**SUPPORTING INFORMATION**

# The sea urchin embryo model as a reliable *in vivo* phenotypic screen to characterize selective antimitotic molecules. Comparative evaluation of combretapyrazoles, -isoxazoles, -1,2,3-triazoles, and -pyrroles as tubulin binding agents

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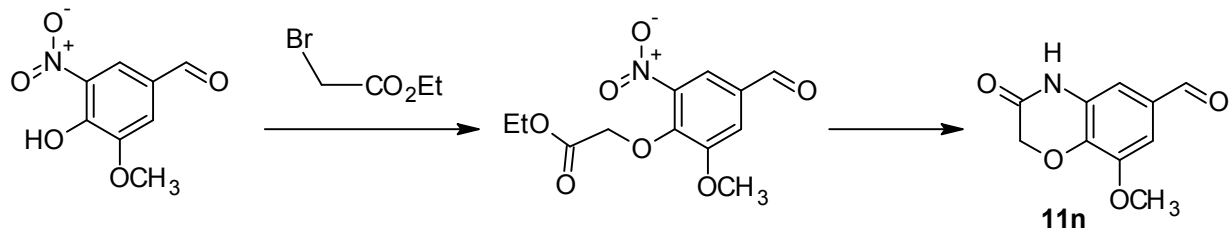
## Table of Contents

**Synthesis of 8-Methoxy-3-oxo-3,4-dihydro-2H-1,4-benzoxazine-6-carbaldehyde (11n) .**

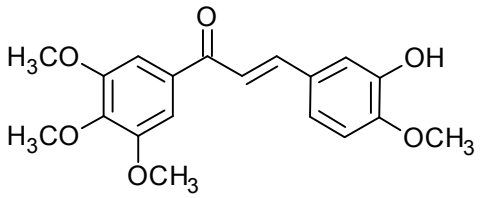



*Synthesis of 4-(Ethoxycarbonylmethoxy)-3-methoxy-5-nitrobenzaldehyde.*[1] Powdered anhydrous $K_2CO_3$ (39.7 g) was added to a solution of nitrovanilline (56.7 g, 0.288 mol) in dry degassed DMF (700 mL) and the resulting suspension was stirred at room temperature for 10 min followed by a dropwise addition of neat ethyl bromoacetate (55.3 g, 0.331 mol, 5 min). The orange reaction slurry thickened initially but gradually liquefied upon stirring at 80 °C for 2 h. The resulting mixture was poured onto ice (200 g) with manual stirring, and then the precipitate was collected, washed with deinonized water (3 × 250 mL) and dried to afford the product as a light-yellow crystals (62.75 g, 77% yield), mp 67–69 °C.

*Synthesis of 8-Methoxy-3-oxo-3,4-dihydro-2H-benzo[b][1,4]oxazine-6-carbaldehyde: Hydrogenation procedure.* A reduced iron particles (60 g, 200 μm) were added to 4-ethoxycarbonylmethoxy-3-methoxy-5-nitrobenzaldehyde (80 g) in glacial AcOH (1 L), the mixture was gradually heated to 80 °C and stirred for 2 h at this temperature. The remaining iron was separated from the resulting solid residue using permanent magnet, the precipitate was washed with of AcOH (2 × 250 mL), the combined AcOH phases were concentrated *in vacuo* and the residue was treated with distilled water (2 × 500 mL). The precipitate was filtered off, washed with distilled water (3 × 250 mL) followed by 20% aq. HCl (3 × 150 mL) and finally with distilled water (3 × 250 mL). The product was dried *in vacuo* to afford the targeted aldehyde as an beige solid (54 g, 92 % yield), mp 237–239 °C. NMR (DMSO-$d_6$): $\delta$ 10.95 (1H, br.s, NH), 9.82 (1H, s, CHO), 7.24 (1H, s, H-5), 7.08 (1H, s, H-7), 4.68 (2H, s, H-2), 3.86 (3H, s, $OCH_3$); EIMS *m/z 208* $[M+1]^+$ (12), 207 $[M]^+$ (100), 206 (18), 178 (18), 160 (11), 134 (10), 122 (10), 94 (11). Anal. Calcd. for $C_{10}H_9NO_4$: C, 57.97; H, 4.38; N 6.76. Found: C, 58.15; H, 4.52; N 6.49.

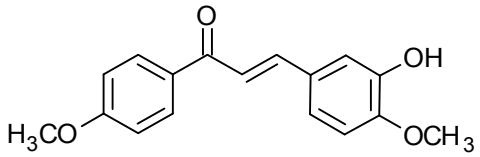
**Analytical Data for Chalcones (13).**

*(2E)-3-(3-Hydroxy-4-methoxyphenyl)-1-(3,4,5-trimethoxyphenyl)-2-propen-1-one (**13a**).*



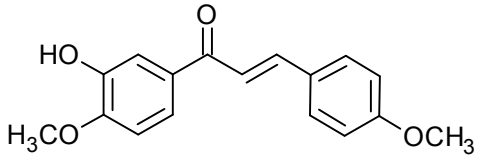
Yellow crystals; 4.2 g (61%); mp 126–128 °C (lit.[2] 127–129 °C); $^1$H NMR (DMSO-$d_6$) $\delta$ 9.19 (1H, s, OH), 7.71 (1H, d, *J* 15.4 Hz, H-2), 7.62 (1H, d, *J* = 15.4 Hz, H-3), 7.40 (2H, s, H-2',6'), 7.39 (1H, d, *J* = 2 Hz, H-2"), 7.30 (1H, dd, *J* = 8.3 Hz, *J* = 2 Hz, H-6"), 7.00 (1H, d, *J* = 8.3 Hz, 5"), 3.90 (6H, s, $OCH_3$-3',5'), 3.84 (3H, s, $OCH_3$), 3.76 (3H, s, $OCH_3$); EIMS *m*/*z* 345 $[M+1]^+$ (21), 344 $[M]^+$ (100), 330 (12), 329 (58), 313 (25), 301 (17), 195 (37), 177 (34), 156 (24), 134 (18), 117 (17), 106 (10), 105 (13), 89 (28), 77 (26). Anal. Calcd. for $C_{19}H_{20}O_6$: C, 66.27; H 5.85. Found: C, 66.40; H, 5.88.

*(2E)-3-(3-Hydroxy-4-methoxyphenyl)-1-(4-methoxyphenyl)-2-propen-1-one (**13b**).*



The reaction mixture was stirred at room temperature for 72 h. Yellow crystals; 3.18 g (56%); mp 149–151 °C (lit.[3] 150–152 °C); $^1$H NMR (DMSO-$d_6$) $\delta$ 9.10 (1H, s, OH), 8.13 (2H, d, J = 8.7 Hz, H-2',6'), 7.69 (1H, d, *J* = 15.5 Hz, H-2), 7.59 (1H, d, *J* = 15.5 Hz, H-3), 7.31 (1H, s, H-2"), 7.28 (1H, d, *J* = 8.3 Hz, H-6"), 7.07 (2H, d, *J* = 8.7 Hz, H-3',5'), 7.0 (1H, d, *J* = 8.3 Hz, 5"), 3.87 (3H, s, $OCH_3$), 3.84 (3H, s, $OCH_3$); EIMS *m*/*z 285* $[M+1]^+$ (10), 284 $[M]^+$ (51), 283 (16), 269 (32), 241 (10), 177 (11), 135 (83), 117 (14), 107 (27), 105 (20), 92 (71), 89 (41), 77 (100). Anal. Calcd. for $C_{17}H_{16}O_4$: C, 71.82; H, 5.67. Found: C, 71.88; H, 5.70.

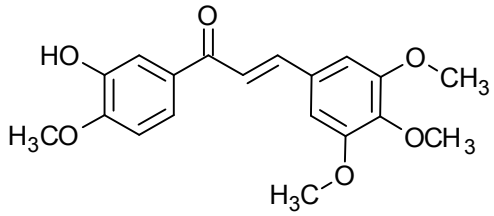
*(2E)-1-(3-Hydroxy-4-methoxyphenyl)-3-(4-methoxyphenyl)-2-propen-1-one (**13c**).*



Acetyl group was hydrolyzed during the condensation of 5-acetyl-2-methoxyphenyl acetate and anisaldehyde (Scheme 2). Yellow crystals; 3.24 g (57%); mp 106–108 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 9.35 (1H, s, OH), 7.82 (2H, d, *J* = 8.7 Hz, H-2",6"), 7.74 (1H, d, *J* = 15.5 Hz, H-2), 7.73 (1H, dd, *J* = 8.5 Hz, *J* = 2.0 Hz, H-6'), 7.65 (1H, d, *J* = 15.5 Hz, H-3), 7.52 (1H, d, *J* = 2.0 Hz, H-2'), 7.05 (1H, d, *J* = 8.5 Hz, H-5'), 7.01 (2H, d, *J* = 8.5 Hz, H-3",5"), 3.88 (3H, s, $OCH_3$), 3.82 (3H, s,

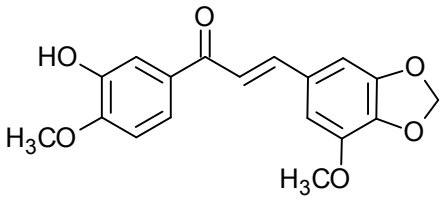
$OCH_3$); EIMS *m/z 285* $[M+1]^+$ (19), 284 $[M]^+$ (100), 283 (23), 269 (53), 253 (20), 161 (46), 151 (37), 133 (25), 108 (19), 89 (24), 77 (25). Anal. Calcd. for $C_{17}H_{16}O_4$: C, 71.82; H, 5.67. Found: C, 71.96; H, 5.72%.

*(2E)-1-(3-Hydroxy-4-methoxyphenyl)-3-(3,4,5-trimethoxyphenyl)-2-propen-1-one (**13d**).*



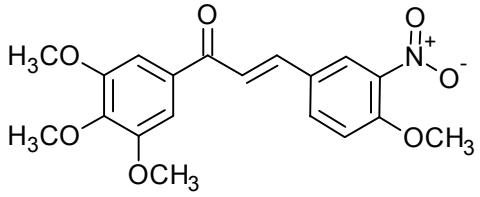

Acetyl group was hydrolyzed during the condensation of 5-acetyl-2-methoxyphenyl acetate and 3,4,5-trimethoxybenzaldehyde. Yellow crystals; 4.34 g (63%); mp 129–131 °C (lit.[2] 130–132 °C); $^1$H NMR (DMSO-$d_6$) $\delta$ 9.39 (1H, s, OH), 7.83 (1H, d, $J$ = 15.5 Hz, H-2), 7.76 (1H, dd, $J$ = 8.5 Hz, $J$ = 1.8 Hz, H-6'), 7.62 (1H, d, $J$ = 15.4 Hz, H-3), 7.54 (1H, d, $J$ = 1.8 Hz, H-2'), 7.20 (2H, s, H-2",6"), 7.07 (1H, d, $J$ 8.5 Hz, 5'), 3.88 (3H, s, $OCH_3$), 3.87 (6H, s, $OCH_3$-3",5"), 3.71 (3H, s, $OCH_3$); EIMS *m/z* 345 $[M+1]^+$ (19), 344 $[M]^+$ (100), 330 (8), 329 (40), 314 (9), 313 (42), 301 (13), 157 (5), 151 (13), 127 (6). Anal. Calcd. for $C_{19}H_{20}O_6$: C, 66.27; H, 5.85. Found: C, 66.37; H, 5.89.

*(2E)-1-(3-Hydroxy-4-methoxyphenyl)-3-(7-methoxy-2H-1,3-benzodioxol-5-yl)prop-2-en-1-one (**13e**).*



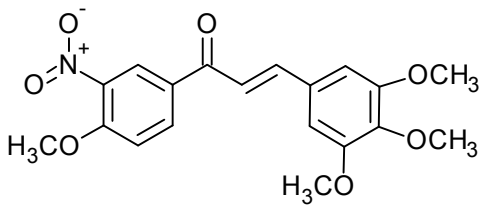

Acetyl group was hydrolyzed during the condensation. Yellow crystals; 5.33 g (68%); mp 170–173 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 9.38 (1H, s, OH), 7.76 (2H, m, H-2, H-6'), 7.60 (1H, d, $J$ = 15.5 Hz, H-3), 7.53 (1H, d, $J$ = 2.1 Hz, H-2'), 7.28 (1H, d, $J$ = 1.4 Hz, H-4"), 7.18 (1H, d, $J$ = 1.4 Hz, H-6"), 7.05 (1H, d, $J$ = 8.5 Hz, H-5'), 6.08 (2H, s, $OCH_2O$), 3.90 (3H, s, $OCH_3$), 3.88 (3H, s, $OCH_3$). Anal. Calcd. for $C_{18}H_{16}O_6$: C, 65.85; H, 4.91. Found: C, 66.11, H 4.75.

*(2E)-3-(4-Methoxy-3-nitrophenyl)-1-(3,4,5-trimethoxyphenyl)prop-2-en-1-one (**13f**).*



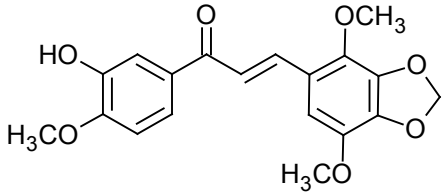
Yellow crystals; 3.93 g (65 %); mp 143–145 °C (lit.[4] 143–145 °C; lit.[5] 142–144 °C).

*(2E)-1-(4-Methoxy-3-nitrophenyl)-3-(3,4,5-trimethoxyphenyl)prop-2-en-1-one (**13g**).*



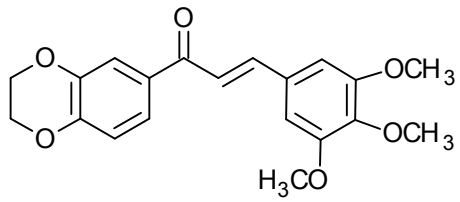
NaOH (100 mmol) was added to a mixture of 3-methoxy-2-nitroacetophenone (4.88 g, 25 mmol) and 3,4,5-trimethoxybenzaldehyde (5.1 g, 26 mmol) in MeOH (50 mL) at 20 °C. Then the temperature raised to 33 °C, and the mixture turned pink. It was stirred for 3 days, neutralized with conc. HCl, the precipitate was filtered off, washed 3 times with a small amount of water and dried first *in vacuo*, then at 50 °C in oven to afford target chalcone. Beige crystals; 8.8 g (95%); mp 147–150 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 8.62 (1H, d, $J$ = 2.2 Hz, H-2'), 8.47 (1H, dd, $J$ = 9 Hz, $J$ = 2.2 Hz, H-5'), 7.90 (1H, d, $J$ = 15.5 Hz, H-2), 7.74 (1H, d, $J$ = 15.5 Hz, H-3), 7.54 (1H, d, $J$ = 9 Hz, H-6'), 7.25 (2H, s, H-2",6"), 4.05 (3H, s, $OCH_3$), 3.87 (6H, s, 2 $OCH_3$), 3.72 (3H, s, $OCH_3$). EIMS *m*/*z* 373 [$M^+$] (100), 358 (16), 342 (39), 330 (11), 312 (5), 295 (11). Anal. Calcd. for $C_{19}H_{19}NO7$: C, 61.12; H, 5.13; N 3.75. Found: C, 61.20; H, 5.21; N 3.66.

*(2E)-3-(4,7-Dimethoxy-2H-1,3-benzodioxol-5-yl)-1-(3-hydroxy-4-methoxyphenyl)prop-2-en-1-one (**13h**).*



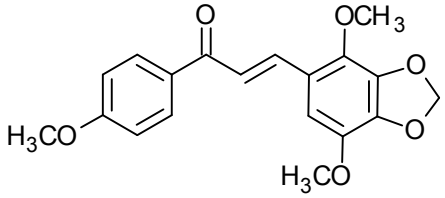
Acetyl group was hydrolyzed during the condensation. Yellow crystals; 4.34 g (73%); mp 162–164 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 9.38 (1H, s, OH), 7.86 (1H, d, $J$ = 15.6 Hz, H-2), 7.77 (1H, d, $J$ = 15.6 Hz, H-3), 7.71 (1H, dd, $J$ = 8.5 Hz, $J$ = 2.2 Hz, H-6'), 7.52 (1H, d, $J$ = 2.2 Hz, H-2'), 7.07 (1H, d, $J$ = 8.5 Hz, H-5'), 7.28 (1H, s, H-6"), 6.10 (2H, s, $OCH_2O$), 3.92 (3H, s, $OCH_3$), 3.89 (3H, s, $OCH_3$), 3.87 (3H, s, $OCH_3$). Anal. Calcd. for $C_{19}H_{18}O_7$: C, 63.68, H, 5.06. Found: C, 63.80, H 4.98.

*(2E)-1-(2,3-dihydro-1,4-benzodioxin-6-yl)-3-(3,4,5-trimethoxyphenyl)prop-2-en-1-one **13l**).*



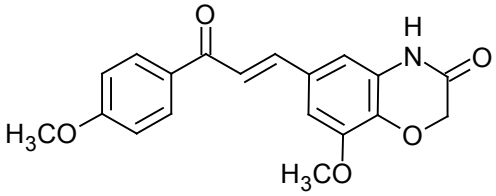
White crystals, 4.37 g (75%); mp 138–140 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 7.86 (1H, d, $J$ = 15.5 Hz, H-2), 7.74 (1H, dd, $J$ = 8.4 Hz, $J$ = 2.1 Hz, H-7'), 7.72 (1H, d, $J$ = 2.1 Hz, H-5'), 7.65 (1H, d, $J$ = 15.6 Hz, H-3), 7.21 (2H, s, H-2",6"), 7.03 (1H, d, $J$ = 8.4 Hz, H-8'), 4.24 (4H, m, H-2',3'), 3.87 (6H, s, 2 $OCH_3$), 3.70 (3H, s, $OCH_3$). Anal. Calcd. for $C_{20}H_{20}O_6$: C, 67.41; H, 5.66. Found: C, 67.70; H, 5.63.

*(2E)-3-(4,7-Dimethoxy-2H-1,3-benzodioxol-5-yl)-1-(4-methoxyphenyl)prop-2-en-1-one* ***(13m)****.*



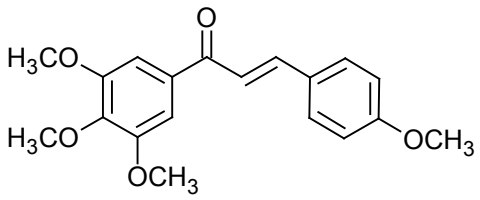
White crystals; 6.22 g (83%); mp 149–151 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 8.14 (2H, d, $J$ = 8.9 Hz, H-2',6'), 7.90 (1H, d, $J$ = 15.6 Hz, H-2), 7.81 (1H, d, $J$ = 15.6 Hz, H-3), 7.30 (1H, s, H-6"), 7.09 (2H, d, $J$ = 8.9 Hz, H-3',5'), 6.11 (2H, s, $OCH_2O$), 3.92 (3H, s, $OCH_3$), 3.90 (3H, s, $OCH_3$), 3.87 (3H, s, $OCH_3$). Anal. Calcd. for $C_{19}H_{18}O_6$: C, 66.66; H, 5.30. Found: C, 66.87; H, 5.14.

*8-Methoxy-6-[(1E)-3-(4-methoxyphenyl)-3-oxoprop-1-en-1-yl]-2H-1,4-benzoxazin-3(4H)-one* ***(13n)****.*



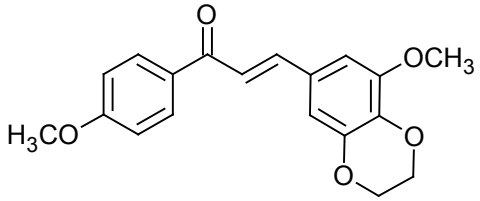
Yellow crystals; 1.88 g (82%); mp 258–261 °C (DMF); $^1$H NMR ($CDCl_3$) $\delta$ 10.82 (1H, br.s, NH), 8.14 (2H, d, $J$ = 8.7 Hz, H-2',6'), 7.77 (1H, d, $J$ = 15.5 Hz, H-2), 7.57 (1H, d, $J$ = 15.5 Hz, H-3), 7.32 (1H, s, H-5"), 7.10 (2H, d, $J$ 8.7 Hz, H-3',5'), 6.90 (1H, s, H-7"), 4.61 (2H, s, H-2"), 3.89 (3H, s, $OCH_3$), 3.87 (3H, s, $OCH_3$). Anal. Calcd. for $C_{19}H_{17}NO_5$: C, 67.25; H, 5.05; N 4.13. Found: C, 66.96; H, 5.11; N 4.35.

*(2E)-3-(4-Methoxyphenyl)-1-(3,4,5-trimethoxyphenyl)-2-propen-1-one* ***(13o)****.*



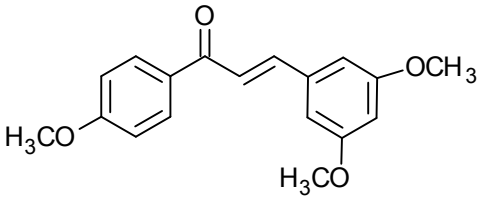
Bright yellow crystals; 5.12 g (78%); mp 99–101 °C (lit.[6] 100–101 °C); $^1$H NMR (DMSO-$d_6$) $\delta$ 7.88 (2H, d, $J$ = 8.8 Hz, H-2",6"), 7.81 (1H, d, $J$ = 15.5 Hz, H-2), 7.72 (1H, d, $J$ = 15.5 Hz, H-3), 7.42 (2H, s, H-2',6'), 7.03 (2H, d, $J$ = 8.8 Hz, H-3",5"), 3.90 (6H, s, $OCH_3$-3',5'), 3.83 (3H, s, $OCH_3$), 3.77 (3H, s, $OCH_3$); EIMS $m/z$ 329 $[M+1]^+$ (19), 328 $[M]^+$ (100), 327 (13), 314 (12), 313 (59), 297 (29), 285 (20), 195 (31), 171 (12), 161 (65), 133 (44), 118 (22), 109 (14), 89 (27), 77 (35). Anal. Calcd. for $C_{19}H_{20}O_5$: C, 69.50; H, 6.14. Found: C, 69.62; H, 6.18.

*(2E)-3-(8-Methoxy-2,3-dihydro-1,4-benzodioxin-6-yl)-1-(4-methoxyphenyl)prop-2-en-1-one (**13p**).*



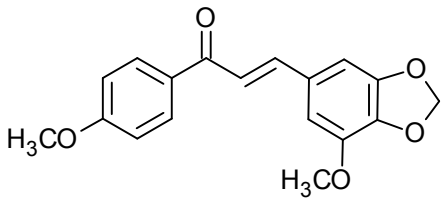
White crystals; 6.89 g (85%); mp 133–135 °C (EtOH); $^1$H NMR ($CDCl_3$) $\delta$ 8.04 (2H, d, $J$ = 8.8 Hz, H-2',6'), 7.68 (1H, d, $J$ = 15.6 Hz, H-2), 7.40 (1H, d, $J$ = 15.6 Hz, H-3), 7.00 (2H, d, $J$ = 8.8 Hz, H-3',5'), 6.90 (1H, d, $J$ = 1.4 Hz, H-5"), 6.79 (1H, d, $J$ = 1.4 Hz, H-7"'), 4.35 (4H, m, H-2",3"), 3.93 (3H, s, $OCH_3$), 3.89 (3H, s, $OCH_3$). Anal. Calcd. for $C_{19}H_{18}O_5$: C, 69.93; H, 5.56. Found: C, 70.30; H, 5.72.

*(2E)-3-(3,5-Dimethoxyphenyl)-1-(4-methoxyphenyl) 2-propen-1-one (**13q**).*



White crystals; 4.82 g (73%); mp 75–77 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 8.18 (2H, d, $J$ = 8.9 Hz, H-2',6'), 7.81 (1H, d, $J$ = 15.6 Hz, H-2), 7.72 (1H, d, $J$ = 15.5 Hz, H-3), 7.09 (2H, d, $J$ = 8.9 Hz, H-3',5'), 7.06 (2H, d, $J$ = 2.3 Hz, H-2",6"), 6.68 (1H, t, $J$ = 2.3 Hz, H-4"), 3.88 (3H, s, 2 $OCH_3$), 3.81 (6H, s, $OCH_3$). Anal. Calcd. for $C_{18}H_{18}O_4$: C, 72.47; H, 6.08. Found: C, 72.13; H, 6.25.

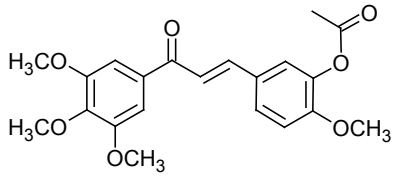
*(2E)-3-(7-Methoxy-2H-1,3-benzodioxol-5-yl)-1-(4-methoxyphenyl)prop-2-en-1-one (**13t**).*



White crystals; 4.82 g (67%); mp 105–107 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 8.17 (2H, d, $J$ = 8.9 Hz, H-2',6'), 7.84 (1H, d, $J$ = 15.5 Hz, H-2), 7.64 (1H, d, $J$ = 15.5 Hz, H-3), 7.30 (1H, d, $J$ = 1.4 Hz, H-4"), 7.20 (1H, d, $J$ = 1.4 Hz, H-6"), 7.08 (2H, d, $J$ = 8.9 Hz, H-3',5'), 6.07 (2H, s, $OCH_2O$), 3.90 (3H, s, $OCH_3$), 3.87 (3H, s, $OCH_3$). Anal. Calcd. for $C_{18}H_{16}O_5$: C, 69.22; H, 5.16. Found: C, 68.94; H, 5.22.

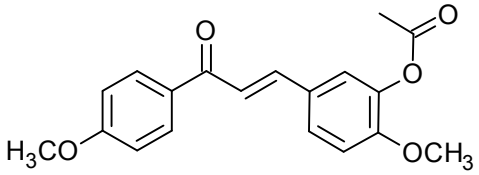
**Analytical Data for Chalcone Acetates (13-Ac).**

*2-Methoxy-5-[(1E)-3-oxo-3-(3,4,5-trimethoxyphenyl)-1-propenyl]phenyl acetate (**13a-Ac**).*



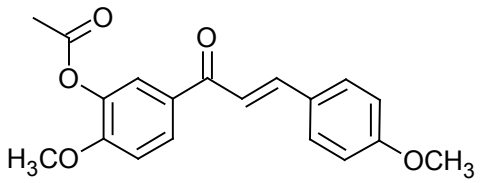
Yellow crystals; 2.1 g (72%); mp 114–116 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 7.84 (1H, d, $J$ = 15.5 Hz, H-2), 7.82 (1H, d, $J$ = 2.2 Hz, H-6'), 7.74 (1H, dd, $J$ = 8.6 Hz, $J$ 2.2 Hz, H-4'), 7.71 (1H, d, $J$ = 15.5 Hz, H-1), 7.43 (2H, s, H-2",6"), 7.21 (1H, d, $J$ = 8.6 Hz, H-3'), 3.91 (6H, s, $OCH_3$-3",5"), 3.85 (3H, s, $OCH_3$), 3.77 (3H, s, $OCH_3$), 2.30 (3H, s, $CH_3C(O)$); EIMS $m/z$ 386 $[M]^+$ (15), 344 (28), 329 (21), 313 (9), 301 (7), 195 (18), 177 (15), 156 (13), 89 (12), 77 (16), 43 (100). Anal. Calcd. for $C_{21}H_{22}O_7$: C, 65.28; H, 5.74. Found: C, 65.37; H, 5.78.

*2-Methoxy-5-[(1E)-3-(4-methoxyphenyl)-3-oxo-1-propenyl]phenyl acetate (**13b-Ac**).*



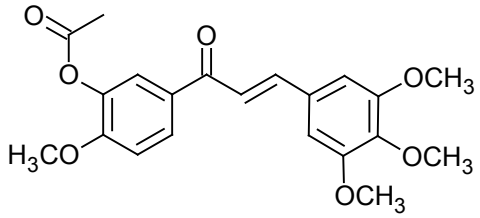
Yellow crystals; 0.46 g (81%); mp 136–138 °C (EtOAc/petroleum ether, 1:1); $^1$H NMR (DMSO-$d_6$) $\delta$ 8.17 (2H, d, $J$ = 8.9 Hz, H-2",6"), 7.85 (1H, d, $J$ = 15.5 Hz, H-2), 7.79 (1H, d, $J$ = 2.1 Hz, H-6'), 7.72 (1H, dd, $J$ = 8.6 Hz, $J$ = 2.1 Hz, H-4'), 7.66 (1H, d, $J$ = 15.5 Hz, H-1), 7.20 (1H, d, $J$ = 8.6 Hz, H-3'), 7.08 (2H, d, $J$ = 8.9 Hz, H-3",5"), 3.87 (3H, s, $OCH_3$), 3.84 (3H, s, $OCH_3$), 2.30 (3H, s, $CH_3C(O)$); EIMS $m/z$ 326 $[M]^+$ (6), 284 (14), 269 (9), 135 (22), 92 (13), 77 (25), 43 (100). Anal. Calcd. for $C_{19}H_{18}O_5$: C, 69.93; H, 5.56. Found: C, 69.99; H, 5.59.

*2-Methoxy-5-[(2E)-3-(4-methoxyphenyl)-2-propenoyl]phenyl acetate (**13c-Ac**).*



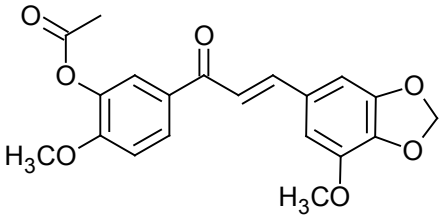
Yellow crystals; 2.9 g (89%); mp 126–128 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 8.13 (1H, dd, $J$= 8.7 Hz, $J$ 2.0 Hz, H-4'), 7.93 (1H, d, $J$ = 2.0 Hz, H-6'), 7.86 (2H, d, $J$ = 8.7 Hz, H-2",6"), 7.81 (1H, d, $J$ = 15.5 Hz, H-2), 7.71 (1H, d, $J$ = 15.5 Hz, H-3), 7.30 (1H, d, $J$ = 8.7 Hz, H-3'), 7.02 (2H, d, $J$ = 8.7 Hz, H-3",5"), 3.89 (3H, s, $OCH_3$), 3.83 (3H, s, $OCH_3$), 2.31 (3H, s, $CH_3C(O)$; EIMS *m/z 327* $[M+1]^+$ (16), 326 $[M]^+$ (78), 285 (20), 284 (100), 283 (30), 269 (43), 253 (16), 161 (41), 151 (21), 133 (14), 89 (7), 77 (8). Anal. Calcd. for $C_{19}H_{18}O_5$: C, 69.93; H, 5.56. Found: C, 69.99; H, 5.59.

*2-Methoxy-5-[(2E)-3-(3,4,5-trimethoxyphenyl) )-2-propenoyl]phenyl acetate (**13d-Ac**).*



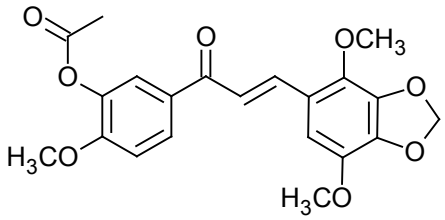
Yellow crystals; 7.7 g (86%); mp 135–137 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 8.16 (1H, dd, $J$ = 8.6 Hz, $J$ = 1.9 Hz, H-4'), 7.93 (1H, d, $J$ = 1.9 Hz, H-6'), 7.88 (1H, d, $J$ = 15.5 Hz, H-2), 7.69 (1H, d, $J$ = 15.5 Hz, H-3), 7.30 (1H, d, $J$ = 8.7 Hz, H-3'), 7.24 (2H, s, H-2",6"), 3.90 (3H, s, $OCH_3$), 3.87 (6H, s, 2 $OCH_3$), 3.71 (3H, s, $OCH_3$), 2.30 (3H, s, $CH_3C(O)$. Anal. Calcd. for $C_{21}H_{22}O_7$: C, 65.28; H, 5.74. Found: C, 65.00; H, 5.79.

*2-Methoxy-5-[(2E)-3-(7-methoxy-2H-1,3-benzodioxol-5-yl) 2-propenoyl]phenyl acetate (**13e-Ac**).*



Yellow crystals; 7.6 g (87 %); mp 176–178 °C (EtOH); $^1$H NMR (DMSO-$d_6$) $\delta$ 8.14 (1H, dd, $J$ = 8.7 Hz, $J$ = 2.2 Hz, H-4'), 7.93 (1H, d, $J$ = 2.2 Hz, H-6'), 7.83 (1H, d, $J$ = 15.4 Hz, H-2), 7.67 (1H, d, $J$ = 15.4 Hz, H-3), 7.33 (1H, d, $J$ = 2.4 Hz, H-4"), 7.29 (1H, d, $J$ = 8.7 Hz, H-3'), 7.20 (1H, d, $J$ = 2.4 Hz, H-6"), 6.09 (2H, s, $OCH_2O$), 3.90 (6H, s, $2OCH_3$), 2.31 (3H, s, $CH_3C(O)$. Anal. Calcd. for $C_{20}H_{18}O_7$: C, 64.86; H, 4.90. Found: C, 64.65; H, 5.09.

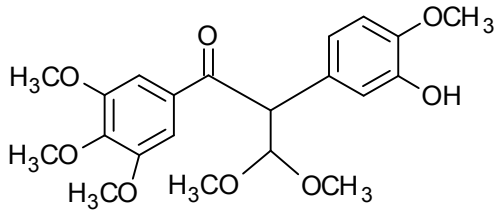
*5-[(2E)-3-(4,7-Dimethoxy-2H-1,3-benzodioxol-5-yl) 2-propenoyl]phenyl acetate (**13h-Ac**).*



Yellow crystals; 2.97 g (88 %); mp 186–187 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 8.14 (1H, dd, $J$ = 8.7 Hz, $J$ = 2.2 Hz, H-4'), 7.93 (1H, d, $J$ = 15.6 Hz, H-2), 7.89 (1H, d, $J$ = 2.2 Hz, H-6'), 7.80 (1H, d, $J$ = 15.6 Hz,-H-3), 7.33 (1H, s, H-5"), 7.29 (1H, d, $J$ = 8.7 Hz, H-3'), 6.11 (2H, s, $OCH_2O$), 3.92 (3H, s, $OCH_3$), 3.90 (3H, s, $OCH_3$), 3.89 (3H, s, $OCH_3$), 2.30 (3H, s, $CH_3C(O)$. EIMS $m/z$ 400 $[M]^+$ (18), 370 (21), 369 (100), 328 (20), 327 (96), 151 (26), 43 (54). Anal. Calcd. for $C_{21}H_{20}O_8$: C, 63.00; H, 5.03. Found: C, 63. 23; H, 4.86.

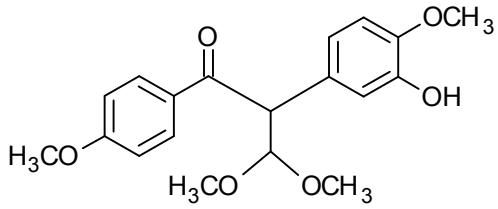
**Analytical Data for Dimethylketoacetals (14).**

*1-(3,4,5-Trimethoxyphenyl)-3,3-dimethoxy-2-(3-hydroxy-4-methoxyphenyl)-1-propanone (**14a**).*



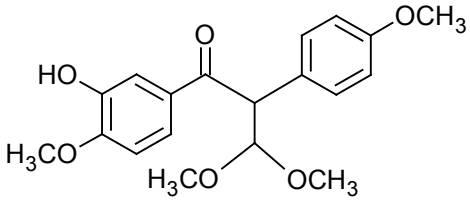
Used *in situ* without purification.

*1-(4-Methoxyphenyl)-3,3-dimethoxy-2-(3-hydroxy-4-methoxyphenyl)-1-propanone (**14b**).*



Used *in situ* without purification.

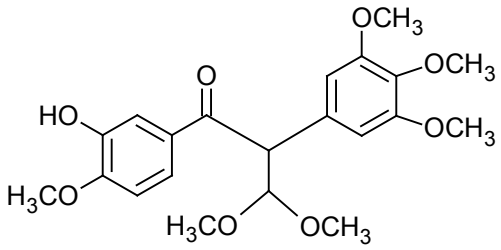
*1-(3-Hydroxy-4-methoxyphenyl)-3,3-dimethoxy-2-(4-methoxyphenyl)-1-propanone (**14c**).*



White solid; 5.82 g (84%); mp 104–107 °C ( EtOAc/petroleum ether); $^1$H NMR ($CDCl_3$) $\delta$ 7.56 (1H, dd, $J$ = 8.2 Hz, $J$ = 2.1 Hz, H-6'), 7.55 (1H, d, $J$ = 2.1 Hz, H-2'), 7.32 (2H, d, $J$ = 8.7 Hz, H-

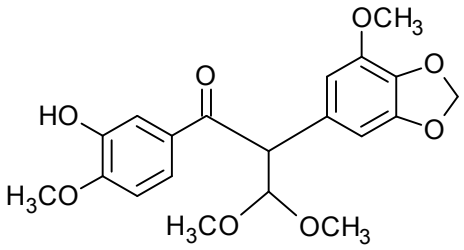
2",6"), 6.84 (1H, d, *J* = 8.2 Hz, H-5'), 6.83 (2H, d, *J* = 8.7 Hz, H-3",5"), 5.61 (1H, s, OH), 5.07 (1H, d, *J* = 8.5 Hz, H-2), 4.77 (1H, d, *J* = 8.5 Hz, H-3), 3.91 (3H, s, $OCH_3$), 3.75 (3H, s, $OCH_3$), 3.43 (3H, s, $OCH_3$), 3.21 (3H, s, $OCH_3$); EIMS *m*/*z* 347 $[M+1]^+$, 346 $[M]^+$. Anal. Calcd. for $C_{19}H_{22}O_6$: C, 65.88; H, 6.40. Found: C, 66.02; H, 6.46.

*1-(3-Hydroxy-4-methoxyphenyl)-3,3-dimethoxy-2-(3,4,5-trimethoxyphenyl)-propanone* ***(14d)***.



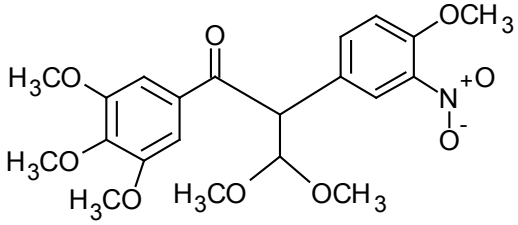

Used *in situ* without purification.

*1-(3-Hydroxy-4-methoxyphenyl)-3,3-dimethoxy-2-(7-methoxy-2H-1,3-benzodioxol-5-yl)-propanone* ***(14e)***.



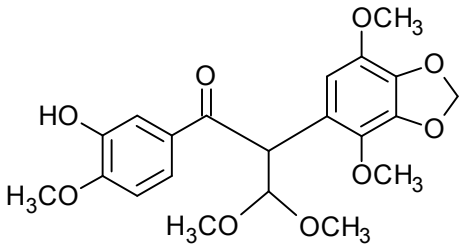

Used *in situ* without purification.

*3,3-Dimethoxy-2-(4-methoxy-3-nitrophenyl)-1-(3,4,5-trimethoxyphenyl)propan-1-one* ***(14f)***.



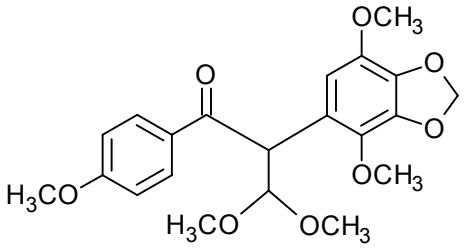

Colorless crystals; 0.53 g (56%); (EtOAc, $R_f$ = 0.36); $^1$H NMR ($CDCl_3$) $\delta$ 7.92 (1H, s, H-2"), 7.60 (1H, d, *J* = 8.7, H-6"), 7.22 (2H, s, H-2',6'), 7.05 (1H, d, *J* = 8.7 Hz, H-5"), 5.04 (1H, d, *J* = 8.1, H-2), 4.83 (1H, d, *J* = 8.1 Hz, H-3), 3.93 (6H, s, $OCH_3$), 3.29 (3H, s, $OCH_3$), 3.45 (3H, s $OCH_3$), 3.88 (9H, s, $OCH_3$); EIMS *m*/*z* $[M^+]$ 435. Anal. Calcd. for $C_{21}H_{25}NO_9$: C, 57.93; H, 5.79; N, 3.22. Found: C, 57.87; H, 5.81; N, 3.32

*1-(3-Hydroxy-4-methoxyphenyl)-3,3-dimethoxy-2-(4,7-dimethoxy-2H-1,3-benzodioxol-5-yl)-propanone* ***(14h)***.



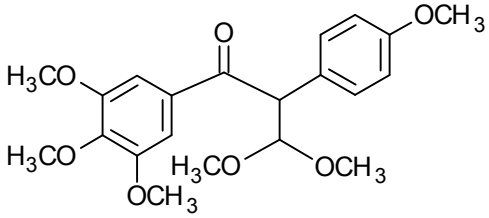
Used *in situ* without purification.

*3,3-Dimethoxy-2-(4,7-dimethoxy-2H-1,3-benzodioxol-5-yl)-1-(4-methoxyphenyl) -1-propanone (**14m**).*



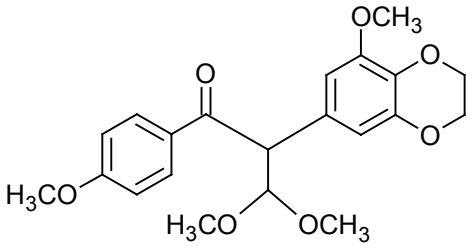
Colorless crystals; 2.21 g (26%); mp 112–114 °C; $^1$H NMR ($CDCl_3$) $\delta$ 8.03 (2H, d, $J$ = 8.9 Hz, H-2',6'), 6.89 (2H, d, $J$ = 8.9 Hz, H-3',5'), 6.53 (1H, s, H-6"), 5.97 (1H, d, $J$ = 1.5 Hz, $OCH_2O$), 5.91 (1H, d, $J$ = 1.5 Hz, $OCH_2O$), 5.33 (1H, d, $J$ = 8.5 Hz, H-2), 5.06 (1H, d, $J$ = 8.5 Hz, H-3), 4.00 (3H, s, $OCH_3$), 3.83 (3H, s, $OCH_3$), 3.81 (3H, s, $OCH_3$), 3.45 (3H, s, $OCH_3$), 3.27 (3H, s, $OCH_3$); EIMS $m/z$ 404 (4) $[M]^+$, 344 (13), 135 (27), 75 (100). Anal. Calcd. for $C_{21}H_{24}O_8$: C, 62.37; H, 5.98. Found: C, 62.65; H, 5.86.

*3,3-Dimethoxy-2-(4-methoxyphenyl)-1-(3,4,5-trimethoxyphenyl)-1-propanone (**14o**).*



Colorless crystals; 6.32 g (81%); mp 104–106 °C; $^1$H NMR ($CDCl_3$) $\delta$ 7.32 (2H, d, $J$ = 8.3 Hz, H-2",6"), 7.26 (6H, s, H-2',6'), 6.85 (2H, d, $J$ = 8.3 Hz, H-3",5"), 5.05 (1H, d, $J$ = 8.2 Hz, H-2), 4.73 (1H, d, $J$ = 8.2 Hz, H-3), 3.87 (9H, s, $OCH_3$-3',4',5'), 3.76 (3H, s, $OCH_3$-4"), 3.46 (3H, s, $OCH_3$), 3.23 (3H, s, $OCH_3$); EIMS $m/z$ 391 $[M+1]^+$, 390 $[M]^+$. Anal. Calcd. for $C_{21}H_{26}O_7$: C, 64.60; H, 6.71. Found: C, 64.57; H, 6.66.

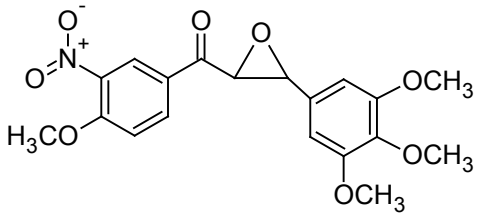
*3,3-Dimethoxy-2-(8-methoxy-2,3-dihydro-1,4-benzodioxin-6-yl)-1-(4-methoxyphenyl -1-propanone (**14p**).*



Colorless crystals; 2.35g (21%); mp 88–90 °C; $^1$H NMR ($CDCl_3$) $\delta$ 7.96 (2H, d, $J$ = 8.5 Hz, H-2',6'), 6.90 (2H, d, $J$ = 8.5 Hz, H-3',5'), 6.60 (1H, s, H-5''), 6.56 (1H, s, H-7''), 5.06 (1H, d, $J$ = 8.1 Hz, H-2), 4.70 (1H, d, $J$ = 8.1 Hz, H-3), 4.35 (4H, m, H-2'',3''), 3.87 (3H, s, $OCH_3$'), 3.83 (3H, s, $OCH_3$), 3.43 (3H, s, $OCH_3$), 3.27 (3H, s, $OCH_3$); EIMS $m/z$ 389 $[M+1]^+$, 388 $[M]^+$. Anal. Calcd. for $C_{21}H_{24}O_7$: C, 64.94; H, 6.23. Found: C, 65.30; H, 6.02.

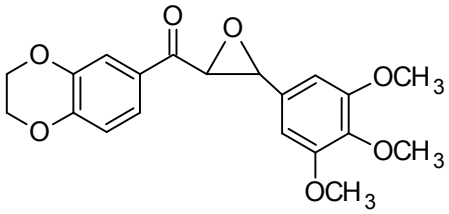
**Synthesis and Analytical Data for Epoxychalcones (15).**

*(4-Methoxy-3-nitrophenyl)[3-(3,4,5-trimethoxyphenyl)oxiran-2-yl]methanone (**15g**).*



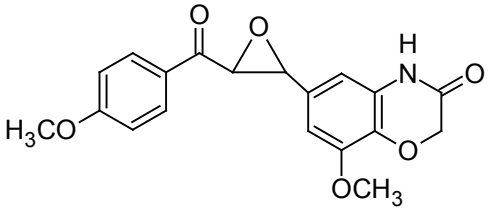
Hydrogen peroxide (32%, 48 mmol, d = 1.122 g/mL) was added to a solution of 1-(4-methoxy-3-nitrophenyl)-3-(3,4,5-trimethoxyphenyl)prop-2-en-1-one (5.60 g, 15 mmol) in MeOH (150 mL), followed with NaOH (2 mL, 4N). The same amount of 32% $H_2O_2$ was added twice after 8 h and after 40 h. Then the mixture was stirred for 1 h, a crystalline precipitate was filtered off, washed with small amount of water and dried. The resulting product containing 20% of the starting chalcone was refluxed in $CH_2Cl_2$ (100 mL) for 4 h and stirred overnight at room temperature. The precipitate was filtered and dried again to produce light-yellow crystals of the product. Light-yellow crystals; 4.15 g (71%; 86% relative to the reacted chalcone), mp 207–209 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 8.58 (1H, d, $J$ = 2.0 Hz, H-2'), 8.33 (1H, dd, $J$ = 8.3 Hz, $J$ = 2.0 Hz, H-6'), 7.54 (1H, d, $J$ = 8.3 Hz, H-5'), 6.78 (2H, s, H-2'',6''), 4.72 (1H, s, H-2), 4.10 (1H, s, H-3), 4.04 (3H, s, $OCH_3$), 3.80 (6H, s, 2 $OCH_3$), 3.69 (3H, s, $OCH_3$). Anal. Calcd. for $C_{19}H_{19}NO_8$: C, 58.61; H, 4.92; N 3.60. Found: C, 58.88; H, 5.05; N 3.41.

*(2,3-Dihydro-1,4-benzodioxin-6-yl)[3-(3,4,5-trimethoxyphenyl)oxiran-2-yl]methanone (**15l**).*



White crystals, 1.80 g (70%); mp 114–116 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 7.59 (1H, dd, $J$ = 8.4 Hz, $J$ = 2.1 Hz, H-7'), 7.55 (1H, d, $J$ = 2.1 Hz, H-5'), 7.03 (1H, d, $J$ = 8.4 Hz, H-8'), 6.75 (2H, s, H-2",6"), 4.78 (1H, s, H-2), 4.32 (4H, m, H-2',3'), 4.01 (1H, s, H-3), 3.79 (6H, s, 2 $OCH_3$), 3.67 (3H, s, $OCH_3$). Anal. Calcd. for $C_{20}H_{20}O_7$: C, 64.51; H, 5.41. Found: C, 64.72; H, 5.33.

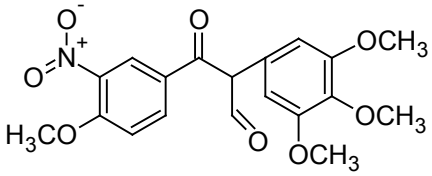
*8-Methoxy-6-[3-(4-methoxybenzoyl)oxiran-2-yl]-2H-1,4-benzoxazin-3(4H)-one (**15n**).*



Light-yellow crystals; 1.73 g (65%); mp 233–240 °C; $^1$H NMR (DMSO-$d_6$) $\delta$ 10.74 (1H, br.s, NH), 8.01 (2H, d, $J$ = 8.9 Hz, H-2',6'), 7.09 (2H, d, $J$ = 8.9 Hz, H-3',5'), 6.77 (1H, d, $J$ = 1.9 Hz, H-5"), 6.58 (1H, d, $J$ = 1.9 Hz, H-7"), 4.66 (1H, d, $J$ = 1.9 Hz, H-2), 4.55 (2H, s, H-2"), 4.02 (1H, d, $J$ = 1.9 Hz, H-3), 3.85 (3H, s, $OCH_3$), 3.79 (3H, s, $OCH_3$). Anal. Calcd. for $C_{19}H_{17}NO_6$: C, 64.22; H, 4.82; N 3.94. Found: C, 63.97; H, 5.01; N 4.16. Target epoxide with 75% purity was used in the next step.

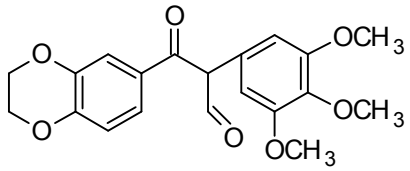
**Analytical Data for Ketoaldehydes (16).**

*3-(4-Methoxy-3-nitrophenyl)-3-oxo-2-(3,4,5-trimethoxyphenyl)propanal **(16g)**.*



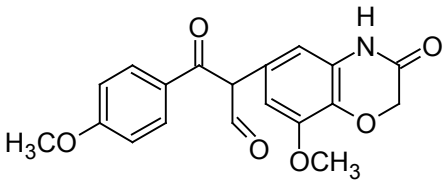
Bright-yellow crystals; 1.47 g (38%); mp 135–136 °C; $^1$H NMR ($CDCl_3$) $\delta$ 15.77 (1H, d, $J$ = 5.7 Hz, OH), 8.59 (1H, d, $J$ = 5.7 Hz, H-1), 8.04 (1H, d, $J$ = 2.3 Hz, H-2'), 7.56 (1H, dd, $J$ = 8.9 Hz, $J$ = 2.3 Hz, H-6'), 6.92 (1H, d, $J$ = 8.9 Hz, H-5'), 6.36 (2H, s, H-2",6"), 3.96 (3H, s, $OCH_3$), 3.88 (3H, s, $OCH_3$), 3.76 (6H, s, 2 $OCH_3$); $^{13}$C NMR ($CDCl_3$): $\delta$ 183.7, 181.6, 154.9, 153.8, 139.0, 138.0, 135.1, 130.5, 127.5, 127.2, 115.9, 112.6, 107.6, 61.1, 56.8, 56.3 (pure enol form). Anal. Calcd. for $C_{19}H_{19}NO_8$: C, 58.61; H, 4.92; N 3.60. Found: C, 58.79; H, 4.80; N 3.76.

*3-(2,3-dDihydro-1,4-benzodioxin-6-yl)-3-oxo-2-(3,4,5-trimethoxyphenyl)propanal **(16l)**.*



$BF_3{\cdot}Et_2O$ (0.38 mL, 2.96 mmol) was added dropwise *via* a syringe to a suspension of corresponding epoxide (1.0 g, 2.69 mmol) in $CH_2Cl_2$ (15 mL) at 0 °C under Ar. The mixture was stirred for 3 h at 20 °C followed by the addition of 5% $NaHCO_3$, then extracted with $CHCl_3$ (2 × 15 mL). The combined extracts were washed with water (2 × 15 mL) and evaporated. The product was isolated by column chromatography (EtOAc/petroleum ether, 1:4, $R_f$ = 0.6) to propanal as the enol form with small amount of the aldehyde. White solid, 0.36 g (35%). Major isomer (enol): $^1$H NMR ($CDCl_3$) $\delta$ 15.98 (1H, d, $J$ = 5.6 Hz, OH), 8.54 (1H, d, $J$ = 5.6 Hz, H-1), 7.08 (1H, dd, $J$ = 8.4 Hz, $J$ = 2.1 Hz, H-7'), 6.90 (1H, d, $J$ = 2.1 Hz, H-5'), 6.69 (1H, d, $J$ = 8.4 Hz, H-8'), 6.33 (2H, s, H-2",6"), 4.23 (4H, m, H-2',3'), 3.86 (3H, s, 2 $OCH_3$), 3.75 (6H, s, $OCH_3$). Anal. Calcd. for $C_{20}H_{20}O_7$: C, 64.51; H, 5.41. Found: C, 64.34; H, 5.29. Minor isomer (aldehyde): 9.92 (s, CHO).

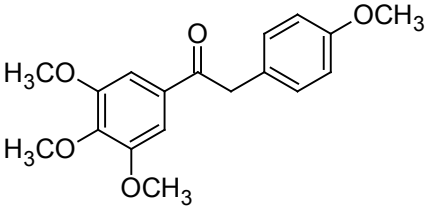
*2-(8-Methoxy-3-oxo-3,4-dihydro-2H-1,4-benzoxazin-6-yl)-3-(4-methoxyphenyl)-3-oxopropanal (**16n**).*



1.5 g (35%). The product was used in the next stage without additional purification.

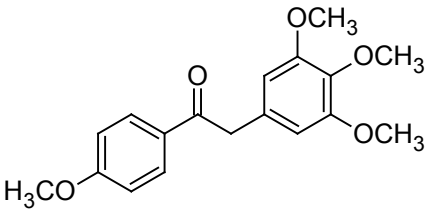
**Analytical Data for 1,2-Diarylethanones (22).**

*2-(4-Methoxyphenyl)-1-(3,4,5-trimethoxyphenyl)ethanone (**22o**).*



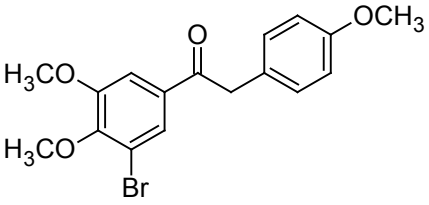
Colorless crystals; 1.35g (75 %); mp 79–80 °C (lit.[7] 81–82 °C); $^1$H NMR ($CDCl_3$) $\delta$ 7.26 (2H, s, H-2',6'), 7.19 (2H, d, $J$ = 8.5 Hz, H-2",6"), 6.87 (2H, d, $J$ = 8.5 Hz, H-3",5"), 4.19 (2H, s, $CH_2$), 3.90 (3H, s, $OCH_3$), 3.89 (6H, s, 2 $OCH_3$), 3.79 (3H, s, $OCH_3$); EIMS $m/z$ 316 [$M^+$] (100), 317 (19), 318 (3). Anal. Calcd. for $C_{18}H_{20}O_5$: C, 68.34; H, 6.37. Found: C, 68.39; H, 6.41.

*1-(4-Methoxyphenyl)-2-(3,4,5-trimethoxyphenyl)ethanone (**22p**).*



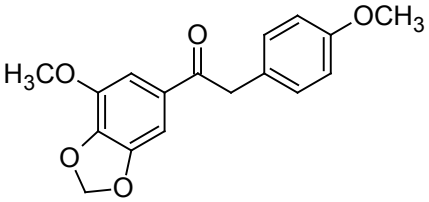
Yellowish solid; 1.43 g (73%); mp 80–82 °C (lit.[8] 80–85 °C); $^1$H NMR ($CDCl_3$) $\delta$ 8.00 (2H, d, *J*=8.5 Hz, H-2',6') 6.94 (2H, d, *J* = 8.5 Hz, H-3',5'), 6.48 (2H, s, H-2",6"), 4.17 (2H, s, $CH_2$), 3.87 (3H, s, $OCH_3$), 3.83 (6H, s, 2 $OCH_3$), 3.82 (3H, s, $OCH_3$); EIMS *m*/*z* 316 [$M^+$] (100), 317 (20), 318 (3). Anal. Calcd. for $C_{18}H_{20}O_5$: C, 68.34; H, 6.37. Found: C, 68.38; H, 6.42.

*1-(3-Bromo-4,5-dimethoxyphenyl)-2-(4-methoxyphenyl)ethanone (**22q**).*



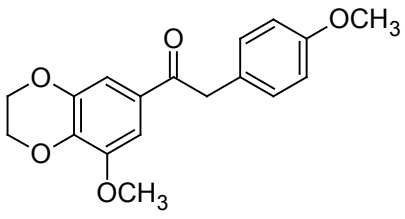
Yellowish solid; 1.52 g (75%); mp 72–73 °C; $^1$H NMR ($CDCl_3$) $\delta$ 7.81 (1H, d, *J* = 1.8 Hz, H-2'), 7.50 (1H, d, *J* = 1.8 Hz, H-6'), 7.17 (2H, d, *J* = 8.5 Hz, H-2",6"), 6.87 (2H, d, *J* = 8.5 Hz, H-3",5"), 4.16 (2H, s, $CH_2$), 3.91 (3H, s, $OCH_3$), 3.89 (3H, s, $OCH_3$), 3.79 (3H, s, $OCH_3$); EIMS *m*/*z* 364 [$M^+$] (100), 366 [M+1]$^+$ (97), 365 (18), 367 (18), 366 (1.6), 368 (1.5). Anal. Calcd. for $C_{17}H_{17}BrO_4$: C, 55.91; H, 4.69; Br, 21.88; O, 17.52. Found: C, 55.97; H, 4.60.

*1-(7-Methoxybenzo[d][1,3]dioxol-5-yl)-2-(4-methoxyphenyl)ethanone (**22r**).*



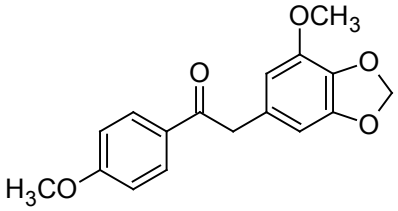
Yellowish crystals; 1.48 g (89%); mp 105–106 °C; $^1$H NMR ($CDCl_3$) $\delta$ 7.30 (1H, s, H-4'), 7.18 (1H, s, H-6'), 7.17 (2H, d, *J* = 8.5 Hz, H-2",6"), 6.86 (2H, d, *J* = 8.5 Hz, H-3",5"), 6.04 (2H, s, $OCH_2O$), 4.13 (2H, s, $CH_2$), 3.92 (3H, s, $OCH_3$), 3.78 (3H, s, $OCH_3$); EIMS *m*/*z* 300 [$M^+$] (100), 301 (18), 302 (3). Anal. Calcd. for $C_{17}H_{16}O_5$: C, 67.99; H, 5.37. Found: C, 67.91; H, 5.35..

*1-(8-Methoxy-2,3-dihydrobenzo[b][1,4]dioxin-6-yl)-2-(4-methoxyphenyl)ethanone (**22s**).*



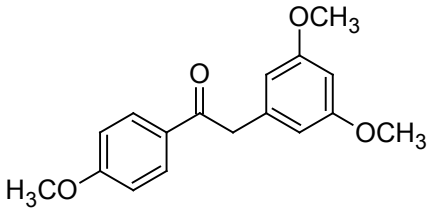
Yellowish solid; 1.44 g (62%); mp 109–110 °C; $^1$H NMR ($CDCl_3$) $\delta$ 7.24 (1H, s, H-5'), 7.20 (1H, s, H-7'), 7.18 (2H, d, $J$ = 8.5 Hz, H-2",6"), 6.86 (2H, d, $J$ = 7.93 Hz, H-3",5"), 4.36 (2H, m, H-2'), 4.28 (2H, m, H-3'), 4.13 (2H, s, $CH_2$), 3.90 (3H, s, $OCH_3$), 3.78 (3H, s, $OCH_3$); EIMS $m/z$ 314 [$M^+$] (100), 315 [M+1]$^+$ (20). Anal. Calcd. for $C_{18}H_{18}O_5$: C, 68.78; H, 5.77; O, 25.45; Found: C, 68.83; H, 5.81.

*2-(7-Methoxybenzo[d][1,3]dioxol-5-yl)-1-(4-methoxyphenyl)ethanone (**22t**).*




Colorless solid; 1.72 g (86%); mp 102–104 °C; $^1$H NMR ($CDCl_3$) $\delta$ 7.98 (2H, d, $J$=8.5 Hz, H-2',6'); 6.93 (2H, d, $J$ = 8.5 Hz, H-3',5'), 6.45 (1H, s, H-4"), 6.43 (1H, s, H-6"), 5.93 (2H, s, $OCH_2O$), 4.12 (2H, s, $CH_2$), 3.87 (3H, s, $OCH_3$), 3.86 (3H, s, $OCH_3$); EIMS $m/z$ 300 [$M^+$] (100), 301 (18), 302 (2.6). Anal. Calcd. for $C_{17}H_{16}O_5$: C, 67.99; H, 5.37. Found: C, 68.05; H, 5.43.

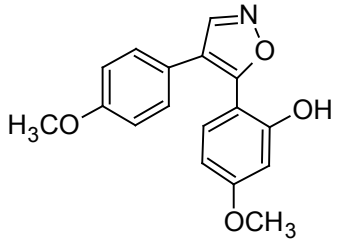
*2-(3,5-Dimethoxyphenyl)-1-(4-methoxyphenyl)ethanone (**22u**).*




Yellowish solid; 1.59 g (71%); mp 71–72 °C; $^1$H NMR ($CDCl_3$) $\delta$ 7.99 (2H, d, $J$ = 8.9 Hz, H-2',6'), 6.92 (2H, d, $J$ = 8.9 Hz, H-3',5'), 6.42 (2H, d, $J$ = 2.3 Hz, H-2",6"), 6.34 (1H, t, $J$ = 2.3 Hz, H-4"), 4.15 (2H, s, H-2), 3.85 (3H, s, $OCH_3$), 3.76 (6H, s, 2 $OCH_3$); EIMS $m/z$ 286 [$M^+$]. Anal. Calcd. for $C_{17}H_{18}O_4$: C, 71.31; H, 6.34. Found: C, 70.99; H, 6.56.

**Analytical Data for Purchased Isoxazoles (3r and 3s).**

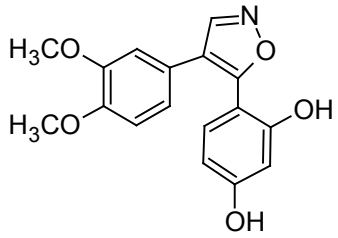
*5-(2-Hydroxy-4-methoxyphenyl)-4-(4-methoxyphenyl)isoxazole (**3r**).*




Purchased from Chemical Block Ltd. White crystals; mp 131 °C (lit.[9] mp 130 °C); $^1$H NMR (DMSO-$d_6$) $\delta$ 10.03 (1H, s, OH), 8.93 (1H, s, H-3), 7.29 (2H, d, $J$ = 8.8 Hz, H-2',6'), 7.19 (1H, d,

*J* = 9.2 Hz, H-6''), 6.90 (2H, d, *J* = 8.8 Hz, H-3',5'), 6.52 (2H, m, H-3'',5'''), 3.76 (3H, s, $OCH_3$), 3.73 (3H, s, $OCH_3$); $^{13}$C NMR (DMSO-$d_6$) $\delta$ 162.0 (C-5), 161.9 (C-4'), 158.5 (C-4''), 157.0 (C-2''), 150.6 (C-3), 131.6 (C-6''), 128.0 (2C, C-2', 6'), 122.4 (C-1'), 116.3 (C-4), 114.1 (2C, C-3', 5'), 107.7 (C-1''), 105.5 (C-5''),-101.6 (C-3''), 55.2 ($OCH_3$), 55.1 ($OCH_3$); EIMS *m*/*z* 297 $[M]^+$ (33), 298 (6), 255 (9), 254 (11), 152 (11), 151 (100). Anal. Calcd for $C_{17}H_{15}NO_4$: C 68.68; H 5.09; N 4.71. Found: C 68.79; H 5.11; N 4.61.

*5-(2,4-Dihydroxyphenyl)-4-(3,4-dimethoxyphenyl)isoxazole (**3s**).*




Purchased from Chemical Block Ltd. White crystals; mp 204–205 °C (lit.[9] mp 205–207 °C); $^1$H NMR (DMSO-$d_6$) $\delta$ 9.83 (1H, s, OH), 9.79 (1H, s, OH), 8.96 (1H, s, H-3), 7.08 (1H, d, *J* = 8.4 Hz, H-6''), 6.96-6.90 (3H, m, H-2',5',6'), 6.43 (1H, d, *J* = 2.3 Hz, H-3''), 6.34 (1H, dd, *J* = 8.4 Hz, *J* = 2.3 Hz, H-5''), 3.73 (3H, s, $OCH_3$), 3.60 (3H, s, $OCH_3$); $^{13}$C NMR (DMSO-$d_6$) $\delta$ 162.5 (C-5), 160.5 (C-4''), 157.0 (C-2''), 150.5 (C-3), 148.6 (C-4'), 148.0 (C-3'), 131.7 (C-6''), 122.7 (C-1'), 119.1 (C-6'), 116.2 (C-4), 111.9 (C-5'), 110.6 (C-2'), 107.2 (C-5''), 106.1 (C-1''), 102.8 (C-3''), 55.5 ($OCH_3$), 55.2 ($OCH_3$); EIMS *m*/*z* 313$[M]^+$ (21), 177 (59), 162 (43), 137 (100). Anal. Calcd for $C_{17}H_{15}NO_5$: C 65.17; H 4.83; N 4.47. Found: C 65.34; H 4.90; N 4.27.

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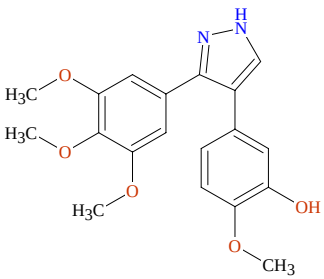
*The Best Applied NMR!*

# 1a (NMR/24267672)

Found protons = 20 impurity* = 3.0 %

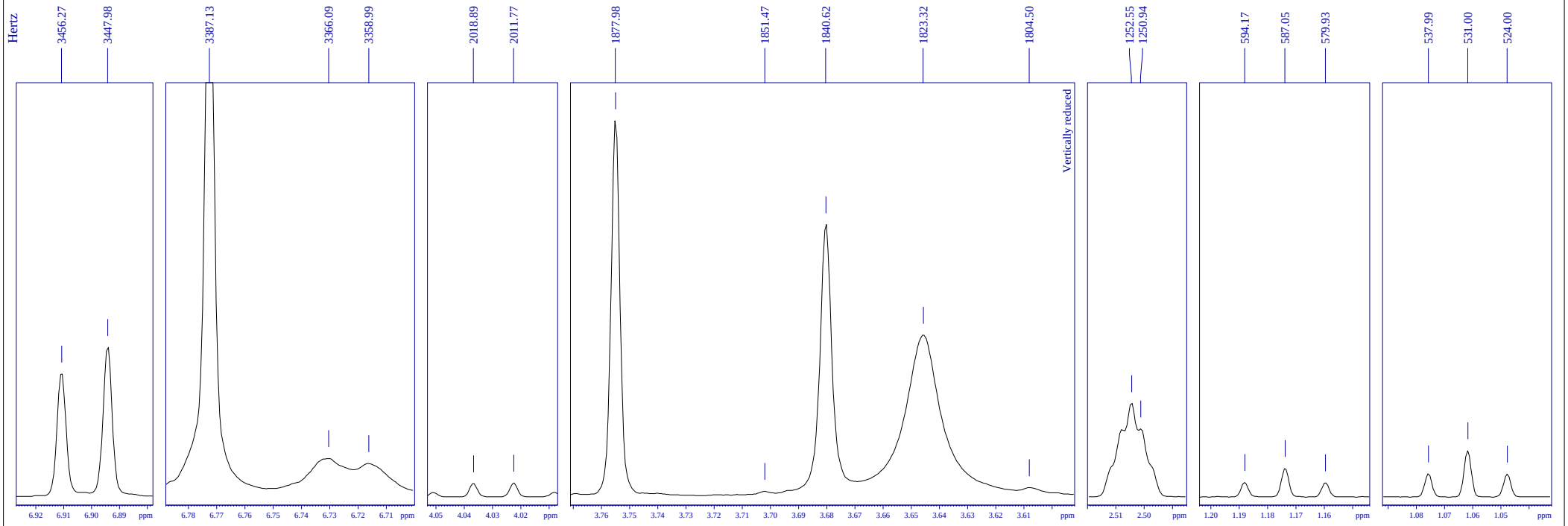


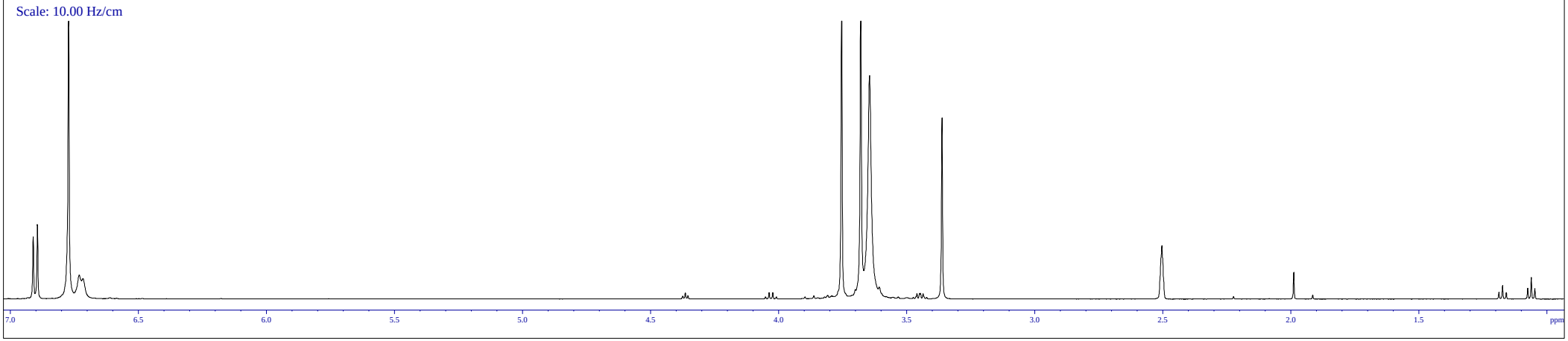


*The Best Applied NMR!*

# 1a (NMR/24267672)





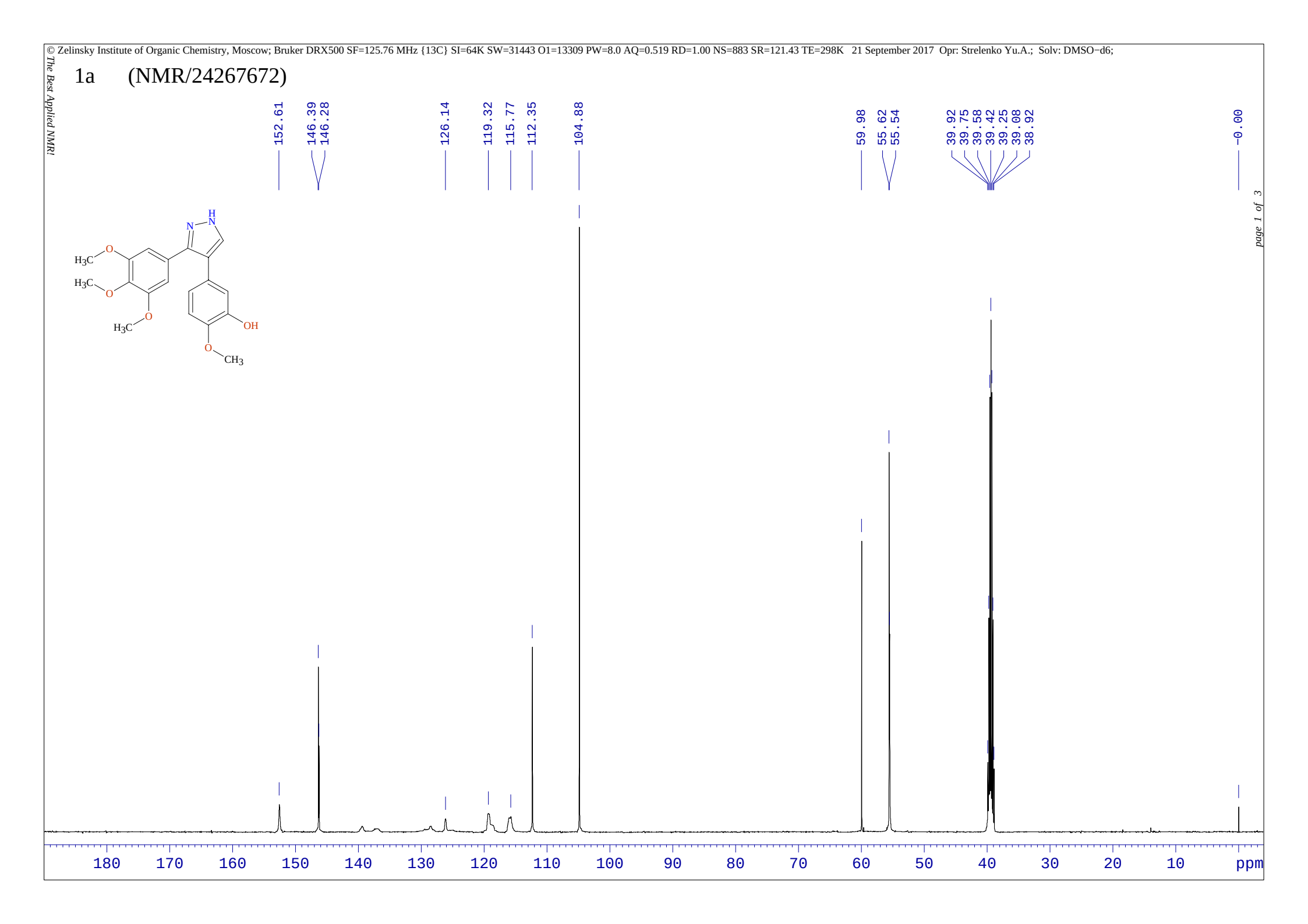
# 1a (NMR/24267672)



Peaks List

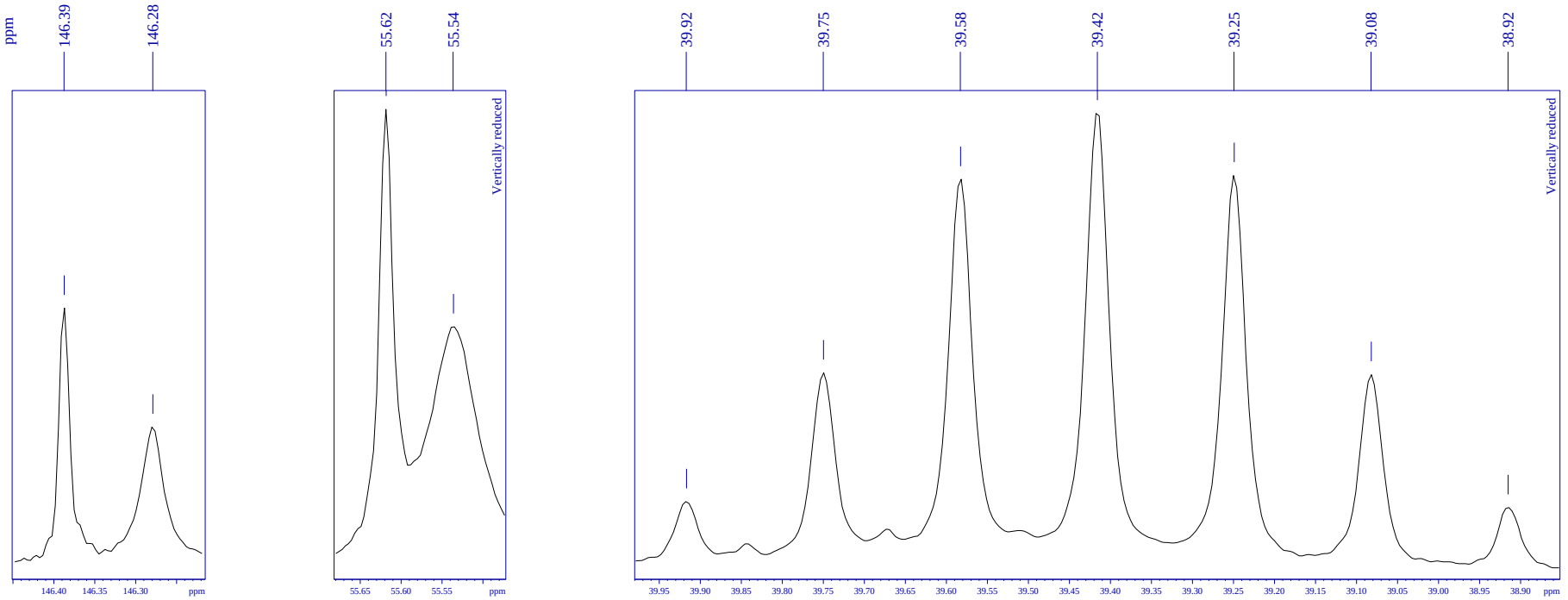
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 14810.7 | 4477.946 | 8.9536 | 4.14 |
| 2 | 18158.5 | 3456.266 | 6.9107 | 2.32 |
| 3 | 18185.7 | 3447.980 | 6.8942 | 2.79 |
| 4 | 18385.1 | 3387.130 | 6.7725 | 12.40 |
| 5 | 18454.0 | 3366.085 | 6.7304 | 0.71 |
| 6 | 18477.3 | 3358.994 | 6.7162 | 0.62 |
| 7 | 22332.1 | 2182.584 | 4.3640 | 0.23 |
| 8 | 22868.5 | 2018.895 | 4.0367 | 0.25 |
| 9 | 22891.9 | 2011.766 | 4.0225 | 0.26 |
| 10 | 23330.2 | 1877.978 | 3.7550 | 16.00 |
| 11 | 23417.1 | 1851.472 | 3.7020 | 0.24 |
| 12 | 23452.7 | 1840.617 | 3.6803 | 11.59 |
| 13 | 23509.3 | 1823.324 | 3.6457 | 6.85 |
| 14 | 23571.0 | 1804.497 | 3.6081 | 0.39 |
| 15 | 23834.9 | 1723.980 | 3.4471 | 0.20 |
| 16 | 23972.6 | 1681.943 | 3.3630 | 6.78 |
| 17 | 25379.7 | 1252.547 | 2.5044 | 1.74 |
| 18 | 25384.9 | 1250.942 | 2.5012 | 1.26 |
| 19 | 26224.0 | 994.877 | 1.9892 | 1.07 |
| 20 | 27537.0 | 594.167 | 1.1880 | 0.27 |
| 21 | 27560.3 | 587.054 | 1.1738 | 0.54 |
| 22 | 27583.7 | 579.931 | 1.1596 | 0.26 |
| 23 | 27721.1 | 537.991 | 1.0757 | 0.43 |
| 24 | 27744.0 | 530.996 | 1.0617 | 0.86 |
| 25 | 27767.0 | 524.000 | 1.0477 | 0.42 |
| 26 | 29484.0 | 0.002 | 0.0000 | 6.11 |

# 1a (NMR/24267672)

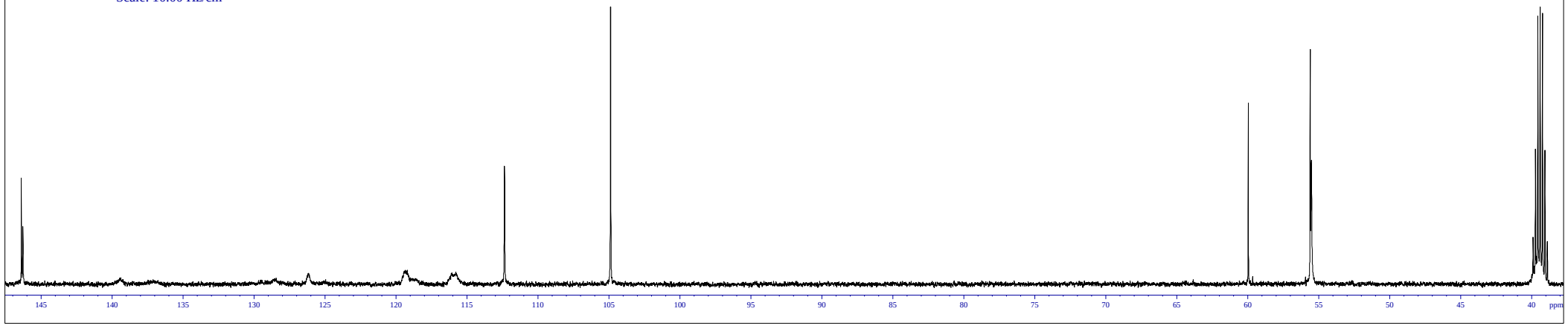


# 1a (NMR/24267672)






Scale: 10.00 Hz/cm



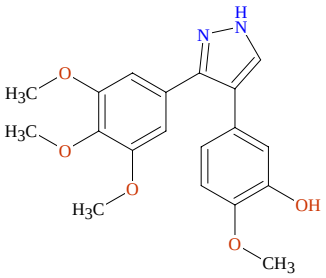
# 1a (NMR/24267672)

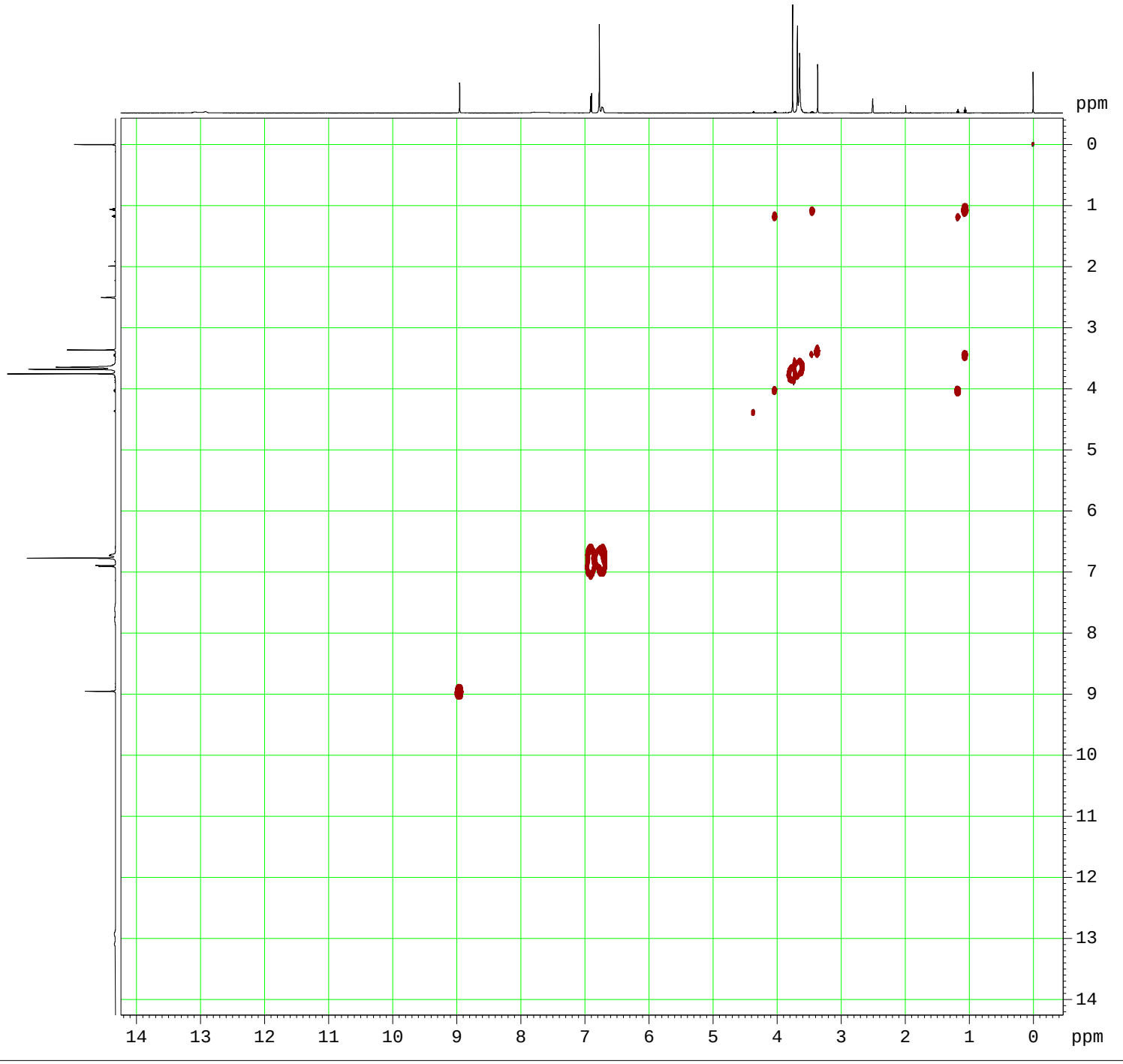


Peaks List

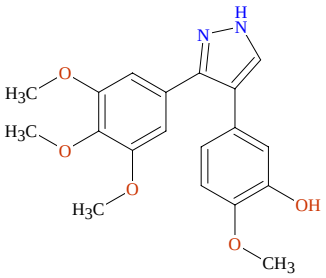
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 20256.0 | 19191.404 | 152.6060 | 0.73 |
| 2 | 21885.8 | 18409.354 | 146.3873 | 3.99 |
| 3 | 21914.2 | 18395.734 | 146.2790 | 2.17 |
| 4 | 27192.2 | 15863.186 | 126.1407 | 0.40 |
| 5 | 28979.1 | 15005.728 | 119.3224 | 0.53 |
| 6 | 29910.7 | 14558.728 | 115.7679 | 0.45 |
| 7 | 30807.0 | 14128.668 | 112.3482 | 4.42 |
| 8 | 32765.6 | 13188.850 | 104.8750 | 14.00 |
| 9 | 44532.5 | 7542.684 | 59.9778 | 6.98 |
| 10 | 45675.0 | 6994.437 | 55.6183 | 8.79 |
| 11 | 45696.6 | 6984.094 | 55.5360 | 4.65 |
| 12 | 49790.1 | 5019.855 | 39.9168 | 1.75 |
| 13 | 49833.9 | 4998.848 | 39.7498 | 5.06 |
| 14 | 49877.7 | 4977.838 | 39.5827 | 10.07 |
| 15 | 49921.4 | 4956.854 | 39.4159 | 11.83 |
| 16 | 49965.2 | 4935.880 | 39.2491 | 10.15 |
| 17 | 50008.9 | 4914.874 | 39.0820 | 5.02 |
| 18 | 50052.7 | 4893.895 | 38.9152 | 1.60 |
| 19 | 60251.8 | −0.003 | −0.0000 | 0.81 |

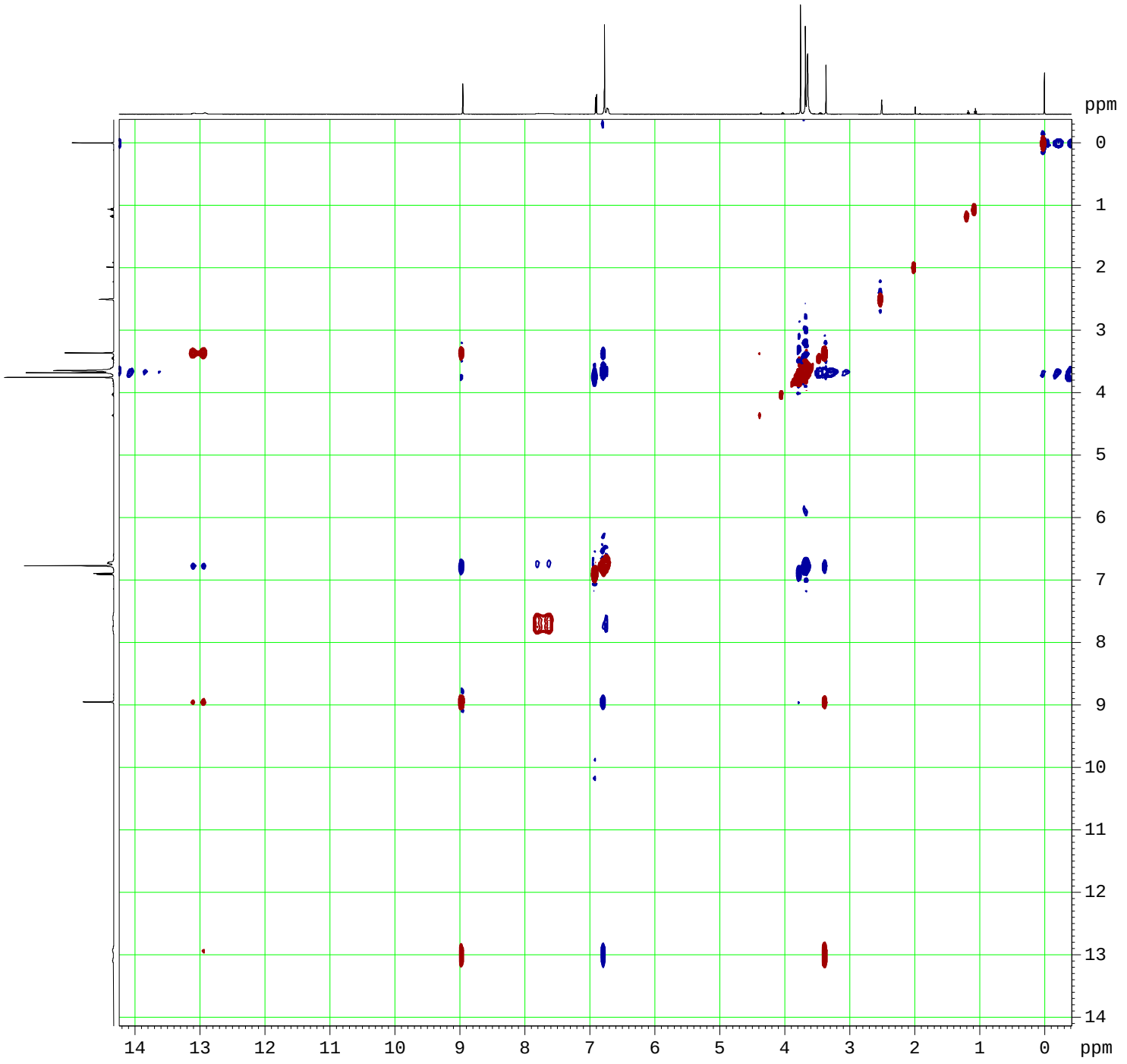
# 1a (NMR/24267672)
# COSY



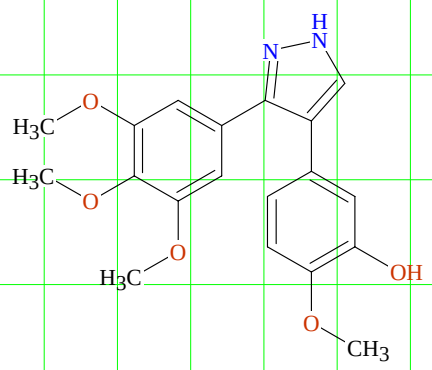



1a (NMR/24267672)
NOESY

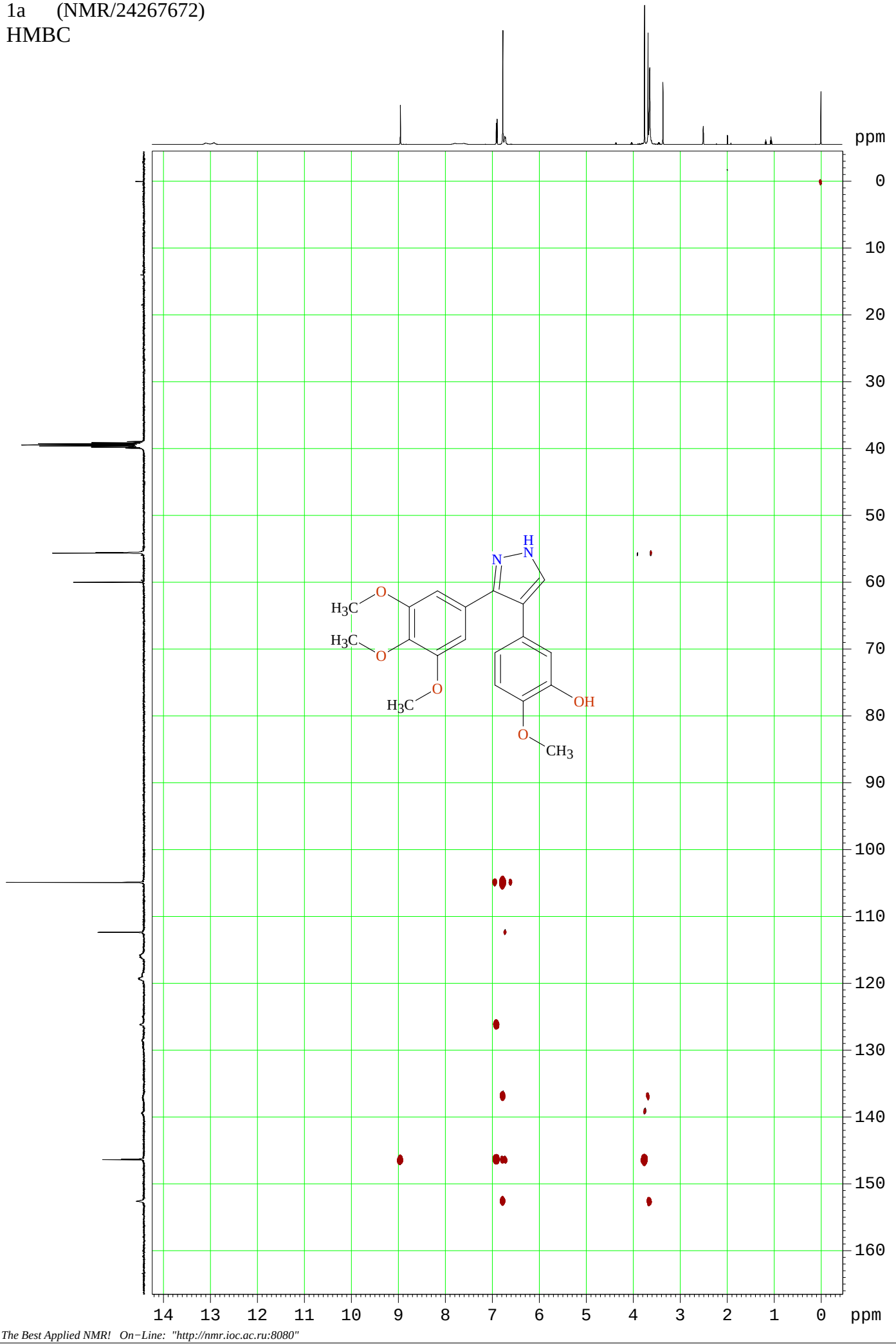


1a (NMR/24267672)
HSQC



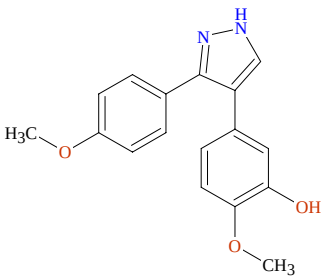
1a (NMR/24267672)
HMBC



*The Best Applied NMR!*

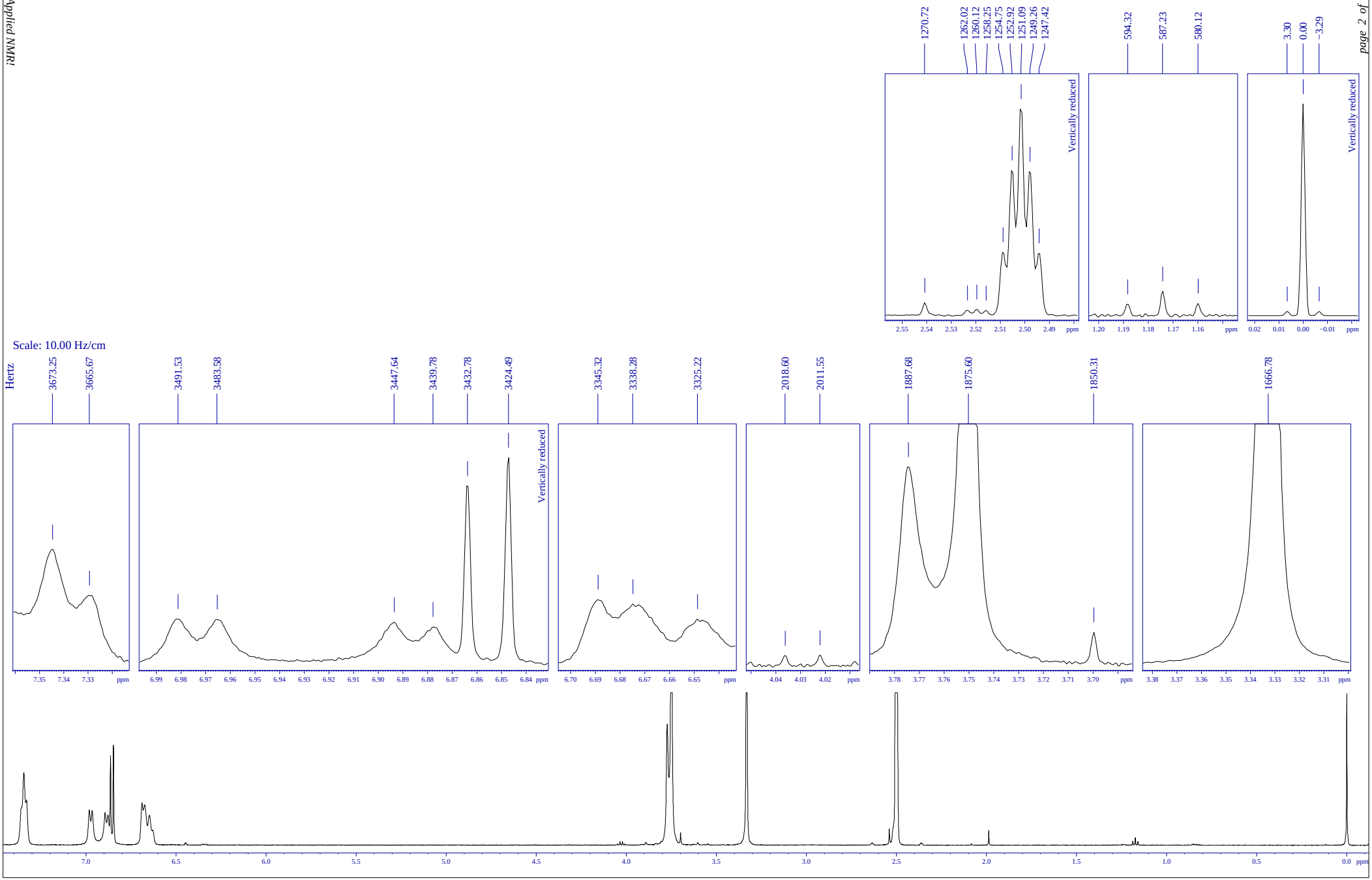
# 1b (NMR/24267689)

