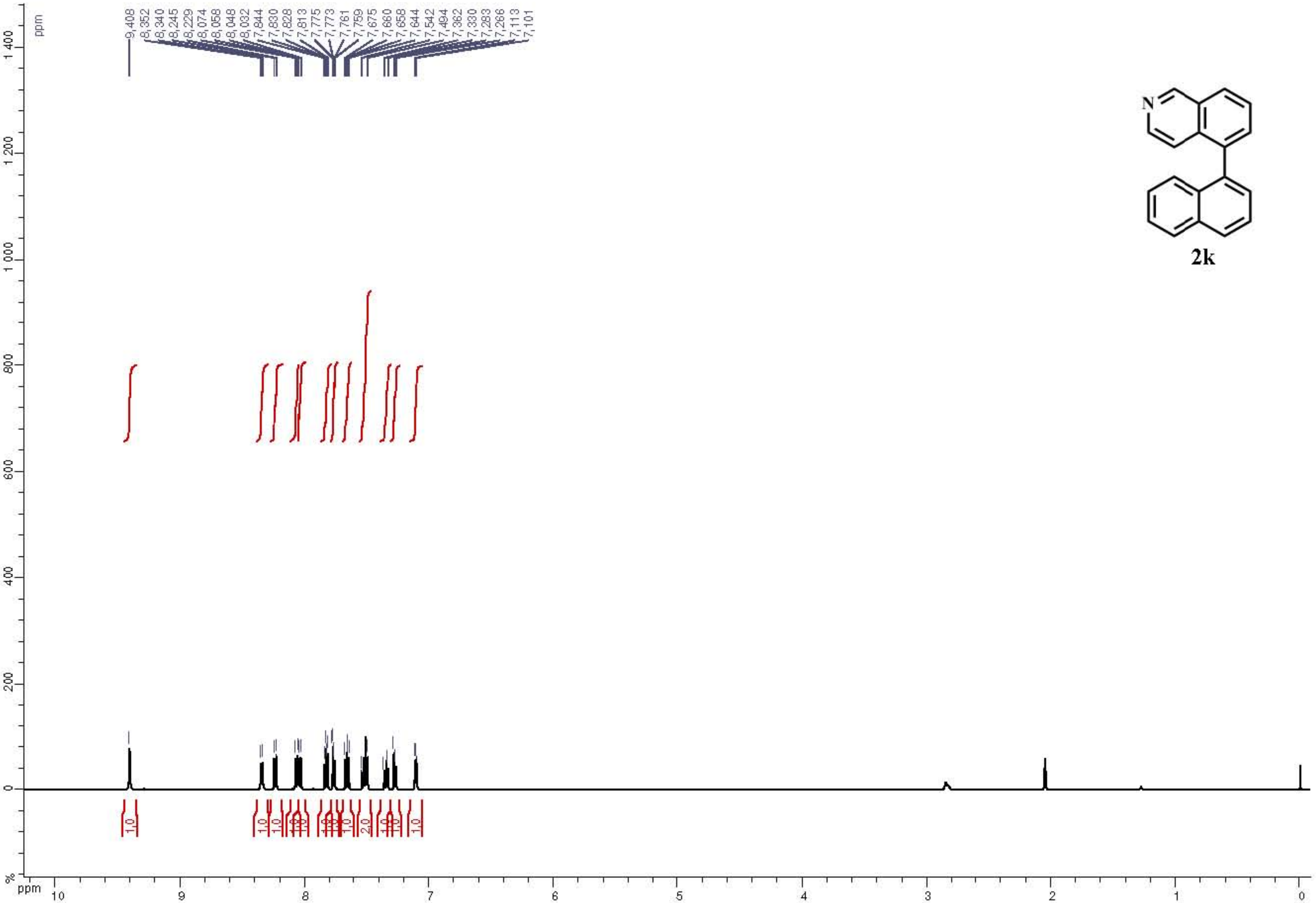
^{13}C NMR (125 MHz, DMSO-d_6) Spectrum of potassium isoquinolin-5-yltrifluoroborate



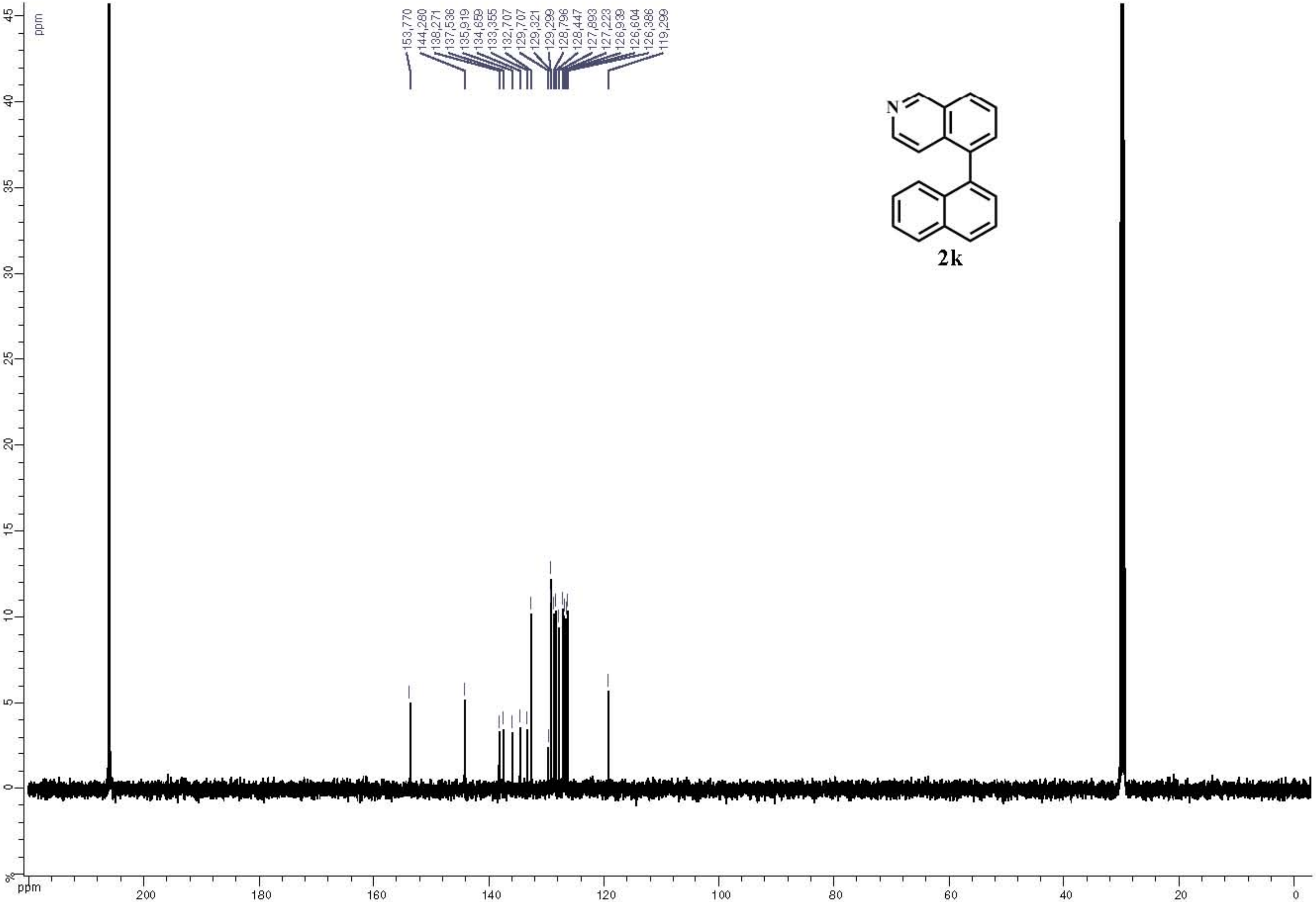
^{19}F NMR (471 MHz, DMSO-d_6) Spectrum of potassium isoquinolin-5-yltrifluoroborate



^{11}B NMR (128 MHz, DMSO-d_6) Spectrum of potassium isoquinolin-5-yltrifluoroborate

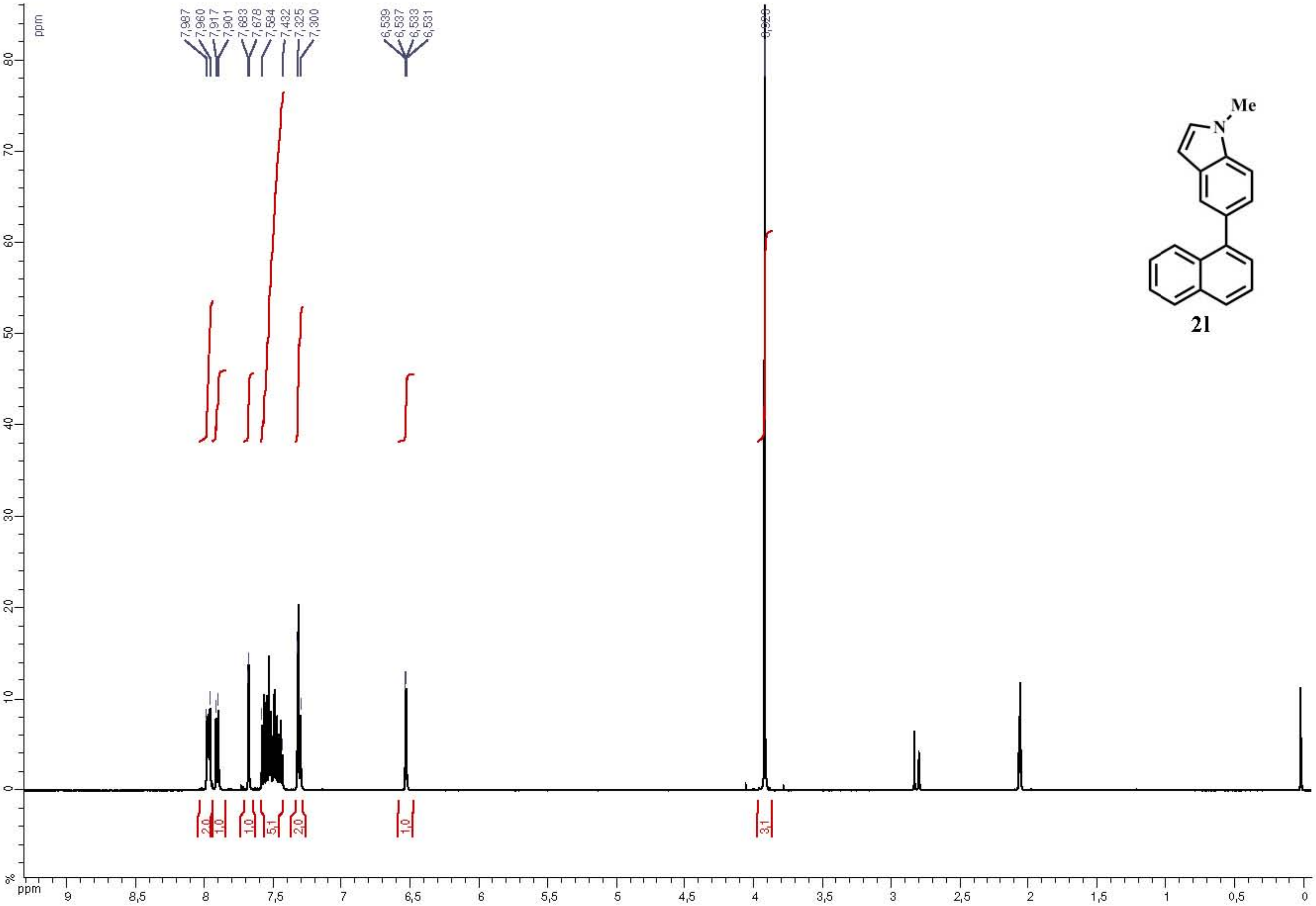


^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 5-(naphthalen-1-yl)isoquinoline **2k** (Table 2, entry 11)

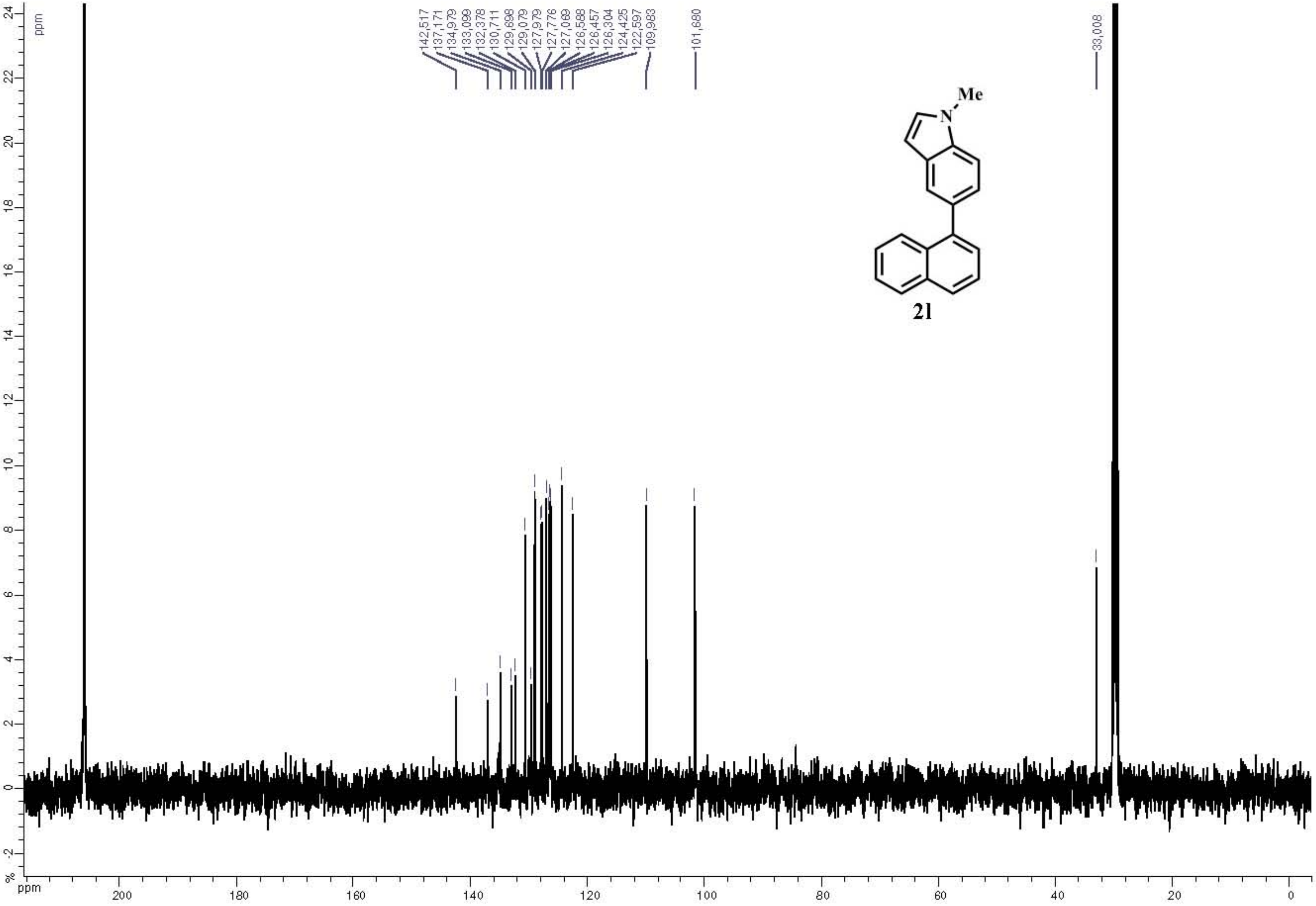


2k

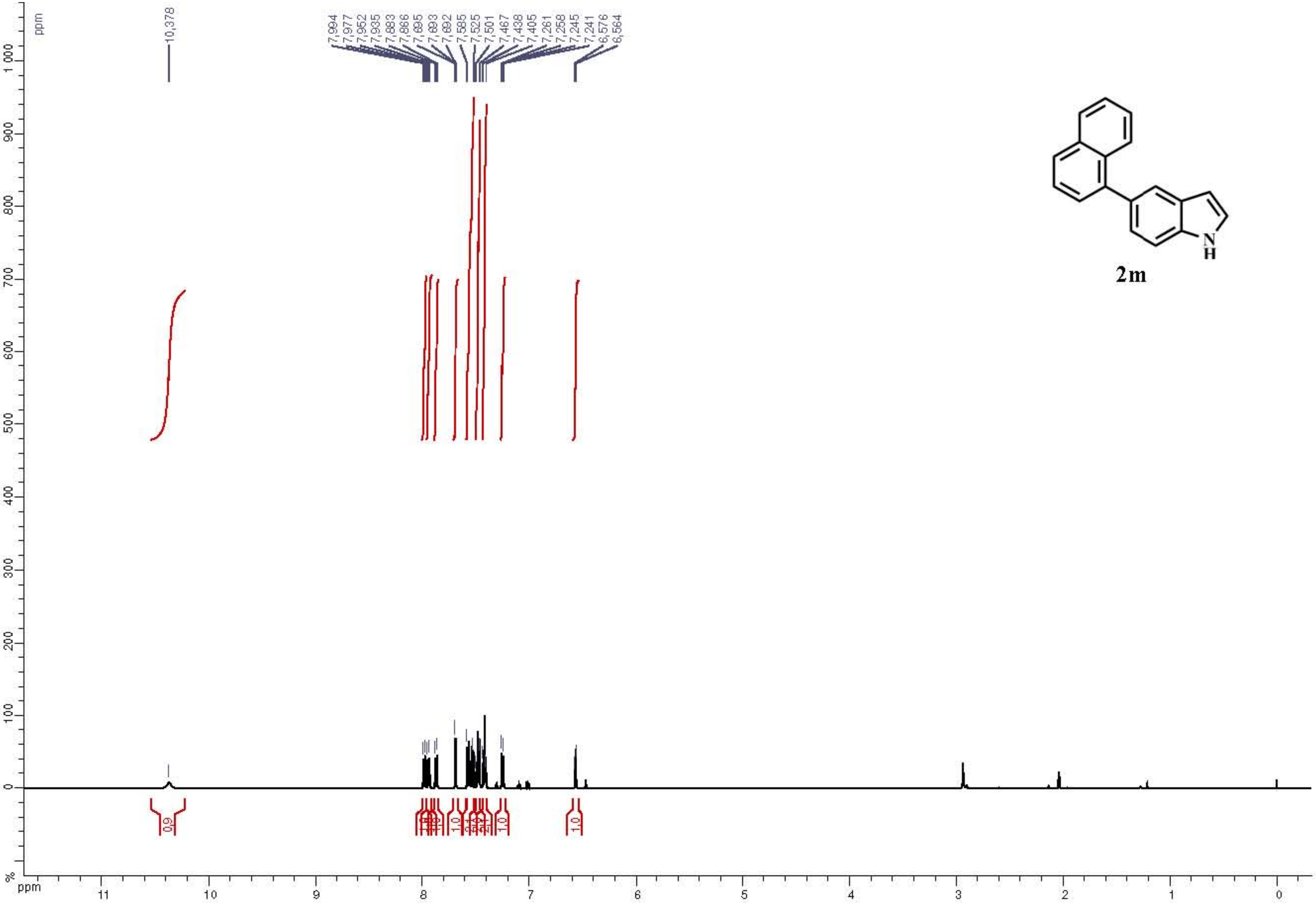
^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 5-(naphthalen-1-yl)isoquinoline **2k** (Table 2, entry 11)



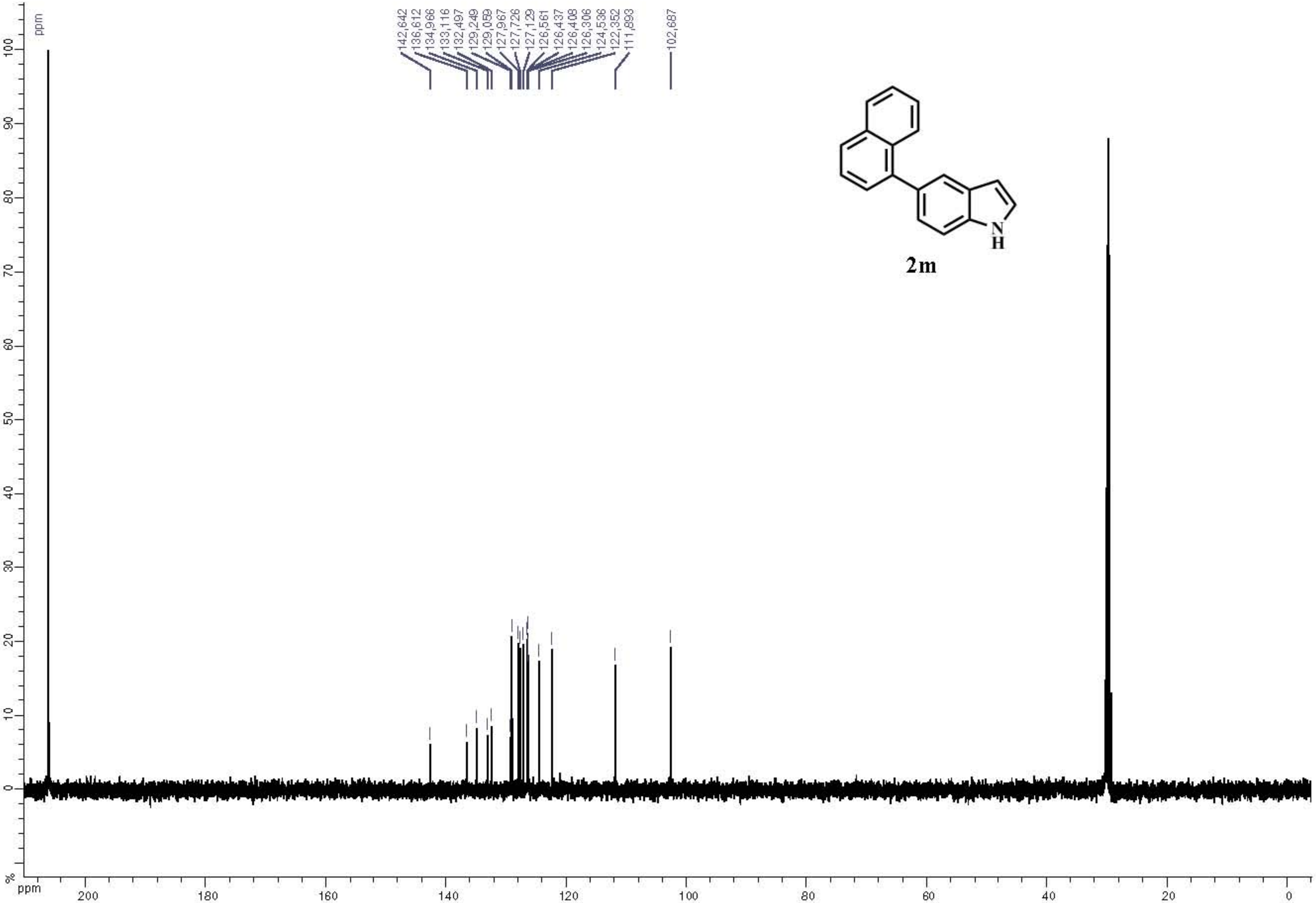
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of *N*-methyl-5-(naphthalen-1-yl)indole **2l** (Table 2, entry 12)