Found protons = 34 impurity* = 0.8 %



# 1b (NMR/24267689)





# 1b (NMR/24267689)

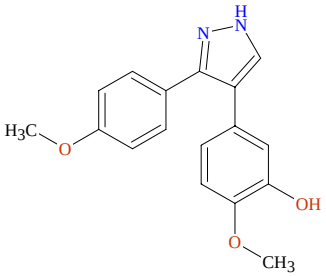


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 8225.1 | 6486.165 | 12.9690 | 0.87 |
| 2 | 8449.6 | 6417.674 | 12.8320 | 0.85 |
| 3 | 14933.1 | 4439.061 | 8.8758 | 2.84 |
| 4 | 16738.2 | 3888.176 | 7.7743 | 0.93 |
| 5 | 17118.7 | 3772.062 | 7.5422 | 1.15 |
| 6 | 17442.5 | 3673.252 | 7.3446 | 2.57 |
| 7 | 17467.3 | 3665.671 | 7.3294 | 1.55 |
| 8 | 18038.0 | 3491.527 | 6.9812 | 1.24 |
| 9 | 18064.0 | 3483.578 | 6.9653 | 1.23 |
| 10 | 18181.8 | 3447.639 | 6.8935 | 1.15 |
| 11 | 18207.5 | 3439.785 | 6.8778 | 1.03 |
| 12 | 18230.5 | 3432.779 | 6.8638 | 4.91 |
| 13 | 18257.6 | 3424.491 | 6.8472 | 5.62 |
| 14 | 18517.1 | 3345.318 | 6.6889 | 1.46 |
| 15 | 18540.1 | 3338.275 | 6.6748 | 1.36 |
| 16 | 18582.9 | 3325.221 | 6.6487 | 1.03 |
| 17 | 22864.5 | 2018.602 | 4.0362 | 0.23 |
| 18 | 22887.5 | 2011.553 | 4.0221 | 0.24 |
| 19 | 23293.5 | 1887.676 | 3.7744 | 4.40 |
| 20 | 23333.0 | 1875.600 | 3.7502 | 24.00 |
| 21 | 23415.9 | 1850.307 | 3.6997 | 0.74 |
| 22 | 23960.1 | 1684.227 | 3.3676 | −0.22 |
| 23 | 23981.1 | 1677.833 | 3.3548 | 0.23 |
| 24 | 24000.0 | 1672.046 | 3.3432 | 0.22 |
| 25 | 24017.4 | 1666.760 | 3.3327 | 63.54 |
| 26 | 24024.9 | 1664.457 | 3.3280 | −0.33 |
| 27 | 24029.7 | 1662.994 | 3.3251 | −0.21 |
| 28 | 24036.5 | 1660.908 | 3.3210 | 0.21 |
| 29 | 24045.9 | 1658.055 | 3.3152 | 0.21 |
| 30 | 25315.1 | 1270.724 | 2.5408 | 1.07 |
| 31 | 25343.6 | 1262.021 | 2.5234 | 0.44 |
| 32 | 25349.8 | 1260.121 | 2.5196 | 0.51 |
| 33 | 25356.0 | 1258.246 | 2.5158 | 0.42 |
| 34 | 25367.4 | 1254.754 | 2.5089 | 5.42 |
| 35 | 25373.4 | 1252.923 | 2.5052 | 12.40 |
| 36 | 25379.4 | 1251.090 | 2.5015 | 17.64 |
| 37 | 25385.4 | 1249.255 | 2.4979 | 12.27 |
| 38 | 25391.5 | 1247.422 | 2.4942 | 5.30 |
| 39 | 26220.7 | 994.349 | 1.9882 | 1.06 |
| 40 | 27531.5 | 594.318 | 1.1883 | 0.26 |
| 41 | 27554.8 | 587.232 | 1.1742 | 0.54 |
| 42 | 27578.1 | 580.122 | 1.1599 | 0.27 |
| 43 | 29468.2 | 3.299 | 0.0066 | 0.23 |
| 44 | 29479.0 | 0.002 | 0.0000 | 11.42 |
| 45 | 29489.8 | −3.294 | −0.0066 | 0.23 |

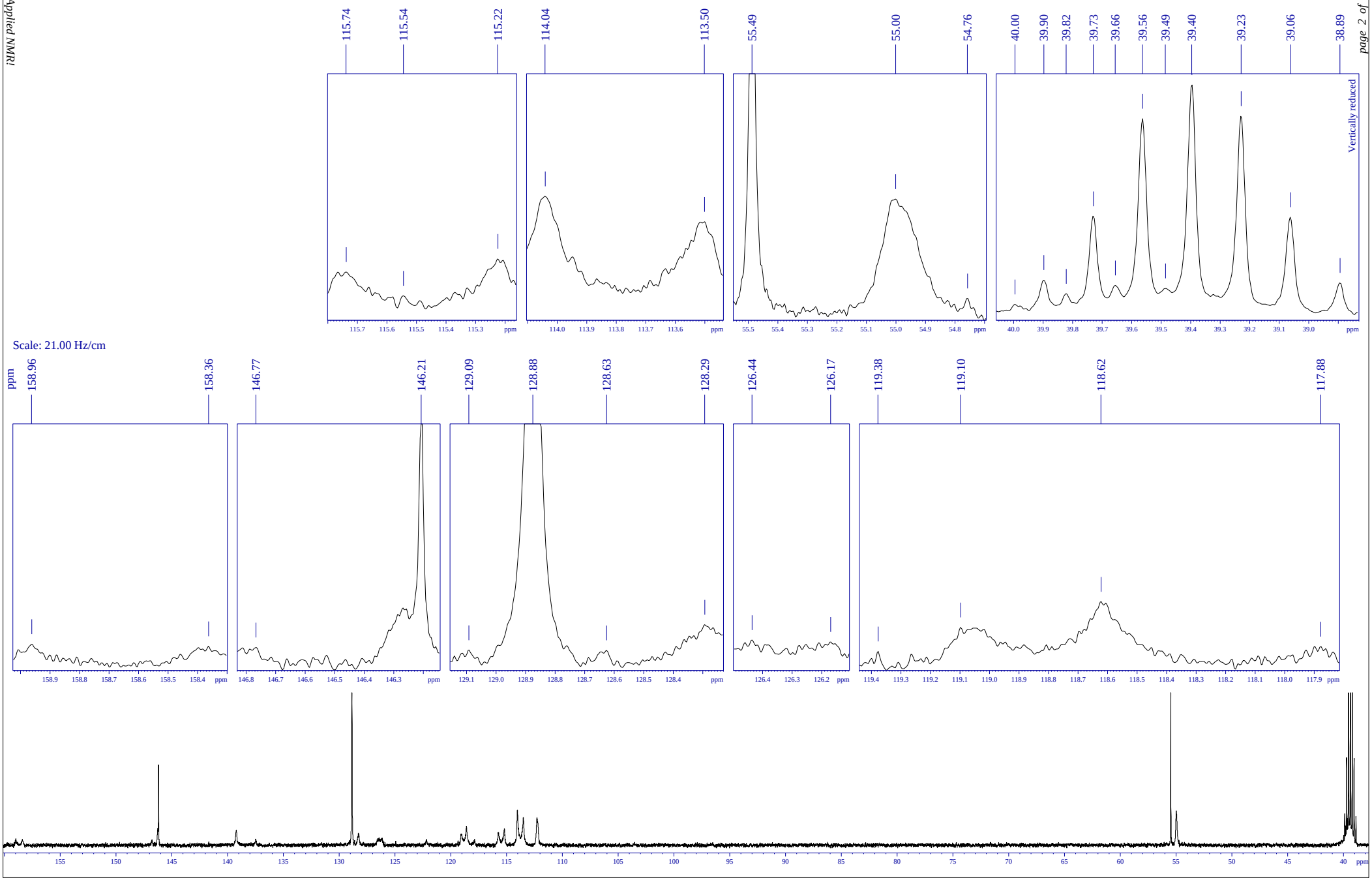
# 1b (NMR/24267689)

195.82 170.44 158.96 158.36 146.77 146.21 141.70 139.23 137.50 129.09 128.88 128.63 128.29 126.44 126.17 124.94 122.19 119.38 119.10 118.62 117.88 115.74 115.54 115.22 114.04 113.50 112.29 55.49 55.00 54.76 40.00 39.90 39.82 39.73 39.66 39.56 39.49 39.40 39.23 39.06 38.89 0.00



# 1b (NMR/24267689)





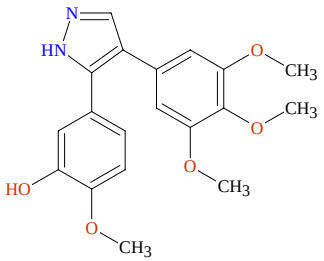
# 1b (NMR/24267689)



Peaks List

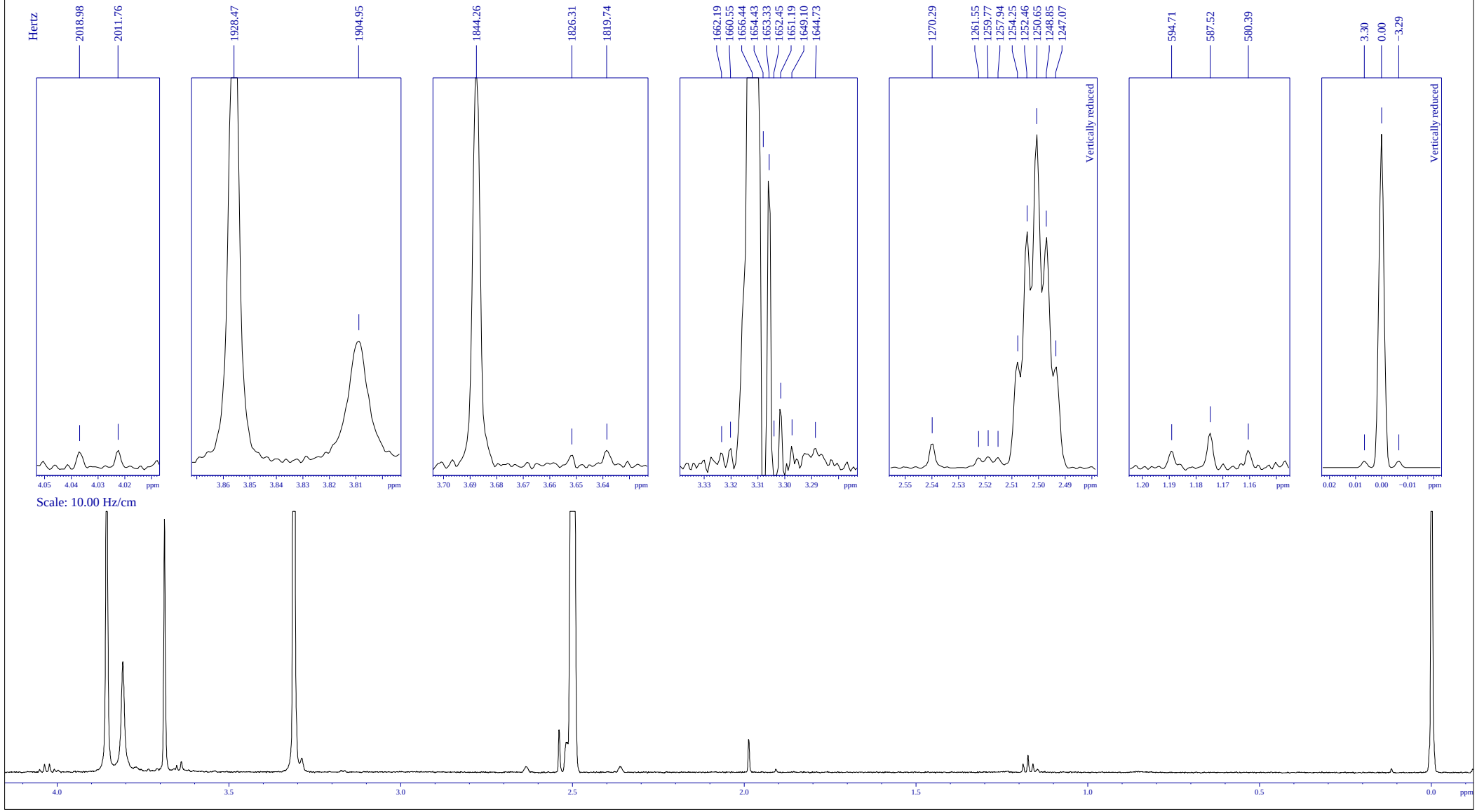
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 8927.1 | 24626.412 | 195.8240 | 0.27 |
| 2 | 15580.2 | 21434.041 | 170.4390 | 0.23 |
| 3 | 18588.1 | 19990.713 | 158.9619 | 0.43 |
| 4 | 18745.2 | 19915.346 | 158.3626 | 0.39 |
| 5 | 21784.3 | 18457.061 | 146.7666 | 0.37 |
| 6 | 21931.1 | 18386.627 | 146.2066 | 5.50 |
| 7 | 23111.8 | 17820.104 | 141.7017 | 0.23 |
| 8 | 23759.5 | 17509.309 | 139.2303 | 1.03 |
| 9 | 24212.0 | 17292.168 | 137.5037 | 0.42 |
| 10 | 26416.6 | 16234.343 | 129.0921 | 0.32 |
| 11 | 26473.5 | 16207.050 | 128.8750 | 13.55 |
| 12 | 26538.8 | 16175.705 | 128.6258 | 0.31 |
| 13 | 26626.0 | 16133.876 | 128.2932 | 0.82 |
| 14 | 27112.8 | 15900.262 | 126.4355 | 0.52 |
| 15 | 27182.5 | 15866.803 | 126.1695 | 0.48 |
| 16 | 27504.0 | 15712.540 | 124.9428 | 0.27 |
| 17 | 28224.5 | 15366.860 | 122.1940 | 0.40 |
| 18 | 28962.7 | 15012.613 | 119.3771 | 0.29 |
| 19 | 29036.1 | 14977.385 | 119.0970 | 0.77 |
| 20 | 29160.7 | 14917.631 | 118.6219 | 1.29 |
| 21 | 29355.7 | 14824.048 | 117.8777 | 0.39 |
| 22 | 29916.6 | 14554.924 | 115.7377 | 0.88 |
| 23 | 29967.3 | 14530.568 | 115.5440 | 0.40 |
| 24 | 30051.1 | 14490.380 | 115.2244 | 1.14 |
| 25 | 30361.4 | 14341.498 | 114.0406 | 2.40 |
| 26 | 30502.8 | 14273.643 | 113.5010 | 1.89 |
| 27 | 30819.7 | 14121.555 | 112.2916 | 1.88 |
| 28 | 45707.3 | 6977.950 | 55.4872 | 13.55 |
| 29 | 45834.7 | 6916.807 | 55.0010 | 2.34 |
| 30 | 45898.5 | 6886.192 | 54.7575 | 0.35 |
| 31 | 49767.5 | 5029.705 | 39.9952 | 0.68 |
| 32 | 49793.1 | 5017.426 | 39.8975 | 2.15 |
| 33 | 49813.0 | 5007.881 | 39.8216 | 1.31 |
| 34 | 49837.2 | 4996.285 | 39.7294 | 6.00 |
| 35 | 49856.6 | 4986.954 | 39.6552 | 1.82 |
| 36 | 49880.8 | 4975.356 | 39.5630 | 11.90 |
| 37 | 49901.2 | 4965.570 | 39.4852 | 1.64 |
| 38 | 49924.6 | 4954.338 | 39.3959 | 14.00 |
| 39 | 49968.3 | 4933.359 | 39.2290 | 12.10 |
| 40 | 50012.1 | 4912.383 | 39.0622 | 5.94 |
| 41 | 50056.2 | 4891.216 | 38.8939 | 1.97 |
| 42 | 60249.7 | 0.006 | 0.0000 | 0.83 |

# 1c (NMR/25267114)



# 1c (NMR/25267114)





# 1c (NMR/25267114)



Peaks List

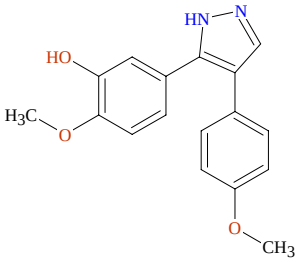
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17663.8 | 3605.418 | 7.2090 | 0.46 |
| 2 | 17797.5 | 3564.618 | 7.1274 | 2.66 |
| 3 | 17947.3 | 3518.896 | 7.0360 | 0.60 |
| 4 | 22862.2 | 2018.984 | 4.0369 | 0.33 |
| 5 | 22885.9 | 2011.759 | 4.0225 | 0.36 |
| 6 | 23158.8 | 1928.474 | 3.8559 | 13.10 |
| 7 | 23235.9 | 1904.952 | 3.8089 | 2.66 |
| 8 | 23434.7 | 1844.257 | 3.6876 | 9.32 |
| 9 | 23493.5 | 1826.312 | 3.6517 | 0.27 |
| 10 | 23515.1 | 1819.736 | 3.6385 | 0.37 |
| 11 | 24031.4 | 1662.187 | 3.3235 | 0.32 |
| 12 | 24036.7 | 1660.554 | 3.3202 | 0.42 |
| 13 | 24050.2 | 1656.443 | 3.3120 | 69.79 |
| 14 | 24056.8 | 1654.427 | 3.3080 | −11.52 |
| 15 | 24060.4 | 1653.332 | 3.3058 | 6.36 |
| 16 | 24063.3 | 1652.447 | 3.3040 | −2.37 |
| 17 | 24067.4 | 1651.190 | 3.3015 | 1.32 |
| 18 | 24074.2 | 1649.102 | 3.2973 | 0.47 |
| 19 | 24088.5 | 1644.733 | 3.2886 | 0.41 |
| 20 | 25315.5 | 1270.288 | 2.5399 | 1.83 |
| 21 | 25344.1 | 1261.553 | 2.5225 | 0.75 |
| 22 | 25350.0 | 1259.765 | 2.5189 | 0.81 |
| 23 | 25356.0 | 1257.944 | 2.5152 | 0.75 |
| 24 | 25368.1 | 1254.250 | 2.5078 | 7.88 |
| 25 | 25373.9 | 1252.461 | 2.5043 | 17.59 |
| 26 | 25379.9 | 1250.651 | 2.5007 | 24.89 |
| 27 | 25385.8 | 1248.850 | 2.4971 | 17.28 |
| 28 | 25391.6 | 1247.071 | 2.4935 | 7.61 |
| 29 | 26220.3 | 994.165 | 1.9878 | 1.43 |
| 30 | 27529.3 | 594.708 | 1.1891 | 0.35 |
| 31 | 27552.8 | 587.517 | 1.1747 | 0.73 |
| 32 | 27576.2 | 580.387 | 1.1605 | 0.37 |
| 33 | 29467.2 | 3.298 | 0.0066 | 0.64 |
| 34 | 29478.0 | 0.002 | 0.0000 | 31.98 |
| 35 | 29488.8 | −3.294 | −0.0066 | 0.64 |

*The Best Applied NMR!*

# 1d (NMR/24267945)

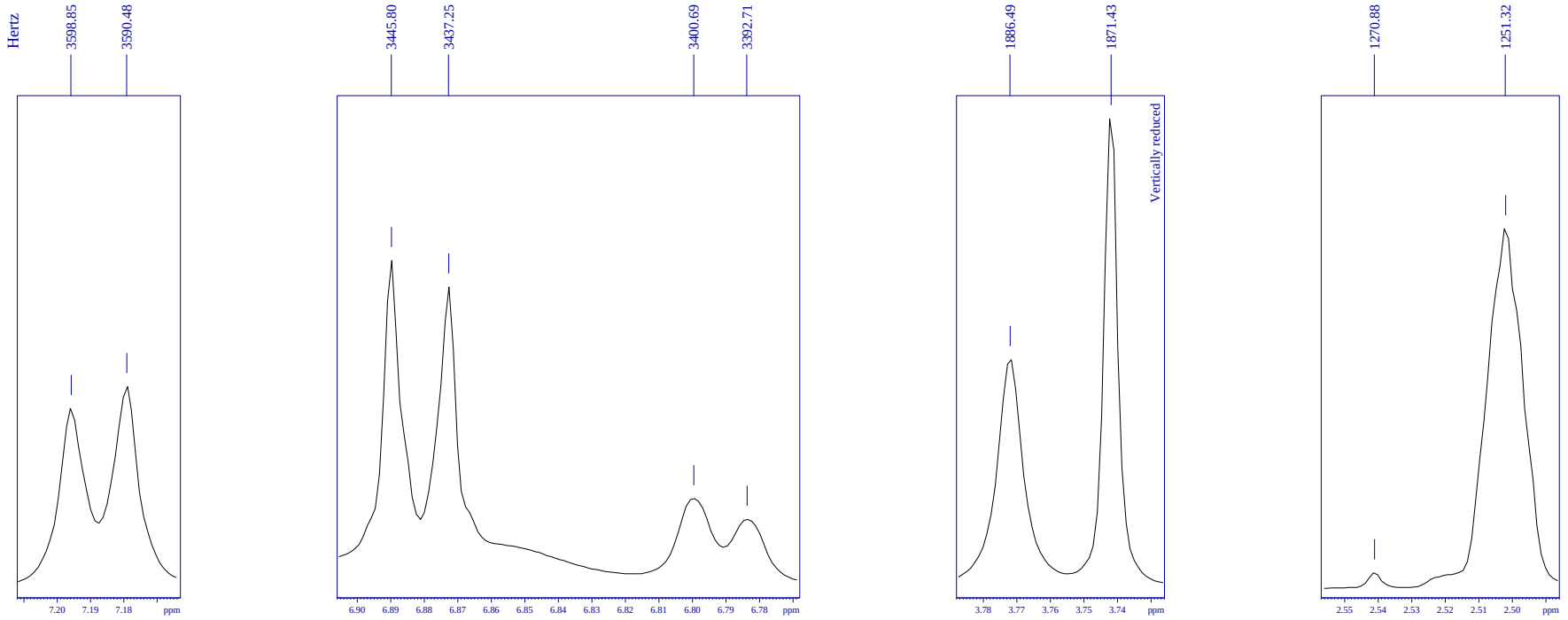
Found protons = 16 impurity* = 1.0 %



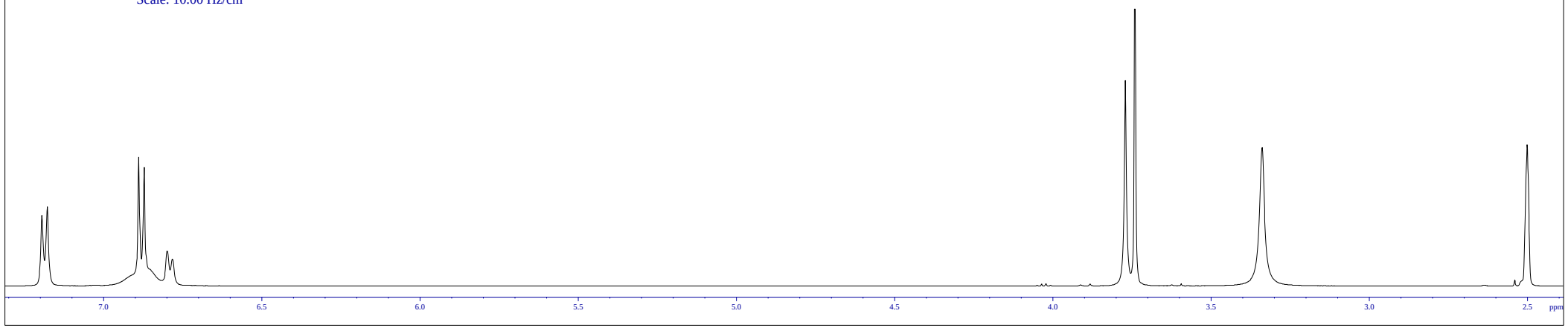


# 1d (NMR/24267945)






Scale: 10.00 Hz/cm



# 1d (NMR/24267945)

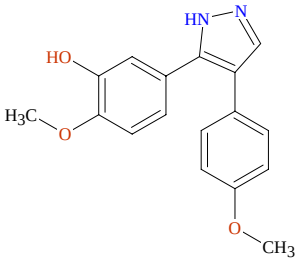


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 8844.1 | 3598.847 | 7.1958 | 2.63 |
| 2 | 8857.8 | 3590.482 | 7.1791 | 2.96 |
| 3 | 9094.9 | 3445.795 | 6.8898 | 4.82 |
| 4 | 9108.9 | 3437.249 | 6.8727 | 4.43 |
| 5 | 9168.8 | 3400.691 | 6.7996 | 1.31 |
| 6 | 9181.8 | 3392.713 | 6.7837 | 1.01 |
| 7 | 11649.6 | 1886.493 | 3.7720 | 7.74 |
| 8 | 11674.3 | 1871.426 | 3.7419 | 16.00 |
| 9 | 12003.6 | 1670.419 | 3.3400 | 5.17 |
| 10 | 12658.2 | 1270.877 | 2.5411 | 0.22 |
| 11 | 12690.3 | 1251.322 | 2.5020 | 5.29 |
| 12 | 13111.6 | 994.145 | 1.9878 | 0.36 |
| 13 | 14740.5 | −0.000 | −0.0000 | 0.84 |

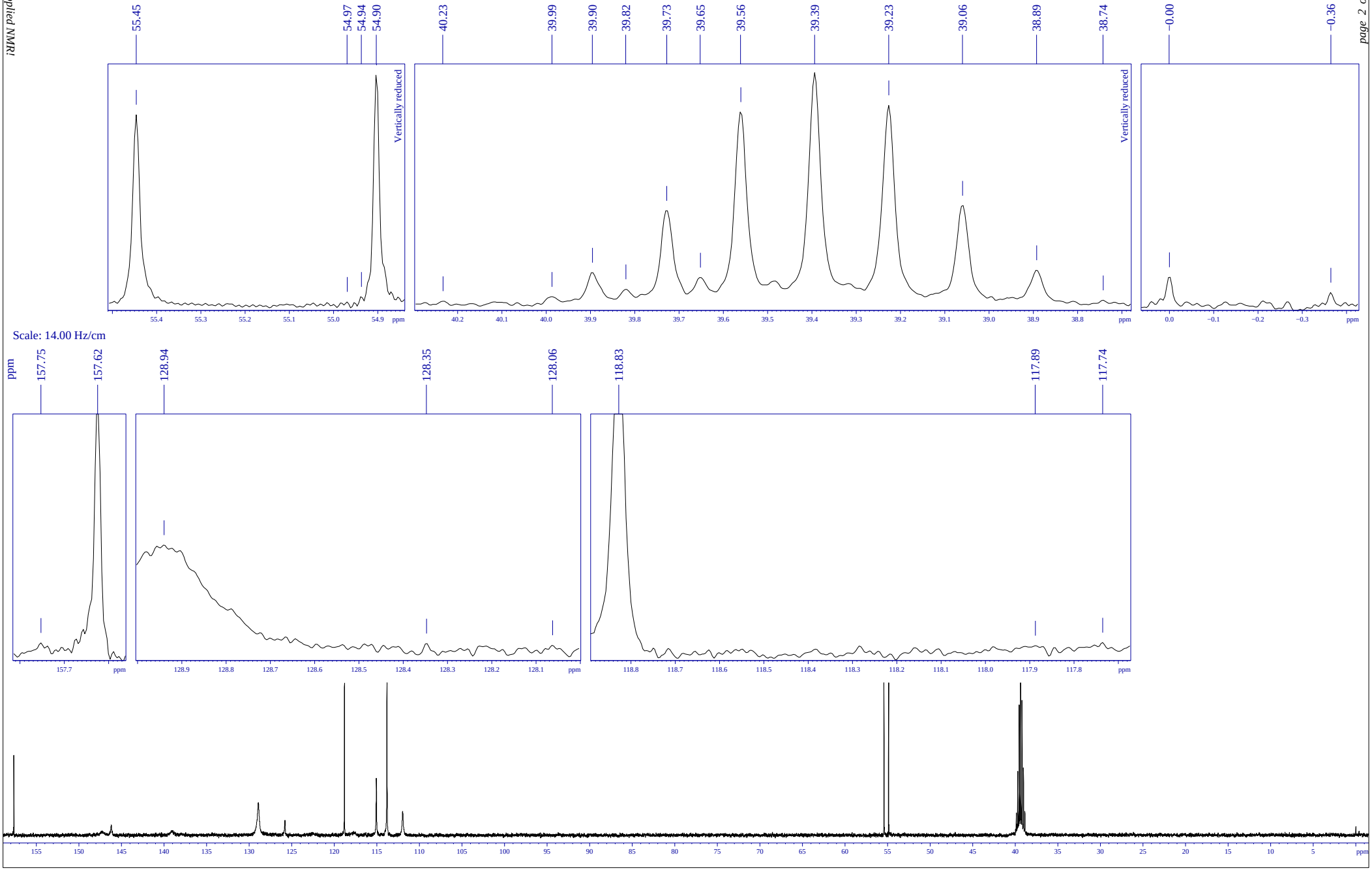
# 1d (NMR/24267945)

157.75
157.62
147.28
146.22
138.99
128.94
128.35
128.06
125.82
118.83
117.89
117.74
115.08
113.83
111.97
68.55
55.45
54.97
54.94
54.90
47.07
40.23
39.99
39.90
39.82
39.73
39.65
39.56
39.39
39.23
39.06
38.89
38.74
−0.00
−0.36



# 1d (NMR/24267945)





# 1d (NMR/24267945)



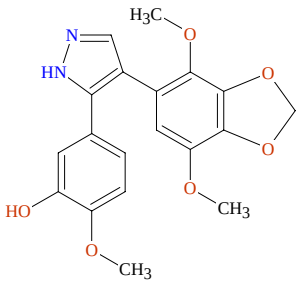
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 18905.9 | 19838.633 | 157.7526 | 0.26 |
| 2 | 18939.5 | 19822.533 | 157.6246 | 5.63 |
| 3 | 21650.1 | 18521.873 | 147.2820 | 0.29 |
| 4 | 21928.4 | 18388.363 | 146.2204 | 0.71 |
| 5 | 23822.1 | 17479.672 | 138.9947 | 0.33 |
| 6 | 26457.3 | 16215.227 | 128.9401 | 2.21 |
| 7 | 26612.6 | 16140.677 | 128.3473 | 0.25 |
| 8 | 26687.3 | 16104.878 | 128.0626 | 0.21 |
| 9 | 27275.3 | 15822.690 | 125.8187 | 1.02 |
| 10 | 29107.6 | 14943.490 | 118.8275 | 10.46 |
| 11 | 29354.1 | 14825.247 | 117.8872 | 0.20 |
| 12 | 29393.9 | 14806.145 | 117.7353 | 0.26 |
| 13 | 30089.6 | 14472.287 | 115.0806 | 3.88 |
| 14 | 30416.8 | 14315.321 | 113.8324 | 11.27 |
| 15 | 30904.8 | 14081.146 | 111.9703 | 1.62 |
| 16 | 42284.4 | 8620.809 | 68.5508 | 0.20 |
| 17 | 45719.0 | 6972.773 | 55.4460 | 11.44 |
| 18 | 45844.0 | 6912.799 | 54.9691 | 0.23 |
| 19 | 45852.4 | 6908.760 | 54.9370 | 0.55 |
| 20 | 45861.3 | 6904.484 | 54.9030 | 14.00 |
| 21 | 47915.0 | 5919.059 | 47.0671 | 0.21 |
| 22 | 49706.1 | 5059.608 | 40.2329 | 0.21 |
| 23 | 49770.6 | 5028.672 | 39.9869 | 0.41 |
| 24 | 49794.5 | 5017.179 | 39.8955 | 1.53 |
| 25 | 49814.3 | 5007.672 | 39.8200 | 0.75 |
| 26 | 49838.5 | 4996.079 | 39.7278 | 4.38 |
| 27 | 49858.4 | 4986.510 | 39.6517 | 1.29 |
| 28 | 49882.3 | 4975.043 | 39.5605 | 8.90 |
| 29 | 49926.1 | 4954.044 | 39.3935 | 10.66 |
| 30 | 49969.9 | 4933.027 | 39.2264 | 9.17 |
| 31 | 50013.6 | 4912.072 | 39.0598 | 4.61 |
| 32 | 50057.4 | 4891.032 | 38.8925 | 1.64 |
| 33 | 50096.8 | 4872.137 | 38.7422 | 0.25 |
| 34 | 60250.5 | −0.003 | −0.0000 | 0.59 |
| 35 | 60346.1 | −45.852 | −0.3646 | 0.26 |

*The Best Applied NMR!*

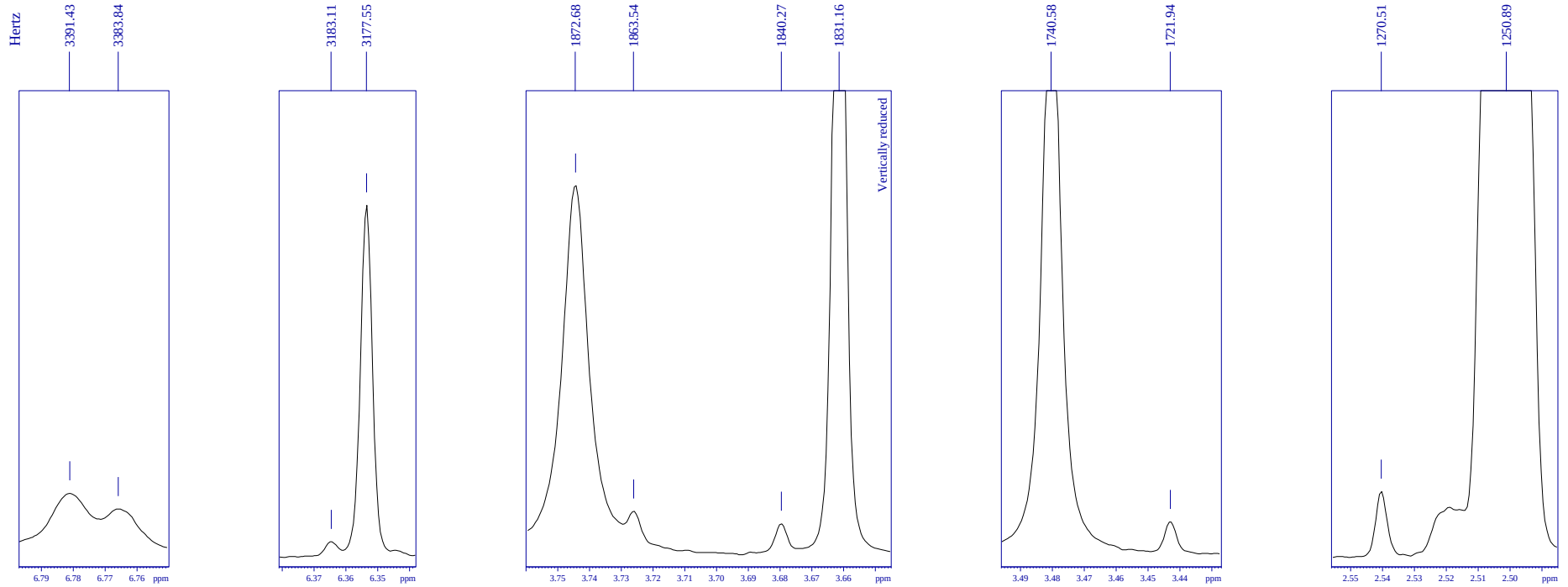
# 1e (NMR/25267200)

Found protons = 16 impurity* = 2.0 %

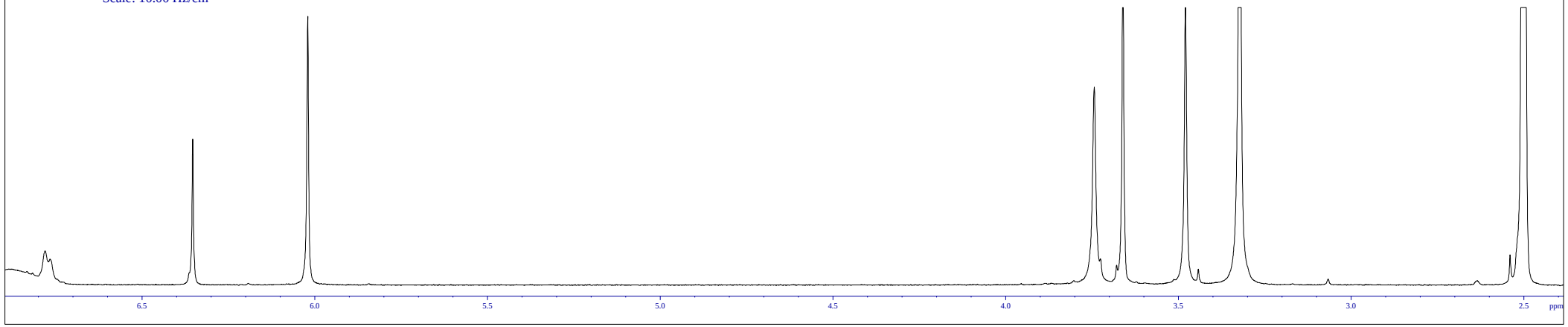


# 1e (NMR/25267200)






Scale: 10.00 Hz/cm



# 1e (NMR/25267200)

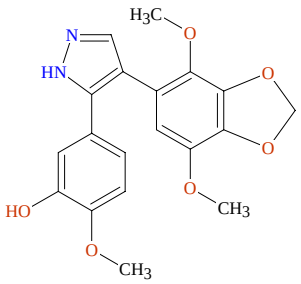


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 16743.0 | 3886.711 | 7.7714 | 0.22 |
| 2 | 18195.0 | 3443.616 | 6.8854 | 0.52 |
| 3 | 18366.0 | 3391.425 | 6.7811 | 1.21 |
| 4 | 18390.8 | 3383.837 | 6.7659 | 0.91 |
| 5 | 19048.6 | 3183.105 | 6.3646 | 0.30 |
| 6 | 19066.8 | 3177.555 | 6.3535 | 6.63 |
| 7 | 19612.3 | 3011.068 | 6.0206 | 11.86 |
| 8 | 23342.6 | 1872.678 | 3.7444 | 7.77 |
| 9 | 23372.6 | 1863.539 | 3.7261 | 0.97 |
| 10 | 23448.8 | 1840.271 | 3.6796 | 0.71 |
| 11 | 23478.7 | 1831.156 | 3.6614 | 19.63 |
| 12 | 23775.5 | 1740.580 | 3.4803 | 11.79 |
| 13 | 23836.6 | 1721.938 | 3.4430 | 0.68 |
| 14 | 24032.6 | 1662.100 | 3.3233 | 23.73 |
| 15 | 24452.6 | 1533.926 | 3.0671 | 0.25 |
| 16 | 25315.8 | 1270.505 | 2.5404 | 1.24 |
| 17 | 25380.1 | 1250.893 | 2.5011 | 31.53 |
| 18 | 26296.1 | 971.352 | 1.9422 | 0.59 |
| 19 | 26804.0 | 816.338 | 1.6323 | 0.85 |
| 20 | 29479.0 | 0.002 | 0.0000 | 11.96 |

# 1e (NMR/25267200)

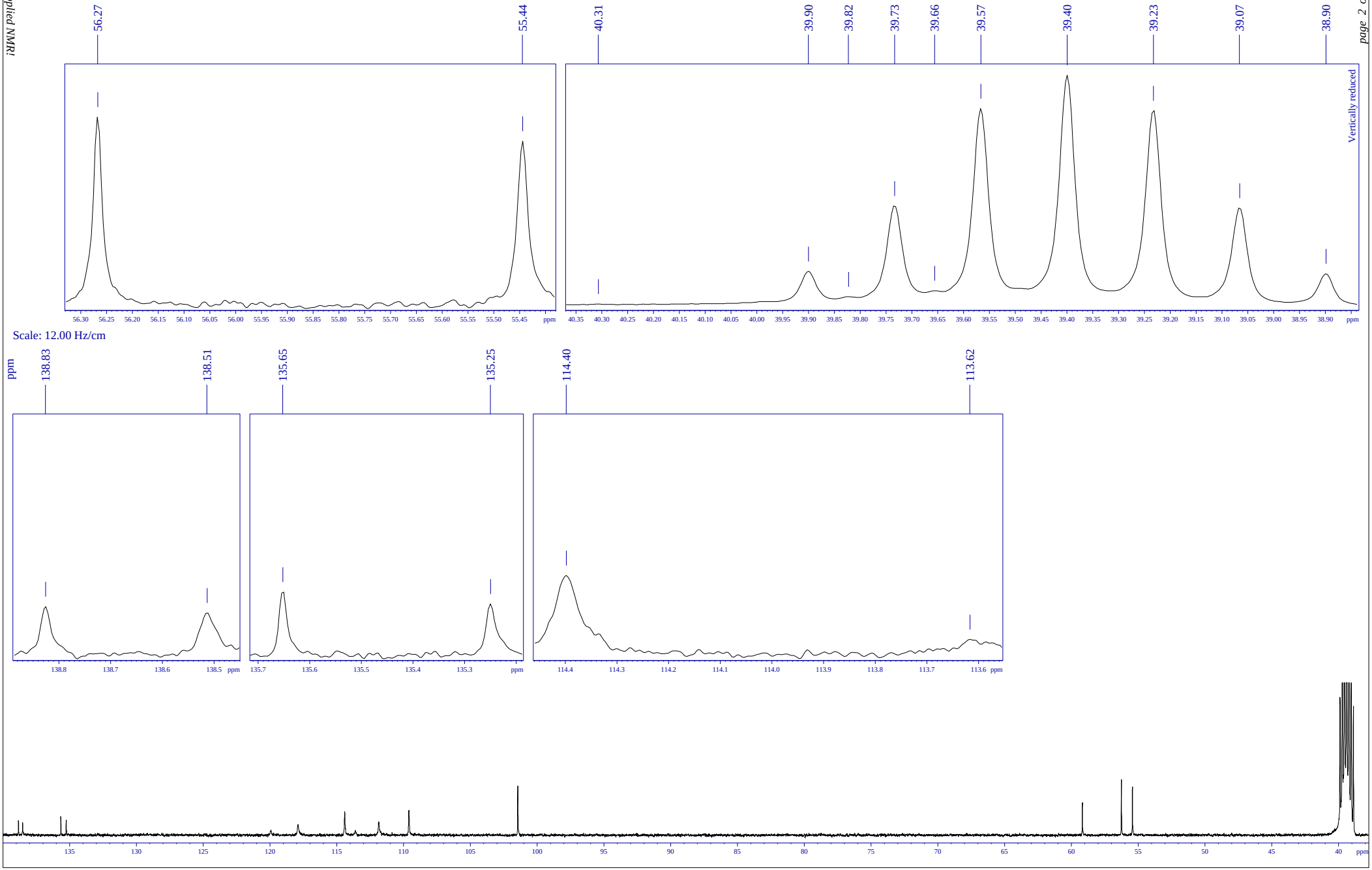
146.19
138.83
138.51
135.65
135.25
119.92
117.89
114.40
113.62
111.85
109.59
101.44
59.19
56.27
55.44
40.31
39.90
39.82
39.73
39.66
39.57
39.40
39.23
39.07
38.90
27.36
−0.00



*The Best Applied NMR!*

# 1e (NMR/25267200)





# 1e (NMR/25267200)

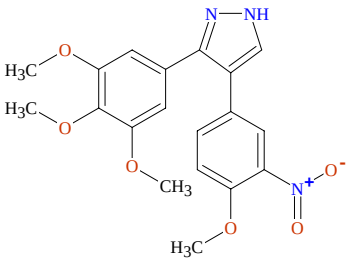


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 21933.6 | 18385.051 | 146.1940 | 0.21 |
| 2 | 23864.8 | 17458.430 | 138.8257 | 1.00 |
| 3 | 23946.6 | 17419.148 | 138.5134 | 0.87 |
| 4 | 24696.6 | 17059.305 | 135.6520 | 1.32 |
| 5 | 24802.0 | 17008.717 | 135.2497 | 1.05 |
| 6 | 28820.1 | 15080.676 | 119.9184 | 0.35 |
| 7 | 29350.9 | 14825.995 | 117.8932 | 0.73 |
| 8 | 30266.9 | 14386.451 | 114.3980 | 1.63 |
| 9 | 30471.7 | 14288.162 | 113.6165 | 0.33 |
| 10 | 30936.0 | 14065.415 | 111.8452 | 0.91 |
| 11 | 31526.8 | 13781.915 | 109.5909 | 1.71 |
| 12 | 33663.8 | 12756.507 | 101.4370 | 3.39 |
| 13 | 44735.4 | 7443.949 | 59.1927 | 2.26 |
| 14 | 45502.2 | 7076.027 | 56.2671 | 3.83 |
| 15 | 45717.9 | 6972.530 | 55.4441 | 3.34 |
| 16 | 49685.2 | 5068.876 | 40.3066 | 0.44 |
| 17 | 49791.7 | 5017.745 | 39.9001 | 9.52 |
| 18 | 49812.0 | 5007.997 | 39.8225 | 2.47 |
| 19 | 49835.4 | 4996.782 | 39.7334 | 27.84 |
| 20 | 49855.7 | 4987.040 | 39.6559 | 4.17 |
| 21 | 49879.1 | 4975.793 | 39.5665 | 54.75 |
| 22 | 49922.9 | 4954.796 | 39.3995 | 64.00 |
| 23 | 49966.6 | 4933.808 | 39.2326 | 54.41 |
| 24 | 50010.4 | 4912.822 | 39.0657 | 27.22 |
| 25 | 50054.2 | 4891.806 | 38.8986 | 8.87 |
| 26 | 53078.9 | 3440.425 | 27.3575 | 0.25 |
| 27 | 60248.9 | −0.000 | −0.0000 | 0.69 |

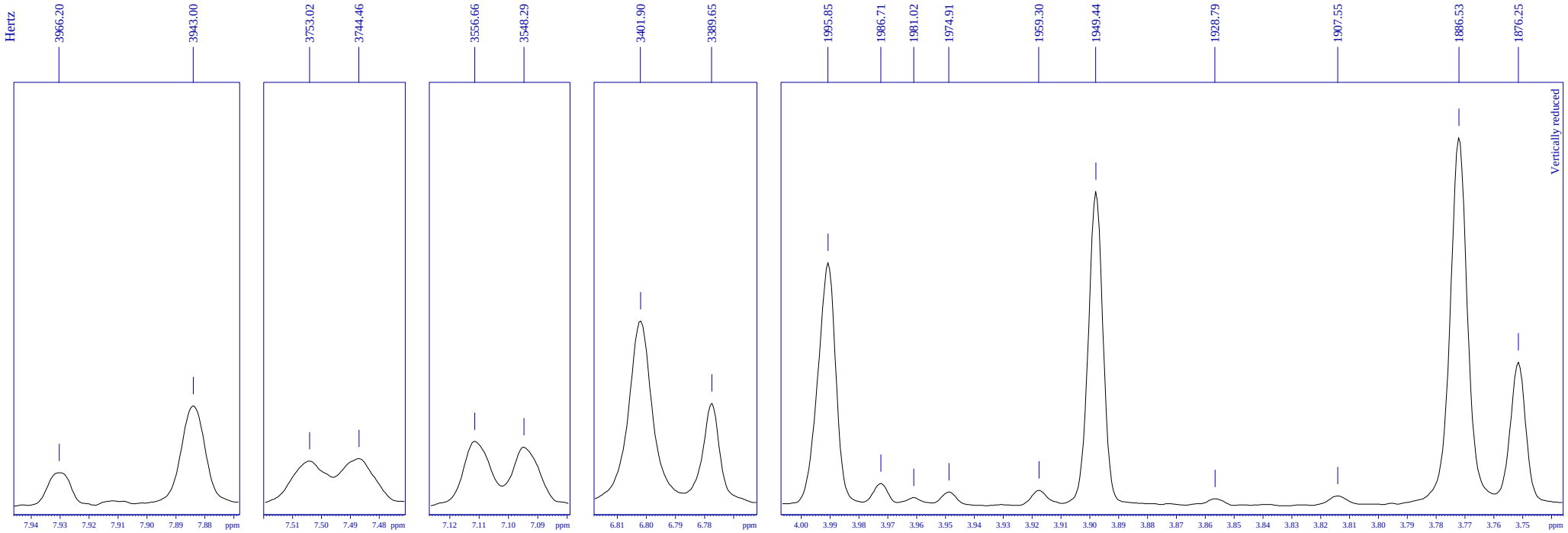
# 1f (NMR/24670091)

Found protons = 37 impurity* = 0.6 %

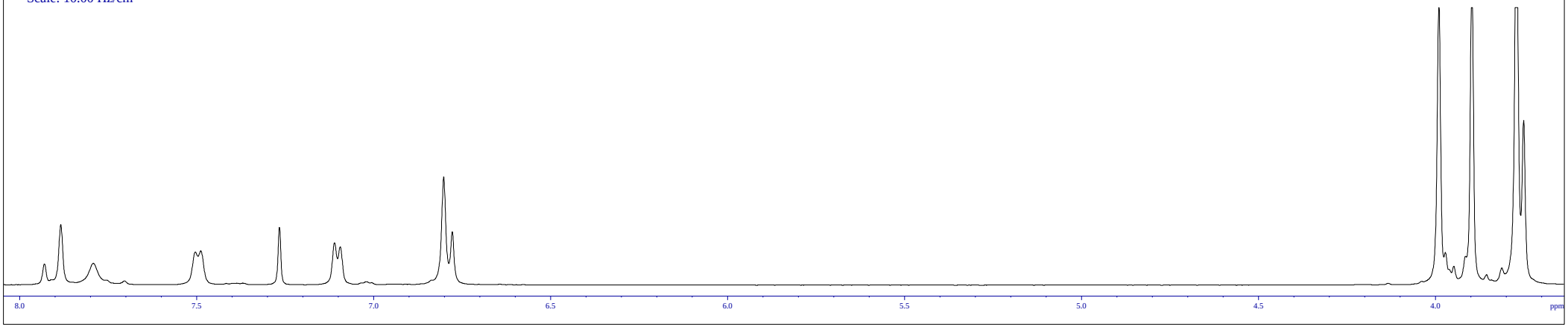


# 1f (NMR/24670091)






Scale: 10.00 Hz/cm



# 1f (NMR/24670091)



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 14828.0 | 4473.874 | 8.9454 | 0.78 |
| 2 | 16491.6 | 3966.201 | 7.9303 | 0.64 |
| 3 | 16567.6 | 3943.003 | 7.8840 | 1.90 |
| 4 | 16720.7 | 3896.283 | 7.7905 | 0.54 |
| 5 | 17190.1 | 3753.020 | 7.5041 | 0.86 |
| 6 | 17218.2 | 3744.461 | 7.4870 | 0.90 |
| 7 | 17580.0 | 3634.035 | 7.2662 | 2.62 |
| 8 | 17833.5 | 3556.660 | 7.1115 | 1.23 |
| 9 | 17861.0 | 3548.292 | 7.0947 | 1.12 |
| 10 | 18340.7 | 3401.900 | 6.8020 | 3.52 |
| 11 | 18380.8 | 3389.649 | 6.7775 | 1.95 |
| 12 | 22948.0 | 1995.848 | 3.9907 | 10.56 |
| 13 | 22977.9 | 1986.711 | 3.9724 | 0.99 |
| 14 | 22996.6 | 1981.020 | 3.9610 | 0.37 |
| 15 | 23016.6 | 1974.909 | 3.9488 | 0.62 |
| 16 | 23067.8 | 1959.295 | 3.9176 | 0.69 |
| 17 | 23100.1 | 1949.437 | 3.8979 | 13.64 |
| 18 | 23167.8 | 1928.788 | 3.8566 | 0.32 |
| 19 | 23237.3 | 1907.549 | 3.8141 | 0.45 |
| 20 | 23306.2 | 1886.525 | 3.7721 | 16.00 |
| 21 | 23339.9 | 1876.247 | 3.7515 | 6.25 |
| 22 | 29488.0 | 0.001 | 0.0000 | 6.33 |

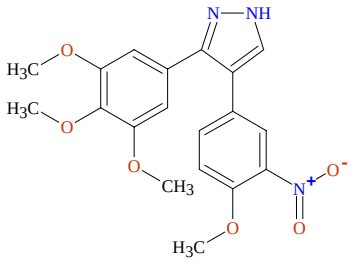
# 1f (NMR/24670091)

153.00 152.66 150.28 147.13 139.42 139.20 138.35 137.56 136.98 134.03 133.52 129.23 128.99 126.00 125.74 124.51 123.99 123.51 116.40 115.89 114.47 114.30 105.17 104.90 99.80

60.01 56.63 55.74 55.56

40.01 39.92 39.76 39.59 39.42 39.26 39.09 38.92 38.49

4.84 −0.00

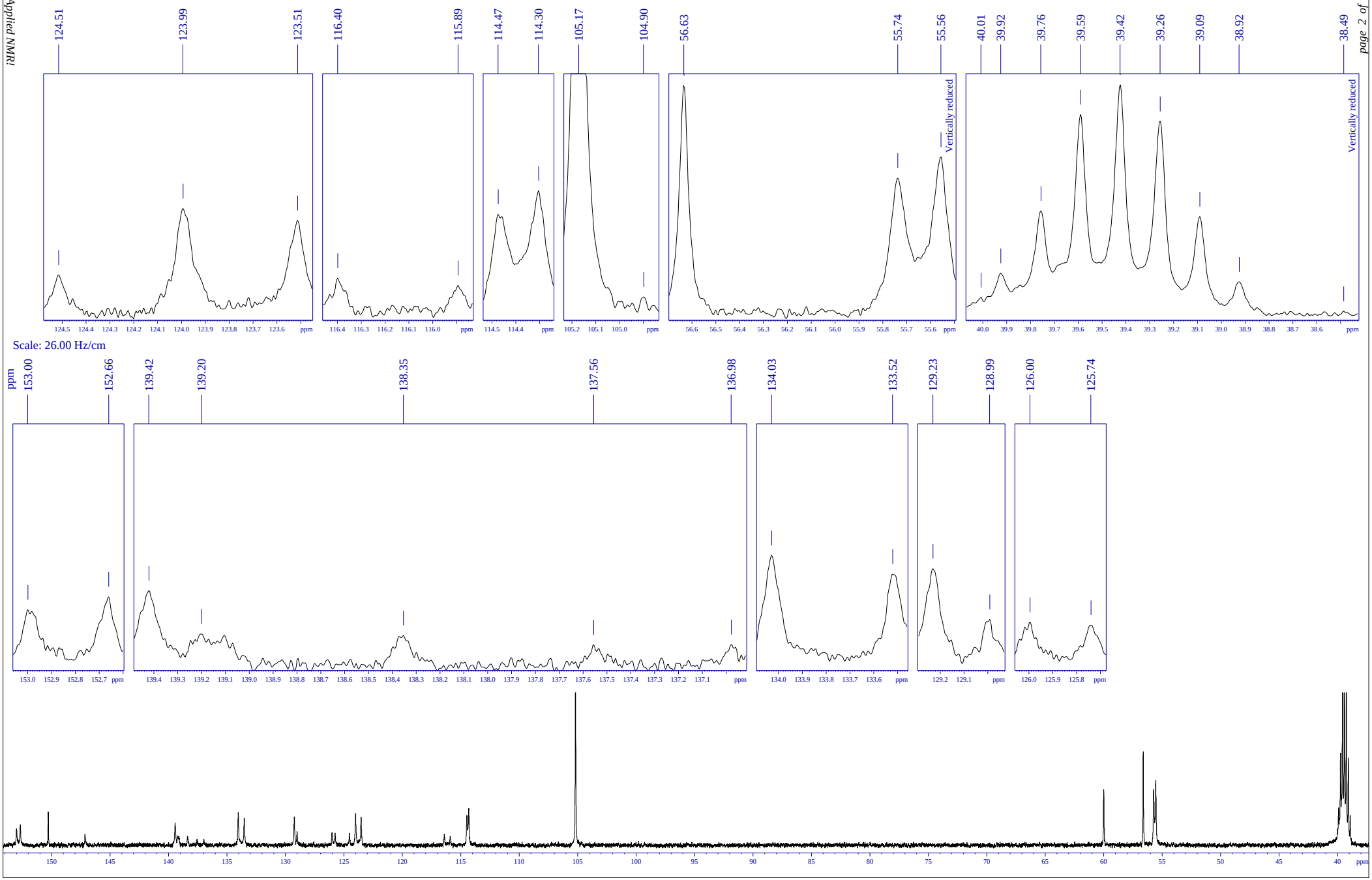





190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

# 1f (NMR/24670091)





# 1f (NMR/24670091)



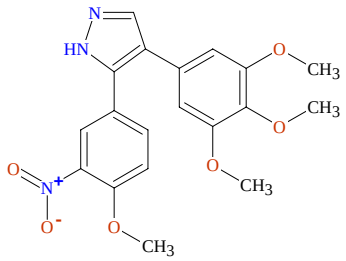
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 20158.4 | 19240.805 | 152.9988 | 1.14 |
| 2 | 20247.2 | 19198.199 | 152.6600 | 1.39 |
| 3 | 20870.3 | 18899.197 | 150.2824 | 2.30 |
| 4 | 21697.7 | 18502.193 | 147.1255 | 0.76 |
| 5 | 23717.1 | 17533.219 | 139.4205 | 1.52 |
| 6 | 23774.7 | 17505.564 | 139.2006 | 0.64 |
| 7 | 23996.7 | 17399.016 | 138.3533 | 0.61 |
| 8 | 24205.8 | 17298.701 | 137.5556 | 0.42 |
| 9 | 24357.2 | 17226.053 | 136.9780 | 0.43 |
| 10 | 25130.3 | 16855.105 | 134.0282 | 2.23 |
| 11 | 25263.3 | 16791.273 | 133.5207 | 1.85 |
| 12 | 26387.8 | 16251.709 | 129.2302 | 1.96 |
| 13 | 26450.3 | 16221.722 | 128.9917 | 0.94 |
| 14 | 27235.6 | 15844.894 | 125.9953 | 0.88 |
| 15 | 27302.6 | 15812.738 | 125.7396 | 0.82 |
| 16 | 27623.6 | 15658.703 | 124.5147 | 0.82 |
| 17 | 27760.3 | 15593.132 | 123.9933 | 2.16 |
| 18 | 27886.1 | 15532.752 | 123.5132 | 1.92 |
| 19 | 29750.8 | 14638.020 | 116.3984 | 0.76 |
| 20 | 29883.0 | 14574.559 | 115.8938 | 0.61 |
| 21 | 30255.2 | 14395.966 | 114.4737 | 2.05 |
| 22 | 30299.7 | 14374.639 | 114.3041 | 2.53 |
| 23 | 32693.4 | 13226.041 | 105.1707 | 12.94 |
| 24 | 32764.7 | 13191.854 | 104.8988 | 0.38 |
| 25 | 34100.3 | 12550.973 | 99.8027 | 0.27 |
| 26 | 44528.3 | 7547.224 | 60.0139 | 3.83 |
| 27 | 45414.3 | 7122.074 | 56.6332 | 6.45 |
| 28 | 45649.2 | 7009.386 | 55.7372 | 3.84 |
| 29 | 45696.6 | 6986.629 | 55.5562 | 4.44 |
| 30 | 49771.7 | 5031.263 | 40.0075 | 1.09 |
| 31 | 49793.4 | 5020.838 | 39.9246 | 2.57 |
| 32 | 49837.6 | 4999.646 | 39.7561 | 6.36 |
| 33 | 49881.2 | 4978.727 | 39.5898 | 12.19 |
| 34 | 49924.7 | 4957.831 | 39.4236 | 14.00 |
| 35 | 49968.6 | 4936.790 | 39.2563 | 11.81 |
| 36 | 50012.2 | 4915.875 | 39.0900 | 6.01 |
| 37 | 50055.5 | 4895.091 | 38.9247 | 2.05 |
| 38 | 50170.3 | 4840.003 | 38.4867 | 0.26 |
| 39 | 58989.1 | 608.428 | 4.8381 | 0.26 |
| 40 | 60257.1 | −0.006 | −0.0000 | 0.55 |

*The Best Applied NMR!*

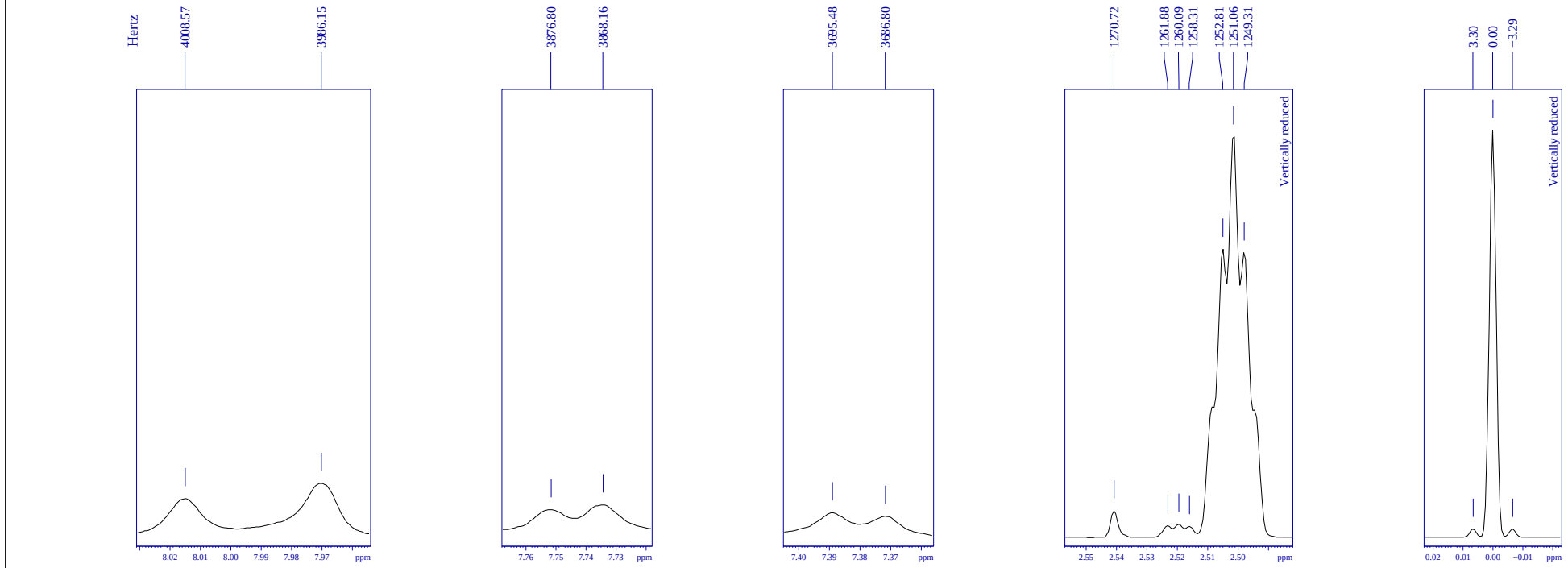
# 1g (NMR/25267266)

Found protons = 35 impurity* = 3.6 %

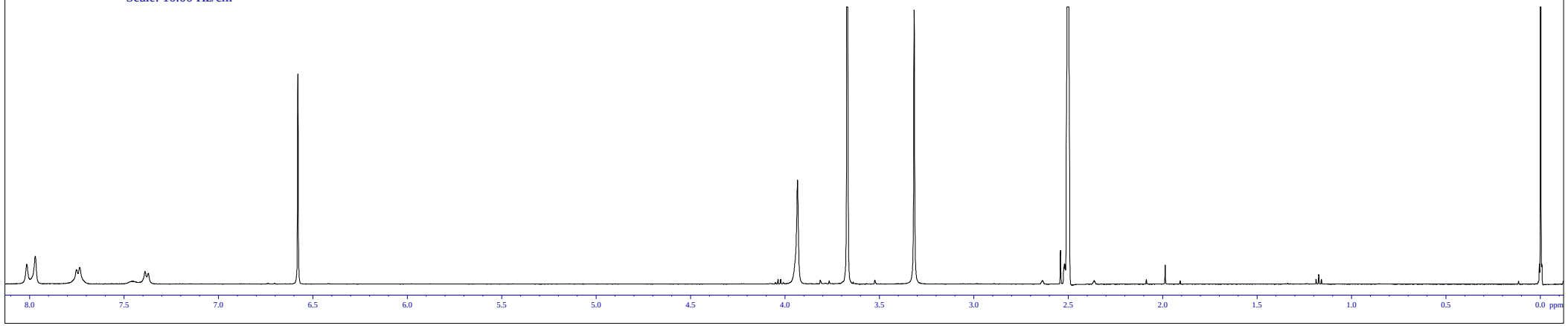


# 1g (NMR/25267266)






Scale: 10.00 Hz/cm



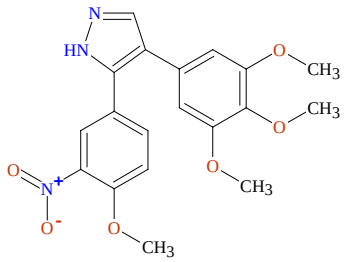
# 1g (NMR/25267266)



Peaks List

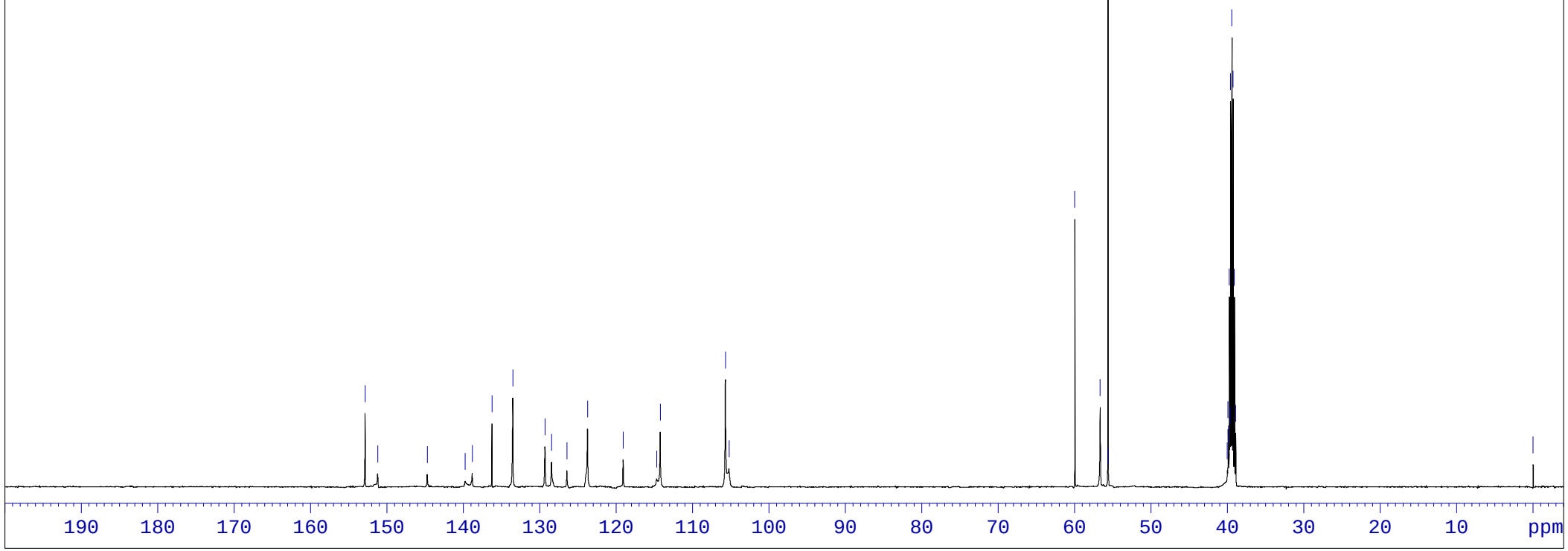
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 7919.4 | 6579.180 | 13.1549 | 0.47 |
| 2 | 16342.7 | 4008.566 | 8.0150 | 0.67 |
| 3 | 16416.2 | 3986.151 | 7.9702 | 0.93 |
| 4 | 16774.5 | 3876.796 | 7.7516 | 0.48 |
| 5 | 16802.8 | 3868.162 | 7.7343 | 0.56 |
| 6 | 17368.7 | 3695.480 | 7.3890 | 0.42 |
| 7 | 17397.1 | 3686.804 | 7.3717 | 0.36 |
| 8 | 18695.6 | 3290.519 | 6.5793 | 7.93 |
| 9 | 23032.1 | 1967.130 | 3.9332 | 3.56 |
| 10 | 23462.2 | 1835.864 | 3.6708 | 28.05 |
| 11 | 24044.3 | 1658.235 | 3.3156 | 10.03 |
| 12 | 25314.1 | 1270.719 | 2.5408 | 1.34 |
| 13 | 25343.1 | 1261.881 | 2.5231 | 0.58 |
| 14 | 25349.0 | 1260.085 | 2.5195 | 0.66 |
| 15 | 25354.8 | 1258.313 | 2.5160 | 0.54 |
| 16 | 25372.8 | 1252.812 | 2.5050 | 14.51 |
| 17 | 25378.5 | 1251.062 | 2.5015 | 20.44 |
| 18 | 25384.3 | 1249.310 | 2.4980 | 14.35 |
| 19 | 26219.4 | 994.458 | 1.9884 | 0.78 |
| 20 | 27552.5 | 587.622 | 1.1749 | 0.40 |
| 21 | 29467.2 | 3.296 | 0.0066 | 0.54 |
| 22 | 29478.0 | 0.002 | 0.0000 | 27.21 |
| 23 | 29488.8 | −3.292 | −0.0066 | 0.54 |

# 1g (NMR/25267266)



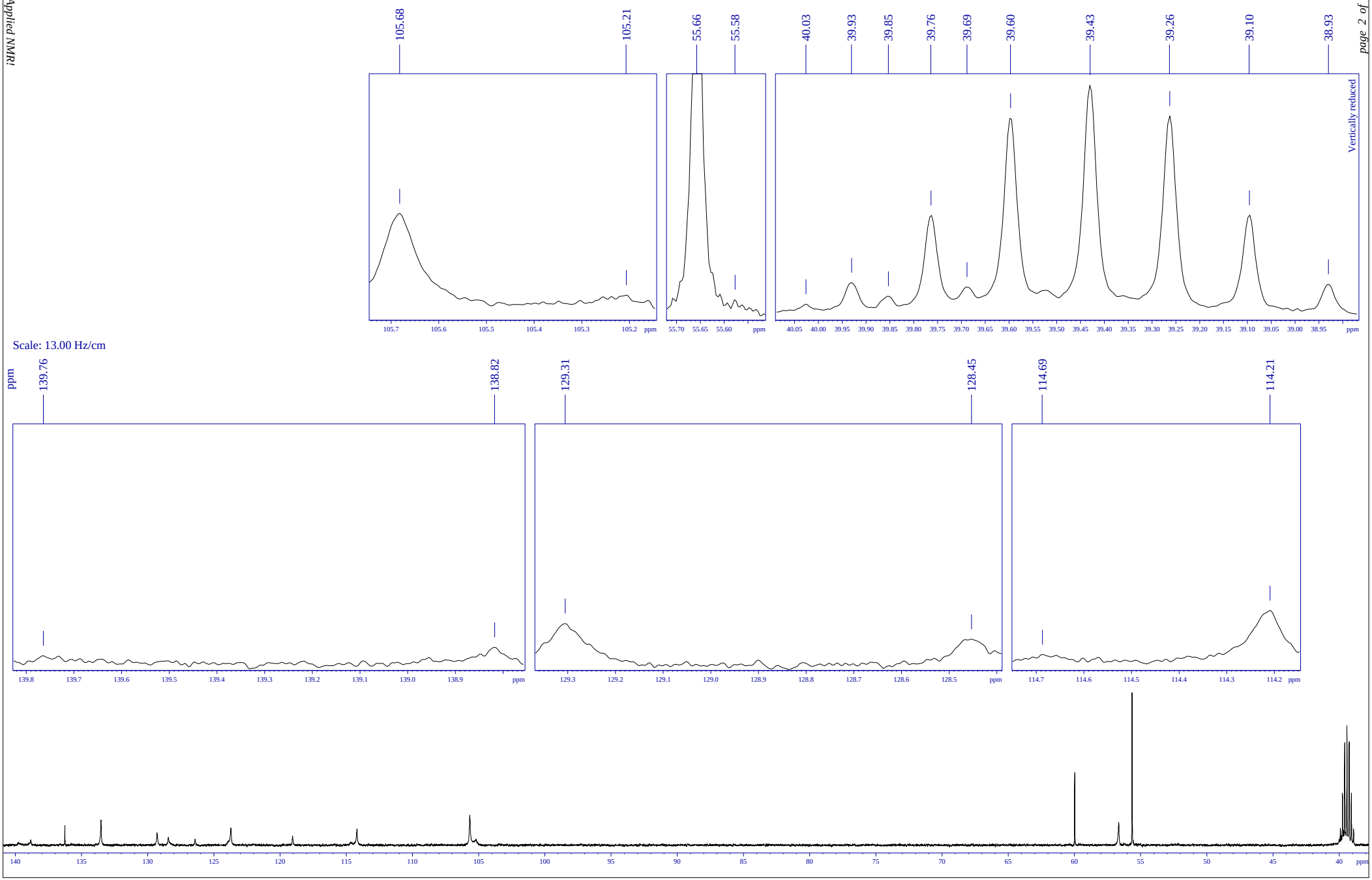

152.84 151.20 144.71 139.76 138.82 136.24 133.51 129.31 128.45 126.44 123.73 119.08 114.69 114.21 105.68 105.21 59.99 56.67 55.66 55.58 40.03 39.93 39.85 39.76 39.69 39.60 39.43 39.26 39.10 38.93 0.00





# 1g (NMR/25267266)





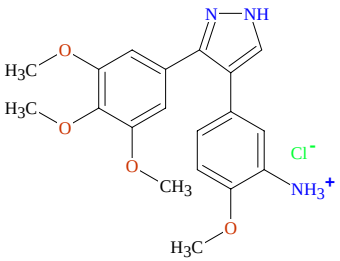
# 1g (NMR/25267266)



Peaks List

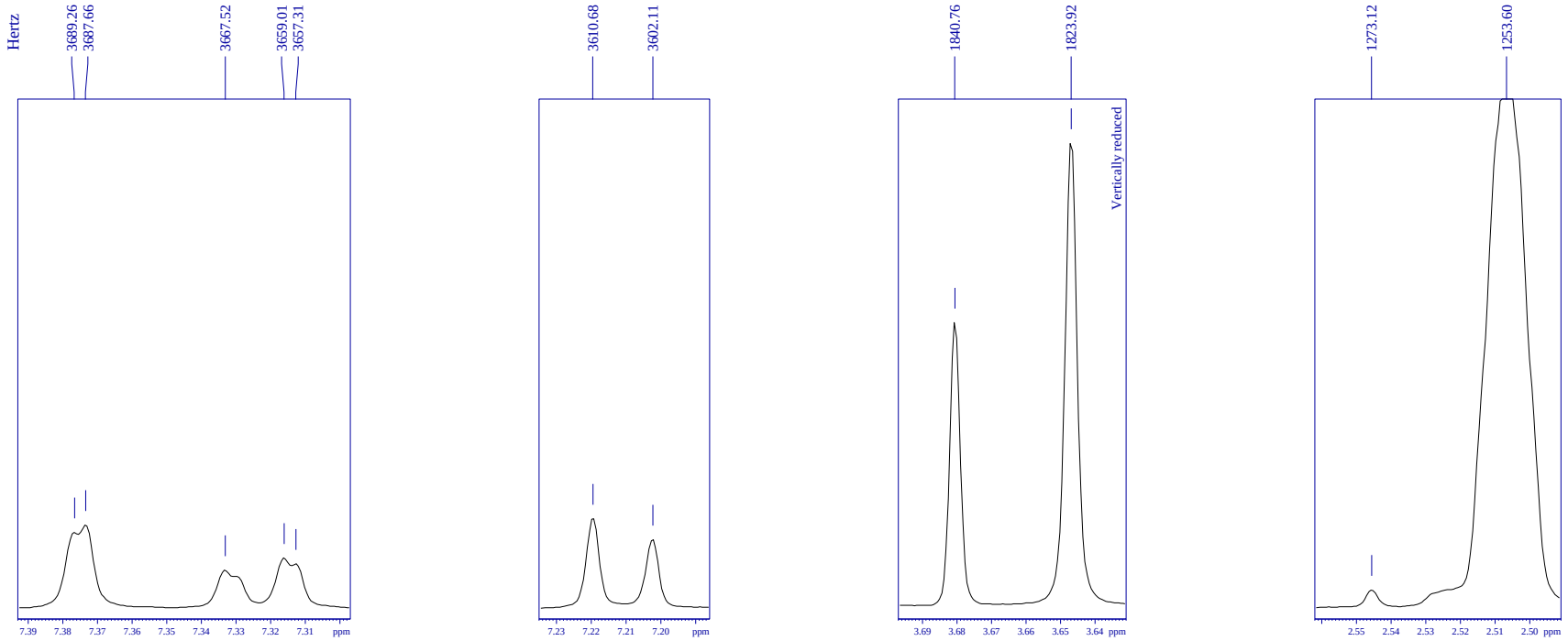
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 20198.5 | 19221.127 | 152.8423 | 1.47 |
| 2 | 20630.1 | 19014.014 | 151.1954 | 0.34 |
| 3 | 22330.2 | 18198.254 | 144.7087 | 0.36 |
| 4 | 23626.1 | 17576.428 | 139.7641 | 0.20 |
| 5 | 23874.2 | 17457.400 | 138.8176 | 0.37 |
| 6 | 24549.8 | 17133.213 | 136.2397 | 1.37 |
| 7 | 25264.8 | 16790.137 | 133.5116 | 1.73 |
| 8 | 26367.2 | 16261.165 | 129.3054 | 0.85 |
| 9 | 26590.6 | 16153.982 | 128.4531 | 0.54 |
| 10 | 27119.3 | 15900.269 | 126.4356 | 0.42 |
| 11 | 27829.3 | 15559.577 | 123.7265 | 1.18 |
| 12 | 29048.2 | 14974.734 | 119.0759 | 0.63 |
| 13 | 30198.4 | 14422.787 | 114.6870 | 0.23 |
| 14 | 30323.7 | 14362.688 | 114.2091 | 1.12 |
| 15 | 32558.5 | 13290.342 | 105.6820 | 2.07 |
| 16 | 32683.1 | 13230.547 | 105.2065 | 0.41 |
| 17 | 44533.2 | 7544.438 | 59.9918 | 5.03 |
| 18 | 45404.6 | 7126.336 | 56.6671 | 1.56 |
| 19 | 45669.1 | 6999.391 | 55.6577 | 14.00 |
| 20 | 45690.2 | 6989.256 | 55.5771 | 0.33 |
| 21 | 49766.0 | 5033.583 | 40.0260 | 0.40 |
| 22 | 49791.0 | 5021.550 | 39.9303 | 1.17 |
| 23 | 49811.3 | 5011.842 | 39.8531 | 0.69 |
| 24 | 49834.7 | 5000.592 | 39.7637 | 3.58 |
| 25 | 49854.5 | 4991.108 | 39.6882 | 1.02 |
| 26 | 49878.4 | 4979.615 | 39.5968 | 7.10 |
| 27 | 49922.2 | 4958.616 | 39.4299 | 8.23 |
| 28 | 49966.0 | 4937.618 | 39.2629 | 7.11 |
| 29 | 50009.8 | 4916.585 | 39.0957 | 3.58 |
| 30 | 50053.2 | 4895.748 | 38.9300 | 1.12 |
| 31 | 60256.2 | 0.005 | 0.0000 | 0.60 |

# 1h (NMR/24670093)



# 1h (NMR/24670093)





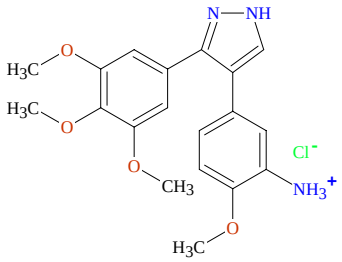
# 1h (NMR/24670093)



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 16750.2 | 3887.576 | 7.7731 | 0.42 |
| 2 | 17400.0 | 3689.261 | 7.3766 | 1.14 |
| 3 | 17405.3 | 3687.665 | 7.3734 | 1.25 |
| 4 | 17471.3 | 3667.523 | 7.3331 | 0.58 |
| 5 | 17499.2 | 3659.010 | 7.3161 | 0.76 |
| 6 | 17504.7 | 3657.311 | 7.3127 | 0.67 |
| 7 | 17657.5 | 3610.677 | 7.2195 | 1.36 |
| 8 | 17685.6 | 3602.111 | 7.2023 | 1.04 |
| 9 | 18478.7 | 3360.078 | 6.7184 | 4.40 |
| 10 | 20053.8 | 2879.406 | 5.7573 | 1.06 |
| 11 | 23103.9 | 1948.586 | 3.8962 | 8.01 |
| 12 | 23457.2 | 1840.760 | 3.6806 | 9.77 |
| 13 | 23512.4 | 1823.920 | 3.6469 | 16.00 |
| 14 | 25317.2 | 1273.121 | 2.5456 | 0.28 |
| 15 | 25381.2 | 1253.601 | 2.5066 | 8.89 |
| 16 | 29489.0 | 0.001 | 0.0000 | 3.93 |

# 1h (NMR/24670093)




152.87 152.74 150.92 137.04 134.09 129.12 126.69 126.14 123.82 120.53 117.28 112.56 104.79 60.02 59.96 56.16 55.93 55.65 40.68 40.05 39.88 39.71 39.55 39.38 39.21 39.05 38.76 0.00

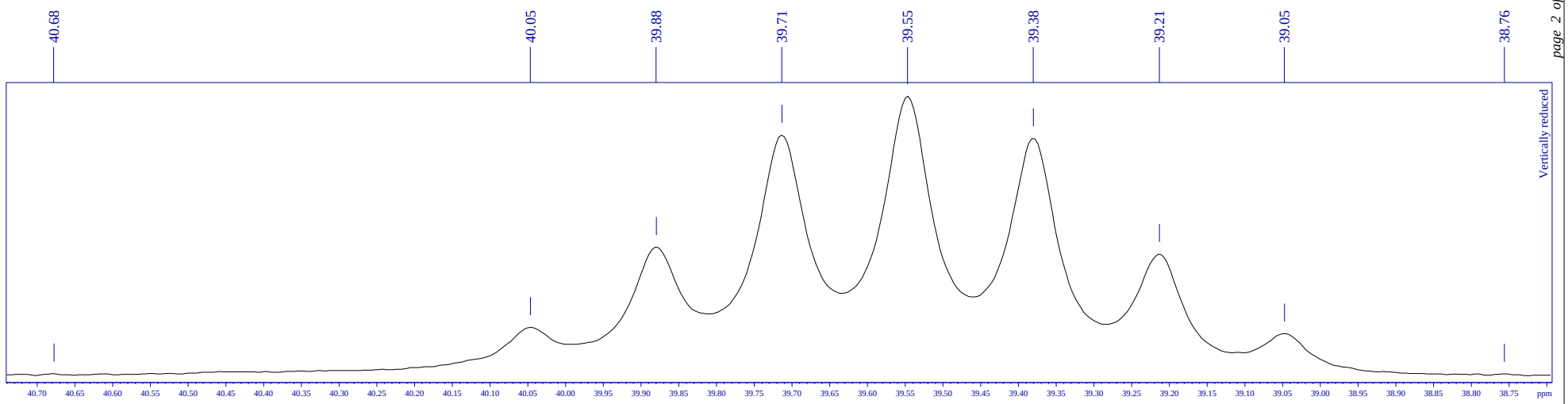


190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

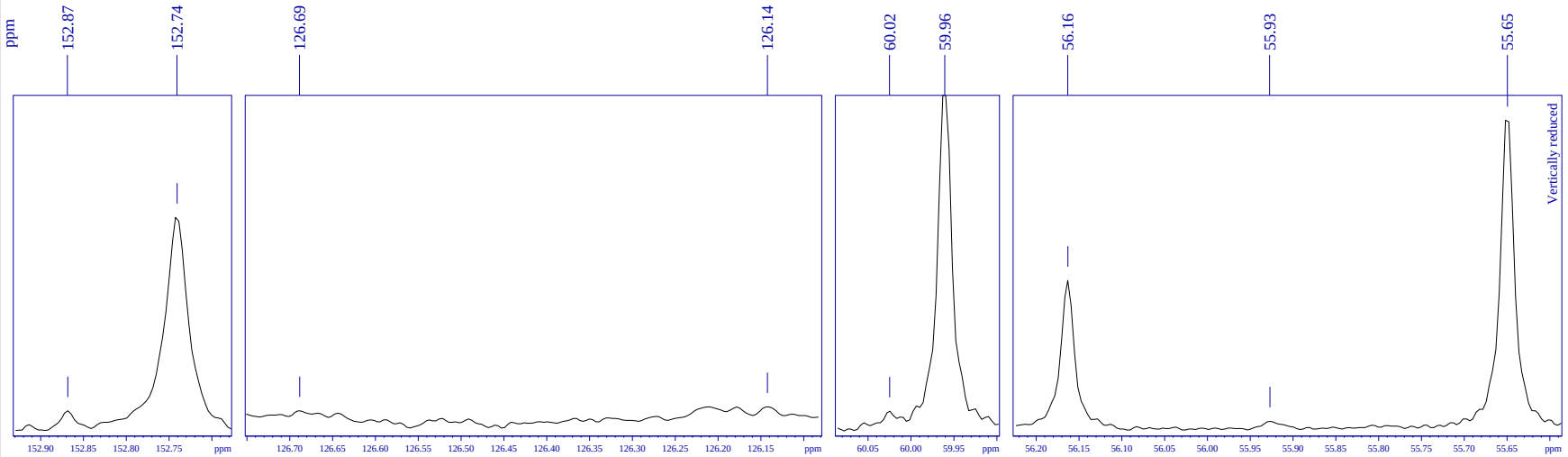
*The Best Applied NMR!*

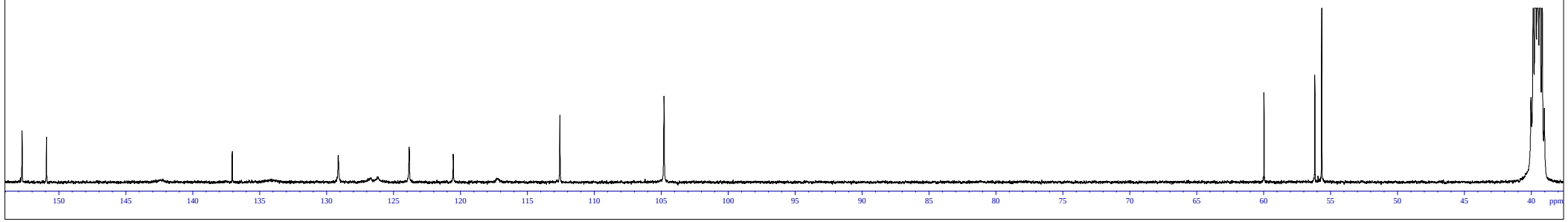
# 1h (NMR/24670093)






Scale: 10.00 Hz/cm



# 1h (NMR/24670093)



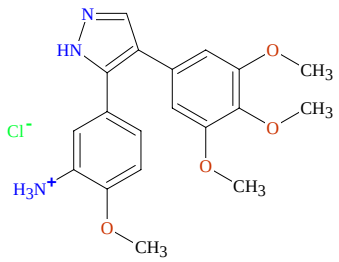
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 20184.9 | 19224.387 | 152.8683 | 0.27 |
| 2 | 20218.4 | 19208.334 | 152.7406 | 3.13 |
| 3 | 20696.6 | 18978.875 | 150.9160 | 2.77 |
| 4 | 24333.0 | 17233.988 | 137.0410 | 1.86 |
| 5 | 25106.0 | 16863.076 | 134.0916 | 0.20 |
| 6 | 26409.8 | 16237.440 | 129.1167 | 1.60 |
| 7 | 27046.3 | 15932.060 | 126.6884 | 0.27 |
| 8 | 27189.4 | 15863.393 | 126.1424 | 0.33 |
| 9 | 27797.2 | 15571.724 | 123.8231 | 2.12 |
| 10 | 28659.9 | 15157.800 | 120.5316 | 1.69 |
| 11 | 29511.0 | 14749.405 | 117.2842 | 0.25 |
| 12 | 30749.1 | 14155.306 | 112.5600 | 4.05 |
| 13 | 32786.6 | 13177.646 | 104.7859 | 5.20 |
| 14 | 44517.8 | 7548.594 | 60.0248 | 0.27 |
| 15 | 44534.7 | 7540.487 | 59.9604 | 5.48 |
| 16 | 45529.9 | 7062.941 | 56.1630 | 6.47 |
| 17 | 45591.8 | 7033.261 | 55.9270 | 0.37 |
| 18 | 45664.5 | 6998.366 | 55.6495 | 13.80 |
| 19 | 49588.4 | 5115.545 | 40.6777 | 0.32 |
| 20 | 49753.8 | 5036.151 | 40.0464 | 5.12 |
| 21 | 49797.5 | 5015.186 | 39.8797 | 13.42 |
| 22 | 49841.1 | 4994.263 | 39.7133 | 24.99 |
| 23 | 49884.8 | 4973.315 | 39.5468 | 29.00 |
| 24 | 49928.4 | 4952.365 | 39.3802 | 24.67 |
| 25 | 49972.2 | 4931.363 | 39.2132 | 12.69 |
| 26 | 50015.6 | 4910.534 | 39.0475 | 4.46 |
| 27 | 50092.0 | 4873.897 | 38.7562 | 0.29 |
| 28 | 60249.4 | 0.007 | 0.0001 | 0.77 |

*The Best Applied NMR!*

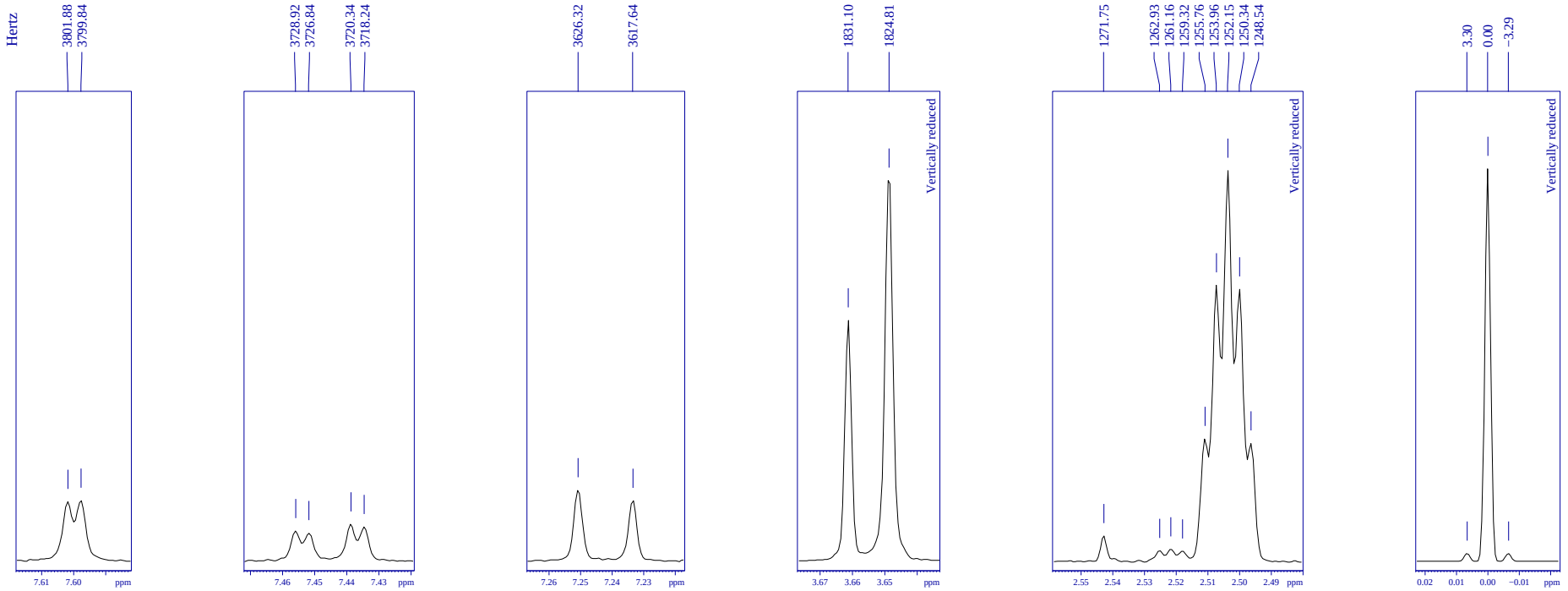
# 1i (NMR/25267265)

Found protons = 23 impurity* = 0.4 %

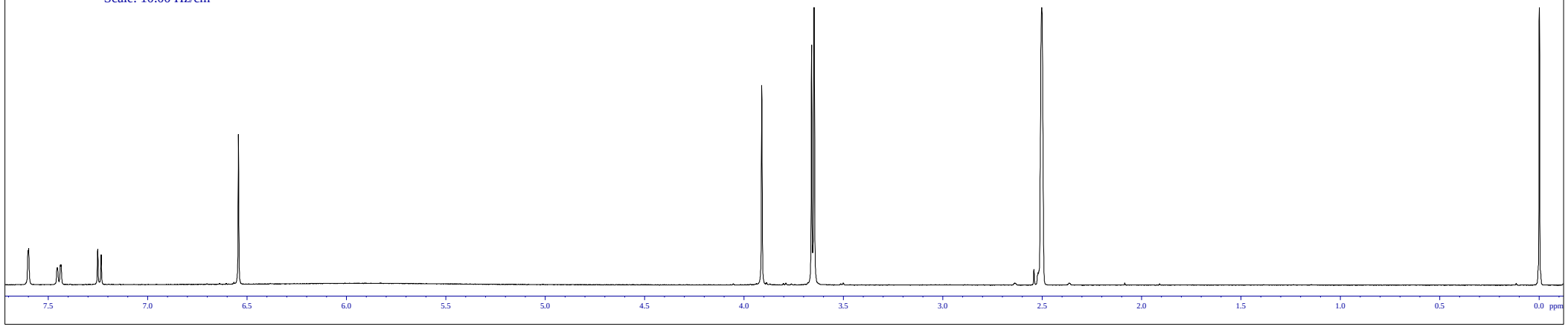


# 1i (NMR/25267265)






Scale: 10.00 Hz/cm



# 1i (NMR/25267265)

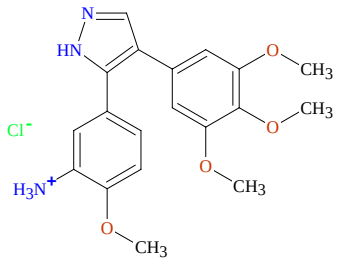


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 16455.6 | 3975.027 | 7.9480 | 2.70 |
| 2 | 17023.0 | 3801.875 | 7.6018 | 1.06 |
| 3 | 17029.7 | 3799.840 | 7.5977 | 1.09 |
| 4 | 17262.1 | 3728.917 | 7.4559 | 0.54 |
| 5 | 17268.9 | 3726.845 | 7.4518 | 0.51 |
| 6 | 17290.2 | 3720.340 | 7.4387 | 0.66 |
| 7 | 17297.1 | 3718.243 | 7.4346 | 0.61 |
| 8 | 17598.3 | 3626.320 | 7.2508 | 1.28 |
| 9 | 17626.7 | 3617.643 | 7.2334 | 1.09 |
| 10 | 18755.1 | 3273.288 | 6.5449 | 5.97 |
| 11 | 23070.1 | 1956.441 | 3.9119 | 7.40 |
| 12 | 23480.9 | 1831.101 | 3.6613 | 9.88 |
| 13 | 23501.5 | 1824.809 | 3.6487 | 16.00 |
| 14 | 25313.7 | 1271.748 | 2.5428 | 0.69 |
| 15 | 25342.6 | 1262.927 | 2.5252 | 0.28 |
| 16 | 25348.4 | 1261.161 | 2.5217 | 0.33 |
| 17 | 25354.5 | 1259.315 | 2.5180 | 0.27 |
| 18 | 25366.1 | 1255.757 | 2.5109 | 3.30 |
| 19 | 25372.0 | 1253.963 | 2.5073 | 7.42 |
| 20 | 25377.9 | 1252.154 | 2.5037 | 10.50 |
| 21 | 25383.9 | 1250.340 | 2.5000 | 7.32 |
| 22 | 25389.8 | 1248.539 | 2.4964 | 3.18 |
| 23 | 29470.2 | 3.297 | 0.0066 | 0.31 |
| 24 | 29481.0 | 0.001 | 0.0000 | 15.56 |
| 25 | 29491.8 | −3.295 | −0.0066 | 0.31 |

# 1i (NMR/25267265)

152.75 151.81 142.90 136.01 132.24 128.91 128.40 125.29 123.56 120.35 118.72 112.53 112.28 105.21 86.31 59.94 56.18 55.64 39.89 39.81 39.72 39.64 39.55 39.39 39.22 39.05 38.89 33.77 −0.00

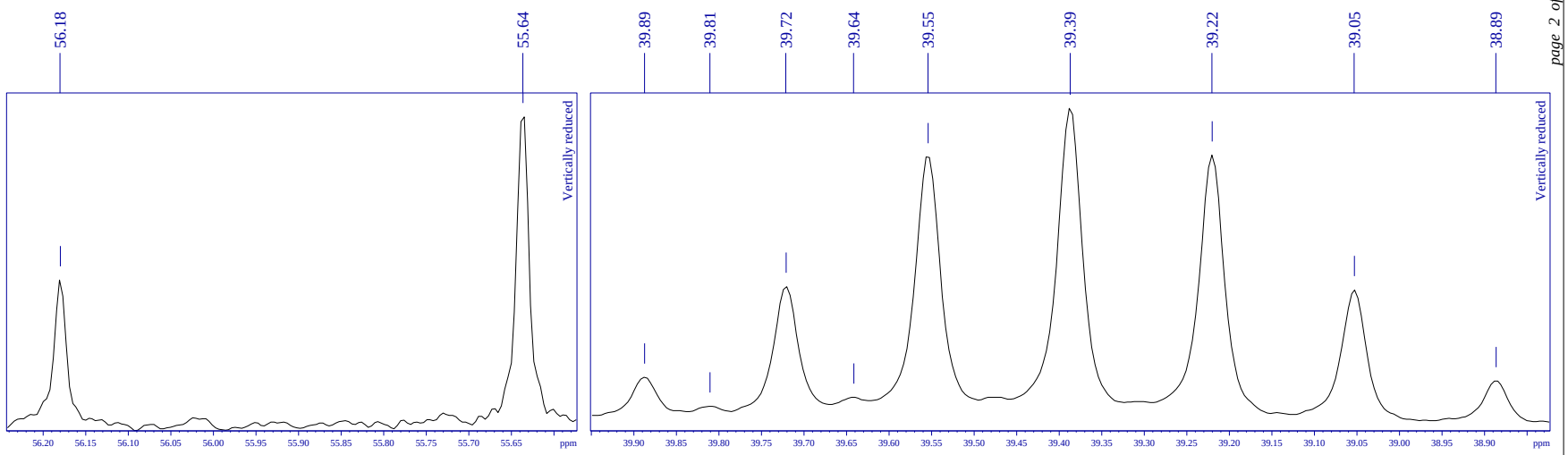




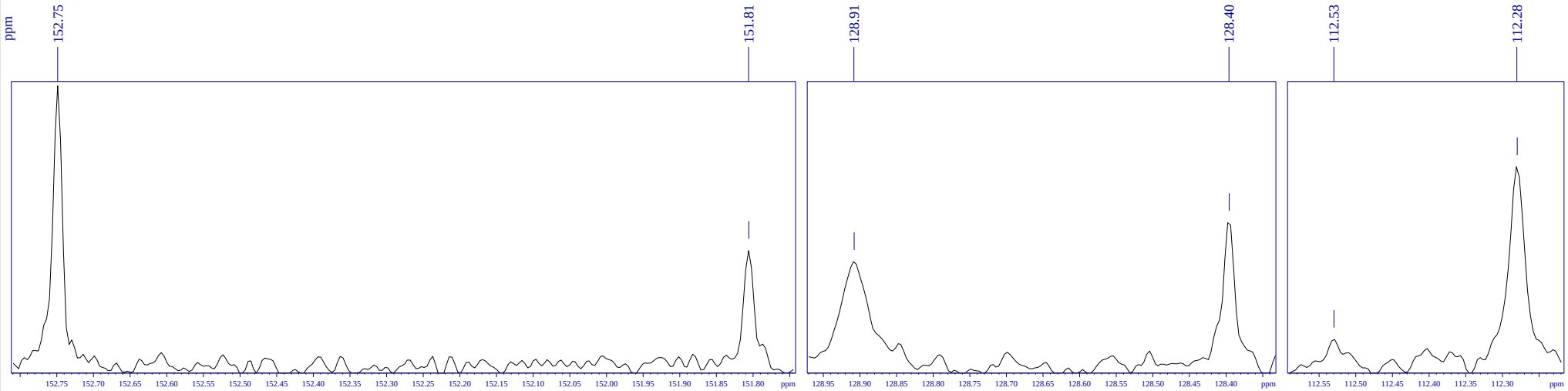

190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

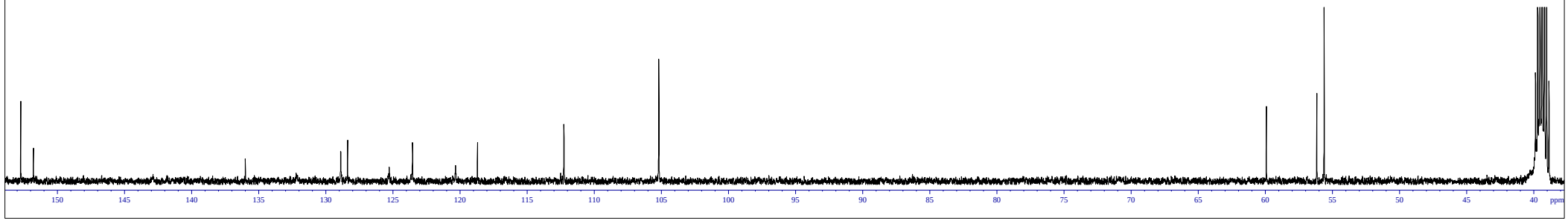
# 1i (NMR/25267265)






Scale: 10.00 Hz/cm



# 1i (NMR/25267265)



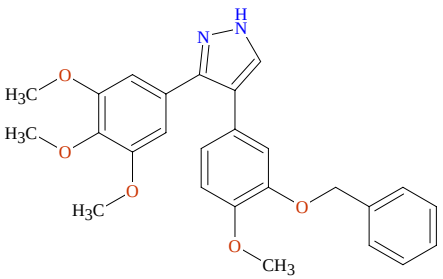
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 20213.0 | 19209.316 | 152.7484 | 4.81 |
| 2 | 20460.0 | 19090.768 | 151.8058 | 2.00 |
| 3 | 22794.2 | 17970.768 | 142.8997 | 0.41 |
| 4 | 24598.9 | 17104.787 | 136.0137 | 1.36 |
| 5 | 25589.2 | 16629.598 | 132.2350 | 0.49 |
| 6 | 26461.2 | 16211.182 | 128.9079 | 1.81 |
| 7 | 26595.4 | 16146.775 | 128.3958 | 2.54 |
| 8 | 27408.4 | 15756.682 | 125.2938 | 0.84 |
| 9 | 27862.5 | 15538.809 | 123.5613 | 2.34 |
| 10 | 28703.1 | 15135.438 | 120.3538 | 0.95 |
| 11 | 29130.9 | 14930.145 | 118.7214 | 2.33 |
| 12 | 30753.7 | 14151.495 | 112.5297 | 0.48 |
| 13 | 30819.2 | 14120.066 | 112.2798 | 3.43 |
| 14 | 32672.7 | 13230.683 | 105.2076 | 7.41 |
| 15 | 37624.8 | 10854.501 | 86.3127 | 0.41 |
| 16 | 44536.4 | 7538.042 | 59.9409 | 4.63 |
| 17 | 45522.2 | 7065.050 | 56.1798 | 5.31 |
| 18 | 45664.6 | 6996.721 | 55.6364 | 11.60 |
| 19 | 49792.1 | 5016.154 | 39.8874 | 6.53 |
| 20 | 49812.3 | 5006.486 | 39.8105 | 2.51 |
| 21 | 49835.7 | 4995.232 | 39.7210 | 19.19 |
| 22 | 49856.6 | 4985.212 | 39.6414 | 3.75 |
| 23 | 49879.5 | 4974.245 | 39.5541 | 37.48 |
| 24 | 49923.3 | 4953.232 | 39.3871 | 44.00 |
| 25 | 49967.0 | 4932.245 | 39.2202 | 37.37 |
| 26 | 50010.8 | 4911.216 | 39.0530 | 18.70 |
| 27 | 50054.5 | 4890.267 | 38.8864 | 6.09 |
| 28 | 51396.4 | 4246.396 | 33.7664 | 0.44 |
| 29 | 60246.0 | −0.004 | −0.0000 | 1.57 |

*The Best Applied NMR!*

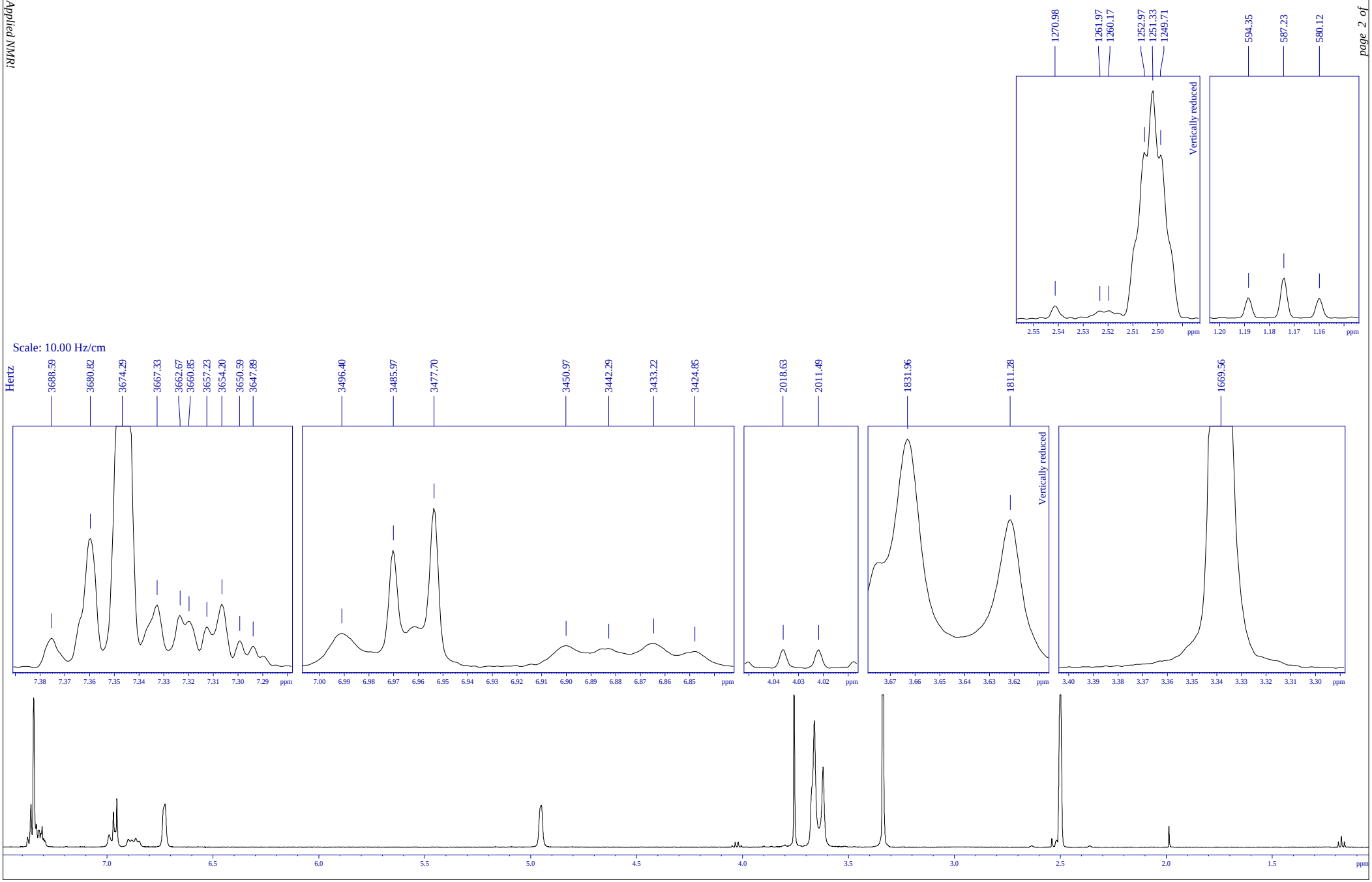
# 1j (NMR/24267676)

Found protons = 24 impurity* = 9.1 %



# 1j (NMR/24267676)





1j (NMR/24267676)

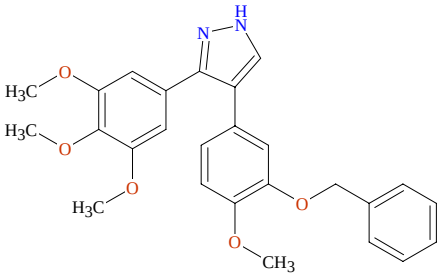
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 7994.7 | 6556.494 | 13.1096 | 0.59 |
| 2 | 8261.4 | 6475.107 | 12.9468 | 0.69 |
| 3 | 16563.9 | 3941.379 | 7.8807 | 0.71 |
| 4 | 16968.5 | 3817.906 | 7.6338 | 0.64 |
| 5 | 17392.2 | 3688.588 | 7.3753 | 0.60 |
| 6 | 17417.7 | 3680.815 | 7.3597 | 2.64 |
| 7 | 17439.1 | 3674.286 | 7.3467 | 9.37 |
| 8 | 17461.9 | 3667.326 | 7.3327 | 1.28 |
| 9 | 17477.2 | 3662.669 | 7.3234 | 1.07 |
| 10 | 17483.1 | 3660.851 | 7.3198 | 0.95 |
| 11 | 17495.0 | 3657.229 | 7.3126 | 0.84 |
| 12 | 17504.9 | 3654.195 | 7.3065 | 1.30 |
| 13 | 17516.8 | 3650.586 | 7.2993 | 0.55 |
| 14 | 17525.6 | 3647.886 | 7.2939 | 0.44 |
| 15 | 18022.0 | 3496.404 | 6.9910 | 0.70 |
| 16 | 18056.2 | 3485.972 | 6.9701 | 2.40 |
| 17 | 18083.3 | 3477.695 | 6.9536 | 3.27 |
| 18 | 18170.9 | 3450.968 | 6.9001 | 0.45 |
| 19 | 18199.3 | 3442.293 | 6.8828 | 0.39 |
| 20 | 18229.0 | 3433.217 | 6.8646 | 0.50 |
| 21 | 18256.5 | 3424.851 | 6.8479 | 0.34 |
| 22 | 18456.1 | 3363.923 | 6.7261 | 2.40 |
| 23 | 21366.9 | 2475.620 | 4.9500 | 2.32 |
| 24 | 22864.4 | 2018.630 | 4.0362 | 0.37 |
| 25 | 22887.8 | 2011.489 | 4.0219 | 0.37 |
| 26 | 23319.4 | 1879.757 | 3.7585 | 16.90 |
| 27 | 23476.0 | 1831.963 | 3.6630 | 7.27 |
| 28 | 23543.8 | 1811.278 | 3.6216 | 4.71 |
| 29 | 23926.3 | 1694.559 | 3.3882 | -0.26 |
| 30 | 23966.7 | 1682.236 | 3.3636 | 0.33 |
| 31 | 23974.0 | 1680.002 | 3.3591 | 0.27 |
| 32 | 24008.0 | 1669.628 | 3.3384 | 64.27 |
| 33 | 24013.8 | 1667.837 | 3.3348 | -7.41 |
| 34 | 24017.3 | 1666.785 | 3.3327 | 1.16 |
| 35 | 24020.1 | 1665.913 | 3.3310 | -0.37 |
| 36 | 24052.0 | 1656.203 | 3.3115 | 0.23 |
| 37 | 24064.2 | 1652.463 | 3.3041 | -0.24 |
| 38 | 25314.2 | 1270.984 | 2.5413 | 0.64 |
| 39 | 25343.8 | 1261.968 | 2.5233 | 0.37 |
| 40 | 25349.7 | 1260.173 | 2.5197 | 0.38 |
| 41 | 25373.3 | 1252.974 | 2.5053 | 8.71 |
| 42 | 25378.7 | 1251.327 | 2.5020 | 11.99 |
| 43 | 25383.9 | 1249.714 | 2.4988 | 8.54 |
| 44 | 26220.3 | 994.467 | 1.9884 | 1.61 |
| 45 | 27531.4 | 594.352 | 1.1884 | 0.42 |
| 46 | 27554.8 | 587.229 | 1.1742 | 0.82 |
| 47 | 27578.1 | 580.115 | 1.1599 | 0.40 |
| 48 | 29479.0 | 0.002 | 0.0000 | 3.12 |

# 1j (NMR/24267676)

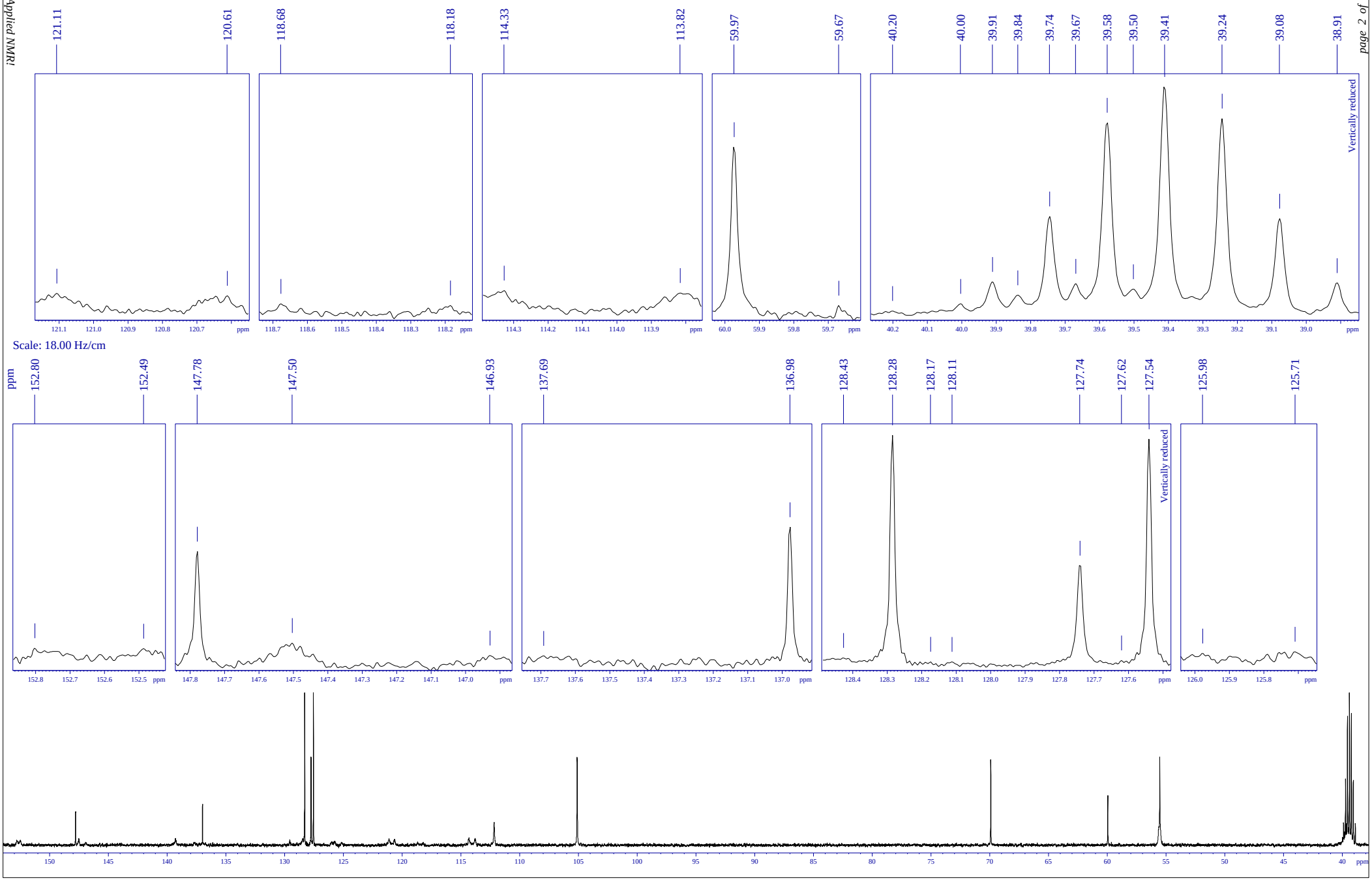
152.80 152.49 147.78 147.50 146.93 139.28 137.69 136.98 129.55 128.43 128.28 128.17 128.11 127.74 127.62 127.54 125.98 125.71 121.11 120.61 118.68 118.18 114.33 113.82 112.19 105.13

69.93 59.97 59.67 55.55 40.20 40.00 39.91 39.84 39.74 39.67 39.58 39.50 39.41 39.24 39.08 38.91 13.99 −0.00



# 1j (NMR/24267676)





# 1j (NMR/24267676)



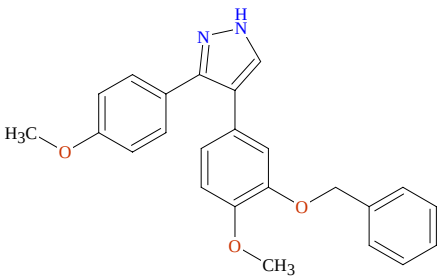
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 20203.3 | 19216.053 | 152.8020 | 0.36 |
| 2 | 20286.0 | 19176.352 | 152.4863 | 0.35 |
| 3 | 21519.7 | 18584.395 | 147.7792 | 2.34 |
| 4 | 21592.0 | 18549.701 | 147.5033 | 0.46 |
| 5 | 21742.5 | 18477.480 | 146.9290 | 0.21 |
| 6 | 23746.5 | 17515.861 | 139.2824 | 0.46 |
| 7 | 24163.4 | 17315.828 | 137.6918 | 0.20 |
| 8 | 24350.7 | 17225.977 | 136.9773 | 2.84 |
| 9 | 26297.2 | 16291.944 | 129.5501 | 0.36 |
| 10 | 26591.7 | 16150.663 | 128.4267 | 0.48 |
| 11 | 26628.9 | 16132.796 | 128.2846 | 14.00 |
| 12 | 26657.9 | 16118.901 | 128.1741 | 0.24 |
| 13 | 26674.1 | 16111.093 | 128.1120 | 0.24 |
| 14 | 26771.5 | 16064.394 | 127.7407 | 6.22 |
| 15 | 26803.0 | 16049.240 | 127.6202 | 0.32 |
| 16 | 26824.0 | 16039.196 | 127.5403 | 13.74 |
| 17 | 27233.6 | 15842.636 | 125.9773 | 0.25 |
| 18 | 27303.8 | 15808.946 | 125.7094 | 0.28 |
| 19 | 28510.2 | 15230.105 | 121.1066 | 0.45 |
| 20 | 28639.9 | 15167.866 | 120.6117 | 0.40 |
| 21 | 29147.0 | 14924.538 | 118.6768 | 0.24 |
| 22 | 29275.9 | 14862.664 | 118.1848 | 0.21 |
| 23 | 30286.9 | 14377.583 | 114.3275 | 0.51 |
| 24 | 30420.9 | 14313.266 | 113.8161 | 0.46 |
| 25 | 30846.9 | 14108.839 | 112.1905 | 1.57 |
| 26 | 32698.5 | 13220.370 | 105.1256 | 6.08 |
| 27 | 41922.5 | 8794.395 | 69.9312 | 6.01 |
| 28 | 44532.3 | 7542.091 | 59.9731 | 3.44 |
| 29 | 44612.0 | 7503.881 | 59.6693 | 0.20 |
| 30 | 45690.6 | 6986.297 | 55.5536 | 6.13 |
| 31 | 49714.3 | 5055.584 | 40.2009 | 0.21 |
| 32 | 49766.1 | 5030.717 | 40.0032 | 0.54 |
| 33 | 49790.4 | 5019.083 | 39.9107 | 1.56 |
| 34 | 49809.6 | 5009.850 | 39.8373 | 0.93 |
| 35 | 49833.9 | 4998.223 | 39.7448 | 4.56 |
| 36 | 49853.8 | 4988.681 | 39.6689 | 1.47 |
| 37 | 49877.6 | 4977.219 | 39.5778 | 8.92 |
| 38 | 49897.6 | 4967.660 | 39.5018 | 1.22 |
| 39 | 49921.4 | 4956.241 | 39.4110 | 10.57 |
| 40 | 49965.1 | 4935.260 | 39.2441 | 9.06 |
| 41 | 50008.9 | 4914.239 | 39.0770 | 4.46 |
| 42 | 50052.6 | 4893.276 | 38.9103 | 1.50 |
| 43 | 56585.1 | 1758.752 | 13.9852 | 0.23 |
| 44 | 60250.4 | −0.005 | −0.0000 | 0.63 |

*The Best Applied NMR!*

# 1k (NMR/24267675)

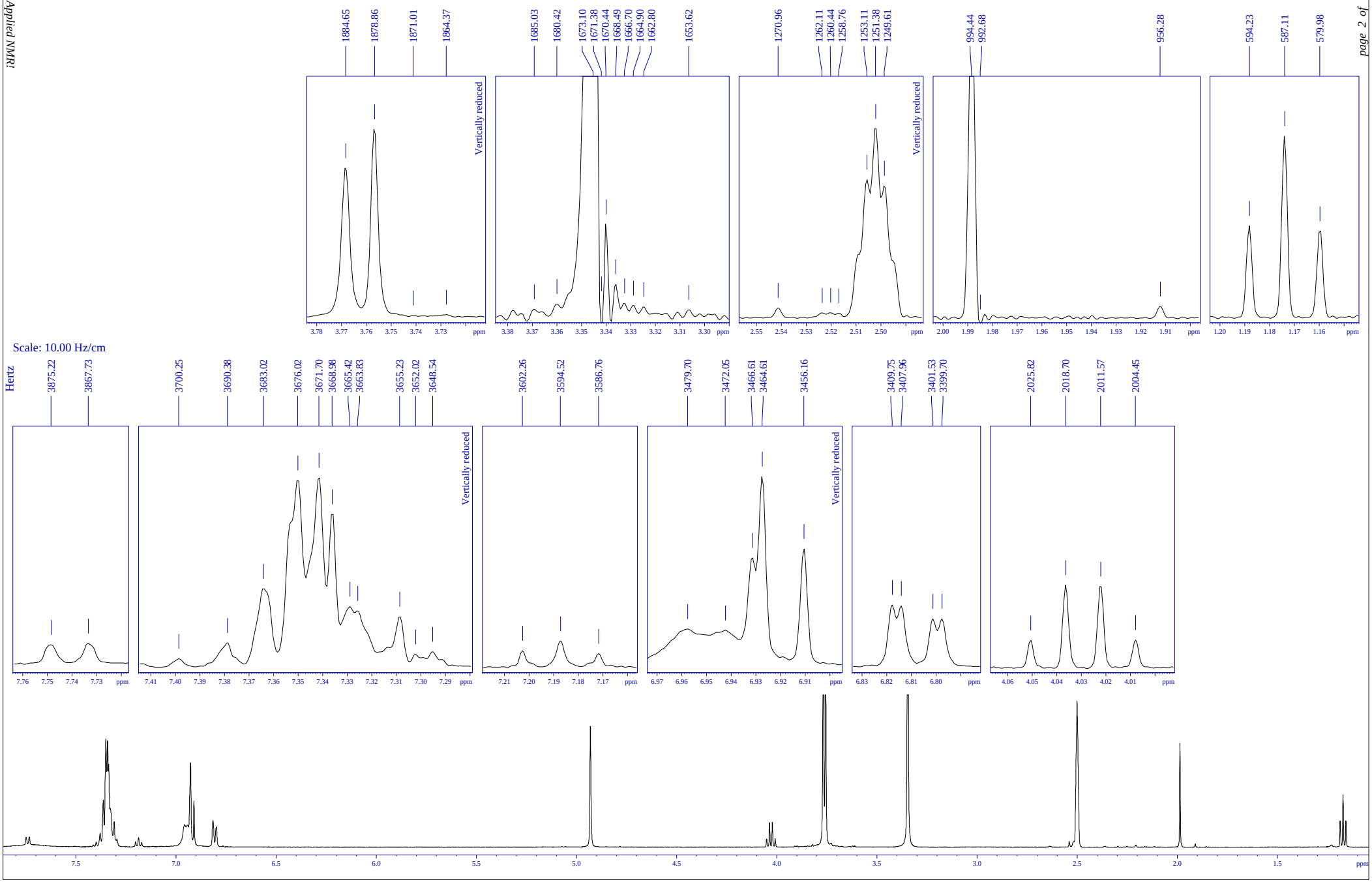
Found protons = 25 impurity* < 0.1 %



*The Best Applied NMR!*

# 1k (NMR/24267675)





1k (NMR/24267675)

Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 16780.7 | 3875.225 | 7.7484 | 0.56 |
| 2 | 16805.2 | 3867.729 | 7.7334 | 0.59 |
| 3 | 17354.0 | 3700.249 | 7.3986 | 0.30 |
| 4 | 17386.4 | 3690.382 | 7.3788 | 0.82 |
| 5 | 17410.5 | 3683.018 | 7.3641 | 2.60 |
| 6 | 17433.4 | 3676.017 | 7.3501 | 6.14 |
| 7 | 17447.6 | 3671.704 | 7.3415 | 6.24 |
| 8 | 17456.5 | 3668.982 | 7.3361 | 5.09 |
| 9 | 17468.2 | 3665.423 | 7.3289 | 1.99 |
| 10 | 17473.4 | 3663.827 | 7.3257 | 1.86 |
| 11 | 17501.6 | 3655.226 | 7.3086 | 1.69 |
| 12 | 17512.1 | 3652.023 | 7.3021 | 0.44 |
| 13 | 17523.5 | 3648.540 | 7.2952 | 0.53 |
| 14 | 17675.1 | 3602.258 | 7.2026 | 0.42 |
| 15 | 17700.5 | 3594.521 | 7.1872 | 0.66 |
| 16 | 17725.9 | 3586.765 | 7.1717 | 0.34 |
| 17 | 18076.7 | 3479.696 | 6.9576 | 1.13 |
| 18 | 18101.8 | 3472.051 | 6.9423 | 1.09 |
| 19 | 18119.6 | 3466.611 | 6.9314 | 3.21 |
| 20 | 18126.2 | 3464.607 | 6.9274 | 5.56 |
| 21 | 18153.9 | 3456.156 | 6.9105 | 3.45 |
| 22 | 18305.9 | 3409.752 | 6.8177 | 1.54 |
| 23 | 18311.8 | 3407.958 | 6.8141 | 1.51 |
| 24 | 18332.9 | 3401.527 | 6.8013 | 1.19 |
| 25 | 18338.9 | 3399.702 | 6.7976 | 1.20 |
| 26 | 21398.3 | 2466.039 | 4.9308 | 7.94 |
| 27 | 22840.8 | 2025.824 | 4.0506 | 0.67 |
| 28 | 22864.1 | 2018.699 | 4.0363 | 2.02 |
| 29 | 22887.5 | 2011.573 | 4.0221 | 2.03 |
| 30 | 22910.8 | 2004.450 | 4.0079 | 0.68 |
| 31 | 23303.4 | 1884.649 | 3.7683 | 13.62 |
| 32 | 23322.4 | 1878.857 | 3.7567 | 17.19 |
| 33 | 23348.1 | 1871.012 | 3.7411 | 0.22 |
| 34 | 23369.9 | 1864.366 | 3.7278 | 0.29 |
| 35 | 23957.5 | 1685.031 | 3.3692 | 0.22 |
| 36 | 23972.6 | 1680.417 | 3.3600 | 0.34 |
| 37 | 23996.6 | 1673.097 | 3.3453 | 34.12 |
| 38 | 24002.2 | 1671.378 | 3.3419 | -2.75 |
| 39 | 24005.3 | 1670.440 | 3.3400 | 2.36 |
| 40 | 24011.7 | 1668.486 | 3.3361 | 0.83 |
| 41 | 24017.5 | 1666.705 | 3.3325 | 0.36 |
| 42 | 24023.5 | 1664.903 | 3.3289 | 0.31 |
| 43 | 24030.4 | 1662.797 | 3.3247 | 0.27 |
| 44 | 24060.4 | 1653.619 | 3.3064 | 0.20 |
| 45 | 25314.3 | 1270.956 | 2.5413 | 0.47 |
| 46 | 25343.3 | 1262.114 | 2.5236 | 0.23 |
| 47 | 25348.8 | 1260.438 | 2.5202 | 0.24 |
| 48 | 25354.3 | 1258.756 | 2.5169 | 0.21 |
| 49 | 25372.8 | 1253.106 | 2.5056 | 6.34 |
| 50 | 25378.5 | 1251.375 | 2.5021 | 8.78 |
| 51 | 25384.3 | 1249.614 | 2.4986 | 6.06 |
| 52 | 26220.4 | 994.441 | 1.9884 | 8.68 |
| 53 | 26226.2 | 992.685 | 1.9849 | -0.29 |
| 54 | 26345.5 | 956.280 | 1.9121 | 0.29 |
| 55 | 27531.8 | 594.227 | 1.1881 | 2.25 |
| 56 | 27555.2 | 587.111 | 1.1739 | 4.44 |
| 57 | 27578.5 | 579.977 | 1.1597 | 2.17 |
| 58 | 29479.0 | 0.002 | 0.0000 | 2.21 |

# 1k (NMR/24267675)

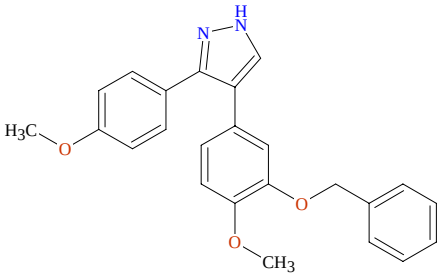
158.80 147.62 147.54 137.02 130.58 129.10 128.43 128.37 128.34 128.32 128.29 128.25 128.24 128.22 128.21 128.19 128.16 128.11 127.82 127.70 127.61 127.59 127.56 127.53 127.51 127.50 127.39 126.00 120.40 118.02 113.80 112.20

69.89

55.45 55.03

40.00 39.91 39.83 39.74 39.67 39.58 39.50 39.41 39.24 39.08 38.91

−0.00



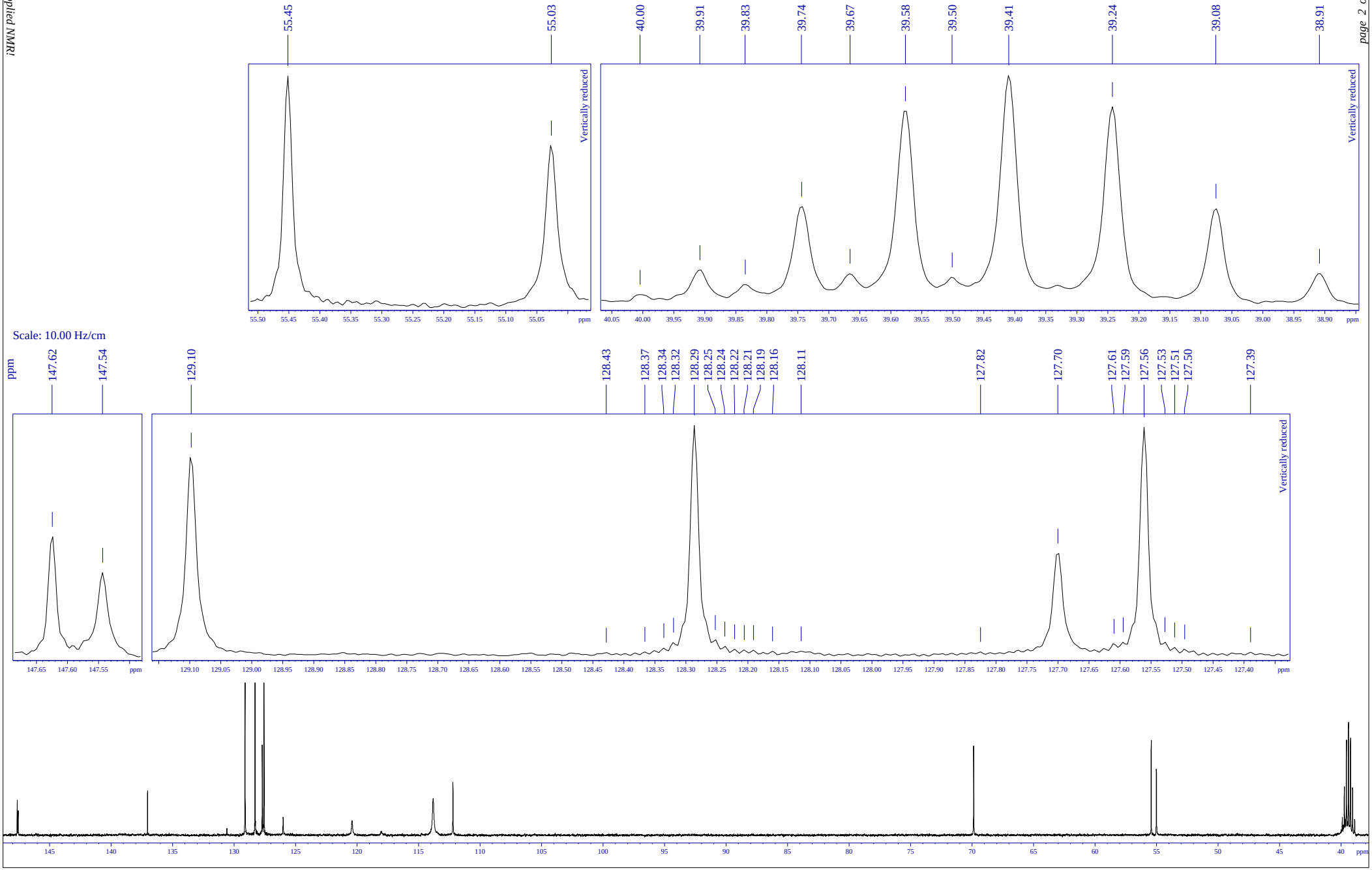



190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

*The Best Applied NMR!*

# 1k (NMR/24267675)





1k (NMR/24267675)

Peaks List

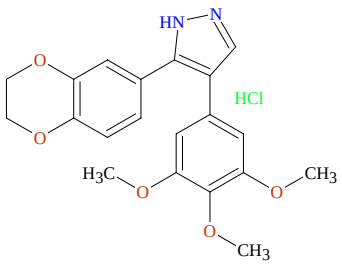
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 18630.4 | 19970.521 | 158.8014 | 0.26 |
| 2 | 21559.7 | 18564.947 | 147.6245 | 2.45 |
| 3 | 21580.9 | 18554.748 | 147.5434 | 1.68 |
| 4 | 24337.7 | 17231.957 | 137.0249 | 3.11 |
| 5 | 26028.1 | 16420.848 | 130.5751 | 0.48 |
| 6 | 26415.3 | 16235.039 | 129.0976 | 12.19 |
| 7 | 26590.7 | 16150.874 | 128.4283 | 0.20 |
| 8 | 26607.0 | 16143.053 | 128.3661 | 0.24 |
| 9 | 26615.0 | 16139.217 | 128.3356 | 0.47 |
| 10 | 26619.1 | 16137.236 | 128.3199 | 0.80 |
| 11 | 26628.0 | 16132.986 | 128.2861 | 14.00 |
| 12 | 26636.8 | 16128.777 | 128.2526 | 0.97 |
| 13 | 26640.8 | 16126.834 | 128.2372 | 0.57 |
| 14 | 26644.9 | 16124.852 | 128.2214 | 0.40 |
| 15 | 26649.0 | 16122.902 | 128.2059 | 0.35 |
| 16 | 26652.9 | 16121.018 | 128.1909 | 0.35 |
| 17 | 26661.0 | 16117.164 | 128.1603 | 0.27 |
| 18 | 26673.1 | 16111.359 | 128.1141 | 0.28 |
| 19 | 26748.9 | 16074.985 | 127.8249 | 0.23 |
| 20 | 26781.6 | 16059.299 | 127.7002 | 6.36 |
| 21 | 26805.3 | 16047.928 | 127.6097 | 0.74 |
| 22 | 26809.2 | 16046.061 | 127.5949 | 0.83 |
| 23 | 26818.0 | 16041.799 | 127.5610 | 13.89 |
| 24 | 26826.8 | 16037.593 | 127.5276 | 0.84 |
| 25 | 26830.9 | 16035.629 | 127.5119 | 0.52 |
| 26 | 26835.1 | 16033.590 | 127.4957 | 0.39 |
| 27 | 26863.0 | 16020.229 | 127.3895 | 0.21 |
| 28 | 27226.9 | 15845.614 | 126.0010 | 1.24 |
| 29 | 28695.9 | 15140.714 | 120.3958 | 0.99 |
| 30 | 29318.3 | 14842.093 | 118.0212 | 0.28 |
| 31 | 30424.1 | 14311.495 | 113.8020 | 2.52 |
| 32 | 30845.2 | 14109.424 | 112.1952 | 3.63 |
| 33 | 41933.8 | 8788.705 | 69.8859 | 6.17 |
| 34 | 45716.9 | 6973.456 | 55.4514 | 6.54 |
| 35 | 45828.2 | 6920.026 | 55.0266 | 4.57 |
| 36 | 49765.3 | 5030.859 | 40.0043 | 0.37 |
| 37 | 49790.6 | 5018.727 | 39.9079 | 1.21 |
| 38 | 49809.8 | 5009.521 | 39.8347 | 0.72 |
| 39 | 49833.6 | 4998.094 | 39.7438 | 3.36 |
| 40 | 49854.1 | 4988.276 | 39.6657 | 1.08 |
| 41 | 49877.5 | 4977.037 | 39.5764 | 6.63 |
| 42 | 49897.2 | 4967.557 | 39.5010 | 0.96 |
| 43 | 49921.2 | 4956.063 | 39.4096 | 7.79 |
| 44 | 49965.0 | 4935.066 | 39.2426 | 6.71 |
| 45 | 50008.7 | 4914.057 | 39.0755 | 3.29 |
| 46 | 50052.5 | 4893.067 | 38.9086 | 1.09 |
| 47 | 60249.9 | −0.001 | −0.0000 | 0.52 |

*The Best Applied NMR!*

# 1l (NMR/22297380)

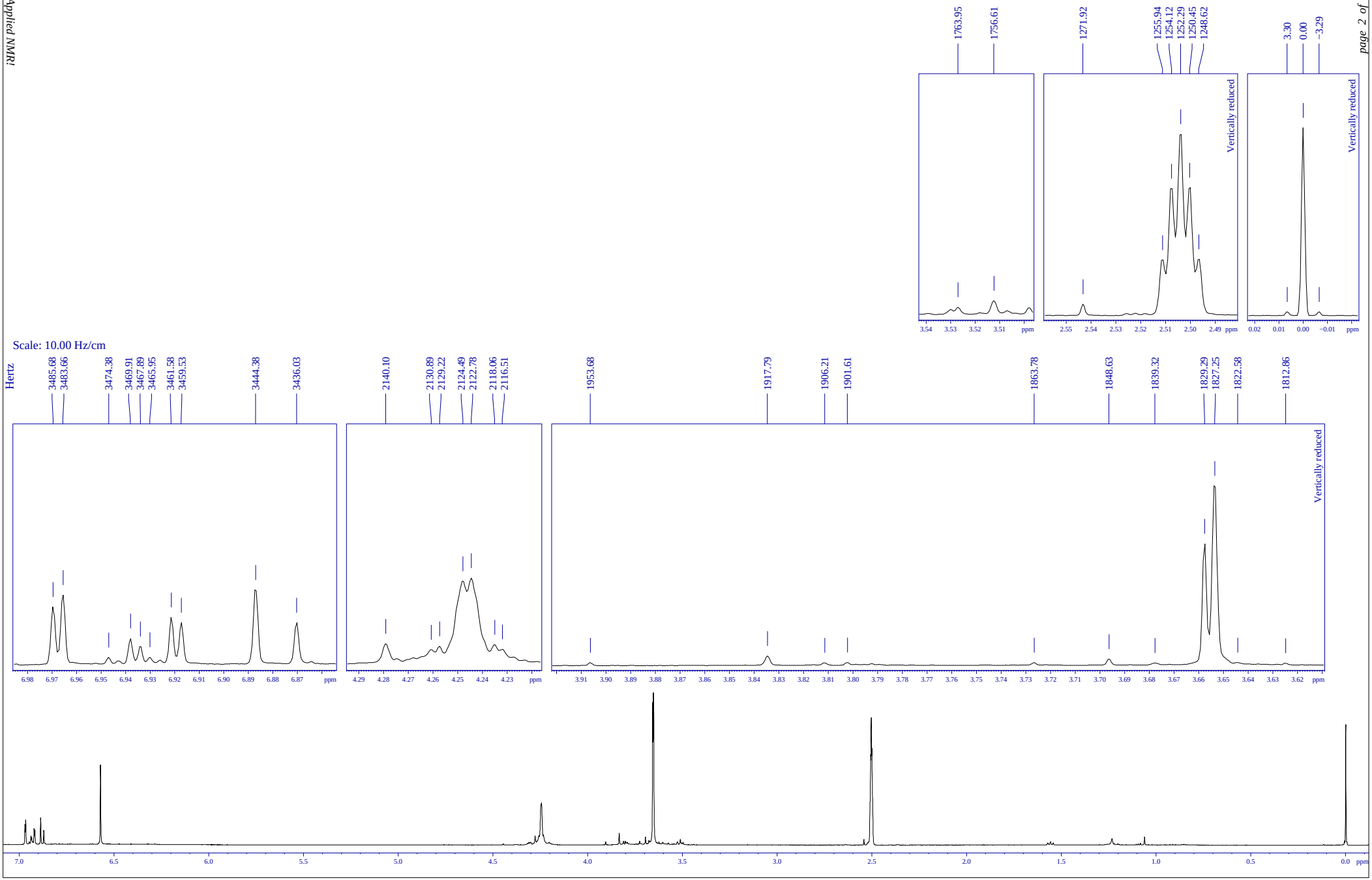
Found protons = 35 impurity* = 4.3 %





# 1l (NMR/22297380)





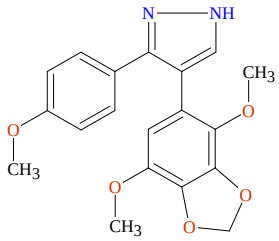
# 1l (NMR/22297380)



Peaks List

| # | Address [points] | Frequency [Hz] | Frequency [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 16583.9 | 3936.498 | 7.8710 | 2.58 |
| 2 | 17582.7 | 3631.693 | 7.2615 | 0.30 |
| 3 | 18061.1 | 3485.684 | 6.9696 | 1.47 |
| 4 | 18067.7 | 3483.661 | 6.9655 | 1.79 |
| 5 | 18098.2 | 3474.377 | 6.9469 | 0.21 |
| 6 | 18112.8 | 3469.906 | 6.9380 | 0.69 |
| 7 | 18119.4 | 3467.888 | 6.9340 | 0.49 |
| 8 | 18125.8 | 3465.951 | 6.9301 | 0.21 |
| 9 | 18140.1 | 3461.577 | 6.9214 | 1.21 |
| 10 | 18146.8 | 3459.528 | 6.9173 | 1.08 |
| 11 | 18196.5 | 3444.377 | 6.8870 | 1.97 |
| 12 | 18223.8 | 3436.030 | 6.8703 | 1.08 |
| 13 | 18714.5 | 3286.277 | 6.5708 | 5.89 |
| 14 | 22470.3 | 2140.097 | 4.2791 | 0.55 |
| 15 | 22500.5 | 2130.894 | 4.2607 | 0.40 |
| 16 | 22506.0 | 2129.224 | 4.2573 | 0.48 |
| 17 | 22521.5 | 2124.493 | 4.2479 | 2.12 |
| 18 | 22527.1 | 2122.778 | 4.2445 | 2.18 |
| 19 | 22542.5 | 2118.064 | 4.2350 | 0.53 |
| 20 | 22547.6 | 2116.515 | 4.2319 | 0.41 |
| 21 | 23081.2 | 1953.683 | 3.9063 | 0.26 |
| 22 | 23198.8 | 1917.793 | 3.8346 | 0.84 |
| 23 | 23236.7 | 1906.207 | 3.8114 | 0.25 |
| 24 | 23251.8 | 1901.610 | 3.8022 | 0.28 |
| 25 | 23375.8 | 1863.783 | 3.7266 | 0.27 |
| 26 | 23425.4 | 1848.634 | 3.6963 | 0.58 |
| 27 | 23455.9 | 1839.324 | 3.6777 | 0.24 |
| 28 | 23488.8 | 1829.292 | 3.6576 | 10.54 |
| 29 | 23495.5 | 1827.248 | 3.6535 | 16.00 |
| 30 | 23510.8 | 1822.580 | 3.6442 | 0.27 |
| 31 | 23542.6 | 1812.859 | 3.6248 | 0.22 |
| 32 | 23702.9 | 1763.952 | 3.5270 | 0.21 |
| 33 | 23726.9 | 1756.609 | 3.5123 | 0.37 |
| 34 | 25315.2 | 1271.920 | 2.5432 | 0.48 |
| 35 | 25367.5 | 1255.943 | 2.5112 | 2.36 |
| 36 | 25373.5 | 1254.120 | 2.5076 | 5.44 |
| 37 | 25379.5 | 1252.285 | 2.5039 | 7.79 |
| 38 | 25385.5 | 1250.451 | 2.5003 | 5.49 |
| 39 | 25391.5 | 1248.625 | 2.4966 | 2.42 |
| 40 | 27461.2 | 617.003 | 1.2337 | 0.33 |
| 41 | 27743.2 | 530.942 | 1.0616 | 0.56 |
| 42 | 29472.2 | 3.298 | 0.0066 | 0.20 |
| 43 | 29483.0 | 0.001 | 0.0000 | 10.35 |
| 44 | 29493.8 | −3.295 | −0.0066 | 0.20 |

# 1m (NMR/22297709)





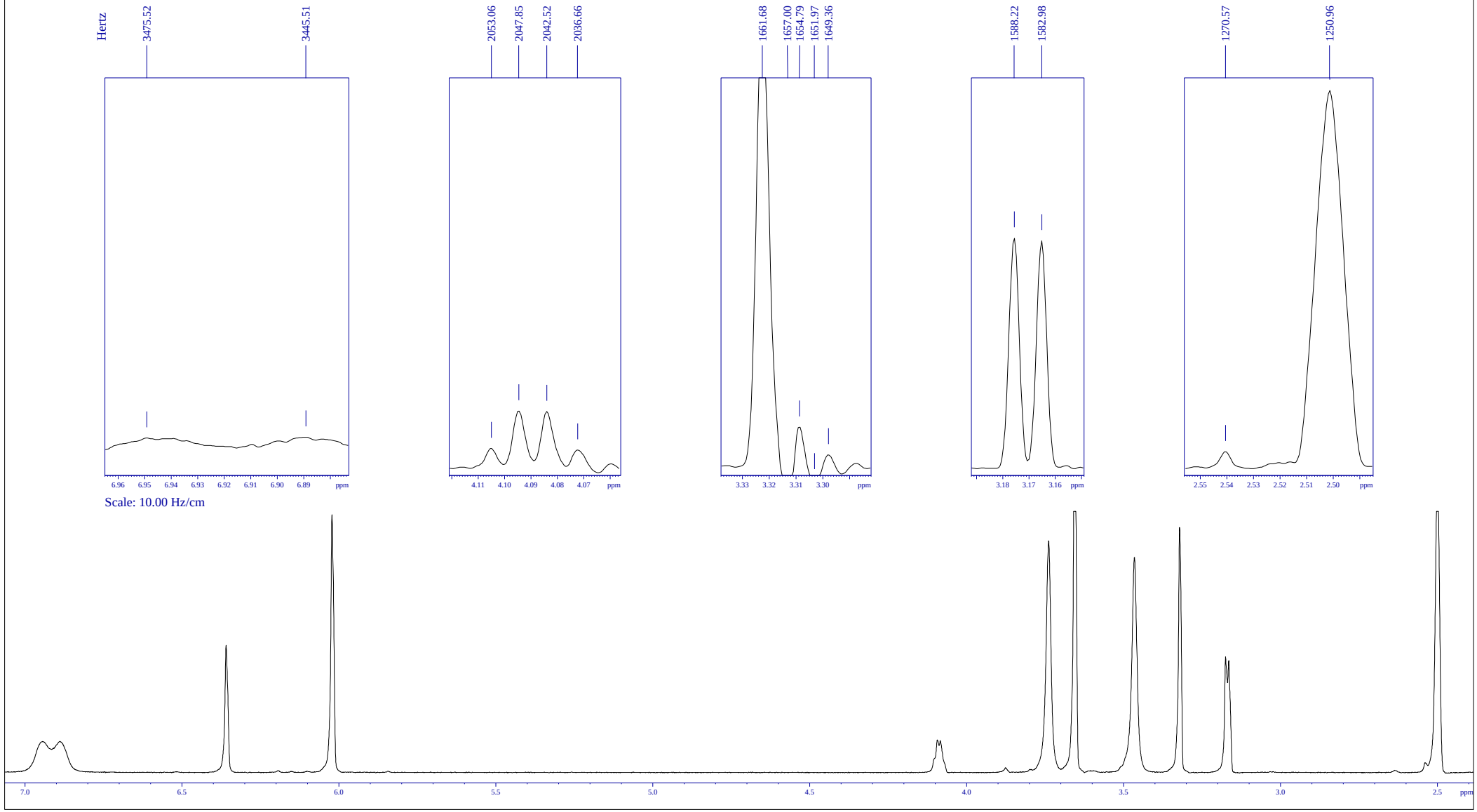

13 12 11 10 9 8 7 6 5 4 3 2 1 ppm

Water DMSO−d5 TMS

13.00 39.32 26.46 12.87 0.28 25.98 7.23 142.53 18.90 0.33 41.82 0.29 18.67

# 1m (NMR/22297709)





# 1m (NMR/22297709)

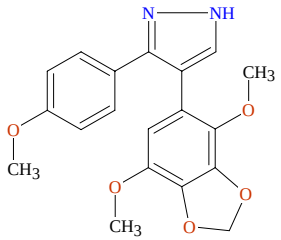


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 8095.2 | 6524.909 | 13.0464 | 0.39 |
| 2 | 8406.6 | 6429.873 | 12.8564 | 0.41 |
| 3 | 16814.4 | 3864.007 | 7.7260 | 0.28 |
| 4 | 17216.0 | 3741.448 | 7.4810 | 0.30 |
| 5 | 17472.9 | 3663.051 | 7.3242 | 1.36 |
| 6 | 18087.4 | 3475.521 | 6.9492 | 0.58 |
| 7 | 18185.8 | 3445.508 | 6.8892 | 0.60 |
| 8 | 19054.1 | 3180.520 | 6.3594 | 4.89 |
| 9 | 19607.1 | 3011.742 | 6.0219 | 10.01 |
| 10 | 22748.5 | 2053.058 | 4.1050 | 0.38 |
| 11 | 22765.6 | 2047.847 | 4.0946 | 1.11 |
| 12 | 22783.1 | 2042.520 | 4.0840 | 1.10 |
| 13 | 22802.3 | 2036.661 | 4.0723 | 0.34 |
| 14 | 23345.9 | 1870.768 | 3.7406 | 5.74 |
| 15 | 23482.5 | 1829.087 | 3.6572 | 16.00 |
| 16 | 23794.3 | 1733.914 | 3.4669 | 5.18 |
| 17 | 24031.0 | 1661.679 | 3.3225 | 9.70 |
| 18 | 24046.3 | 1657.004 | 3.3131 | −1.12 |
| 19 | 24053.6 | 1654.794 | 3.3087 | 0.80 |
| 20 | 24062.8 | 1651.968 | 3.3031 | −0.28 |
| 21 | 24071.4 | 1649.364 | 3.2979 | 0.25 |
| 22 | 24271.7 | 1588.222 | 3.1756 | 4.50 |
| 23 | 24288.9 | 1582.984 | 3.1651 | 4.43 |
| 24 | 25312.6 | 1270.572 | 2.5405 | 0.31 |
| 25 | 25376.9 | 1250.958 | 2.5013 | 7.36 |
| 26 | 29476.0 | 0.002 | 0.0000 | 8.35 |

# 1m (NMR/22297709)

158.57
140.39
138.85
138.57
135.66
135.36
129.41
128.33
128.11
127.04
119.85
113.71
109.64
101.49
59.22
56.30
54.98
48.52
40.01
39.91
39.84
39.75
39.67
39.58
39.50
39.41
39.25
39.08
38.91
0.00



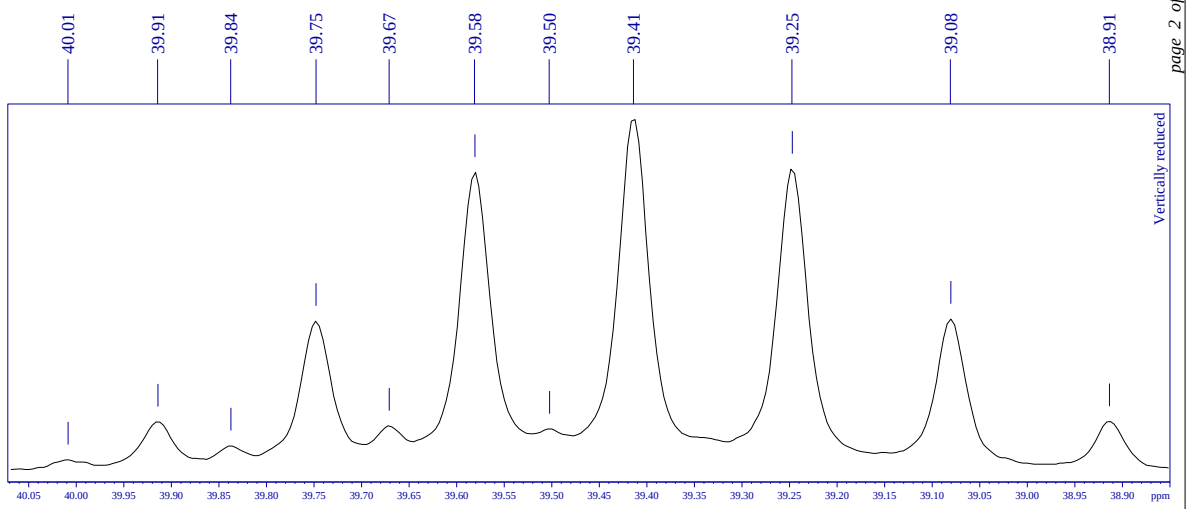



180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

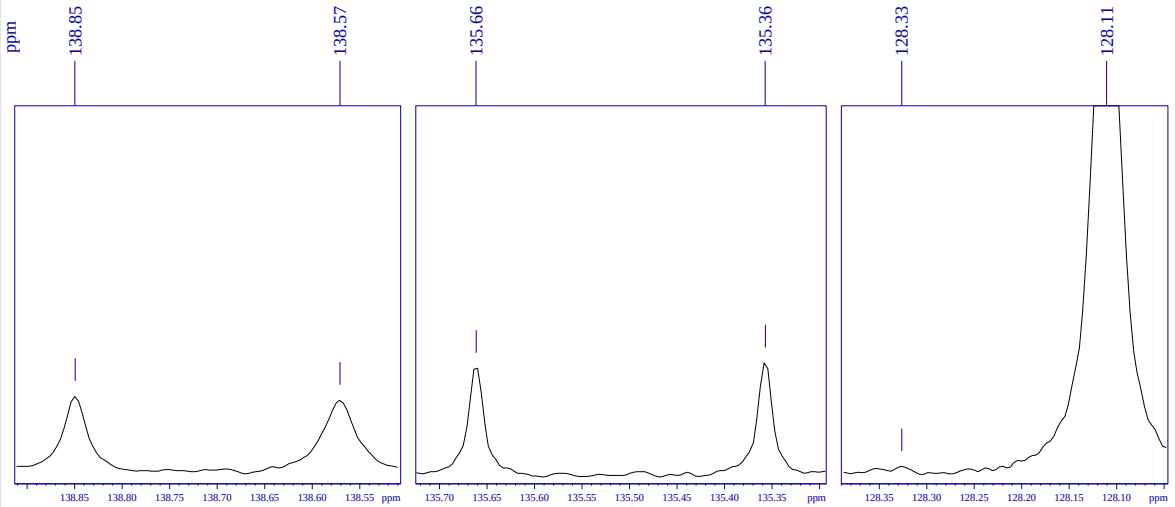
*The Best Applied NMR!*

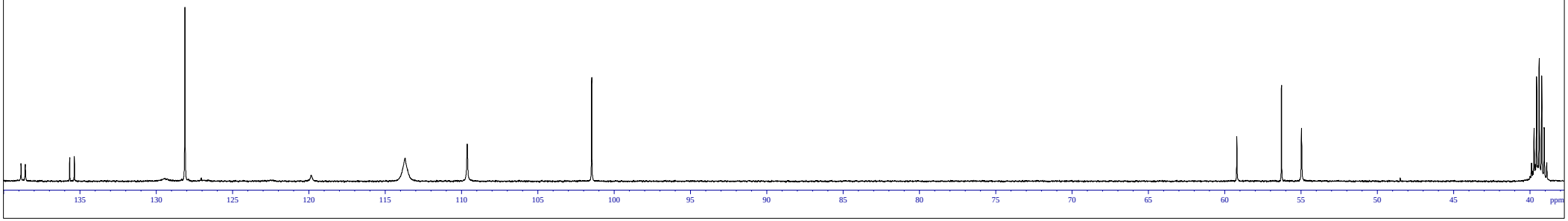
# 1m (NMR/22297709)






Scale: 10.00 Hz/cm



# 1m (NMR/22297709)



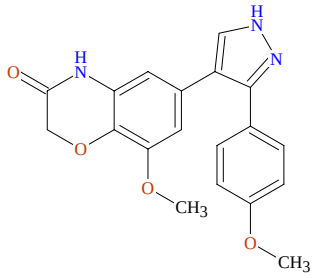
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 18697.8 | 19941.758 | 158.5727 | 0.15 |
| 2 | 23463.7 | 17654.908 | 140.3881 | 0.17 |
| 3 | 23867.0 | 17461.400 | 138.8494 | 1.04 |
| 4 | 23940.0 | 17426.367 | 138.5708 | 1.00 |
| 5 | 24702.5 | 17060.482 | 135.6614 | 1.45 |
| 6 | 24782.3 | 17022.211 | 135.3570 | 1.50 |
| 7 | 26340.7 | 16274.451 | 129.4110 | 0.18 |
| 8 | 26624.9 | 16138.044 | 128.3263 | 0.13 |
| 9 | 26681.6 | 16110.851 | 128.1101 | 14.00 |
| 10 | 26962.4 | 15976.122 | 127.0388 | 0.21 |
| 11 | 28845.3 | 15072.629 | 119.8544 | 0.36 |
| 12 | 30454.5 | 14300.466 | 113.7143 | 1.38 |
| 13 | 31521.6 | 13788.451 | 109.6429 | 2.21 |
| 14 | 33658.9 | 12762.903 | 101.4879 | 6.19 |
| 15 | 44736.8 | 7447.337 | 59.2197 | 2.67 |
| 16 | 45502.7 | 7079.831 | 56.2973 | 5.77 |
| 17 | 45847.1 | 6914.552 | 54.9831 | 3.17 |
| 18 | 47541.1 | 6101.696 | 48.5194 | 0.21 |
| 19 | 49771.7 | 5031.394 | 40.0086 | 0.31 |
| 20 | 49796.5 | 5019.516 | 39.9141 | 1.09 |
| 21 | 49816.6 | 5009.861 | 39.8374 | 0.60 |
| 22 | 49840.0 | 4998.613 | 39.7479 | 3.16 |
| 23 | 49860.2 | 4988.924 | 39.6709 | 1.00 |
| 24 | 49883.8 | 4977.596 | 39.5808 | 6.22 |
| 25 | 49904.4 | 4967.726 | 39.5023 | 0.94 |
| 26 | 49927.6 | 4956.601 | 39.4138 | 7.35 |
| 27 | 49971.3 | 4935.627 | 39.2471 | 6.30 |
| 28 | 50015.0 | 4914.668 | 39.0804 | 3.20 |
| 29 | 50058.7 | 4893.694 | 38.9136 | 1.10 |
| 30 | 60257.4 | 0.001 | 0.0000 | 0.25 |

*The Best Applied NMR!*

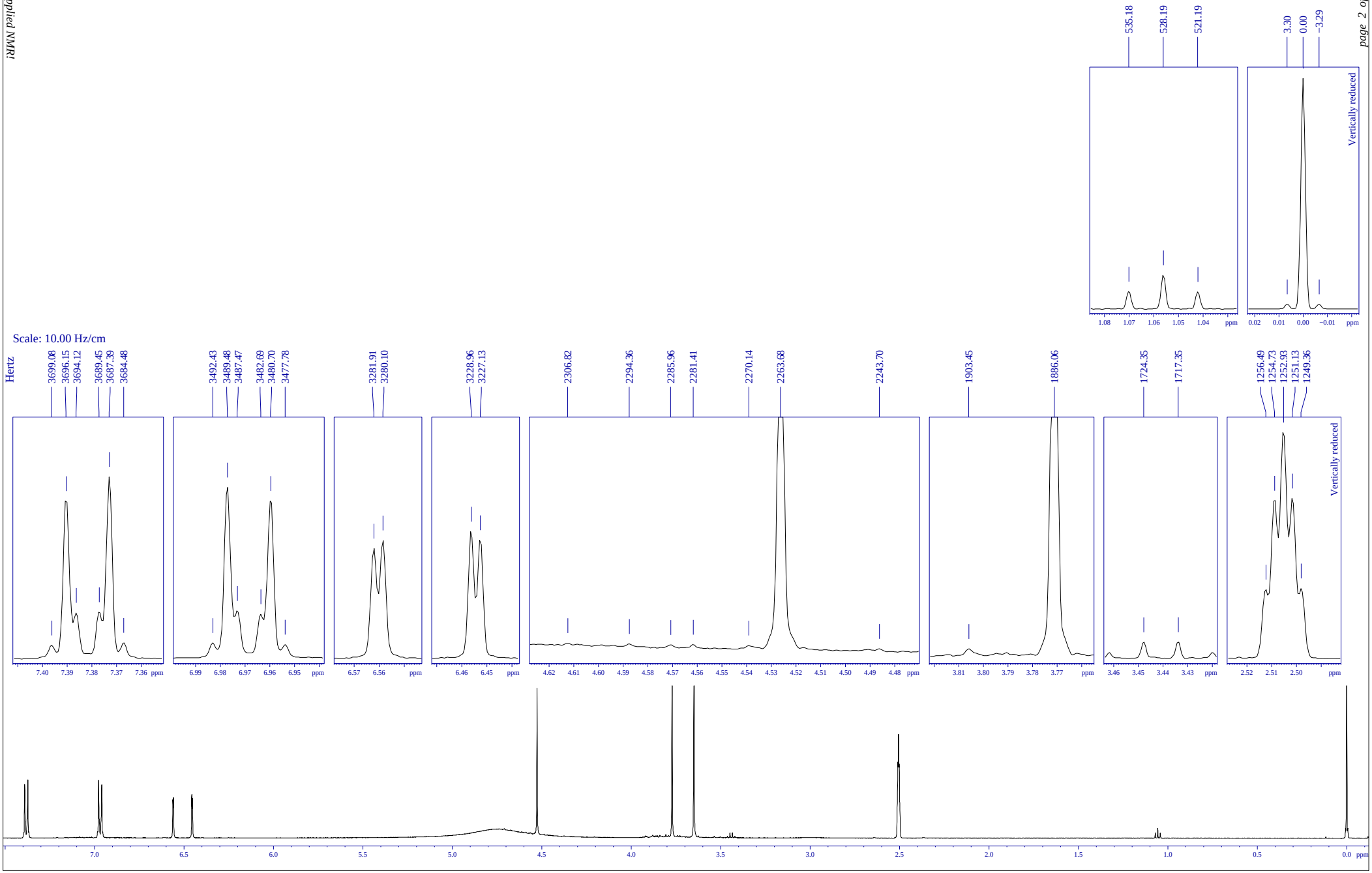
# 1n (NMR/27237315)

Found protons = 32 impurity* = 1.0 %



# 1n (NMR/27237315)





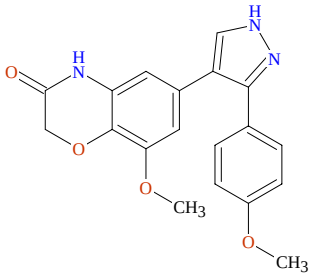
# 1n (NMR/27237315)



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 12081.8 | 5311.025 | 10.6193 | 2.33 |
| 2 | 16717.5 | 3896.328 | 7.7906 | 4.68 |
| 3 | 17363.9 | 3699.080 | 7.3962 | 0.27 |
| 4 | 17373.5 | 3696.148 | 7.3904 | 3.29 |
| 5 | 17380.1 | 3694.125 | 7.3863 | 0.93 |
| 6 | 17395.4 | 3689.448 | 7.3770 | 0.96 |
| 7 | 17402.2 | 3687.390 | 7.3729 | 3.70 |
| 8 | 17411.7 | 3684.483 | 7.3671 | 0.33 |
| 9 | 18041.0 | 3492.425 | 6.9830 | 0.32 |
| 10 | 18050.7 | 3489.480 | 6.9771 | 3.51 |
| 11 | 18057.3 | 3487.466 | 6.9731 | 0.98 |
| 12 | 18072.9 | 3482.687 | 6.9636 | 0.91 |
| 13 | 18079.4 | 3480.701 | 6.9596 | 3.27 |
| 14 | 18089.0 | 3477.784 | 6.9538 | 0.29 |
| 15 | 18730.8 | 3281.911 | 6.5621 | 2.24 |
| 16 | 18736.8 | 3280.096 | 6.5585 | 2.41 |
| 17 | 18904.3 | 3228.961 | 6.4562 | 2.62 |
| 18 | 18910.4 | 3227.126 | 6.4526 | 2.44 |
| 19 | 21768.7 | 2354.837 | 4.7084 | 0.47 |
| 20 | 21926.0 | 2306.818 | 4.6124 | 0.32 |
| 21 | 21966.8 | 2294.363 | 4.5875 | 0.30 |
| 22 | 21994.4 | 2285.959 | 4.5707 | 0.28 |
| 23 | 22009.3 | 2281.408 | 4.5616 | 0.29 |
| 24 | 22046.2 | 2270.144 | 4.5391 | 0.27 |
| 25 | 22067.4 | 2263.680 | 4.5262 | 9.45 |
| 26 | 22132.8 | 2243.702 | 4.4862 | 0.20 |
| 27 | 23247.8 | 1903.447 | 3.8059 | 0.20 |
| 28 | 23304.8 | 1886.055 | 3.7711 | 14.81 |
| 29 | 23505.2 | 1824.906 | 3.6489 | 12.50 |
| 30 | 23834.7 | 1724.347 | 3.4478 | 0.34 |
| 31 | 23857.6 | 1717.351 | 3.4338 | 0.35 |
| 32 | 25367.7 | 1256.487 | 2.5123 | 1.77 |
| 33 | 25373.5 | 1254.729 | 2.5088 | 4.10 |
| 34 | 25379.4 | 1252.926 | 2.5052 | 5.87 |
| 35 | 25385.3 | 1251.128 | 2.5016 | 4.12 |
| 36 | 25391.1 | 1249.364 | 2.4981 | 1.80 |
| 37 | 27731.3 | 535.177 | 1.0701 | 0.36 |
| 38 | 27754.2 | 528.193 | 1.0561 | 0.69 |
| 39 | 27777.2 | 521.194 | 1.0421 | 0.35 |
| 40 | 29474.2 | 3.298 | 0.0066 | 0.42 |
| 41 | 29485.0 | 0.002 | 0.0000 | 21.32 |
| 42 | 29495.8 | −3.295 | −0.0066 | 0.42 |

# 1n (NMR/27237315)



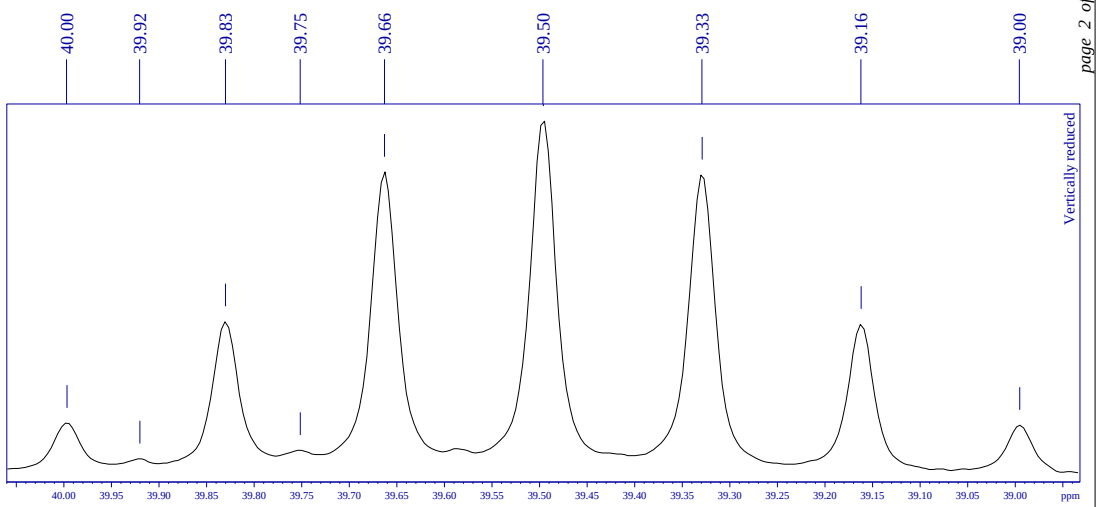

165.00 159.39 148.14 142.25 134.11 131.29 129.42 128.16 126.81 122.64 118.32 114.11 108.10 107.38 66.73 56.06 55.71 55.23 40.00 39.92 39.83 39.75 39.66 39.50 39.33 39.16 39.00 18.59 0.14



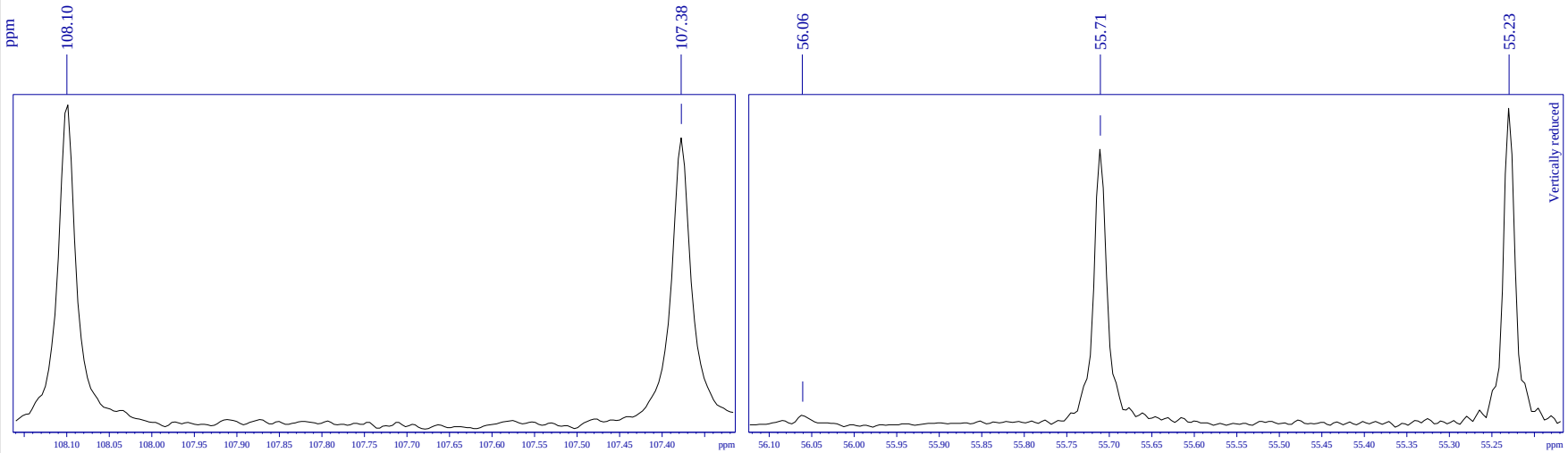
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

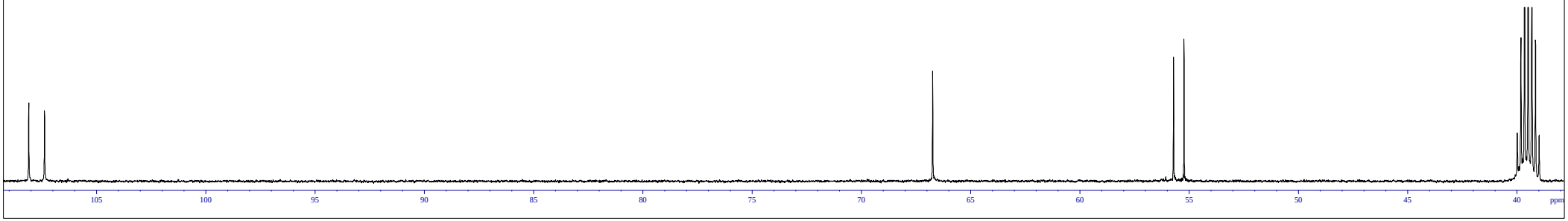
# 1n (NMR/27237315)






Scale: 10.00 Hz/cm



# 1n (NMR/27237315)

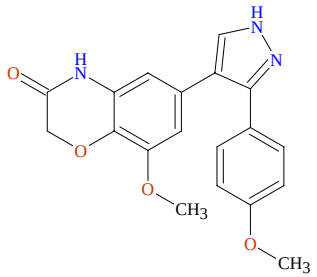


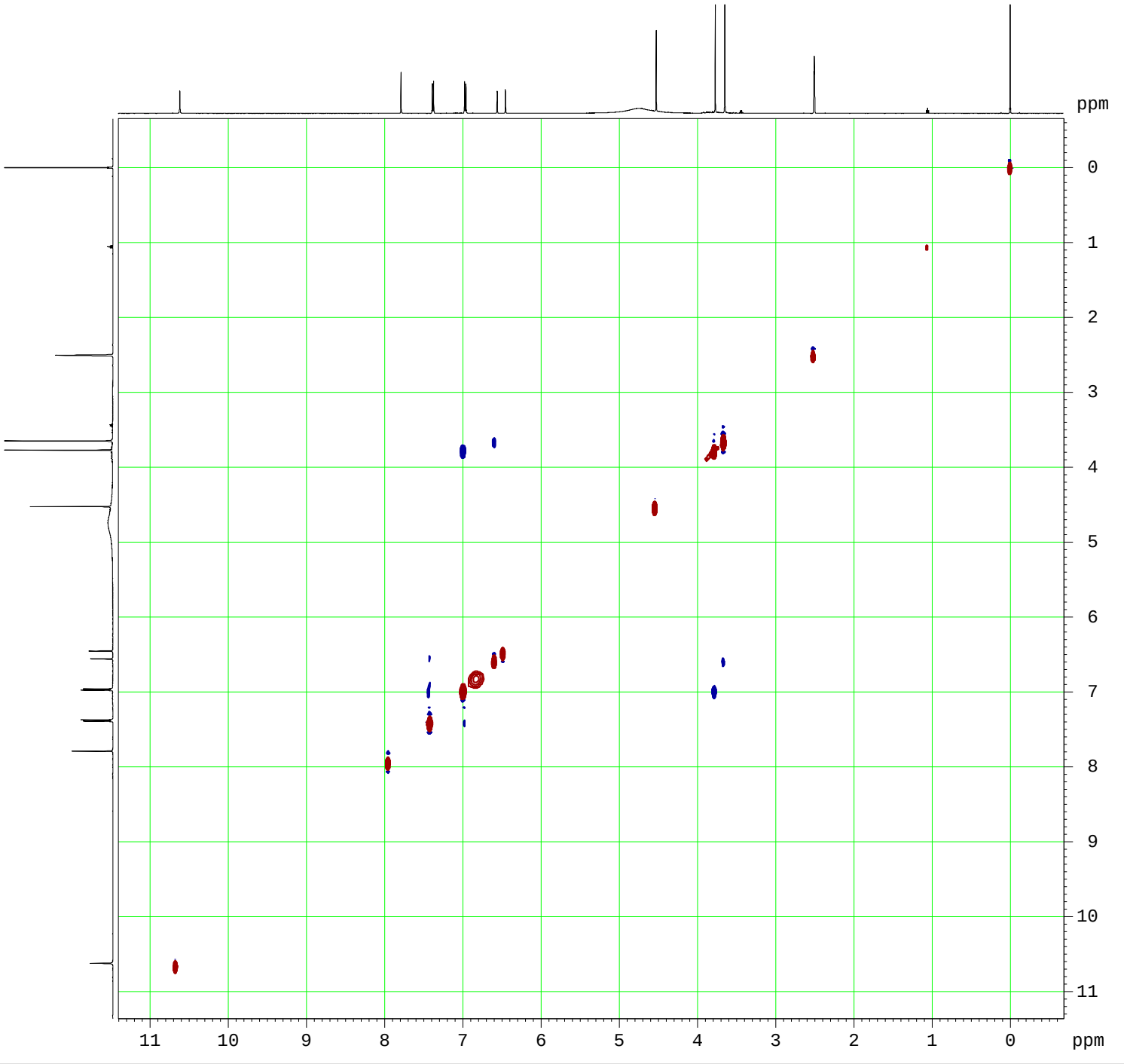
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17042.5 | 20750.262 | 165.0017 | 4.01 |
| 2 | 18513.1 | 20044.615 | 159.3906 | 3.70 |
| 3 | 21462.5 | 18629.383 | 148.1369 | 3.47 |
| 4 | 23005.2 | 17889.141 | 142.2507 | 1.17 |
| 5 | 25139.6 | 16864.963 | 134.1066 | 1.63 |
| 6 | 25876.7 | 16511.273 | 131.2942 | 2.73 |
| 7 | 26368.6 | 16275.258 | 129.4174 | 11.44 |
| 8 | 26697.4 | 16117.473 | 128.1628 | 3.93 |
| 9 | 27051.4 | 15947.592 | 126.8119 | 3.14 |
| 10 | 28144.7 | 15423.011 | 122.6405 | 1.93 |
| 11 | 29277.0 | 14879.710 | 118.3203 | 3.28 |
| 12 | 30379.5 | 14350.687 | 114.1136 | 11.66 |
| 13 | 31955.6 | 13594.386 | 108.0997 | 4.77 |
| 14 | 32144.9 | 13503.554 | 107.3774 | 4.23 |
| 15 | 42797.1 | 8392.241 | 66.7333 | 6.62 |
| 16 | 45594.3 | 7050.059 | 56.0606 | 0.28 |
| 17 | 45686.1 | 7006.030 | 55.7105 | 7.44 |
| 18 | 45812.1 | 6945.556 | 55.2296 | 8.55 |
| 19 | 49804.4 | 5029.900 | 39.9967 | 2.91 |
| 20 | 49824.5 | 5020.262 | 39.9201 | 0.90 |
| 21 | 49848.1 | 5008.951 | 39.8301 | 8.61 |
| 22 | 49868.7 | 4999.069 | 39.7515 | 1.37 |
| 23 | 49891.9 | 4987.935 | 39.6630 | 17.03 |
| 24 | 49935.6 | 4966.937 | 39.4960 | 20.00 |
| 25 | 49979.4 | 4945.942 | 39.3291 | 16.96 |
| 26 | 50023.2 | 4924.927 | 39.1620 | 8.47 |
| 27 | 50066.9 | 4903.960 | 38.9953 | 2.78 |
| 28 | 55414.5 | 2337.958 | 18.5909 | 0.25 |
| 29 | 60250.9 | 17.290 | 0.1375 | 0.70 |