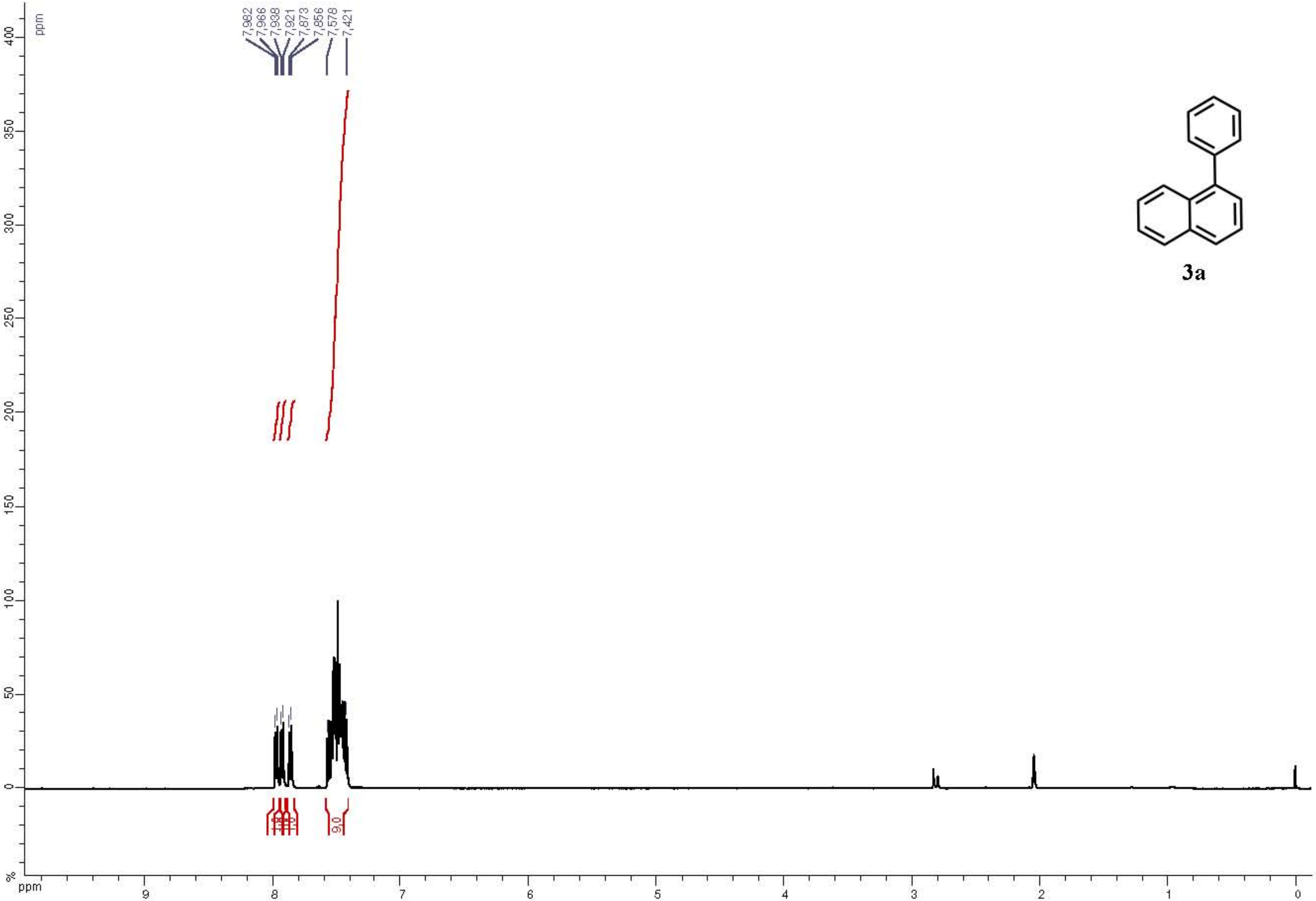
^{13}C NMR (125 MHz, C_3D_6O) Spectrum of *N*-methyl-5-(naphthalen-1-yl)indole **2l** (Table 2, entry 12)



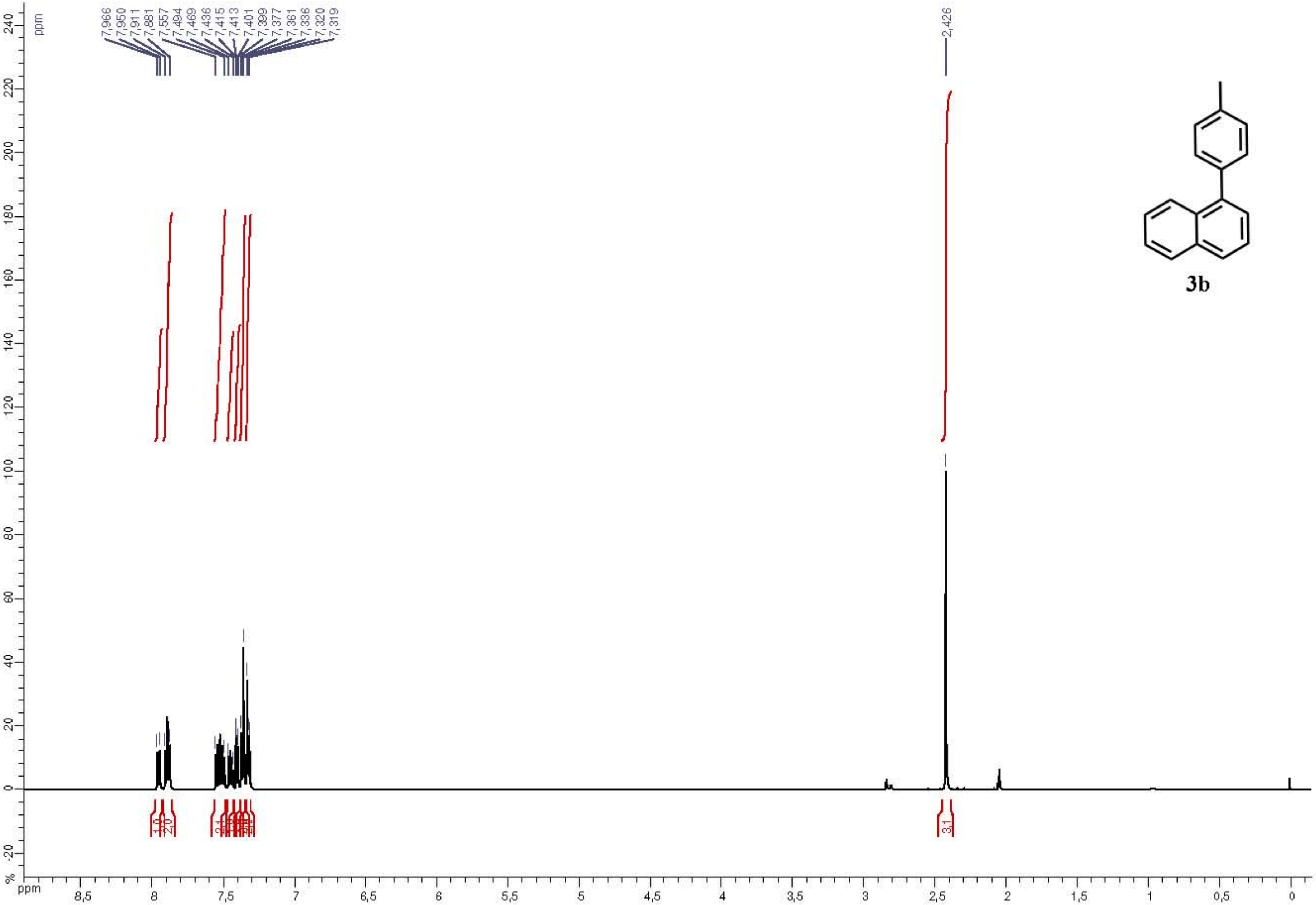
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 5-(naphthalen-1-yl)-1*H*-indole **2m** (Table 2, entry 13)



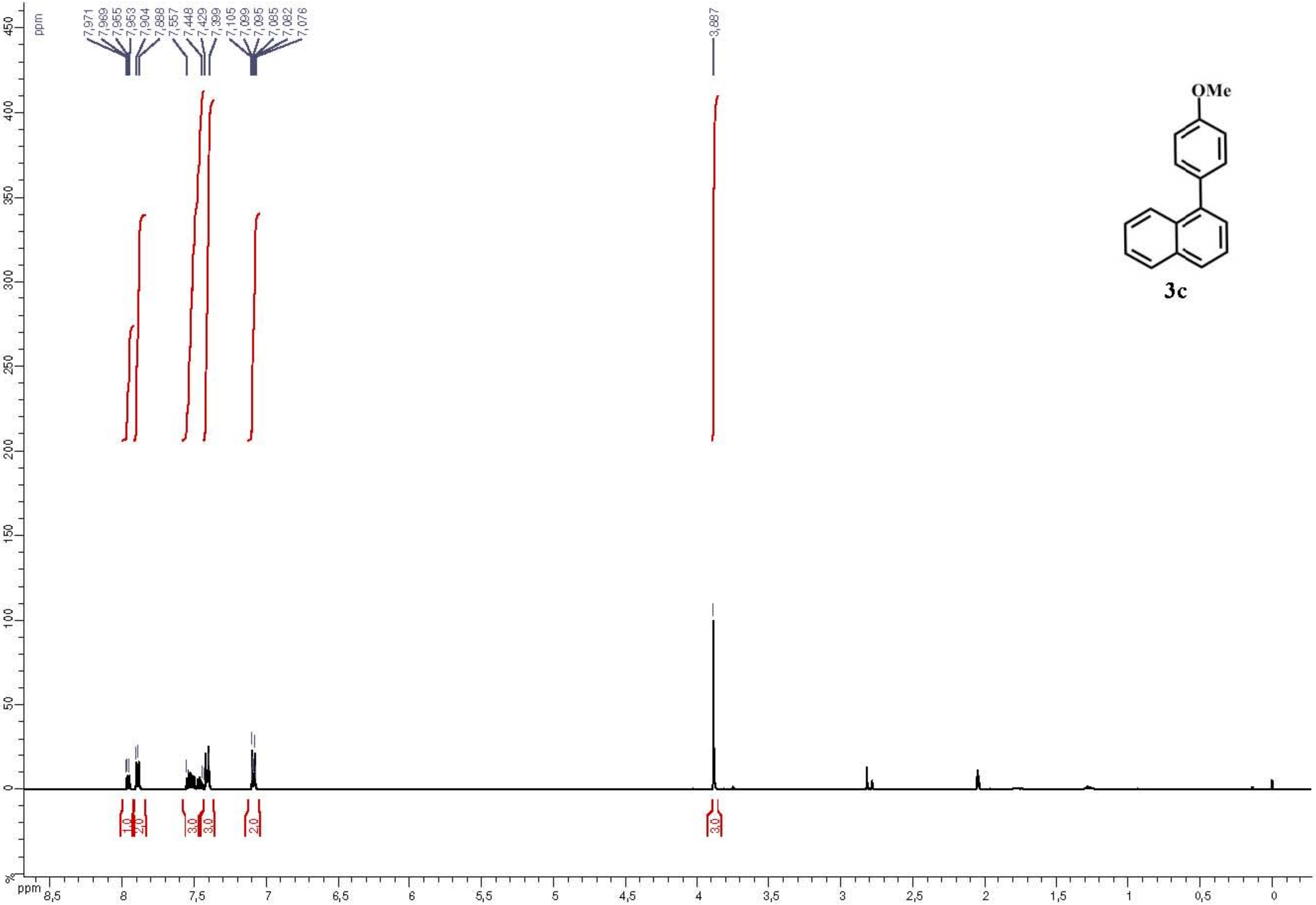
^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 5-(naphthalen-1-yl)-1*H*-indole **2m** (Table 2, entry 13)



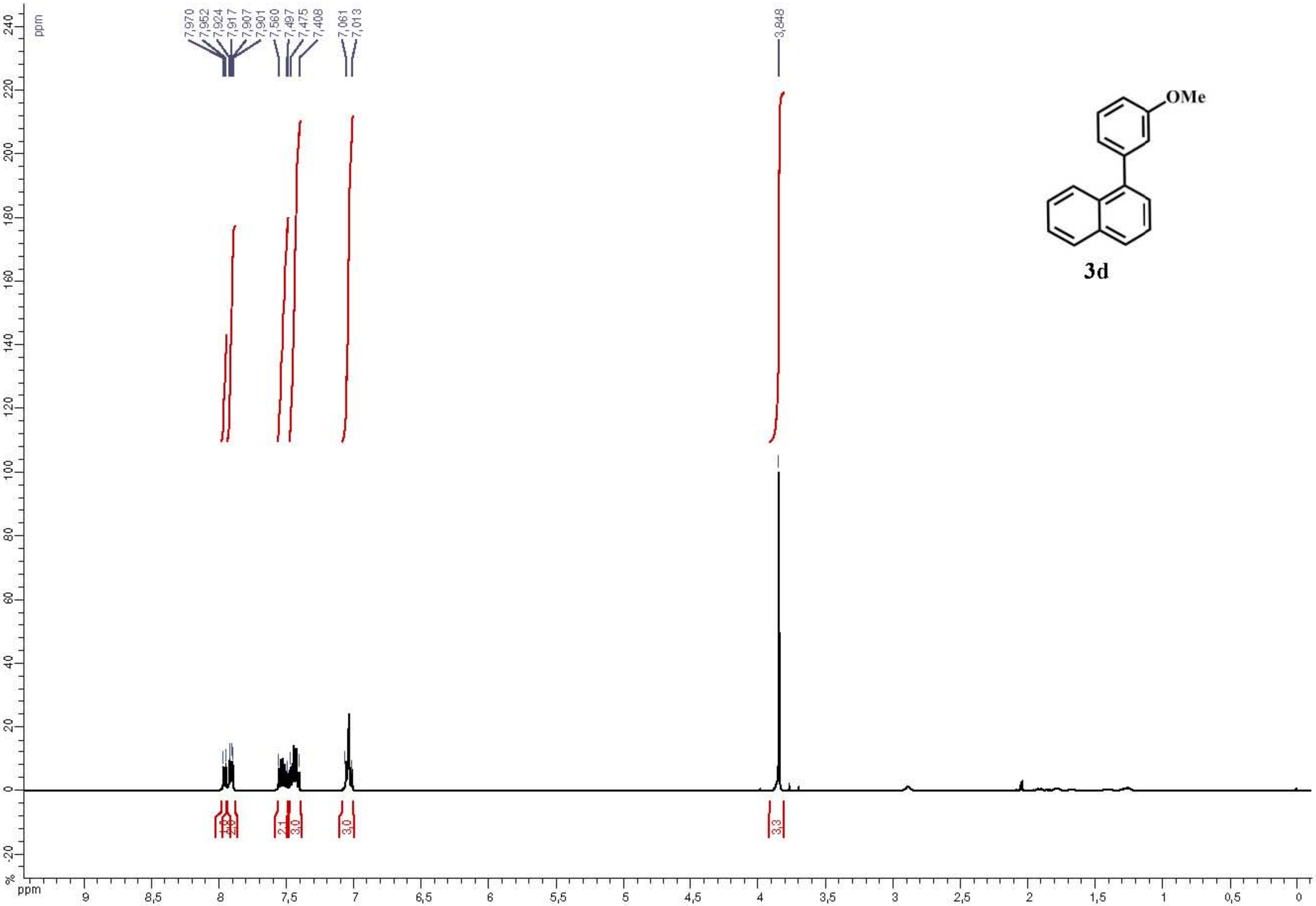
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 1-phenylnaphthalene **3a** (Table 3, entry 1)



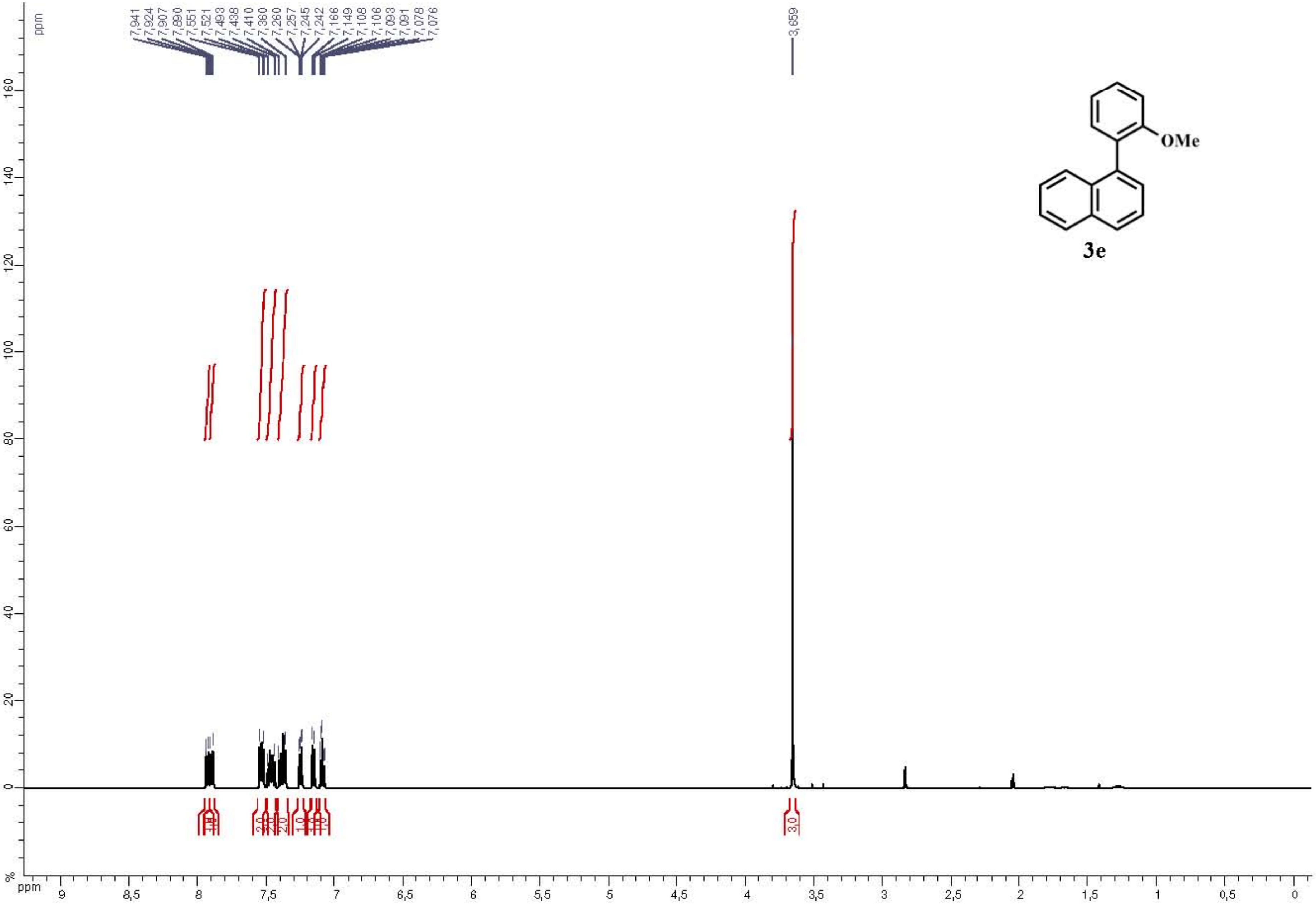
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 1-(*p*-tolyl)naphthalene **3b** (Table 3, entry 2)