# 1n (NMR/27237315)

## NOESY

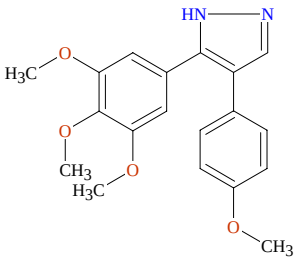




*The Best Applied NMR!*

# 1o (NMR/22257607)

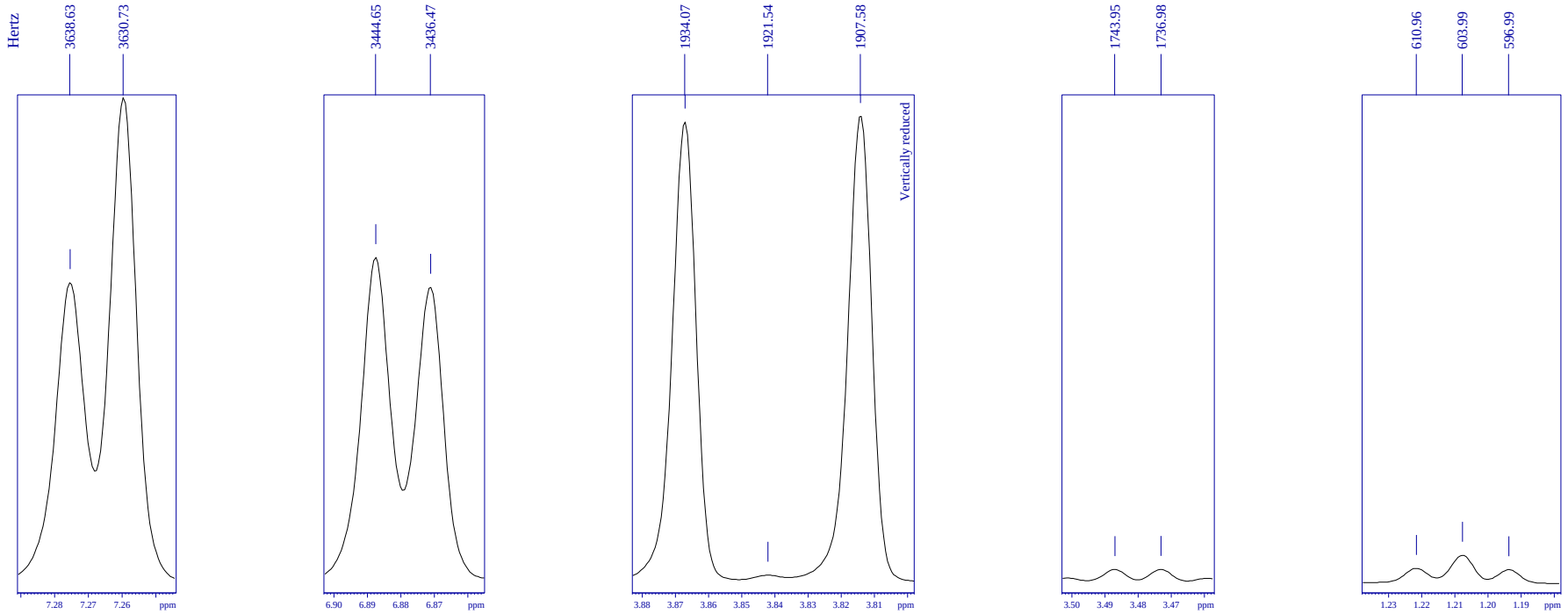
Found protons = 19 impurity* = 0.7 %



*The Best Applied NMR!*

# 1o (NMR/22257607)





# 1o (NMR/22257607)

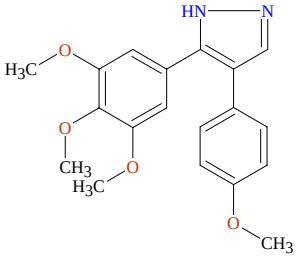


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 16945.8 | 3824.291 | 7.6466 | 4.68 |
| 2 | 17554.2 | 3638.627 | 7.2754 | 4.51 |
| 3 | 17580.1 | 3630.728 | 7.2596 | 7.27 |
| 4 | 18189.9 | 3444.646 | 6.8875 | 4.88 |
| 5 | 18216.7 | 3436.467 | 6.8711 | 4.44 |
| 6 | 18501.2 | 3349.629 | 6.6975 | 8.60 |
| 7 | 23139.7 | 1934.067 | 3.8671 | 16.22 |
| 8 | 23180.8 | 1921.538 | 3.8421 | 0.28 |
| 9 | 23226.5 | 1907.575 | 3.8142 | 16.45 |
| 10 | 23413.5 | 1850.524 | 3.7001 | 32.00 |
| 11 | 23762.7 | 1743.954 | 3.4870 | 0.20 |
| 12 | 23785.5 | 1736.977 | 3.4731 | 0.21 |
| 13 | 27475.3 | 610.964 | 1.2216 | 0.22 |
| 14 | 27498.1 | 603.994 | 1.2077 | 0.42 |
| 15 | 27521.1 | 596.991 | 1.1937 | 0.20 |
| 16 | 29477.3 | −0.000 | −0.0000 | 2.64 |

# 1o (NMR/22257607)

157.90 152.57 146.73 139.45 129.71 129.42 128.64 125.58 124.96 113.80 105.12 104.87 104.58 59.98 55.52 55.00 40.01 39.92 39.84 39.75 39.68 39.59 39.51 39.42 39.35 39.25 39.08 38.92 0.00






190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

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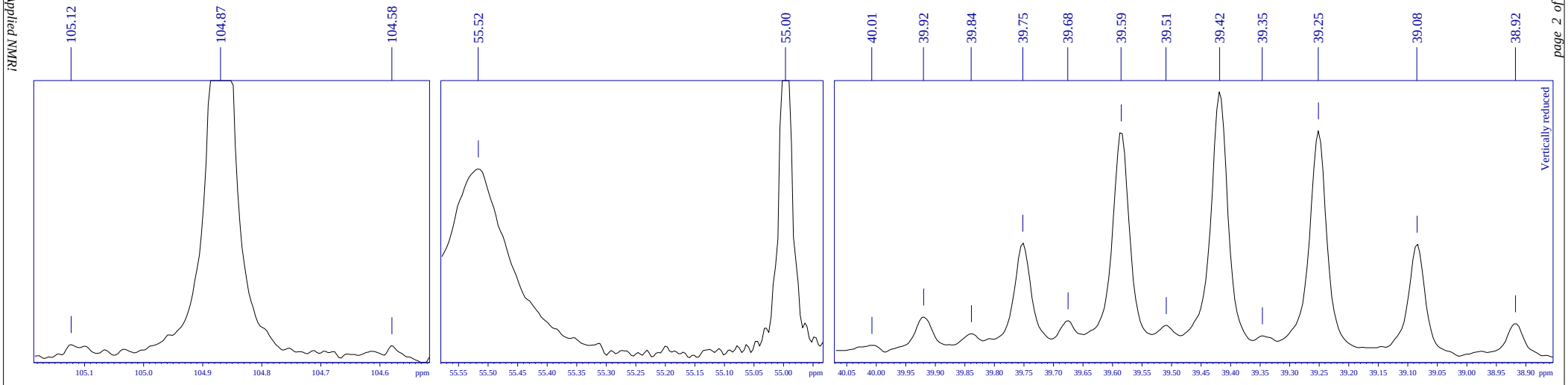
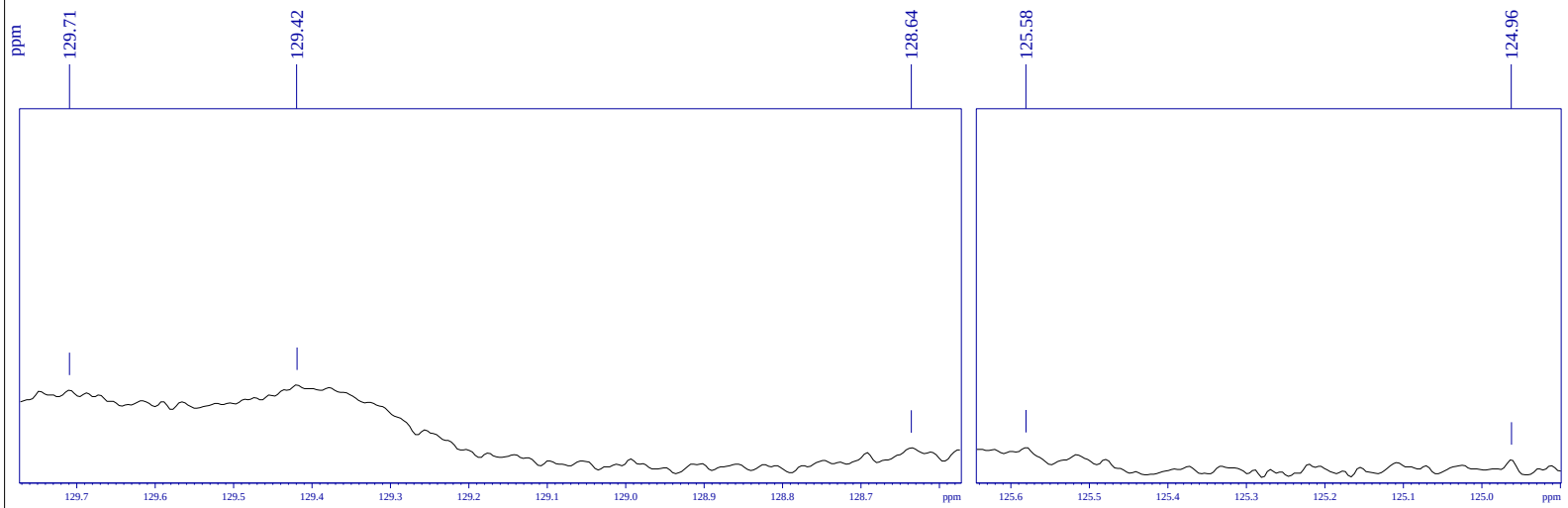
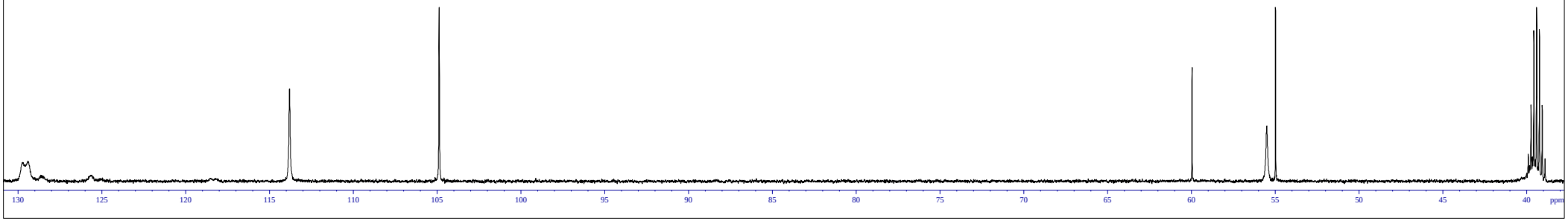
# 1o (NMR/22257607)






Scale: 12.00 Hz/cm



# 1o (NMR/22257607)



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 18870.4 | 19857.428 | 157.9021 | 4.52 |
| 2 | 20269.0 | 19186.303 | 152.5654 | 0.46 |
| 3 | 21797.7 | 18452.787 | 146.7327 | 0.20 |
| 4 | 23706.3 | 17536.994 | 139.4505 | 0.36 |
| 5 | 26259.3 | 16311.965 | 129.7093 | 1.13 |
| 6 | 26335.3 | 16275.473 | 129.4191 | 1.20 |
| 7 | 26540.7 | 16176.957 | 128.6358 | 0.37 |
| 8 | 27341.3 | 15792.767 | 125.5807 | 0.37 |
| 9 | 27503.4 | 15714.994 | 124.9623 | 0.22 |
| 10 | 30429.7 | 14310.873 | 113.7971 | 5.51 |
| 11 | 32703.1 | 13220.008 | 105.1227 | 0.22 |
| 12 | 32769.5 | 13188.149 | 104.8694 | 14.00 |
| 13 | 32845.4 | 13151.719 | 104.5797 | 0.21 |
| 14 | 44534.9 | 7542.656 | 59.9776 | 6.80 |
| 15 | 45704.1 | 6981.641 | 55.5165 | 3.30 |
| 16 | 45840.4 | 6916.232 | 54.9964 | 10.70 |
| 17 | 49768.8 | 5031.239 | 40.0074 | 0.48 |
| 18 | 49791.8 | 5020.229 | 39.9198 | 1.62 |
| 19 | 49813.0 | 5010.057 | 39.8389 | 0.94 |
| 20 | 49835.8 | 4999.095 | 39.7518 | 4.58 |
| 21 | 49855.9 | 4989.480 | 39.6753 | 1.46 |
| 22 | 49879.5 | 4978.151 | 39.5852 | 9.09 |
| 23 | 49899.4 | 4968.573 | 39.5090 | 1.28 |
| 24 | 49923.2 | 4957.162 | 39.4183 | 10.67 |
| 25 | 49942.1 | 4948.096 | 39.3462 | 0.86 |
| 26 | 49967.0 | 4936.162 | 39.2513 | 9.08 |
| 27 | 50010.8 | 4915.146 | 39.0842 | 4.55 |
| 28 | 50054.4 | 4894.197 | 38.9176 | 1.35 |
| 29 | 60254.2 | 0.003 | 0.0000 | 0.67 |

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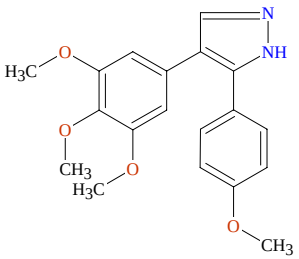
# 1p (NMR/22257580)

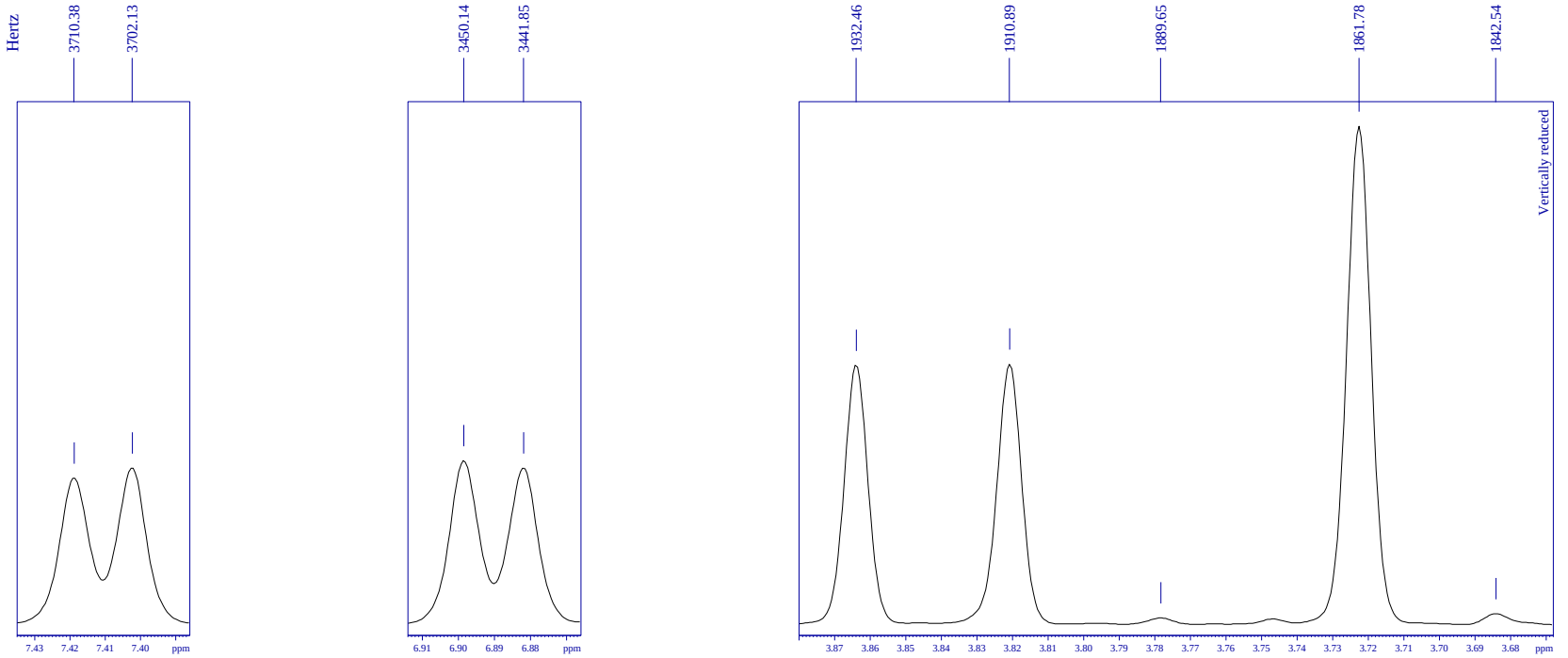
Found protons = 9 impurity* = 0.8 %



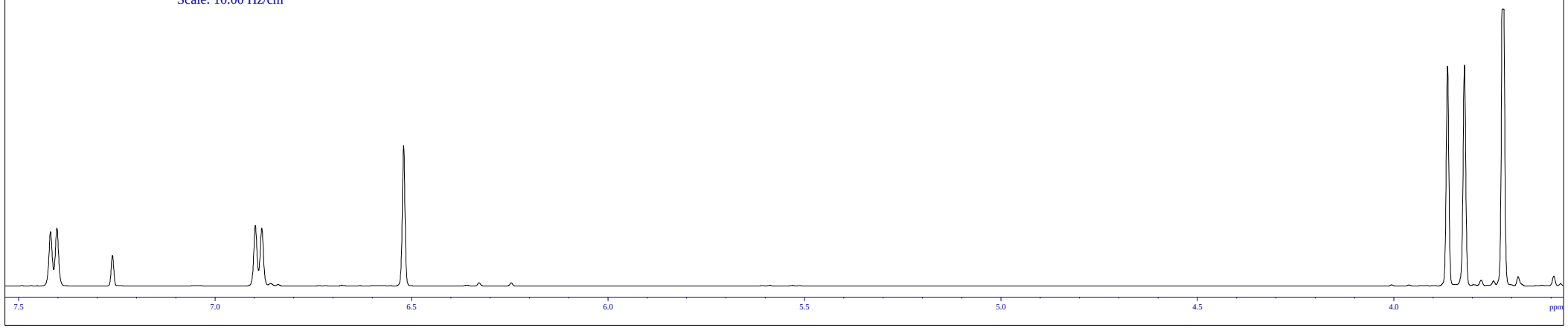


# 1p (NMR/22257580)






Scale: 10.00 Hz/cm



# 1p (NMR/22257580)

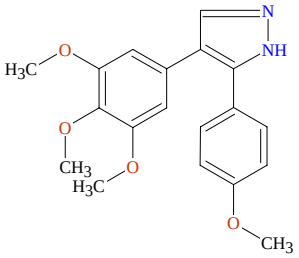


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 16894.7 | 3840.605 | 7.6792 | 2.52 |
| 2 | 17321.5 | 3710.379 | 7.4188 | 2.07 |
| 3 | 17348.5 | 3702.134 | 7.4023 | 2.21 |
| 4 | 17579.8 | 3631.531 | 7.2612 | 1.17 |
| 5 | 18174.2 | 3450.144 | 6.8985 | 2.31 |
| 6 | 18201.4 | 3441.846 | 6.8819 | 2.21 |
| 7 | 18792.8 | 3261.365 | 6.5210 | 5.33 |
| 8 | 23147.3 | 1932.461 | 3.8639 | 8.34 |
| 9 | 23218.0 | 1910.893 | 3.8208 | 8.37 |
| 10 | 23287.6 | 1889.646 | 3.7783 | 0.23 |
| 11 | 23378.9 | 1861.781 | 3.7226 | 16.00 |
| 12 | 23442.0 | 1842.540 | 3.6841 | 0.36 |
| 13 | 23590.8 | 1797.131 | 3.5933 | 0.38 |
| 14 | 23763.1 | 1744.551 | 3.4882 | 0.24 |
| 15 | 29479.6 | 0.002 | 0.0000 | 2.76 |

# 1p (NMR/22257580)

194.73
163.47 159.82 159.21 158.56 152.64 152.58 147.10 139.25 137.99 135.86 131.72 130.94 129.34 129.07 128.90 128.73 128.57 127.68 126.44 122.02 117.97 114.01 113.77 113.49 105.40 104.93 103.76
59.99 59.96 59.91 59.87 59.79 55.75 55.63 55.61 55.60 55.55 55.51 55.50 55.47 55.45 55.44 55.41 55.29 55.25 55.08 40.33 40.01 39.92 39.84 39.75 39.68 39.59 39.51 39.42 39.34 39.25 39.09 38.92
0.00






190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

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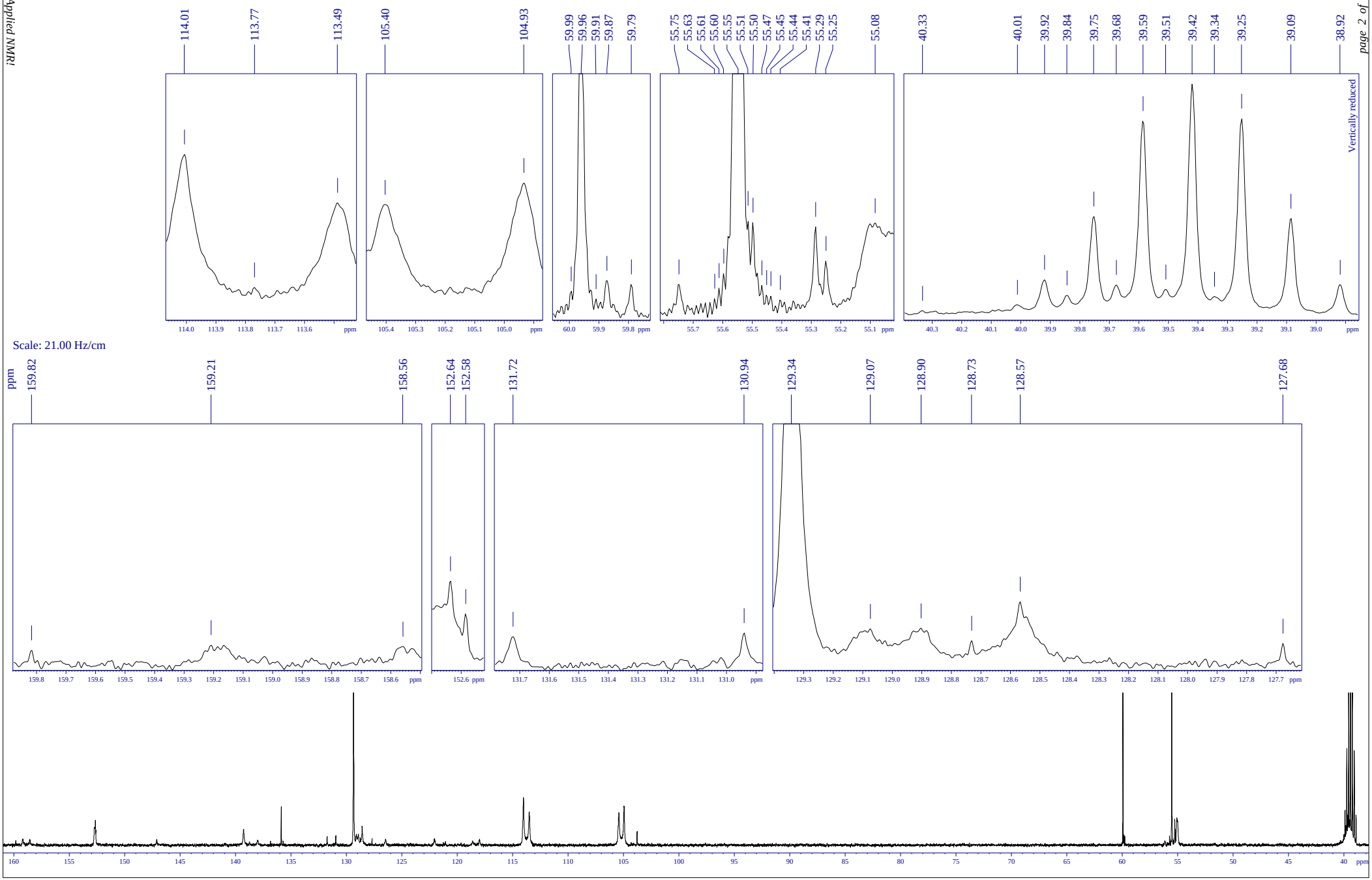
# 1p (NMR/22257580)





1p (NMR/2225780)

Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 9217.3 | 24489.377 | 194.7344 | 0.42 |
| 2 | 17411.6 | 20557.430 | 163.4684 | 0.33 |
| 3 | 18368.7 | 20098.189 | 159.8166 | 0.32 |
| 4 | 18528.1 | 20021.723 | 159.2085 | 0.42 |
| 5 | 18698.4 | 19940.012 | 158.5588 | 0.39 |
| 6 | 20250.6 | 19195.203 | 152.6362 | 1.73 |
| 7 | 20264.1 | 19188.695 | 152.5845 | 1.05 |
| 8 | 21702.0 | 18498.771 | 147.0983 | 0.40 |
| 9 | 23757.8 | 17512.322 | 139.2543 | 1.09 |
| 10 | 24089.7 | 17353.037 | 137.9877 | 0.35 |
| 11 | 24646.4 | 17085.936 | 135.8638 | 2.71 |
| 12 | 25731.7 | 16565.150 | 131.7226 | 0.59 |
| 13 | 25936.7 | 16466.785 | 130.9404 | 0.66 |
| 14 | 26355.8 | 16265.683 | 129.3413 | 12.99 |
| 15 | 26425.8 | 16232.094 | 129.0742 | 0.74 |
| 16 | 26470.8 | 16210.506 | 128.9025 | 0.76 |
| 17 | 26515.7 | 16188.954 | 128.7312 | 0.51 |
| 18 | 26558.8 | 16168.271 | 128.5667 | 1.30 |
| 19 | 26792.1 | 16056.332 | 127.6766 | 0.45 |
| 20 | 27115.4 | 15901.229 | 126.4432 | 0.42 |
| 21 | 28274.0 | 15345.259 | 122.0223 | 0.43 |
| 22 | 29335.9 | 14835.734 | 117.9706 | 0.41 |
| 23 | 30374.8 | 14337.222 | 114.0066 | 3.26 |
| 24 | 30437.0 | 14307.397 | 113.7694 | 0.57 |
| 25 | 30510.7 | 14272.014 | 113.4880 | 2.28 |
| 26 | 32629.6 | 13255.310 | 105.4034 | 2.24 |
| 27 | 32752.7 | 13196.218 | 104.9335 | 2.68 |
| 28 | 33060.7 | 13048.452 | 103.7585 | 0.95 |
| 29 | 44530.7 | 7544.698 | 59.9938 | 0.49 |
| 30 | 44539.6 | 7540.434 | 59.9599 | 11.66 |
| 31 | 44552.8 | 7534.095 | 59.9095 | 0.34 |
| 32 | 44562.5 | 7529.475 | 59.8728 | 0.72 |
| 33 | 44584.2 | 7519.049 | 59.7899 | 0.64 |
| 34 | 45643.4 | 7010.789 | 55.7483 | 0.65 |
| 35 | 45675.2 | 6995.559 | 55.6272 | 0.35 |
| 36 | 45679.0 | 6993.702 | 55.6124 | 0.56 |
| 37 | 45683.2 | 6991.700 | 55.5965 | 0.86 |
| 38 | 45696.1 | 6985.509 | 55.5473 | 32.00 |
| 39 | 45704.8 | 6981.354 | 55.5143 | 1.92 |
| 40 | 45709.2 | 6979.233 | 55.4974 | 1.89 |
| 41 | 45717.1 | 6975.453 | 55.4673 | 0.61 |
| 42 | 45721.3 | 6973.425 | 55.4512 | 0.43 |
| 43 | 45725.1 | 6971.616 | 55.4368 | 0.39 |
| 44 | 45733.4 | 6967.624 | 55.4051 | 0.33 |
| 45 | 45764.8 | 6952.558 | 55.2853 | 1.80 |
| 46 | 45774.0 | 6948.140 | 55.2501 | 1.10 |
| 47 | 45817.6 | 6927.209 | 55.0837 | 1.87 |
| 48 | 49683.7 | 5072.145 | 40.3326 | 0.32 |
| 49 | 49767.9 | 5031.732 | 40.0113 | 0.72 |
| 50 | 49791.9 | 5020.188 | 39.9195 | 2.39 |
| 51 | 49811.9 | 5010.624 | 39.8434 | 1.35 |
| 52 | 49835.7 | 4999.188 | 39.7525 | 6.66 |
| 53 | 49855.7 | 4989.606 | 39.6763 | 2.06 |
| 54 | 49879.4 | 4978.242 | 39.5859 | 13.10 |
| 55 | 49899.6 | 4968.523 | 39.5087 | 1.75 |
| 56 | 49923.1 | 4957.247 | 39.4190 | 15.49 |
| 57 | 49942.8 | 4947.812 | 39.3440 | 1.26 |
| 58 | 49966.8 | 4936.262 | 39.2521 | 13.19 |
| 59 | 50010.6 | 4915.272 | 39.0852 | 6.53 |
| 60 | 50054.3 | 4894.302 | 38.9185 | 2.08 |
| 61 | 60254.2 | 0.000 | 0.0000 | 1.01 |

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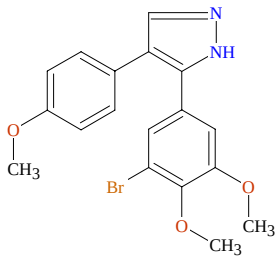
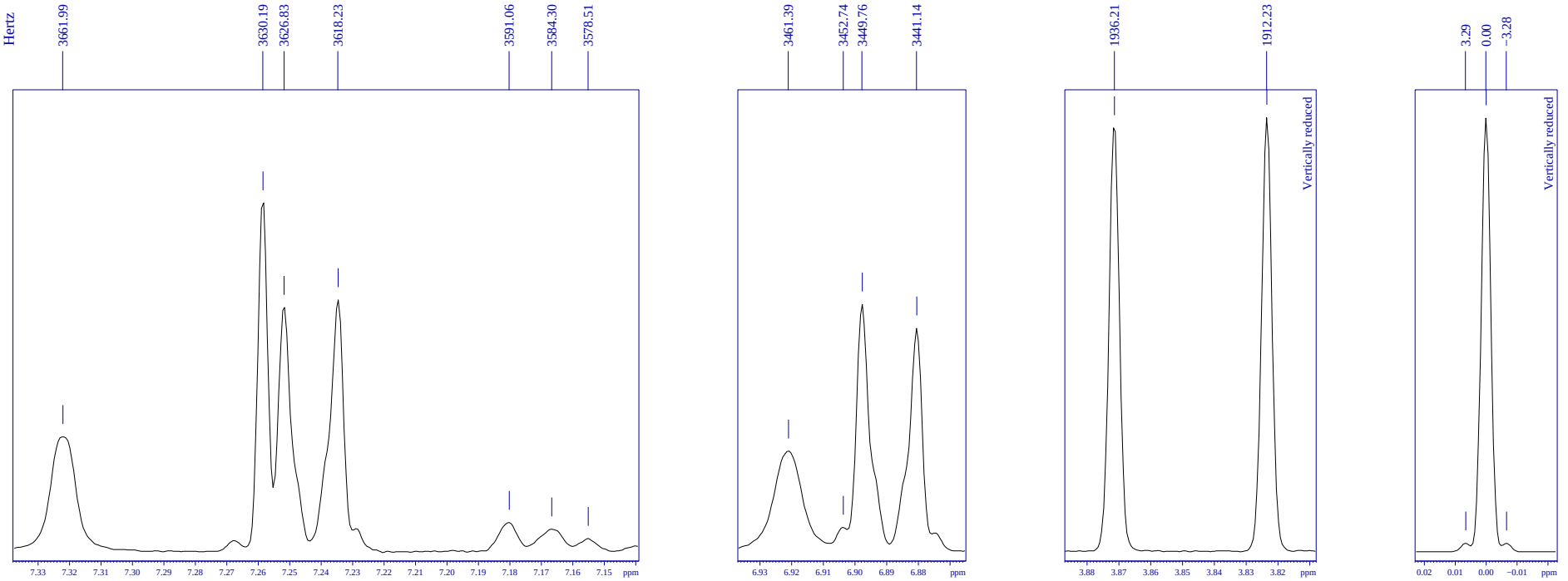
# 1q (NMR/22297854)

Found protons = 15 impurity* < 0.1 %

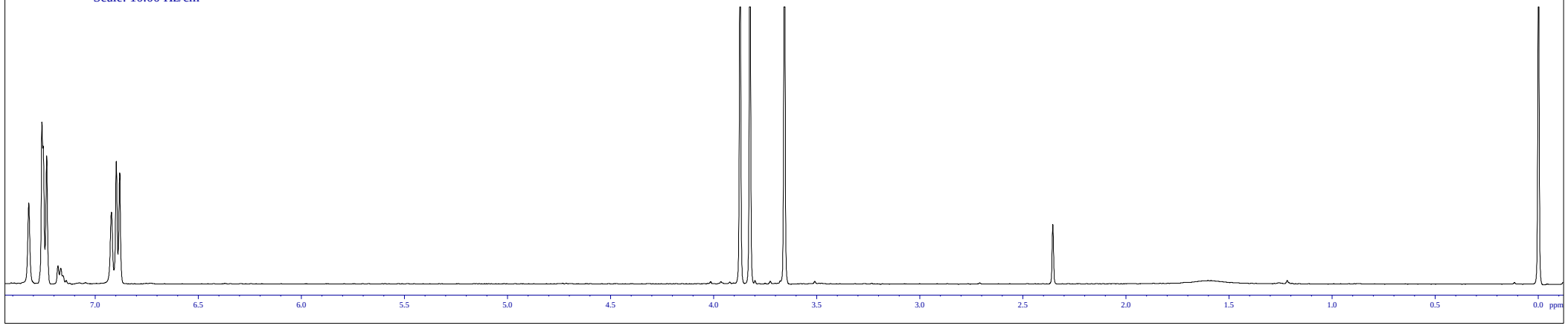


# 1q (NMR/22297854)






Scale: 10.00 Hz/cm



# 1q (NMR/22297854)



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 16953.1 | 3821.368 | 7.6407 | 3.69 |
| 2 | 17475.4 | 3661.990 | 7.3221 | 1.86 |
| 3 | 17579.6 | 3630.191 | 7.2585 | 5.70 |
| 4 | 17590.6 | 3626.833 | 7.2518 | 3.97 |
| 5 | 17618.8 | 3618.228 | 7.2346 | 4.07 |
| 6 | 17707.8 | 3591.056 | 7.1802 | 0.47 |
| 7 | 17730.0 | 3584.296 | 7.1667 | 0.37 |
| 8 | 17749.0 | 3578.505 | 7.1551 | 0.21 |
| 9 | 18132.7 | 3461.386 | 6.9210 | 1.62 |
| 10 | 18161.1 | 3452.736 | 6.9037 | 0.39 |
| 11 | 18170.8 | 3449.756 | 6.8977 | 4.00 |
| 12 | 18199.1 | 3441.143 | 6.8805 | 3.61 |
| 13 | 23130.4 | 1936.208 | 3.8714 | 15.84 |
| 14 | 23209.0 | 1912.226 | 3.8235 | 16.00 |
| 15 | 23483.3 | 1828.523 | 3.6561 | 15.03 |
| 16 | 25617.0 | 1177.363 | 2.3541 | 1.92 |
| 17 | 29464.2 | 3.294 | 0.0066 | 0.27 |
| 18 | 29475.0 | 0.002 | 0.0000 | 13.21 |
| 19 | 29485.8 | −3.284 | −0.0066 | 0.26 |

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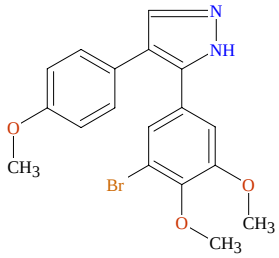
# 1q (NMR/22297854)

158.02
153.16
152.90
145.24
144.65
139.58
135.95
131.40
129.72
129.28
128.85
126.98
125.36
125.08
122.77
118.57
116.75
116.33
114.00
113.86
111.60
60.03
55.80
55.59
55.01
40.01
39.92
39.85
39.76
39.68
39.59
39.51
39.42
39.35
39.25
39.09
38.92
0.00

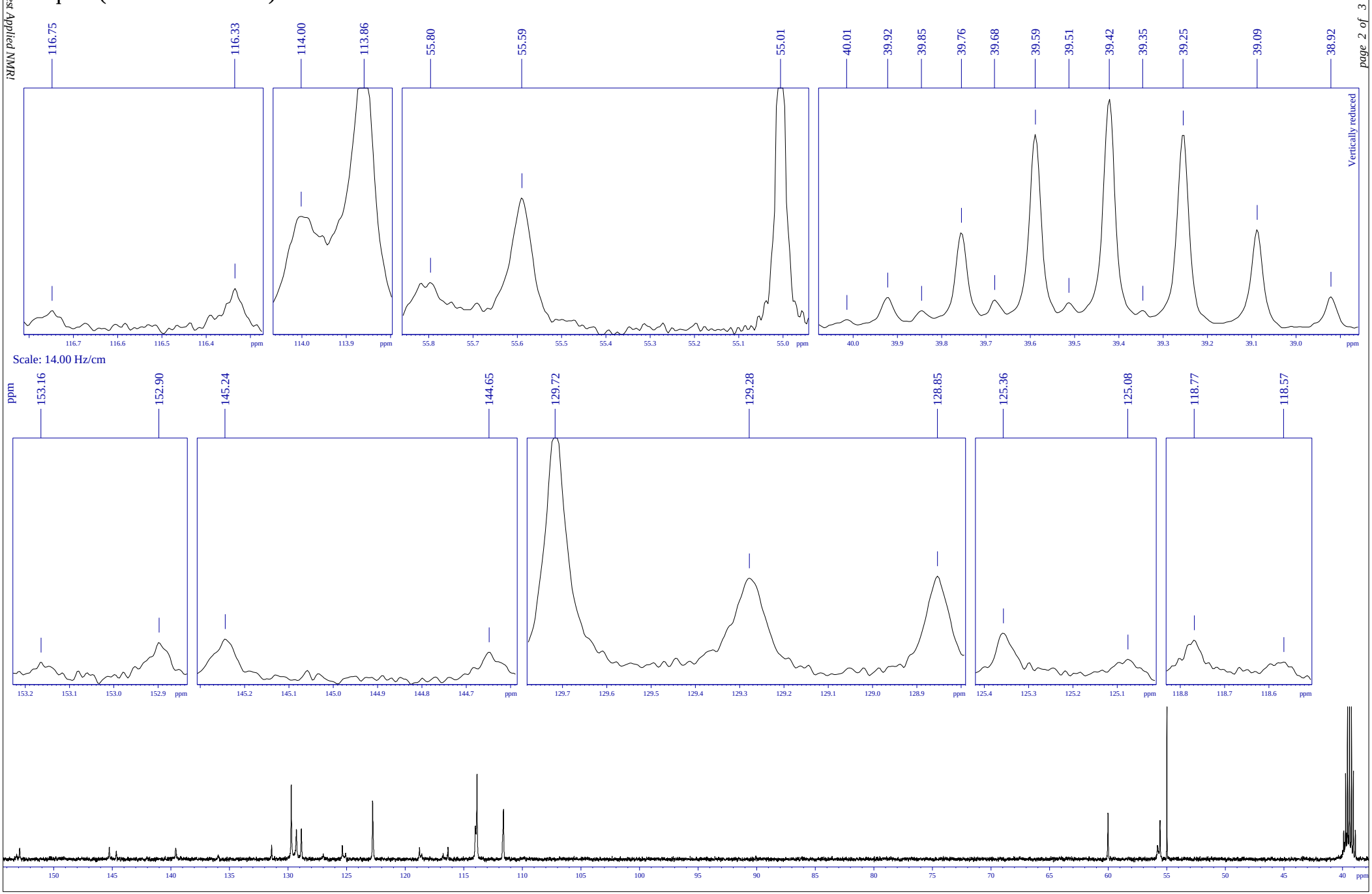





190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

# 1q (NMR/22297854)





# 1q (NMR/22297854)



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 18837.9 | 19872.273 | 158.0201 | 5.33 |
| 2 | 20110.5 | 19261.611 | 153.1643 | 0.36 |
| 3 | 20180.4 | 19228.092 | 152.8977 | 0.76 |
| 4 | 22186.4 | 18265.541 | 145.2437 | 0.83 |
| 5 | 22342.4 | 18190.656 | 144.6483 | 0.56 |
| 6 | 23671.5 | 17552.914 | 139.5771 | 0.76 |
| 7 | 24622.1 | 17096.799 | 135.9501 | 0.31 |
| 8 | 25815.8 | 16523.994 | 131.3953 | 0.97 |
| 9 | 26255.9 | 16312.830 | 129.7162 | 5.10 |
| 10 | 26370.7 | 16257.738 | 129.2781 | 2.05 |
| 11 | 26482.0 | 16204.325 | 128.8534 | 2.09 |
| 12 | 26972.3 | 15969.078 | 126.9827 | 0.37 |
| 13 | 27398.4 | 15764.597 | 125.3568 | 0.94 |
| 14 | 27472.1 | 15729.260 | 125.0758 | 0.41 |
| 15 | 28075.7 | 15439.599 | 122.7724 | 4.02 |
| 16 | 29125.2 | 14936.035 | 118.7682 | 0.80 |
| 17 | 29178.1 | 14910.633 | 118.5662 | 0.36 |
| 18 | 29654.6 | 14682.002 | 116.7482 | 0.39 |
| 19 | 29762.9 | 14630.027 | 116.3349 | 0.84 |
| 20 | 30374.4 | 14336.598 | 114.0016 | 2.29 |
| 21 | 30411.7 | 14318.744 | 113.8596 | 5.85 |
| 22 | 31004.0 | 14034.517 | 111.5995 | 3.42 |
| 23 | 44519.8 | 7549.157 | 60.0293 | 3.18 |
| 24 | 45629.3 | 7016.781 | 55.7960 | 0.95 |
| 25 | 45683.4 | 6990.831 | 55.5896 | 2.67 |
| 26 | 45836.5 | 6917.359 | 55.0054 | 11.94 |
| 27 | 49765.5 | 5032.070 | 40.0140 | 0.61 |
| 28 | 49789.6 | 5020.492 | 39.9219 | 1.97 |
| 29 | 49809.7 | 5010.877 | 39.8454 | 1.16 |
| 30 | 49833.3 | 4999.550 | 39.7554 | 5.90 |
| 31 | 49853.0 | 4990.105 | 39.6803 | 1.81 |
| 32 | 49877.0 | 4978.557 | 39.5884 | 11.84 |
| 33 | 49896.8 | 4969.050 | 39.5128 | 1.64 |
| 34 | 49920.8 | 4957.566 | 39.4215 | 14.00 |
| 35 | 49940.6 | 4948.046 | 39.3458 | 1.16 |
| 36 | 49964.5 | 4936.584 | 39.2547 | 11.92 |
| 37 | 50008.2 | 4915.592 | 39.0877 | 6.08 |
| 38 | 50051.9 | 4894.646 | 38.9212 | 2.01 |
| 39 | 60252.6 | 0.002 | 0.0000 | 0.80 |

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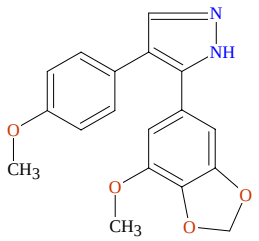
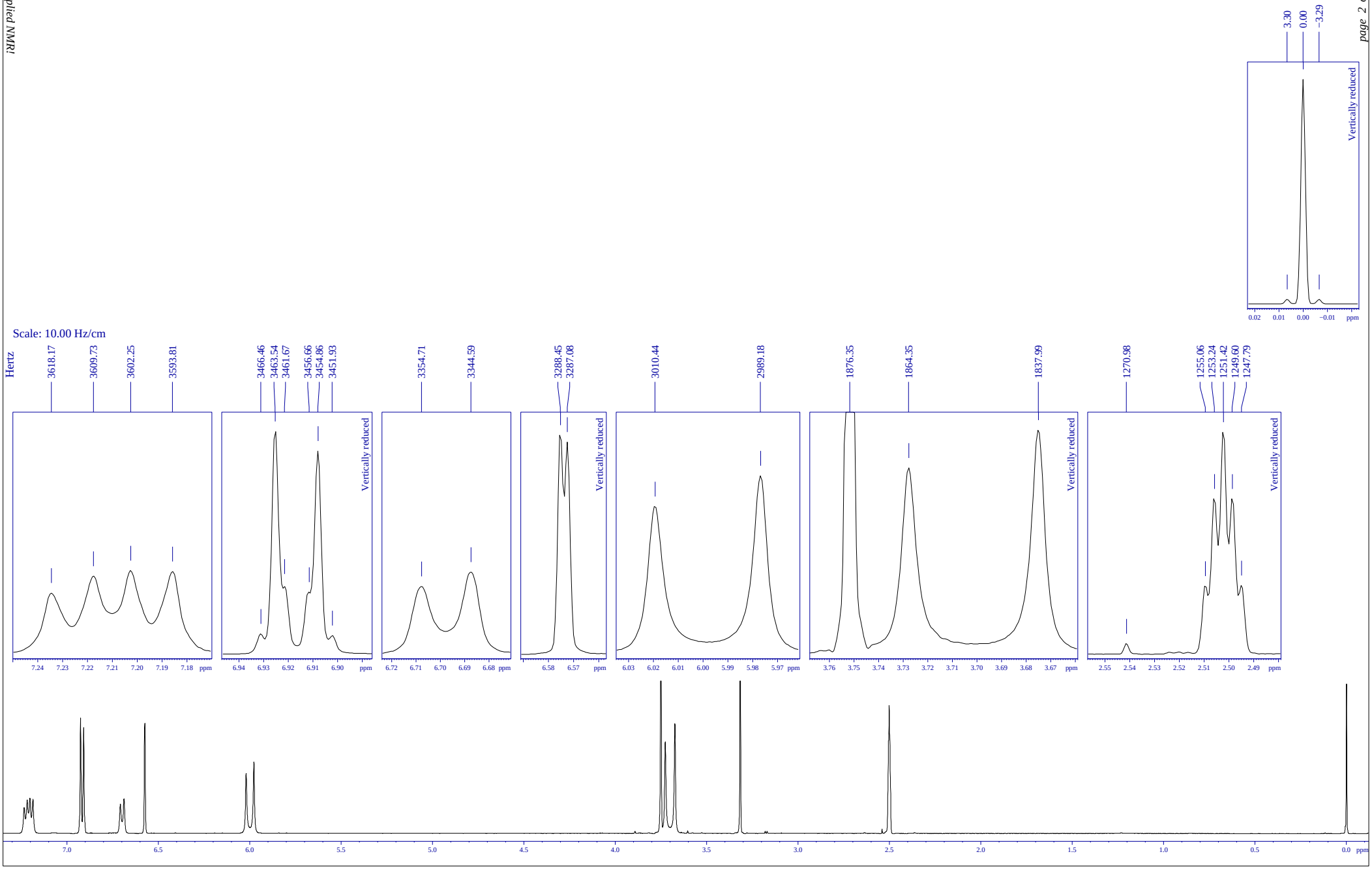
# 1r (NMR/22257525)

Found protons = 15 impurity* < 0.1 %



# 1r (NMR/22257525)





# 1r (NMR/22257525)

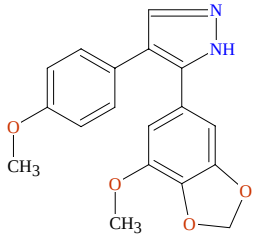


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 8094.7 | 6526.288 | 13.0492 | 0.86 |
| 2 | 8322.9 | 6456.635 | 12.9099 | 1.11 |
| 3 | 16644.6 | 3917.066 | 7.8321 | 1.56 |
| 4 | 17037.8 | 3797.063 | 7.5922 | 1.16 |
| 5 | 17624.0 | 3618.167 | 7.2345 | 1.27 |
| 6 | 17651.6 | 3609.732 | 7.2176 | 1.62 |
| 7 | 17676.2 | 3602.250 | 7.2026 | 1.73 |
| 8 | 17703.8 | 3593.814 | 7.1858 | 1.72 |
| 9 | 18121.1 | 3466.464 | 6.9311 | 0.65 |
| 10 | 18130.7 | 3463.538 | 6.9253 | 7.21 |
| 11 | 18136.8 | 3461.667 | 6.9215 | 2.17 |
| 12 | 18153.2 | 3456.660 | 6.9115 | 1.99 |
| 13 | 18159.1 | 3454.859 | 6.9079 | 6.52 |
| 14 | 18168.7 | 3451.926 | 6.9021 | 0.60 |
| 15 | 18487.3 | 3354.712 | 6.7077 | 1.41 |
| 16 | 18520.5 | 3344.589 | 6.6874 | 1.71 |
| 17 | 18704.4 | 3288.448 | 6.5752 | 6.50 |
| 18 | 18708.9 | 3287.084 | 6.5725 | 6.15 |
| 19 | 19615.4 | 3010.444 | 6.0193 | 3.08 |
| 20 | 19685.1 | 2989.183 | 5.9768 | 3.71 |
| 21 | 23331.6 | 1876.352 | 3.7517 | 32.85 |
| 22 | 23370.9 | 1864.349 | 3.7277 | 4.75 |
| 23 | 23457.3 | 1837.986 | 3.6750 | 5.73 |
| 24 | 24043.2 | 1659.172 | 3.3175 | 27.40 |
| 25 | 25315.2 | 1270.985 | 2.5413 | 0.34 |
| 26 | 25367.4 | 1255.062 | 2.5095 | 2.23 |
| 27 | 25373.4 | 1253.245 | 2.5058 | 5.07 |
| 28 | 25379.3 | 1251.423 | 2.5022 | 7.24 |
| 29 | 25385.3 | 1249.601 | 2.4986 | 5.04 |
| 30 | 25391.2 | 1247.794 | 2.4949 | 2.22 |
| 31 | 29469.2 | 3.297 | 0.0066 | 0.23 |
| 32 | 29480.0 | 0.001 | 0.0000 | 11.37 |
| 33 | 29490.8 | −3.295 | −0.0066 | 0.23 |

# 1r (NMR/22257525)

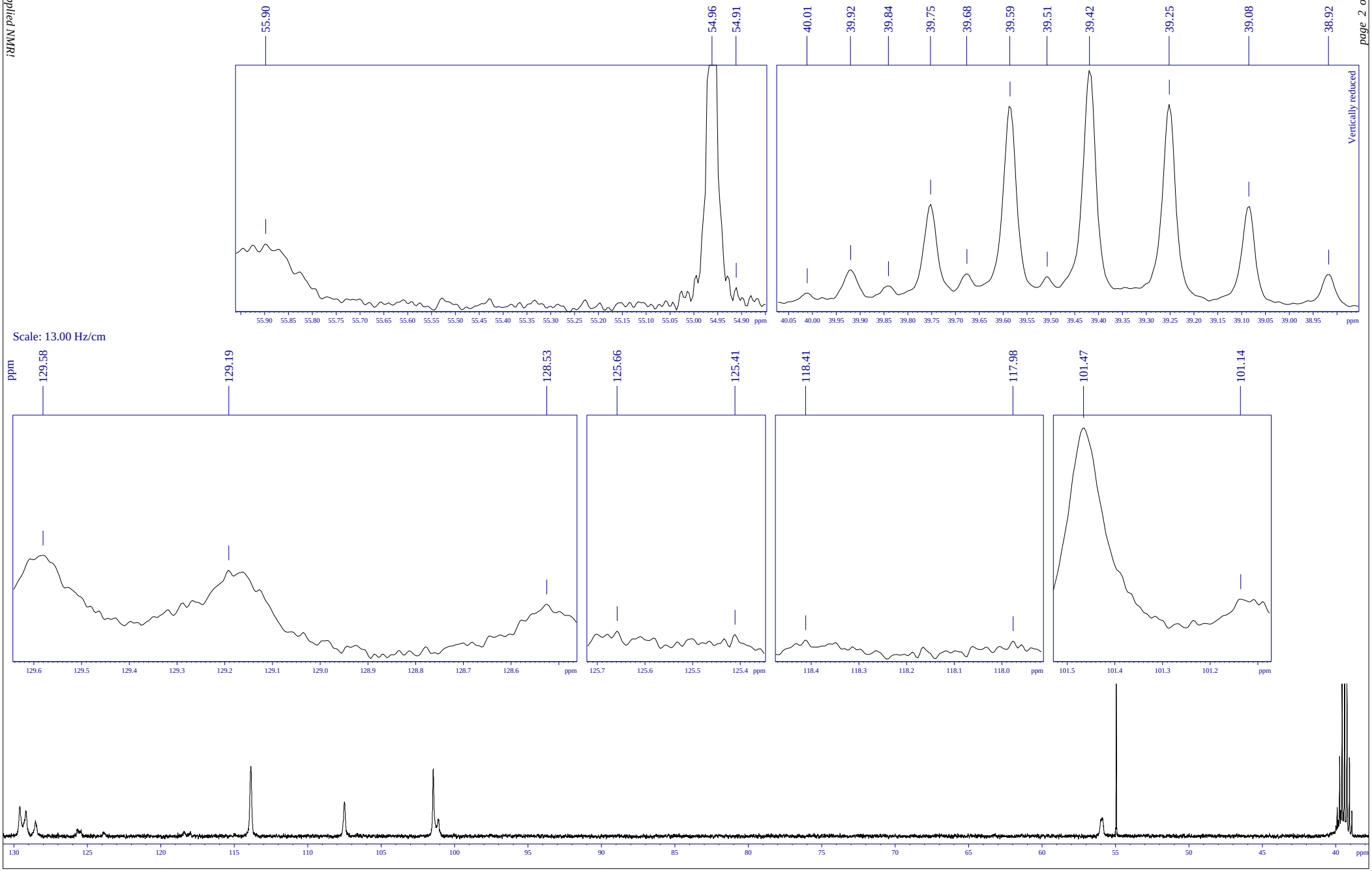
157.85
146.67
143.14
139.37
129.58
129.19
128.53
125.66
125.41
118.41
117.98
113.87
107.48
101.47
101.14
55.90
54.96
54.91
40.01
39.92
39.84
39.75
39.68
39.59
39.51
39.42
39.25
39.08
38.92
0.00



*The Best Applied NMR!*

# 1r (NMR/22257525)





# 1r (NMR/22257525)

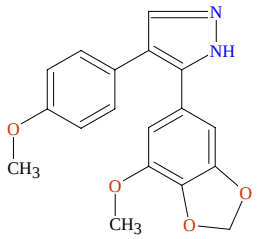


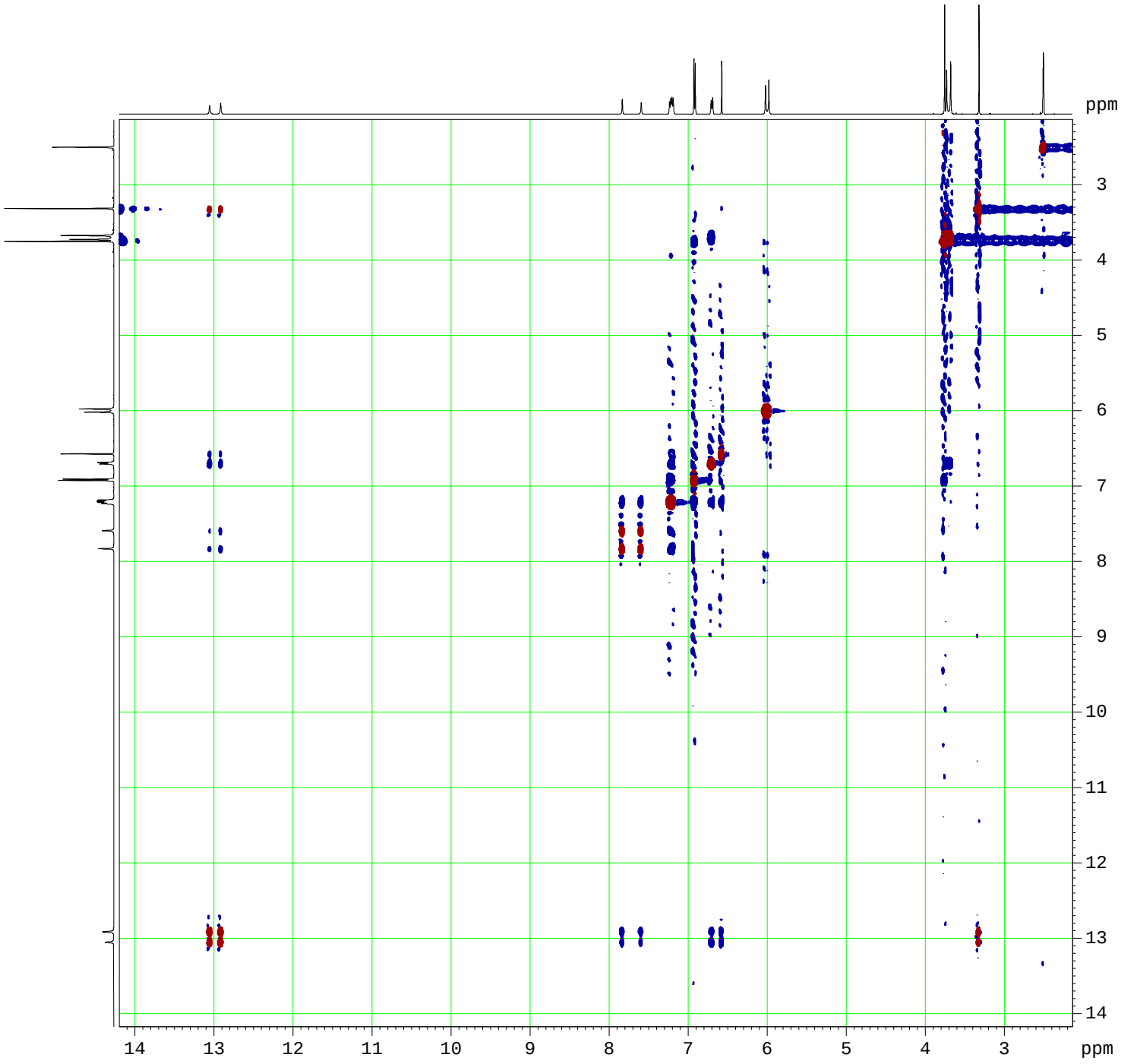
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 18884.4 | 19850.713 | 157.8487 | 5.53 |
| 2 | 21812.9 | 18445.525 | 146.6749 | 0.31 |
| 3 | 22740.4 | 18000.480 | 143.1360 | 0.40 |
| 4 | 23728.7 | 17526.240 | 139.3650 | 0.67 |
| 5 | 26293.0 | 16295.796 | 129.5807 | 2.00 |
| 6 | 26395.0 | 16246.859 | 129.1916 | 1.71 |
| 7 | 26569.7 | 16163.053 | 128.5252 | 1.04 |
| 8 | 27321.0 | 15802.527 | 125.6584 | 0.51 |
| 9 | 27385.9 | 15771.419 | 125.4110 | 0.44 |
| 10 | 29220.4 | 14891.164 | 118.4114 | 0.33 |
| 11 | 29334.3 | 14836.479 | 117.9766 | 0.31 |
| 12 | 30410.4 | 14320.144 | 113.8708 | 4.67 |
| 13 | 32086.0 | 13516.104 | 107.4772 | 2.29 |
| 14 | 33661.6 | 12760.081 | 101.4655 | 4.52 |
| 15 | 33748.0 | 12718.634 | 101.1359 | 1.14 |
| 16 | 45604.3 | 7029.573 | 55.8977 | 1.24 |
| 17 | 45849.6 | 6911.863 | 54.9617 | 14.00 |
| 18 | 45862.8 | 6905.505 | 54.9111 | 0.38 |
| 19 | 49768.0 | 5031.686 | 40.0109 | 0.72 |
| 20 | 49791.8 | 5020.233 | 39.9198 | 1.94 |
| 21 | 49812.6 | 5010.267 | 39.8406 | 1.09 |
| 22 | 49835.7 | 4999.156 | 39.7522 | 5.38 |
| 23 | 49855.7 | 4989.568 | 39.6760 | 1.73 |
| 24 | 49879.4 | 4978.206 | 39.5856 | 10.57 |
| 25 | 49899.9 | 4968.396 | 39.5076 | 1.59 |
| 26 | 49923.2 | 4957.181 | 39.4185 | 12.39 |
| 27 | 49967.0 | 4936.192 | 39.2516 | 10.59 |
| 28 | 50010.6 | 4915.233 | 39.0849 | 5.28 |
| 29 | 50054.6 | 4894.165 | 38.9174 | 1.71 |
| 30 | 60254.2 | 0.005 | 0.0000 | 0.98 |

# 1r (NMR/22257525)

## NOESY



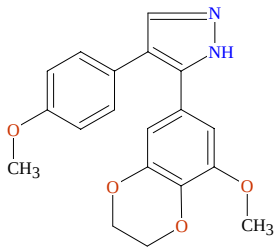



*The Best Applied NMR!*

# 1s (NMR/22297897)

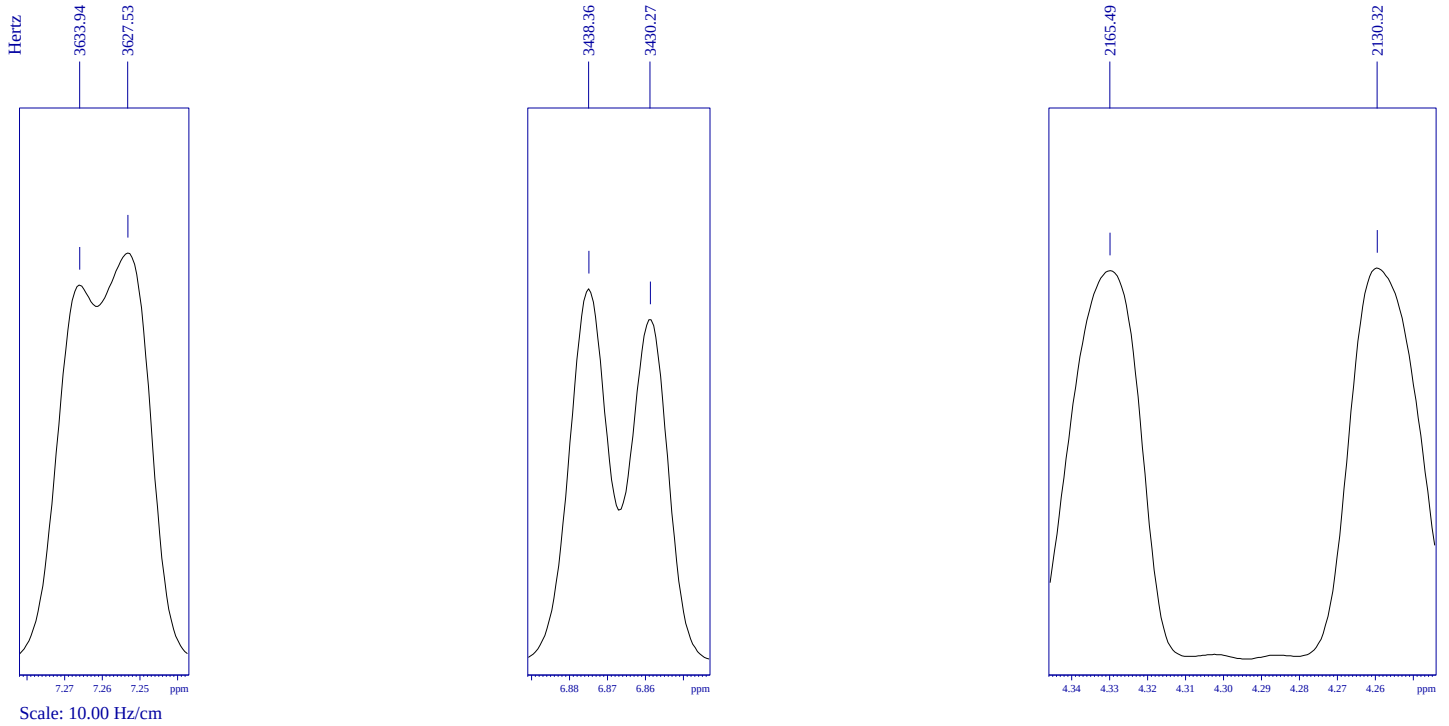
Found protons = 16 impurity* = 0.7 %

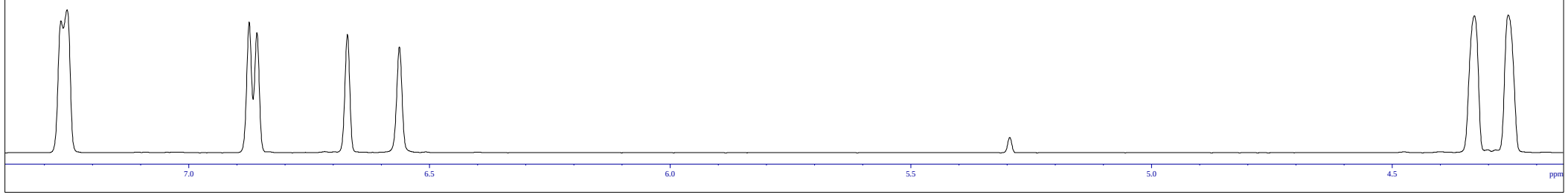




# 1s (NMR/22297897)





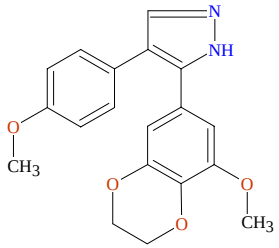
# 1s (NMR/22297897)



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 16964.6 | 3818.109 | 7.6342 | 4.91 |
| 2 | 17568.1 | 3633.939 | 7.2660 | 5.00 |
| 3 | 17589.1 | 3627.527 | 7.2532 | 5.42 |
| 4 | 18209.0 | 3438.357 | 6.8749 | 4.95 |
| 5 | 18235.5 | 3430.266 | 6.8587 | 4.55 |
| 6 | 18543.5 | 3336.278 | 6.6708 | 4.49 |
| 7 | 18720.5 | 3282.241 | 6.5628 | 4.01 |
| 8 | 20799.1 | 2647.898 | 5.2944 | 0.59 |
| 9 | 22379.9 | 2165.493 | 4.3299 | 5.19 |
| 10 | 22495.1 | 2130.324 | 4.2595 | 5.22 |
| 11 | 23228.3 | 1906.566 | 3.8121 | 16.00 |
| 12 | 23436.7 | 1842.972 | 3.6850 | 15.53 |
| 13 | 27439.3 | 621.484 | 1.2426 | 0.42 |
| 14 | 29475.8 | −0.001 | −0.0000 | 3.73 |

# 1s (NMR/22297897)




157.82 148.38 143.51 139.65 139.34 139.07 132.62 129.41 128.49 125.69 117.98 113.81 113.53 108.59 104.11

63.85 63.73 55.39 55.01 54.96 54.86 40.38 40.00 39.91 39.84 39.74 39.67 39.58 39.50 39.41 39.24 39.07 38.91 24.86

−0.00

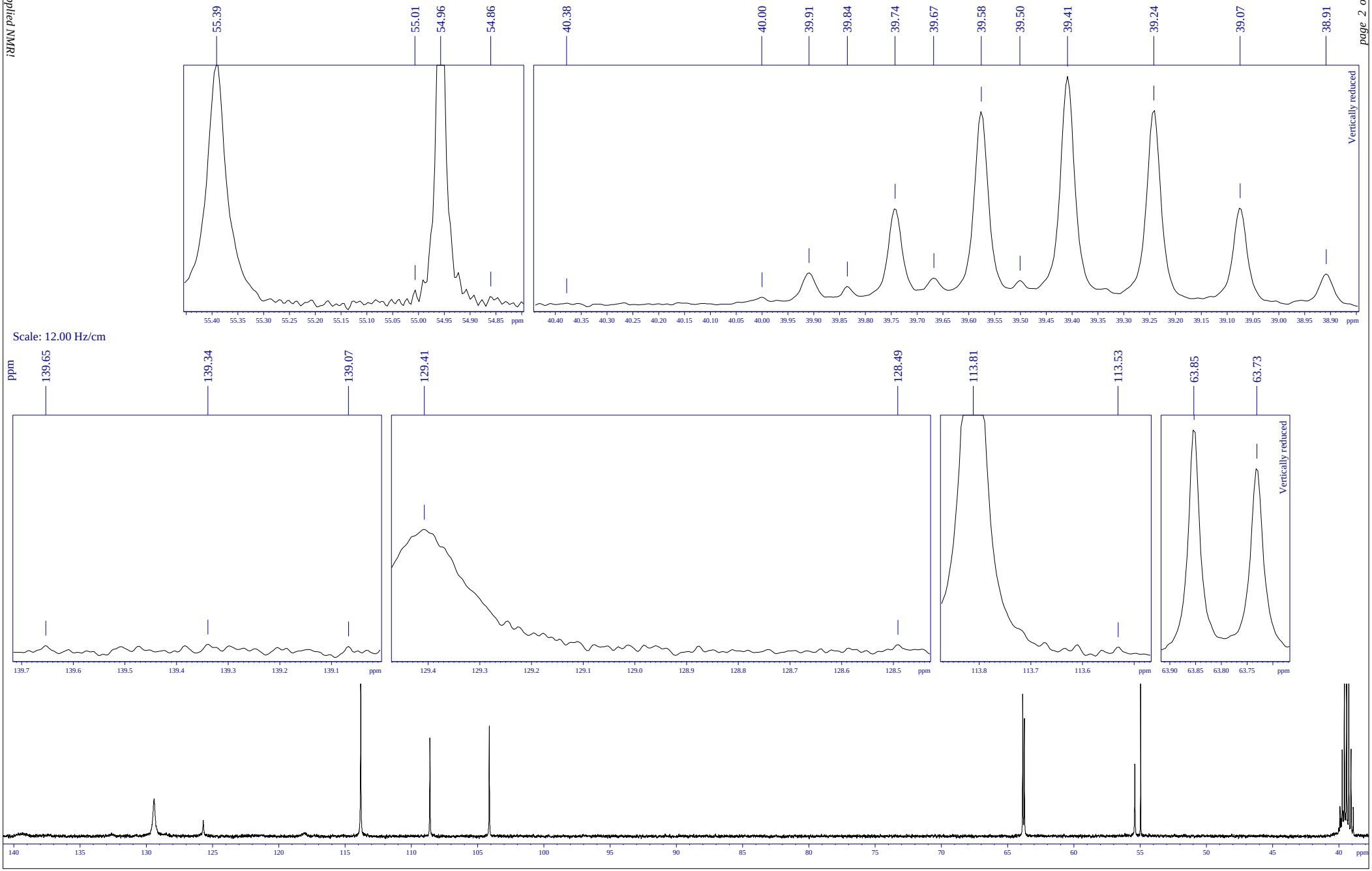


190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

*The Best Applied NMR!*

# 1s (NMR/22297897)





# 1s (NMR/22297897)



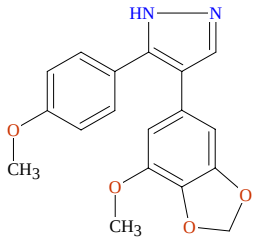
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 18890.1 | 19846.613 | 157.8161 | 5.10 |
| 2 | 21363.1 | 18659.971 | 148.3802 | 0.42 |
| 3 | 22639.3 | 18047.598 | 143.5107 | 0.68 |
| 4 | 23650.3 | 17562.492 | 139.6532 | 0.23 |
| 5 | 23732.6 | 17523.010 | 139.3393 | 0.25 |
| 6 | 23804.0 | 17488.756 | 139.0669 | 0.21 |
| 7 | 25494.1 | 16677.754 | 132.6180 | 0.22 |
| 8 | 26335.6 | 16273.999 | 129.4074 | 2.58 |
| 9 | 26575.7 | 16158.776 | 128.4912 | 0.25 |
| 10 | 27308.7 | 15807.052 | 125.6943 | 1.09 |
| 11 | 29330.0 | 14837.188 | 117.9822 | 0.25 |
| 12 | 30423.0 | 14312.694 | 113.8115 | 11.18 |
| 13 | 30496.6 | 14277.403 | 113.5309 | 0.20 |
| 14 | 31791.7 | 13655.981 | 108.5895 | 6.81 |
| 15 | 32966.2 | 13092.387 | 104.1079 | 7.61 |
| 16 | 43516.4 | 8030.007 | 63.8529 | 9.92 |
| 17 | 43548.4 | 8014.660 | 63.7309 | 8.20 |
| 18 | 45734.2 | 6965.835 | 55.3909 | 4.99 |
| 19 | 45834.9 | 6917.514 | 55.0066 | 0.34 |
| 20 | 45848.0 | 6911.249 | 54.9568 | 12.40 |
| 21 | 45873.4 | 6899.067 | 54.8599 | 0.22 |
| 22 | 49668.8 | 5077.864 | 40.3781 | 0.22 |
| 23 | 49767.9 | 5030.317 | 40.0000 | 0.59 |
| 24 | 49791.8 | 5018.872 | 39.9090 | 2.06 |
| 25 | 49811.2 | 5009.561 | 39.8350 | 1.24 |
| 26 | 49835.4 | 4997.936 | 39.7425 | 6.01 |
| 27 | 49855.1 | 4988.500 | 39.6675 | 1.75 |
| 28 | 49879.1 | 4976.958 | 39.5757 | 11.87 |
| 29 | 49898.8 | 4967.526 | 39.5007 | 1.60 |
| 30 | 49922.9 | 4955.954 | 39.4087 | 14.00 |
| 31 | 49966.6 | 4934.961 | 39.2418 | 12.00 |
| 32 | 50010.4 | 4913.968 | 39.0748 | 6.04 |
| 33 | 50054.1 | 4893.013 | 38.9082 | 1.99 |
| 34 | 53735.7 | 3126.445 | 24.8608 | 0.28 |
| 35 | 60251.3 | −0.004 | −0.0000 | 1.00 |

*The Best Applied NMR!*

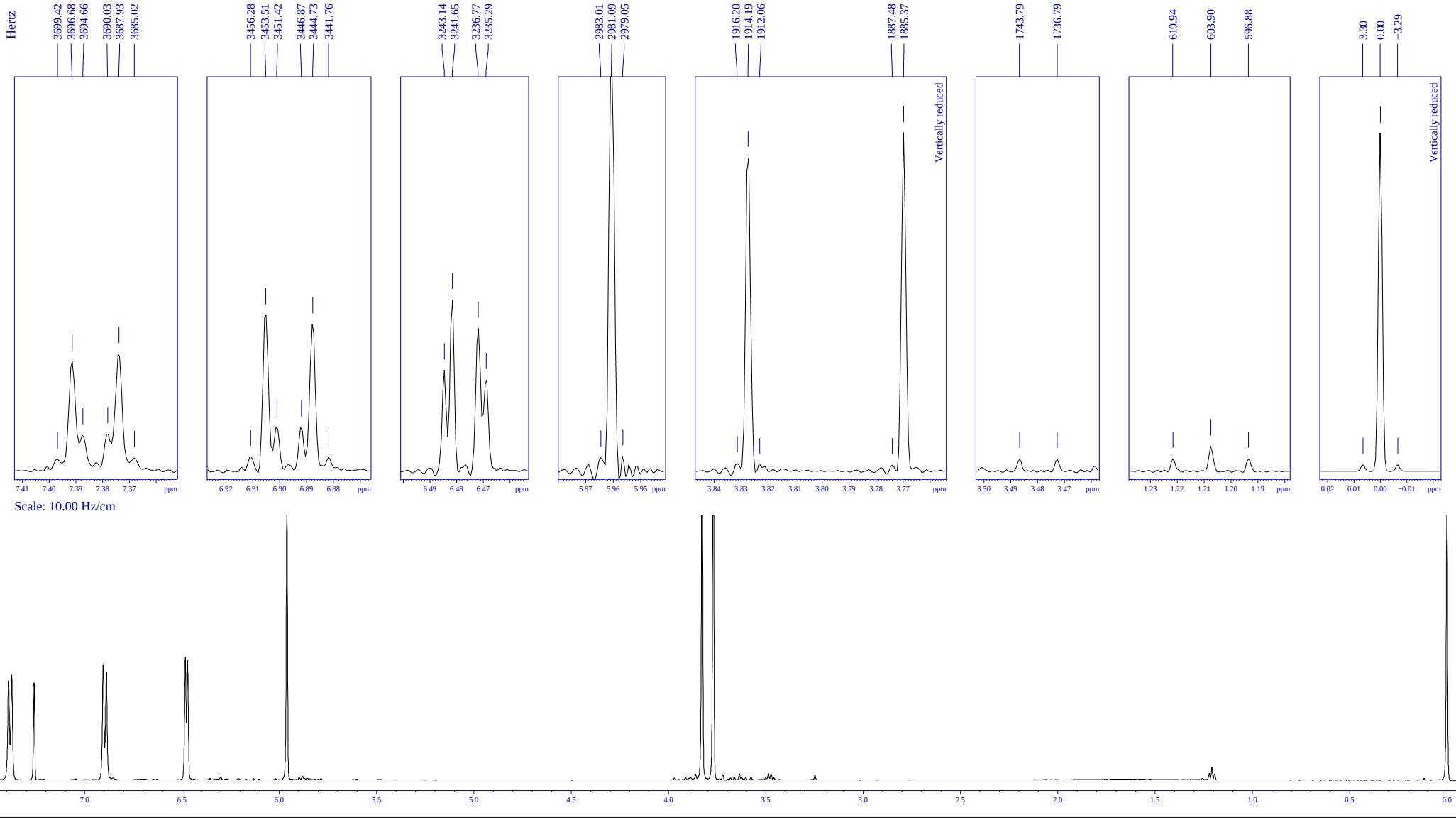
# 1t (NMR/22257608)

Found protons = 16 impurity* = 2.6 %



# 1t (NMR/22257608)





# 1t (NMR/22257608)



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 16965.2 | 3818.616 | 7.6352 | 4.42 |
| 2 | 17355.7 | 3699.424 | 7.3969 | 0.25 |
| 3 | 17364.7 | 3696.677 | 7.3914 | 2.29 |
| 4 | 17371.3 | 3694.664 | 7.3874 | 0.75 |
| 5 | 17386.5 | 3690.031 | 7.3781 | 0.79 |
| 6 | 17393.4 | 3687.927 | 7.3739 | 2.48 |
| 7 | 17402.9 | 3685.020 | 7.3681 | 0.28 |
| 8 | 17580.9 | 3630.703 | 7.2595 | 4.36 |
| 9 | 18152.5 | 3456.281 | 6.9108 | 0.31 |
| 10 | 18161.6 | 3453.509 | 6.9052 | 3.34 |
| 11 | 18168.4 | 3451.416 | 6.9010 | 0.92 |
| 12 | 18183.3 | 3446.870 | 6.8919 | 0.92 |
| 13 | 18190.3 | 3444.730 | 6.8877 | 3.09 |
| 14 | 18200.1 | 3441.757 | 6.8817 | 0.30 |
| 15 | 18850.9 | 3243.141 | 6.4846 | 2.10 |
| 16 | 18855.8 | 3241.648 | 6.4816 | 3.60 |
| 17 | 18871.8 | 3236.771 | 6.4719 | 2.99 |
| 18 | 18876.6 | 3235.289 | 6.4689 | 1.95 |
| 19 | 19703.3 | 2983.009 | 5.9645 | 0.29 |
| 20 | 19709.6 | 2981.087 | 5.9606 | 10.02 |
| 21 | 19716.3 | 2979.049 | 5.9565 | 0.33 |
| 22 | 23199.0 | 1916.203 | 3.8314 | 0.39 |
| 23 | 23205.6 | 1914.188 | 3.8274 | 15.34 |
| 24 | 23212.6 | 1912.063 | 3.8231 | 0.32 |
| 25 | 23293.1 | 1887.479 | 3.7740 | 0.30 |
| 26 | 23300.0 | 1885.367 | 3.7698 | 16.00 |
| 27 | 23764.0 | 1743.786 | 3.4867 | 0.26 |
| 28 | 23786.9 | 1736.786 | 3.4727 | 0.26 |
| 29 | 27476.1 | 610.936 | 1.2216 | 0.26 |
| 30 | 27499.2 | 603.897 | 1.2075 | 0.52 |
| 31 | 27522.1 | 596.883 | 1.1935 | 0.26 |
| 32 | 29467.2 | 3.299 | 0.0066 | 0.25 |
| 33 | 29478.0 | 0.002 | 0.0000 | 12.57 |
| 34 | 29488.8 | −3.294 | −0.0066 | 0.25 |

# 1t (NMR/22257608)

159.15
158.52
148.35
143.07
139.30
137.93
133.20
129.21
128.55
127.90
126.36
121.99
118.37
114.06
113.57
107.76
107.33
102.06
101.63
100.98
55.98
55.03
40.01
39.92
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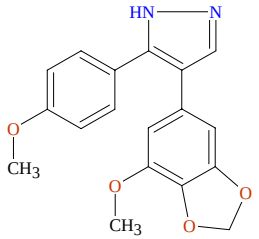
39.75
39.68
39.59
39.51
39.42
39.25
39.08
38.92
15.07
0.00

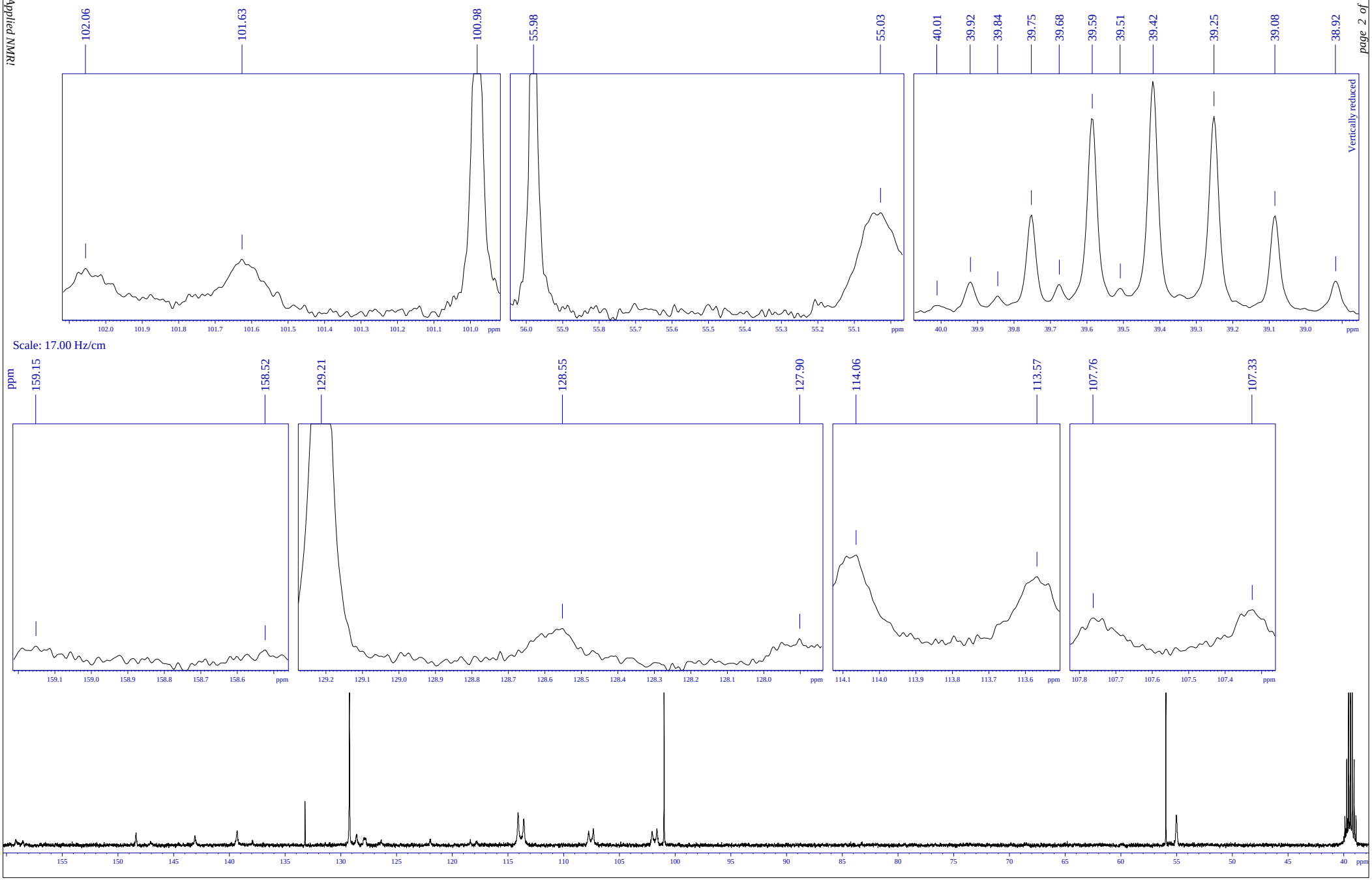





190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

# 1t (NMR/22257608)





# 1t (NMR/22257608)



Peaks List

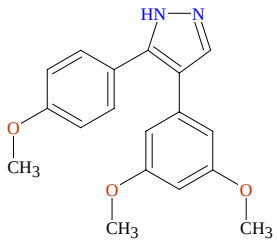
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 18542.9 | 20014.576 | 159.1517 | 0.39 |
| 2 | 18707.5 | 19935.578 | 158.5235 | 0.31 |
| 3 | 21372.9 | 18656.648 | 148.3537 | 0.84 |
| 4 | 22756.9 | 17992.561 | 143.0730 | 0.65 |
| 5 | 23746.5 | 17517.682 | 139.2969 | 0.97 |
| 6 | 24104.2 | 17346.072 | 137.9323 | 0.33 |
| 7 | 25344.1 | 16751.119 | 133.2014 | 2.96 |
| 8 | 26389.5 | 16249.508 | 129.2127 | 12.85 |
| 9 | 26562.6 | 16166.423 | 128.5520 | 0.74 |
| 10 | 26733.1 | 16084.612 | 127.9015 | 0.54 |
| 11 | 27138.3 | 15890.177 | 126.3553 | 0.36 |
| 12 | 28282.8 | 15341.003 | 121.9884 | 0.41 |
| 13 | 29231.7 | 14885.715 | 118.3681 | 0.38 |
| 14 | 30359.7 | 14344.459 | 114.0641 | 2.20 |
| 15 | 30489.6 | 14282.108 | 113.5683 | 1.77 |
| 16 | 32011.3 | 13551.933 | 107.7621 | 0.95 |
| 17 | 32125.7 | 13497.066 | 107.3258 | 1.11 |
| 18 | 33507.0 | 12834.245 | 102.0552 | 0.94 |
| 19 | 33619.4 | 12780.304 | 101.6263 | 1.12 |
| 20 | 33788.4 | 12699.211 | 100.9815 | 14.00 |
| 21 | 45582.6 | 7039.943 | 55.9801 | 12.19 |
| 22 | 45832.1 | 6920.218 | 55.0281 | 2.04 |
| 23 | 49767.9 | 5031.705 | 40.0111 | 0.59 |
| 24 | 49791.9 | 5020.189 | 39.9195 | 1.94 |
| 25 | 49811.5 | 5010.772 | 39.8446 | 1.13 |
| 26 | 49835.7 | 4999.172 | 39.7524 | 5.84 |
| 27 | 49855.8 | 4989.532 | 39.6757 | 1.80 |
| 28 | 49879.4 | 4978.168 | 39.5853 | 11.48 |
| 29 | 49899.6 | 4968.491 | 39.5084 | 1.57 |
| 30 | 49923.2 | 4957.183 | 39.4185 | 13.53 |
| 31 | 49966.9 | 4936.188 | 39.2515 | 11.52 |
| 32 | 50010.7 | 4915.180 | 39.0845 | 5.78 |
| 33 | 50054.4 | 4894.219 | 38.9178 | 2.00 |
| 34 | 56303.7 | 1895.558 | 15.0731 | 0.32 |
| 35 | 60254.2 | 0.003 | 0.0000 | 0.91 |

*The Best Applied NMR!*

# 1u (NMR/25277858)

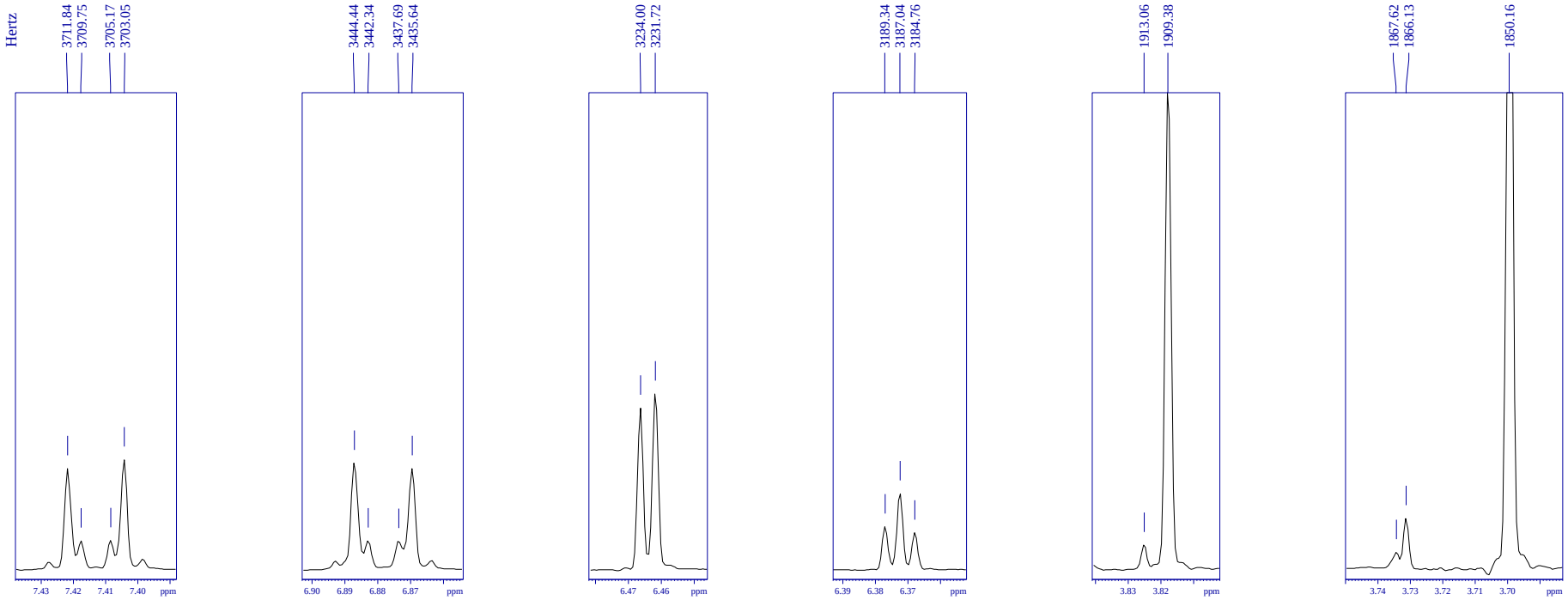
Found protons = 18 impurity* = 0.5 %





# 1u (NMR/25277858)





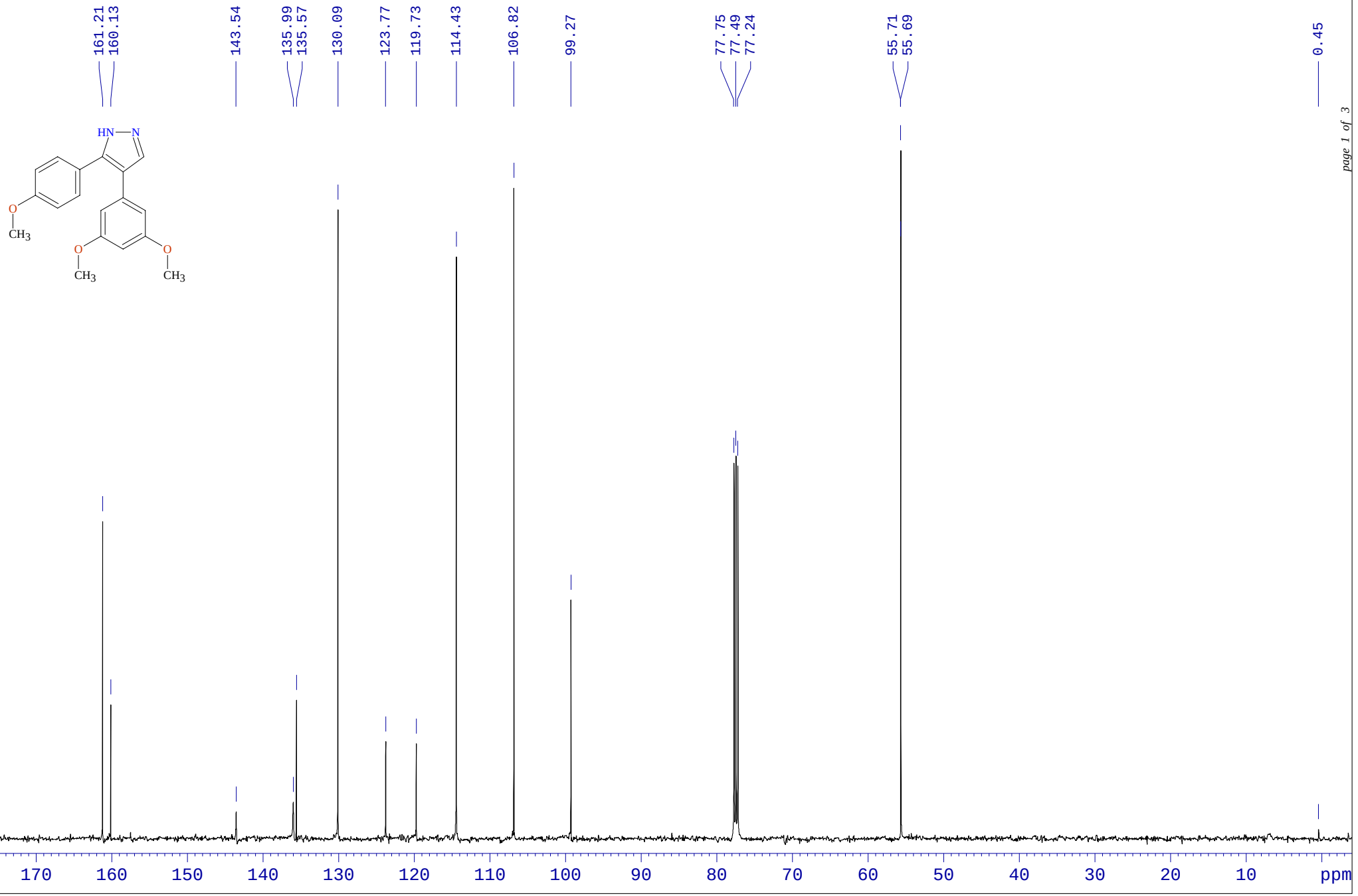

# 1u (NMR/25277858)



Peaks List

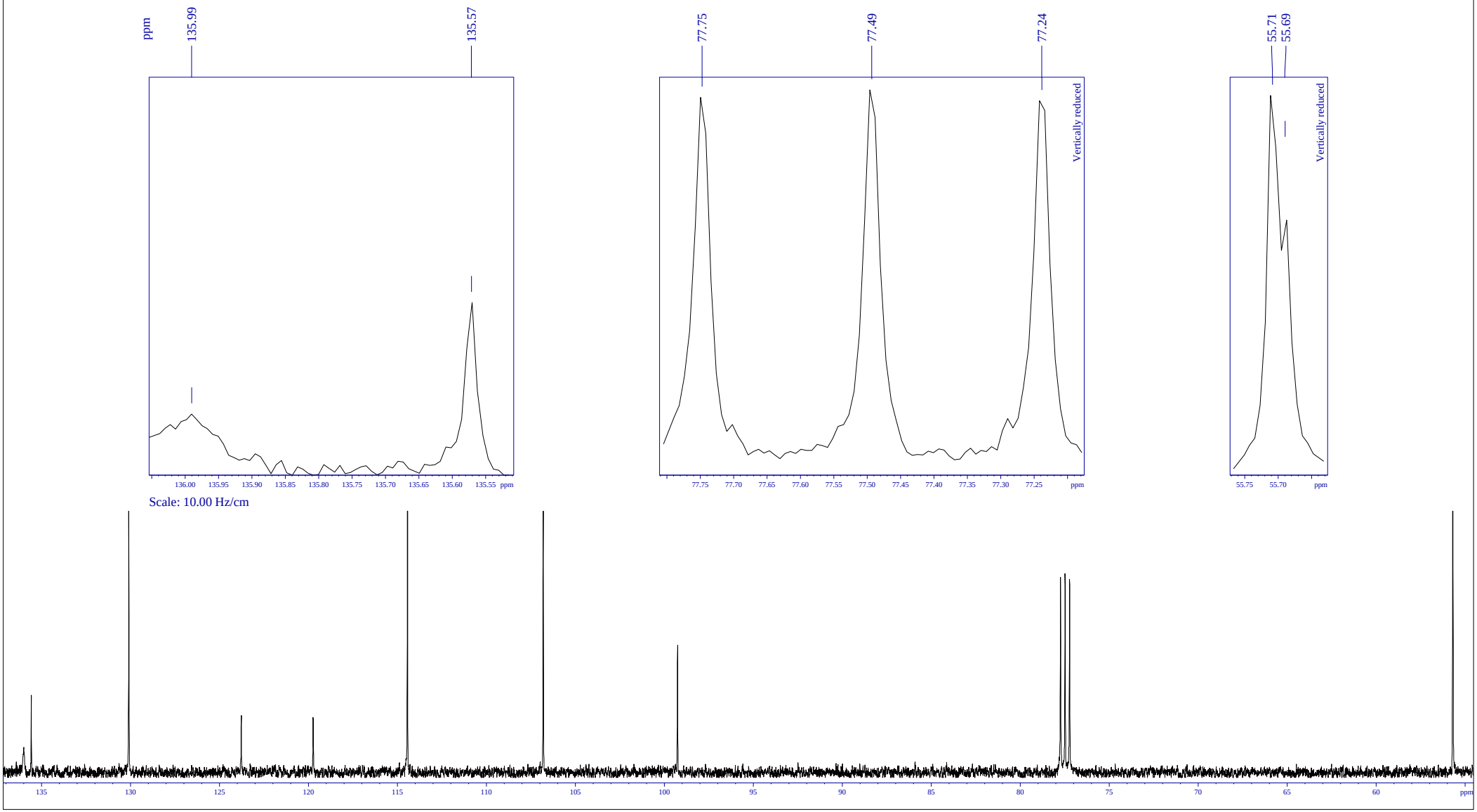
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 16899.2 | 3838.761 | 7.6755 | 1.65 |
| 2 | 17315.0 | 3711.844 | 7.4218 | 1.64 |
| 3 | 17321.9 | 3709.753 | 7.4176 | 0.47 |
| 4 | 17336.9 | 3705.169 | 7.4084 | 0.48 |
| 5 | 17343.8 | 3703.055 | 7.4042 | 1.79 |
| 6 | 17581.3 | 3630.578 | 7.2593 | 0.61 |
| 7 | 18191.3 | 3444.440 | 6.8871 | 1.75 |
| 8 | 18198.1 | 3442.345 | 6.8829 | 0.47 |
| 9 | 18213.4 | 3437.687 | 6.8736 | 0.47 |
| 10 | 18220.1 | 3435.645 | 6.8695 | 1.64 |
| 11 | 18880.8 | 3233.999 | 6.4663 | 2.63 |
| 12 | 18888.3 | 3231.720 | 6.4618 | 2.91 |
| 13 | 19027.2 | 3189.343 | 6.3770 | 0.70 |
| 14 | 19034.7 | 3187.043 | 6.3724 | 1.26 |
| 15 | 19042.2 | 3184.761 | 6.3679 | 0.60 |
| 16 | 23209.3 | 1913.057 | 3.8251 | 0.41 |
| 17 | 23221.4 | 1909.377 | 3.8178 | 8.03 |
| 18 | 23358.2 | 1867.619 | 3.7343 | 0.29 |
| 19 | 23363.1 | 1866.129 | 3.7313 | 0.83 |
| 20 | 23415.4 | 1850.156 | 3.6994 | 16.00 |
| 21 | 29478.0 | 0.002 | 0.0000 | 2.18 |

# 1u (NMR/25277858)



# 1u (NMR/25277858)





# 1u (NMR/25277858)

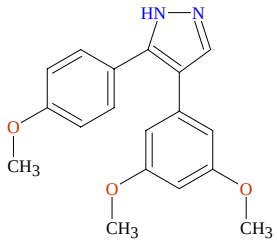


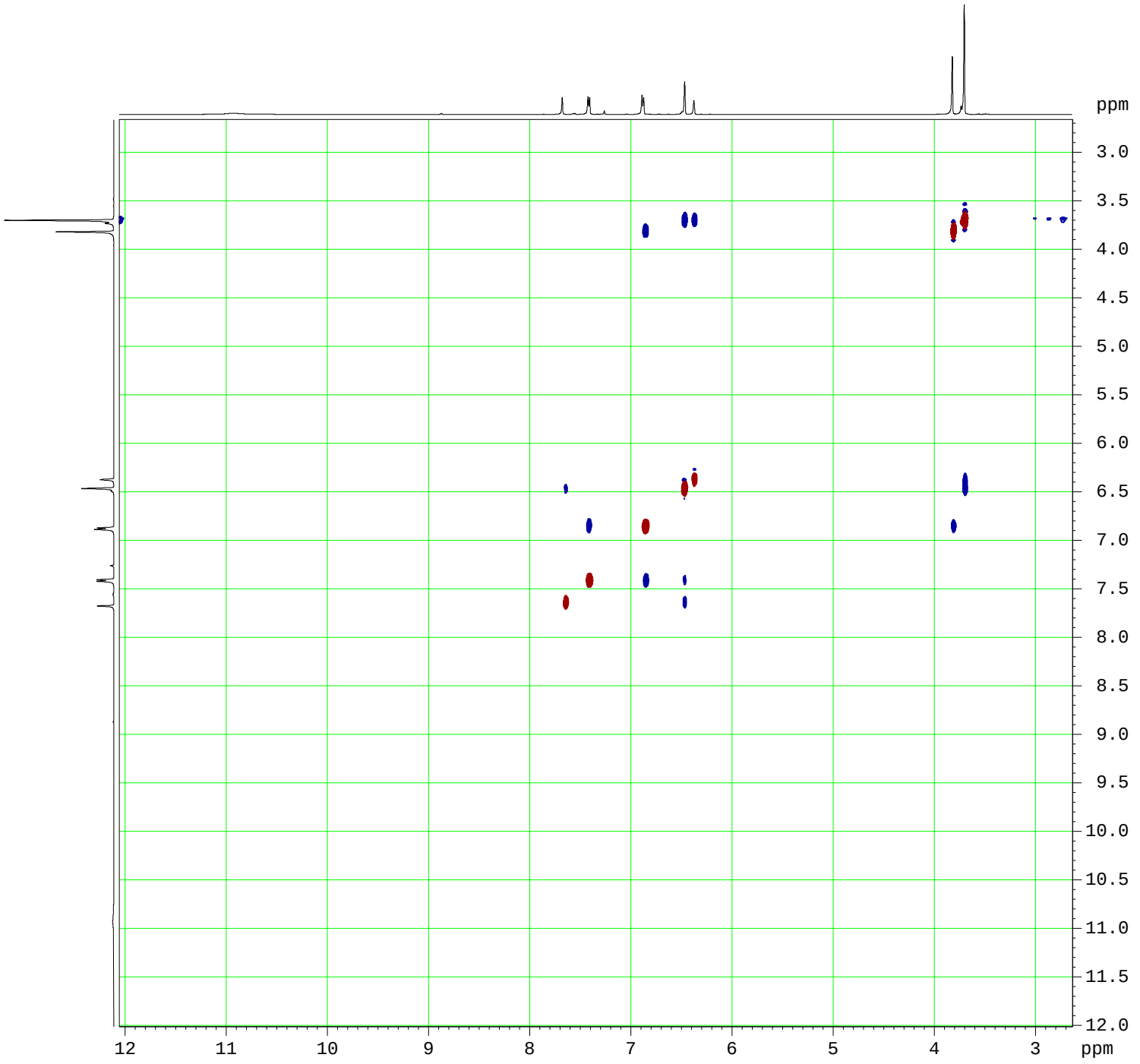
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 9988.0 | 20273.207 | 161.2084 | 6.45 |
| 2 | 10124.1 | 20137.500 | 160.1293 | 2.94 |
| 3 | 12215.4 | 18051.861 | 143.5447 | 0.74 |
| 4 | 13168.0 | 17101.824 | 135.9902 | 0.97 |
| 5 | 13220.8 | 17049.121 | 135.5712 | 3.02 |
| 6 | 13911.8 | 16359.972 | 130.0912 | 12.54 |
| 7 | 14708.8 | 15565.129 | 123.7707 | 2.23 |
| 8 | 15218.4 | 15056.935 | 119.7297 | 2.21 |
| 9 | 15886.4 | 14390.728 | 114.4321 | 12.13 |
| 10 | 16846.1 | 13433.674 | 106.8218 | 12.86 |
| 11 | 17797.7 | 12484.554 | 99.2746 | 5.04 |
| 12 | 20512.3 | 9777.319 | 77.7473 | 7.68 |
| 13 | 20544.3 | 9745.359 | 77.4931 | 7.87 |
| 14 | 20576.4 | 9713.331 | 77.2384 | 7.80 |
| 15 | 23291.3 | 7005.772 | 55.7085 | 14.00 |
| 16 | 23293.7 | 7003.392 | 55.6896 | 9.23 |
| 17 | 30259.3 | 56.535 | 0.4496 | 0.67 |

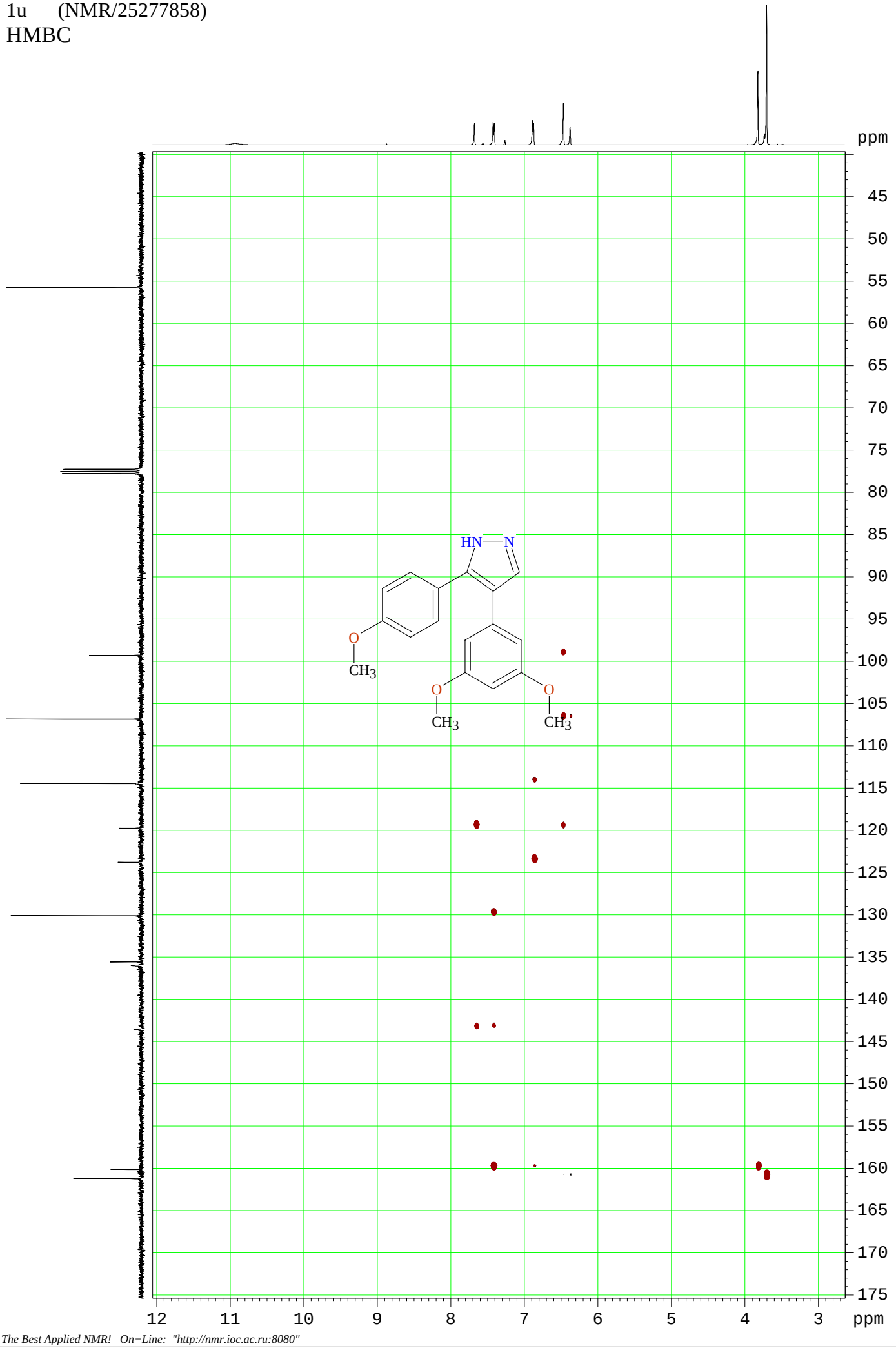
1u (NMR/25277858)

NOESY



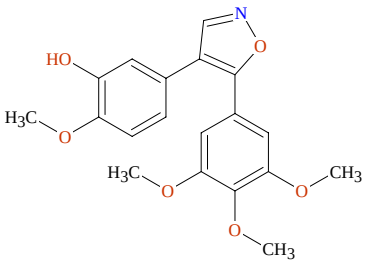
1u (NMR/25277858)
HMBC



*The Best Applied NMR!*

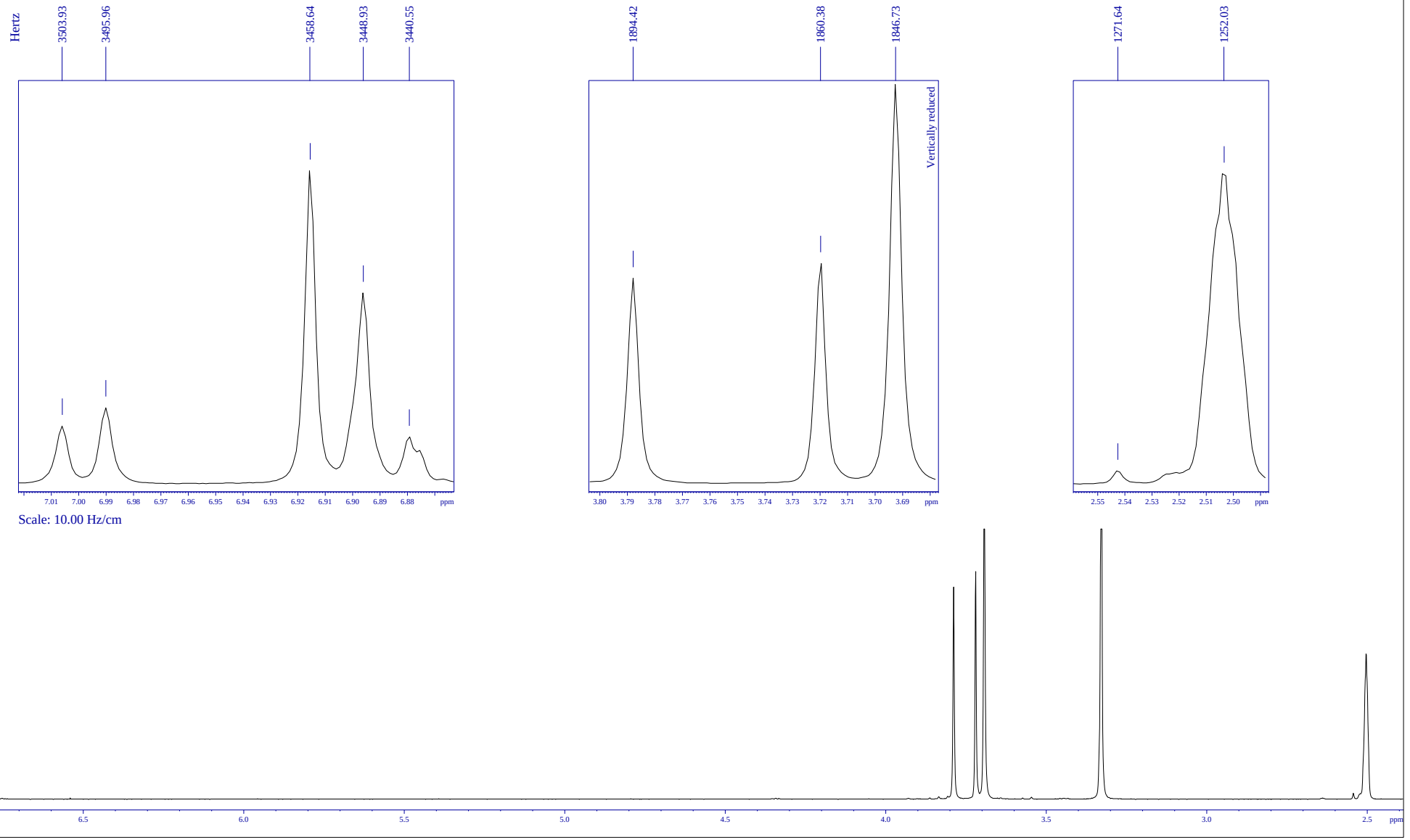
# 3a (NMR/24267943)

Found protons = 19 impurity* = 0.4 %



# 3a (NMR/24267943)





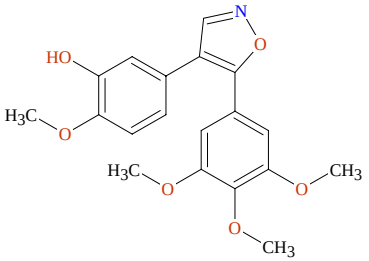
# 3a (NMR/24267943)



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 7224.8 | 4588.026 | 9.1737 | 2.71 |
| 2 | 7543.0 | 4393.763 | 8.7852 | 3.03 |
| 3 | 9001.0 | 3503.925 | 7.0060 | 1.01 |
| 4 | 9014.0 | 3495.959 | 6.9901 | 1.33 |
| 5 | 9075.1 | 3458.639 | 6.9155 | 5.50 |
| 6 | 9091.1 | 3448.929 | 6.8961 | 3.34 |
| 7 | 9104.8 | 3440.553 | 6.8793 | 0.82 |
| 8 | 11638.0 | 1894.425 | 3.7879 | 7.91 |
| 9 | 11693.7 | 1860.385 | 3.7198 | 8.64 |
| 10 | 11716.1 | 1846.731 | 3.6925 | 15.40 |
| 11 | 12014.5 | 1664.602 | 3.3283 | 24.51 |
| 12 | 12658.3 | 1271.643 | 2.5426 | 0.23 |
| 13 | 12690.5 | 1252.031 | 2.5034 | 5.49 |
| 14 | 14741.8 | −0.001 | −0.0000 | 0.88 |

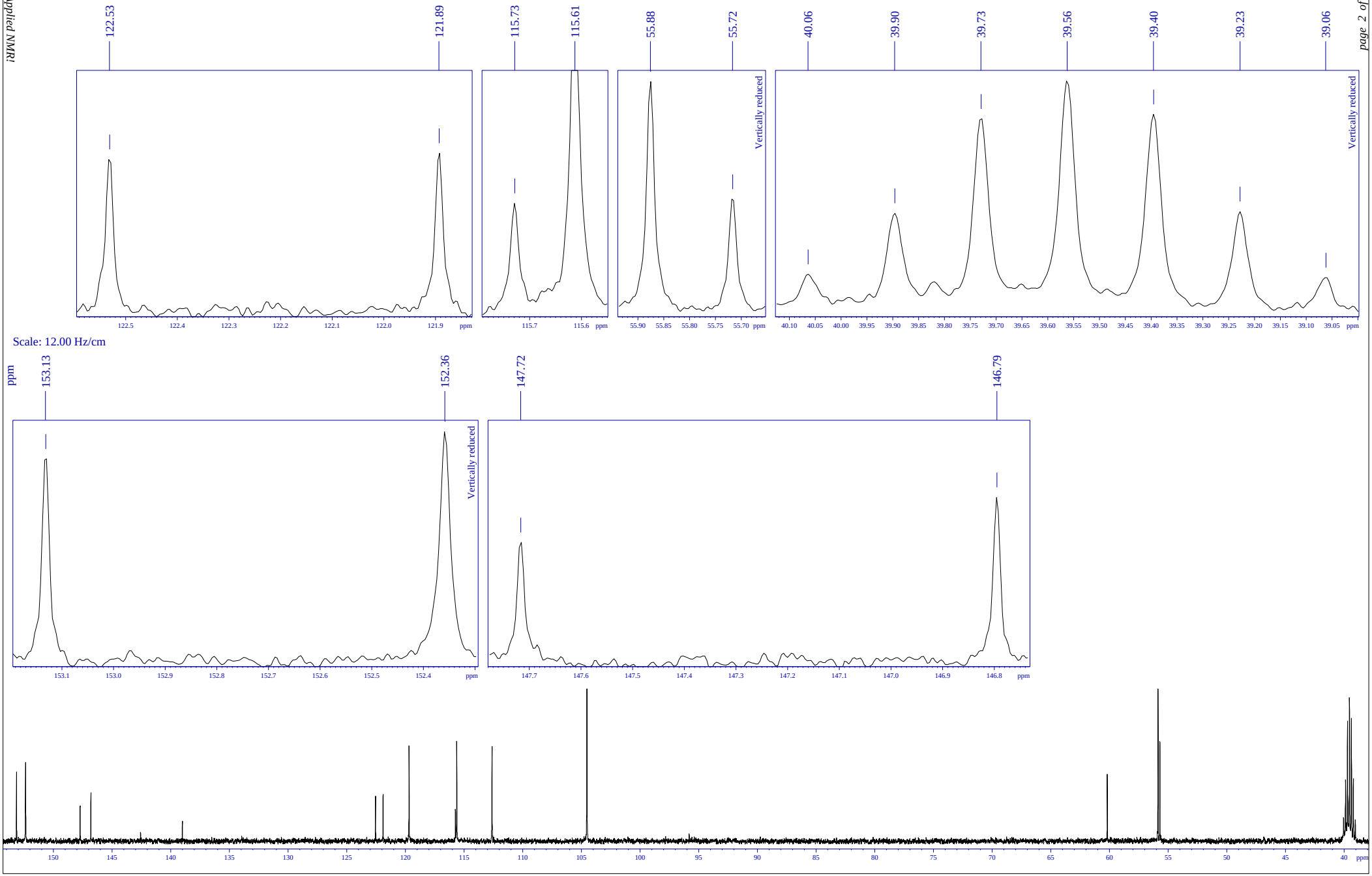
# 3a (NMR/24267943)



*The Best Applied NMR!*

# 3a (NMR/24267943)





# 3a (NMR/24267943)



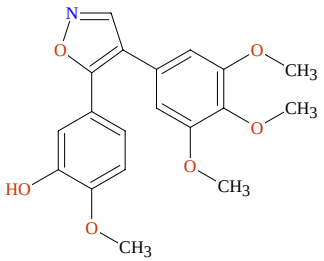
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17768.4 | 20401.918 | 162.2318 | 2.27 |
| 2 | 20153.5 | 19257.465 | 153.1313 | 4.92 |
| 3 | 20356.2 | 19160.221 | 152.3581 | 5.42 |
| 4 | 21572.6 | 18576.514 | 147.7165 | 2.45 |
| 5 | 21814.2 | 18460.609 | 146.7949 | 3.34 |
| 6 | 23858.4 | 17479.732 | 138.9952 | 1.41 |
| 7 | 28173.4 | 15409.229 | 122.5310 | 3.15 |
| 8 | 28340.7 | 15328.974 | 121.8928 | 3.26 |
| 9 | 28921.2 | 15050.421 | 119.6778 | 6.59 |
| 10 | 29956.1 | 14553.808 | 115.7288 | 2.20 |
| 11 | 29986.7 | 14539.161 | 115.6124 | 6.94 |
| 12 | 30774.1 | 14161.314 | 112.6078 | 6.51 |
| 13 | 32893.8 | 13144.206 | 104.5200 | 12.54 |
| 14 | 44508.4 | 7571.090 | 60.2037 | 4.73 |
| 15 | 45642.8 | 7026.770 | 55.8754 | 14.00 |
| 16 | 45684.5 | 7006.795 | 55.7166 | 7.02 |
| 17 | 49786.8 | 5038.337 | 40.0638 | 1.61 |
| 18 | 49830.8 | 5017.239 | 39.8960 | 4.22 |
| 19 | 49874.6 | 4996.235 | 39.7290 | 8.30 |
| 20 | 49918.3 | 4975.263 | 39.5622 | 9.88 |
| 21 | 49962.1 | 4954.253 | 39.3952 | 8.43 |
| 22 | 50005.9 | 4933.223 | 39.2280 | 4.29 |
| 23 | 50049.4 | 4912.324 | 39.0618 | 1.48 |

*The Best Applied NMR!*

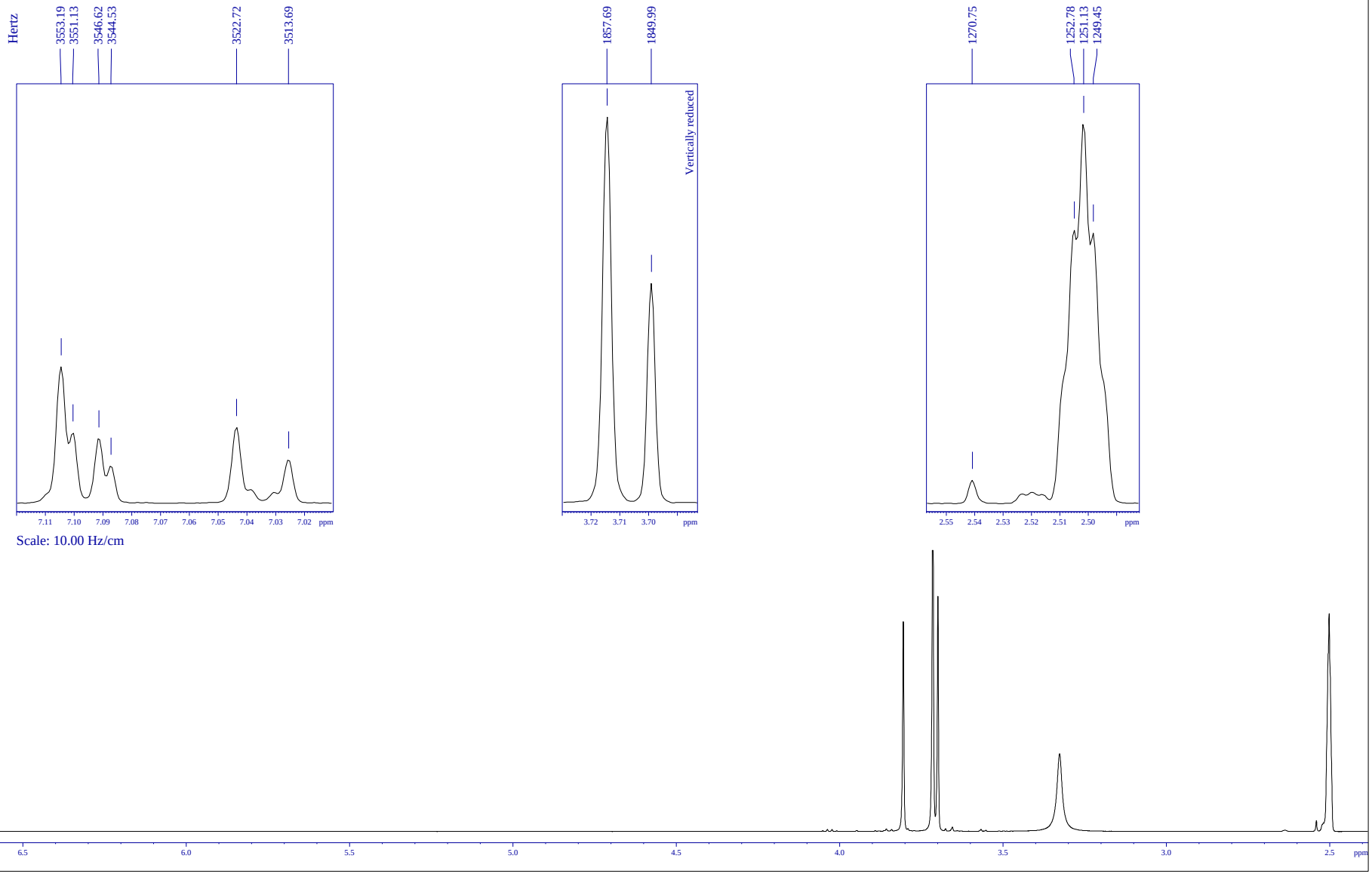
# 3b (NMR/25267112)

Found protons = 20 impurity* = 1.6 %



# 3b (NMR/25267112)





# 3b (NMR/25267112)



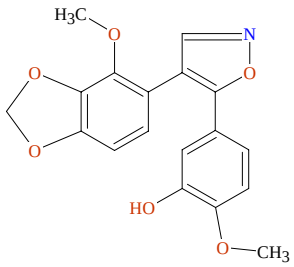
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 14079.9 | 4700.044 | 9.3976 | 0.98 |
| 2 | 15012.7 | 4415.370 | 8.8284 | 3.44 |
| 3 | 17837.9 | 3553.189 | 7.1045 | 2.46 |
| 4 | 17844.7 | 3551.132 | 7.1004 | 1.28 |
| 5 | 17859.4 | 3546.623 | 7.0914 | 1.18 |
| 6 | 17866.3 | 3544.530 | 7.0872 | 0.67 |
| 7 | 17937.8 | 3522.722 | 7.0436 | 1.37 |
| 8 | 17967.4 | 3513.686 | 7.0255 | 0.79 |
| 9 | 18424.5 | 3374.177 | 6.7466 | 5.71 |
| 10 | 23245.1 | 1903.060 | 3.8051 | 7.80 |
| 11 | 23393.7 | 1857.691 | 3.7144 | 16.00 |
| 12 | 23418.9 | 1849.995 | 3.6990 | 9.05 |
| 13 | 24029.9 | 1663.534 | 3.3262 | 2.23 |
| 14 | 25317.0 | 1270.747 | 2.5408 | 0.41 |
| 15 | 25375.9 | 1252.784 | 2.5049 | 4.92 |
| 16 | 25381.3 | 1251.131 | 2.5016 | 6.85 |
| 17 | 25386.8 | 1249.447 | 2.4982 | 4.87 |
| 18 | 26222.6 | 994.392 | 1.9883 | 0.33 |
| 19 | 29481.0 | 0.001 | 0.0000 | 7.13 |

*The Best Applied NMR!*

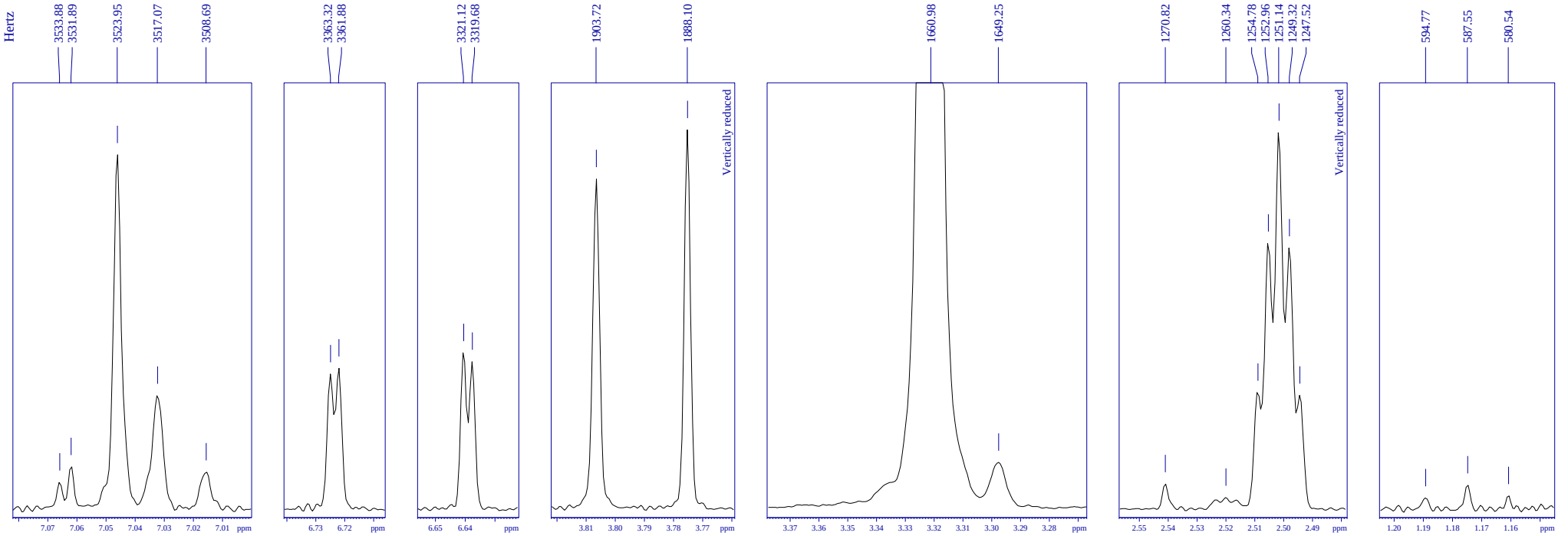
# 3c (NMR/25267207)

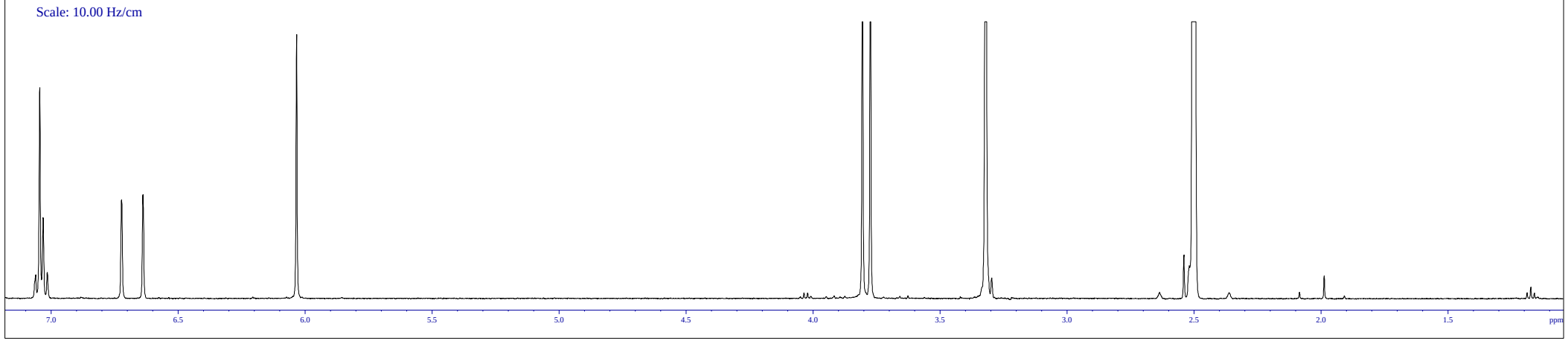
Found protons = 15 impurity* = 3.6 %



# 3c (NMR/25267207)





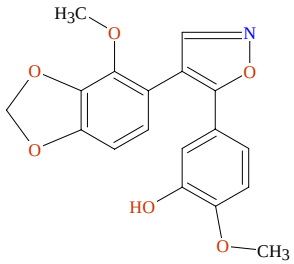



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 14086.2 | 4697.827 | 9.3932 | 4.59 |
| 2 | 15117.7 | 4383.029 | 8.7638 | 6.03 |
| 3 | 17900.2 | 3533.877 | 7.0659 | 0.50 |
| 4 | 17906.7 | 3531.895 | 7.0620 | 0.79 |
| 5 | 17932.7 | 3523.951 | 7.0461 | 6.60 |
| 6 | 17955.3 | 3517.066 | 7.0323 | 2.10 |
| 7 | 17982.7 | 3508.688 | 7.0156 | 0.68 |
| 8 | 18459.1 | 3363.325 | 6.7249 | 2.49 |
| 9 | 18463.8 | 3361.882 | 6.7220 | 2.61 |
| 10 | 18597.3 | 3321.125 | 6.6405 | 2.94 |
| 11 | 18602.1 | 3319.676 | 6.6376 | 2.72 |
| 12 | 19590.4 | 3018.057 | 6.0345 | 9.08 |
| 13 | 22888.5 | 2011.581 | 4.0221 | 0.20 |
| 14 | 23241.9 | 1903.724 | 3.8065 | 13.09 |
| 15 | 23293.1 | 1888.095 | 3.7752 | 15.03 |
| 16 | 23970.9 | 1681.232 | 3.3616 | 0.28 |
| 17 | 23982.8 | 1677.611 | 3.3543 | 0.95 |
| 18 | 23985.3 | 1676.858 | 3.3528 | −0.82 |
| 19 | 23987.8 | 1676.102 | 3.3513 | 0.67 |
| 20 | 23990.0 | 1675.410 | 3.3499 | −0.61 |
| 21 | 23992.4 | 1674.685 | 3.3485 | 0.69 |
| 22 | 23995.0 | 1673.879 | 3.3469 | −0.54 |
| 23 | 24006.8 | 1670.297 | 3.3397 | 0.53 |
| 24 | 24011.6 | 1668.816 | 3.3368 | 0.55 |
| 25 | 24014.1 | 1668.063 | 3.3353 | −0.48 |
| 26 | 24016.8 | 1667.252 | 3.3336 | 0.46 |
| 27 | 24022.0 | 1665.639 | 3.3304 | 0.46 |
| 28 | 24025.7 | 1664.526 | 3.3282 | −0.26 |
| 29 | 24037.4 | 1660.958 | 3.3211 | 103.40 |
| 30 | 24042.8 | 1659.305 | 3.3177 | −1.12 |
| 31 | 24045.9 | 1658.370 | 3.3159 | 0.90 |
| 32 | 24054.7 | 1655.672 | 3.3105 | 0.24 |
| 33 | 24061.9 | 1653.475 | 3.3061 | 0.31 |
| 34 | 24067.0 | 1651.928 | 3.3030 | 0.40 |
| 35 | 24076.6 | 1648.983 | 3.2971 | 0.45 |
| 36 | 24091.7 | 1644.387 | 3.2879 | −0.44 |
| 37 | 24094.0 | 1643.672 | 3.2865 | 0.75 |
| 38 | 24096.5 | 1642.913 | 3.2850 | −0.68 |
| 39 | 24099.1 | 1642.117 | 3.2834 | 0.57 |
| 40 | 25315.8 | 1270.819 | 2.5410 | 1.60 |
| 41 | 25350.1 | 1260.341 | 2.5200 | 0.73 |
| 42 | 25368.4 | 1254.776 | 2.5089 | 7.44 |
| 43 | 25374.3 | 1252.963 | 2.5053 | 16.91 |
| 44 | 25380.3 | 1251.144 | 2.5016 | 23.91 |
| 45 | 25386.2 | 1249.319 | 2.4980 | 16.54 |
| 46 | 25392.1 | 1247.515 | 2.4944 | 7.18 |
| 47 | 26061.9 | 1043.125 | 2.0857 | 0.25 |
| 48 | 26221.2 | 994.506 | 1.9885 | 0.90 |
| 49 | 27531.1 | 594.766 | 1.1892 | 0.20 |
| 50 | 27554.7 | 587.552 | 1.1748 | 0.45 |
| 51 | 27577.7 | 580.540 | 1.1608 | 0.25 |
| 52 | 29480.0 | 0.001 | 0.0000 | 7.81 |

# 3c (NMR/25267207)

163.11
152.34
149.47
148.81
146.72
143.50
134.63
123.81
119.63
118.78
114.63
113.90
112.36
108.39
102.45
101.54
56.35
55.62
40.06
39.89
39.73
39.56
39.39
39.23
39.06



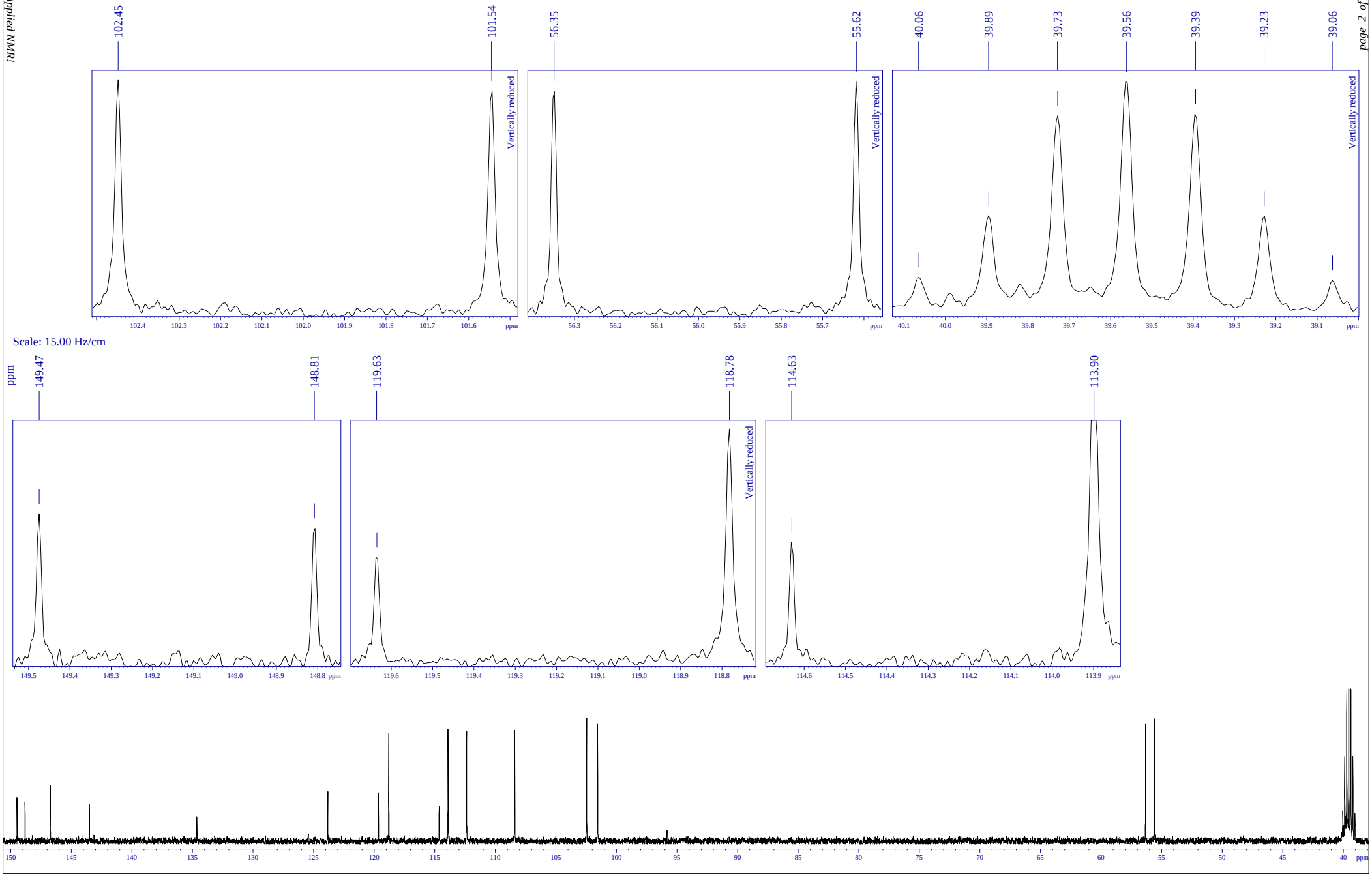



180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

*The Best Applied NMR!*

# 3c (NMR/25267207)





# 3c (NMR/25267207)



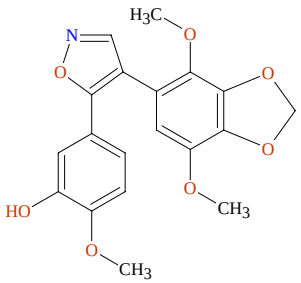
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17537.0 | 20512.957 | 163.1147 | 2.42 |
| 2 | 20361.4 | 19157.738 | 152.3383 | 6.47 |
| 3 | 21112.0 | 18797.570 | 149.4743 | 2.97 |
| 4 | 21286.6 | 18713.773 | 148.8080 | 2.76 |
| 5 | 21832.8 | 18451.662 | 146.7238 | 3.80 |
| 6 | 22676.6 | 18046.816 | 143.5045 | 2.64 |
| 7 | 25002.6 | 16930.711 | 134.6295 | 1.71 |
| 8 | 27837.8 | 15570.246 | 123.8113 | 3.39 |
| 9 | 28932.4 | 15045.020 | 119.6348 | 3.43 |
| 10 | 29155.9 | 14937.772 | 118.7820 | 7.38 |
| 11 | 30244.2 | 14415.578 | 114.6297 | 2.42 |
| 12 | 30435.8 | 14323.659 | 113.8987 | 7.69 |
| 13 | 30839.2 | 14130.090 | 112.3595 | 7.53 |
| 14 | 31880.7 | 13630.317 | 108.3854 | 7.61 |
| 15 | 33437.0 | 12883.573 | 102.4475 | 8.39 |
| 16 | 33673.7 | 12769.998 | 101.5443 | 8.07 |
| 17 | 45518.6 | 7086.386 | 56.3495 | 8.22 |
| 18 | 45710.2 | 6994.447 | 55.6184 | 8.42 |
| 19 | 49786.8 | 5038.363 | 40.0640 | 2.09 |
| 20 | 49831.1 | 5017.087 | 39.8948 | 5.79 |
| 21 | 49874.8 | 4996.126 | 39.7281 | 11.84 |
| 22 | 49918.5 | 4975.169 | 39.5615 | 14.00 |
| 23 | 49962.3 | 4954.148 | 39.3943 | 11.97 |
| 24 | 50005.8 | 4933.249 | 39.2282 | 5.79 |
| 25 | 50049.2 | 4912.451 | 39.0628 | 1.90 |

*The Best Applied NMR!*

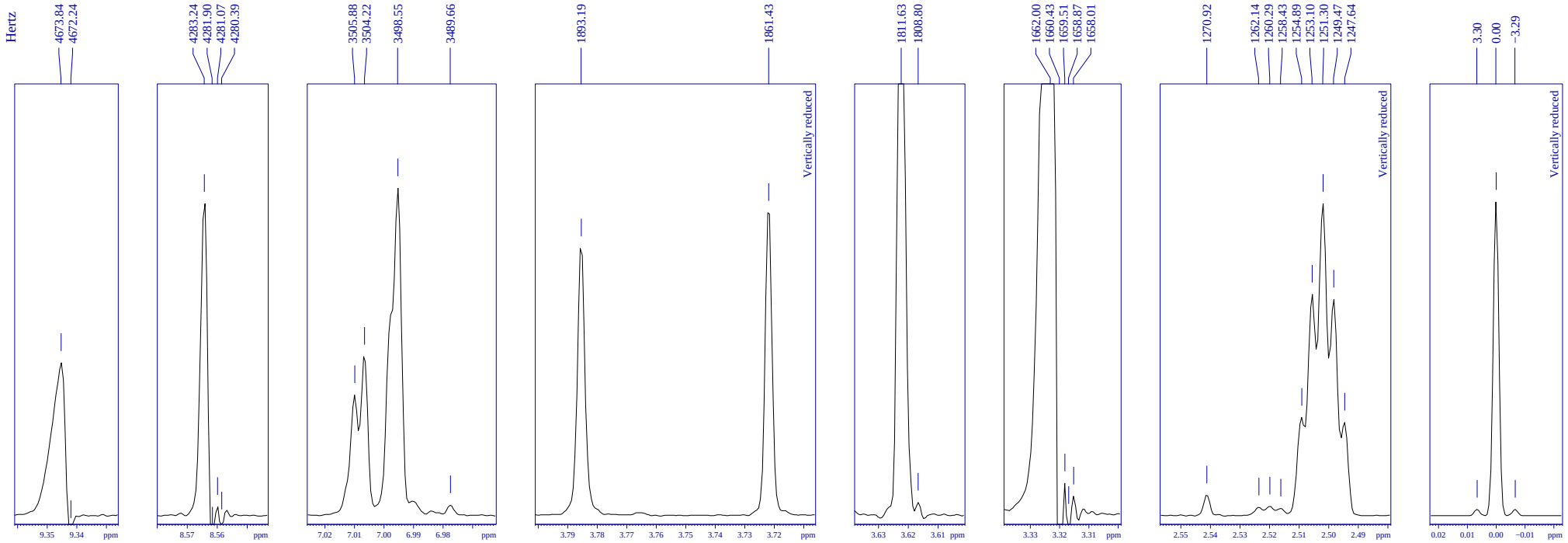
# 3d (NMR/25267148)

Found protons = 17 impurity* = 0.6 %

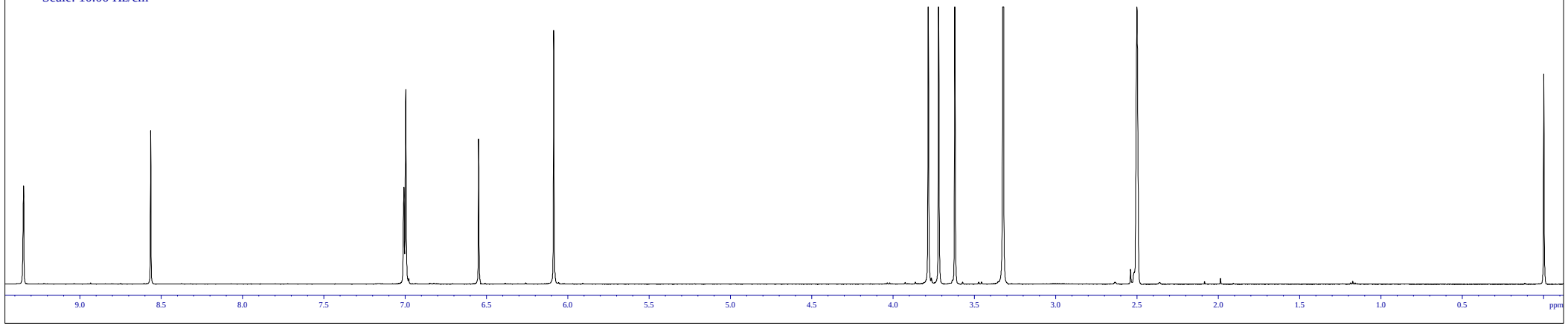


# 3d (NMR/25267148)






Scale: 10.00 Hz/cm



# 3d (NMR/25267148)

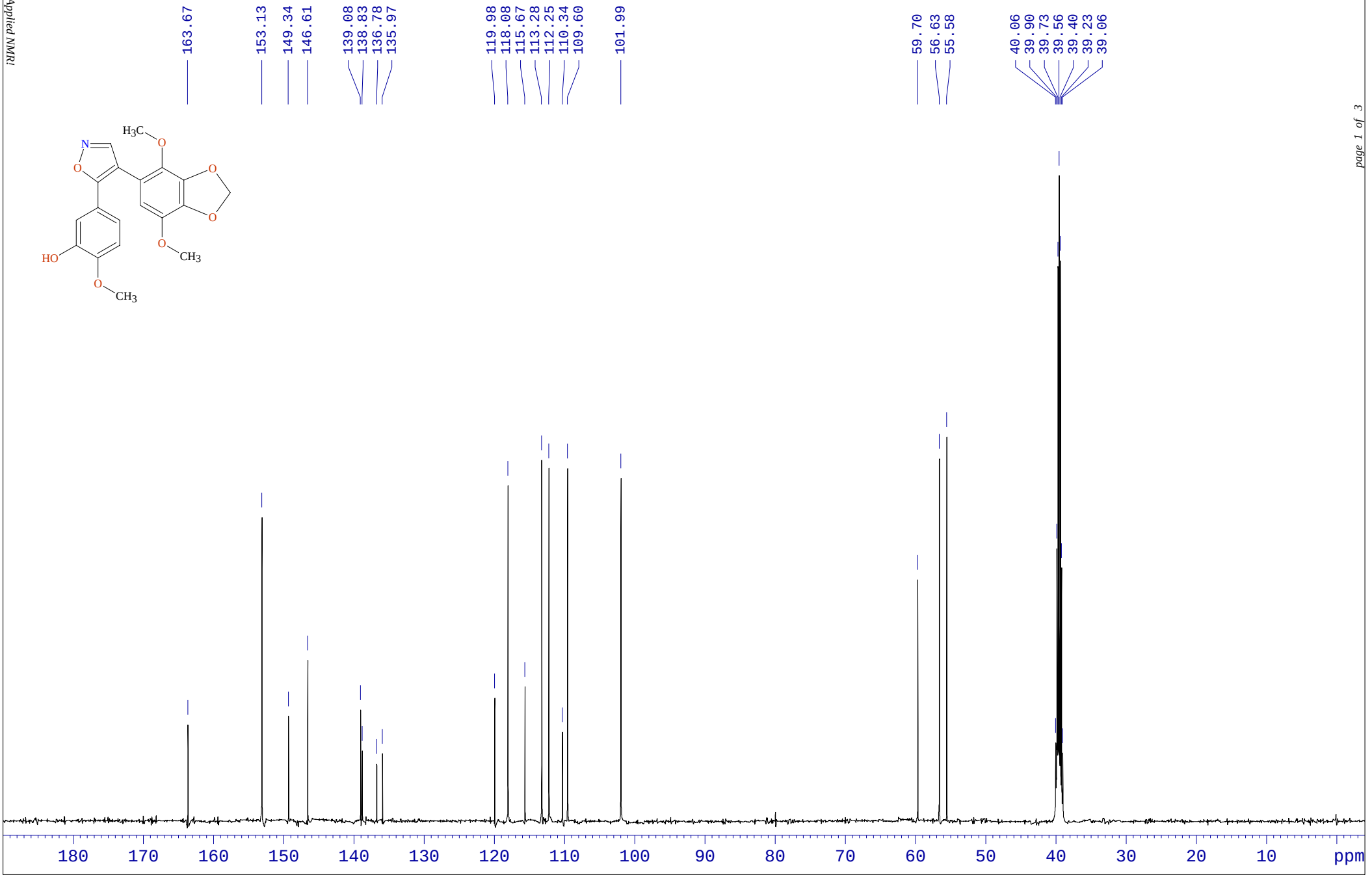


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 14162.8 | 4673.840 | 9.3453 | 3.42 |
| 2 | 14168.0 | 4672.239 | 9.3420 | −0.52 |
| 3 | 15442.7 | 4283.245 | 8.5643 | 7.07 |
| 4 | 15447.1 | 4281.895 | 8.5616 | −1.42 |
| 5 | 15449.8 | 4281.074 | 8.5599 | 0.21 |
| 6 | 15452.0 | 4280.385 | 8.5585 | −0.30 |
| 7 | 17989.9 | 3505.881 | 7.0099 | 2.70 |
| 8 | 17995.4 | 3504.224 | 7.0066 | 3.60 |
| 9 | 18014.0 | 3498.552 | 6.9953 | 7.31 |
| 10 | 18043.1 | 3489.661 | 6.9775 | 0.24 |
| 11 | 18747.6 | 3274.656 | 6.5476 | 6.66 |
| 12 | 19504.1 | 3043.801 | 6.0860 | 11.09 |
| 13 | 23274.4 | 1893.192 | 3.7854 | 16.47 |
| 14 | 23378.5 | 1861.427 | 3.7219 | 18.90 |
| 15 | 23541.7 | 1811.630 | 3.6223 | 20.39 |
| 16 | 23550.9 | 1808.796 | 3.6167 | 0.30 |
| 17 | 24032.0 | 1662.000 | 3.3231 | 28.04 |
| 18 | 24037.1 | 1660.435 | 3.3200 | −6.25 |
| 19 | 24040.1 | 1659.514 | 3.3182 | 0.74 |
| 20 | 24042.2 | 1658.870 | 3.3169 | −0.68 |
| 21 | 24045.0 | 1658.014 | 3.3152 | 0.43 |
| 22 | 25313.5 | 1270.922 | 2.5412 | 0.69 |
| 23 | 25342.2 | 1262.142 | 2.5236 | 0.28 |
| 24 | 25348.3 | 1260.286 | 2.5199 | 0.31 |
| 25 | 25354.4 | 1258.427 | 2.5162 | 0.24 |
| 26 | 25366.0 | 1254.895 | 2.5091 | 3.21 |
| 27 | 25371.8 | 1253.103 | 2.5056 | 7.26 |
| 28 | 25377.8 | 1251.295 | 2.5019 | 10.27 |
| 29 | 25383.7 | 1249.470 | 2.4983 | 7.12 |
| 30 | 25389.7 | 1247.645 | 2.4946 | 3.08 |
| 31 | 26219.3 | 994.487 | 1.9885 | 0.28 |
| 32 | 29467.2 | 3.298 | 0.0066 | 0.21 |
| 33 | 29478.0 | 0.002 | 0.0000 | 10.70 |
| 34 | 29488.8 | −3.294 | −0.0066 | 0.21 |

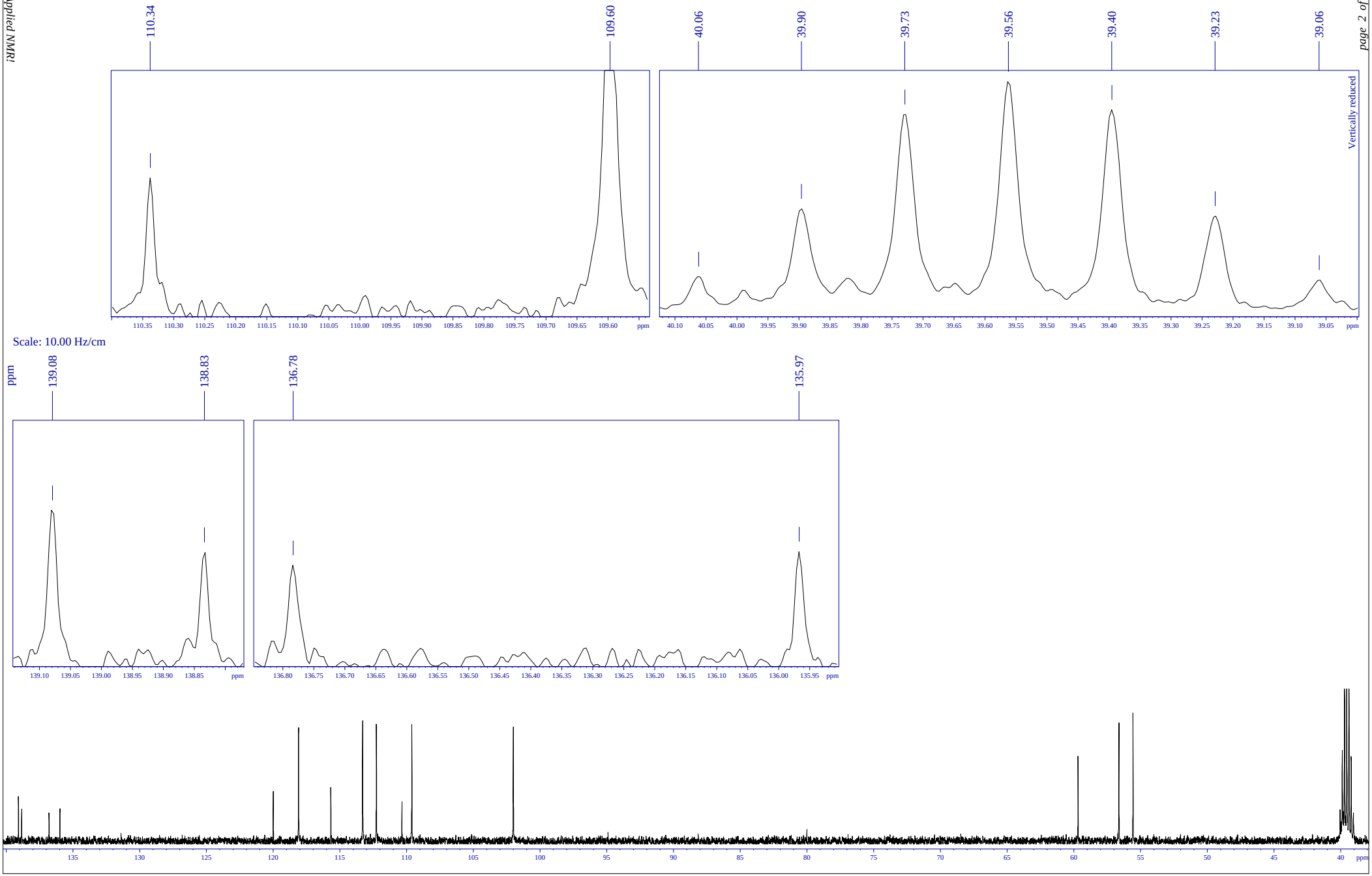
# 3d (NMR/25267148)





# 3d (NMR/25267148)





# 3d (NMR/25267148)



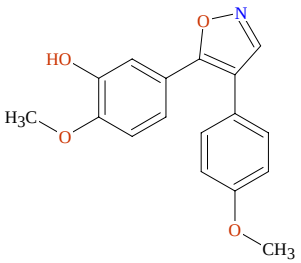
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17392.4 | 20582.328 | 163.6664 | 2.80 |
| 2 | 20152.7 | 19257.869 | 153.1345 | 7.10 |
| 3 | 21147.1 | 18780.707 | 149.3402 | 3.04 |
| 4 | 21862.9 | 18437.223 | 146.6089 | 4.25 |
| 5 | 23836.4 | 17490.277 | 139.0790 | 3.13 |
| 6 | 23900.7 | 17459.430 | 138.8337 | 2.25 |
| 7 | 24438.0 | 17201.592 | 136.7834 | 1.95 |
| 8 | 24652.0 | 17098.916 | 135.9670 | 2.23 |
| 9 | 28842.1 | 15088.352 | 119.9794 | 3.44 |
| 10 | 29338.8 | 14850.025 | 118.0843 | 7.81 |
| 11 | 29972.0 | 14546.207 | 115.6684 | 3.68 |
| 12 | 30597.3 | 14246.171 | 113.2826 | 8.33 |
| 13 | 30866.7 | 14116.910 | 112.2547 | 8.13 |
| 14 | 31369.1 | 13875.829 | 110.3377 | 2.71 |
| 15 | 31563.4 | 13782.609 | 109.5964 | 8.10 |
| 16 | 33556.4 | 12826.295 | 101.9920 | 7.94 |
| 17 | 44639.7 | 7508.107 | 59.7029 | 5.92 |
| 18 | 45444.5 | 7121.930 | 56.6321 | 8.39 |
| 19 | 45719.8 | 6989.853 | 55.5818 | 8.86 |
| 20 | 49787.3 | 5038.082 | 40.0618 | 2.16 |
| 21 | 49830.8 | 5017.247 | 39.8961 | 6.26 |
| 22 | 49874.5 | 4996.265 | 39.7292 | 12.08 |
| 23 | 49918.3 | 4975.242 | 39.5621 | 14.00 |
| 24 | 49962.0 | 4954.285 | 39.3954 | 12.24 |
| 25 | 50005.7 | 4933.324 | 39.2288 | 5.83 |
| 26 | 50049.6 | 4912.228 | 39.0610 | 1.95 |

*The Best Applied NMR!*

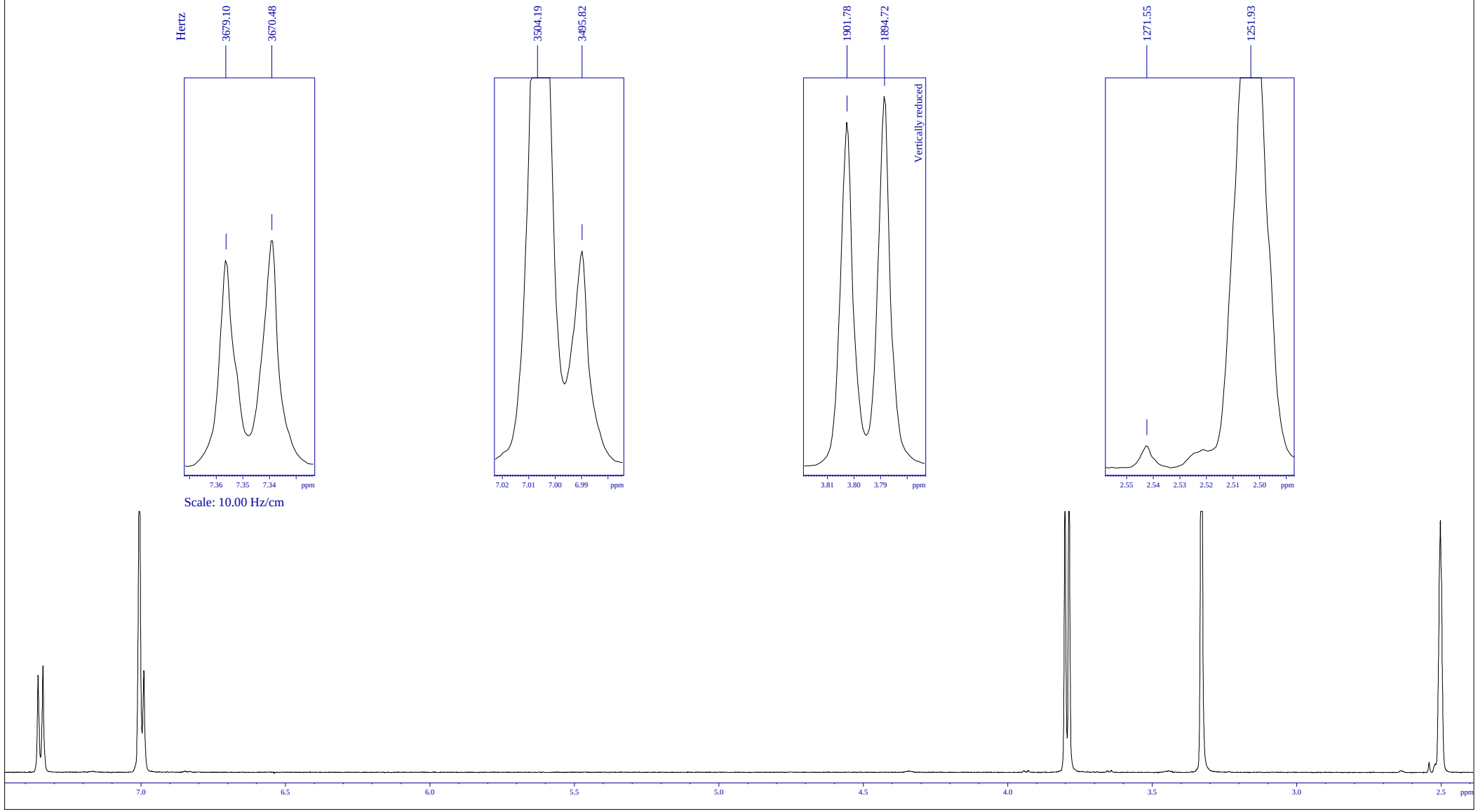
# 3e (NMR/24267944)

Found protons = 15 impurity* = 0.6 %



# 3e (NMR/24267944)





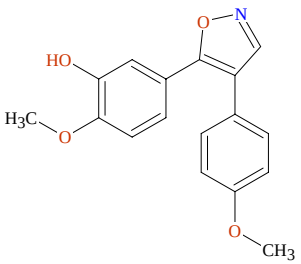
# 3e (NMR/24267944)



Peaks List

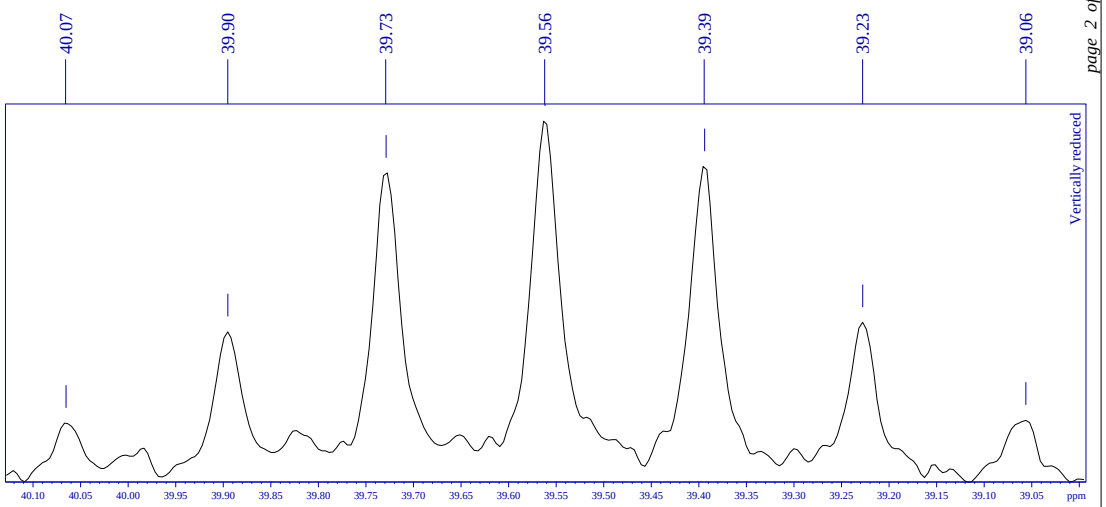
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 14152.6 | 4678.461 | 9.3545 | 4.94 |
| 2 | 15165.5 | 4369.330 | 8.7364 | 5.39 |
| 3 | 17427.2 | 3679.104 | 7.3563 | 3.91 |
| 4 | 17455.5 | 3670.481 | 7.3391 | 4.32 |
| 5 | 18000.4 | 3504.187 | 7.0066 | 12.21 |
| 6 | 18027.8 | 3495.822 | 6.9898 | 4.08 |
| 7 | 23251.2 | 1901.780 | 3.8026 | 14.80 |
| 8 | 23274.3 | 1894.724 | 3.7885 | 15.96 |
| 9 | 24026.3 | 1665.243 | 3.3296 | 44.16 |
| 10 | 25316.3 | 1271.550 | 2.5424 | 0.41 |
| 11 | 25380.6 | 1251.935 | 2.5032 | 10.13 |
| 12 | 27747.9 | 529.479 | 1.0587 | 0.25 |
| 13 | 29482.9 | 0.001 | 0.0000 | 1.58 |

# 3e (NMR/24267944)

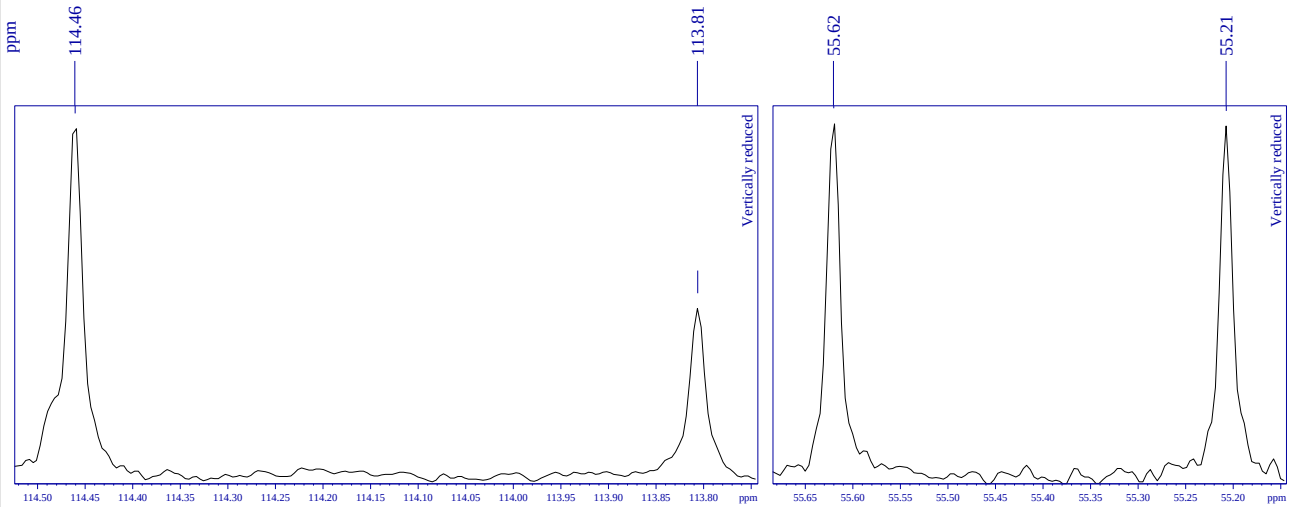


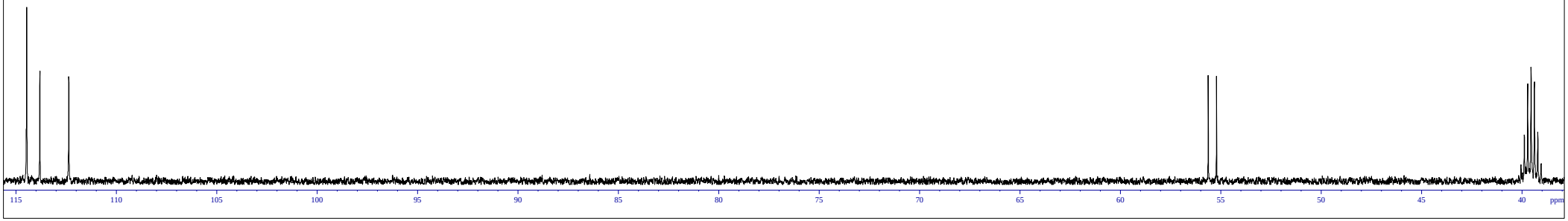
# 3e (NMR/24267944)






Scale: 10.00 Hz/cm



# 3e (NMR/24267944)



Peaks List

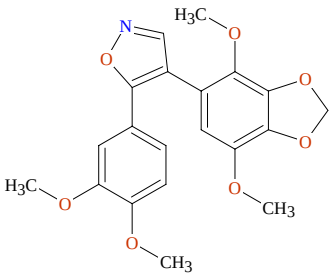
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17601.6 | 20481.959 | 162.8682 | 1.77 |
| 2 | 18626.2 | 19990.346 | 158.9590 | 2.35 |
| 3 | 20360.3 | 19158.234 | 152.3423 | 5.12 |
| 4 | 21134.0 | 18786.984 | 149.3902 | 1.89 |
| 5 | 21823.2 | 18456.270 | 146.7604 | 2.83 |
| 6 | 26298.2 | 16309.038 | 129.6861 | 13.94 |
| 7 | 28339.2 | 15329.675 | 121.8984 | 2.52 |
| 8 | 28872.2 | 15073.940 | 119.8648 | 2.64 |
| 9 | 29209.2 | 14912.223 | 118.5789 | 6.21 |
| 10 | 30288.6 | 14394.304 | 114.4605 | 14.00 |
| 11 | 30460.1 | 14312.017 | 113.8062 | 6.60 |
| 12 | 30838.2 | 14130.549 | 112.3632 | 6.30 |
| 13 | 45709.7 | 6994.668 | 55.6201 | 6.40 |
| 14 | 45817.9 | 6942.755 | 55.2073 | 6.29 |
| 15 | 49786.4 | 5038.522 | 40.0653 | 1.01 |
| 16 | 49831.0 | 5017.140 | 39.8952 | 2.77 |
| 17 | 49874.6 | 4996.214 | 39.7288 | 5.88 |
| 18 | 49918.4 | 4975.193 | 39.5617 | 6.89 |
| 19 | 49962.4 | 4954.092 | 39.3939 | 6.00 |
| 20 | 50005.9 | 4933.191 | 39.2277 | 2.95 |
| 21 | 50050.9 | 4911.622 | 39.0562 | 1.06 |

*The Best Applied NMR!*

# 3f (NMR/22297893)

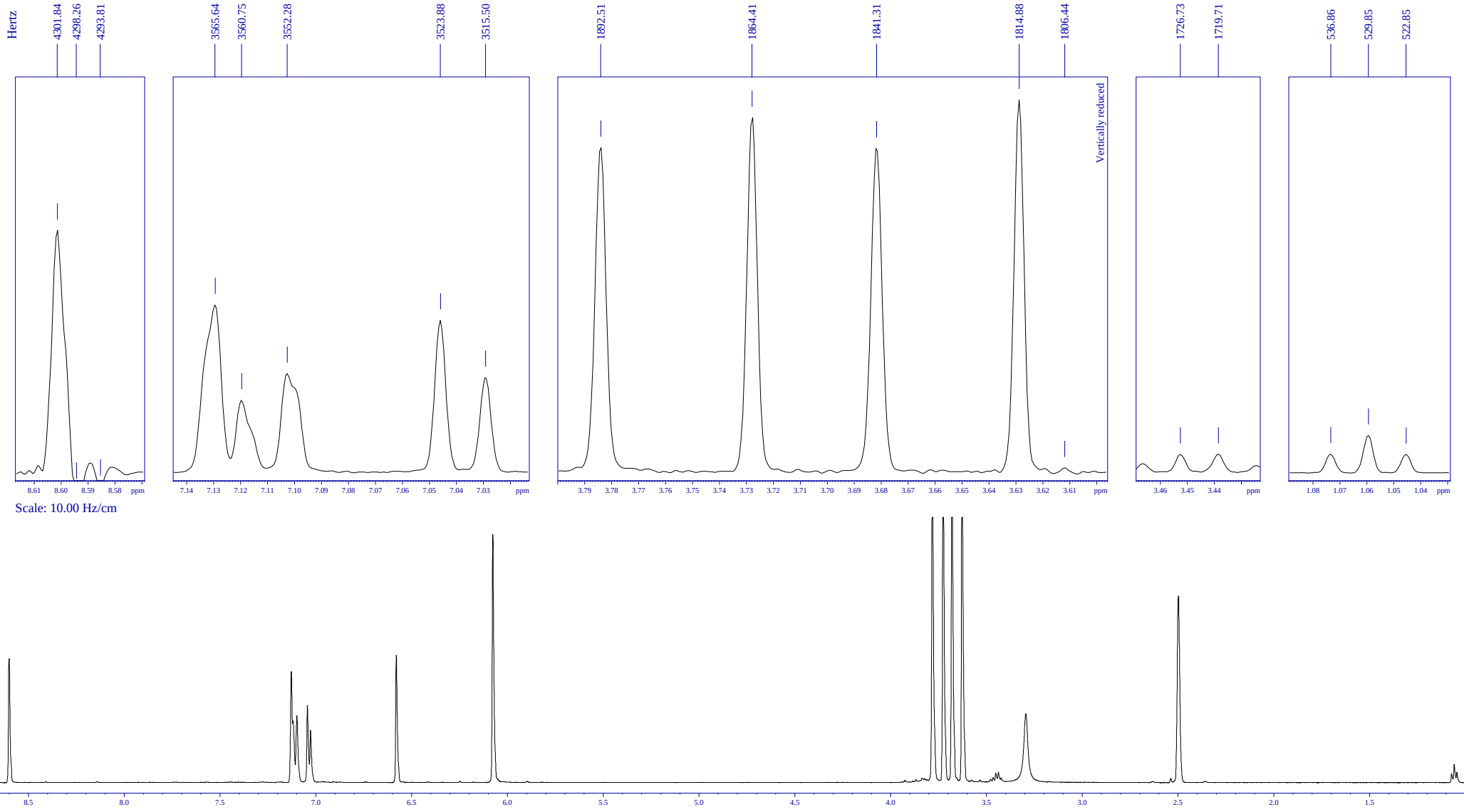
Found protons = 20 impurity* = 0.7 %





# 3f (NMR/22297893)





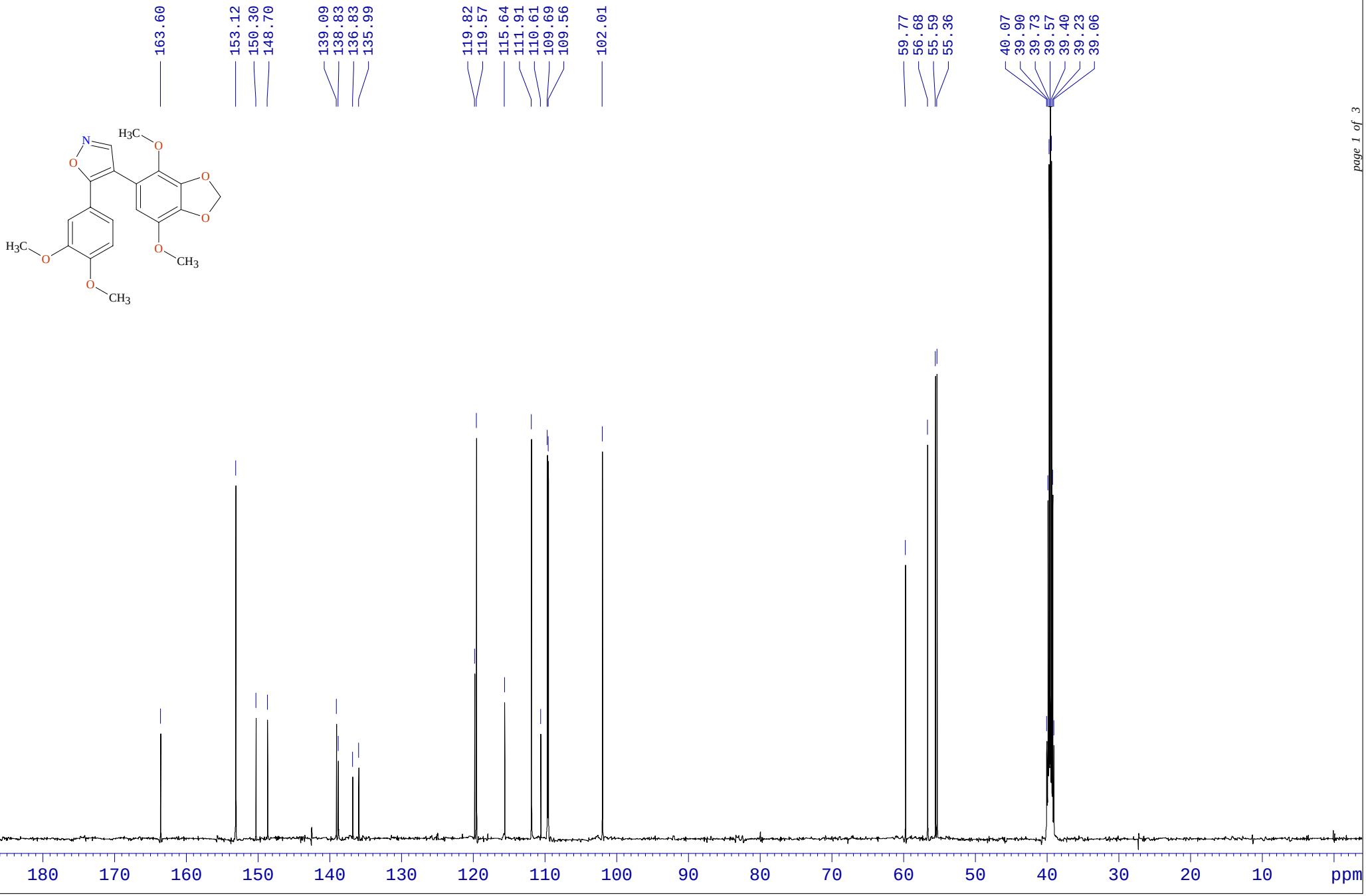
# 3f (NMR/22297893)



Peaks List

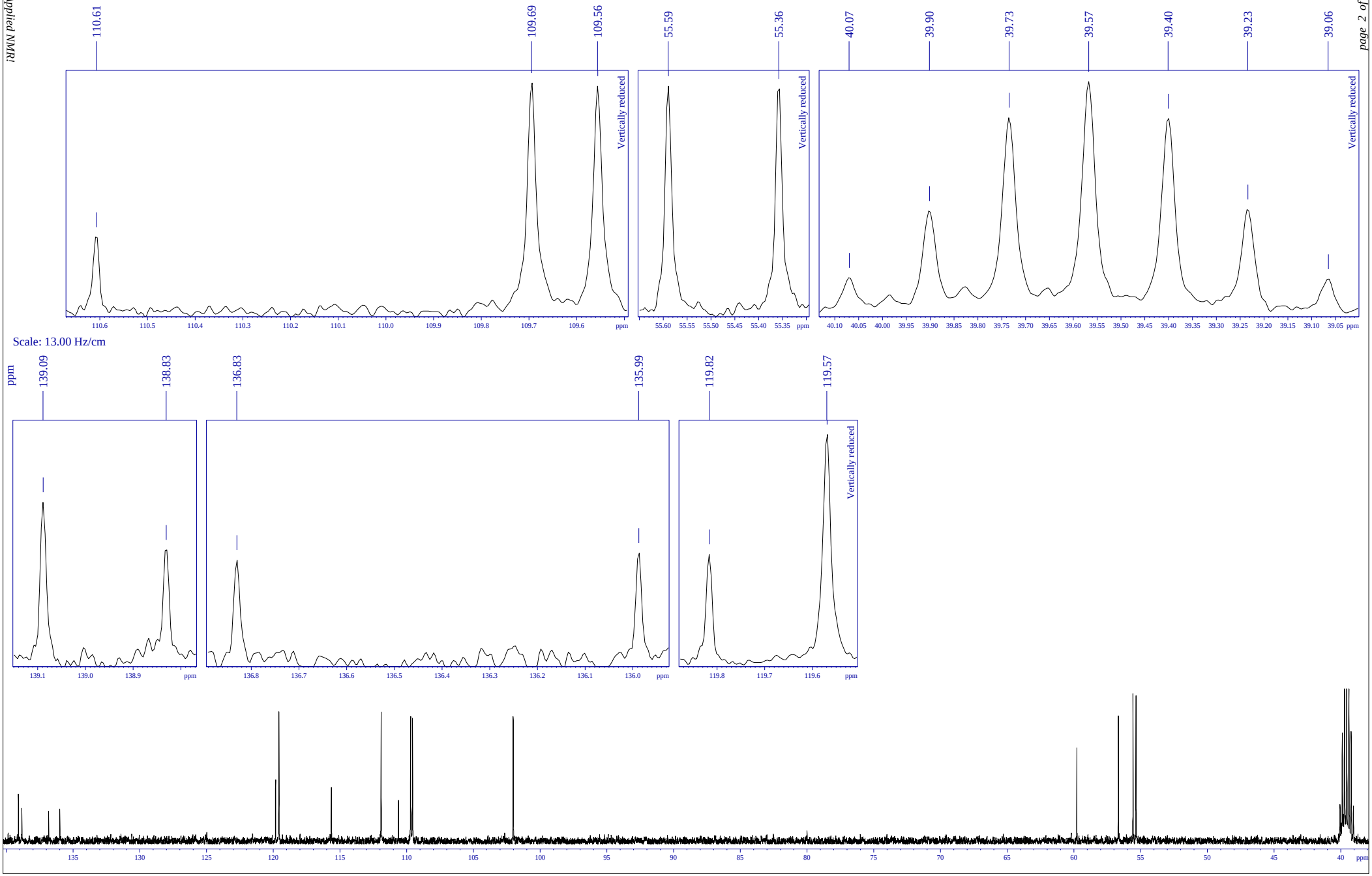
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 15379.8 | 4301.835 | 8.6014 | 4.56 |
| 2 | 15391.5 | 4298.256 | 8.5943 | −0.41 |
| 3 | 15406.0 | 4293.814 | 8.5854 | −0.29 |
| 4 | 17792.1 | 3565.644 | 7.1294 | 3.16 |
| 5 | 17808.1 | 3560.749 | 7.1196 | 1.37 |
| 6 | 17835.9 | 3552.275 | 7.1027 | 1.86 |
| 7 | 17928.9 | 3523.884 | 7.0459 | 2.86 |
| 8 | 17956.4 | 3515.502 | 7.0292 | 1.80 |
| 9 | 18689.4 | 3291.812 | 6.5819 | 4.78 |
| 10 | 19515.3 | 3039.771 | 6.0780 | 9.16 |
| 11 | 23274.6 | 1892.514 | 3.7840 | 14.06 |
| 12 | 23366.7 | 1864.414 | 3.7279 | 15.31 |
| 13 | 23442.4 | 1841.309 | 3.6817 | 14.04 |
| 14 | 23529.0 | 1814.877 | 3.6288 | 16.00 |
| 15 | 23556.7 | 1806.438 | 3.6119 | 0.21 |
| 16 | 23817.9 | 1726.728 | 3.4526 | 0.35 |
| 17 | 23840.8 | 1719.714 | 3.4385 | 0.35 |
| 18 | 24072.6 | 1648.994 | 3.2971 | 1.46 |
| 19 | 25377.8 | 1250.659 | 2.5007 | 4.69 |
| 20 | 27716.8 | 536.857 | 1.0734 | 0.36 |
| 21 | 27739.8 | 529.846 | 1.0594 | 0.71 |
| 22 | 27762.7 | 522.851 | 1.0454 | 0.35 |
| 23 | 29476.0 | 0.002 | 0.0000 | 4.18 |

# 3f (NMR/22297893)



# 3f (NMR/22297893)





# 3f (NMR/22297893)



Peaks List

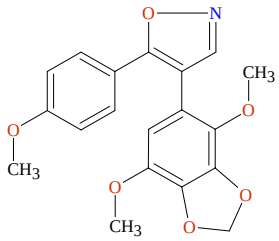
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17408.8 | 20574.502 | 163.6041 | 3.02 |
| 2 | 20156.2 | 19256.184 | 153.1211 | 8.04 |
| 3 | 20894.3 | 18902.012 | 150.3048 | 3.26 |
| 4 | 21316.0 | 18699.652 | 148.6957 | 3.33 |
| 5 | 23833.9 | 17491.465 | 139.0885 | 3.24 |
| 6 | 23901.5 | 17459.037 | 138.8306 | 2.36 |
| 7 | 24425.8 | 17207.459 | 136.8301 | 2.07 |
| 8 | 24646.7 | 17101.488 | 135.9874 | 2.25 |
| 9 | 28884.9 | 15067.834 | 119.8163 | 4.23 |
| 10 | 28949.7 | 15036.744 | 119.5690 | 9.03 |
| 11 | 29980.0 | 14542.351 | 115.6377 | 3.69 |
| 12 | 30957.7 | 14073.230 | 111.9074 | 8.98 |
| 13 | 31298.5 | 13909.709 | 110.6071 | 2.91 |
| 14 | 31537.7 | 13794.904 | 109.6942 | 8.64 |
| 15 | 31574.0 | 13777.494 | 109.5557 | 8.46 |
| 16 | 33551.4 | 12828.696 | 102.0111 | 8.72 |
| 17 | 44623.1 | 7516.074 | 59.7662 | 6.45 |
| 18 | 45431.5 | 7128.158 | 56.6816 | 8.91 |
| 19 | 45717.8 | 6990.792 | 55.5893 | 10.21 |
| 20 | 45778.5 | 6961.655 | 55.3576 | 10.35 |
| 21 | 49785.3 | 5039.062 | 40.0696 | 2.53 |
| 22 | 49829.4 | 5017.927 | 39.9015 | 7.50 |
| 23 | 49873.1 | 4996.917 | 39.7344 | 14.35 |
| 24 | 49916.9 | 4975.920 | 39.5675 | 17.00 |
| 25 | 49960.6 | 4954.930 | 39.4006 | 14.35 |
| 26 | 50004.3 | 4933.958 | 39.2338 | 7.61 |
| 27 | 50048.6 | 4912.734 | 39.0650 | 2.45 |