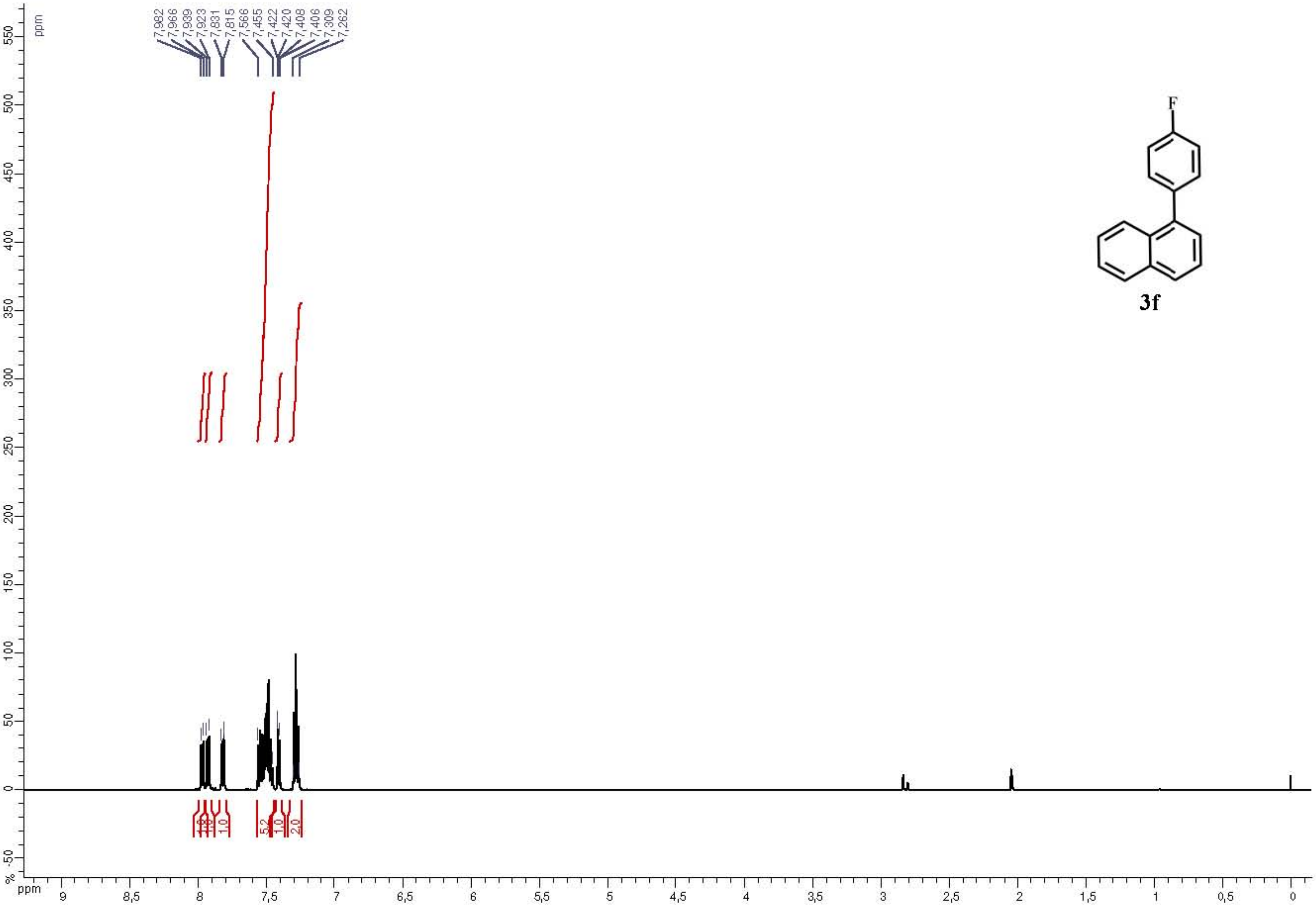
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 1-(4-methoxyphenyl)naphthalene **3c** (Table 3, entry 3)



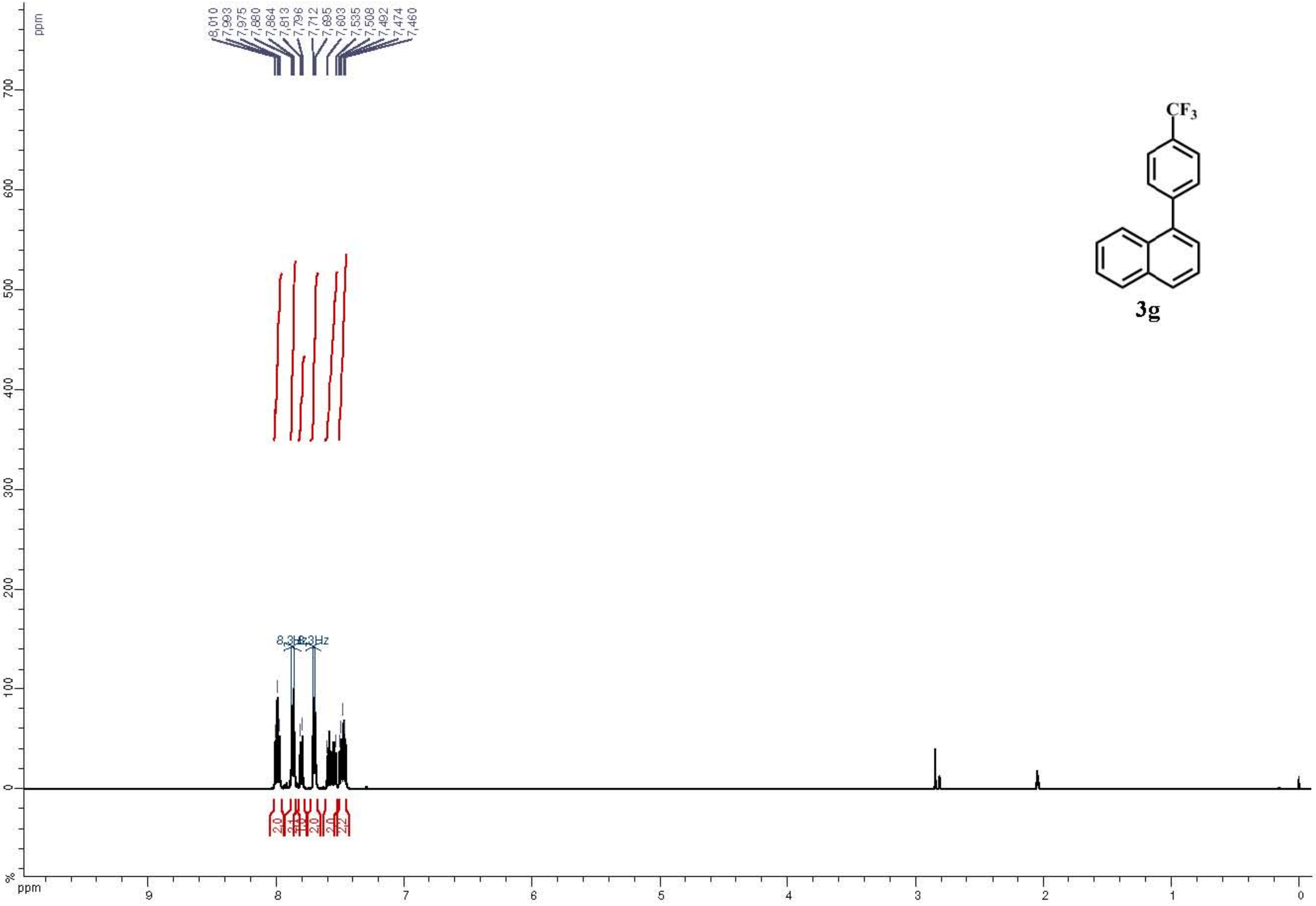
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 1-(3-methoxyphenyl)naphthalene **3d** (Table 3, entry 4)



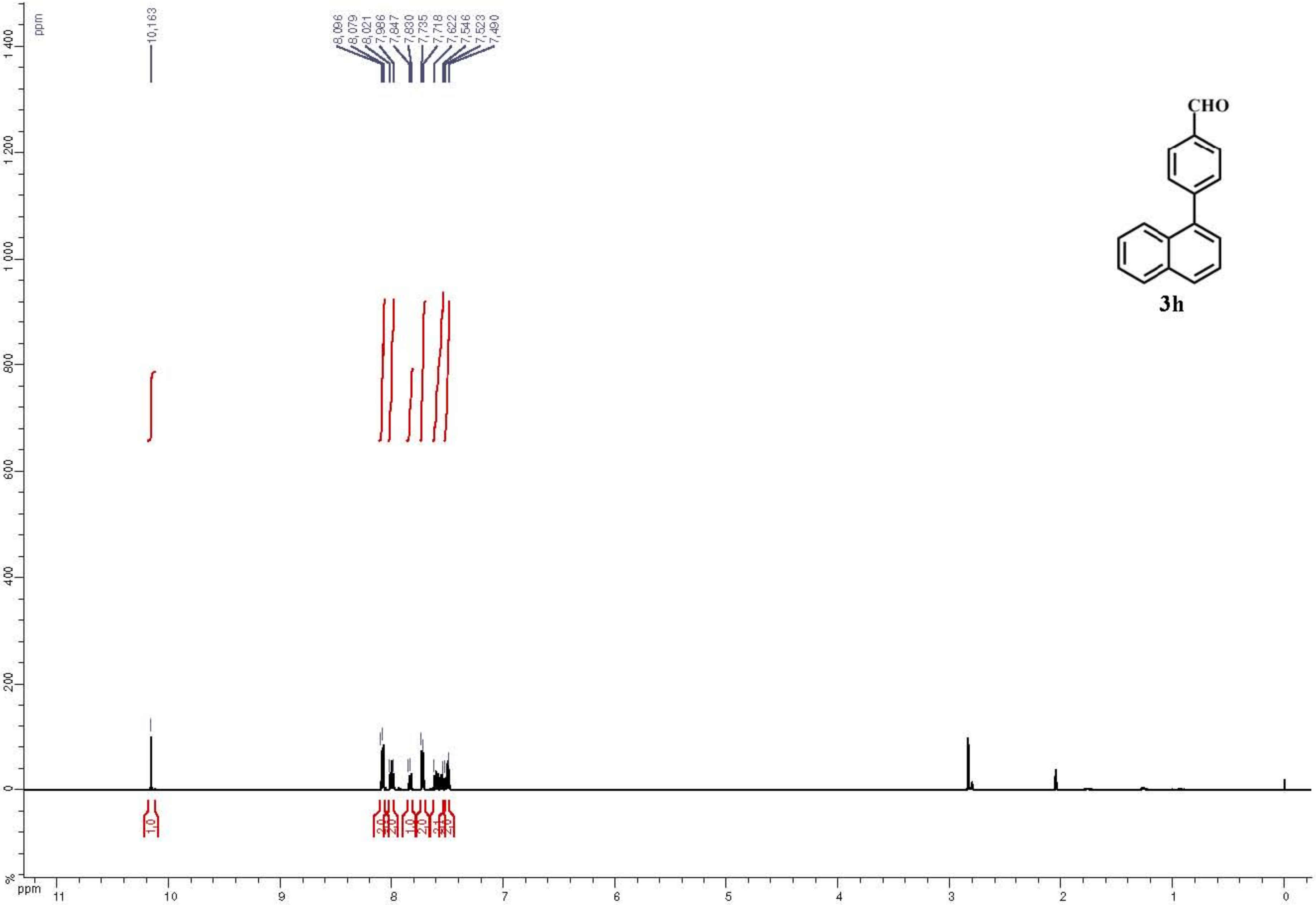
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 1-(2-methoxyphenyl)naphthalene **3e** (Table 3, entry 5)



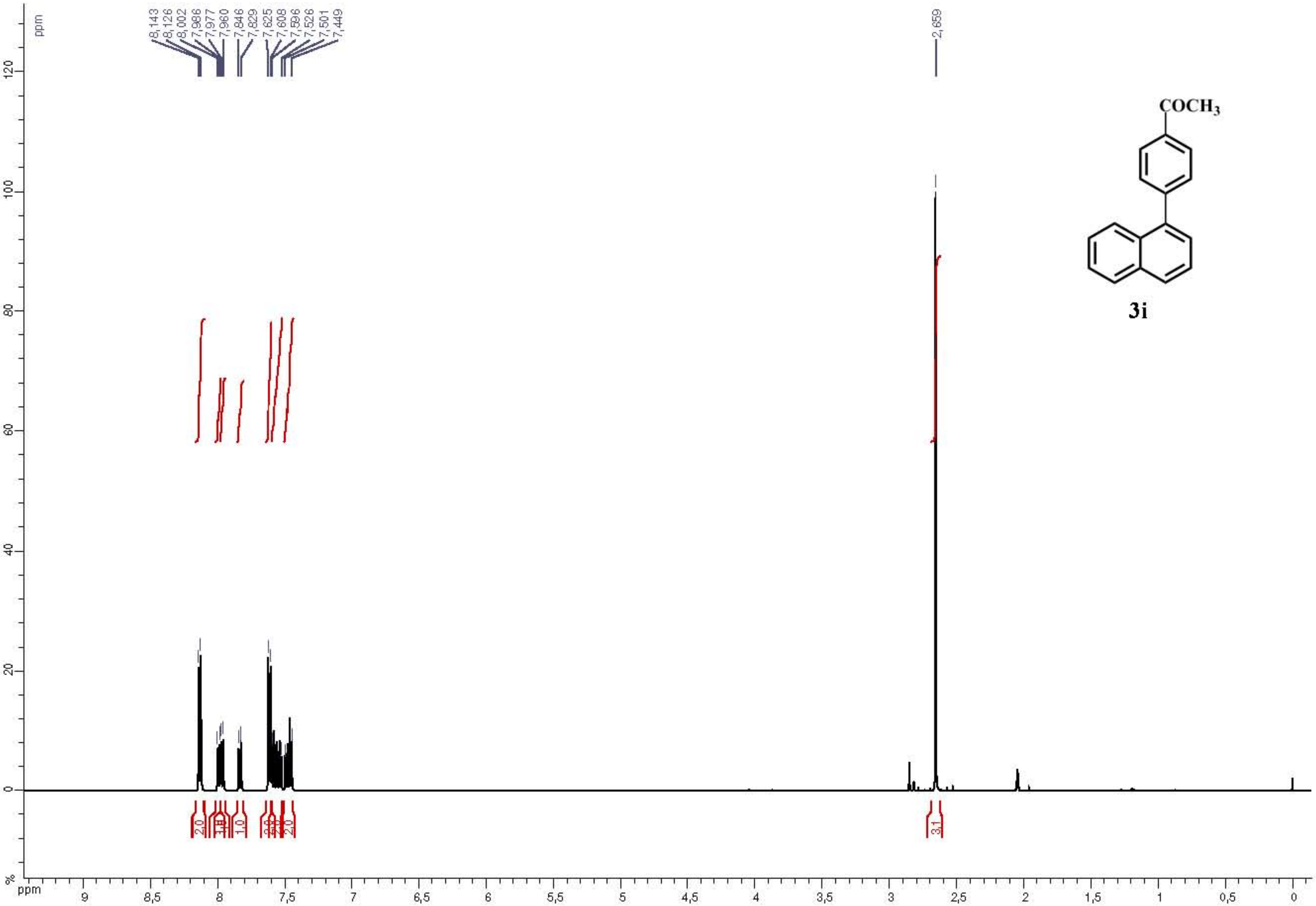
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 1-(4-fluorophenyl)naphthalene **3f** (Table 3, entry 6)



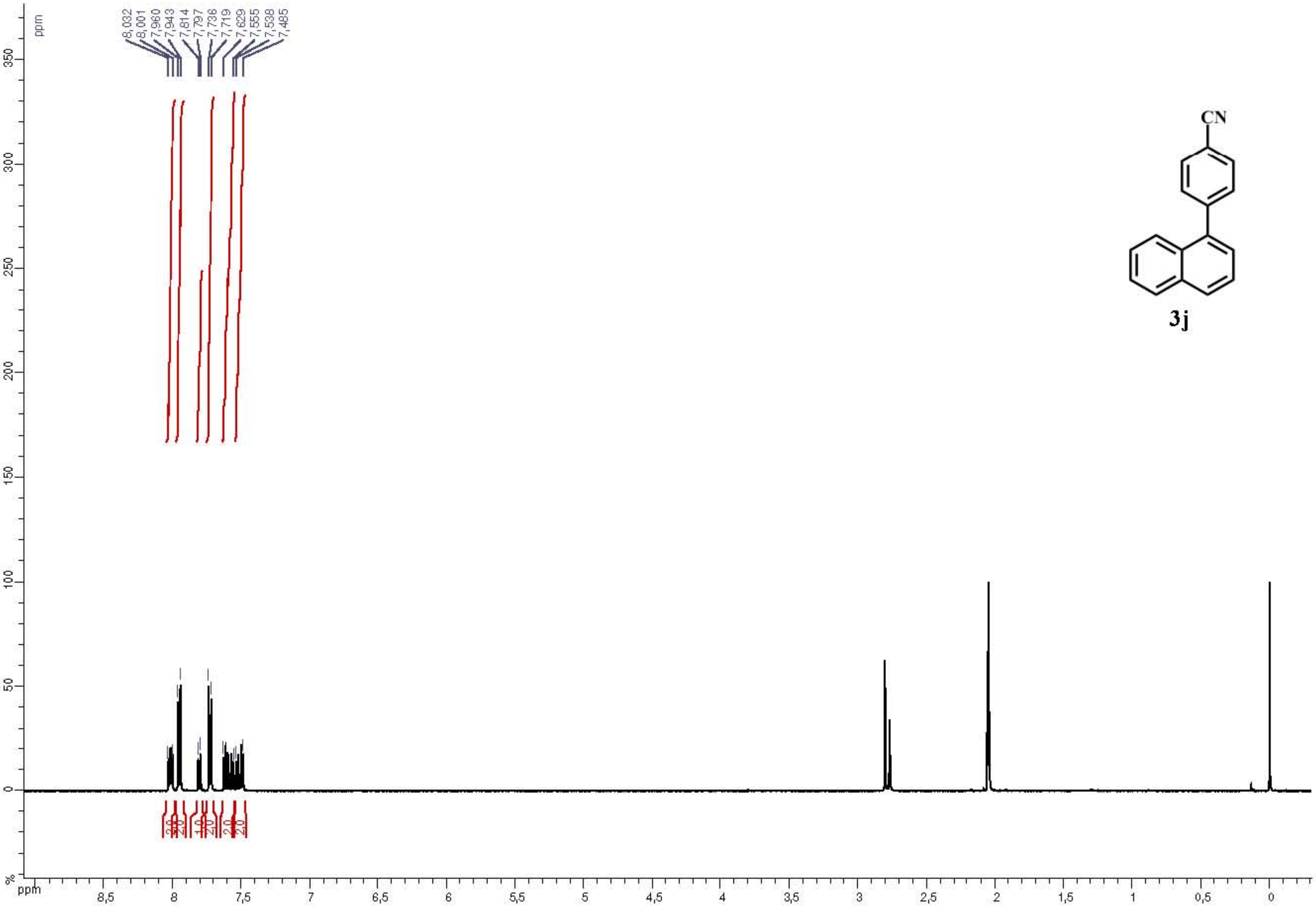
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 1-(4-(trifluoromethyl)phenyl)naphthalene **3g** (Table 3, entry 7)



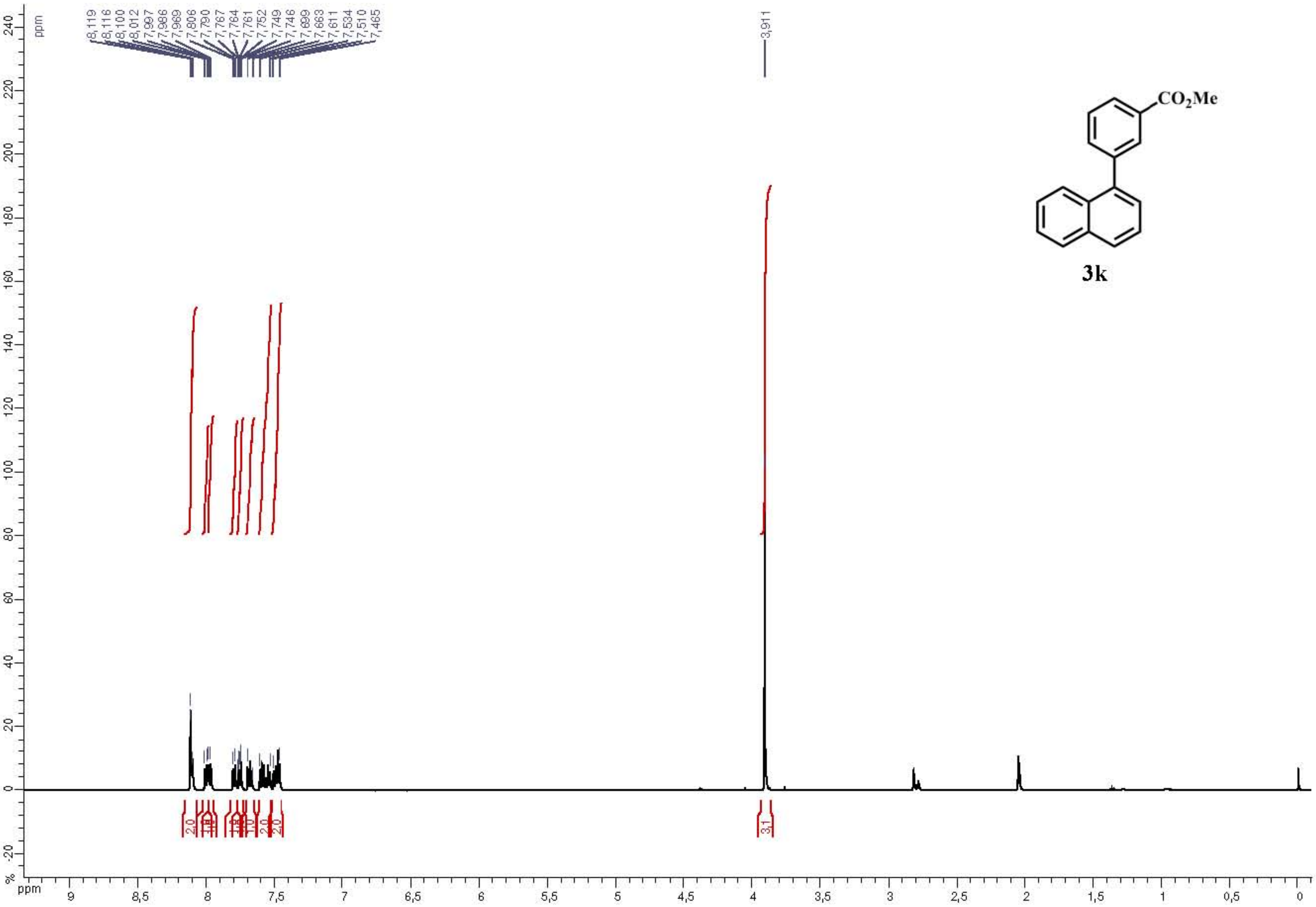
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 4-(naphthalen-1-yl)benzaldehyde **3h** (Table 3, entry 8)