*The Best Applied NMR!*

# 3g (NMR/22297880)

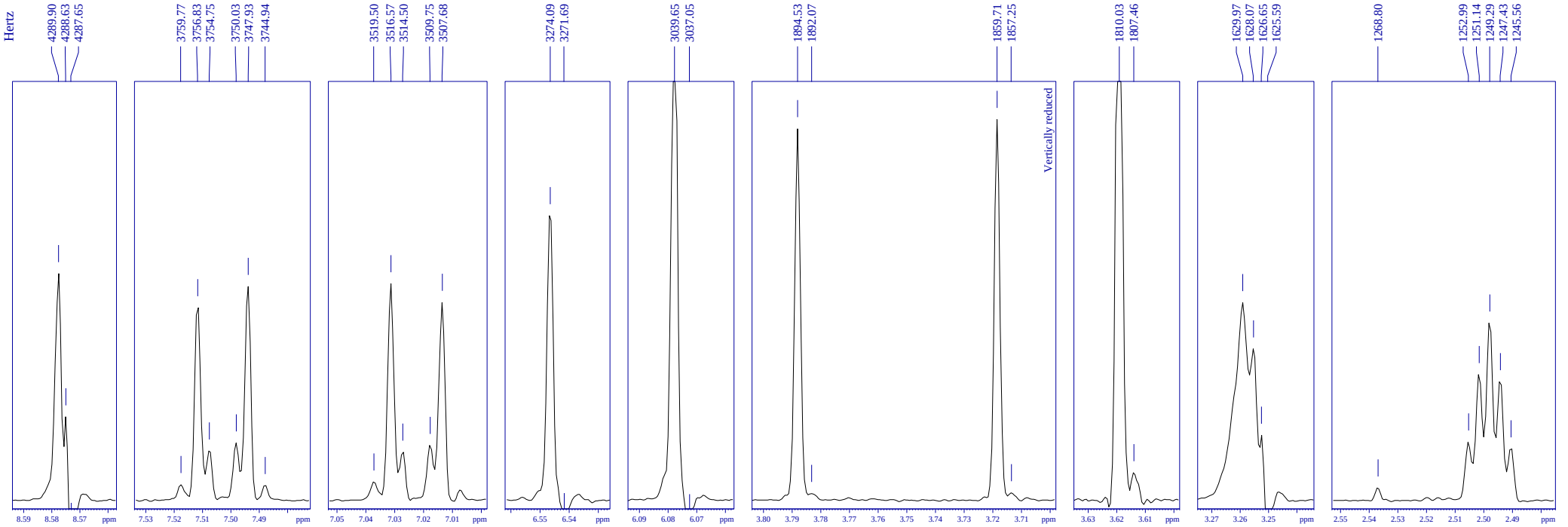
Found protons = 17 impurity* = 0.9 %



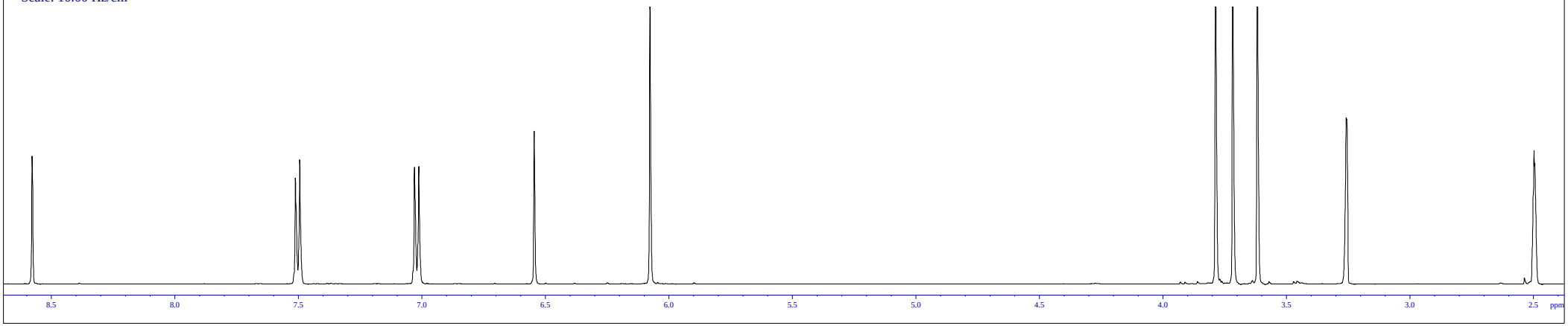


# 3g (NMR/22297880)






Scale: 10.00 Hz/cm



# 3g (NMR/22297880)

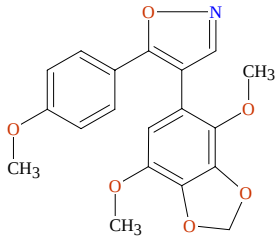


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 15414.9 | 4289.896 | 8.5776 | 4.16 |
| 2 | 15419.0 | 4288.633 | 8.5750 | 1.53 |
| 3 | 15422.2 | 4287.646 | 8.5731 | −1.33 |
| 4 | 17152.0 | 3759.774 | 7.5176 | 0.29 |
| 5 | 17161.6 | 3756.828 | 7.5117 | 3.60 |
| 6 | 17168.4 | 3754.753 | 7.5076 | 0.93 |
| 7 | 17183.9 | 3750.031 | 7.4981 | 1.05 |
| 8 | 17190.8 | 3747.935 | 7.4939 | 3.95 |
| 9 | 17200.6 | 3744.944 | 7.4879 | 0.28 |
| 10 | 17939.3 | 3519.502 | 7.0372 | 0.34 |
| 11 | 17948.9 | 3516.573 | 7.0313 | 3.97 |
| 12 | 17955.7 | 3514.503 | 7.0272 | 0.90 |
| 13 | 17971.2 | 3509.754 | 7.0177 | 1.01 |
| 14 | 17978.0 | 3507.679 | 7.0135 | 3.62 |
| 15 | 18743.4 | 3274.092 | 6.5465 | 5.38 |
| 16 | 18751.3 | 3271.687 | 6.5417 | −0.62 |
| 17 | 19511.7 | 3039.654 | 6.0777 | 10.16 |
| 18 | 19520.2 | 3037.054 | 6.0725 | −0.50 |
| 19 | 23264.0 | 1894.532 | 3.7881 | 15.39 |
| 20 | 23272.1 | 1892.070 | 3.7832 | 0.29 |
| 21 | 23378.1 | 1859.713 | 3.7185 | 15.79 |
| 22 | 23386.2 | 1857.247 | 3.7135 | 0.32 |
| 23 | 23540.9 | 1810.026 | 3.6191 | 16.00 |
| 24 | 23549.3 | 1807.463 | 3.6140 | 0.52 |
| 25 | 24130.9 | 1629.969 | 3.2591 | 3.62 |
| 26 | 24137.1 | 1628.068 | 3.2553 | 2.78 |
| 27 | 24141.8 | 1626.654 | 3.2525 | 1.21 |
| 28 | 24145.3 | 1625.590 | 3.2503 | −1.49 |
| 29 | 25314.4 | 1268.804 | 2.5369 | 0.24 |
| 30 | 25366.2 | 1252.992 | 2.5053 | 1.08 |
| 31 | 25372.3 | 1251.142 | 2.5016 | 2.32 |
| 32 | 25378.3 | 1249.288 | 2.4979 | 3.29 |
| 33 | 25384.4 | 1247.435 | 2.4942 | 2.22 |
| 34 | 25390.5 | 1245.561 | 2.4905 | 0.98 |
| 35 | 29472.0 | −0.002 | −0.0000 | 4.78 |

# 3g (NMR/22297880)

163.57
160.56
153.14
139.09
138.83
136.83
135.93
128.00
119.89
115.55
114.48
110.44
109.55
102.02
59.71
56.63
55.33
40.07
39.90
39.74
39.57
39.40
39.23
39.07

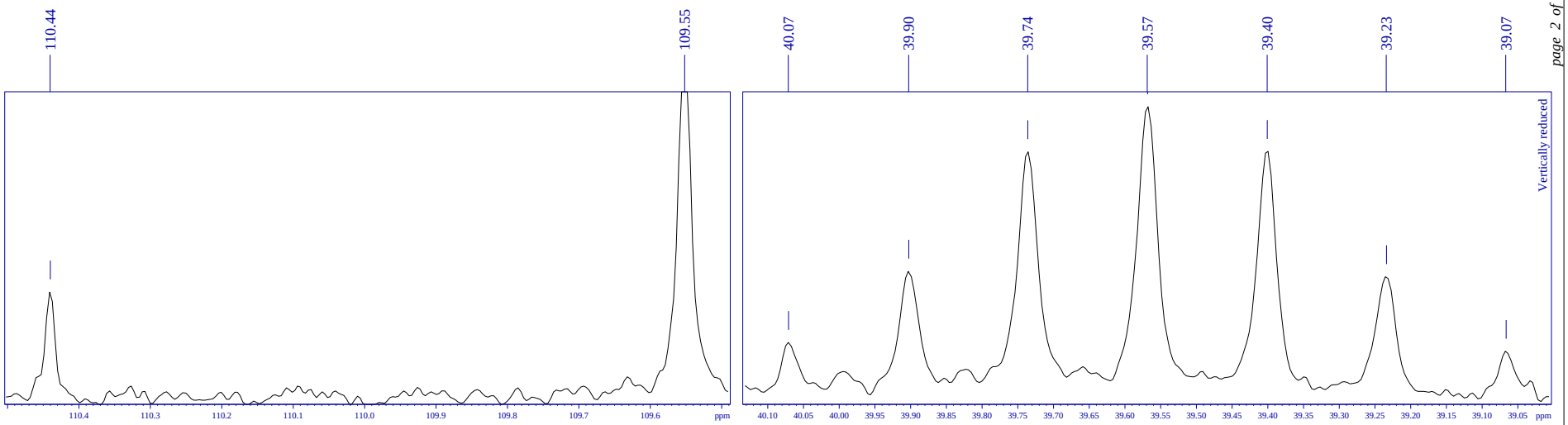




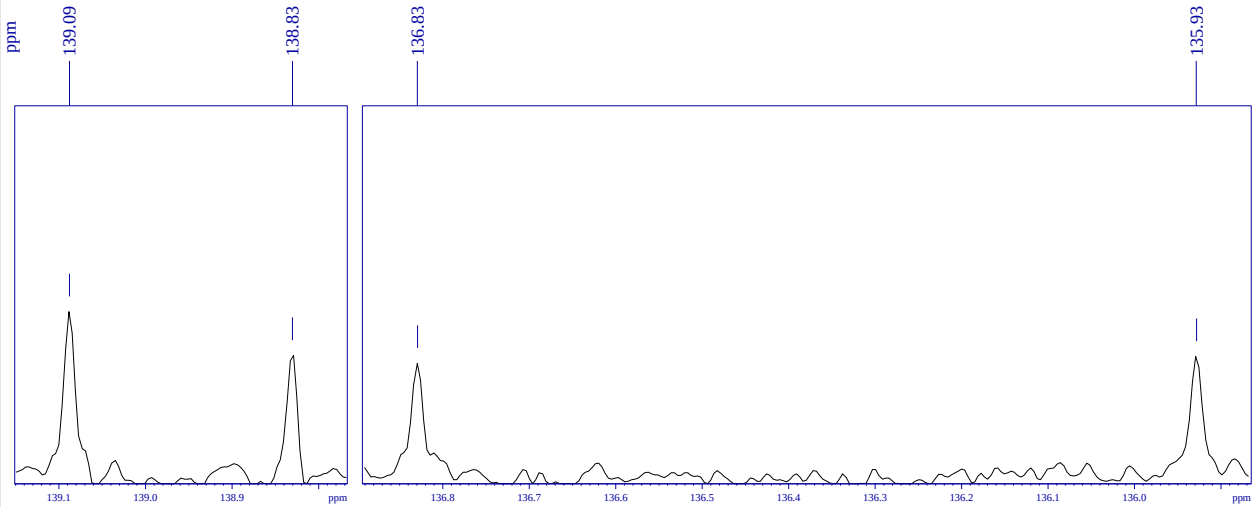

180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

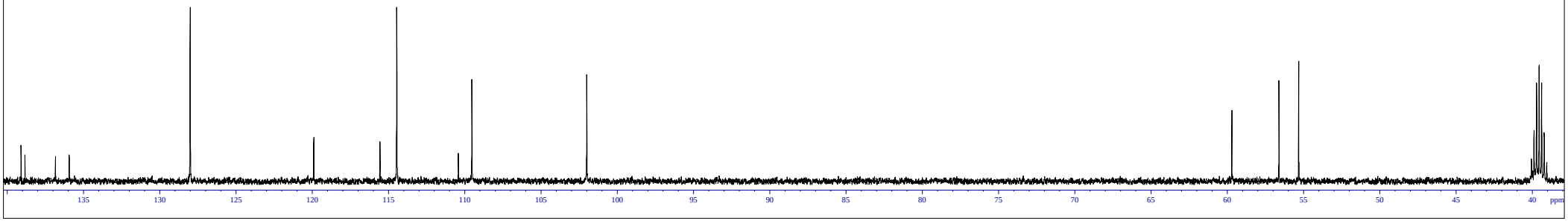
# 3g (NMR/22297880)






Scale: 11.00 Hz/cm



# 3g (NMR/22297880)



Peaks List

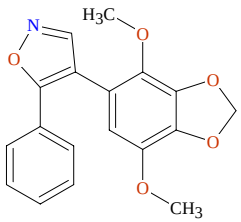
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17417.2 | 20570.428 | 163.5717 | 1.75 |
| 2 | 18207.0 | 20191.486 | 160.5585 | 2.53 |
| 3 | 20151.4 | 19258.471 | 153.1393 | 5.64 |
| 4 | 23834.1 | 17491.375 | 139.0878 | 2.18 |
| 5 | 23901.6 | 17458.994 | 138.8303 | 1.64 |
| 6 | 24426.1 | 17207.346 | 136.8292 | 1.50 |
| 7 | 24662.2 | 17094.037 | 135.9282 | 1.59 |
| 8 | 26741.1 | 16096.527 | 127.9962 | 14.00 |
| 9 | 28864.9 | 15077.406 | 119.8924 | 2.64 |
| 10 | 30002.6 | 14531.506 | 115.5515 | 2.44 |
| 11 | 30283.7 | 14396.646 | 114.4791 | 13.73 |
| 12 | 31342.2 | 13888.712 | 110.4401 | 1.71 |
| 13 | 31575.0 | 13777.005 | 109.5519 | 6.15 |
| 14 | 33549.7 | 12829.470 | 102.0173 | 6.48 |
| 15 | 44637.3 | 7509.273 | 59.7122 | 4.33 |
| 16 | 45444.8 | 7121.809 | 56.6311 | 6.14 |
| 17 | 45785.0 | 6958.542 | 55.3329 | 7.25 |
| 18 | 49785.0 | 5039.231 | 40.0709 | 1.34 |
| 19 | 49829.1 | 5018.065 | 39.9026 | 3.06 |
| 20 | 49872.7 | 4997.120 | 39.7360 | 5.96 |
| 21 | 49916.7 | 4976.018 | 39.5683 | 7.04 |
| 22 | 49960.6 | 4954.963 | 39.4008 | 6.00 |
| 23 | 50004.3 | 4933.969 | 39.2339 | 2.94 |
| 24 | 50048.2 | 4912.901 | 39.0664 | 1.13 |

*The Best Applied NMR!*

# 3h (NMR/22297894)

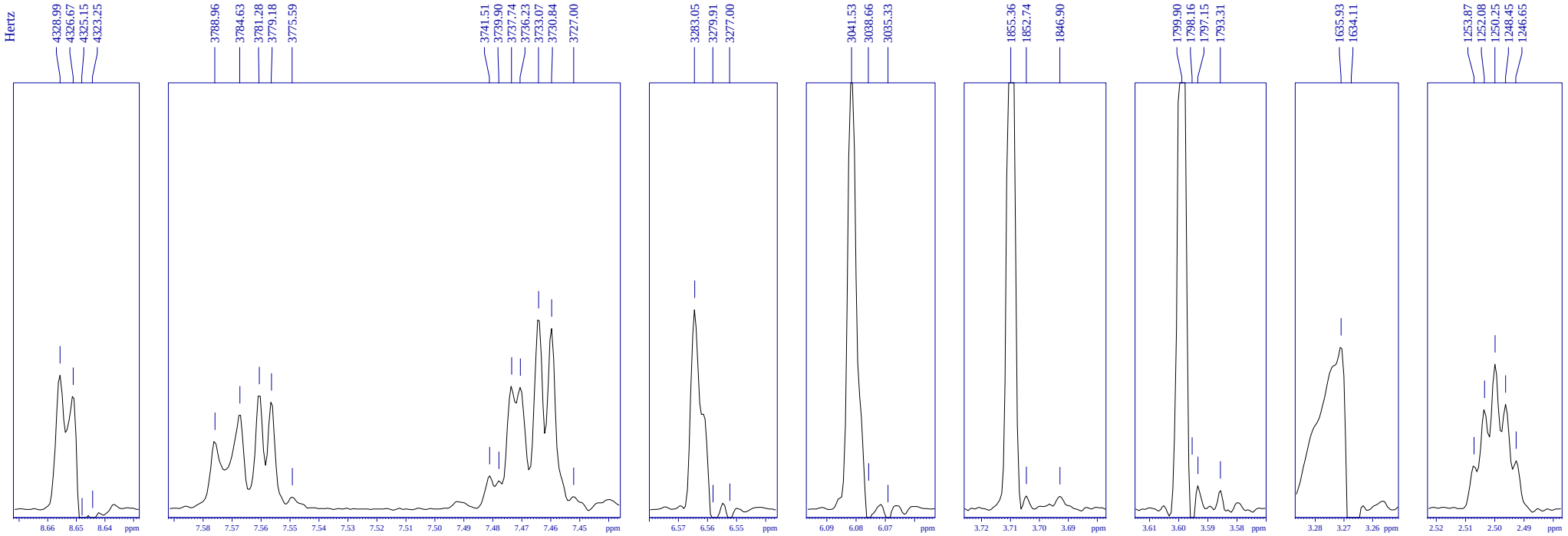
Found protons = 15 impurity* = 1.0 %



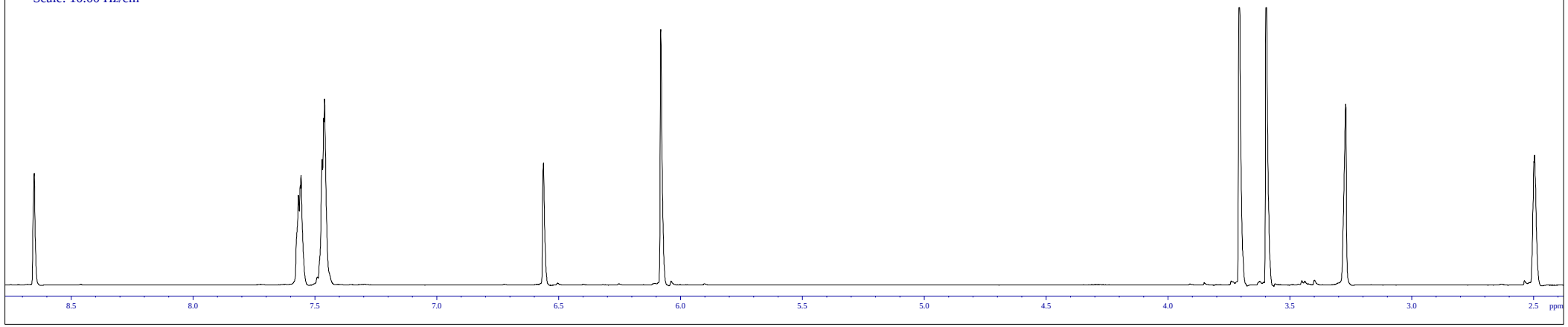


# 3h (NMR/22297894)






Scale: 10.00 Hz/cm



# 3h (NMR/22297894)

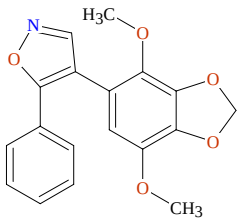


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 15287.8 | 4328.986 | 8.6557 | 2.41 |
| 2 | 15295.4 | 4326.667 | 8.6511 | 2.03 |
| 3 | 15300.3 | 4325.146 | 8.6480 | −0.50 |
| 4 | 15306.6 | 4323.250 | 8.6443 | −0.34 |
| 5 | 17057.3 | 3788.958 | 7.5759 | 1.22 |
| 6 | 17071.5 | 3784.633 | 7.5673 | 1.72 |
| 7 | 17082.5 | 3781.276 | 7.5606 | 2.08 |
| 8 | 17089.4 | 3779.182 | 7.5564 | 1.94 |
| 9 | 17101.1 | 3775.592 | 7.5492 | 0.21 |
| 10 | 17212.8 | 3741.510 | 7.4811 | 0.59 |
| 11 | 17218.1 | 3739.904 | 7.4779 | 0.51 |
| 12 | 17225.2 | 3737.736 | 7.4735 | 2.20 |
| 13 | 17230.1 | 3736.228 | 7.4705 | 2.18 |
| 14 | 17240.5 | 3733.067 | 7.4642 | 3.45 |
| 15 | 17247.8 | 3730.838 | 7.4597 | 3.25 |
| 16 | 17260.3 | 3727.003 | 7.4521 | 0.22 |
| 17 | 18715.1 | 3283.048 | 6.5644 | 3.57 |
| 18 | 18725.4 | 3279.914 | 6.5581 | −0.30 |
| 19 | 18734.9 | 3277.002 | 6.5523 | −0.26 |
| 20 | 19506.5 | 3041.527 | 6.0815 | 8.44 |
| 21 | 19515.9 | 3038.662 | 6.0757 | −0.28 |
| 22 | 19526.8 | 3035.328 | 6.0691 | −0.29 |
| 23 | 23393.3 | 1855.359 | 3.7098 | 15.92 |
| 24 | 23401.9 | 1852.739 | 3.7045 | 0.24 |
| 25 | 23421.1 | 1846.905 | 3.6929 | 0.23 |
| 26 | 23575.1 | 1799.900 | 3.5989 | 16.00 |
| 27 | 23580.8 | 1798.158 | 3.5954 | −0.59 |
| 28 | 23584.1 | 1797.154 | 3.5934 | 0.42 |
| 29 | 23596.7 | 1793.306 | 3.5857 | 0.35 |
| 30 | 24112.4 | 1635.929 | 3.2710 | 2.91 |
| 31 | 24118.3 | 1634.114 | 3.2674 | −2.53 |
| 32 | 25364.3 | 1253.869 | 2.5071 | 0.78 |
| 33 | 25370.2 | 1252.076 | 2.5035 | 1.79 |
| 34 | 25376.2 | 1250.252 | 2.4999 | 2.60 |
| 35 | 25382.1 | 1248.453 | 2.4963 | 1.87 |
| 36 | 25387.9 | 1246.655 | 2.4927 | 0.87 |
| 37 | 27735.8 | 530.149 | 1.0600 | 0.22 |
| 38 | 29473.0 | −0.003 | −0.0000 | 3.86 |

# 3h (NMR/22297894)

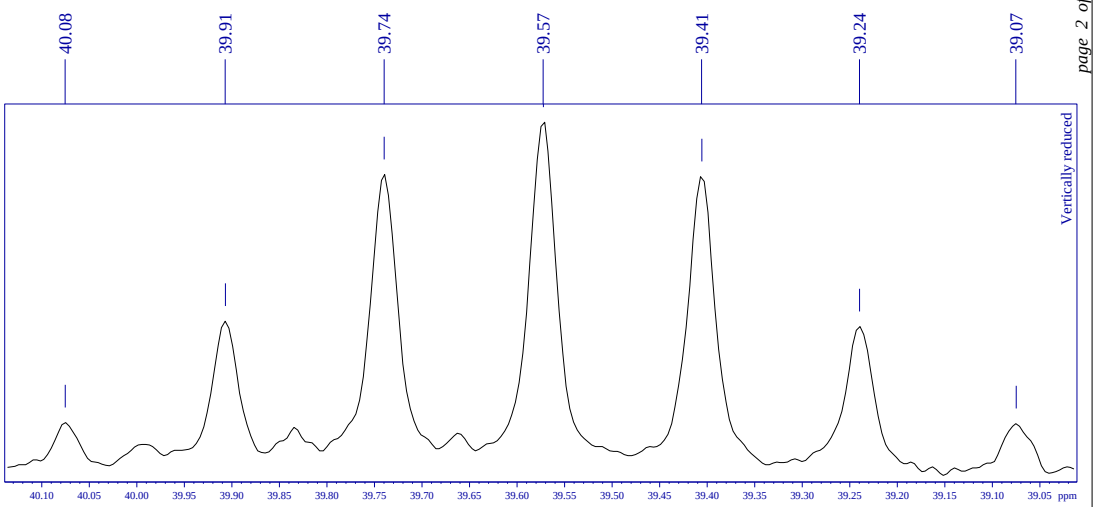




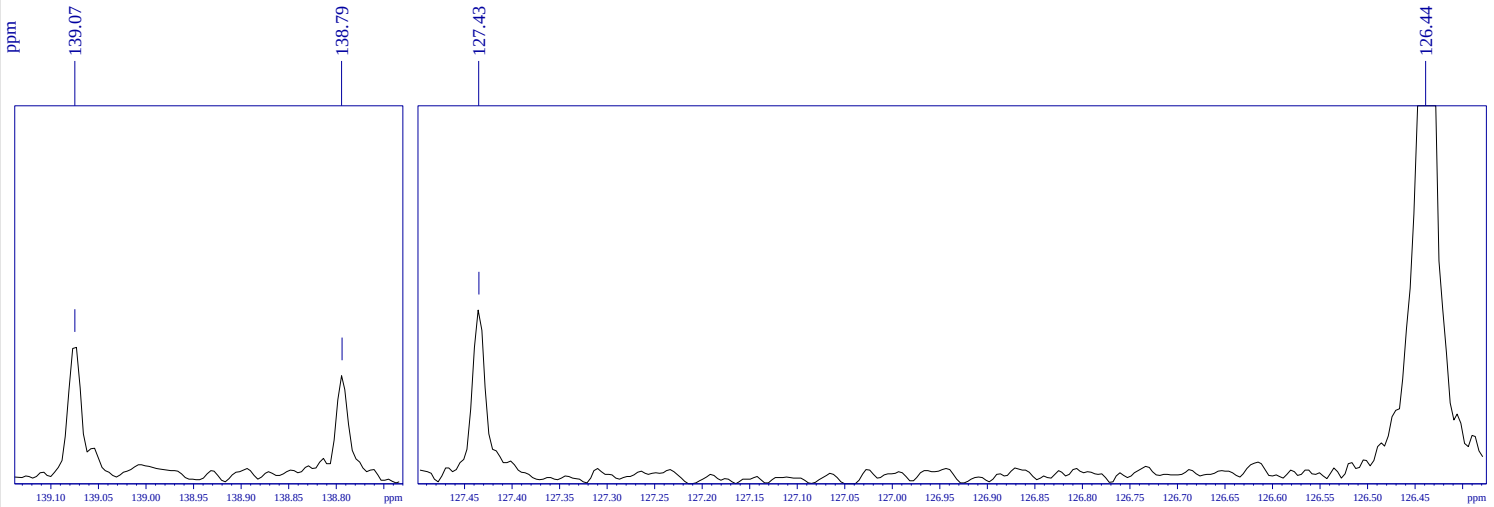

163.55
153.24
139.07
138.79
136.94
135.84
130.16
129.03
127.43
126.44
115.20
111.83
109.53
102.04
59.63
56.62
40.08
39.91
39.74
39.57
39.41
39.24
39.07

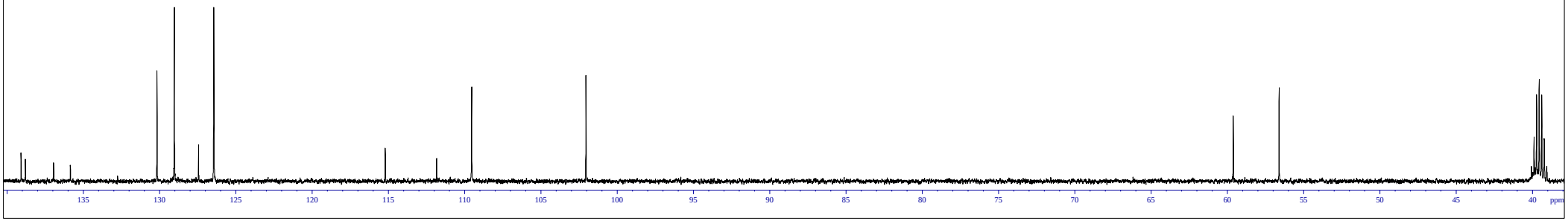
# 3h (NMR/22297894)






Scale: 10.00 Hz/cm



# 3h (NMR/22297894)



Peaks List

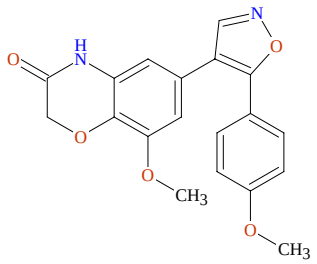
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17422.0 | 20568.139 | 163.5535 | 1.45 |
| 2 | 20125.7 | 19270.832 | 153.2376 | 6.46 |
| 3 | 23837.5 | 17489.742 | 139.0748 | 1.76 |
| 4 | 23911.1 | 17454.424 | 138.7939 | 1.33 |
| 5 | 24396.0 | 17221.754 | 136.9438 | 1.11 |
| 6 | 24685.7 | 17082.770 | 135.8386 | 0.99 |
| 7 | 26174.0 | 16368.604 | 130.1597 | 6.66 |
| 8 | 26470.9 | 16226.170 | 129.0271 | 14.00 |
| 9 | 26888.2 | 16025.943 | 127.4349 | 2.20 |
| 10 | 27149.3 | 15900.629 | 126.4385 | 13.83 |
| 11 | 30095.7 | 14486.841 | 115.1963 | 2.02 |
| 12 | 30977.5 | 14063.715 | 111.8317 | 1.43 |
| 13 | 31580.1 | 13774.577 | 109.5325 | 5.69 |
| 14 | 33543.7 | 12832.384 | 102.0404 | 6.46 |
| 15 | 44659.0 | 7498.840 | 59.6292 | 3.92 |
| 16 | 45447.0 | 7120.747 | 56.6227 | 5.64 |
| 17 | 49783.8 | 5039.782 | 40.0753 | 0.90 |
| 18 | 49828.0 | 5018.594 | 39.9068 | 2.67 |
| 19 | 49871.7 | 4997.597 | 39.7398 | 5.24 |
| 20 | 49915.6 | 4976.529 | 39.5723 | 6.17 |
| 21 | 49959.3 | 4955.565 | 39.4056 | 5.21 |
| 22 | 50002.8 | 4934.700 | 39.2397 | 2.58 |
| 23 | 50046.0 | 4913.971 | 39.0749 | 0.89 |

*The Best Applied NMR!*

# 3i (NMR/27237487)

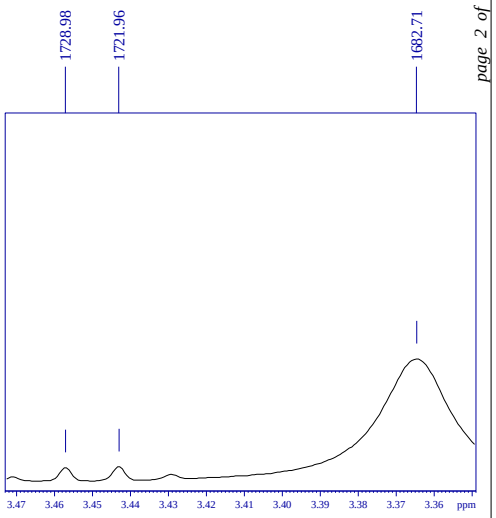
Found protons = 33 impurity* = 1.5 %



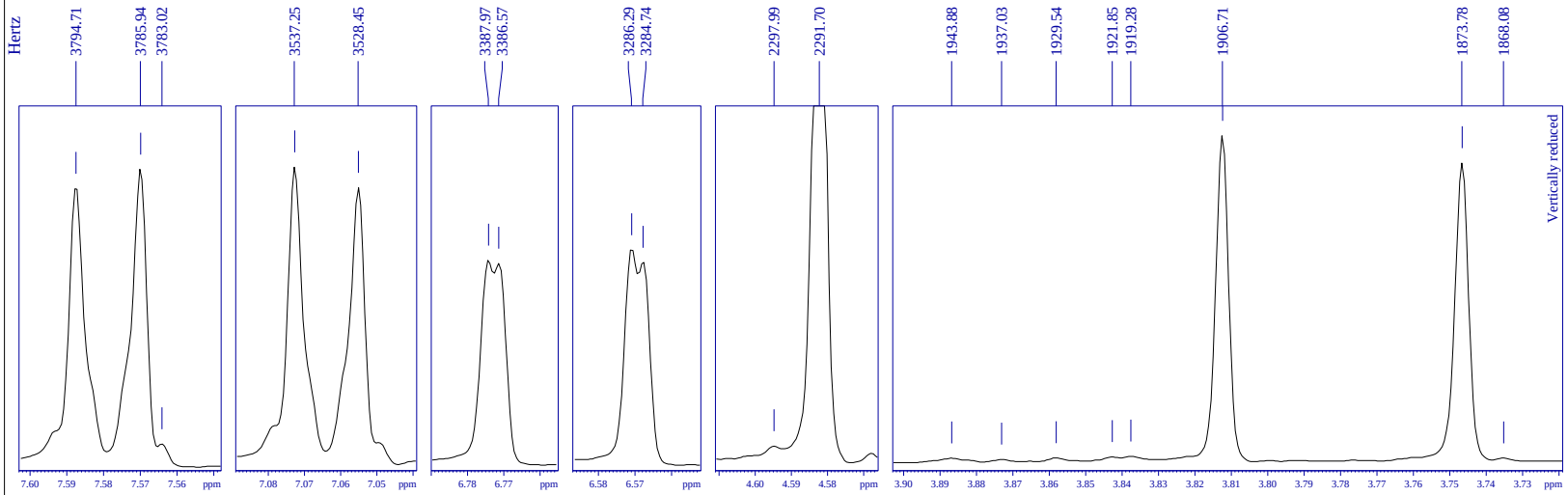


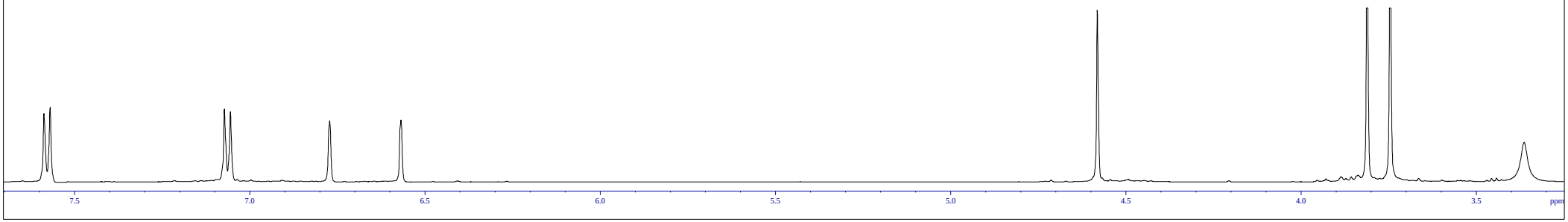
# 3i (NMR/27237487)






Scale: 10.00 Hz/cm



# 3i (NMR/27237487)

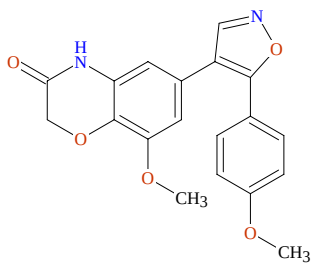


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 11972.4 | 5345.636 | 10.6885 | 2.90 |
| 2 | 15088.8 | 4394.582 | 8.7869 | 6.05 |
| 3 | 17054.5 | 3794.713 | 7.5875 | 3.97 |
| 4 | 17083.2 | 3785.943 | 7.5699 | 4.20 |
| 5 | 17092.8 | 3783.024 | 7.5641 | 0.28 |
| 6 | 17898.1 | 3537.249 | 7.0727 | 4.22 |
| 7 | 17927.0 | 3528.451 | 7.0551 | 3.92 |
| 8 | 18387.3 | 3387.972 | 6.7742 | 2.90 |
| 9 | 18391.9 | 3386.568 | 6.7714 | 2.85 |
| 10 | 18720.5 | 3286.291 | 6.5709 | 3.07 |
| 11 | 18725.6 | 3284.739 | 6.5678 | 2.88 |
| 12 | 21958.9 | 2297.994 | 4.5948 | 0.25 |
| 13 | 21979.5 | 2291.704 | 4.5822 | 10.27 |
| 14 | 23119.3 | 1943.884 | 3.8868 | 0.27 |
| 15 | 23141.7 | 1937.029 | 3.8731 | 0.21 |
| 16 | 23166.3 | 1929.536 | 3.8581 | 0.28 |
| 17 | 23191.5 | 1921.851 | 3.8427 | 0.33 |
| 18 | 23199.9 | 1919.283 | 3.8376 | 0.36 |
| 19 | 23241.1 | 1906.712 | 3.8124 | 16.00 |
| 20 | 23349.0 | 1873.783 | 3.7466 | 14.66 |
| 21 | 23367.7 | 1868.084 | 3.7352 | 0.27 |
| 22 | 23823.5 | 1728.985 | 3.4571 | 0.22 |
| 23 | 23846.5 | 1721.965 | 3.4430 | 0.23 |
| 24 | 23975.1 | 1682.713 | 3.3646 | 1.71 |
| 25 | 25379.3 | 1254.188 | 2.5077 | 2.11 |
| 26 | 27747.1 | 531.597 | 1.0629 | 0.38 |
| 27 | 29489.0 | 0.001 | 0.0000 | 4.15 |

# 3i (NMR/27237487)

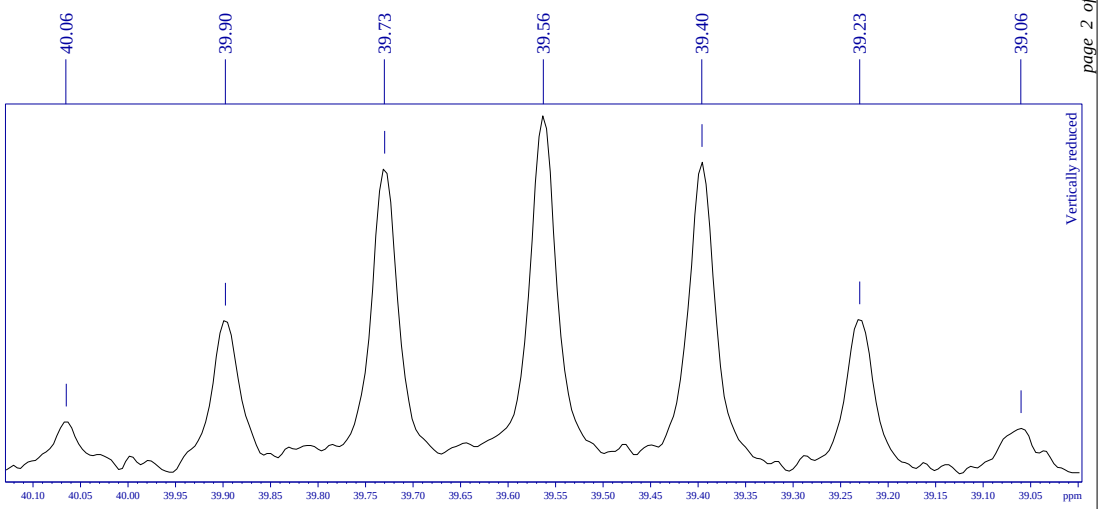




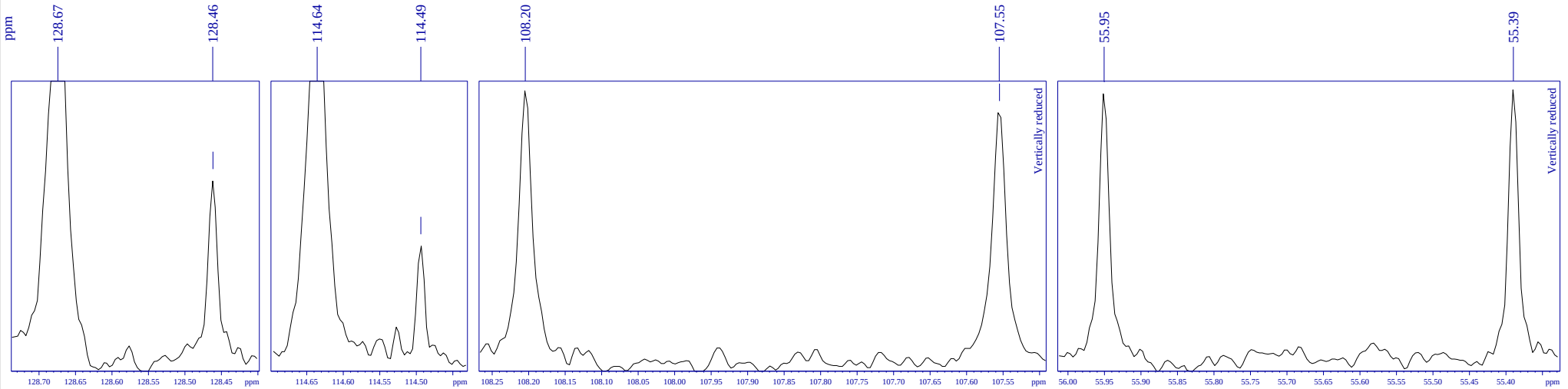

164.89 163.05 160.73 152.29 148.55 132.15 128.67 128.46 123.65 119.45 114.64 114.49 108.20 107.55 66.73 55.95 55.39 40.06 39.90 39.73 39.56 39.40 39.23 39.06

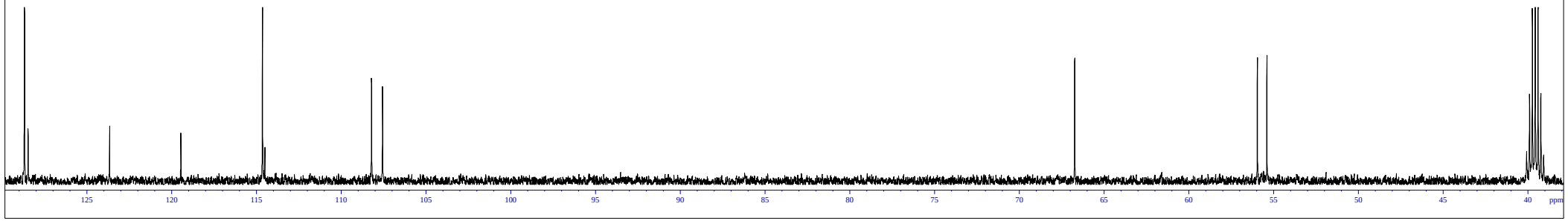
# 3i (NMR/27237487)






Scale: 10.00 Hz/cm



# 3i (NMR/27237487)



Peaks List

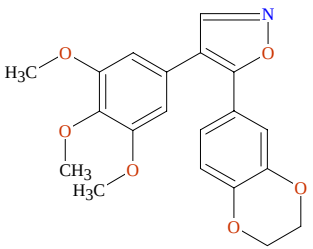
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17071.2 | 20736.459 | 164.8920 | 3.30 |
| 2 | 17555.1 | 20504.271 | 163.0457 | 2.09 |
| 3 | 18161.4 | 20213.377 | 160.7325 | 2.92 |
| 4 | 20374.2 | 19151.561 | 152.2892 | 5.60 |
| 5 | 21354.1 | 18681.400 | 148.5506 | 2.49 |
| 6 | 25651.2 | 16619.490 | 132.1547 | 1.83 |
| 7 | 26563.4 | 16181.771 | 128.6741 | 14.00 |
| 8 | 26619.1 | 16155.057 | 128.4616 | 3.13 |
| 9 | 27879.5 | 15550.247 | 123.6523 | 3.39 |
| 10 | 28980.1 | 15022.138 | 119.4529 | 2.88 |
| 11 | 30242.7 | 14416.334 | 114.6357 | 13.97 |
| 12 | 30279.8 | 14398.490 | 114.4938 | 2.03 |
| 13 | 31928.2 | 13607.540 | 108.2043 | 6.14 |
| 14 | 32098.4 | 13525.876 | 107.5549 | 5.71 |
| 15 | 42798.6 | 8391.534 | 66.7277 | 7.44 |
| 16 | 45623.2 | 7036.191 | 55.9503 | 7.37 |
| 17 | 45770.1 | 6965.685 | 55.3897 | 7.46 |
| 18 | 49786.5 | 5038.483 | 40.0650 | 1.80 |
| 19 | 49830.4 | 5017.426 | 39.8975 | 5.19 |
| 20 | 49874.3 | 4996.342 | 39.7299 | 10.31 |
| 21 | 49918.1 | 4975.334 | 39.5628 | 12.04 |
| 22 | 49961.9 | 4954.348 | 39.3959 | 10.49 |
| 23 | 50005.4 | 4933.464 | 39.2299 | 5.23 |
| 24 | 50049.9 | 4912.115 | 39.0601 | 1.55 |

*The Best Applied NMR!*

# 3j (NMR/22297312)

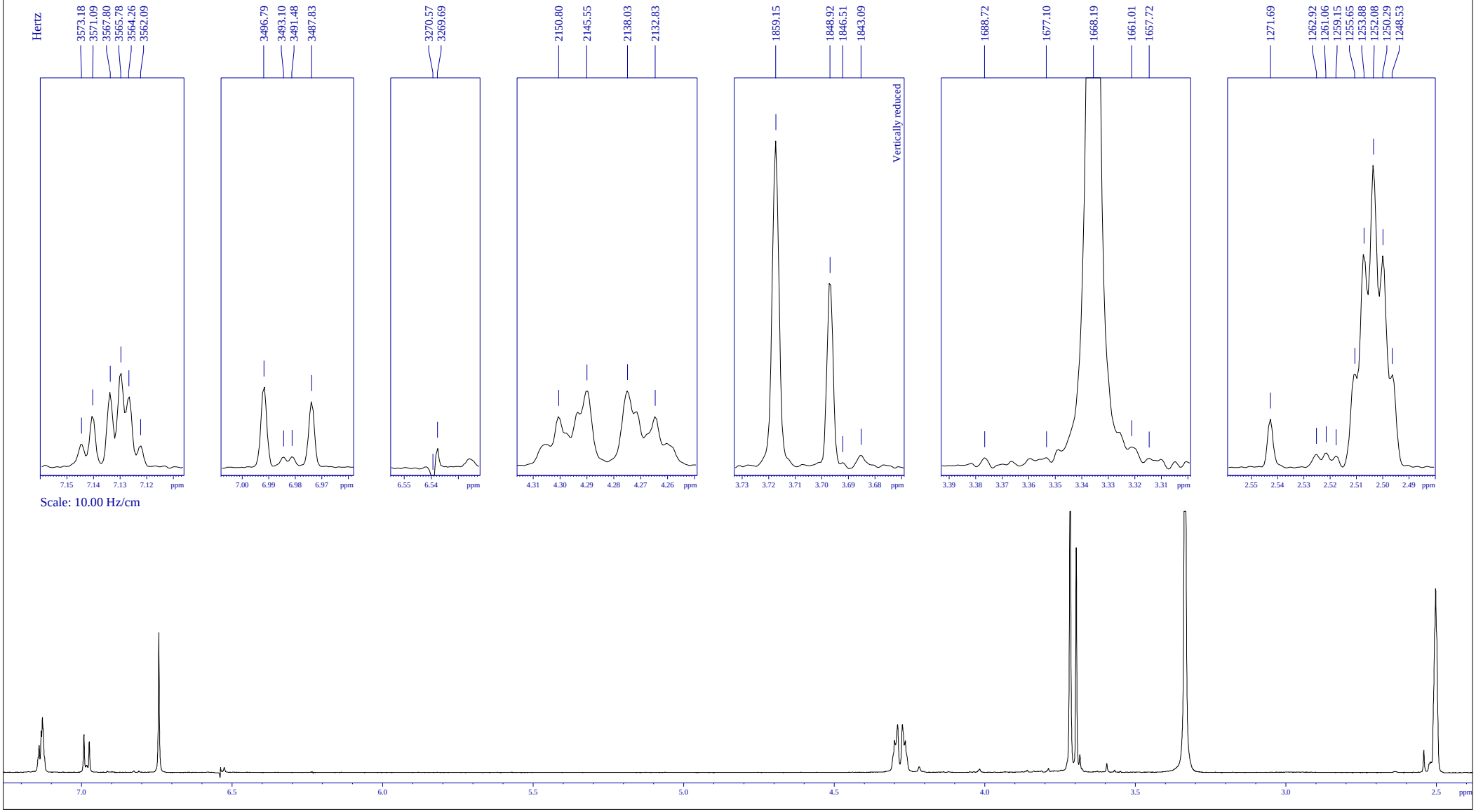
Found protons = 20 impurity* = 2.6 %





# 3j (NMR/22297312)





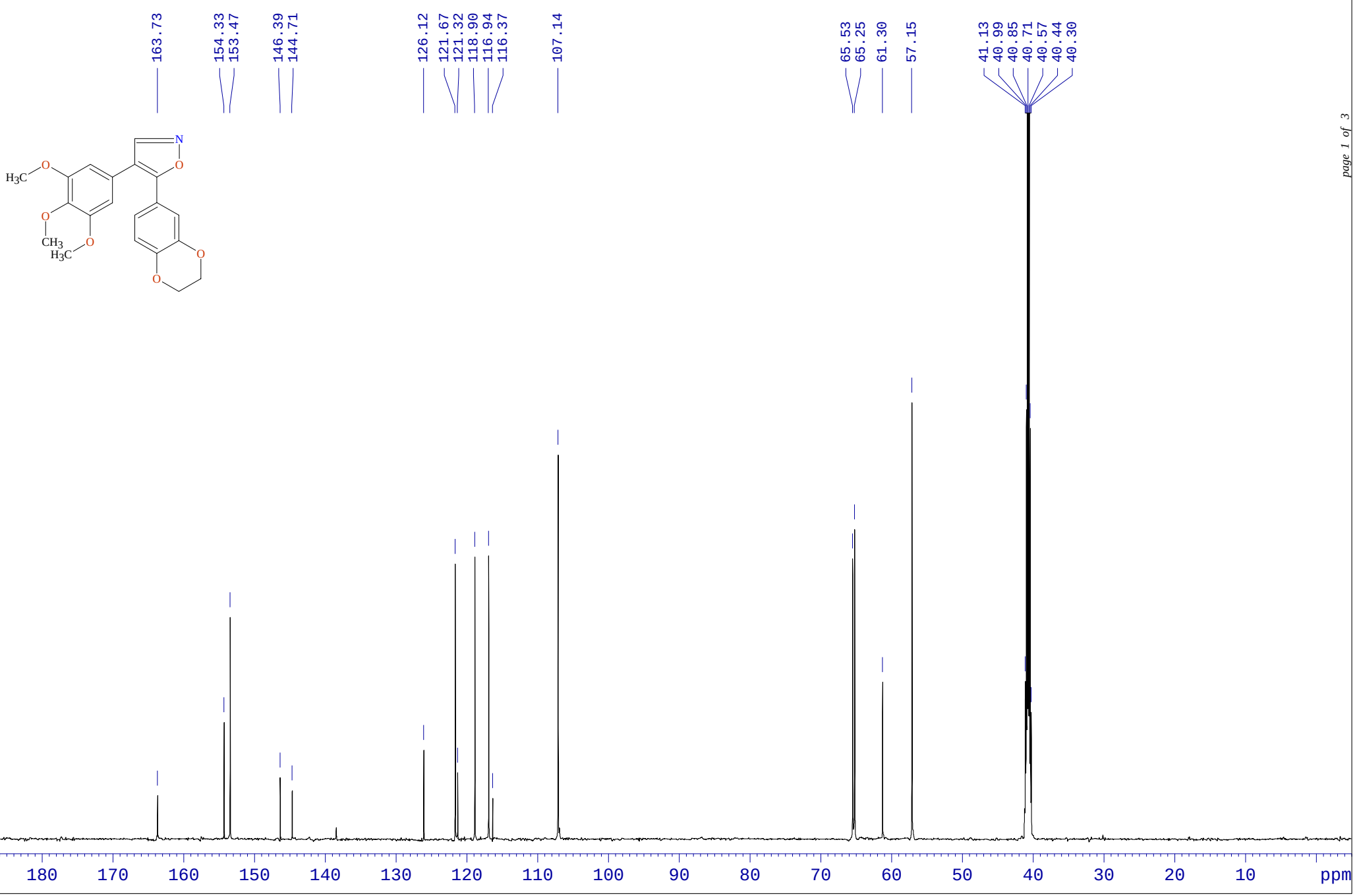
# 3j (NMR/22297312)



Peaks List

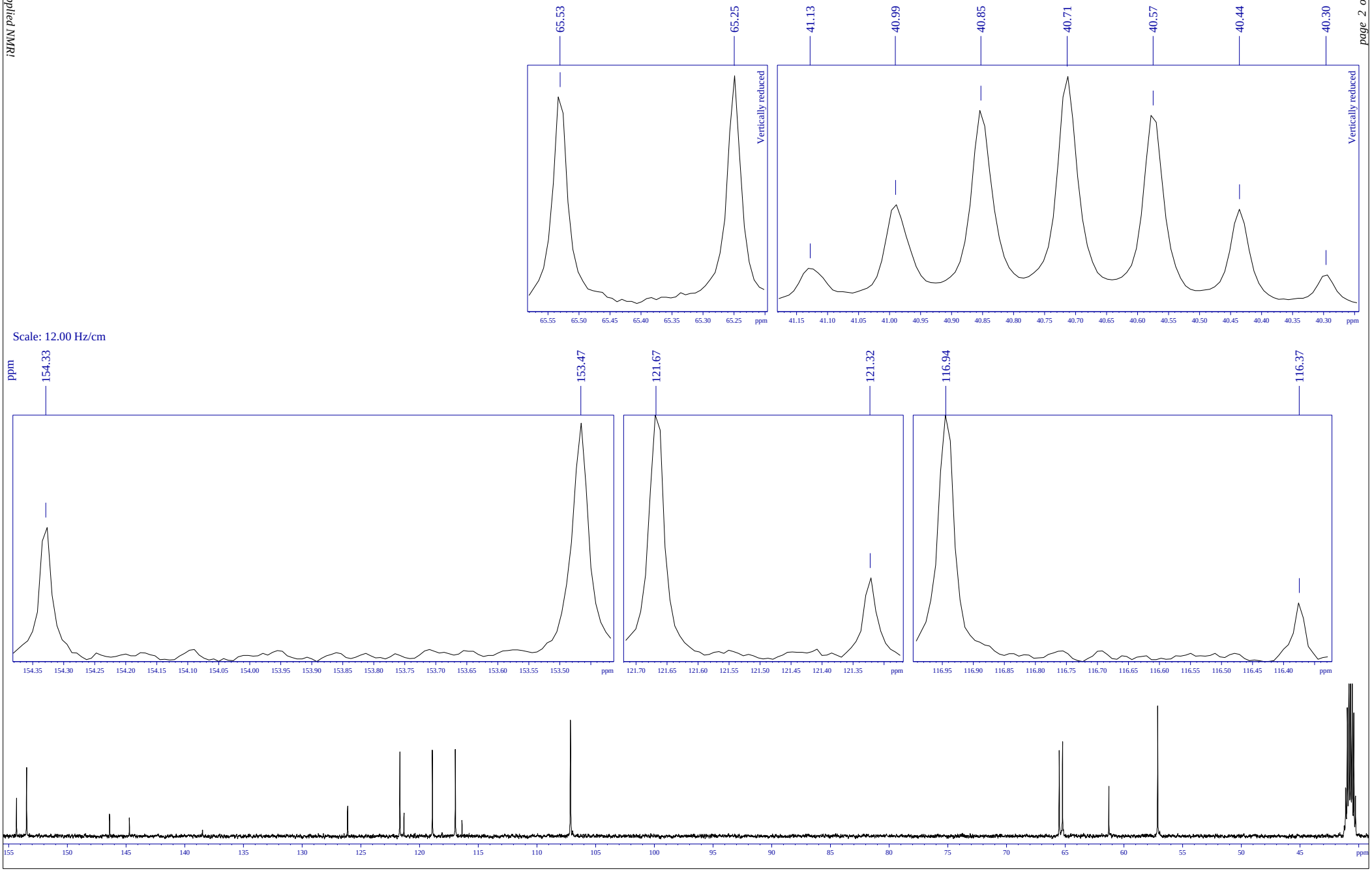
| # | Address [points] | Frequency [Hz] | Frequency [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 14985.9 | 4423.864 | 8.8454 | 3.92 |
| 2 | 17773.4 | 3573.183 | 7.1445 | 0.51 |
| 3 | 17780.2 | 3571.094 | 7.1403 | 1.11 |
| 4 | 17791.0 | 3567.801 | 7.1337 | 1.61 |
| 5 | 17797.6 | 3565.784 | 7.1297 | 2.05 |
| 6 | 17802.6 | 3564.260 | 7.1267 | 1.54 |
| 7 | 17809.8 | 3562.086 | 7.1223 | 0.47 |
| 8 | 18023.7 | 3496.792 | 6.9918 | 1.74 |
| 9 | 18035.8 | 3493.102 | 6.9844 | 0.23 |
| 10 | 18041.1 | 3491.484 | 6.9812 | 0.24 |
| 11 | 18053.1 | 3487.826 | 6.9738 | 1.41 |
| 12 | 18431.4 | 3372.377 | 6.7430 | 6.44 |
| 13 | 18765.0 | 3270.570 | 6.5394 | −0.50 |
| 14 | 18767.9 | 3269.692 | 6.5377 | 0.41 |
| 15 | 22434.3 | 2150.803 | 4.3005 | 1.10 |
| 16 | 22451.5 | 2145.555 | 4.2900 | 1.65 |
| 17 | 22476.1 | 2138.026 | 4.2749 | 1.65 |
| 18 | 22493.1 | 2132.830 | 4.2646 | 1.10 |
| 19 | 23389.9 | 1859.153 | 3.7173 | 18.03 |
| 20 | 23423.5 | 1848.916 | 3.6969 | 10.47 |
| 21 | 23431.4 | 1846.512 | 3.6921 | 0.27 |
| 22 | 23442.6 | 1843.093 | 3.6852 | 0.69 |
| 23 | 23589.9 | 1798.129 | 3.5953 | 0.40 |
| 24 | 23948.4 | 1688.725 | 3.3766 | 0.21 |
| 25 | 23986.5 | 1677.104 | 3.3533 | 0.21 |
| 26 | 24015.7 | 1668.190 | 3.3355 | 36.40 |
| 27 | 24039.2 | 1661.011 | 3.3212 | 0.44 |
| 28 | 24050.0 | 1657.719 | 3.3146 | 0.20 |
| 29 | 25314.9 | 1271.689 | 2.5427 | 1.04 |
| 30 | 25343.7 | 1262.919 | 2.5252 | 0.28 |
| 31 | 25349.8 | 1261.058 | 2.5215 | 0.32 |
| 32 | 25356.0 | 1259.154 | 2.5177 | 0.25 |
| 33 | 25367.5 | 1255.646 | 2.5106 | 2.01 |
| 34 | 25373.3 | 1253.876 | 2.5071 | 4.61 |
| 35 | 25379.2 | 1252.079 | 2.5035 | 6.50 |
| 36 | 25385.1 | 1250.287 | 2.4999 | 4.54 |
| 37 | 25390.8 | 1248.529 | 2.4964 | 1.99 |
| 38 | 27461.1 | 616.717 | 1.2331 | 0.31 |
| 39 | 29482.0 | 0.001 | 0.0000 | 2.51 |

# 3j (NMR/22297312)



# 3j (NMR/22297312)





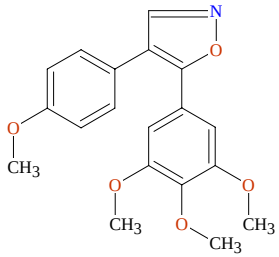
# 3j (NMR/22297312)



Peaks List

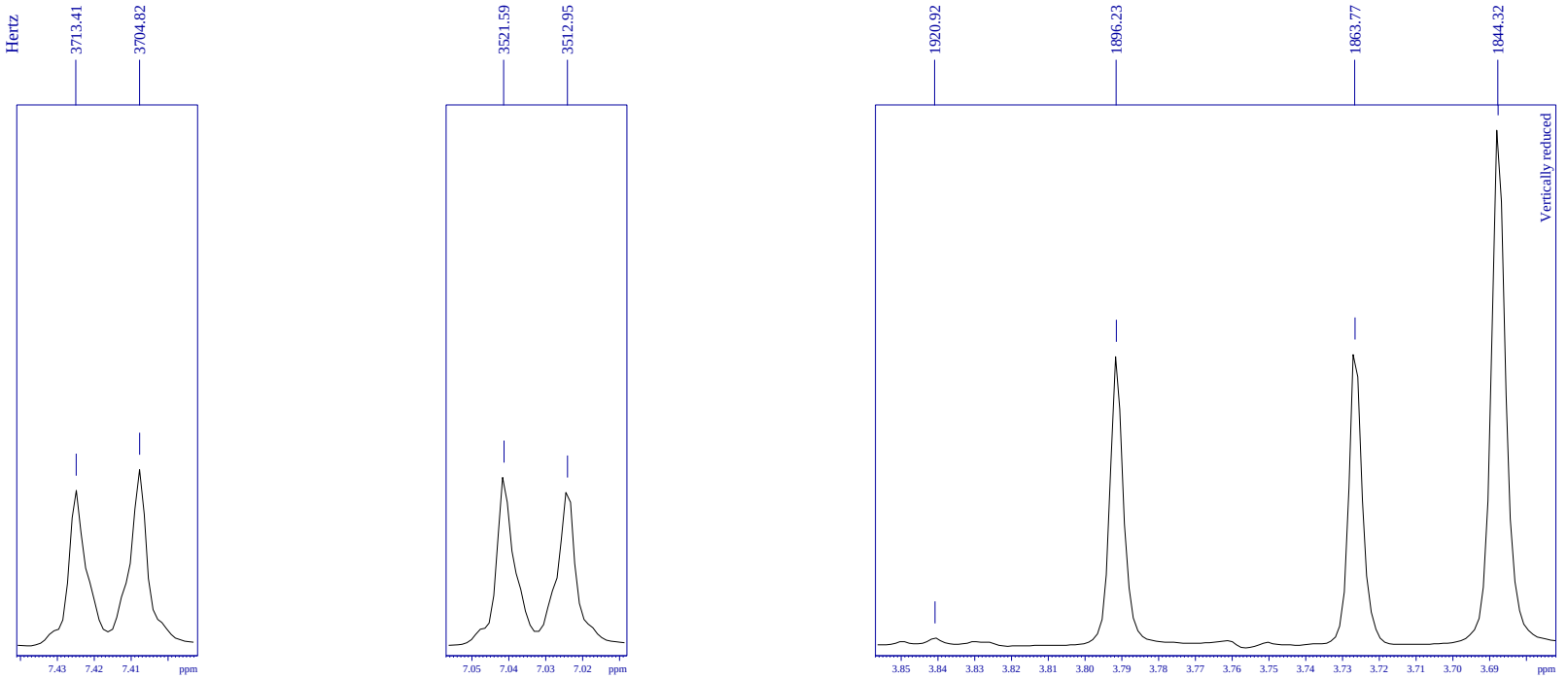
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 10823.1 | 24706.730 | 163.7262 | 1.16 |
| 2 | 12012.7 | 23288.648 | 154.3289 | 2.70 |
| 3 | 12121.9 | 23158.406 | 153.4658 | 4.73 |
| 4 | 13017.1 | 22091.289 | 146.3943 | 1.51 |
| 5 | 13230.7 | 21836.658 | 144.7069 | 1.29 |
| 6 | 15583.8 | 19031.580 | 126.1182 | 2.11 |
| 7 | 16147.2 | 18359.939 | 121.6674 | 5.83 |
| 8 | 16190.8 | 18307.873 | 121.3224 | 1.60 |
| 9 | 16497.9 | 17941.842 | 118.8968 | 5.94 |
| 10 | 16745.1 | 17647.170 | 116.9440 | 5.96 |
| 11 | 16817.2 | 17561.244 | 116.3746 | 1.10 |
| 12 | 17986.3 | 16167.475 | 107.1384 | 8.09 |
| 13 | 23253.3 | 9888.722 | 65.5304 | 6.04 |
| 14 | 23288.9 | 9846.312 | 65.2494 | 6.48 |
| 15 | 23788.8 | 9250.407 | 61.3005 | 3.47 |
| 16 | 24314.5 | 8623.713 | 57.1475 | 9.42 |
| 17 | 26342.4 | 6206.323 | 41.1280 | 3.37 |
| 18 | 26359.8 | 6185.545 | 40.9903 | 8.86 |
| 19 | 26377.2 | 6164.777 | 40.8527 | 17.08 |
| 20 | 26394.8 | 6143.778 | 40.7135 | 20.00 |
| 21 | 26412.4 | 6122.860 | 40.5749 | 16.88 |
| 22 | 26430.0 | 6101.848 | 40.4356 | 8.45 |
| 23 | 26447.7 | 6080.788 | 40.2961 | 2.81 |

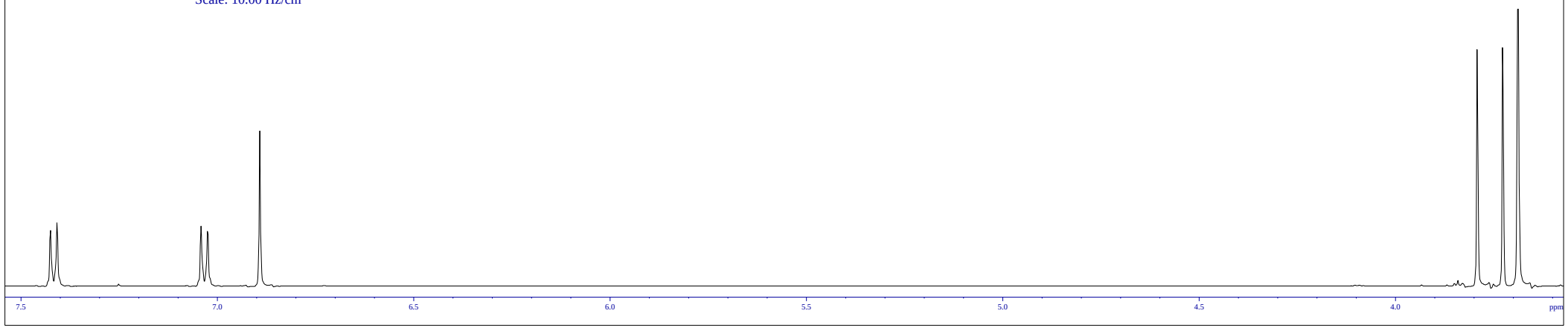
# 3k (NMR/22257797)



# 3k (NMR/22257797)





# 3k (NMR/22257797)

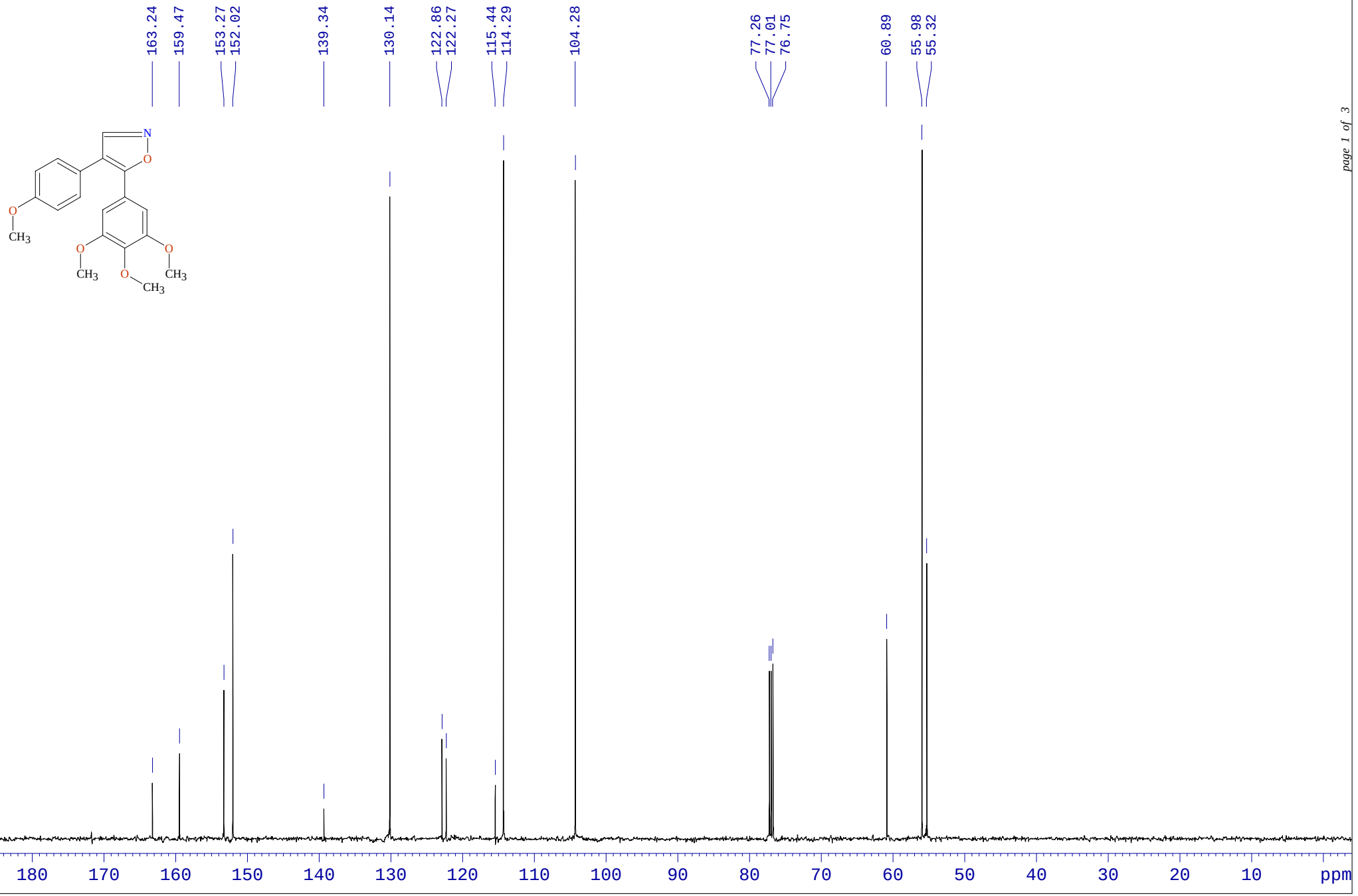


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 7523.8 | 4409.867 | 8.8174 | 3.26 |
| 2 | 8664.9 | 3713.412 | 7.4249 | 2.08 |
| 3 | 8679.0 | 3704.822 | 7.4077 | 2.36 |
| 4 | 8979.2 | 3521.585 | 7.0413 | 2.27 |
| 5 | 8993.3 | 3512.954 | 7.0241 | 2.09 |
| 6 | 9102.0 | 3446.655 | 6.8915 | 5.82 |
| 7 | 11601.7 | 1920.920 | 3.8408 | 0.21 |
| 8 | 11642.2 | 1896.230 | 3.7915 | 8.93 |
| 9 | 11695.4 | 1863.766 | 3.7266 | 9.24 |
| 10 | 11727.2 | 1844.323 | 3.6877 | 16.00 |
| 11 | 12012.9 | 1669.983 | 3.3391 | 1.08 |
| 12 | 12689.5 | 1256.976 | 2.5133 | 0.68 |
| 13 | 14749.0 | −0.000 | −0.0000 | 0.81 |

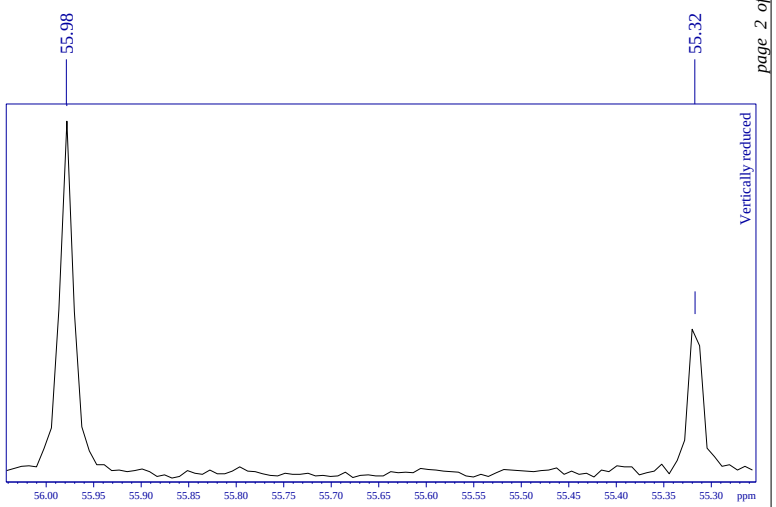
# 3k (NMR/22257797)



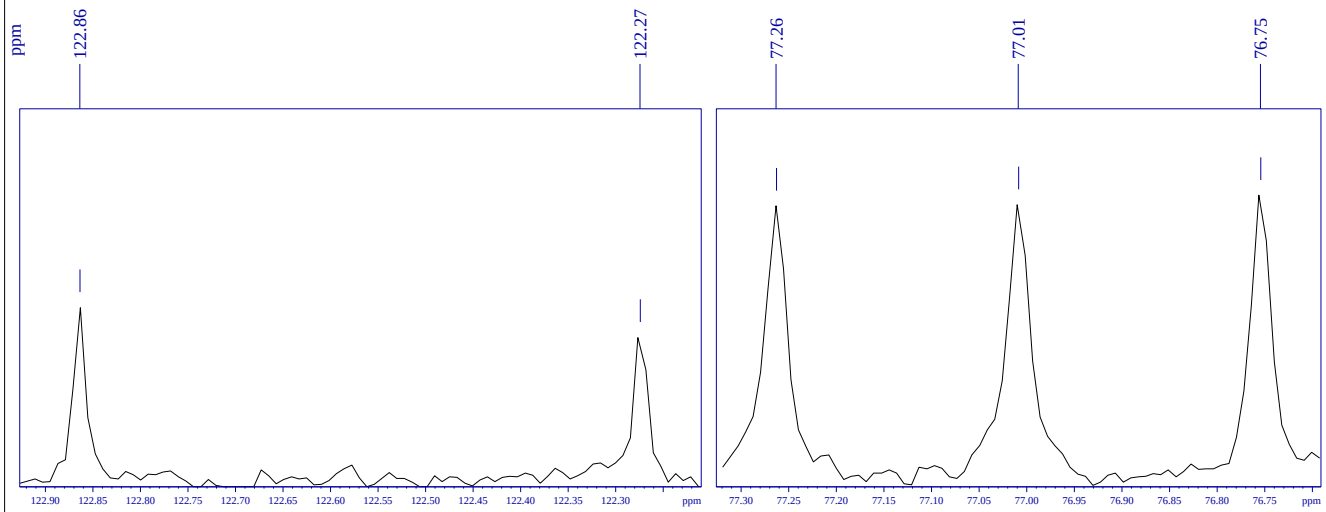


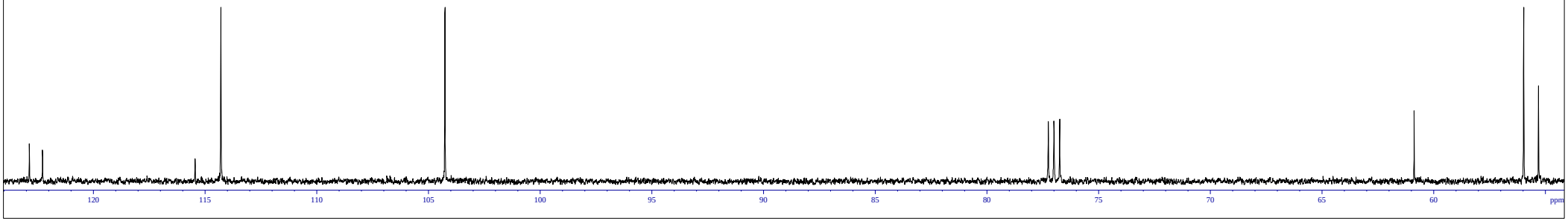
# 3k (NMR/22257797)






Scale: 10.00 Hz/cm



# 3k (NMR/22257797)



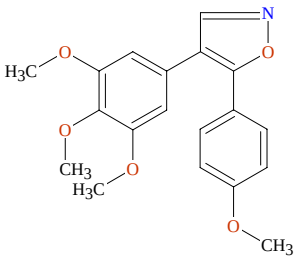
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 9671.0 | 20528.256 | 163.2364 | 1.40 |
| 2 | 10145.9 | 20054.609 | 159.4701 | 1.98 |
| 3 | 10927.3 | 19275.357 | 153.2737 | 3.37 |
| 4 | 11085.4 | 19117.652 | 152.0196 | 6.32 |
| 5 | 12684.4 | 17522.938 | 139.3388 | 0.86 |
| 6 | 13844.3 | 16366.174 | 130.1404 | 13.68 |
| 7 | 14761.9 | 15451.055 | 122.8636 | 2.28 |
| 8 | 14836.3 | 15376.924 | 122.2741 | 1.93 |
| 9 | 15697.8 | 14517.668 | 115.4415 | 1.37 |
| 10 | 15843.2 | 14372.706 | 114.2888 | 14.00 |
| 11 | 17105.8 | 13113.497 | 104.2758 | 13.60 |
| 12 | 20512.1 | 9716.403 | 77.2628 | 3.61 |
| 13 | 20544.1 | 9684.414 | 77.0085 | 3.64 |
| 14 | 20576.2 | 9652.433 | 76.7542 | 3.79 |
| 15 | 22577.2 | 7656.864 | 60.8858 | 4.32 |
| 16 | 23196.0 | 7039.702 | 55.9783 | 13.98 |
| 17 | 23279.4 | 6956.552 | 55.3171 | 6.09 |

*The Best Applied NMR!*

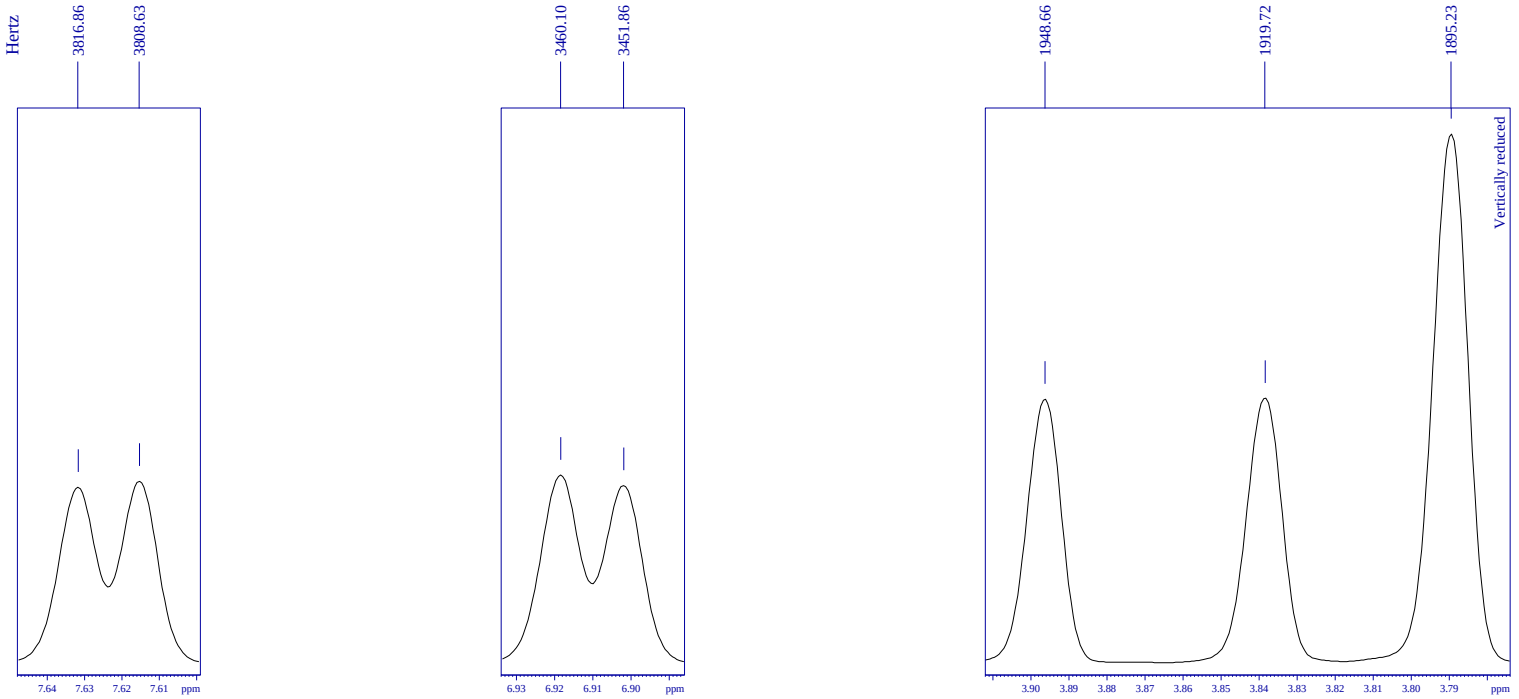
# 3l (NMR/22257574)

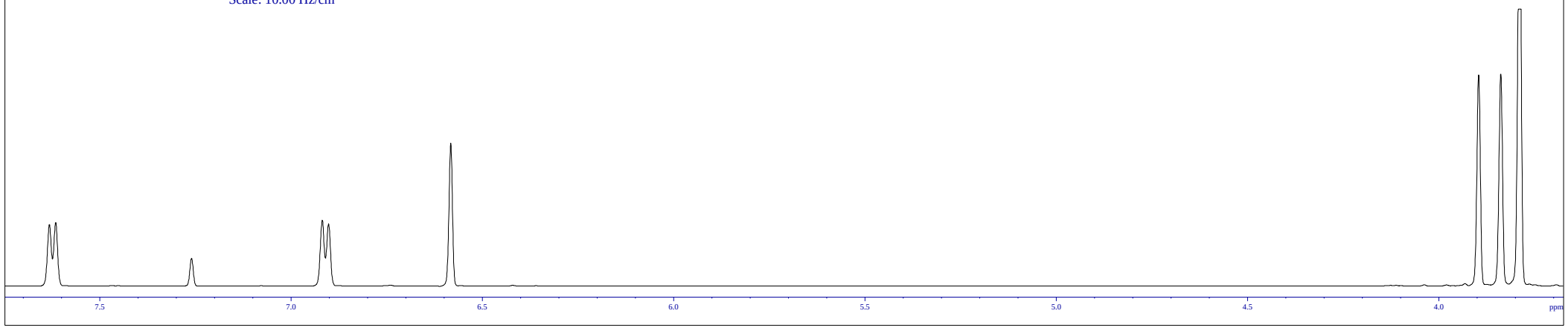
Found protons = 9 impurity* < 0.1 %



# 3l (NMR/22257574)





# 3l (NMR/22257574)

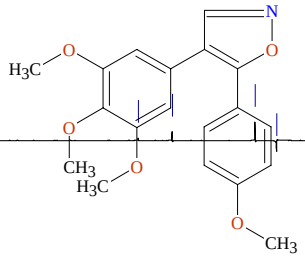


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 15867.4 | 4153.649 | 8.3051 | 2.33 |
| 2 | 16971.0 | 3816.860 | 7.6317 | 2.33 |
| 3 | 16997.9 | 3808.629 | 7.6153 | 2.41 |
| 4 | 17579.9 | 3631.043 | 7.2602 | 1.05 |
| 5 | 18140.0 | 3460.098 | 6.9184 | 2.49 |
| 6 | 18167.0 | 3451.863 | 6.9019 | 2.36 |
| 7 | 18690.6 | 3292.080 | 6.5824 | 5.42 |
| 8 | 23092.7 | 1948.658 | 3.8963 | 8.00 |
| 9 | 23187.5 | 1919.720 | 3.8384 | 8.03 |
| 10 | 23267.8 | 1895.228 | 3.7895 | 16.00 |
| 11 | 26911.1 | 783.375 | 1.5663 | 0.95 |
| 12 | 29478.1 | 0.002 | 0.0000 | 1.45 |

# 3l (NMR/22257574)

163.94
160.93
153.62
151.72
128.84
128.82
125.81
120.13
114.95
114.13
114.10
105.86
105.83
77.30
77.04
76.79
60.96
56.18
56.16
55.34
55.32

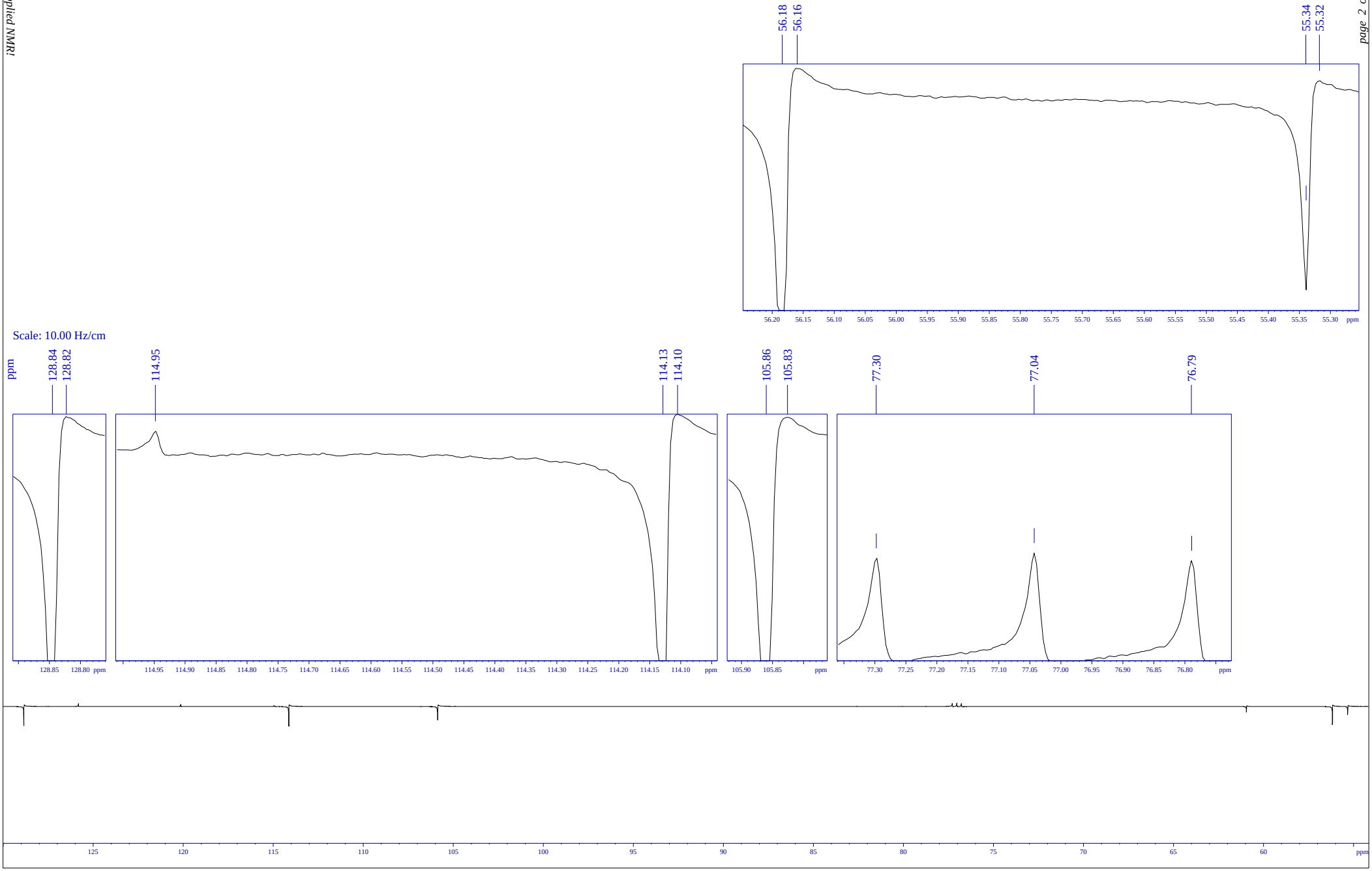





170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

# 3l (NMR/22257574)





# 3l (NMR/22257574)



Peaks List

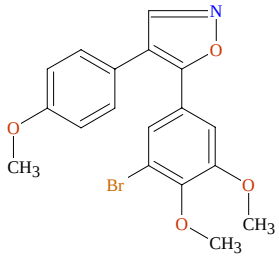
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 16723.5 | 20617.031 | 163.9424 | 0.10 |
| 2 | 17541.7 | 20238.688 | 160.9339 | 0.21 |
| 3 | 19529.9 | 19319.373 | 153.6237 | 0.42 |
| 4 | 20048.1 | 19079.789 | 151.7185 | −0.26 |
| 5 | 26269.1 | 16203.266 | 128.8450 | −2.18 |
| 6 | 26275.3 | 16200.408 | 128.8223 | 0.18 |
| 7 | 27094.9 | 15821.445 | 125.8089 | 0.29 |
| 8 | 28639.6 | 15107.187 | 120.1292 | 0.24 |
| 9 | 30048.8 | 14455.599 | 114.9479 | 0.10 |
| 10 | 30271.7 | 14352.529 | 114.1283 | −2.29 |
| 11 | 30278.0 | 14349.576 | 114.1049 | 0.19 |
| 12 | 32520.5 | 13312.690 | 105.8598 | −1.57 |
| 13 | 32529.8 | 13308.401 | 105.8257 | 0.17 |
| 14 | 40288.7 | 9720.783 | 77.2977 | 0.37 |
| 15 | 40357.9 | 9688.756 | 77.0430 | 0.38 |
| 16 | 40427.0 | 9656.810 | 76.7890 | 0.36 |
| 17 | 44731.6 | 7666.424 | 60.9618 | −0.65 |
| 18 | 46031.2 | 7065.516 | 56.1835 | −2.07 |
| 19 | 46037.7 | 7062.504 | 56.1596 | 0.17 |
| 20 | 46260.8 | 6959.329 | 55.3391 | −0.97 |
| 21 | 46266.7 | 6956.605 | 55.3175 | 0.10 |