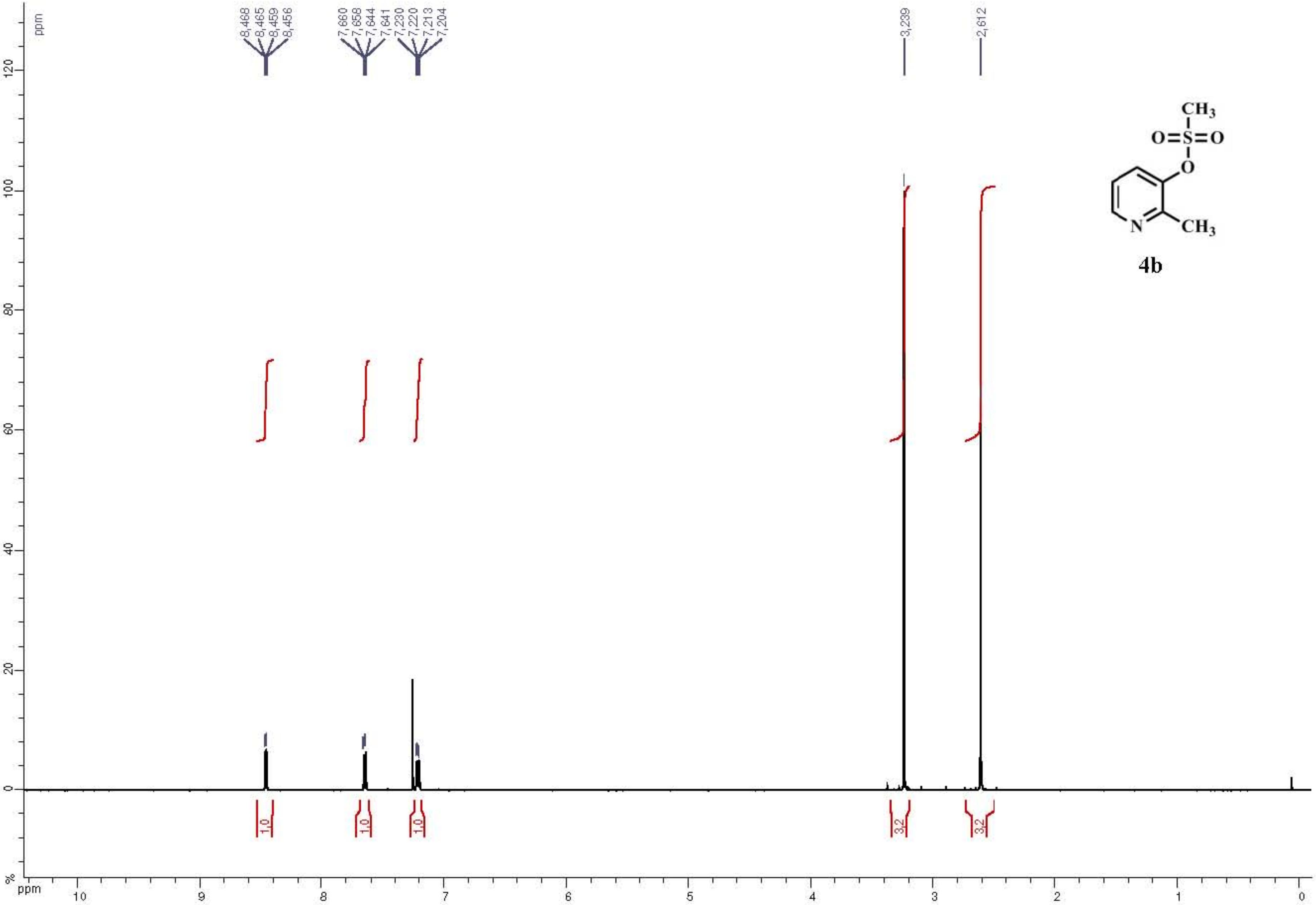
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 1-(4-(naphthalen-1-yl)phenyl)ethanone **3i** (Table 3, entry 9)



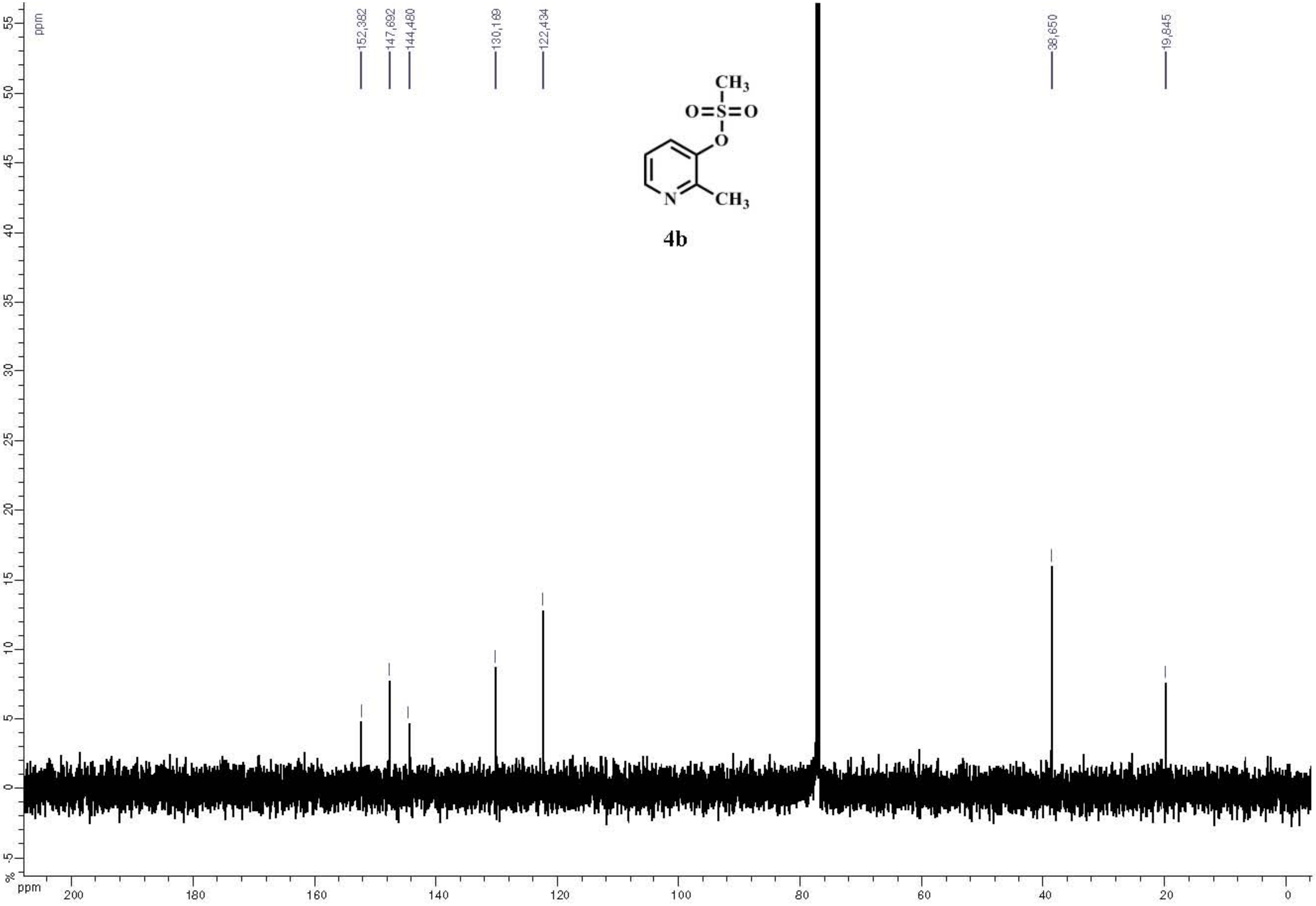
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 4-(naphthalen-1-yl)benzonitrile **3j** (Table 3, entry 10)



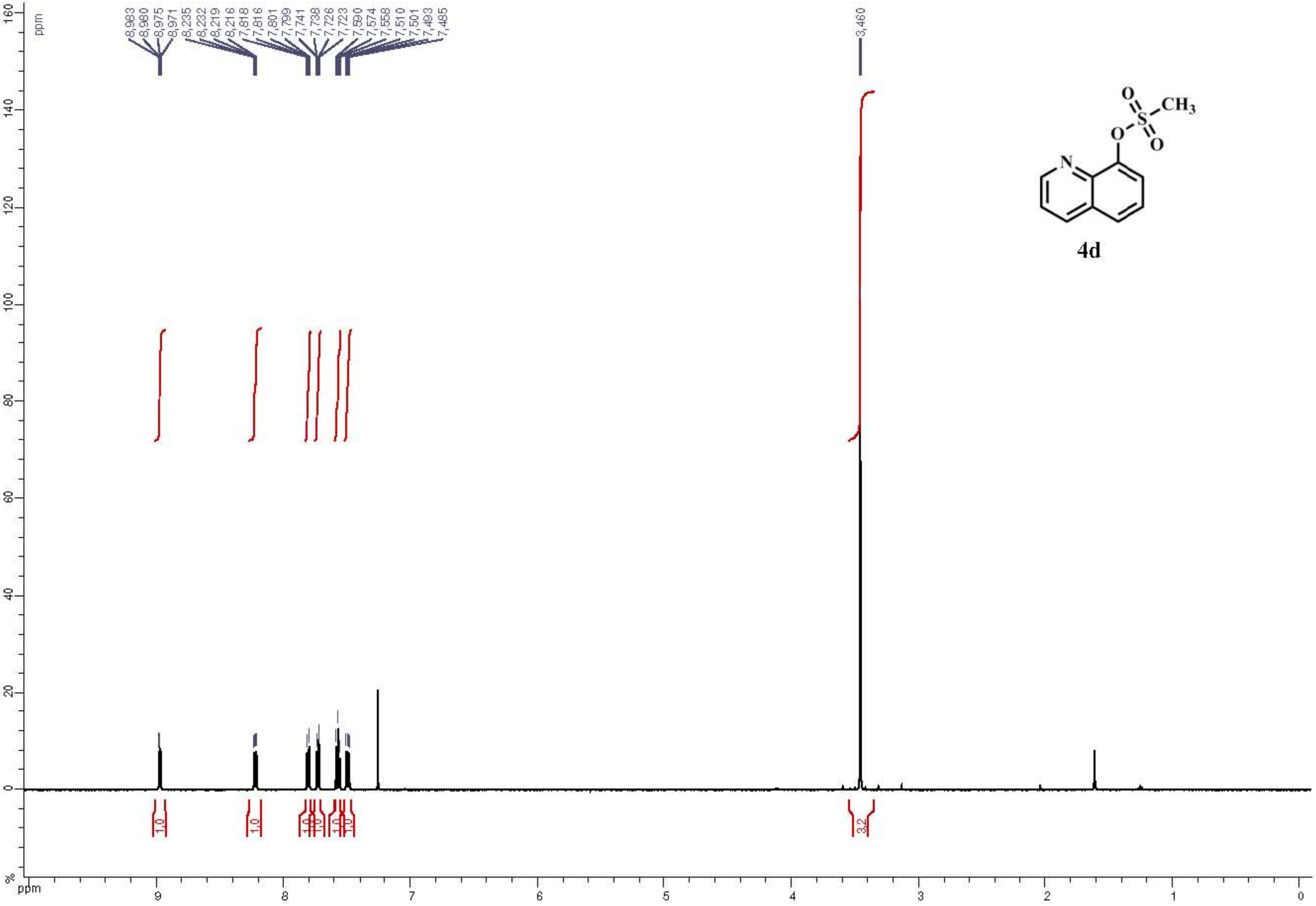
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of methyl 3-(naphthalen-1-yl)benzoate **3k** (Table 3, entry 11)



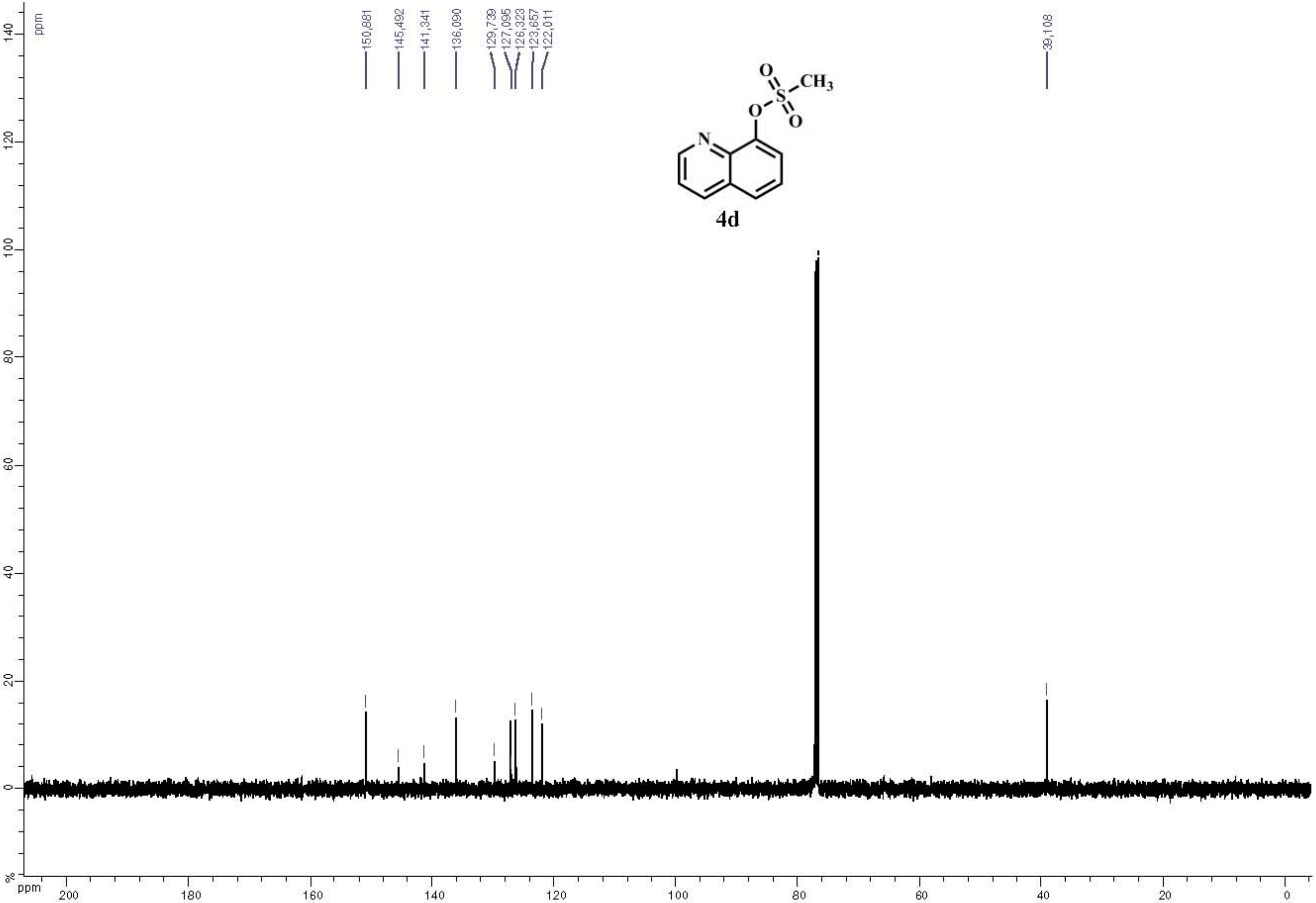
^{1}H NMR (500 MHz, CDCl$_3$) Spectrum of 2-methylpyridin-3-yl methanesulfonate **4b** (Table 4, entry 2)



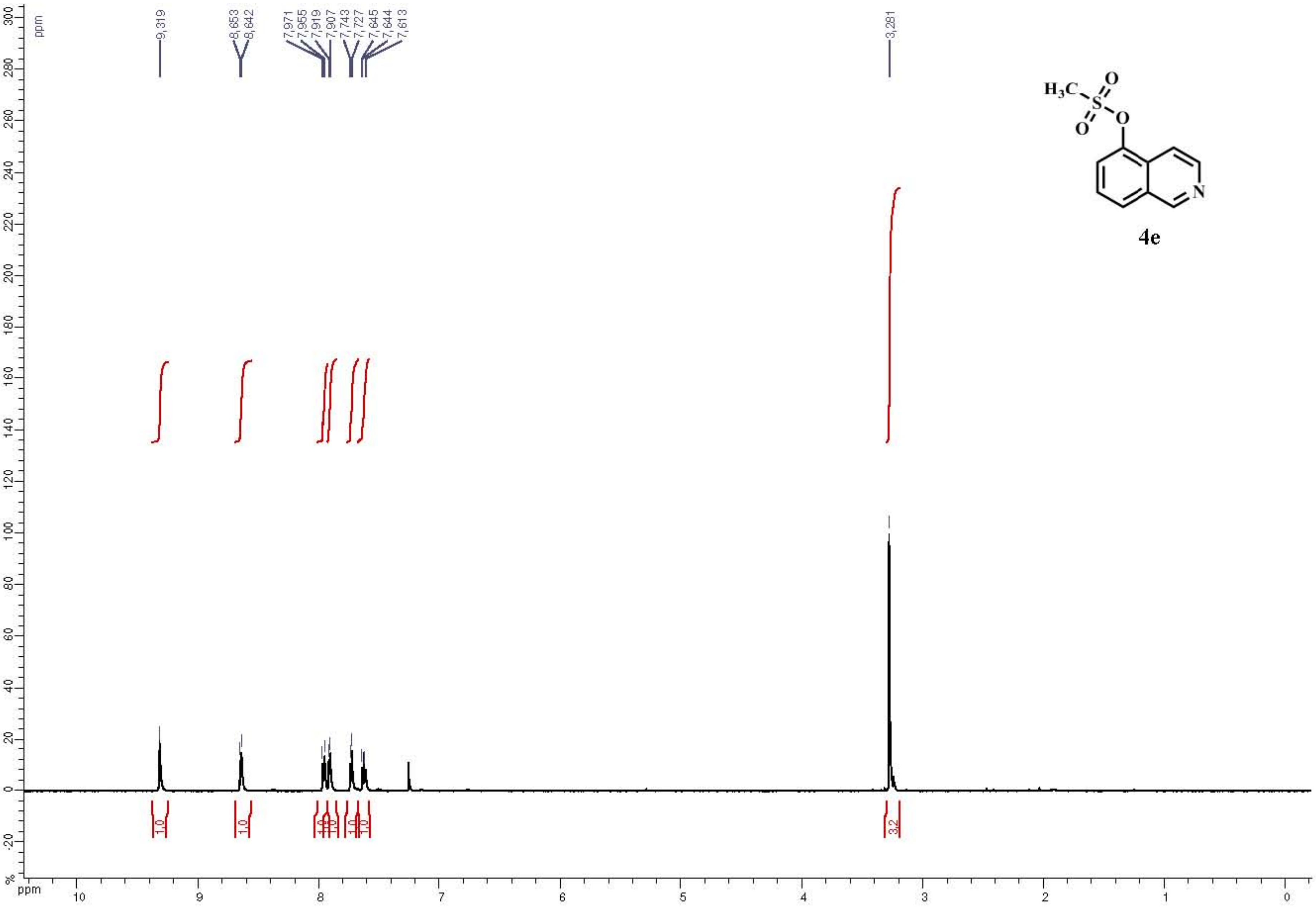
^{13}C NMR (125 MHz, CDCl$_3$) Spectrum of 2-methylpyridin-3-yl methanesulfonate **4b** (Table 4, entry 2)



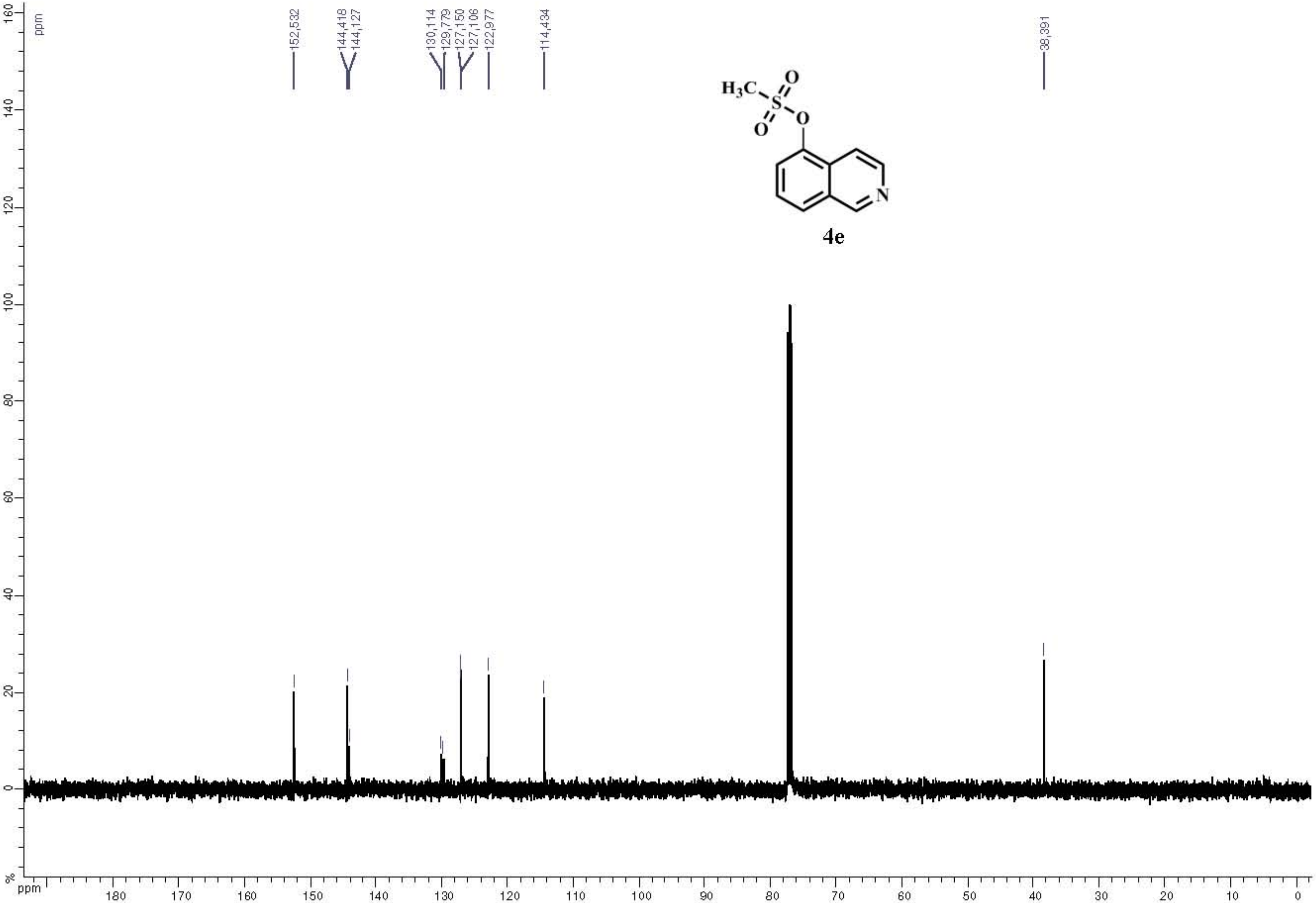
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of quinolin-8-yl methanesulfonate **4d** (Table 4, entry 4)



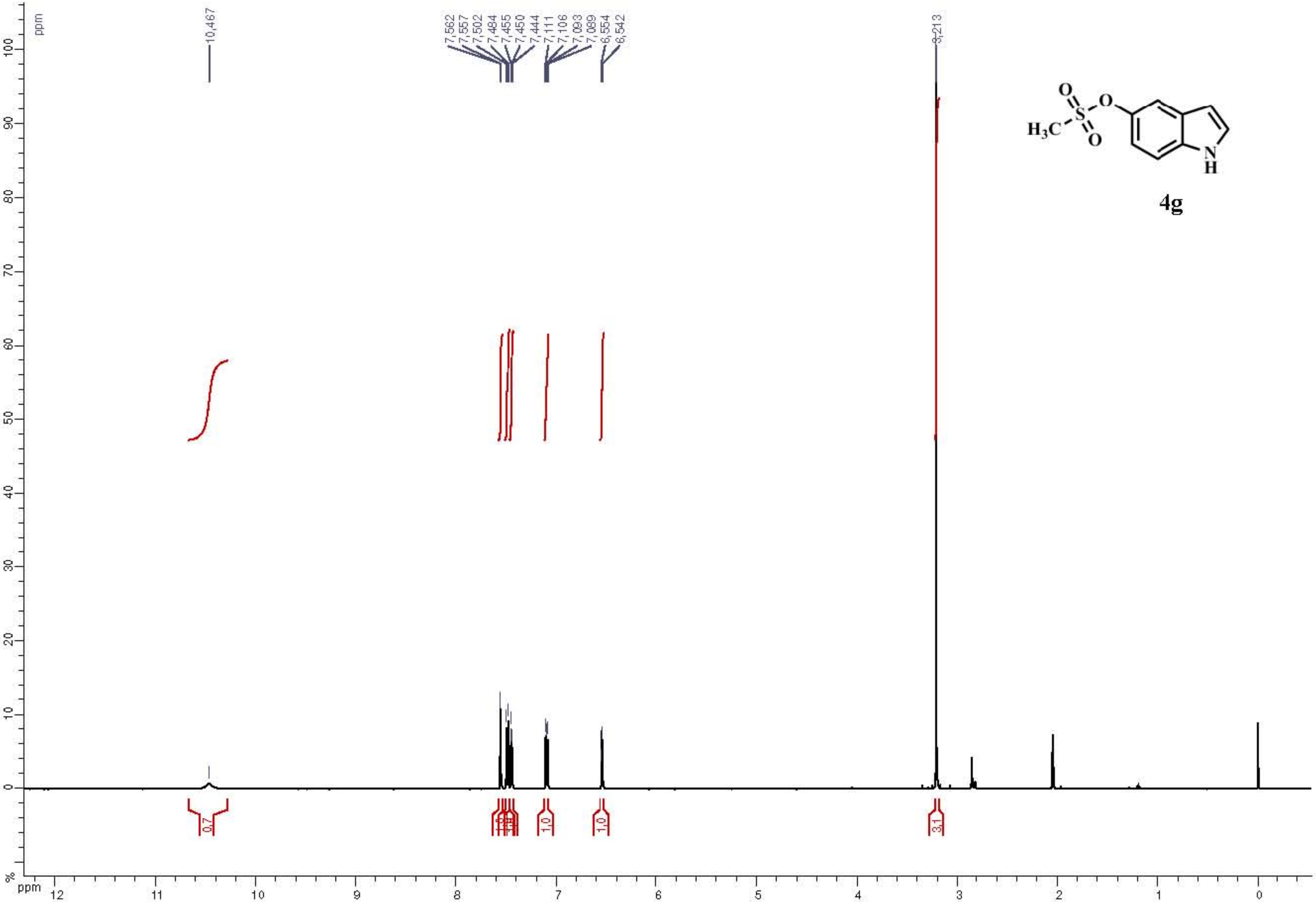
^{13}C NMR (125 MHz, CDCl$_3$) Spectrum of quinolin-8-yl methanesulfonate **4d** (Table 4, entry 4)



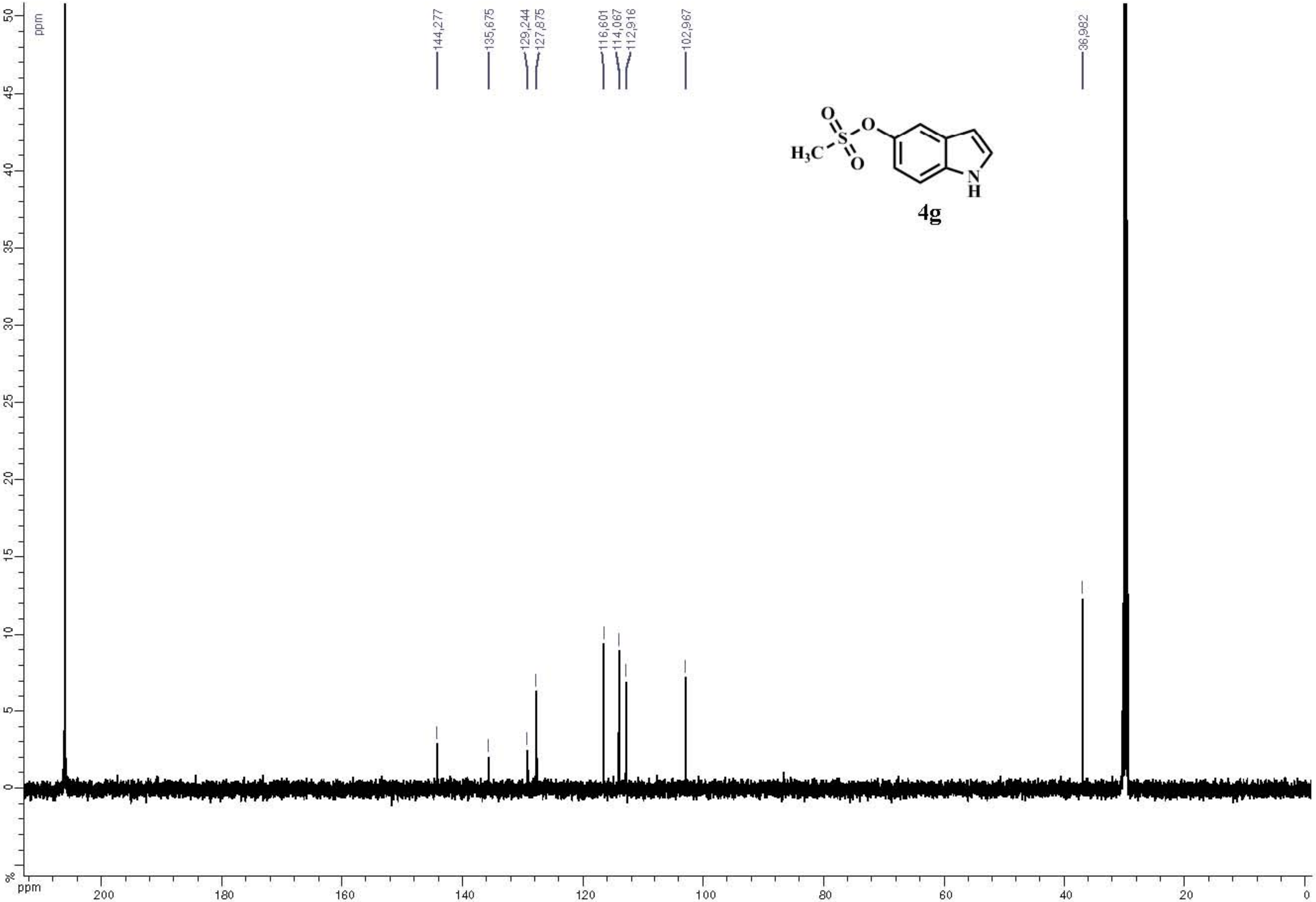
^{1}H NMR (500 MHz, CDCl$_3$) Spectrum of isoquinolin-5-yl methanesulfonate **4e** (Table 4, entry 5)



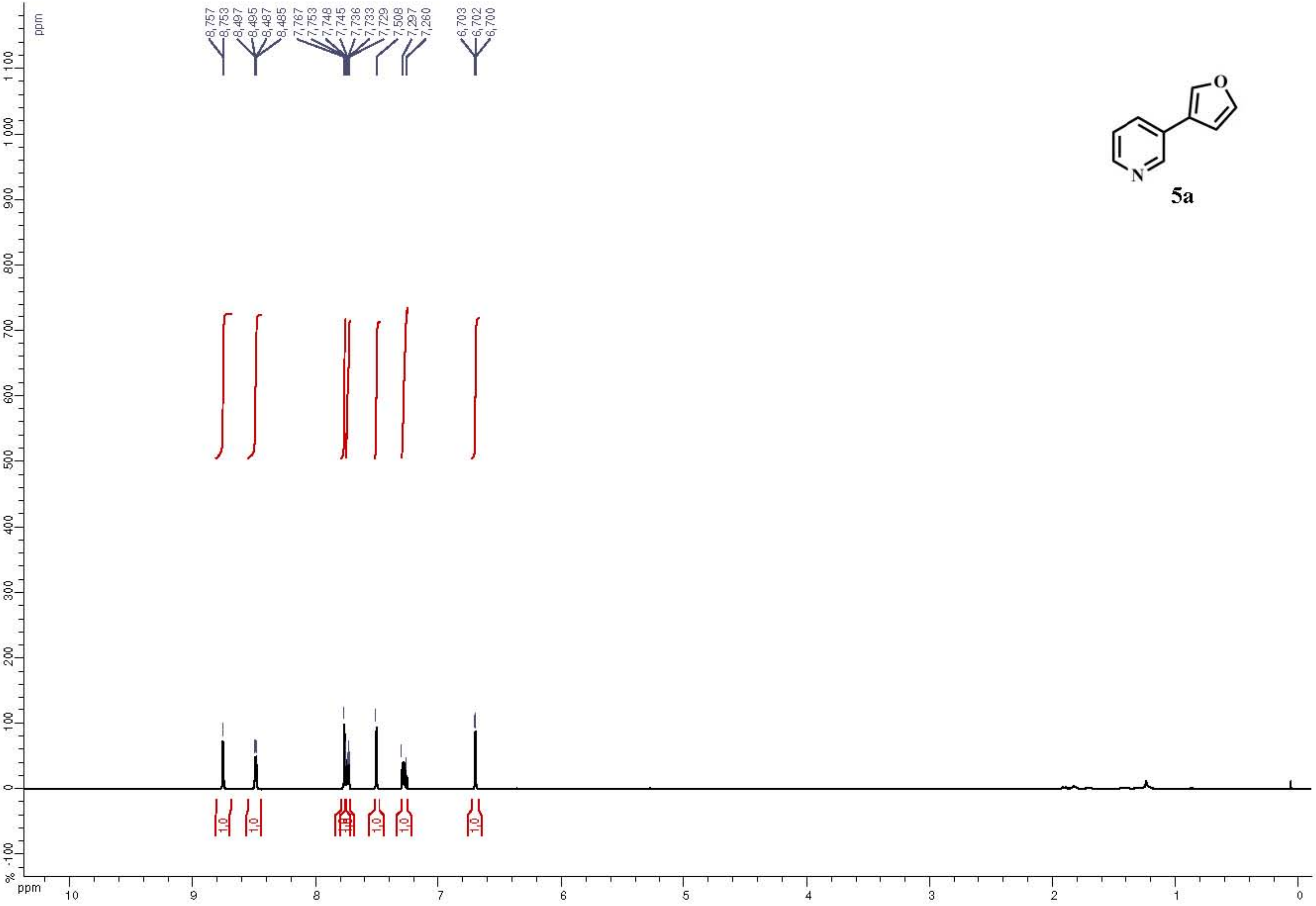
^{13}C NMR (125 MHz, CDCl$_3$) Spectrum of isoquinolin-5-yl methanesulfonate **4e** (Table 4, entry 5)



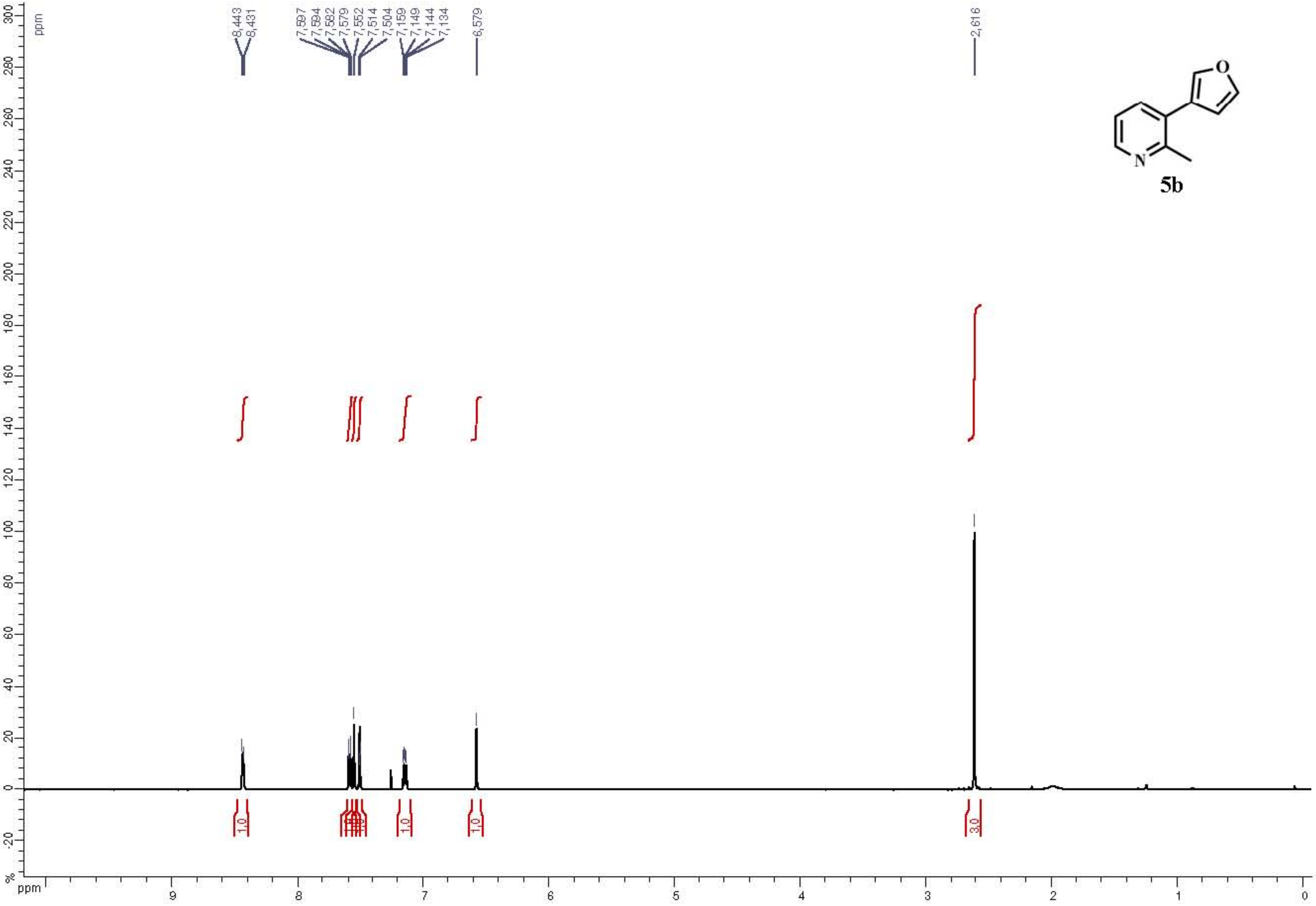
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 1*H*-indol-5-yl methanesulfonate **4g** (Table 4, entry 7)



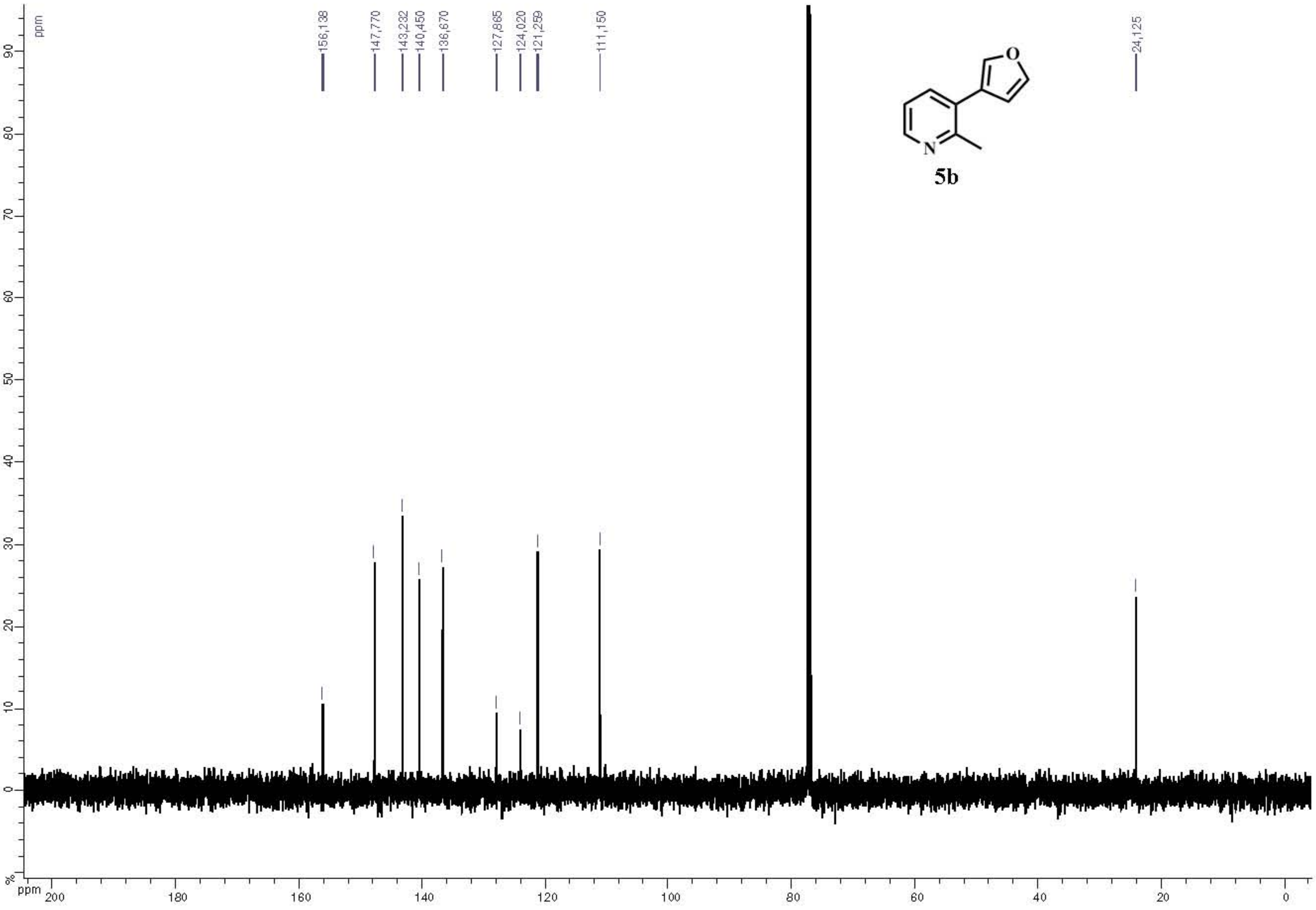
^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 1*H*-indol-5-yl methanesulfonate **4g** (Table 4, entry 7)