*The Best Applied NMR!*

# 3m (NMR/22297287)

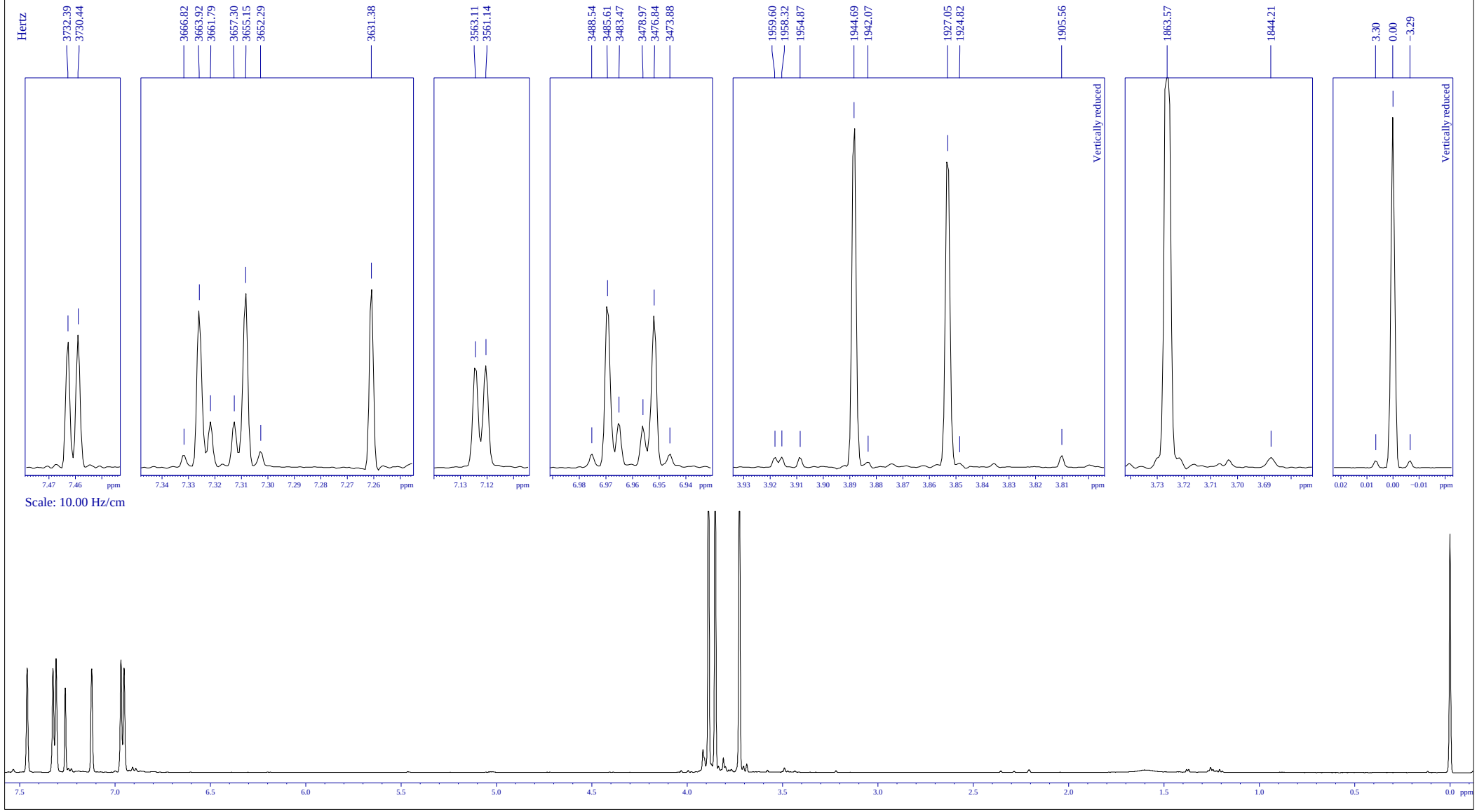
Found protons = 17 impurity* = 1.2 %





# 3m (NMR/22297287)





# 3m (NMR/22297287)



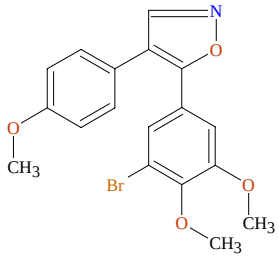
Peaks List

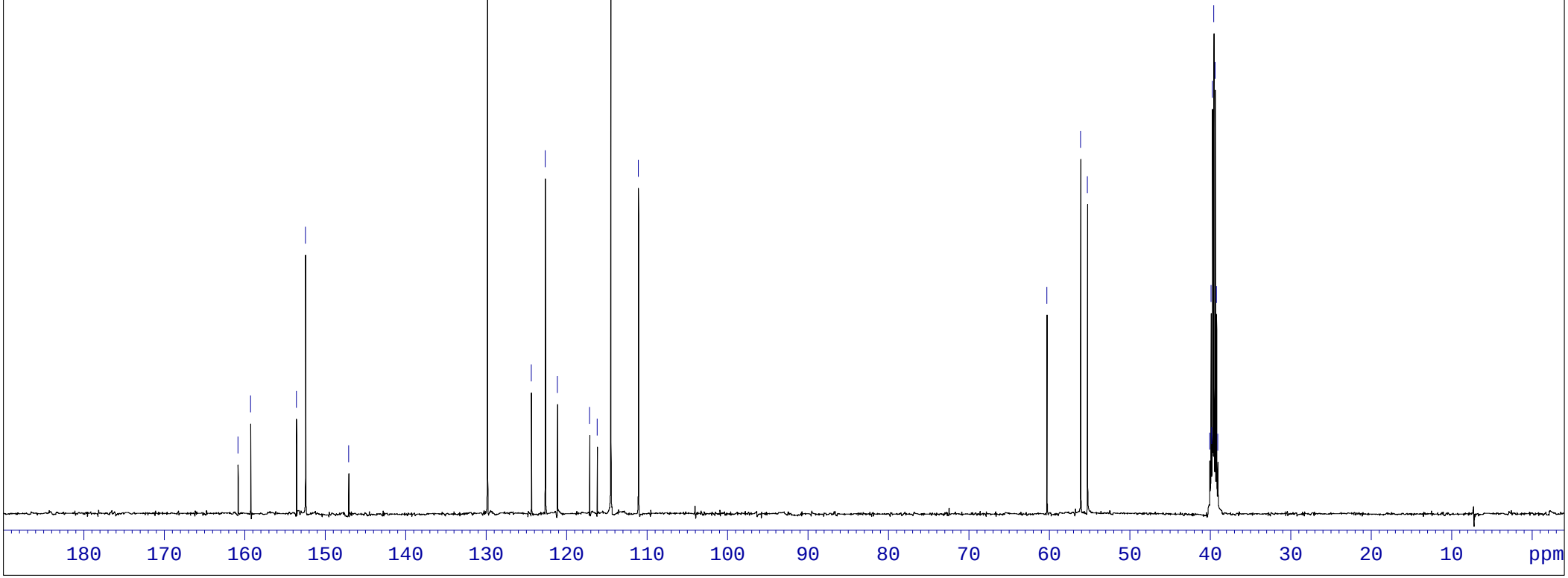
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 15865.2 | 4154.297 | 8.3064 | 3.84 |
| 2 | 17247.7 | 3732.387 | 7.4628 | 2.56 |
| 3 | 17254.1 | 3730.441 | 7.4589 | 2.66 |
| 4 | 17462.6 | 3666.825 | 7.3317 | 0.25 |
| 5 | 17472.1 | 3663.922 | 7.3259 | 3.13 |
| 6 | 17479.0 | 3661.792 | 7.3217 | 0.92 |
| 7 | 17493.8 | 3657.295 | 7.3127 | 0.92 |
| 8 | 17500.8 | 3655.152 | 7.3084 | 3.51 |
| 9 | 17510.2 | 3652.286 | 7.3027 | 0.32 |
| 10 | 17578.7 | 3631.380 | 7.2609 | 3.65 |
| 11 | 17802.4 | 3563.107 | 7.1244 | 2.06 |
| 12 | 17808.9 | 3561.136 | 7.1204 | 2.04 |
| 13 | 18046.8 | 3488.539 | 6.9753 | 0.28 |
| 14 | 18056.4 | 3485.607 | 6.9694 | 3.31 |
| 15 | 18063.4 | 3483.472 | 6.9651 | 0.91 |
| 16 | 18078.1 | 3478.965 | 6.9561 | 0.84 |
| 17 | 18085.1 | 3476.842 | 6.9519 | 3.03 |
| 18 | 18094.8 | 3473.883 | 6.9460 | 0.27 |
| 19 | 23056.8 | 1959.595 | 3.9182 | 0.47 |
| 20 | 23061.0 | 1958.317 | 3.9156 | 0.48 |
| 21 | 23072.3 | 1954.874 | 3.9087 | 0.47 |
| 22 | 23105.6 | 1944.690 | 3.8884 | 16.00 |
| 23 | 23114.2 | 1942.065 | 3.8831 | 0.24 |
| 24 | 23163.4 | 1927.053 | 3.8531 | 14.62 |
| 25 | 23170.7 | 1924.823 | 3.8486 | 0.22 |
| 26 | 23233.9 | 1905.558 | 3.8101 | 0.55 |
| 27 | 23371.5 | 1863.571 | 3.7262 | 12.94 |
| 28 | 23434.9 | 1844.209 | 3.6875 | 0.21 |
| 29 | 29467.2 | 3.299 | 0.0066 | 0.20 |
| 30 | 29478.0 | 0.002 | 0.0000 | 10.38 |
| 31 | 29488.8 | −3.294 | −0.0066 | 0.20 |

# 3m (NMR/22297287)



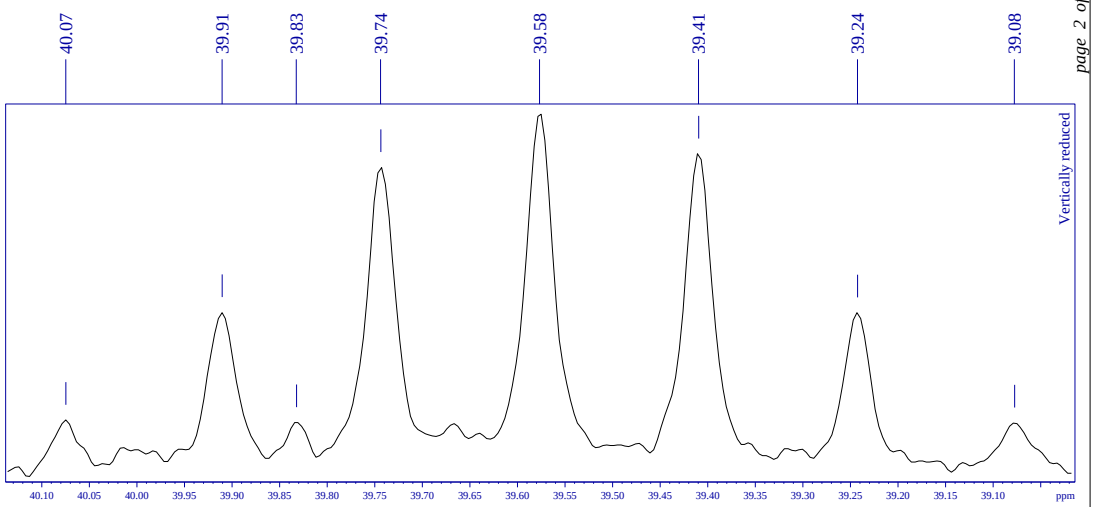
160.85
159.28
153.59
152.46
147.09
129.85
124.39
122.66
121.15
117.15
116.21
114.52
111.09
60.32
56.13
55.28
40.07
39.91
39.83
39.74
39.58
39.41
39.24
39.08



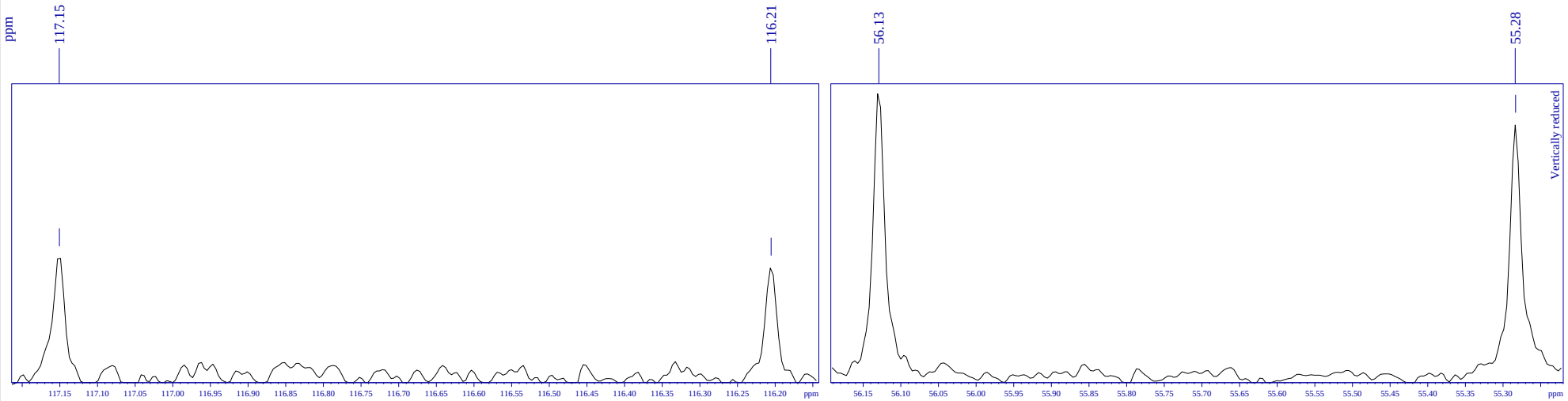



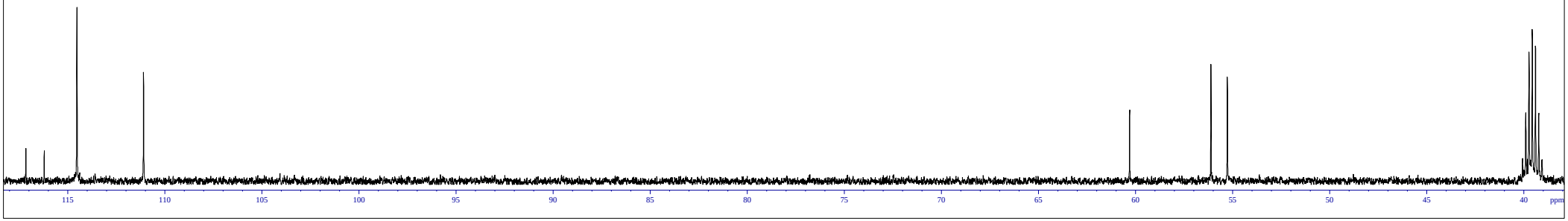
# 3m (NMR/22297287)






Scale: 10.00 Hz/cm



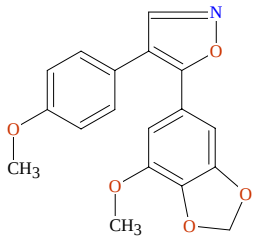
# 3m (NMR/22297287)



Peaks List

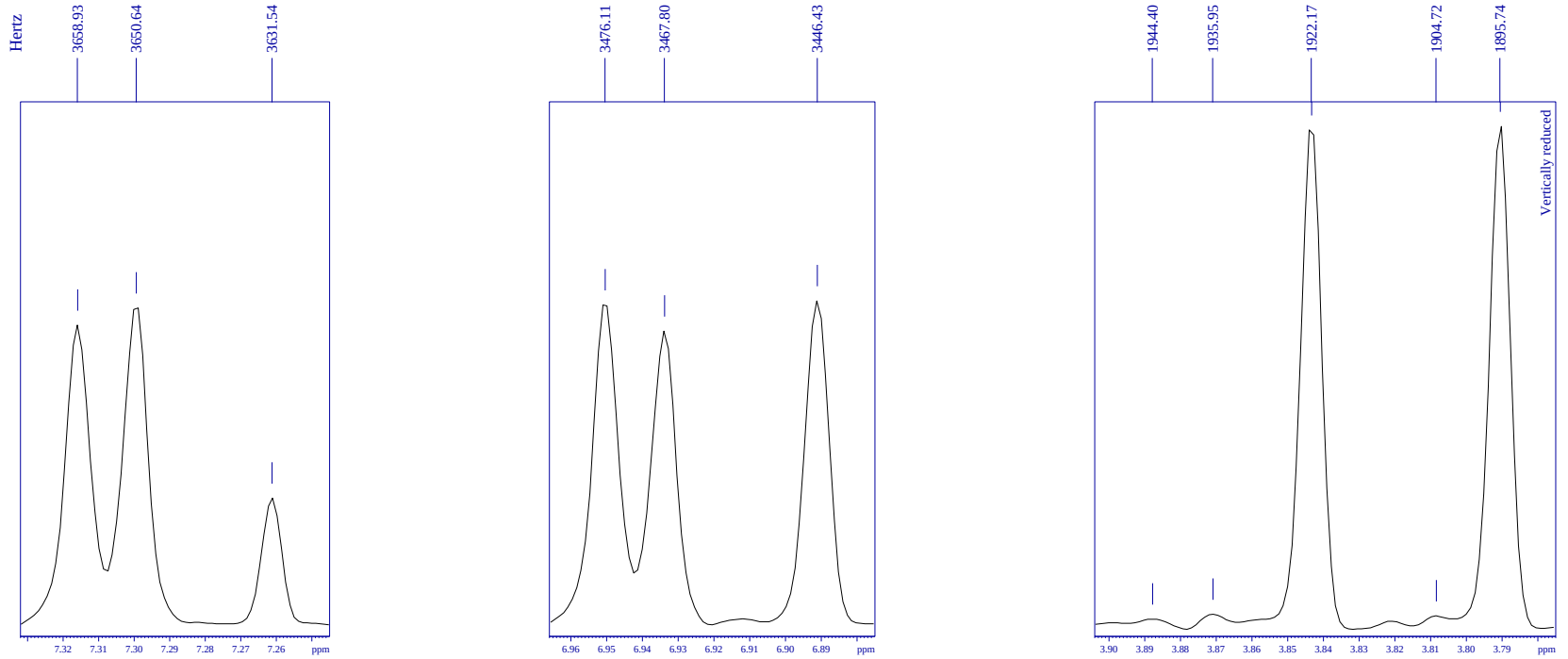
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 18130.5 | 20228.197 | 160.8504 | 1.47 |
| 2 | 18540.9 | 20031.277 | 159.2845 | 2.28 |
| 3 | 20034.4 | 19314.619 | 153.5858 | 2.29 |
| 4 | 20328.4 | 19173.535 | 152.4639 | 5.18 |
| 5 | 21735.8 | 18498.215 | 147.0939 | 1.28 |
| 6 | 26254.5 | 16329.983 | 129.8526 | 14.00 |
| 7 | 27685.0 | 15643.610 | 124.3947 | 2.84 |
| 8 | 28138.8 | 15425.860 | 122.6632 | 6.59 |
| 9 | 28534.5 | 15235.949 | 121.1531 | 2.56 |
| 10 | 29583.5 | 14732.610 | 117.1506 | 1.99 |
| 11 | 29831.2 | 14613.740 | 116.2054 | 1.79 |
| 12 | 30272.6 | 14401.971 | 114.5215 | 13.92 |
| 13 | 31171.9 | 13970.449 | 111.0901 | 6.41 |
| 14 | 44478.8 | 7585.320 | 60.3169 | 4.21 |
| 15 | 45576.3 | 7058.681 | 56.1292 | 6.97 |
| 16 | 45798.0 | 6952.312 | 55.2833 | 6.11 |
| 17 | 49784.0 | 5039.710 | 40.0747 | 1.35 |
| 18 | 49827.0 | 5019.046 | 39.9104 | 4.01 |
| 19 | 49847.5 | 5009.217 | 39.8322 | 1.30 |
| 20 | 49870.7 | 4998.066 | 39.7436 | 7.61 |
| 21 | 49914.6 | 4977.030 | 39.5763 | 8.97 |
| 22 | 49958.3 | 4956.054 | 39.4095 | 7.96 |
| 23 | 50002.1 | 4935.058 | 39.2425 | 4.00 |
| 24 | 50045.3 | 4914.284 | 39.0774 | 1.29 |

# 3n (NMR/22257483)

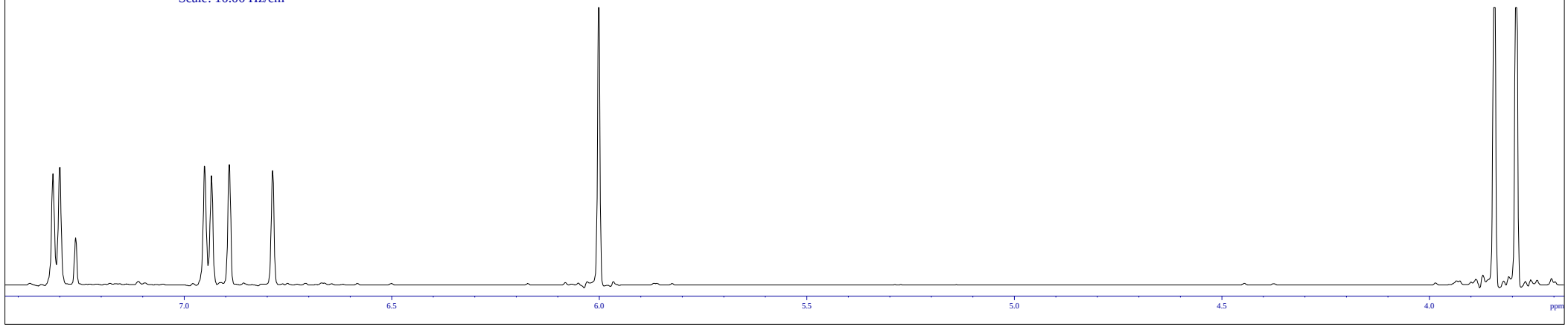


# 3n (NMR/22257483)






Scale: 10.00 Hz/cm



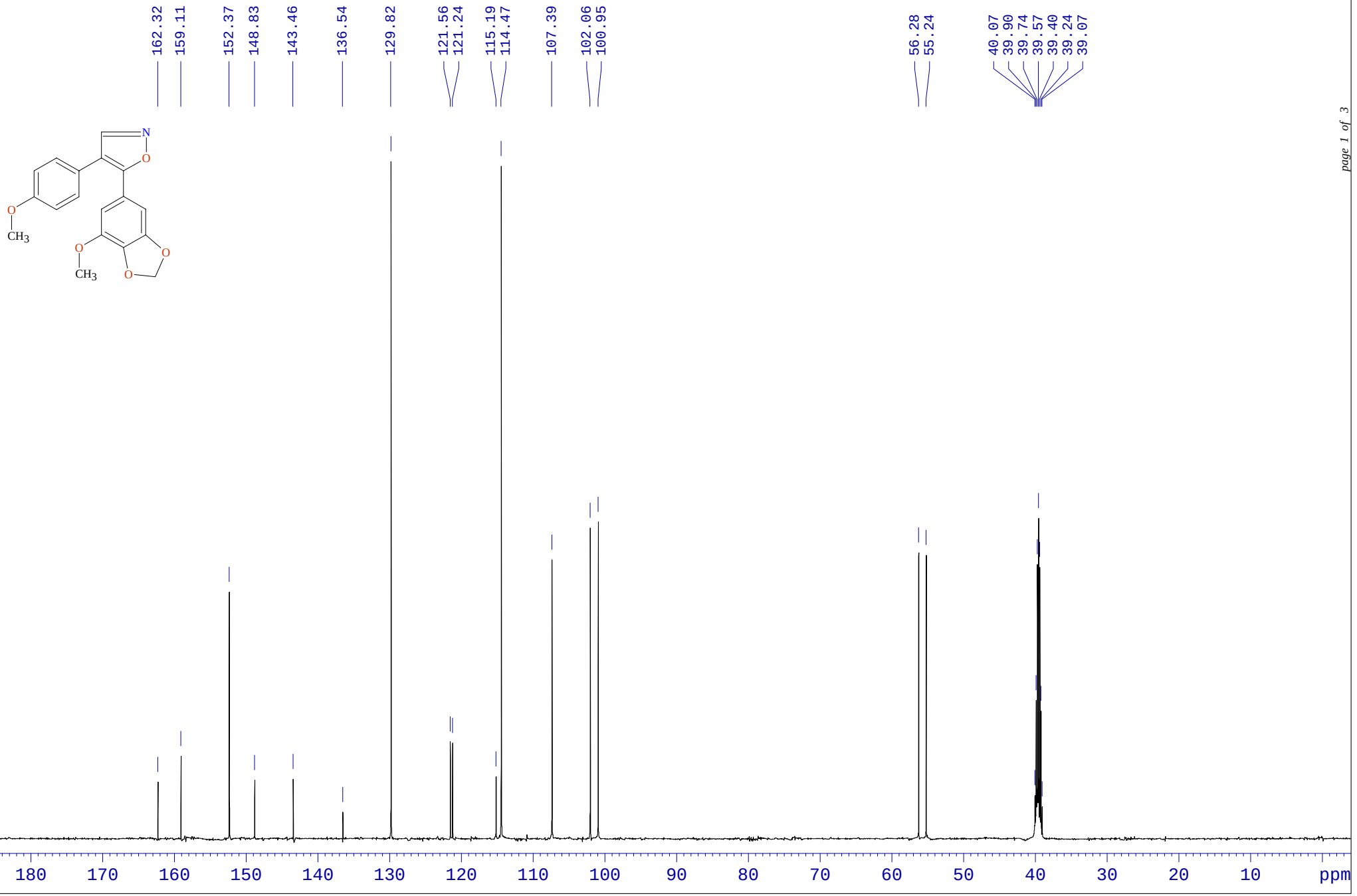
# 3n (NMR/22257483)



Peaks List

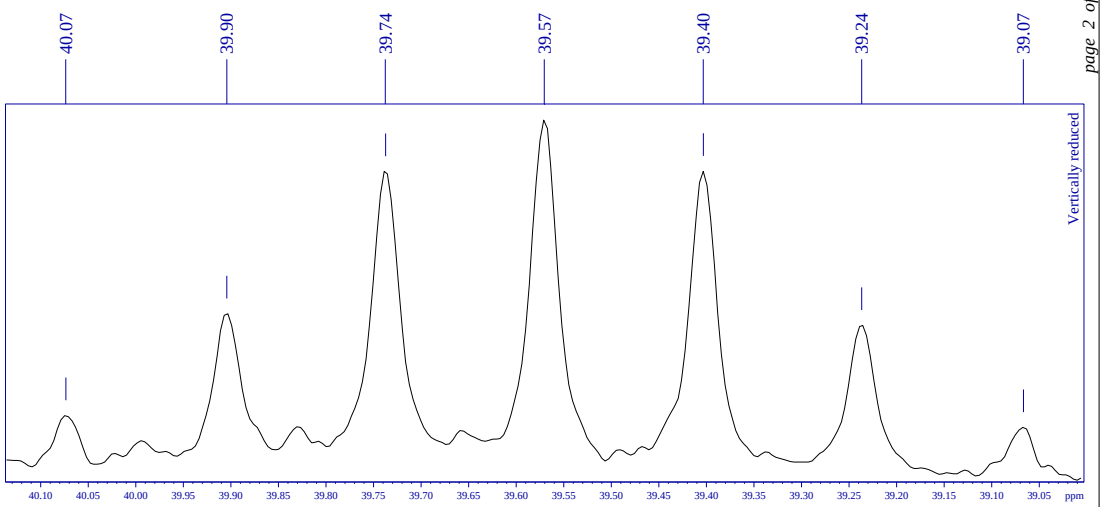
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 7959.6 | 4138.275 | 8.2744 | 5.17 |
| 2 | 8744.9 | 3658.926 | 7.3159 | 4.17 |
| 3 | 8758.5 | 3650.635 | 7.2994 | 4.48 |
| 4 | 8789.8 | 3631.541 | 7.2612 | 1.78 |
| 5 | 9044.5 | 3476.107 | 6.9504 | 4.52 |
| 6 | 9058.1 | 3467.802 | 6.9338 | 4.09 |
| 7 | 9093.1 | 3446.434 | 6.8911 | 4.51 |
| 8 | 9178.7 | 3394.198 | 6.7866 | 4.31 |
| 9 | 9822.5 | 3001.229 | 6.0009 | 10.81 |
| 10 | 11554.0 | 1944.396 | 3.8878 | 0.22 |
| 11 | 11567.9 | 1935.947 | 3.8709 | 0.37 |
| 12 | 11590.4 | 1922.171 | 3.8433 | 16.00 |
| 13 | 11619.0 | 1904.716 | 3.8084 | 0.32 |
| 14 | 11633.8 | 1895.737 | 3.7905 | 15.91 |
| 15 | 11703.2 | 1853.352 | 3.7057 | 0.25 |
| 16 | 13440.0 | 793.304 | 1.5862 | 0.89 |
| 17 | 14739.7 | −0.002 | −0.0000 | 0.48 |

# 3n (NMR/22257483)

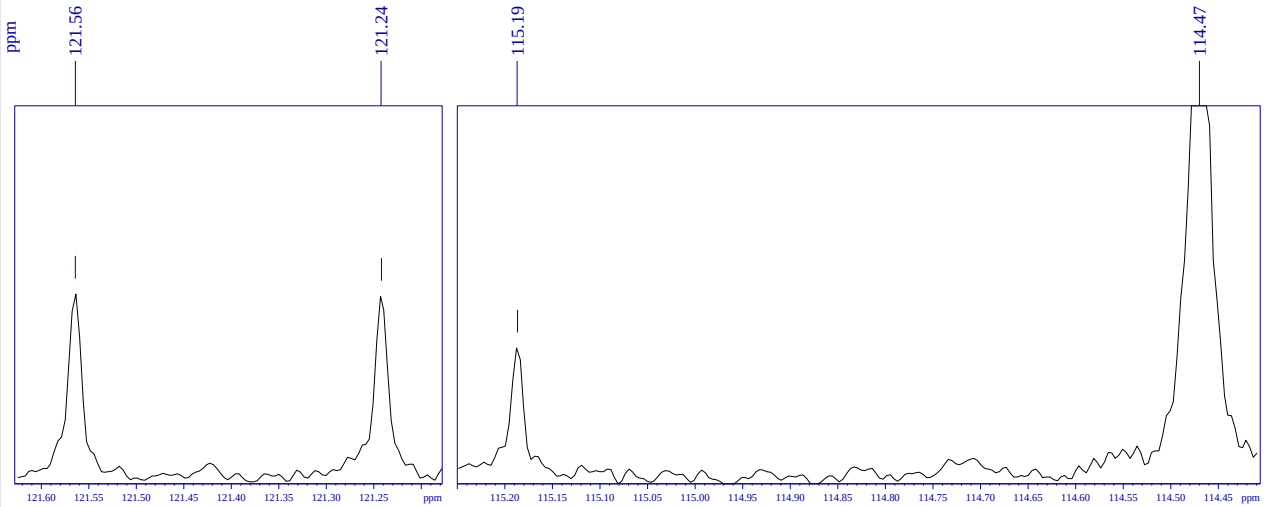


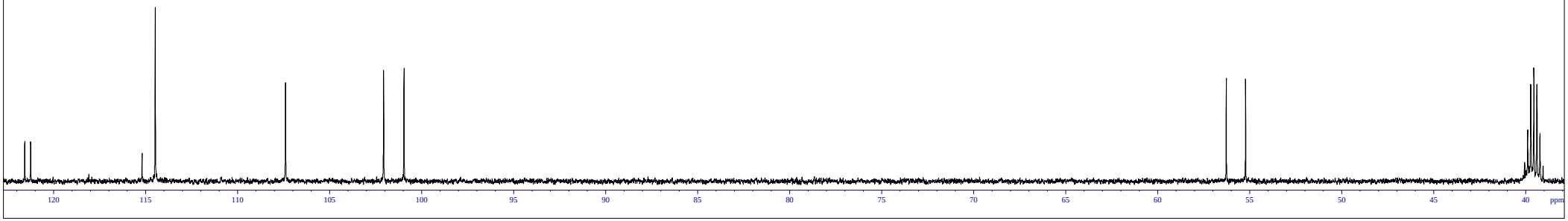
# 3n (NMR/22257483)






Scale: 10.00 Hz/cm



# 3n (NMR/22257483)



Peaks List

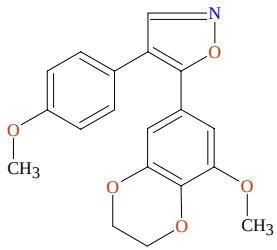
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17744.7 | 20413.295 | 162.3222 | 1.58 |
| 2 | 18586.3 | 20009.496 | 159.1113 | 2.14 |
| 3 | 20352.9 | 19161.771 | 152.3704 | 5.41 |
| 4 | 21279.6 | 18717.129 | 148.8347 | 1.61 |
| 5 | 22687.4 | 18041.613 | 143.4631 | 1.64 |
| 6 | 24501.7 | 17171.062 | 136.5407 | 0.93 |
| 7 | 26262.2 | 16326.309 | 129.8234 | 14.00 |
| 8 | 28426.8 | 15287.653 | 121.5642 | 2.42 |
| 9 | 28511.3 | 15247.116 | 121.2419 | 2.40 |
| 10 | 30098.2 | 14485.634 | 115.1867 | 1.71 |
| 11 | 30286.2 | 14395.435 | 114.4695 | 13.93 |
| 12 | 32141.5 | 13505.184 | 107.3904 | 6.07 |
| 13 | 33538.7 | 12834.757 | 102.0593 | 6.74 |
| 14 | 33829.1 | 12695.415 | 100.9513 | 6.80 |
| 15 | 45535.7 | 7078.195 | 56.2843 | 6.29 |
| 16 | 45810.1 | 6946.491 | 55.2370 | 6.15 |
| 17 | 49784.3 | 5039.562 | 40.0735 | 1.14 |
| 18 | 49828.6 | 5018.279 | 39.9043 | 3.11 |
| 19 | 49872.4 | 4997.273 | 39.7373 | 5.87 |
| 20 | 49916.2 | 4976.254 | 39.5701 | 6.83 |
| 21 | 49960.0 | 4955.259 | 39.4032 | 5.84 |
| 22 | 50003.6 | 4934.317 | 39.2367 | 2.89 |
| 23 | 50048.2 | 4912.935 | 39.0666 | 0.91 |

*The Best Applied NMR!*

# 3o (NMR/22297286)

Found protons = 15 impurity* = 1.4 %

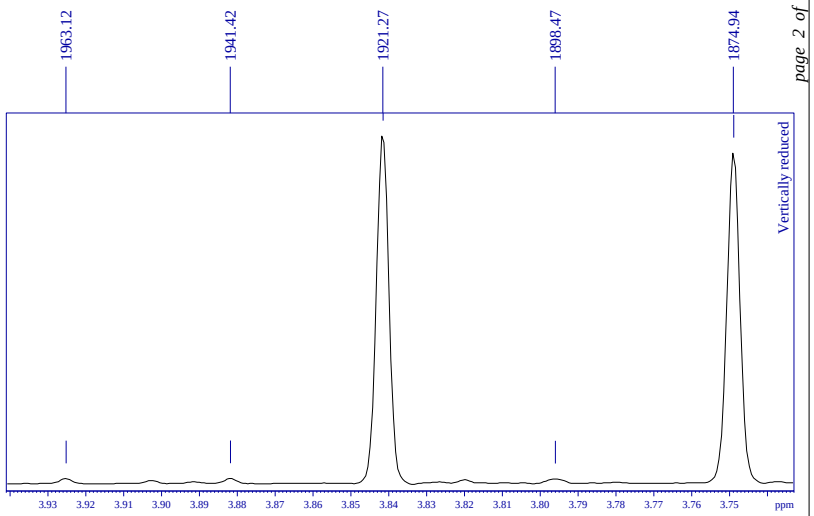




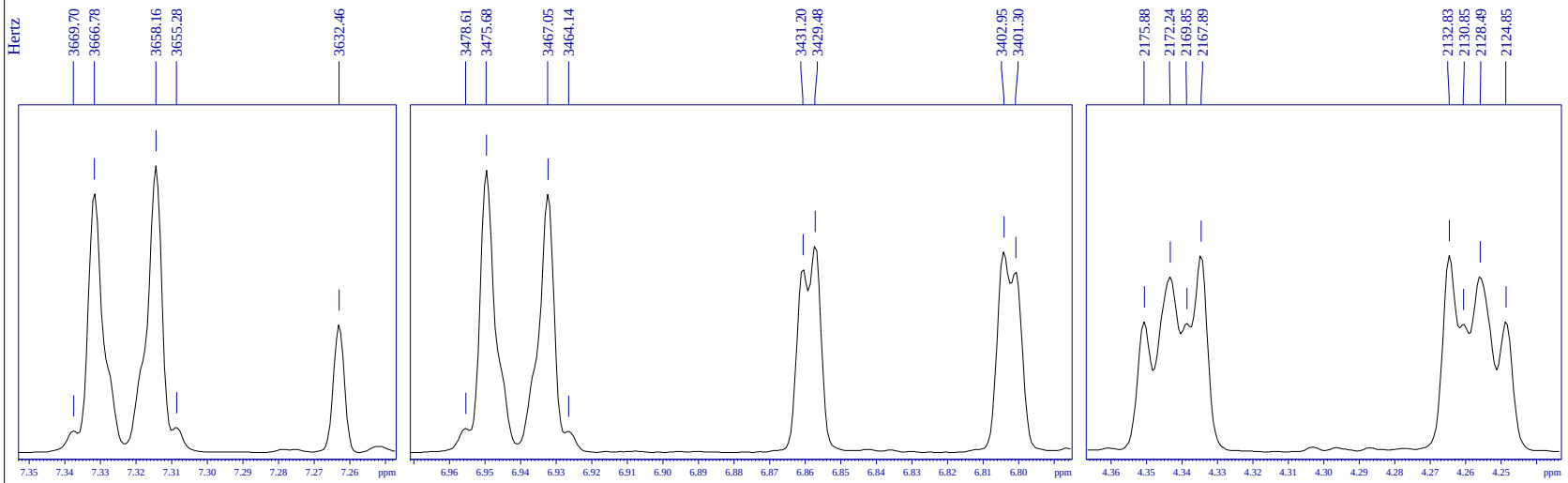
*The Best Applied NMR!*

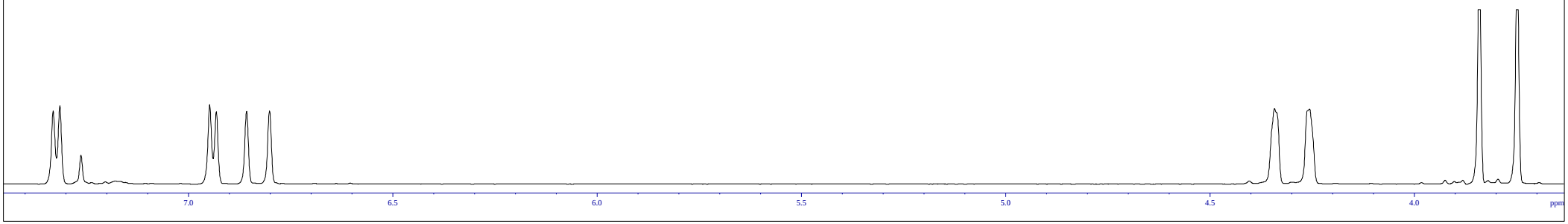
# 3o (NMR/22297286)






Scale: 10.00 Hz/cm



# 3o (NMR/22297286)

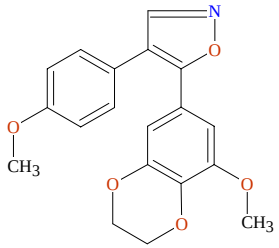


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 15923.8 | 4137.932 | 8.2737 | 5.43 |
| 2 | 17458.1 | 3669.695 | 7.3375 | 0.31 |
| 3 | 17467.7 | 3666.783 | 7.3317 | 3.68 |
| 4 | 17495.9 | 3658.159 | 7.3144 | 4.06 |
| 5 | 17505.4 | 3655.275 | 7.3086 | 0.35 |
| 6 | 17580.2 | 3632.457 | 7.2630 | 1.81 |
| 7 | 18084.3 | 3478.612 | 6.9554 | 0.34 |
| 8 | 18093.9 | 3475.680 | 6.9496 | 4.00 |
| 9 | 18122.2 | 3467.054 | 6.9323 | 3.66 |
| 10 | 18131.7 | 3464.142 | 6.9265 | 0.30 |
| 11 | 18239.6 | 3431.202 | 6.8606 | 2.60 |
| 12 | 18245.3 | 3429.478 | 6.8572 | 2.93 |
| 13 | 18332.2 | 3402.948 | 6.8041 | 2.85 |
| 14 | 18337.6 | 3401.302 | 6.8008 | 2.56 |
| 15 | 22353.1 | 2175.875 | 4.3506 | 1.85 |
| 16 | 22365.0 | 2172.235 | 4.3433 | 2.48 |
| 17 | 22372.8 | 2169.849 | 4.3386 | 1.83 |
| 18 | 22379.3 | 2167.886 | 4.3346 | 2.79 |
| 19 | 22494.1 | 2132.833 | 4.2646 | 2.79 |
| 20 | 22500.6 | 2130.847 | 4.2606 | 1.82 |
| 21 | 22508.4 | 2128.491 | 4.2559 | 2.50 |
| 22 | 22520.3 | 2124.851 | 4.2486 | 1.86 |
| 23 | 23050.2 | 1963.125 | 3.9252 | 0.23 |
| 24 | 23121.4 | 1941.420 | 3.8818 | 0.24 |
| 25 | 23187.4 | 1921.272 | 3.8415 | 16.00 |
| 26 | 23262.1 | 1898.475 | 3.7960 | 0.22 |
| 27 | 23339.2 | 1874.943 | 3.7489 | 15.09 |
| 28 | 23767.5 | 1744.240 | 3.4876 | 0.21 |
| 29 | 25626.3 | 1176.966 | 2.3533 | 0.35 |
| 30 | 29483.0 | 0.002 | 0.0000 | 5.21 |

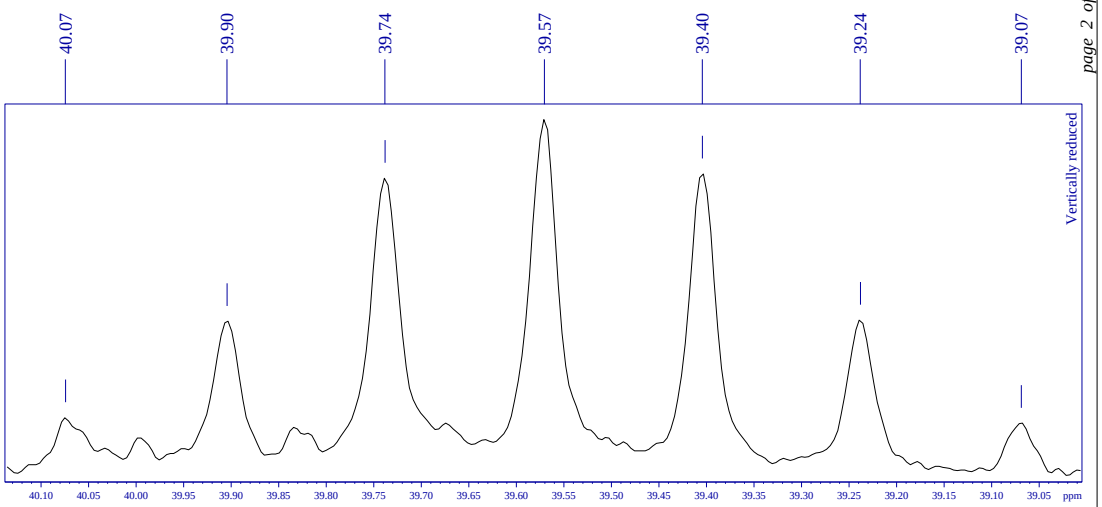
# 3o (NMR/22297286)



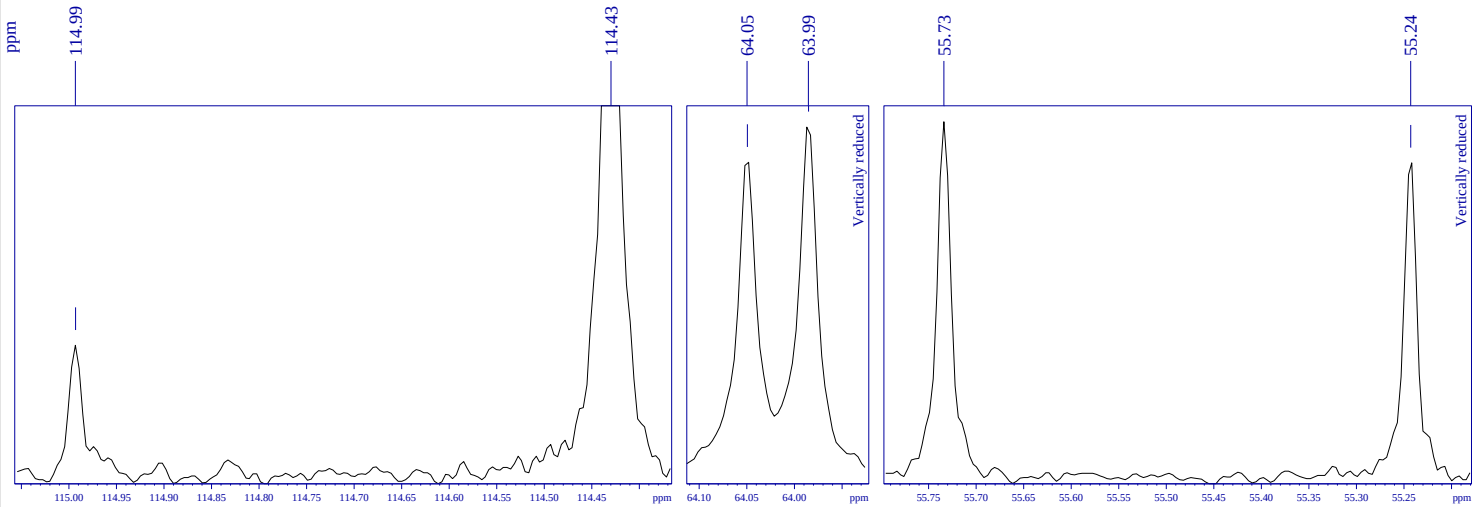


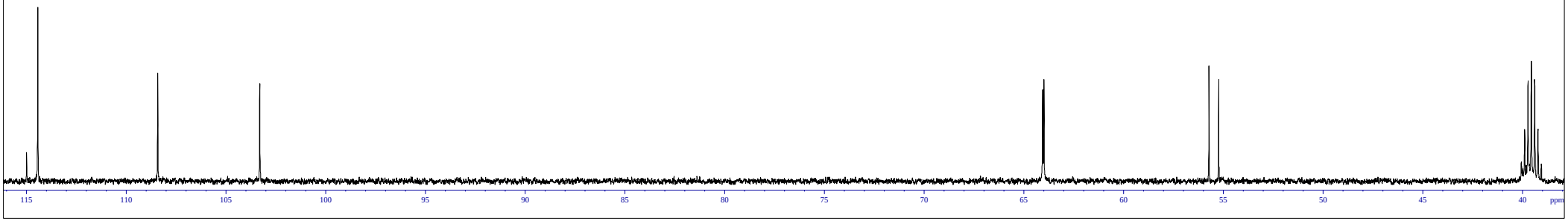
# 3o (NMR/22297286)






Scale: 10.00 Hz/cm



# 3o (NMR/22297286)



Peaks List

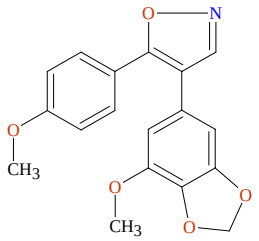
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17732.7 | 20419.055 | 162.3680 | 1.60 |
| 2 | 18590.5 | 20007.473 | 159.0952 | 2.27 |
| 3 | 20341.1 | 19167.438 | 152.4154 | 5.03 |
| 4 | 21244.2 | 18734.094 | 148.9696 | 1.94 |
| 5 | 22567.0 | 18099.402 | 143.9227 | 2.10 |
| 6 | 24941.3 | 16960.113 | 134.8633 | 1.51 |
| 7 | 26242.9 | 16335.578 | 129.8971 | 13.96 |
| 8 | 28392.5 | 15304.096 | 121.6950 | 2.57 |
| 9 | 29097.8 | 14965.690 | 119.0040 | 2.58 |
| 10 | 30149.0 | 14461.276 | 114.9930 | 1.72 |
| 11 | 30296.7 | 14390.396 | 114.4294 | 14.00 |
| 12 | 31872.3 | 13634.354 | 108.4175 | 6.57 |
| 13 | 33213.3 | 12990.904 | 103.3009 | 5.90 |
| 14 | 43500.6 | 8054.712 | 64.0494 | 5.61 |
| 15 | 43517.4 | 8046.637 | 63.9852 | 6.21 |
| 16 | 45680.0 | 7008.932 | 55.7336 | 6.92 |
| 17 | 45808.6 | 6947.226 | 55.2429 | 6.27 |
| 18 | 49784.1 | 5039.651 | 40.0742 | 1.16 |
| 19 | 49828.6 | 5018.275 | 39.9043 | 3.13 |
| 20 | 49872.2 | 4997.373 | 39.7381 | 6.03 |
| 21 | 49916.2 | 4976.277 | 39.5703 | 7.22 |
| 22 | 49959.7 | 4955.394 | 39.4043 | 6.14 |
| 23 | 50003.2 | 4934.489 | 39.2380 | 3.15 |
| 24 | 50047.6 | 4913.210 | 39.0688 | 1.06 |

*The Best Applied NMR!*

# 3p (NMR/22257590)

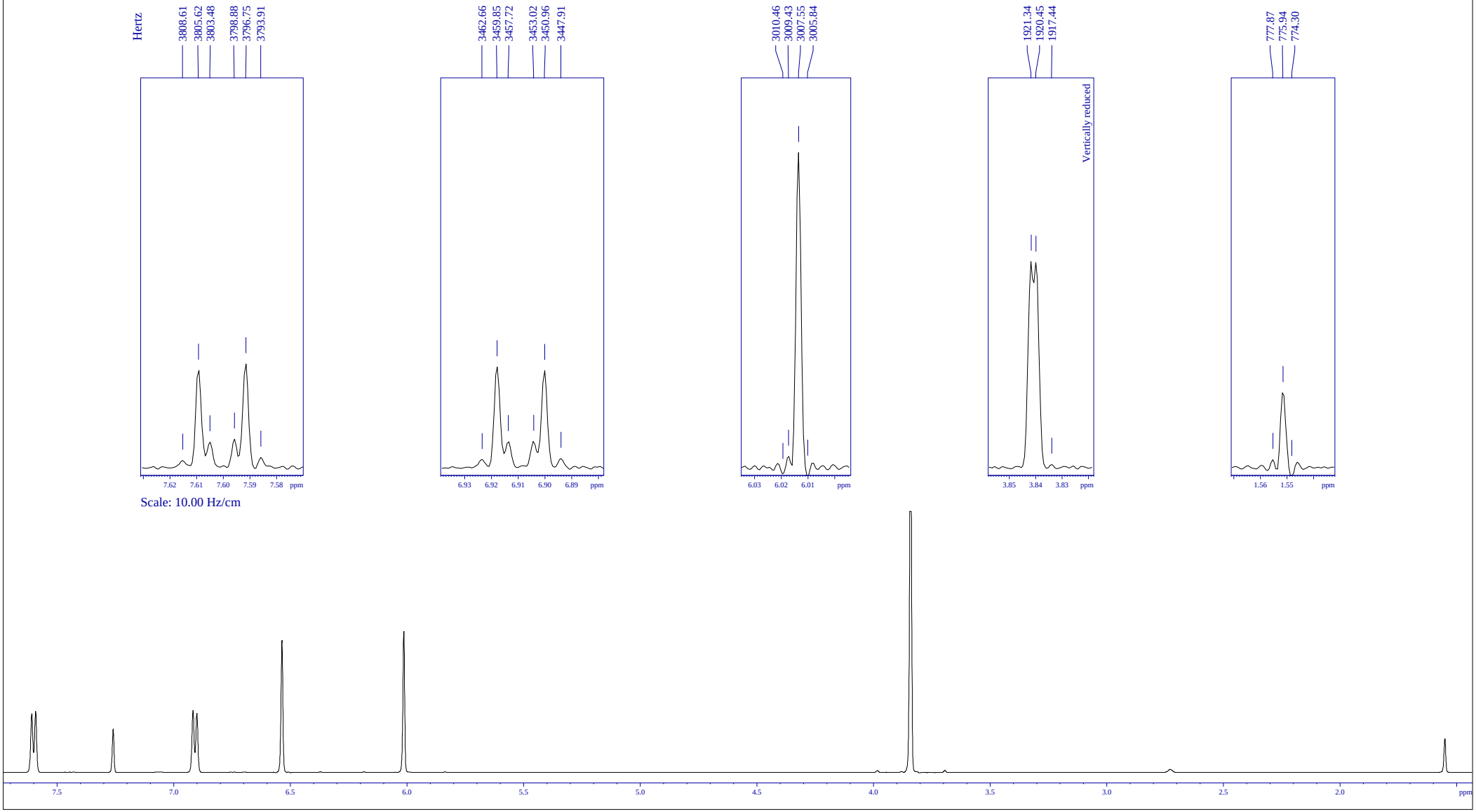
Found protons = 15 impurity* = 0.3 %





# 3p (NMR/22257590)





# 3p (NMR/22257590)

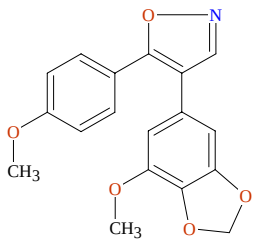


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 15937.4 | 4132.563 | 8.2630 | 5.44 |
| 2 | 16998.9 | 3808.608 | 7.6152 | 0.25 |
| 3 | 17008.7 | 3805.622 | 7.6093 | 3.33 |
| 4 | 17015.7 | 3803.480 | 7.6050 | 0.88 |
| 5 | 17030.8 | 3798.875 | 7.5958 | 0.97 |
| 6 | 17037.8 | 3796.747 | 7.5915 | 3.53 |
| 7 | 17047.1 | 3793.913 | 7.5859 | 0.35 |
| 8 | 17581.4 | 3630.849 | 7.2598 | 3.47 |
| 9 | 18132.5 | 3462.664 | 6.9235 | 0.27 |
| 10 | 18141.8 | 3459.850 | 6.9179 | 3.44 |
| 11 | 18148.7 | 3457.724 | 6.9137 | 0.89 |
| 12 | 18164.1 | 3453.018 | 6.9042 | 0.89 |
| 13 | 18170.9 | 3450.962 | 6.9001 | 3.29 |
| 14 | 18180.9 | 3447.906 | 6.8940 | 0.31 |
| 15 | 18767.6 | 3268.865 | 6.5360 | 8.85 |
| 16 | 19614.3 | 3010.460 | 6.0194 | −0.22 |
| 17 | 19617.7 | 3009.427 | 6.0173 | 0.39 |
| 18 | 19623.8 | 3007.551 | 6.0135 | 10.71 |
| 19 | 19629.4 | 3005.843 | 6.0101 | −0.33 |
| 20 | 23183.1 | 1921.341 | 3.8417 | 16.00 |
| 21 | 23186.1 | 1920.450 | 3.8399 | 15.89 |
| 22 | 23195.9 | 1917.436 | 3.8339 | 0.25 |
| 23 | 26930.1 | 777.868 | 1.5553 | 0.27 |
| 24 | 26936.4 | 775.936 | 1.5515 | 2.62 |
| 25 | 26941.7 | 774.305 | 1.5482 | −0.38 |
| 26 | 29479.0 | −0.003 | −0.0000 | 7.88 |

# 3p (NMR/22257590)

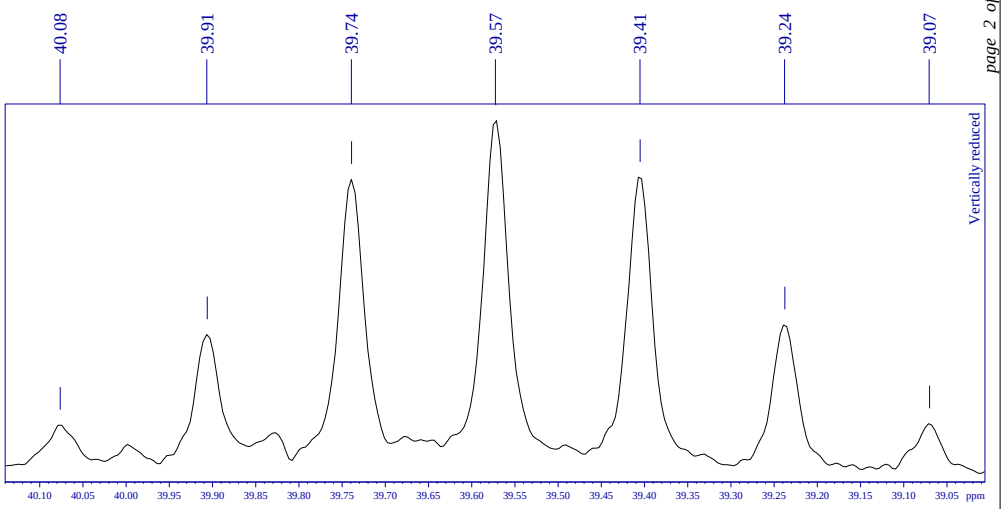




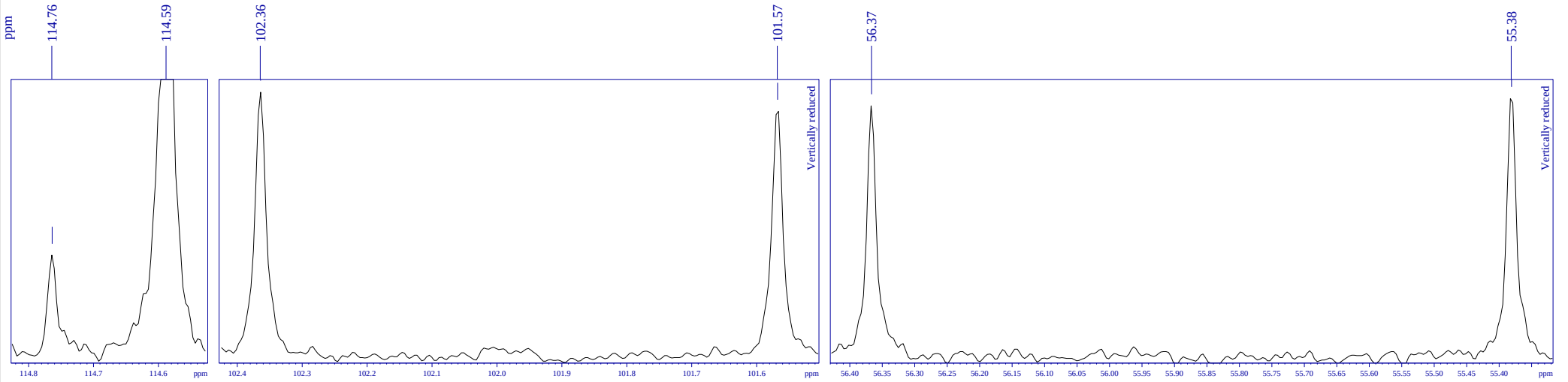

163.04
160.71
152.32
148.86
143.53
134.67
128.79
123.75
119.53
114.76
114.59
108.34
102.36
101.57
56.37
55.38
40.08
39.91
39.74
39.57
39.41
39.24
39.07

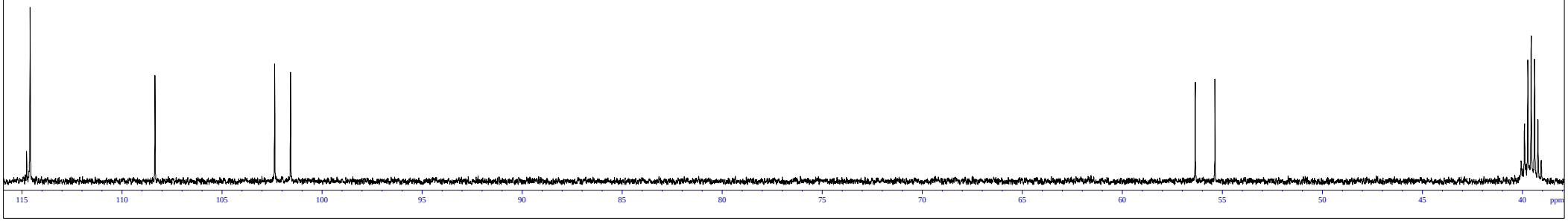
# 3p (NMR/22257590)






Scale: 11.00 Hz/cm



# 3p (NMR/22257590)



Peaks List

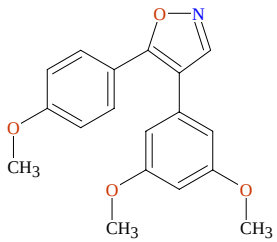
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17556.9 | 20503.418 | 163.0389 | 1.57 |
| 2 | 18167.2 | 20210.561 | 160.7101 | 2.33 |
| 3 | 20367.2 | 19154.951 | 152.3162 | 5.57 |
| 4 | 21274.0 | 18719.828 | 148.8561 | 1.72 |
| 5 | 22669.0 | 18050.459 | 143.5335 | 1.74 |
| 6 | 24991.5 | 16936.002 | 134.6715 | 1.12 |
| 7 | 26534.2 | 16195.780 | 128.7854 | 14.00 |
| 8 | 27854.9 | 15562.039 | 123.7461 | 2.58 |
| 9 | 28960.3 | 15031.642 | 119.5285 | 2.12 |
| 10 | 30209.1 | 14432.433 | 114.7637 | 1.79 |
| 11 | 30255.1 | 14410.352 | 114.5881 | 13.85 |
| 12 | 31891.3 | 13625.238 | 108.3450 | 6.43 |
| 13 | 33458.8 | 12873.086 | 102.3641 | 7.06 |
| 14 | 33667.6 | 12772.939 | 101.5677 | 6.68 |
| 15 | 45514.1 | 7088.532 | 56.3665 | 5.97 |
| 16 | 45772.4 | 6964.579 | 55.3809 | 6.30 |
| 17 | 49783.5 | 5039.911 | 40.0763 | 1.23 |
| 18 | 49828.2 | 5018.500 | 39.9061 | 3.45 |
| 19 | 49871.9 | 4997.500 | 39.7391 | 7.28 |
| 20 | 49915.6 | 4976.521 | 39.5722 | 8.77 |
| 21 | 49959.5 | 4955.499 | 39.4051 | 7.39 |
| 22 | 50003.3 | 4934.441 | 39.2376 | 3.71 |
| 23 | 50047.2 | 4913.375 | 39.0701 | 1.26 |

*The Best Applied NMR!*

# 3q (NMR/25277859)

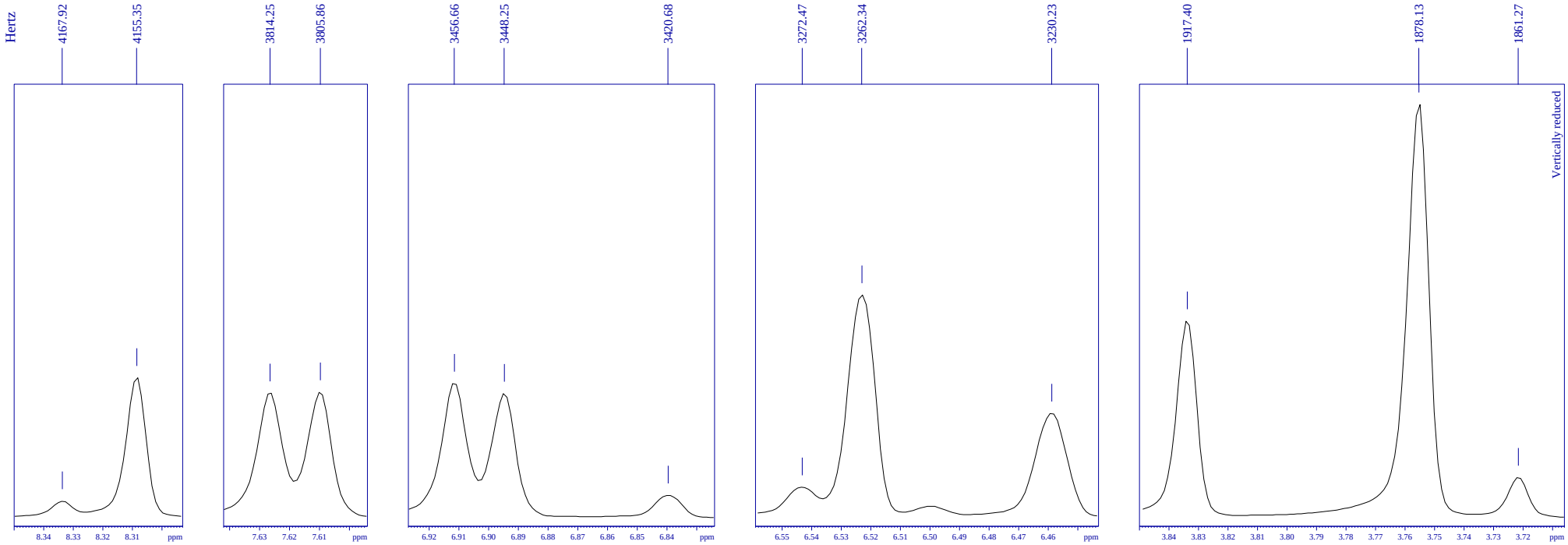
Found protons = 18 impurity* < 0.1 %



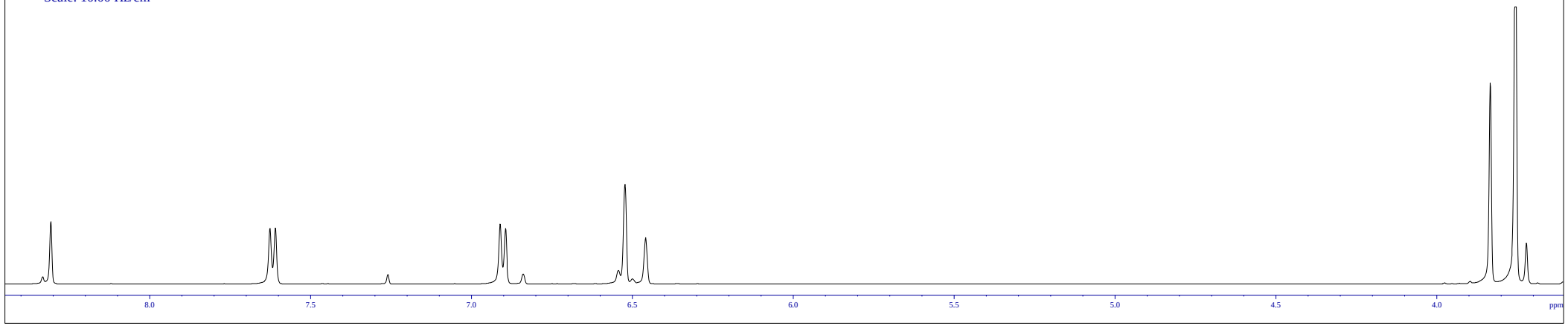


# 3q (NMR/25277859)






Scale: 10.00 Hz/cm



# 3q (NMR/25277859)

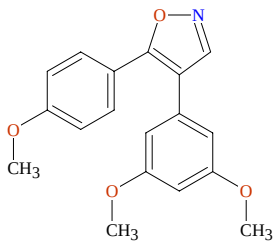


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 7910.1 | 4167.919 | 8.3337 | 0.28 |
| 2 | 7930.7 | 4155.354 | 8.3085 | 2.37 |
| 3 | 8489.6 | 3814.250 | 7.6265 | 2.12 |
| 4 | 8503.3 | 3805.856 | 7.6097 | 2.12 |
| 5 | 8789.6 | 3631.106 | 7.2603 | 0.36 |
| 6 | 9075.4 | 3456.655 | 6.9115 | 2.28 |
| 7 | 9089.2 | 3448.248 | 6.8947 | 2.09 |
| 8 | 9134.4 | 3420.684 | 6.8396 | 0.38 |
| 9 | 9377.2 | 3272.473 | 6.5432 | 0.51 |
| 10 | 9393.8 | 3262.342 | 6.5230 | 3.75 |
| 11 | 9446.4 | 3230.226 | 6.4588 | 1.76 |
| 12 | 11597.3 | 1917.404 | 3.8338 | 7.63 |
| 13 | 11661.7 | 1878.126 | 3.7553 | 16.00 |
| 14 | 11689.3 | 1861.266 | 3.7216 | 1.55 |
| 15 | 14738.8 | −0.001 | −0.0000 | 0.73 |

# 3q (NMR/25277859)





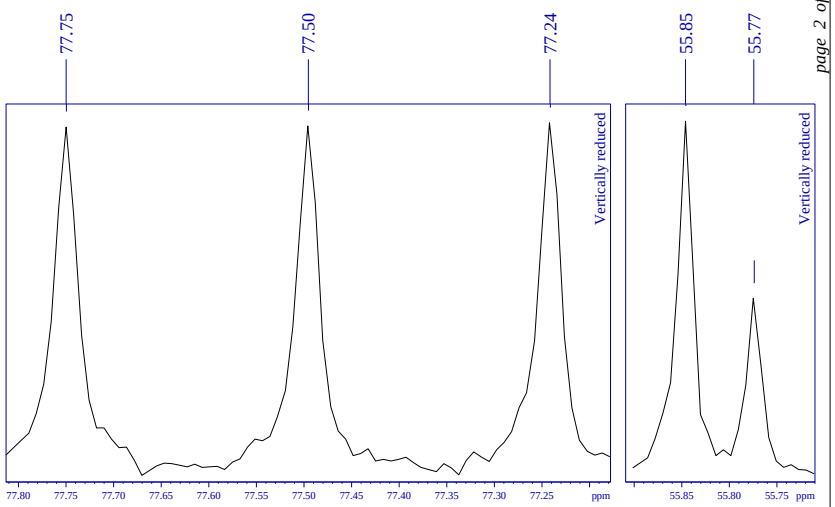

164.63
161.60
161.37
152.21
132.66
129.37
120.56
115.36
114.59
107.33
107.14
100.44
77.75
77.50
77.24
55.85
55.77

170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

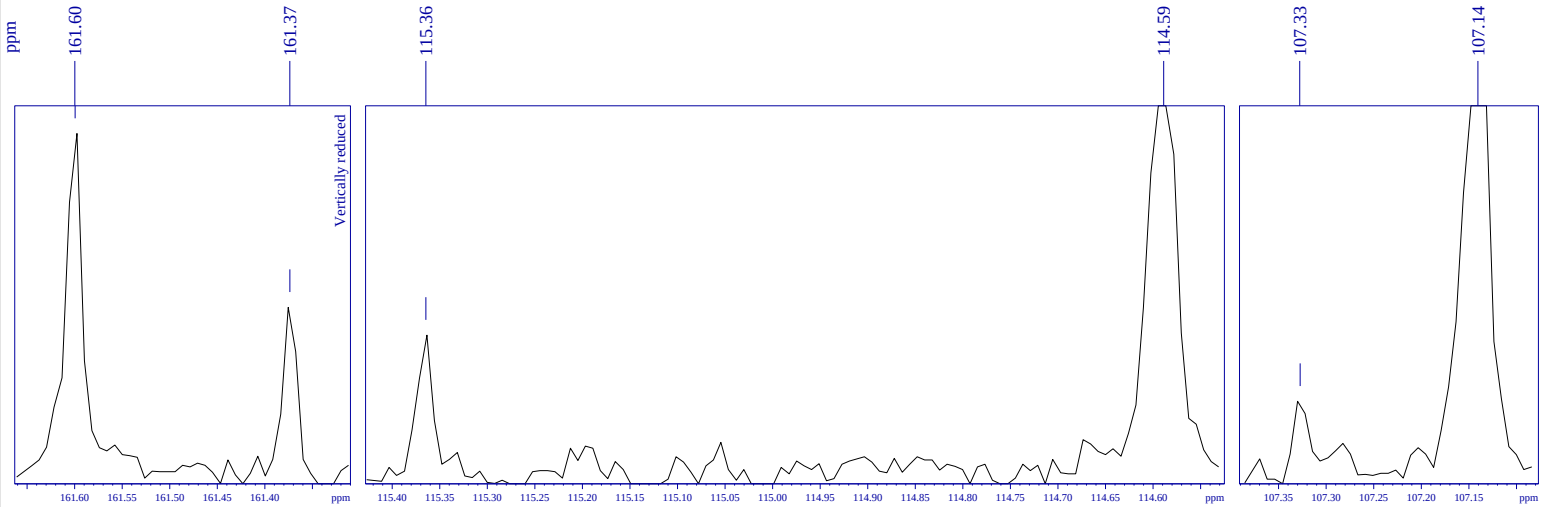
*The Best Applied NMR!*

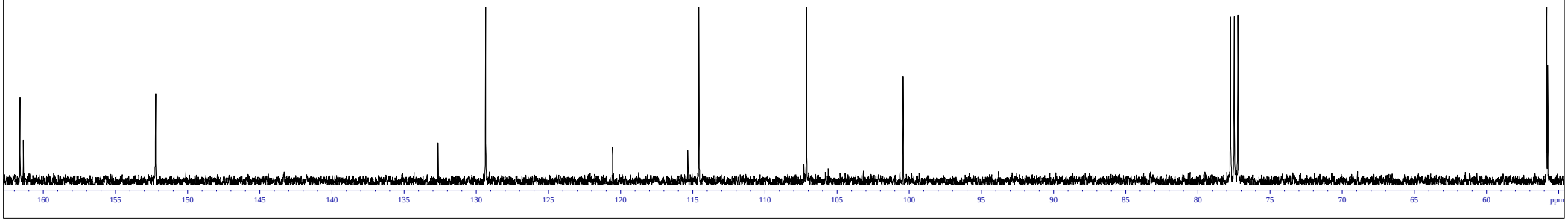
# 3q (NMR/25277859)






Scale: 10.00 Hz/cm



# 3q (NMR/25277859)

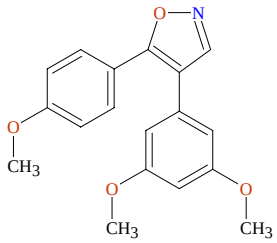


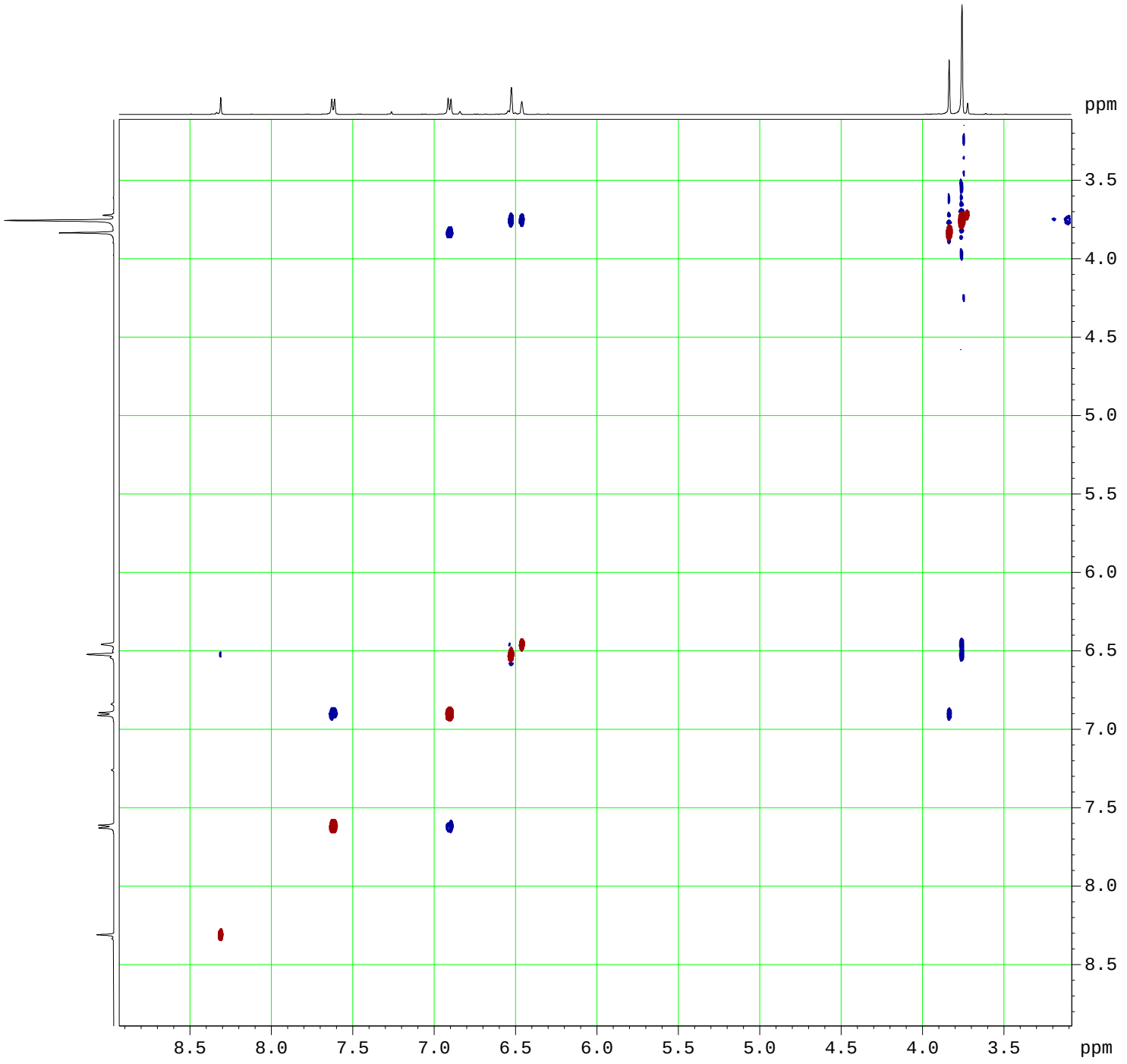
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 9556.9 | 20703.160 | 164.6273 | 1.68 |
| 2 | 9938.7 | 20322.387 | 161.5995 | 5.21 |
| 3 | 9967.2 | 20293.988 | 161.3737 | 2.54 |
| 4 | 11122.8 | 19141.525 | 152.2095 | 5.35 |
| 5 | 13587.3 | 16683.645 | 132.6649 | 2.39 |
| 6 | 14003.1 | 16268.946 | 129.3674 | 13.21 |
| 7 | 15113.2 | 15161.822 | 120.5637 | 2.14 |
| 8 | 15768.8 | 14507.988 | 115.3646 | 1.89 |
| 9 | 15866.7 | 14410.417 | 114.5887 | 12.99 |
| 10 | 16782.3 | 13497.240 | 107.3273 | 1.03 |
| 11 | 16805.9 | 13473.714 | 107.1402 | 13.11 |
| 12 | 17651.1 | 12630.773 | 100.4373 | 6.36 |
| 13 | 20512.0 | 9777.616 | 77.7496 | 9.91 |
| 14 | 20544.1 | 9745.631 | 77.4953 | 9.95 |
| 15 | 20576.1 | 9713.673 | 77.2412 | 10.05 |
| 16 | 23274.0 | 7023.026 | 55.8457 | 14.00 |
| 17 | 23283.1 | 7013.990 | 55.7738 | 7.00 |

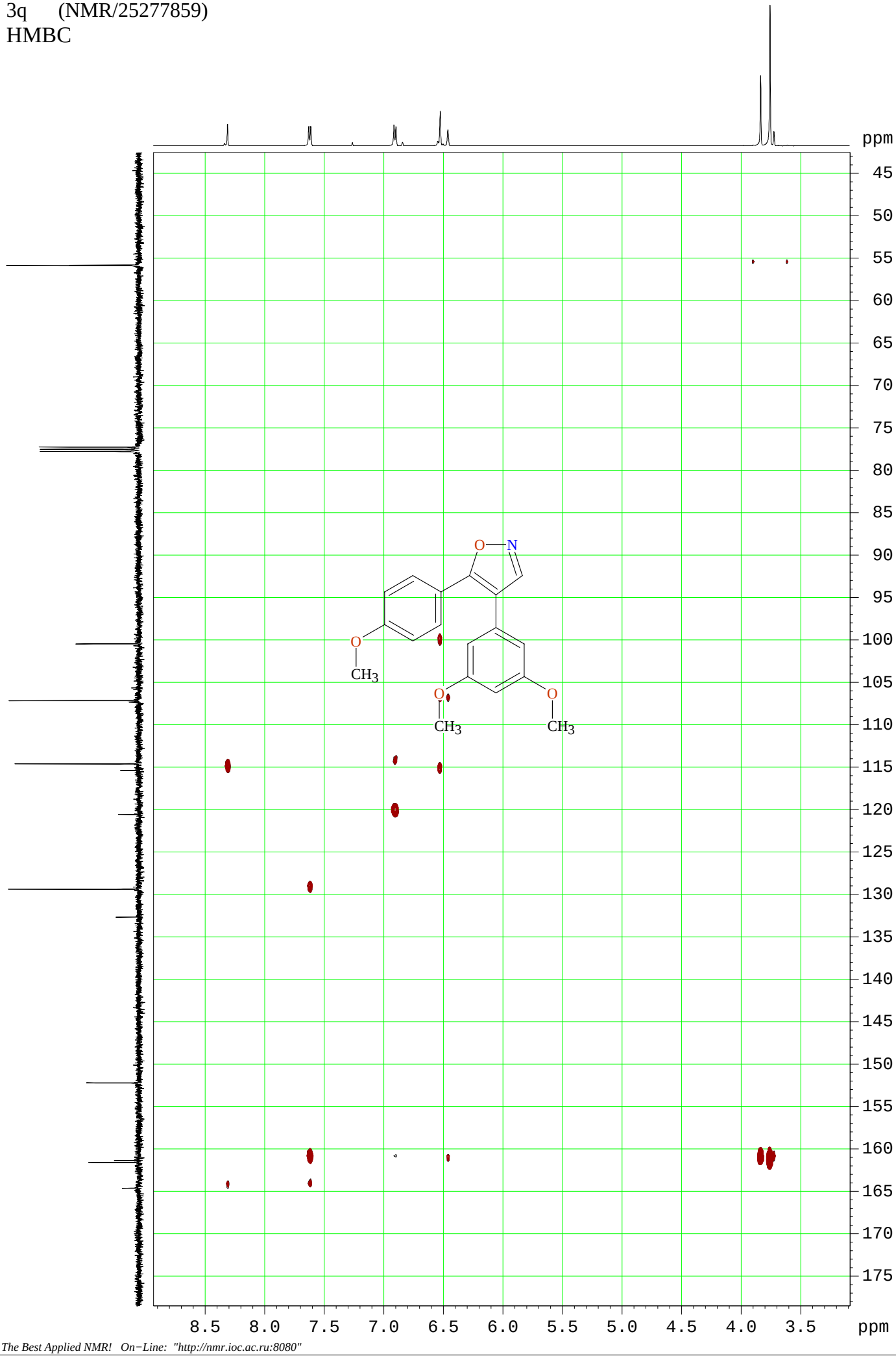
# 3q (NMR/25277859)

## NOESY



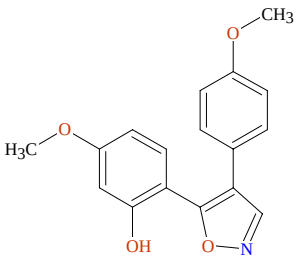
3q (NMR/25277859)
HMBC



*The Best Applied NMR!*

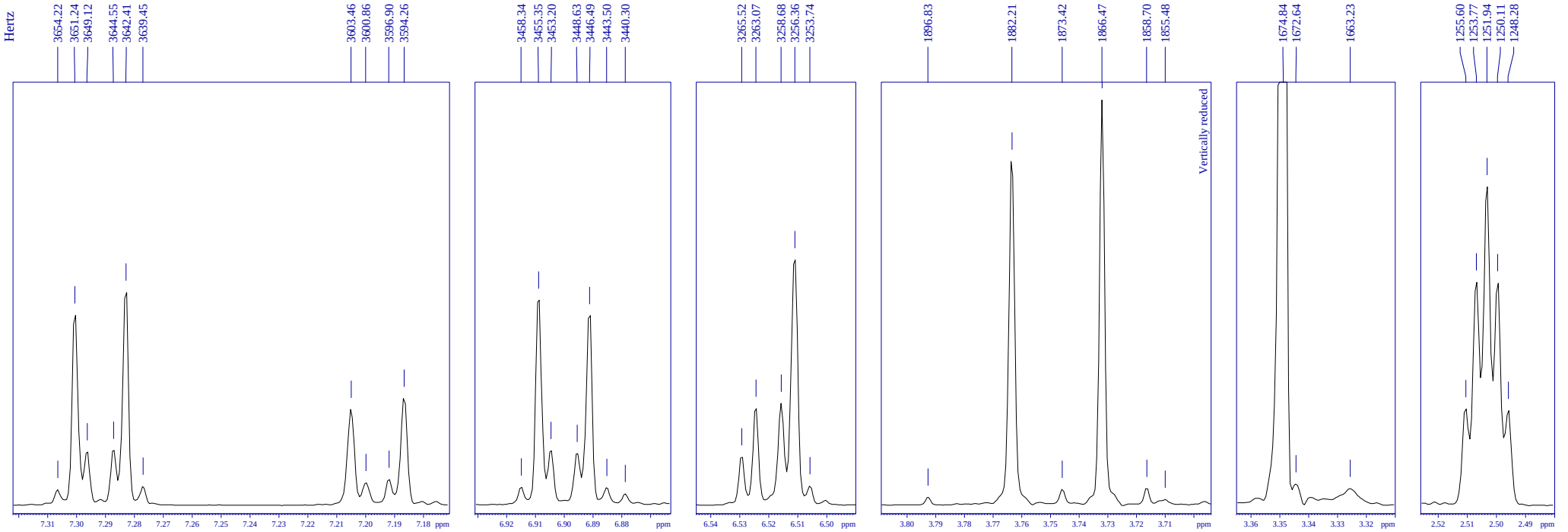
# 3r (NMR/18251561)

Found protons = 15 impurity* = 2.4 %

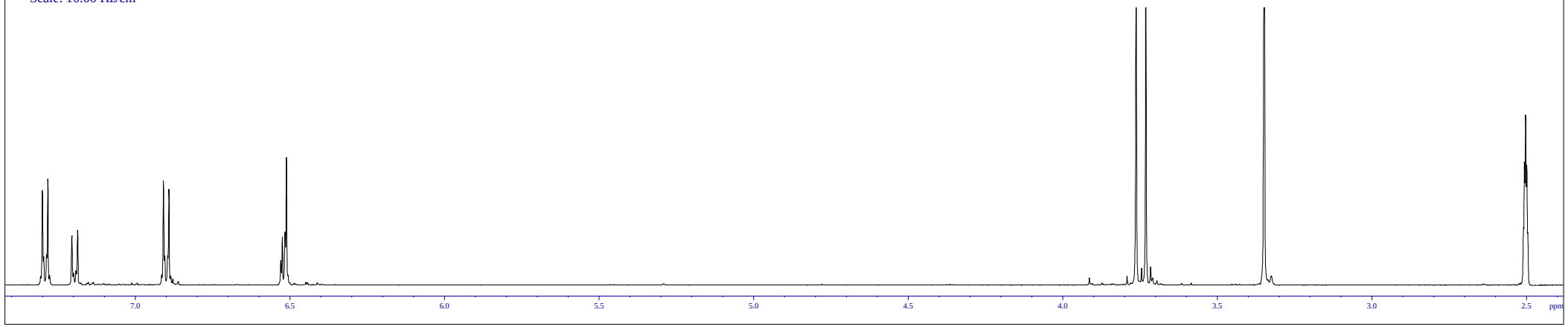


# 3r (NMR/18251561)






Scale: 10.00 Hz/cm



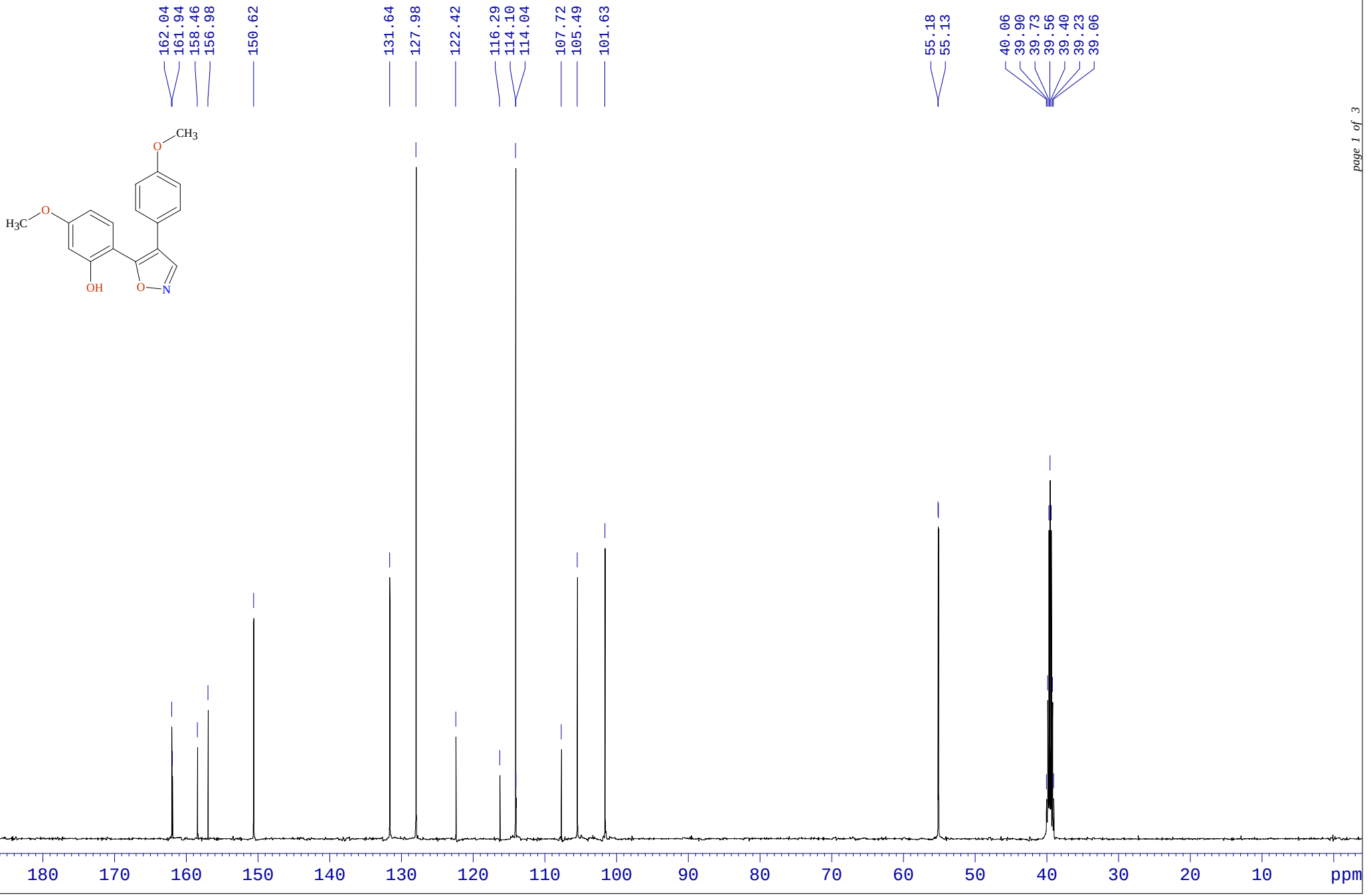
# 3r (NMR/18251561)



Peaks List

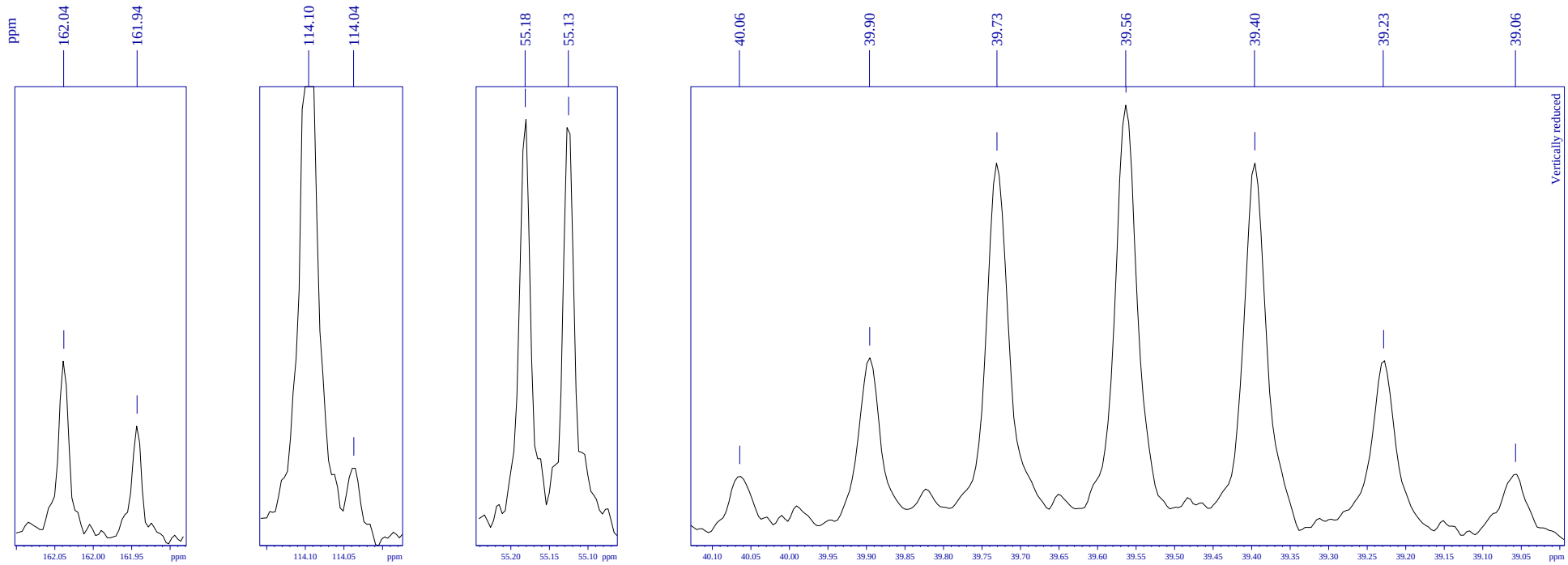
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 13047.4 | 5015.456 | 10.0283 | 4.18 |
| 2 | 14476.1 | 4579.451 | 9.1565 | 0.27 |
| 3 | 14841.3 | 4468.003 | 8.9337 | 6.75 |
| 4 | 17507.8 | 3654.224 | 7.3065 | 0.27 |
| 5 | 17517.6 | 3651.235 | 7.3006 | 3.36 |
| 6 | 17524.6 | 3649.121 | 7.2963 | 0.95 |
| 7 | 17539.5 | 3644.553 | 7.2872 | 0.98 |
| 8 | 17546.6 | 3642.405 | 7.2829 | 3.82 |
| 9 | 17556.3 | 3639.450 | 7.2770 | 0.33 |
| 10 | 17674.2 | 3603.460 | 7.2050 | 1.66 |
| 11 | 17682.7 | 3600.862 | 7.1999 | 0.39 |
| 12 | 17695.7 | 3596.899 | 7.1919 | 0.45 |
| 13 | 17704.3 | 3594.263 | 7.1867 | 1.87 |
| 14 | 18149.7 | 3458.337 | 6.9149 | 0.32 |
| 15 | 18159.5 | 3455.346 | 6.9089 | 3.68 |
| 16 | 18166.6 | 3453.199 | 6.9046 | 0.98 |
| 17 | 18181.5 | 3448.629 | 6.8955 | 0.92 |
| 18 | 18188.5 | 3446.493 | 6.8912 | 3.42 |
| 19 | 18198.4 | 3443.498 | 6.8852 | 0.31 |
| 20 | 18208.8 | 3440.300 | 6.8788 | 0.20 |
| 21 | 18781.6 | 3265.519 | 6.5293 | 0.87 |
| 22 | 18789.6 | 3263.071 | 6.5244 | 1.74 |
| 23 | 18804.0 | 3258.683 | 6.5157 | 1.76 |
| 24 | 18811.6 | 3256.362 | 6.5110 | 4.37 |
| 25 | 18820.1 | 3253.740 | 6.5058 | 0.34 |
| 26 | 23066.7 | 1957.801 | 3.9146 | 0.27 |
| 27 | 23266.5 | 1896.830 | 3.7927 | 0.32 |
| 28 | 23314.4 | 1882.206 | 3.7634 | 13.86 |
| 29 | 23343.2 | 1873.424 | 3.7459 | 0.62 |
| 30 | 23366.0 | 1866.466 | 3.7320 | 15.86 |
| 31 | 23391.4 | 1858.697 | 3.7164 | 0.68 |
| 32 | 23402.0 | 1855.478 | 3.7100 | 0.23 |
| 33 | 23993.9 | 1674.844 | 3.3488 | 32.94 |
| 34 | 24001.1 | 1672.644 | 3.3444 | 0.37 |
| 35 | 24031.9 | 1663.232 | 3.3256 | 0.29 |
| 36 | 25367.7 | 1255.598 | 2.5105 | 1.69 |
| 37 | 25373.6 | 1253.773 | 2.5069 | 3.93 |
| 38 | 25379.6 | 1251.940 | 2.5032 | 5.61 |
| 39 | 25385.7 | 1250.107 | 2.4996 | 3.92 |
| 40 | 25391.6 | 1248.281 | 2.4959 | 1.67 |
| 41 | 26062.7 | 1043.483 | 2.0864 | 0.70 |
| 42 | 29482.0 | 0.001 | 0.0000 | 5.02 |