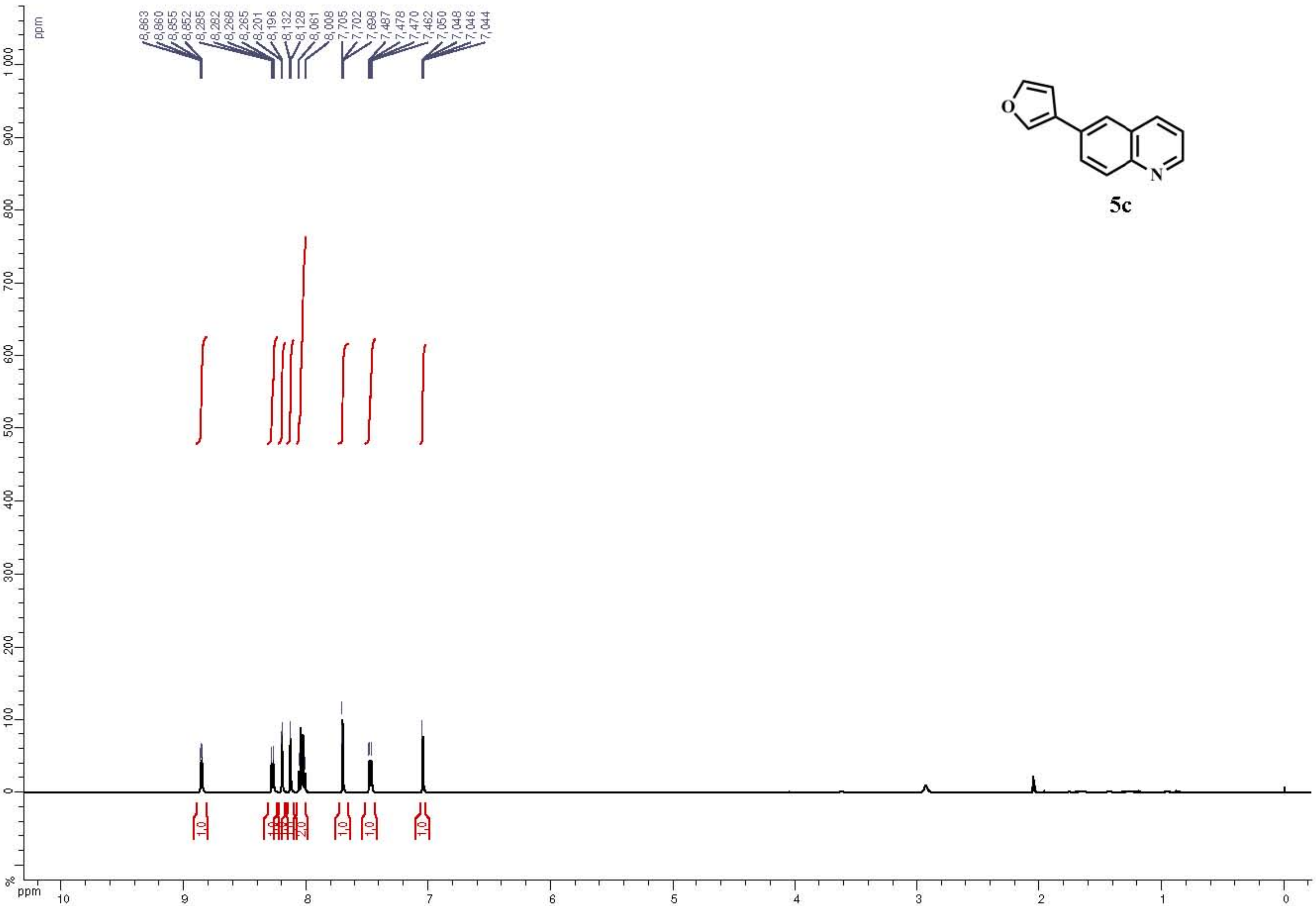
^{1}H NMR (500 MHz, CDCl$_3$) Spectrum of 3-(furan-3-yl)pyridine **5a** (Table 4, entry 1)



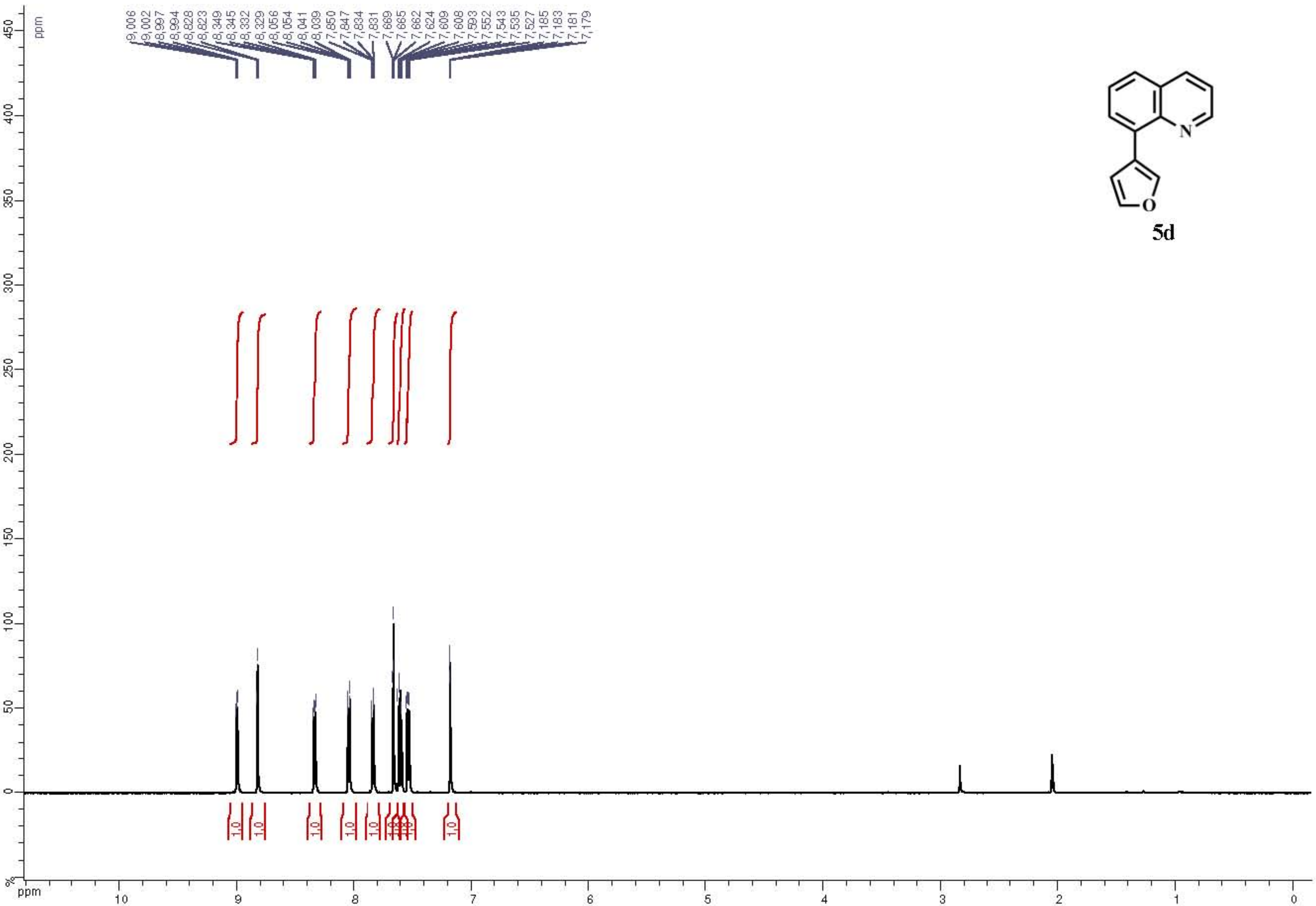
^{1}H NMR (500 MHz, CDCl$_3$) Spectrum of 3-(furan-3-yl)-2-methylpyridine **5b** (Table 4, entry 2)



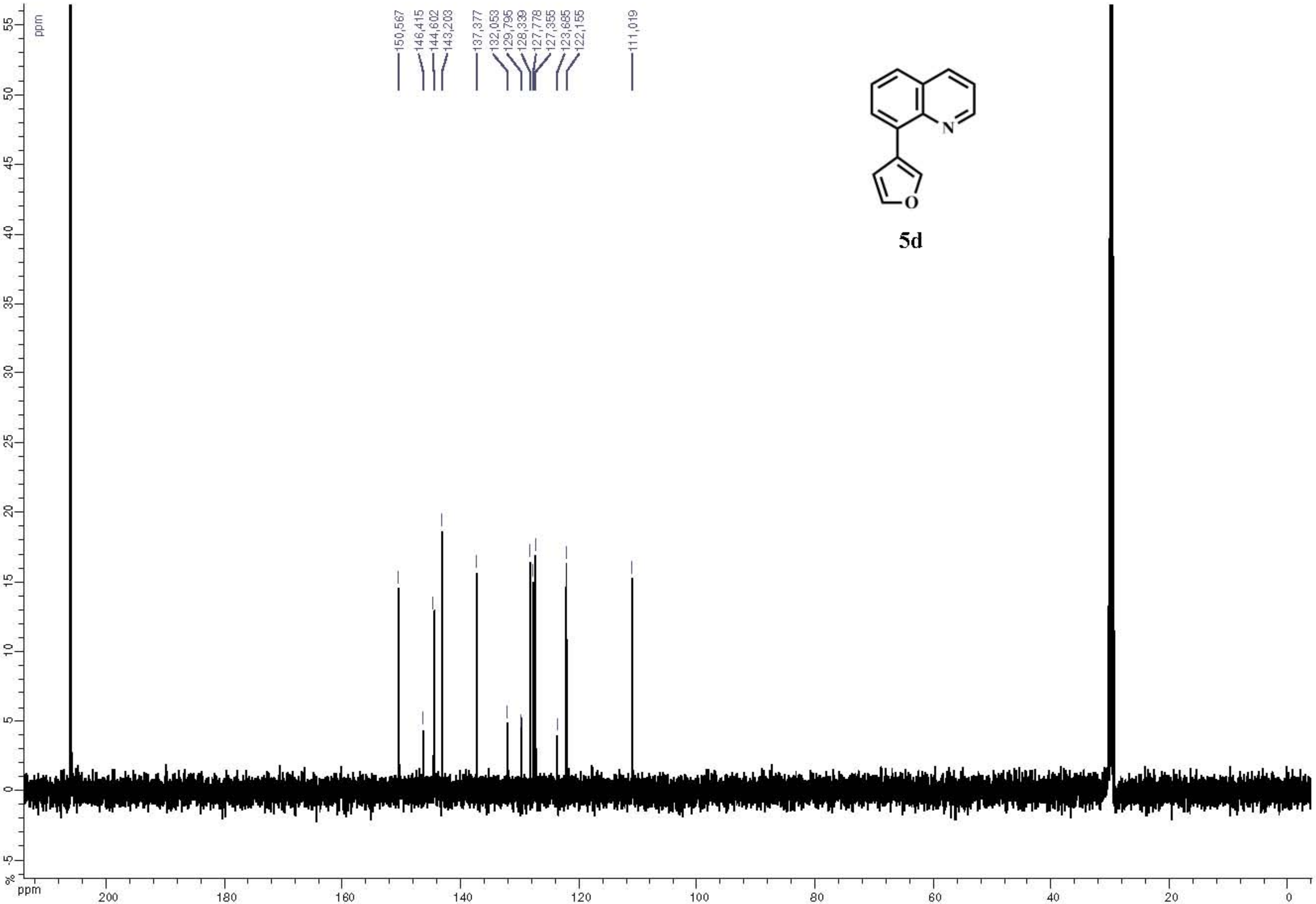
^{13}C NMR (125 MHz, CDCl$_3$) Spectrum of 3-(furan-3-yl)-2-methylpyridine **5b** (Table 4, entry 2)



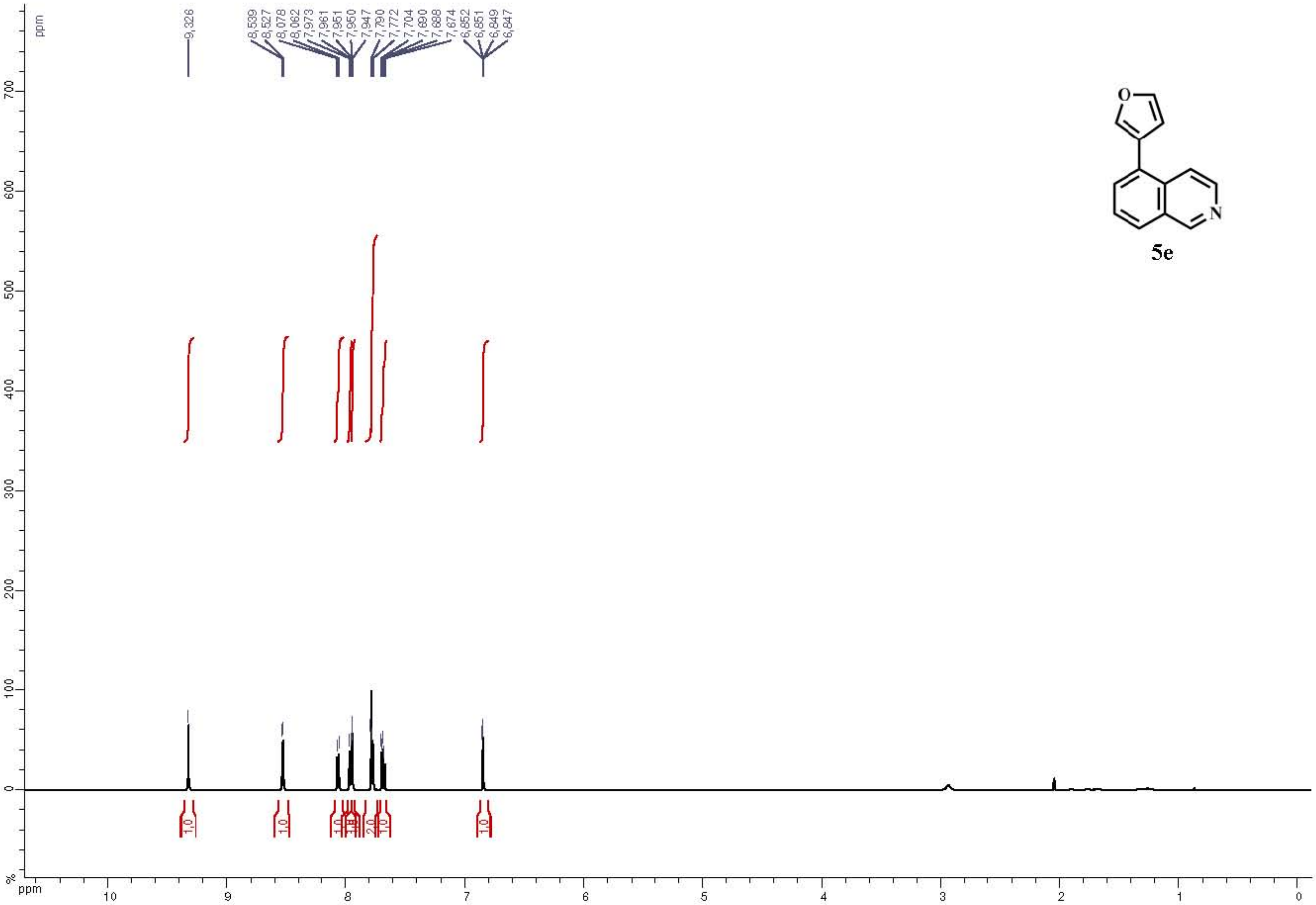
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 6-(furan-3-yl)quinoline **5c** (Table 4, entry 3)



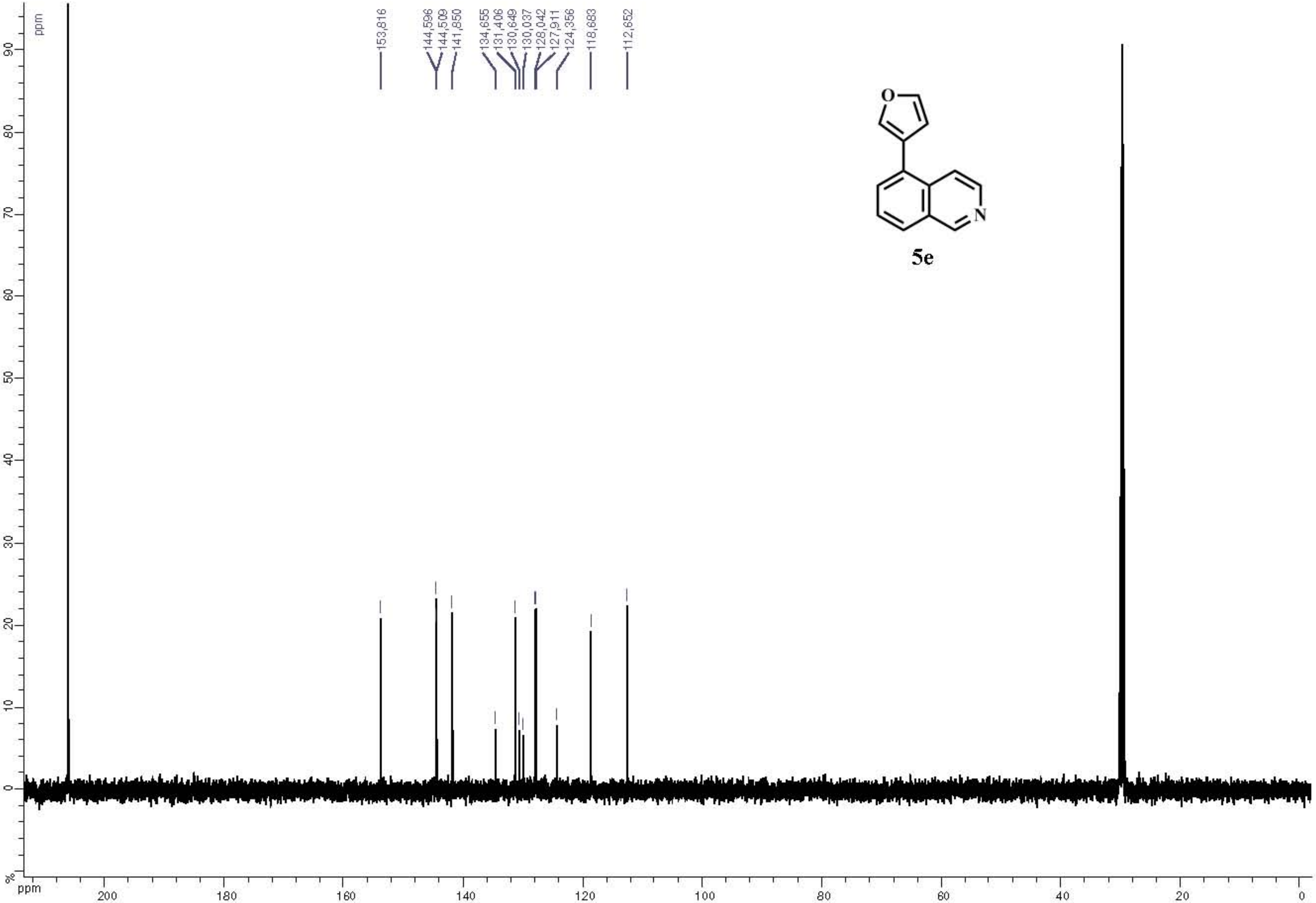
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 8-(furan-3-yl)quinoline **5d** (Table 4, entry 4)



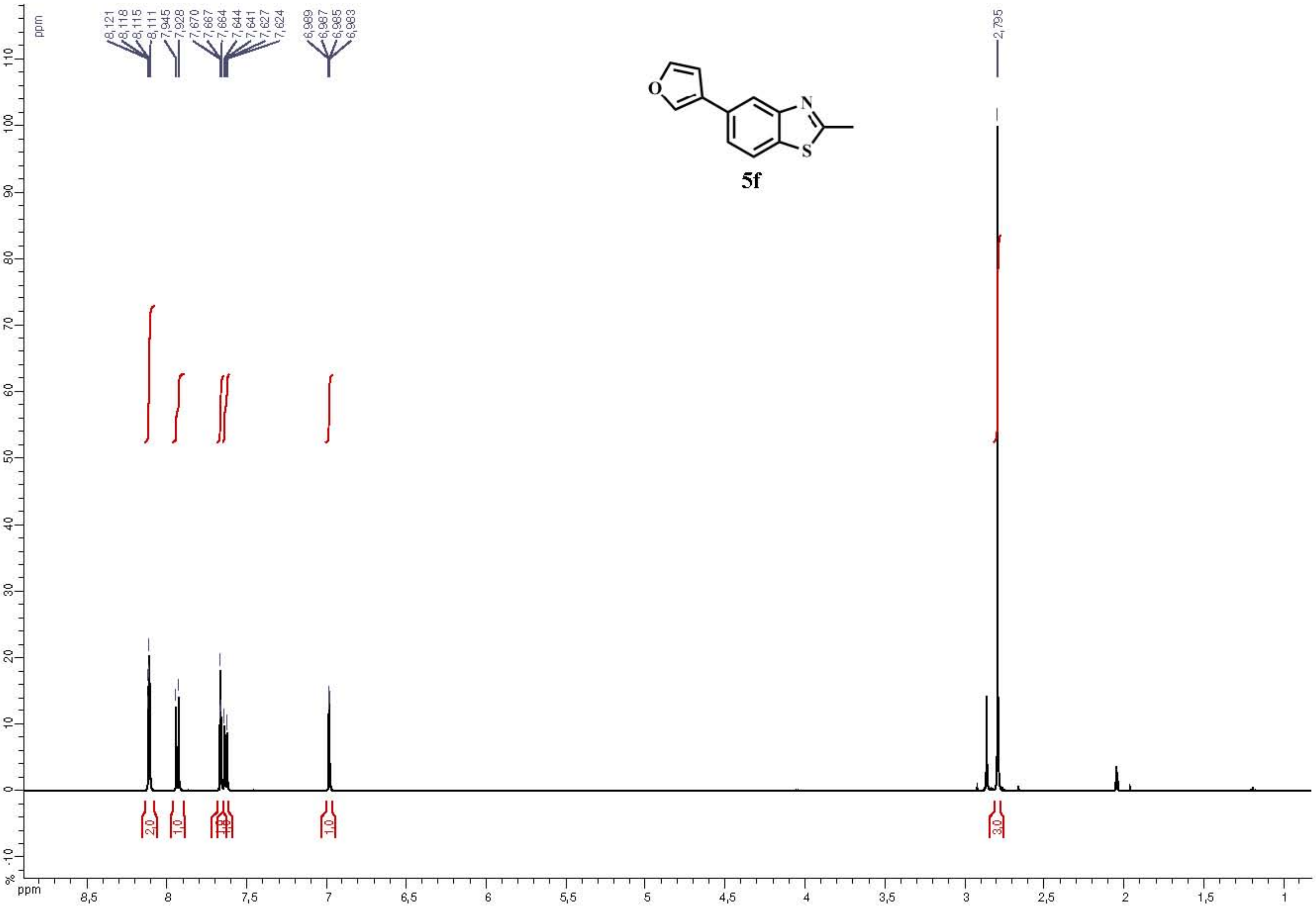
^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 8-(furan-3-yl)quinoline **5d** (Table 4, entry 4)



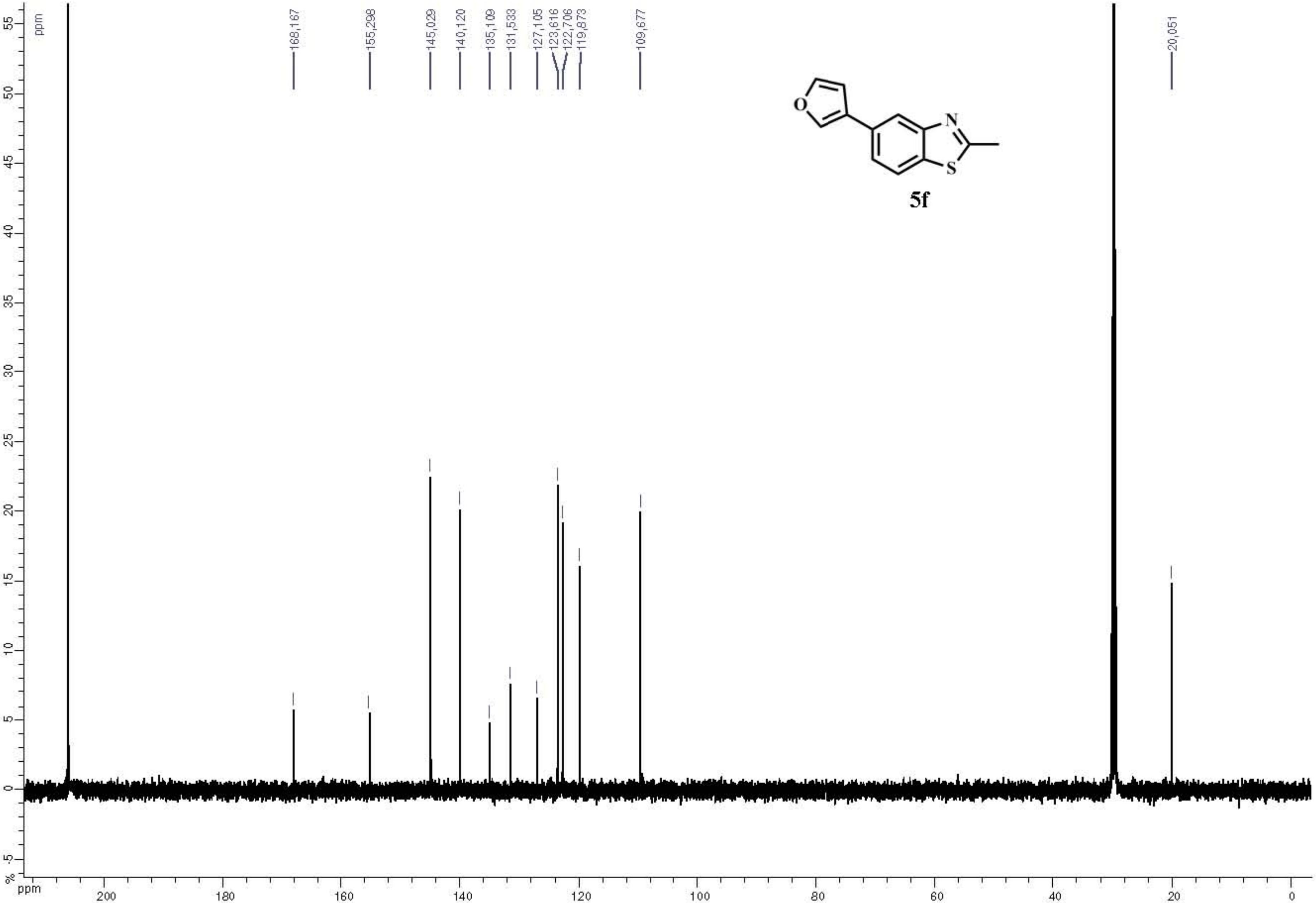
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 5-(furan-3-yl)isoquinoline **5e** (Table 4, entry 5)



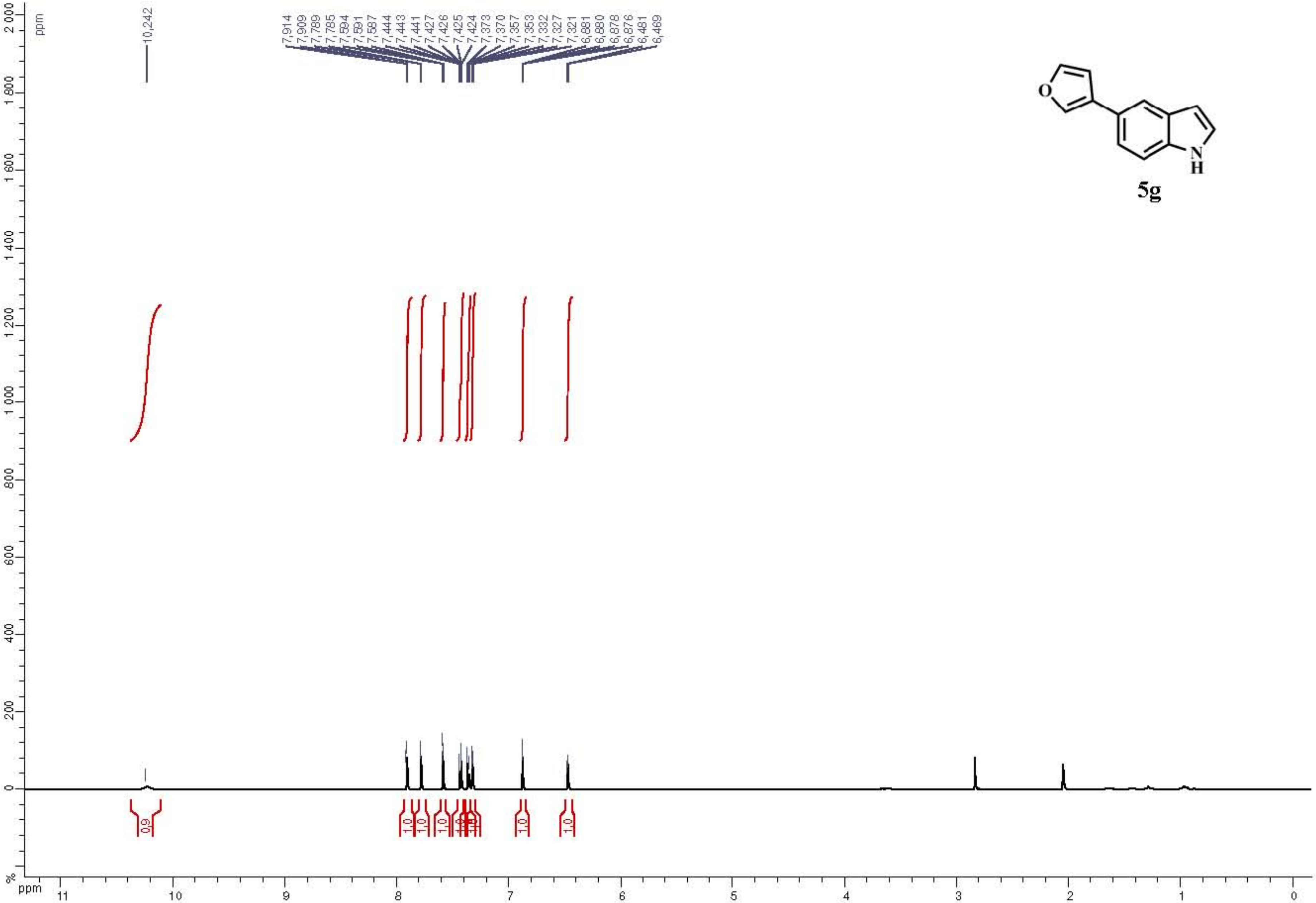
^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 8-(furan-3-yl)quinoline **5e** (Table 4, entry 5)



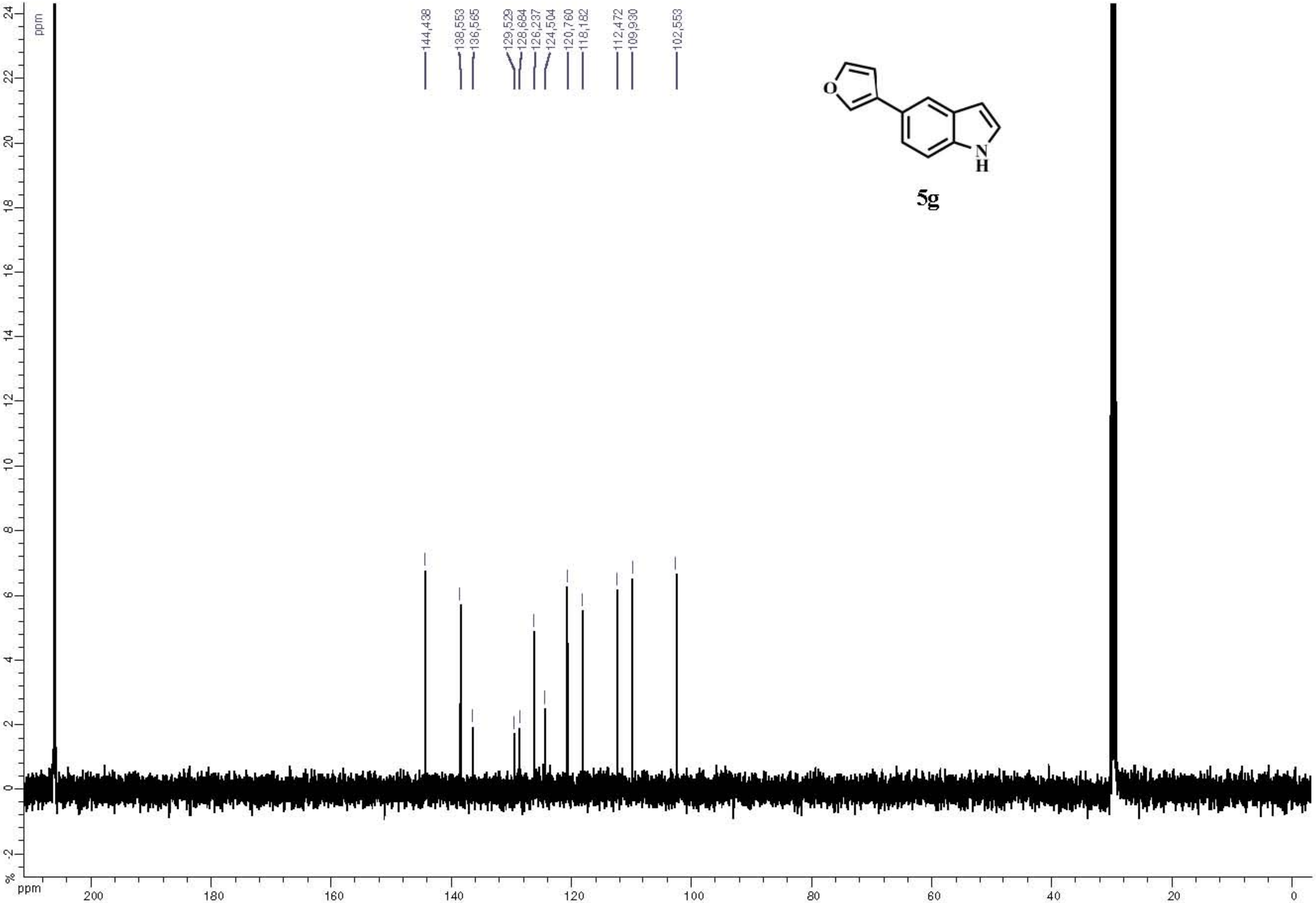
^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 5-(furan-3-yl)-2-methylbenzo[d]thiazole **5f** (Table 4, entry 6)



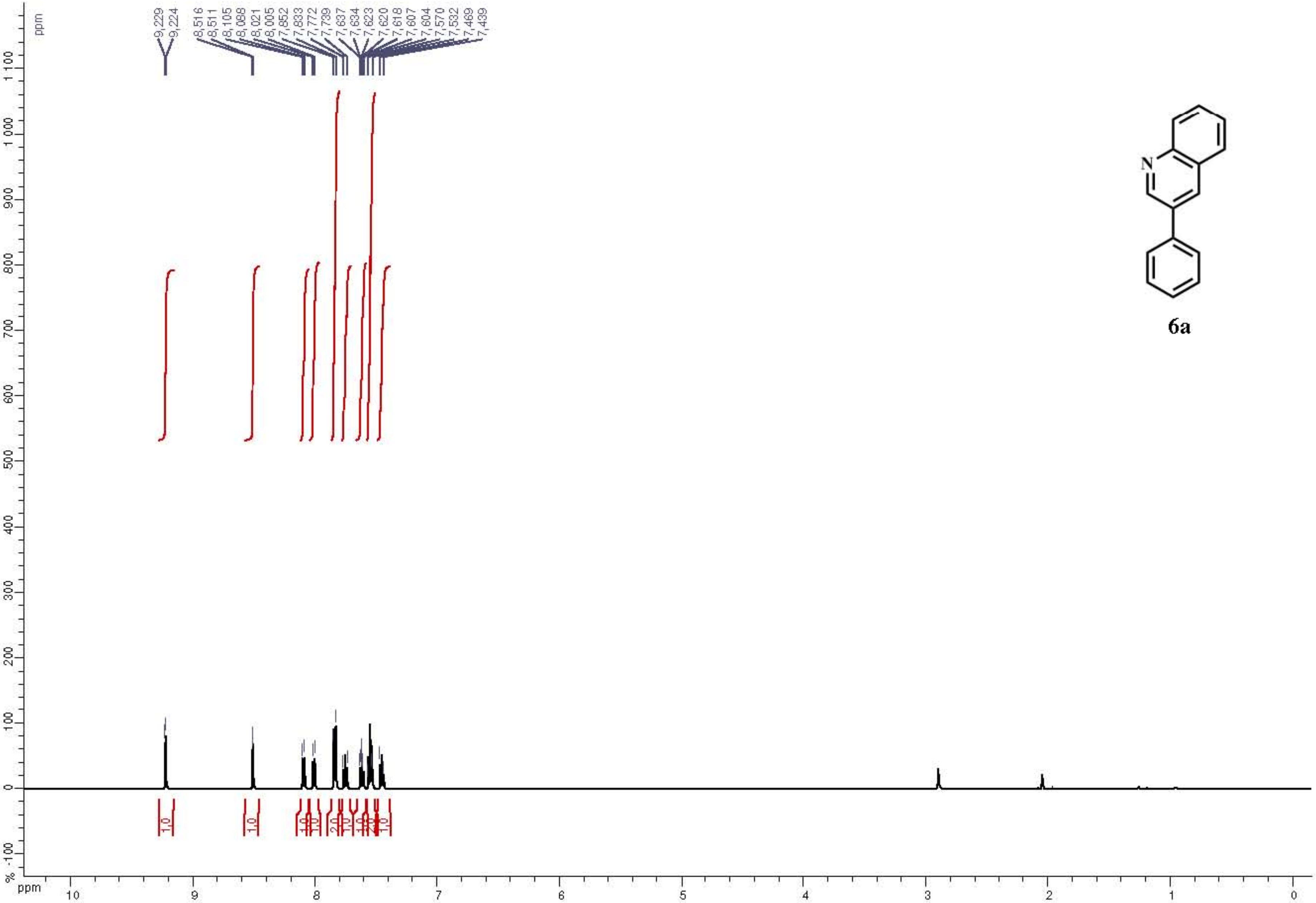
^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 5-(furan-3-yl)-2-methylbenzo[d]thiazole **5f** (Table 4, entry 6)



^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 5-(furan-3-yl)-1*H*-indole **5g** (Table 4, entry 7)

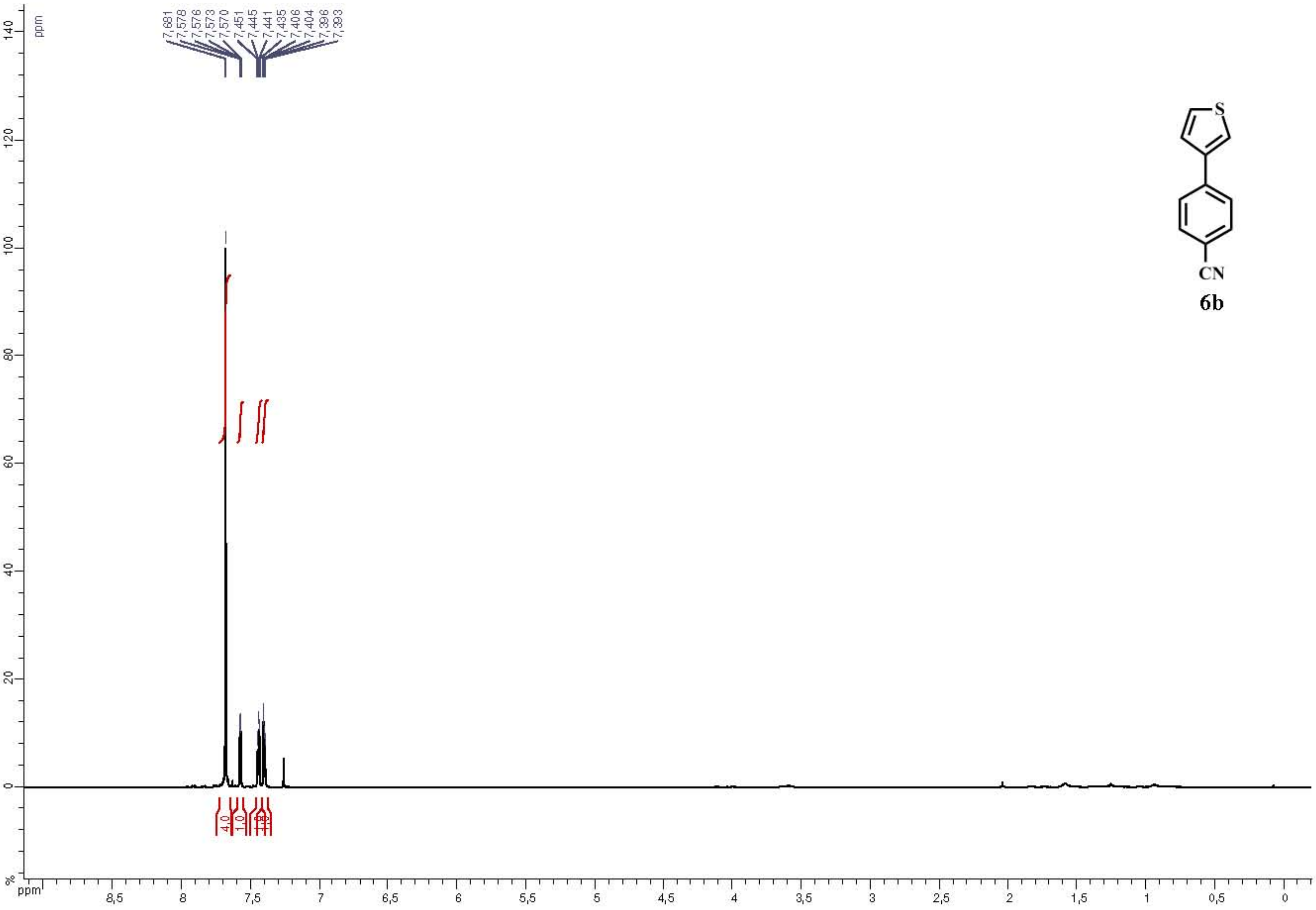


^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 5-(furan-3-yl)-1*H*-indole **5g** (Table 4, entry 7)



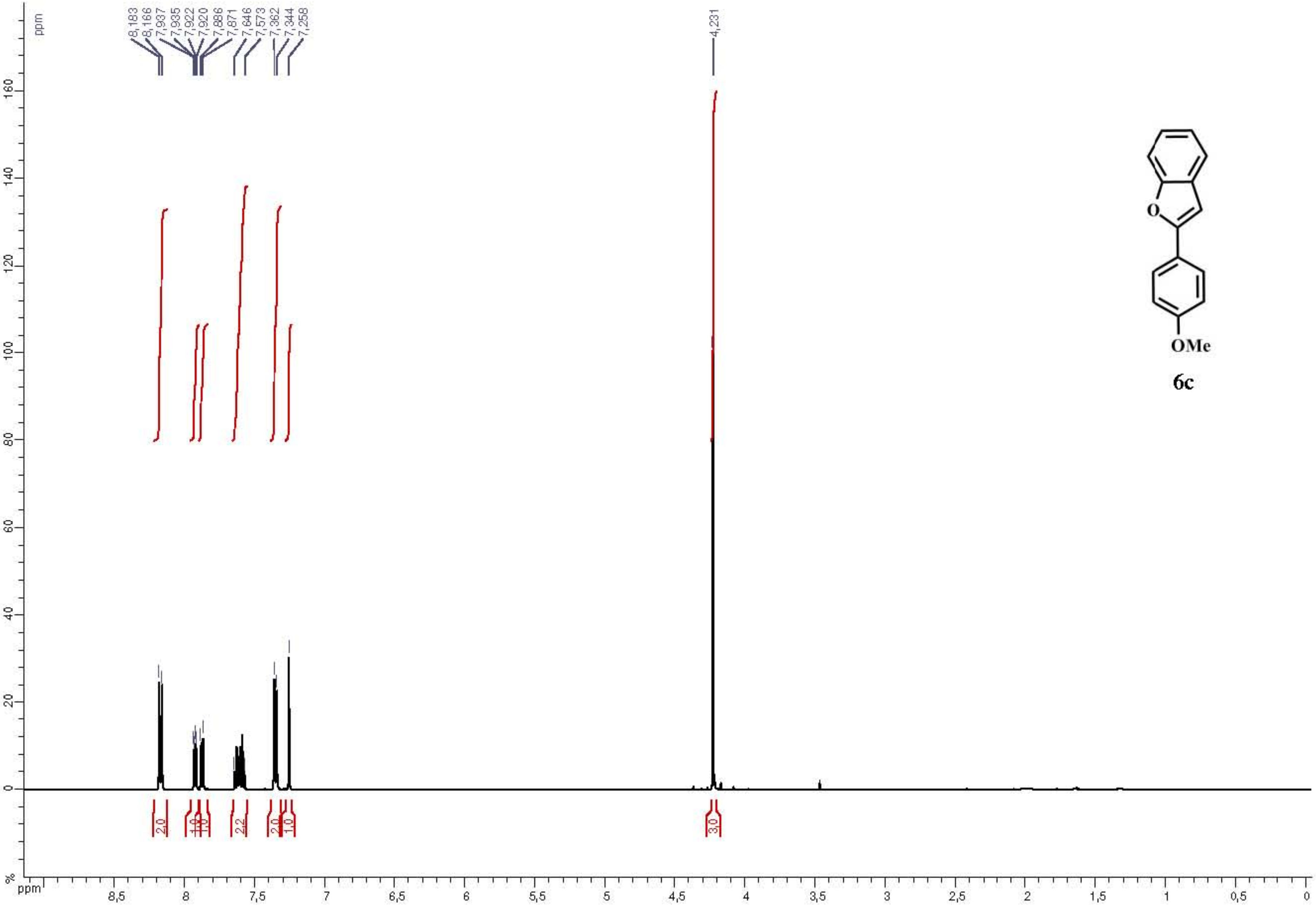
6a

^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 3-phenylquinoline **6a** (Table 5, entry 1)

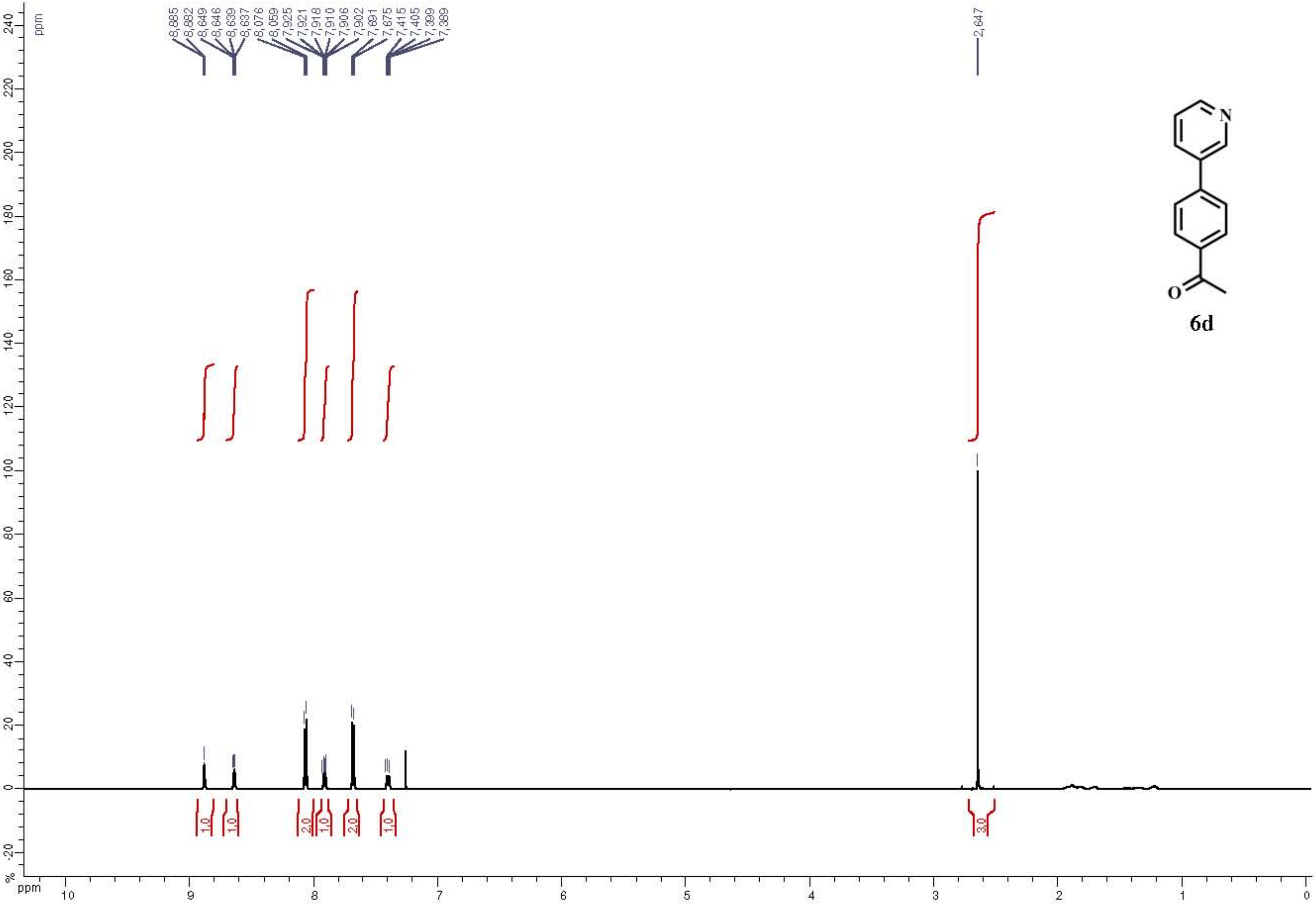


6b

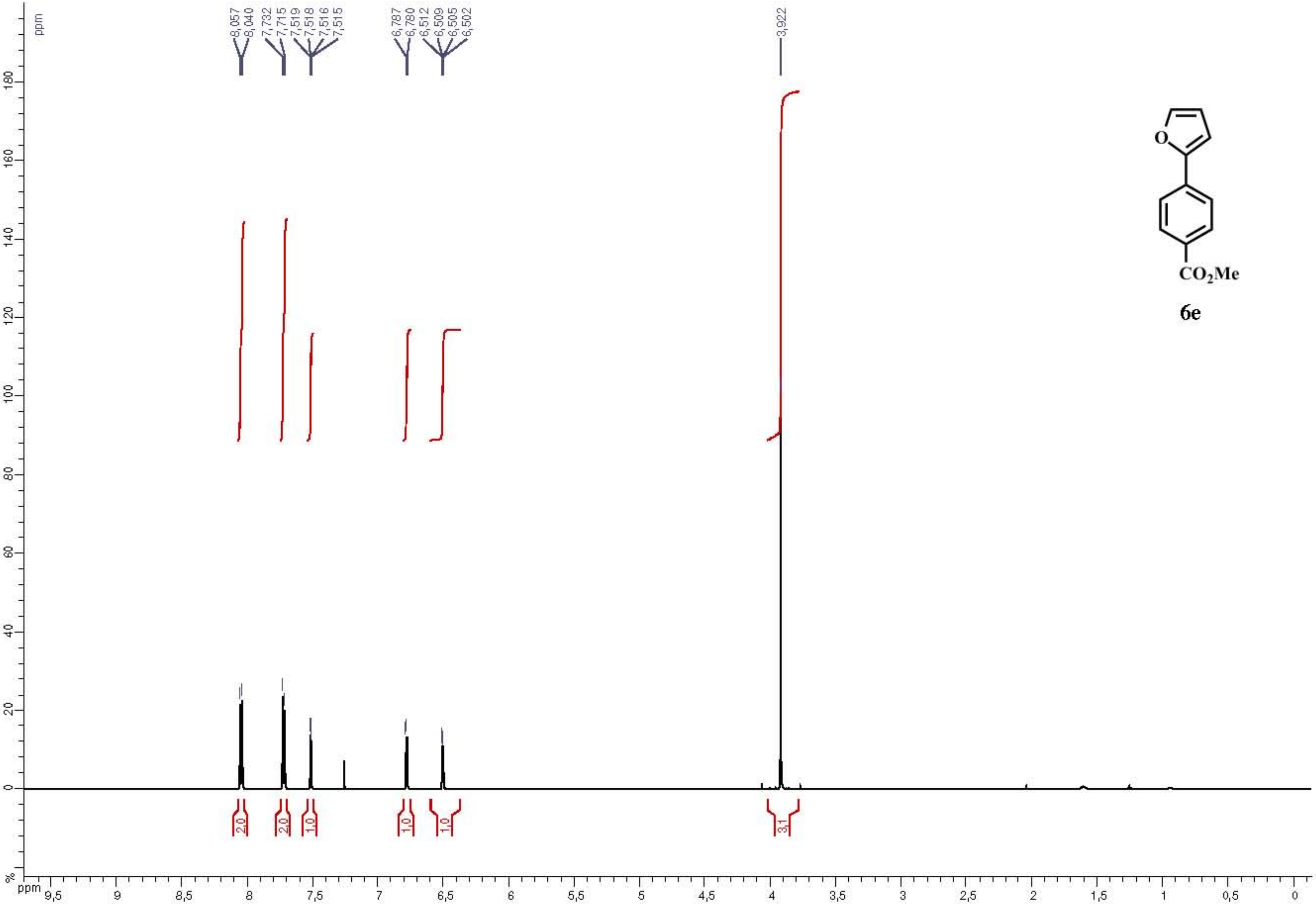
^{1}H NMR (500 MHz, CDCl$_3$) Spectrum of 4-(thiophen-3-yl)benzonitrile **6b** (Table 5, entry 2)



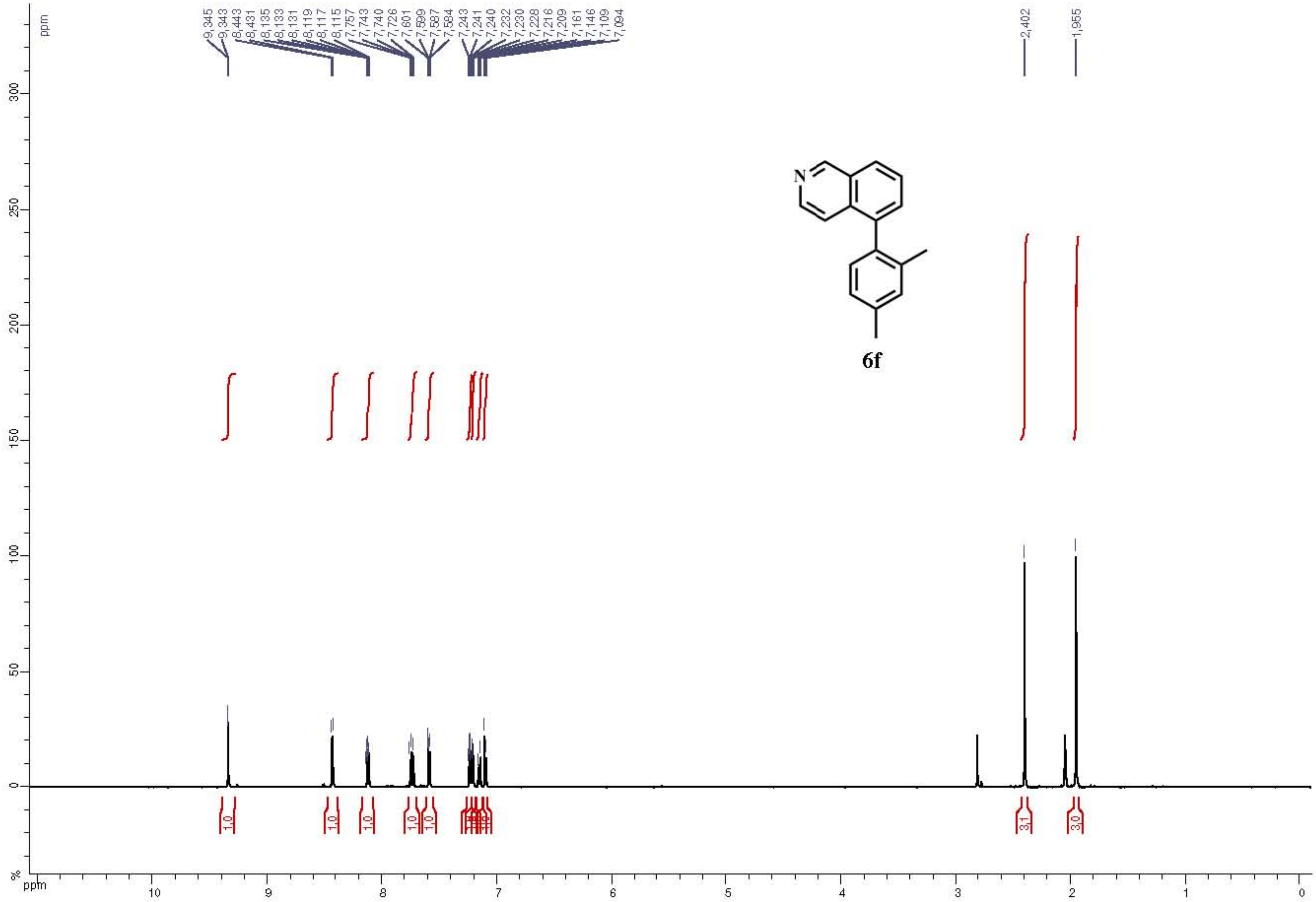
^{1}H NMR (500 MHz, $CDCl_3$) Spectrum of 2-(4-methoxyphenyl)benzofuran **6c** (Table 5, entry 3)



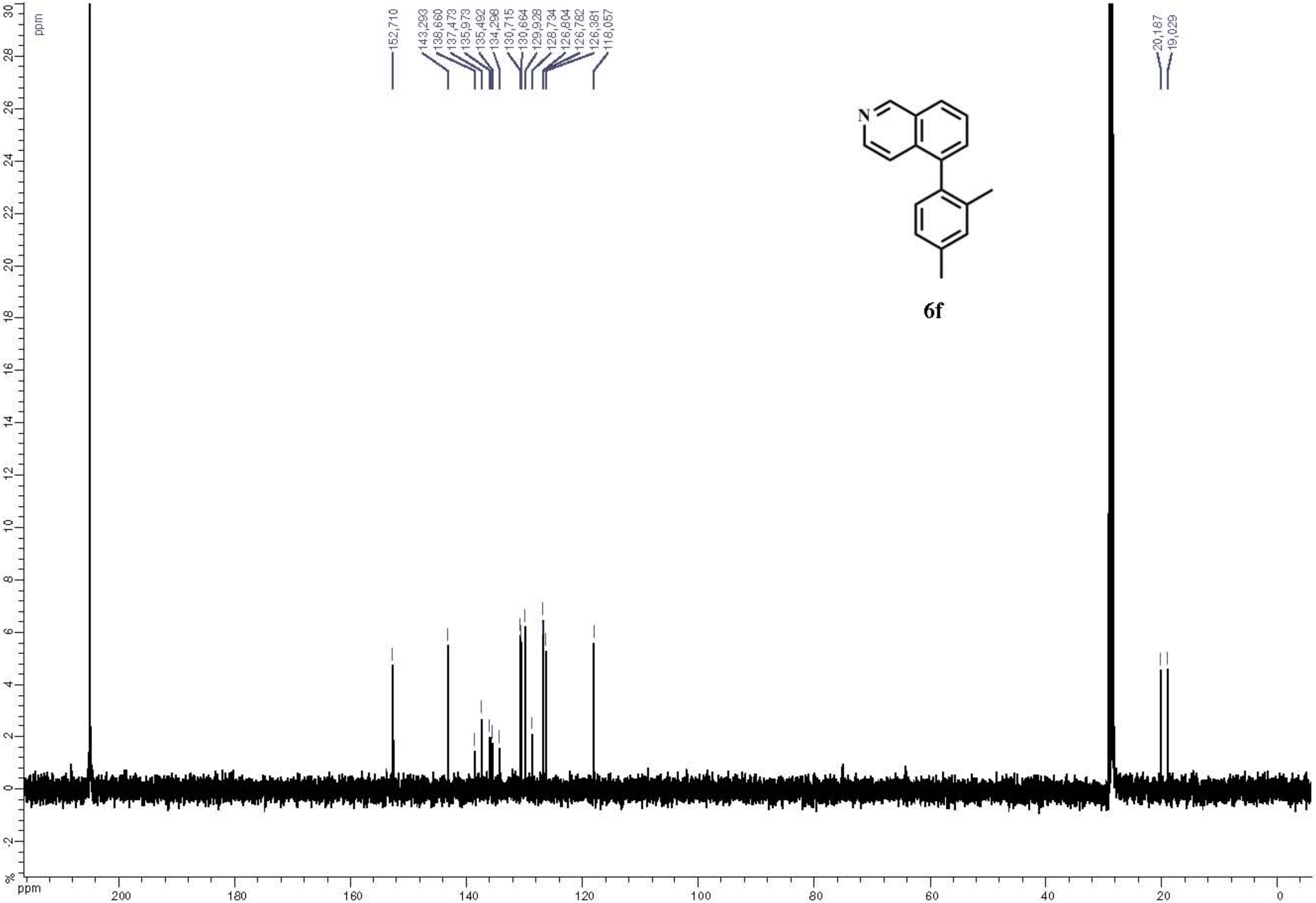
^{1}H NMR (500 MHz, CDCl$_3$) Spectrum of 1-(4-(pyridin-3-yl)phenyl)ethanone **6d** (Table 5, entry 4)



^{1}H NMR (500 MHz, CDCl$_3$) Spectrum of methyl 4-(furan-2-yl)benzoate **6e** (Table 5, entry 5)



^{1}H NMR (500 MHz, C_3D_6O) Spectrum of 5-(2,4-dimethylphenyl)isoquinoline **6f** (Table 5, entry 6)



^{13}C NMR (125 MHz, C_3D_6O) Spectrum of 5-(2,4-dimethylphenyl)isoquinoline **6f** (Table 5, entry 6)