# 3r (NMR/18251561)



# 3r (NMR/18251561)





# 3r (NMR/18251561)



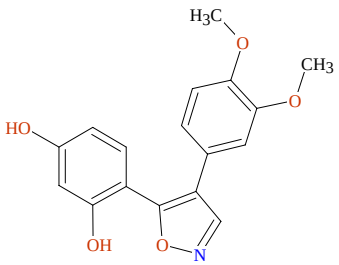
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17819.1 | 20377.594 | 162.0383 | 2.86 |
| 2 | 17844.1 | 20365.602 | 161.9430 | 1.80 |
| 3 | 18757.2 | 19927.451 | 158.4589 | 2.41 |
| 4 | 19144.1 | 19741.805 | 156.9827 | 3.18 |
| 5 | 20812.9 | 18941.088 | 150.6156 | 5.00 |
| 6 | 25784.9 | 16555.332 | 131.6445 | 5.81 |
| 7 | 26745.0 | 16094.635 | 127.9812 | 13.93 |
| 8 | 28202.7 | 15395.176 | 122.4192 | 2.62 |
| 9 | 29808.2 | 14624.791 | 116.2933 | 1.83 |
| 10 | 30384.2 | 14348.406 | 114.0955 | 14.00 |
| 11 | 30399.5 | 14341.076 | 114.0372 | 1.13 |
| 12 | 32055.5 | 13546.455 | 107.7186 | 2.33 |
| 13 | 32639.0 | 13266.479 | 105.4923 | 5.81 |
| 14 | 33651.5 | 12780.656 | 101.6291 | 6.41 |
| 15 | 45824.7 | 6939.481 | 55.1813 | 6.84 |
| 16 | 45839.4 | 6932.426 | 55.1252 | 6.85 |
| 17 | 49786.6 | 5038.426 | 40.0645 | 1.08 |
| 18 | 49830.8 | 5017.209 | 39.8958 | 3.19 |
| 19 | 49874.1 | 4996.434 | 39.7306 | 6.67 |
| 20 | 49918.0 | 4975.372 | 39.5631 | 7.70 |
| 21 | 49961.9 | 4954.346 | 39.3959 | 6.68 |
| 22 | 50005.7 | 4933.320 | 39.2287 | 3.15 |
| 23 | 50050.6 | 4911.772 | 39.0574 | 1.12 |

*The Best Applied NMR!*

# 3s (NMR/18251568)

Found protons = 23 impurity* = 1.5 %

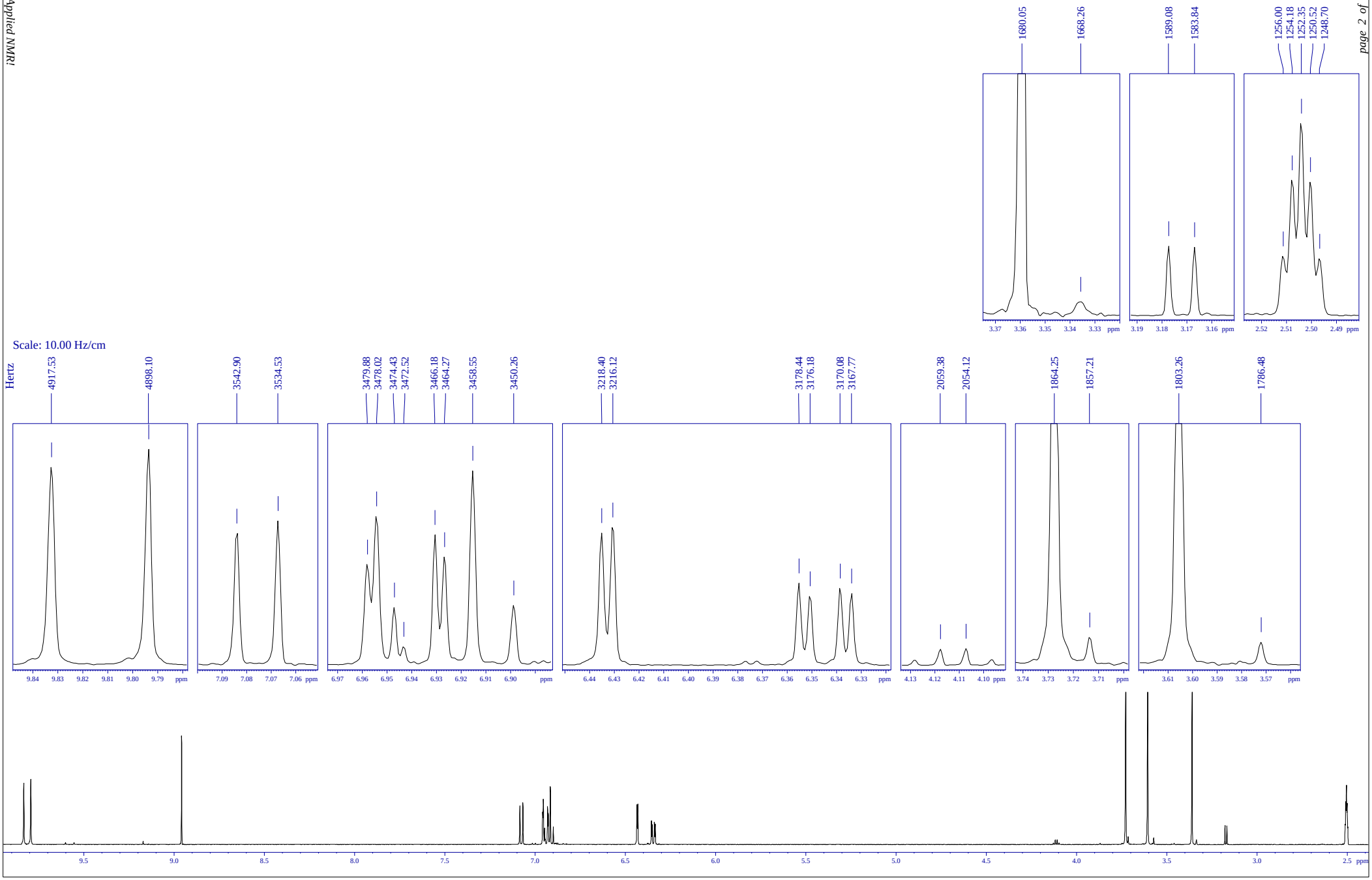





45 3
1.4 *
23 *
95 6
47 3
3.1 *
142 10
87 0
8.1 *
47 1
9.1 0
Water
DMSO−d5
TMS
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
45.05 1.34 0.75 22.60 95.52 47.37 3.24 0.32 142.74 0.47 87.44 8.17 0.05 46.68 0.57 9.07

# 3s (NMR/18251568)





# 3s (NMR/18251568)

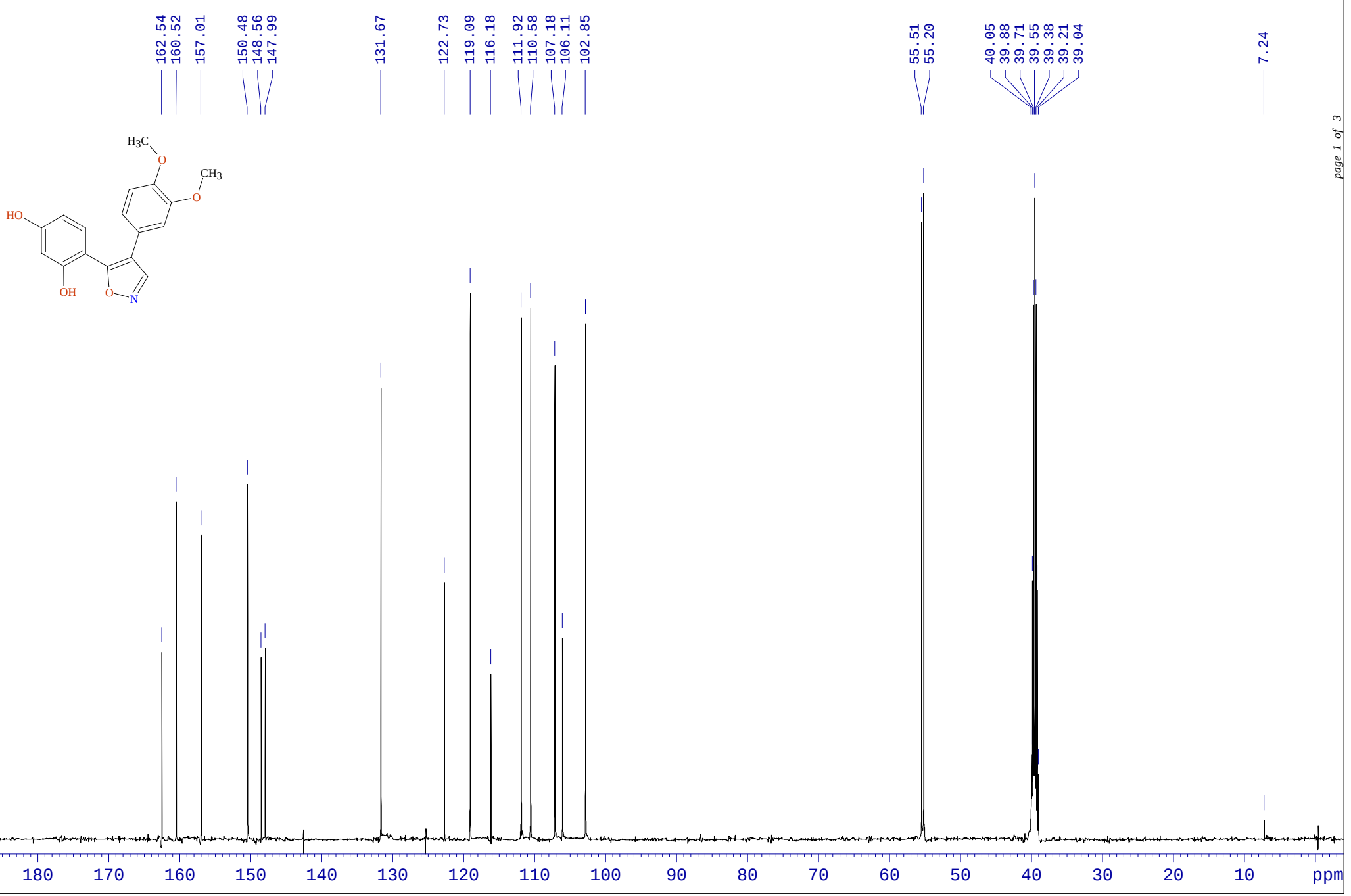


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 13369.2 | 4917.531 | 9.8325 | 3.87 |
| 2 | 13432.9 | 4898.096 | 9.7936 | 4.20 |
| 3 | 14452.6 | 4586.908 | 9.1714 | 0.24 |
| 4 | 14802.4 | 4480.180 | 8.9580 | 8.07 |
| 5 | 17873.6 | 3542.903 | 7.0840 | 2.62 |
| 6 | 17901.0 | 3534.534 | 7.0672 | 2.80 |
| 7 | 18080.1 | 3479.876 | 6.9579 | 1.96 |
| 8 | 18086.2 | 3478.022 | 6.9542 | 2.91 |
| 9 | 18098.0 | 3474.425 | 6.9470 | 1.12 |
| 10 | 18104.2 | 3472.524 | 6.9432 | 0.36 |
| 11 | 18125.0 | 3466.178 | 6.9306 | 2.53 |
| 12 | 18131.3 | 3464.268 | 6.9267 | 2.13 |
| 13 | 18150.0 | 3458.551 | 6.9153 | 3.78 |
| 14 | 18177.2 | 3450.260 | 6.8987 | 1.17 |
| 15 | 18936.9 | 3218.403 | 6.4351 | 2.57 |
| 16 | 18944.4 | 3216.123 | 6.4306 | 2.75 |
| 17 | 19067.9 | 3178.443 | 6.3552 | 1.60 |
| 18 | 19075.3 | 3176.177 | 6.3507 | 1.37 |
| 19 | 19095.3 | 3170.079 | 6.3385 | 1.52 |
| 20 | 19102.9 | 3167.771 | 6.3339 | 1.40 |
| 21 | 22734.8 | 2059.379 | 4.1177 | 0.31 |
| 22 | 22752.1 | 2054.119 | 4.1072 | 0.32 |
| 23 | 23374.2 | 1864.247 | 3.7275 | 15.74 |
| 24 | 23397.3 | 1857.215 | 3.7135 | 0.55 |
| 25 | 23574.1 | 1803.262 | 3.6056 | 15.37 |
| 26 | 23629.1 | 1786.481 | 3.5720 | 0.45 |
| 27 | 23977.8 | 1680.047 | 3.3592 | 23.73 |
| 28 | 24016.4 | 1668.264 | 3.3357 | 0.26 |
| 29 | 24275.9 | 1589.076 | 3.1773 | 1.35 |
| 30 | 24293.1 | 1583.843 | 3.1669 | 1.33 |
| 31 | 25367.3 | 1256.001 | 2.5113 | 1.16 |
| 32 | 25373.3 | 1254.178 | 2.5077 | 2.66 |
| 33 | 25379.3 | 1252.348 | 2.5040 | 3.78 |
| 34 | 25385.3 | 1250.518 | 2.5004 | 2.62 |
| 35 | 25391.3 | 1248.698 | 2.4967 | 1.11 |
| 36 | 29483.0 | 0.001 | 0.0000 | 3.25 |

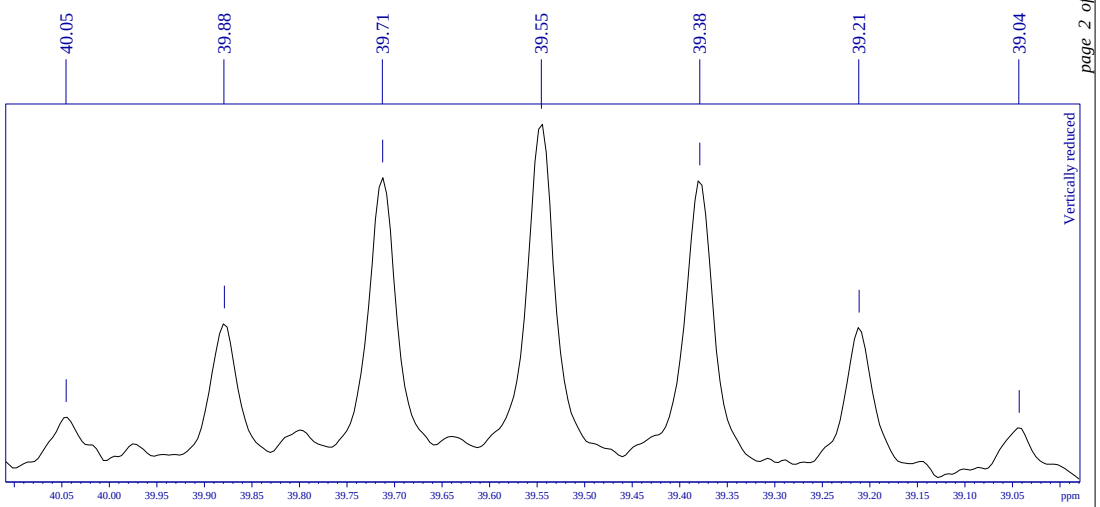
# 3s (NMR/18251568)



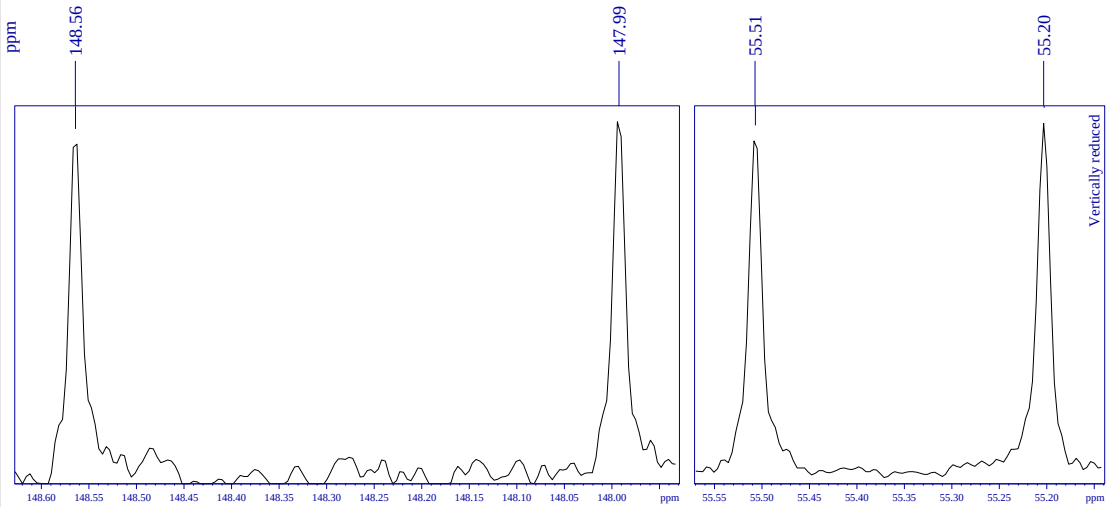


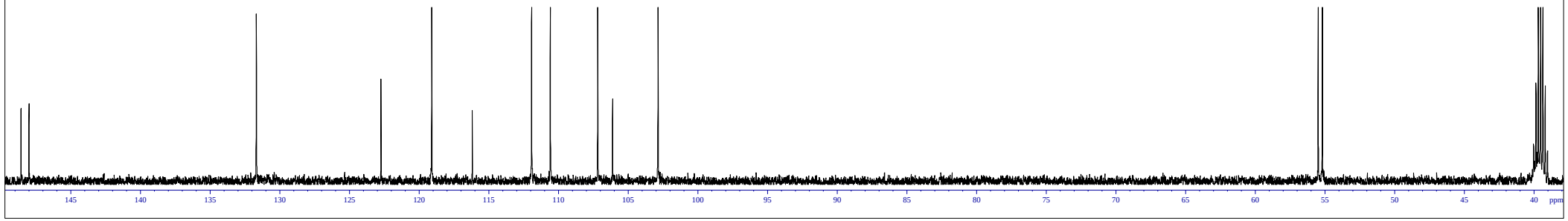
# 3s (NMR/18251568)






Scale: 10.00 Hz/cm



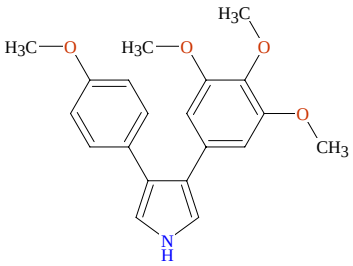
# 3s (NMR/18251568)



Peaks List

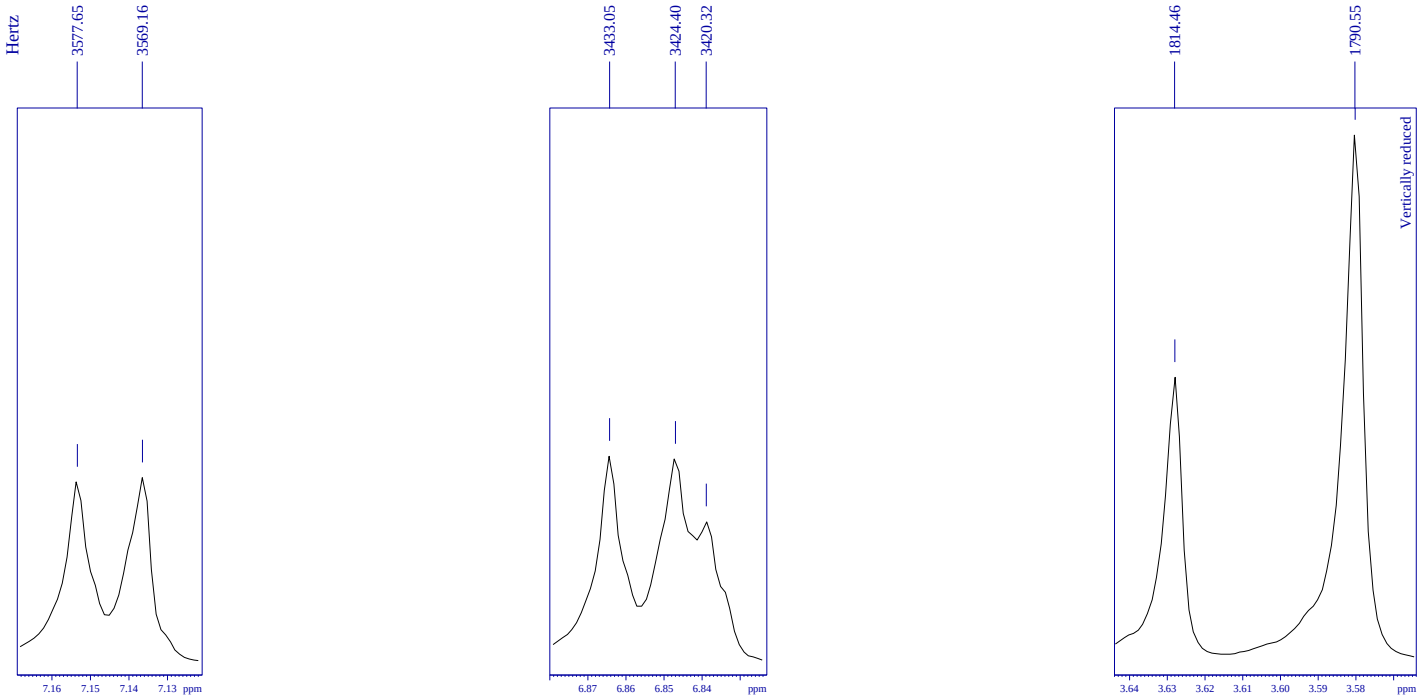
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17687.4 | 20440.801 | 162.5410 | 4.70 |
| 2 | 18217.0 | 20186.699 | 160.5204 | 7.79 |
| 3 | 19136.9 | 19745.250 | 157.0101 | 7.11 |
| 4 | 20849.4 | 18923.555 | 150.4761 | 8.05 |
| 5 | 21350.5 | 18683.096 | 148.5641 | 4.53 |
| 6 | 21500.4 | 18611.195 | 147.9923 | 4.78 |
| 7 | 25777.0 | 16559.102 | 131.6745 | 10.07 |
| 8 | 28120.1 | 15434.820 | 122.7345 | 6.15 |
| 9 | 29075.0 | 14976.639 | 119.0911 | 11.98 |
| 10 | 29838.2 | 14610.419 | 116.1790 | 4.30 |
| 11 | 30954.2 | 14074.895 | 111.9206 | 11.55 |
| 12 | 31306.0 | 13906.111 | 110.5785 | 11.66 |
| 13 | 32197.1 | 13478.499 | 107.1782 | 10.54 |
| 14 | 32477.2 | 13344.092 | 106.1094 | 5.03 |
| 15 | 33331.1 | 12934.379 | 102.8515 | 11.36 |
| 16 | 45739.4 | 6980.423 | 55.5069 | 13.63 |
| 17 | 45819.1 | 6942.188 | 55.2028 | 14.00 |
| 18 | 49791.6 | 5036.018 | 40.0454 | 2.26 |
| 19 | 49835.3 | 5015.093 | 39.8790 | 5.93 |
| 20 | 49878.9 | 4994.164 | 39.7125 | 11.64 |
| 21 | 49922.7 | 4973.158 | 39.5455 | 13.81 |
| 22 | 49966.3 | 4952.208 | 39.3789 | 11.56 |
| 23 | 50010.2 | 4931.134 | 39.2113 | 5.77 |
| 24 | 50054.4 | 4909.956 | 39.0429 | 1.83 |
| 25 | 58388.3 | 911.049 | 7.2445 | 1.11 |

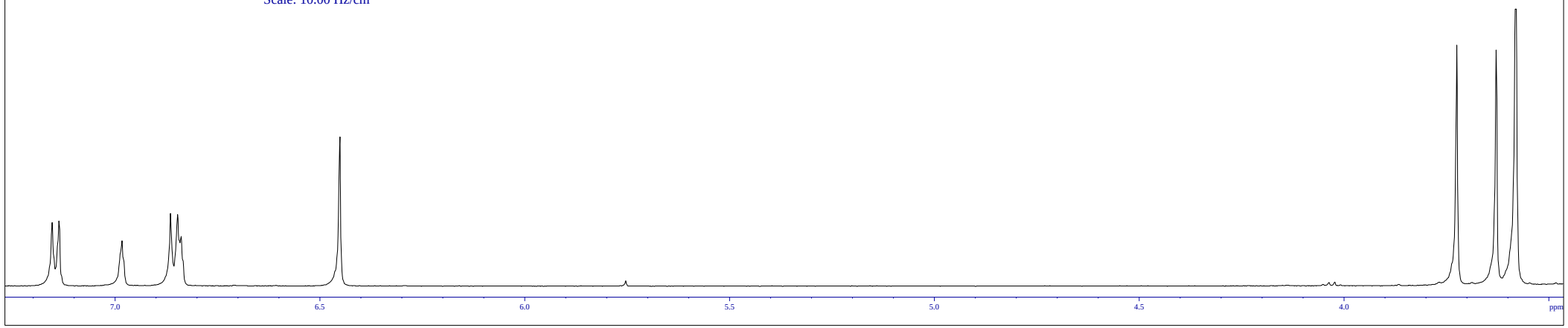
# 10a (NMR/27290001)



# 10a (NMR/27290001)





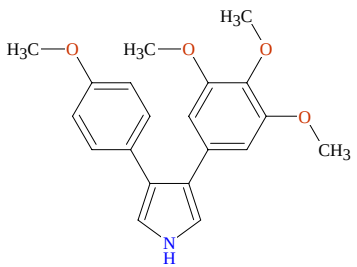
# 10a (NMR/27290001)



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 5705.5 | 5514.079 | 11.0253 | 0.84 |
| 2 | 8878.1 | 3577.646 | 7.1534 | 2.41 |
| 3 | 8892.0 | 3569.159 | 7.1365 | 2.46 |
| 4 | 9017.9 | 3492.372 | 6.9829 | 1.72 |
| 5 | 9115.1 | 3433.046 | 6.8643 | 2.74 |
| 6 | 9129.2 | 3424.399 | 6.8470 | 2.72 |
| 7 | 9135.9 | 3420.320 | 6.8389 | 1.88 |
| 8 | 9453.7 | 3226.366 | 6.4511 | 5.76 |
| 9 | 10025.7 | 2877.224 | 5.7530 | 0.20 |
| 10 | 11688.0 | 1862.616 | 3.7243 | 9.11 |
| 11 | 11766.9 | 1814.462 | 3.6280 | 8.93 |
| 12 | 11806.1 | 1790.548 | 3.5802 | 16.51 |
| 13 | 11926.5 | 1717.075 | 3.4333 | 0.21 |
| 14 | 12004.1 | 1669.685 | 3.3385 | 28.58 |
| 15 | 12689.9 | 1251.151 | 2.5017 | 8.29 |
| 16 | 13110.7 | 994.277 | 1.9880 | 0.54 |
| 17 | 13432.7 | 797.776 | 1.5951 | 1.45 |
| 18 | 13777.3 | 587.456 | 1.1746 | 0.28 |
| 19 | 14739.8 | −0.002 | −0.0000 | 0.55 |

# 10a (NMR/27290001)



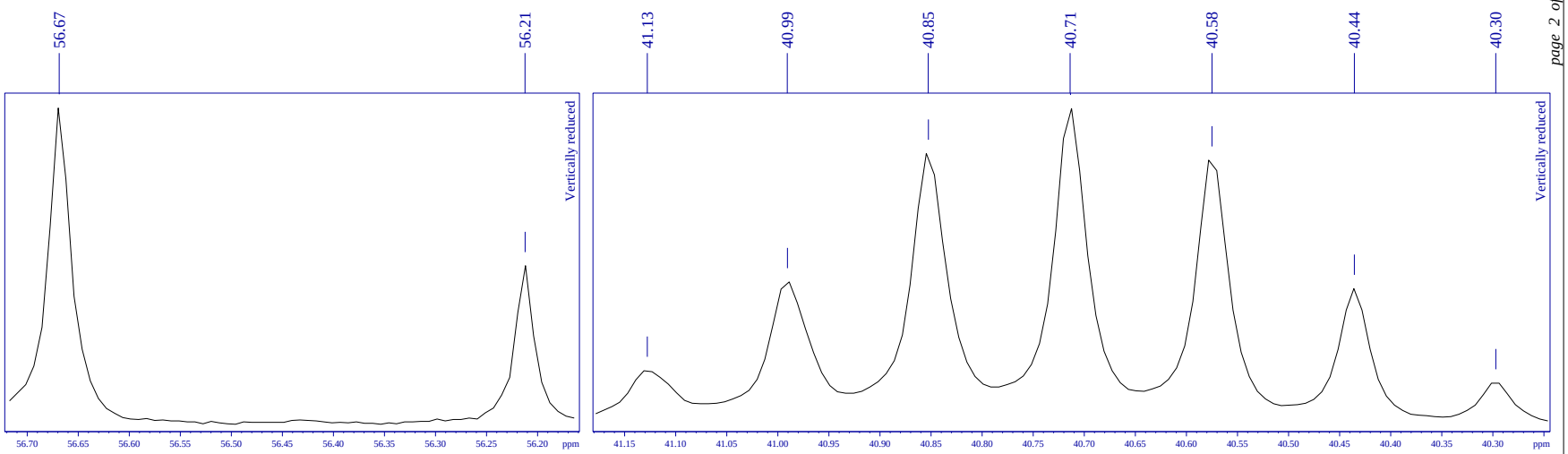

158.49 153.62 136.46 133.10 130.62 129.91 122.86 122.73 118.56 118.40 114.69 106.32 61.20 56.67 56.21 41.13 40.99 40.85 40.71 40.58 40.44 40.30



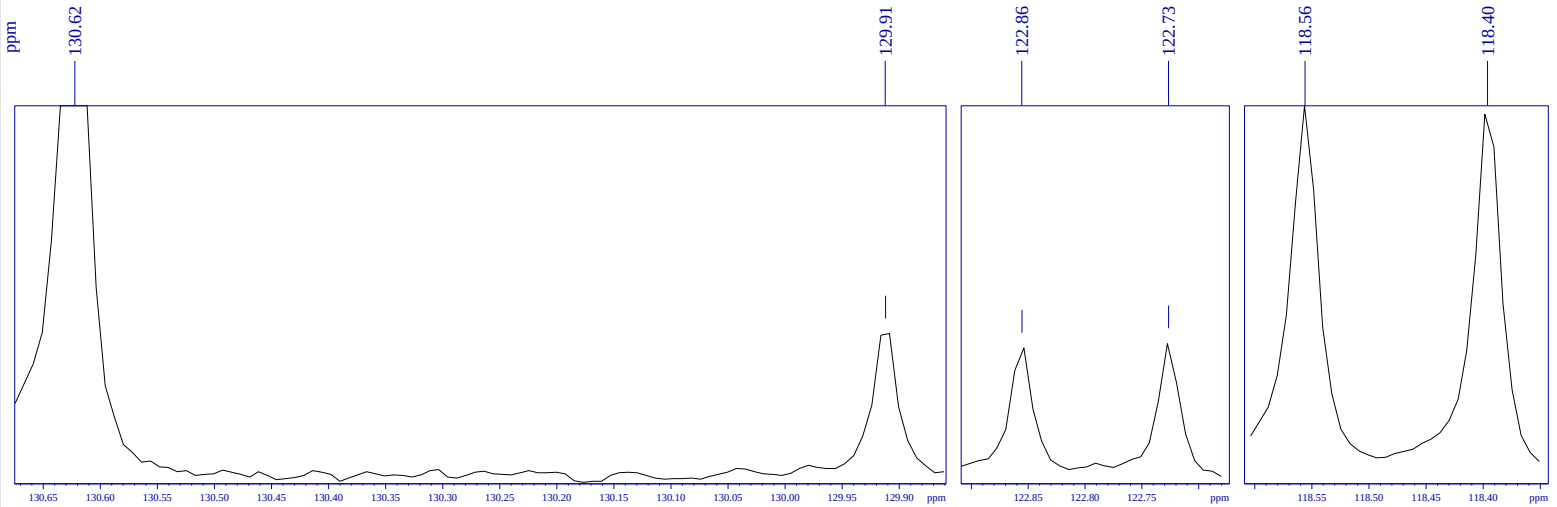
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

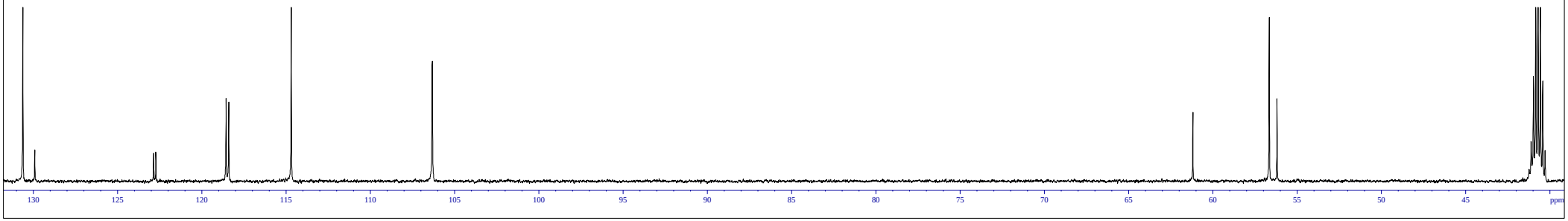
# 10a (NMR/27290001)






Scale: 10.00 Hz/cm



# 10a (NMR/27290001)



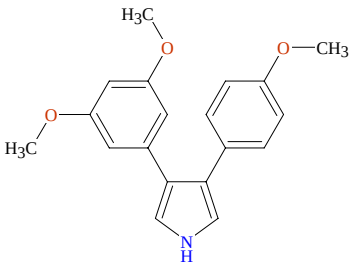
Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 11485.5 | 23917.039 | 158.4931 | 1.79 |
| 2 | 12101.8 | 23182.359 | 153.6245 | 3.34 |
| 3 | 14274.5 | 20592.377 | 136.4613 | 0.50 |
| 4 | 14699.9 | 20085.170 | 133.1001 | 2.51 |
| 5 | 15013.6 | 19711.248 | 130.6222 | 11.32 |
| 6 | 15103.5 | 19604.064 | 129.9120 | 1.99 |
| 7 | 15996.8 | 18539.229 | 122.8555 | 1.72 |
| 8 | 16013.1 | 18519.766 | 122.7265 | 1.75 |
| 9 | 16541.0 | 17890.414 | 118.5560 | 4.98 |
| 10 | 16561.3 | 17866.240 | 118.3958 | 4.87 |
| 11 | 17030.8 | 17306.576 | 114.6870 | 11.41 |
| 12 | 18089.6 | 16044.326 | 106.3223 | 7.32 |
| 13 | 23801.0 | 9235.899 | 61.2043 | 4.13 |
| 14 | 24375.1 | 8551.451 | 56.6686 | 9.88 |
| 15 | 24432.9 | 8482.576 | 56.2122 | 4.96 |
| 16 | 26342.4 | 6206.295 | 41.1278 | 2.44 |
| 17 | 26359.8 | 6185.589 | 40.9906 | 6.34 |
| 18 | 26377.2 | 6164.770 | 40.8526 | 12.04 |
| 19 | 26394.8 | 6143.778 | 40.7135 | 14.00 |
| 20 | 26412.4 | 6122.872 | 40.5750 | 11.89 |
| 21 | 26430.0 | 6101.845 | 40.4356 | 6.01 |
| 22 | 26447.5 | 6080.946 | 40.2971 | 1.90 |

*The Best Applied NMR!*

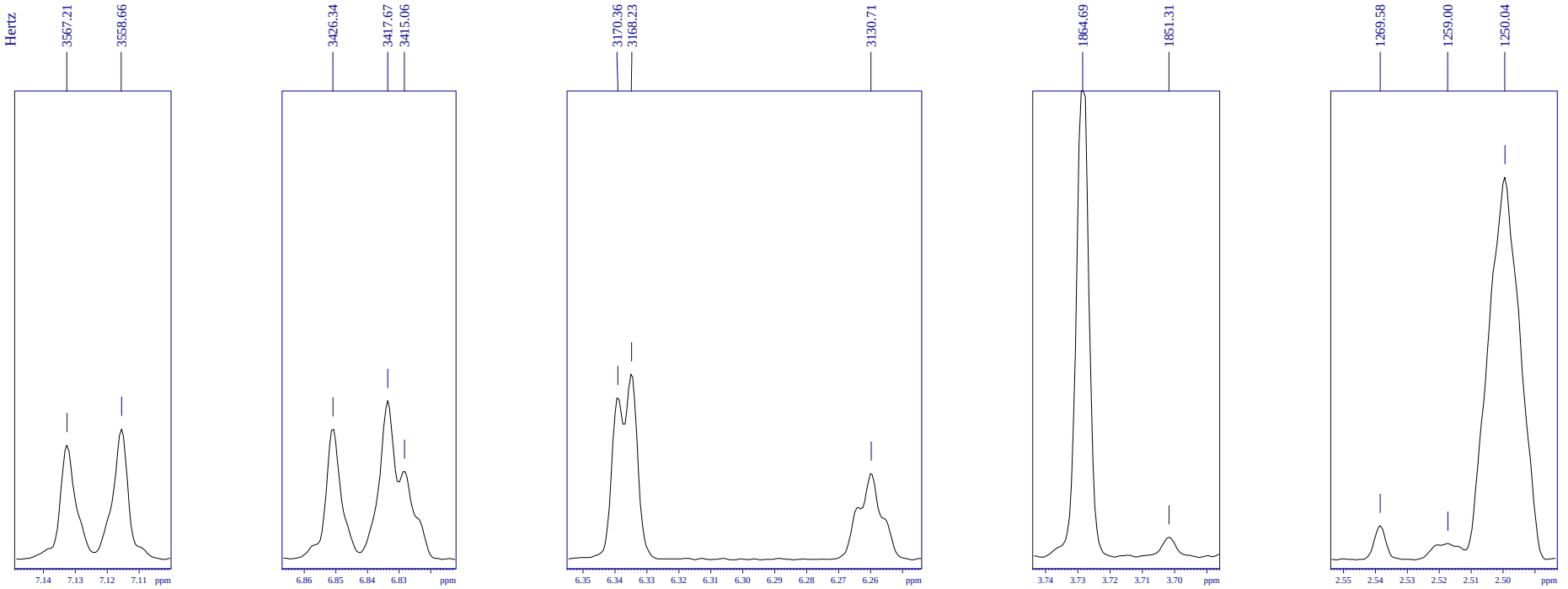
# 10b (NMR/26290015)

Found protons = 22 impurity* = 2.1 %

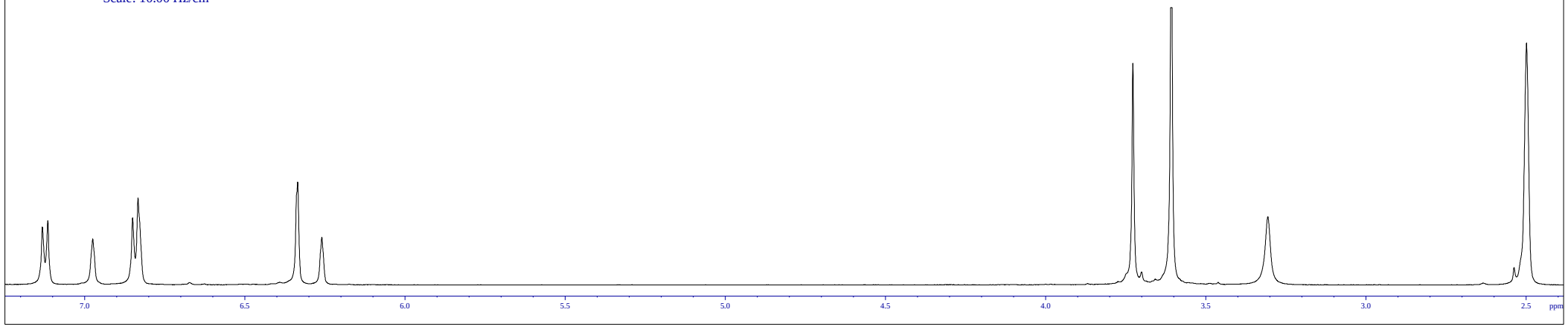


# 10b (NMR/26290015)






Scale: 10.00 Hz/cm



# 10b (NMR/26290015)

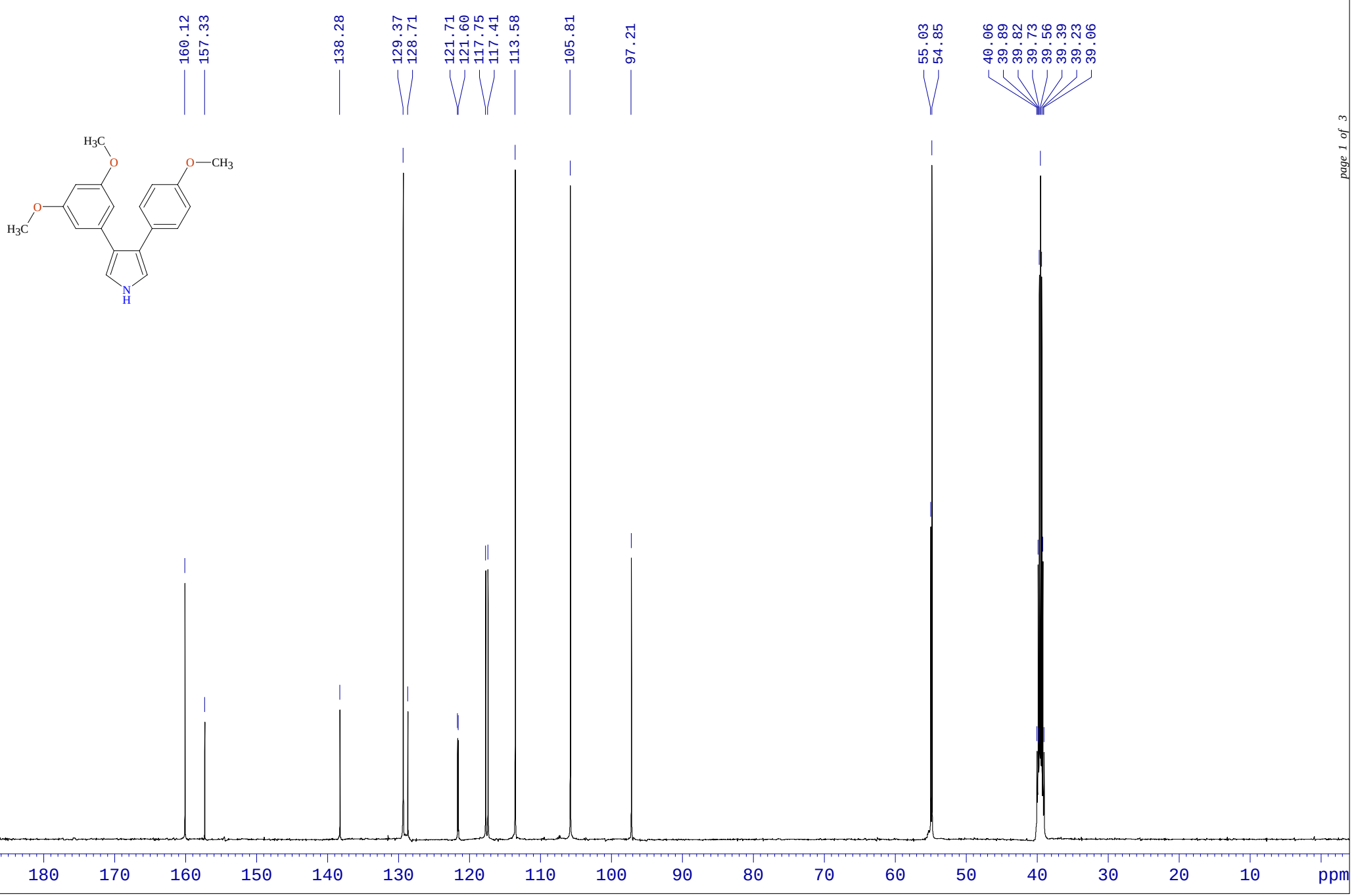


Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 11445.5 | 5502.478 | 11.0021 | 0.49 |
| 2 | 17787.0 | 3567.209 | 7.1326 | 1.89 |
| 3 | 17815.0 | 3558.660 | 7.1155 | 2.16 |
| 4 | 18045.2 | 3488.414 | 6.9750 | 1.31 |
| 5 | 18248.6 | 3426.341 | 6.8509 | 2.16 |
| 6 | 18277.0 | 3417.667 | 6.8336 | 2.62 |
| 7 | 18285.5 | 3415.058 | 6.8283 | 1.46 |
| 8 | 19087.4 | 3170.356 | 6.3391 | 2.69 |
| 9 | 19094.3 | 3168.234 | 6.3348 | 3.07 |
| 10 | 19217.3 | 3130.706 | 6.2598 | 1.42 |
| 11 | 23365.8 | 1864.694 | 3.7284 | 8.41 |
| 12 | 23409.6 | 1851.314 | 3.7017 | 0.37 |
| 13 | 23562.1 | 1804.792 | 3.6086 | 16.00 |
| 14 | 24055.5 | 1654.211 | 3.3076 | 1.60 |
| 15 | 25315.8 | 1269.583 | 2.5385 | 0.56 |
| 16 | 25350.5 | 1259.002 | 2.5173 | 0.26 |
| 17 | 25379.9 | 1250.042 | 2.4994 | 6.31 |
| 18 | 29476.0 | 0.002 | 0.0000 | 5.23 |

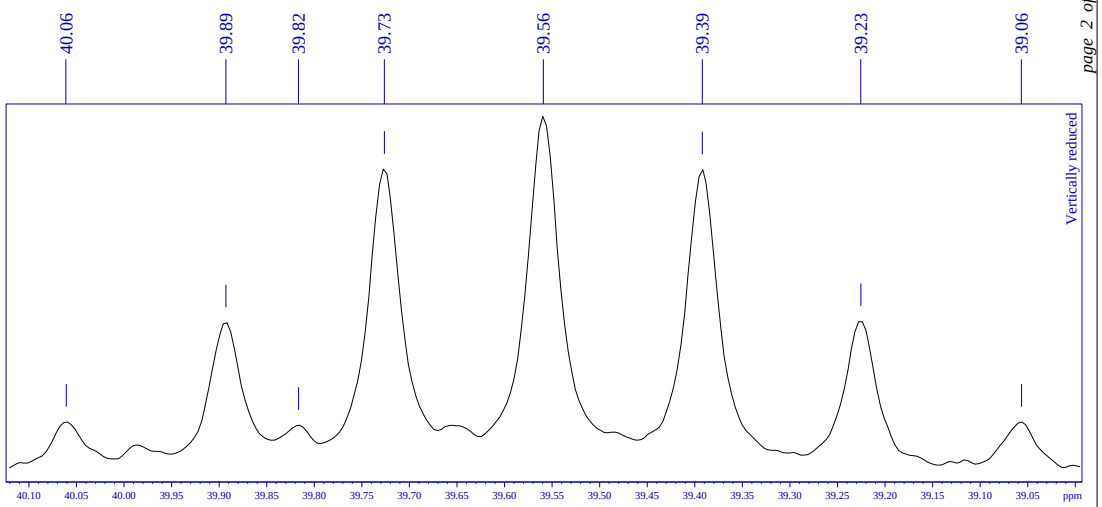
# 10b (NMR/26290015)



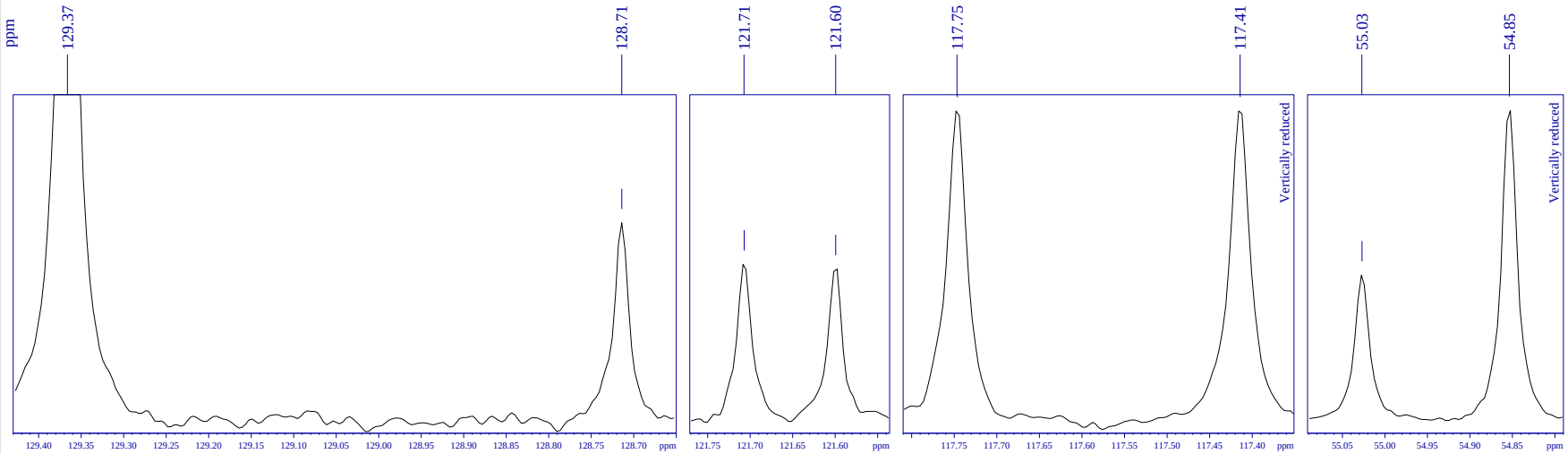


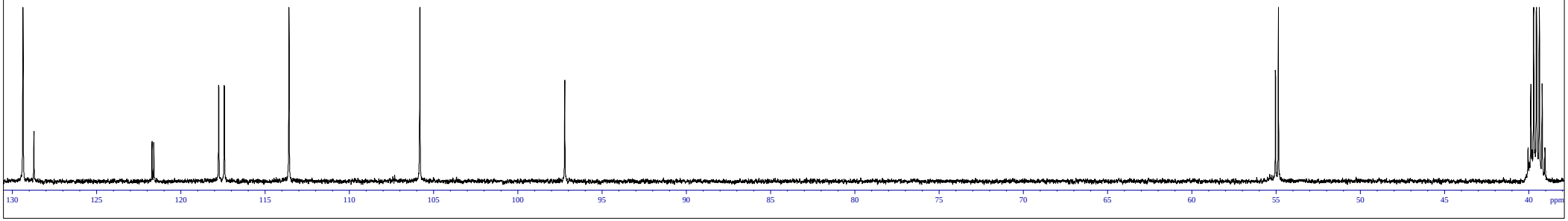
# 10b (NMR/26290015)






Scale: 10.00 Hz/cm



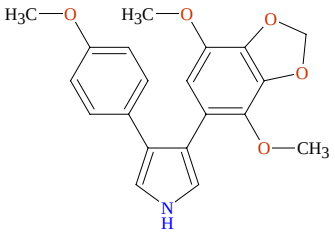
# 10b (NMR/26290015)



Peaks List

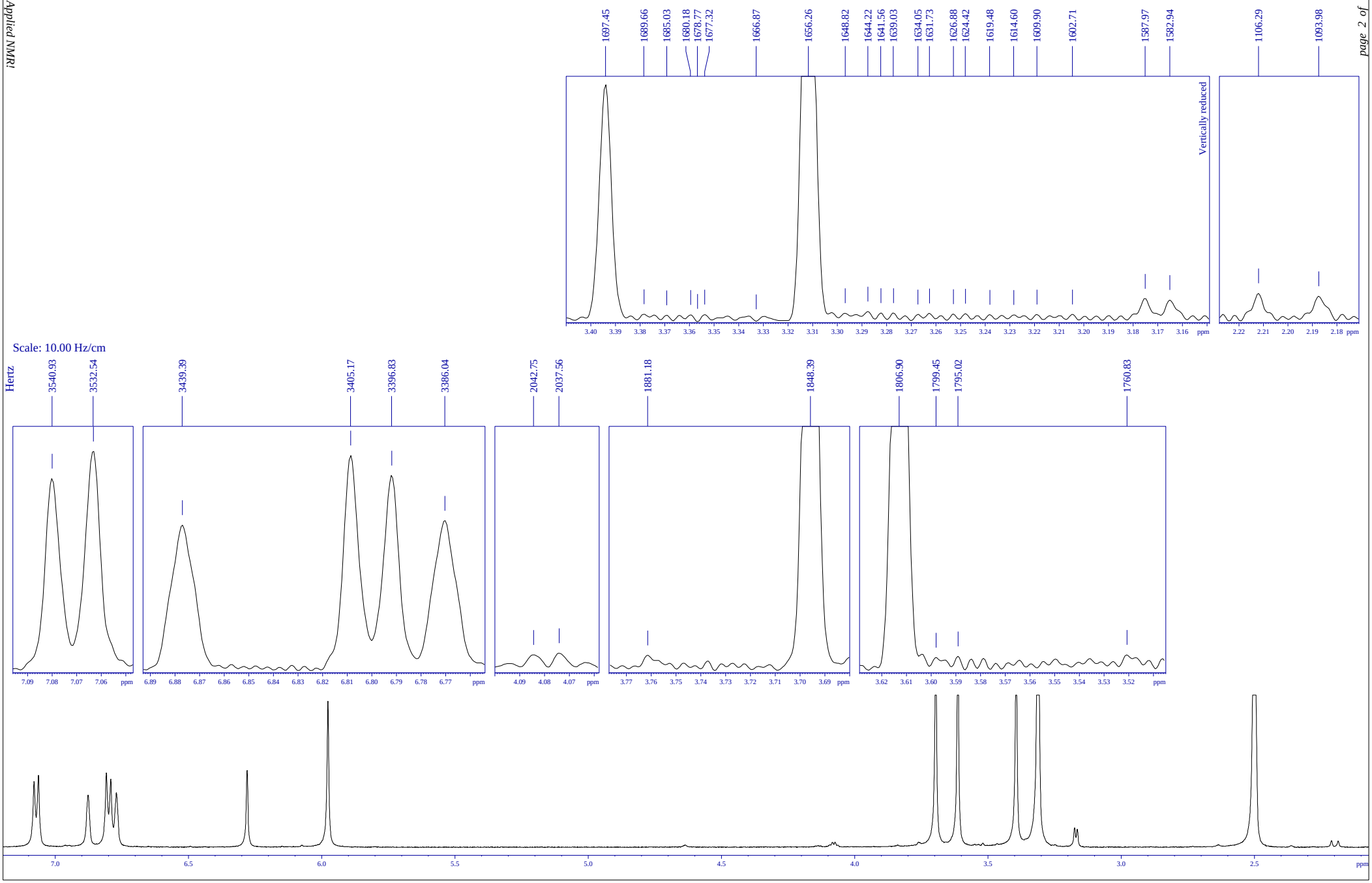
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 18320.7 | 20136.910 | 160.1245 | 5.60 |
| 2 | 19052.8 | 19785.609 | 157.3310 | 2.77 |
| 3 | 24045.5 | 17389.932 | 138.2811 | 3.00 |
| 4 | 26382.1 | 16268.779 | 129.3659 | 13.70 |
| 5 | 26552.9 | 16186.796 | 128.7140 | 2.98 |
| 6 | 28389.4 | 15305.607 | 121.7070 | 2.41 |
| 7 | 28417.6 | 15292.076 | 121.5994 | 2.35 |
| 8 | 29427.4 | 14807.525 | 117.7463 | 5.77 |
| 9 | 29514.4 | 14765.758 | 117.4142 | 5.79 |
| 10 | 30520.5 | 14283.021 | 113.5756 | 13.92 |
| 11 | 32555.6 | 13306.477 | 105.8103 | 13.57 |
| 12 | 34809.9 | 12224.799 | 97.2090 | 6.04 |
| 13 | 45865.2 | 6920.059 | 55.0269 | 6.67 |
| 14 | 45910.7 | 6898.252 | 54.8535 | 14.00 |
| 15 | 49787.6 | 5037.949 | 40.0607 | 2.01 |
| 16 | 49831.6 | 5016.841 | 39.8929 | 5.81 |
| 17 | 49851.6 | 5007.241 | 39.8165 | 1.89 |
| 18 | 49875.3 | 4995.899 | 39.7263 | 11.65 |
| 19 | 49919.1 | 4974.863 | 39.5591 | 13.63 |
| 20 | 49962.8 | 4953.871 | 39.3921 | 11.61 |
| 21 | 50006.5 | 4932.908 | 39.2254 | 5.86 |
| 22 | 50050.8 | 4911.656 | 39.0565 | 2.00 |

# 10c (NMR/27290021)



# 10c (NMR/27290021)





10c (NMR/27290021)

Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 11626.7 | 5447.492 | 10.8922 | 1.35 |
| 2 | 17874.1 | 3540.927 | 7.0800 | 3.79 |
| 3 | 17901.6 | 3532.542 | 7.0632 | 4.35 |
| 4 | 18206.8 | 3439.393 | 6.8770 | 2.86 |
| 5 | 18318.9 | 3405.171 | 6.8086 | 4.25 |
| 6 | 18346.3 | 3396.832 | 6.7919 | 3.86 |
| 7 | 18381.6 | 3386.038 | 6.7703 | 2.95 |
| 8 | 19184.8 | 3140.930 | 6.2802 | 5.19 |
| 9 | 19681.8 | 2989.242 | 5.9769 | 9.67 |
| 10 | 22783.3 | 2042.747 | 4.0844 | 0.26 |
| 11 | 22800.3 | 2037.562 | 4.0741 | 0.30 |
| 12 | 23312.7 | 1881.179 | 3.7614 | 0.26 |
| 13 | 23420.2 | 1848.392 | 3.6958 | 15.66 |
| 14 | 23556.1 | 1806.901 | 3.6129 | 15.65 |
| 15 | 23580.6 | 1799.448 | 3.5980 | 0.21 |
| 16 | 23595.1 | 1795.017 | 3.5891 | 0.24 |
| 17 | 23707.1 | 1760.831 | 3.5207 | 0.27 |
| 18 | 23914.8 | 1697.451 | 3.3940 | 16.10 |
| 19 | 23940.3 | 1689.657 | 3.3784 | 0.27 |
| 20 | 23955.5 | 1685.028 | 3.3692 | 0.20 |
| 21 | 23971.4 | 1680.178 | 3.3595 | 0.22 |
| 22 | 23976.0 | 1678.772 | 3.3567 | −0.24 |
| 23 | 23980.8 | 1677.315 | 3.3538 | 0.25 |
| 24 | 24015.0 | 1666.866 | 3.3329 | −0.21 |
| 25 | 24049.7 | 1656.264 | 3.3117 | 38.26 |
| 26 | 24074.1 | 1648.823 | 3.2968 | 0.34 |
| 27 | 24089.2 | 1644.225 | 3.2876 | 0.45 |
| 28 | 24097.9 | 1641.560 | 3.2823 | 0.34 |
| 29 | 24106.2 | 1639.026 | 3.2772 | 0.34 |
| 30 | 24122.5 | 1634.053 | 3.2673 | 0.26 |
| 31 | 24130.2 | 1631.726 | 3.2626 | 0.32 |
| 32 | 24146.0 | 1626.879 | 3.2529 | 0.27 |
| 33 | 24154.1 | 1624.425 | 3.2480 | 0.30 |
| 34 | 24170.3 | 1619.484 | 3.2381 | 0.23 |
| 35 | 24186.3 | 1614.602 | 3.2284 | 0.22 |
| 36 | 24201.7 | 1609.903 | 3.2190 | 0.25 |
| 37 | 24225.2 | 1602.715 | 3.2046 | 0.25 |
| 38 | 24273.5 | 1587.974 | 3.1751 | 1.35 |
| 39 | 24290.0 | 1582.937 | 3.1651 | 1.25 |
| 40 | 25158.5 | 1317.895 | 2.6351 | 0.21 |
| 41 | 25380.0 | 1250.308 | 2.5000 | 14.97 |
| 42 | 25851.9 | 1106.289 | 2.2120 | 0.50 |
| 43 | 25892.2 | 1093.983 | 2.1874 | 0.44 |
| 44 | 26156.1 | 1013.446 | 2.0264 | 0.42 |
| 45 | 27453.8 | 617.417 | 1.2345 | 0.46 |
| 46 | 28063.9 | 431.242 | 0.8623 | 0.22 |
| 47 | 29477.0 | −0.000 | −0.0000 | 6.01 |

# 10c (NMR/27290021)

158.16
140.10
139.51
136.88
135.74
130.52
129.24
124.12
123.69
119.49
118.37
116.87
114.71
111.10
102.47
60.22
57.40
56.13
41.12
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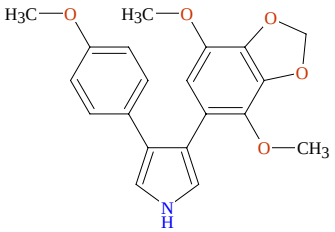
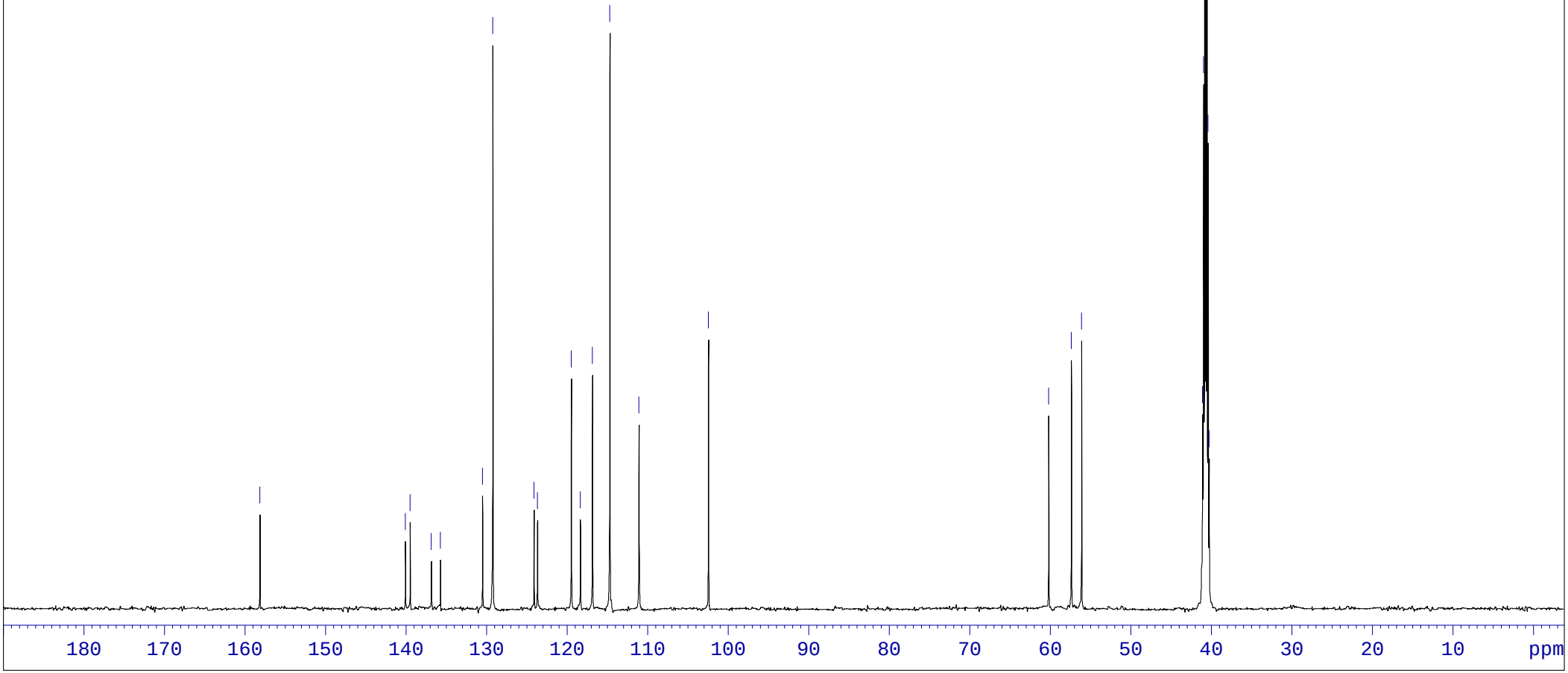
40.84
40.70
40.56
40.43
40.29

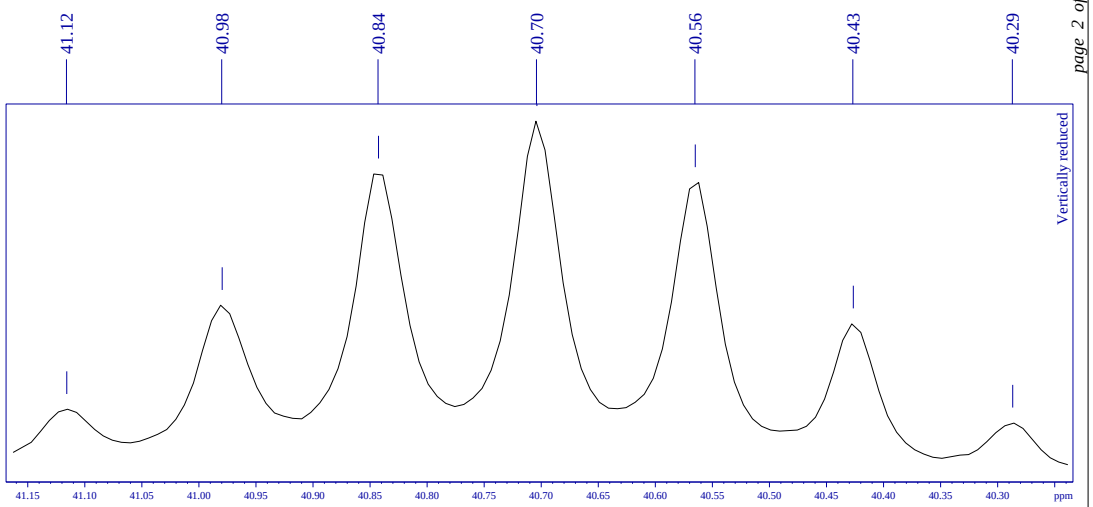


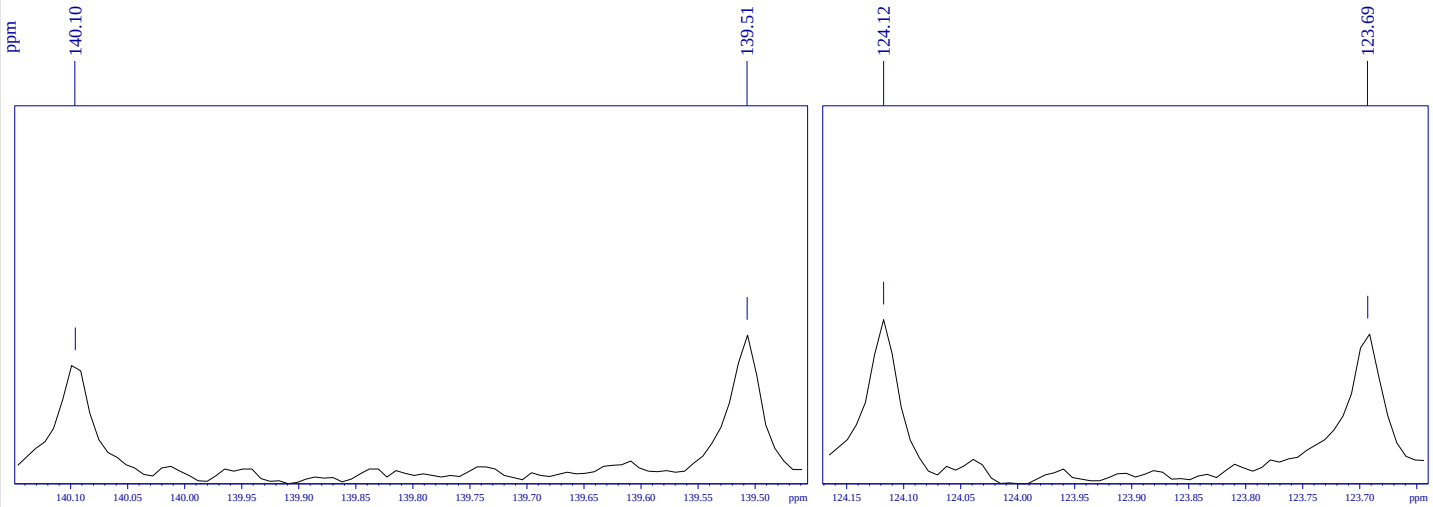
*The Best Applied NMR!*

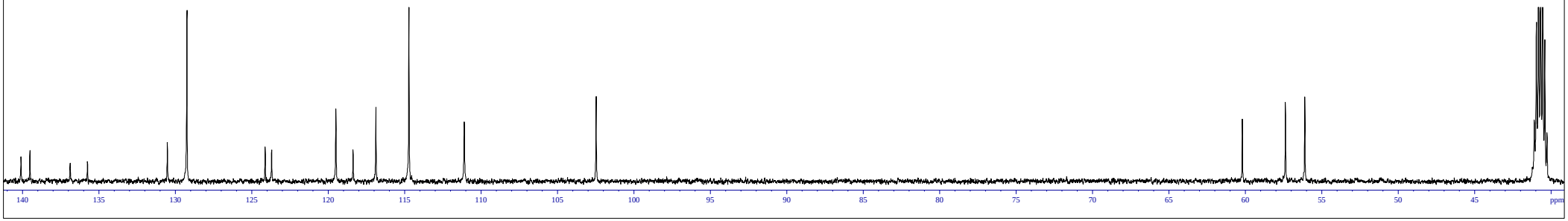
# 10c (NMR/27290021)






Scale: 10.00 Hz/cm



# 10c (NMR/27290021)



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 11527.4 | 23867.105 | 158.1622 | 2.02 |
| 2 | 13814.4 | 21140.852 | 140.0959 | 1.50 |
| 3 | 13888.9 | 21051.986 | 139.5070 | 1.87 |
| 4 | 14221.6 | 20655.447 | 136.8792 | 1.13 |
| 5 | 14365.1 | 20484.277 | 135.7449 | 1.18 |
| 6 | 15027.0 | 19695.277 | 130.5164 | 2.33 |
| 7 | 15188.7 | 19502.574 | 129.2394 | 10.53 |
| 8 | 15837.0 | 18729.680 | 124.1176 | 2.07 |
| 9 | 15890.8 | 18665.611 | 123.6930 | 1.91 |
| 10 | 16422.6 | 18031.605 | 119.4916 | 4.48 |
| 11 | 16565.1 | 17861.715 | 118.3658 | 1.91 |
| 12 | 16754.1 | 17636.361 | 116.8724 | 4.49 |
| 13 | 17027.7 | 17310.207 | 114.7111 | 10.66 |
| 14 | 17485.2 | 16764.879 | 111.0973 | 3.60 |
| 15 | 18577.9 | 15462.317 | 102.4655 | 5.13 |
| 16 | 23926.1 | 9086.713 | 60.2157 | 3.77 |
| 17 | 24283.0 | 8661.259 | 57.3963 | 4.75 |
| 18 | 24443.7 | 8469.693 | 56.1269 | 5.17 |
| 19 | 26343.9 | 6204.479 | 41.1158 | 3.70 |
| 20 | 26361.1 | 6183.929 | 40.9796 | 9.60 |
| 21 | 26378.5 | 6163.266 | 40.8426 | 17.35 |
| 22 | 26396.1 | 6142.318 | 40.7038 | 20.00 |
| 23 | 26413.6 | 6121.361 | 40.5650 | 16.73 |
| 24 | 26431.2 | 6100.471 | 40.4265 | 8.56 |
| 25 | 26448.8 | 6079.384 | 40.2868 | 2.94 |

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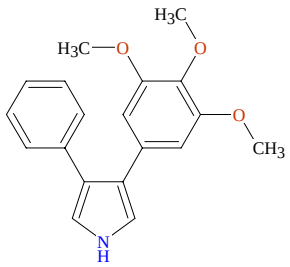
# 10d (NMR/26290191)

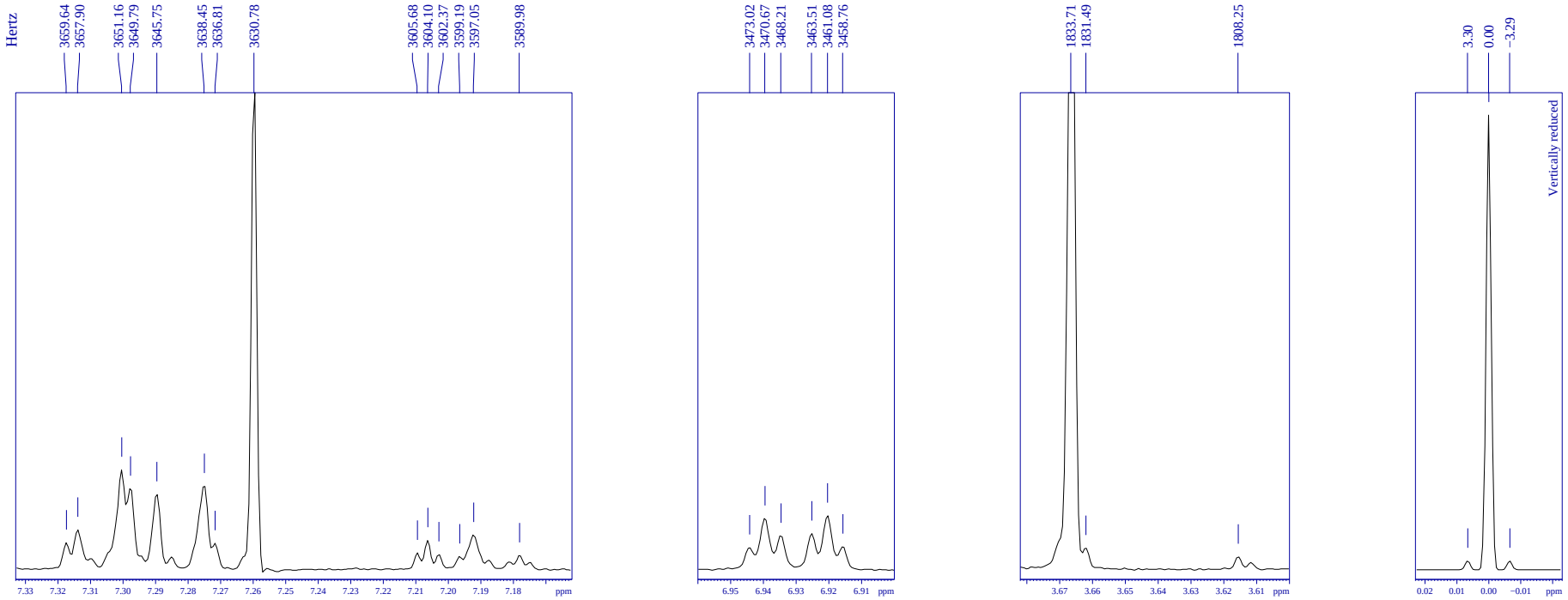
Found protons = 20 impurity* < 0.1 %





# 10d (NMR/26290191)





# 10d (NMR/26290191)

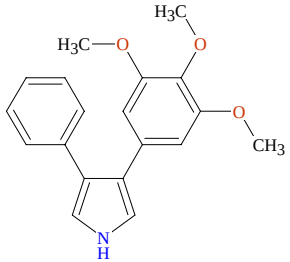


Peaks List

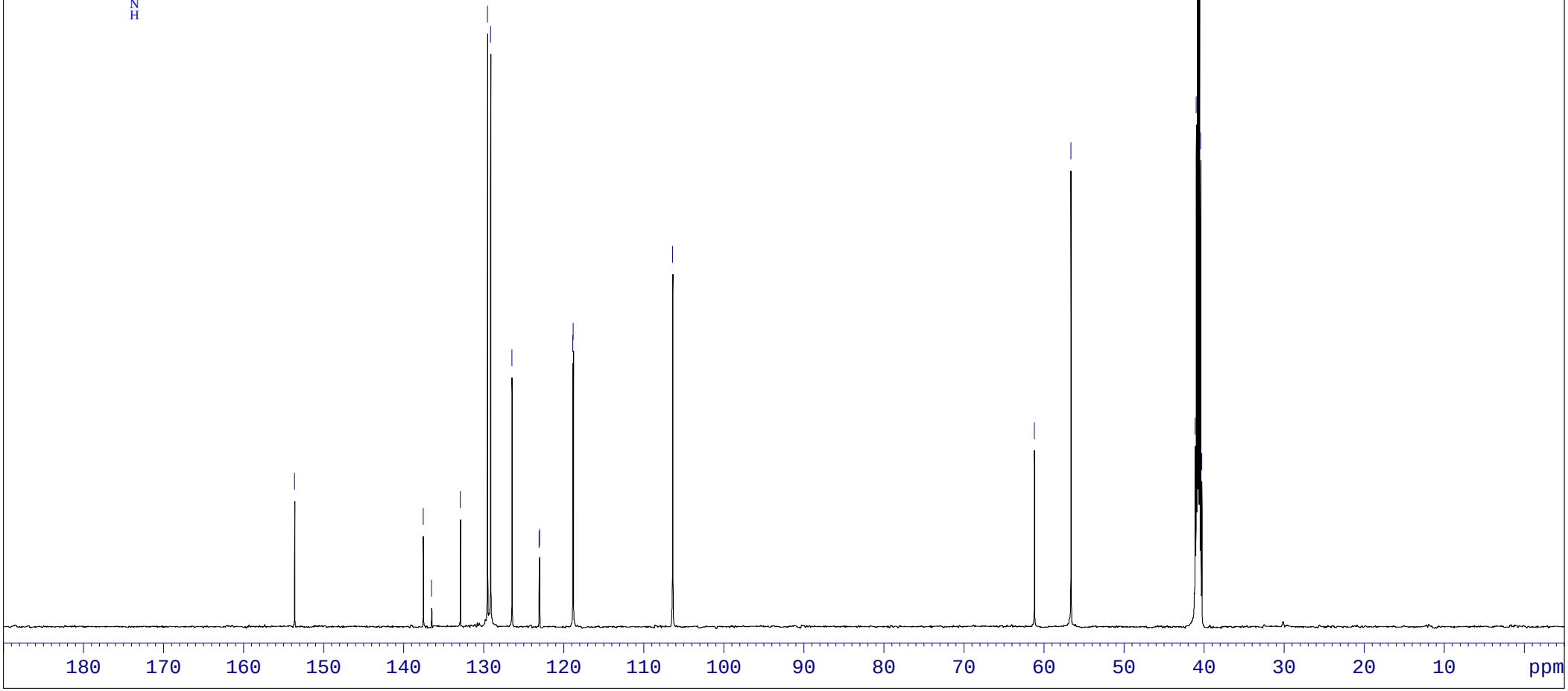
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 17485.1 | 3659.643 | 7.3174 | 0.42 |
| 2 | 17490.8 | 3657.900 | 7.3139 | 0.62 |
| 3 | 17512.9 | 3651.156 | 7.3004 | 1.54 |
| 4 | 17517.4 | 3649.792 | 7.2977 | 1.26 |
| 5 | 17530.6 | 3645.748 | 7.2896 | 1.18 |
| 6 | 17554.5 | 3638.450 | 7.2750 | 1.32 |
| 7 | 17559.9 | 3636.806 | 7.2717 | 0.41 |
| 8 | 17579.7 | 3630.776 | 7.2597 | 7.53 |
| 9 | 17661.9 | 3605.677 | 7.2095 | 0.26 |
| 10 | 17667.1 | 3604.100 | 7.2063 | 0.46 |
| 11 | 17672.8 | 3602.371 | 7.2029 | 0.24 |
| 12 | 17683.2 | 3599.191 | 7.1965 | 0.20 |
| 13 | 17690.2 | 3597.050 | 7.1922 | 0.54 |
| 14 | 17713.4 | 3589.978 | 7.1781 | 0.23 |
| 15 | 18096.6 | 3473.021 | 6.9442 | 0.35 |
| 16 | 18104.3 | 3470.670 | 6.9395 | 0.80 |
| 17 | 18112.4 | 3468.208 | 6.9346 | 0.53 |
| 18 | 18127.8 | 3463.509 | 6.9252 | 0.56 |
| 19 | 18135.7 | 3461.083 | 6.9204 | 0.84 |
| 20 | 18143.3 | 3458.759 | 6.9157 | 0.36 |
| 21 | 18871.3 | 3236.599 | 6.4715 | 4.86 |
| 22 | 23169.1 | 1925.007 | 3.8490 | 8.48 |
| 23 | 23468.3 | 1833.714 | 3.6665 | 14.43 |
| 24 | 23475.6 | 1831.486 | 3.6620 | 0.34 |
| 25 | 23551.7 | 1808.253 | 3.6156 | 0.20 |
| 26 | 26857.0 | 799.577 | 1.5987 | 0.34 |
| 27 | 27422.4 | 627.031 | 1.2537 | 0.60 |
| 28 | 29466.2 | 3.299 | 0.0066 | 0.32 |
| 29 | 29477.0 | 0.002 | 0.0000 | 16.00 |
| 30 | 29487.8 | −3.294 | −0.0066 | 0.32 |

# 10d (NMR/26290191)

153.63
137.55
136.52
132.93
129.54
129.15
126.48
123.09
123.02
118.87
118.83
106.41
61.21
56.64
41.13
40.99
40.85
40.71
40.57
40.43
40.30





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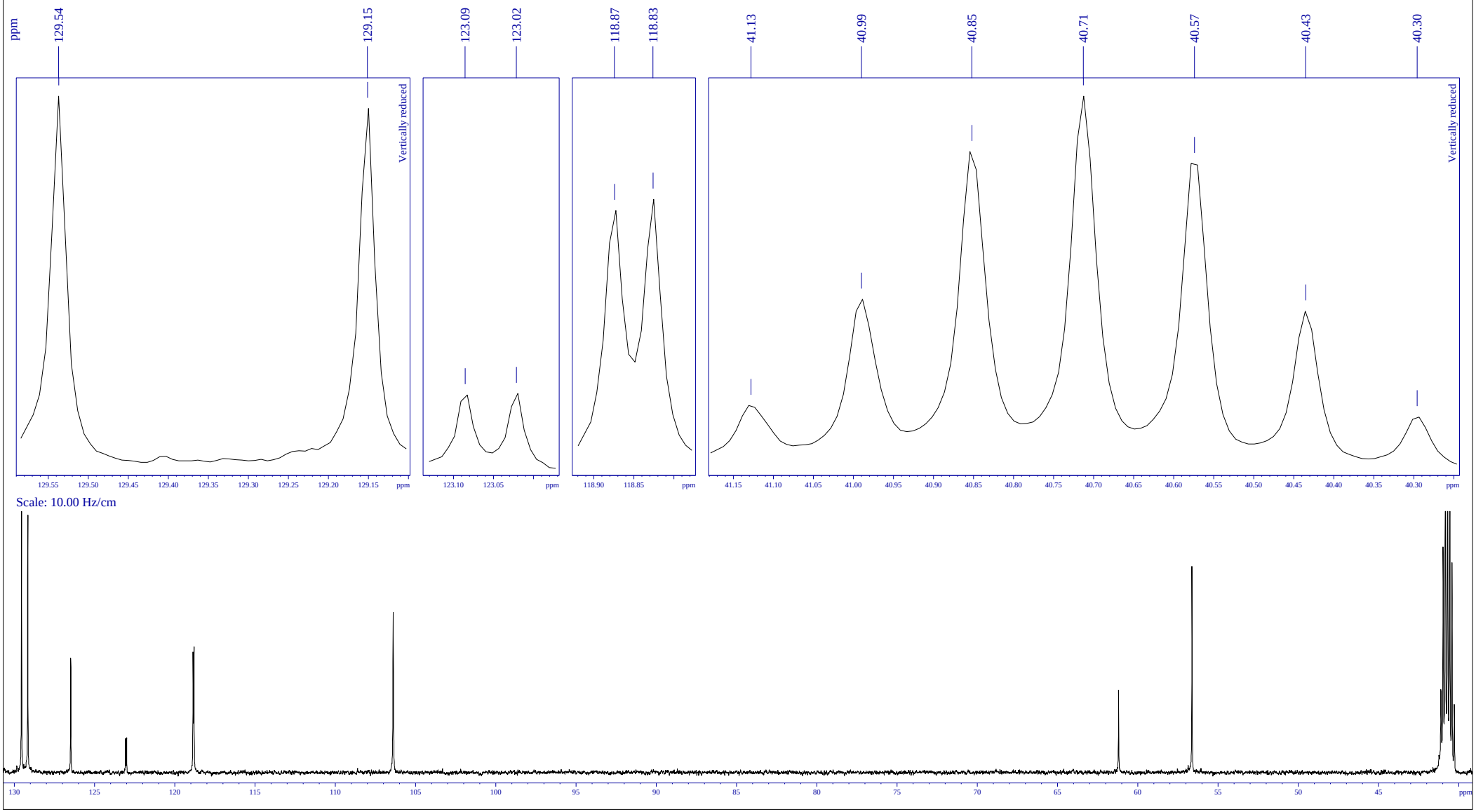
# 10d (NMR/26290191)





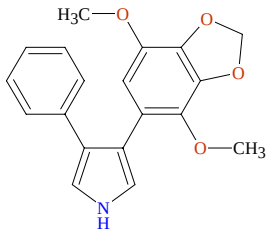
# 10d (NMR/26290191)



Peaks List

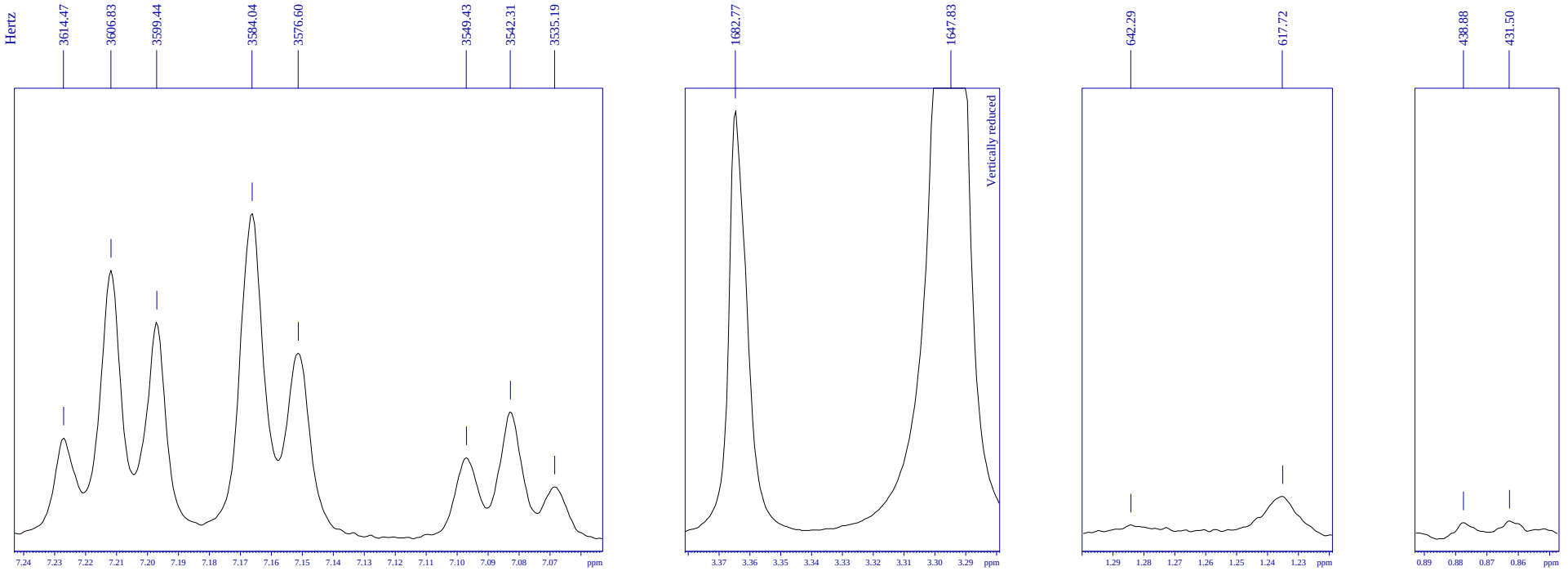
| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 12100.5 | 23183.893 | 153.6347 | 2.53 |
| 2 | 14136.1 | 20757.369 | 137.5547 | 1.79 |
| 3 | 14267.5 | 20600.730 | 136.5166 | 0.46 |
| 4 | 14722.0 | 20058.881 | 132.9259 | 2.09 |
| 5 | 15151.0 | 19547.473 | 129.5369 | 10.68 |
| 6 | 15199.8 | 19489.230 | 129.1510 | 10.40 |
| 7 | 15538.3 | 19085.713 | 126.4769 | 4.74 |
| 8 | 15967.7 | 18573.922 | 123.0854 | 1.41 |
| 9 | 15975.8 | 18564.270 | 123.0214 | 1.42 |
| 10 | 16500.8 | 17938.412 | 118.8740 | 4.90 |
| 11 | 16506.8 | 17931.170 | 118.8260 | 5.08 |
| 12 | 18078.8 | 16057.253 | 106.4080 | 6.46 |
| 13 | 23800.3 | 9236.638 | 61.2092 | 3.44 |
| 14 | 24378.8 | 8547.101 | 56.6398 | 8.37 |
| 15 | 26342.4 | 6206.323 | 41.1280 | 3.38 |
| 16 | 26359.8 | 6185.520 | 40.9901 | 9.09 |
| 17 | 26377.3 | 6164.684 | 40.8520 | 17.19 |
| 18 | 26394.9 | 6143.671 | 40.7128 | 20.00 |
| 19 | 26412.5 | 6122.730 | 40.5740 | 16.85 |
| 20 | 26430.1 | 6101.741 | 40.4349 | 8.43 |
| 21 | 26447.7 | 6080.760 | 40.2959 | 2.76 |

# 10e (NMR/27290008)



# 10e (NMR/27290008)





# 10e (NMR/27290008)



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 11505.1 | 5483.920 | 10.9650 | 1.34 |
| 2 | 17630.9 | 3614.472 | 7.2271 | 1.69 |
| 3 | 17656.0 | 3606.833 | 7.2118 | 4.40 |
| 4 | 17680.2 | 3599.437 | 7.1970 | 3.56 |
| 5 | 17730.6 | 3584.040 | 7.1662 | 5.33 |
| 6 | 17755.0 | 3576.596 | 7.1513 | 3.06 |
| 7 | 17844.1 | 3549.427 | 7.0970 | 1.37 |
| 8 | 17867.4 | 3542.312 | 7.0828 | 2.12 |
| 9 | 17890.7 | 3535.191 | 7.0685 | 0.90 |
| 10 | 18067.6 | 3481.212 | 6.9606 | 3.34 |
| 11 | 18336.8 | 3399.070 | 6.7964 | 3.34 |
| 12 | 19165.5 | 3146.149 | 6.2907 | 5.91 |
| 13 | 19683.5 | 2988.061 | 5.9746 | 11.10 |
| 14 | 23557.1 | 1805.938 | 3.6109 | 17.25 |
| 15 | 23811.7 | 1728.253 | 3.4556 | 0.24 |
| 16 | 23960.7 | 1682.772 | 3.3647 | 15.46 |
| 17 | 24075.2 | 1647.829 | 3.2948 | 45.82 |
| 18 | 25379.6 | 1249.778 | 2.4989 | 15.75 |
| 19 | 27370.2 | 642.286 | 1.2842 | 0.28 |
| 20 | 27450.7 | 617.723 | 1.2351 | 0.74 |
| 21 | 27742.5 | 528.662 | 1.0570 | 0.21 |
| 22 | 28036.7 | 438.882 | 0.8775 | 0.32 |
| 23 | 28060.9 | 431.495 | 0.8628 | 0.35 |
| 24 | 29474.8 | 0.000 | 0.0000 | 2.54 |

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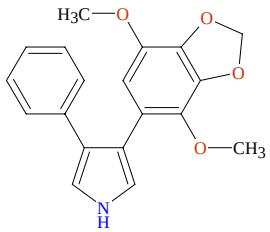
# 10e (NMR/27290008)



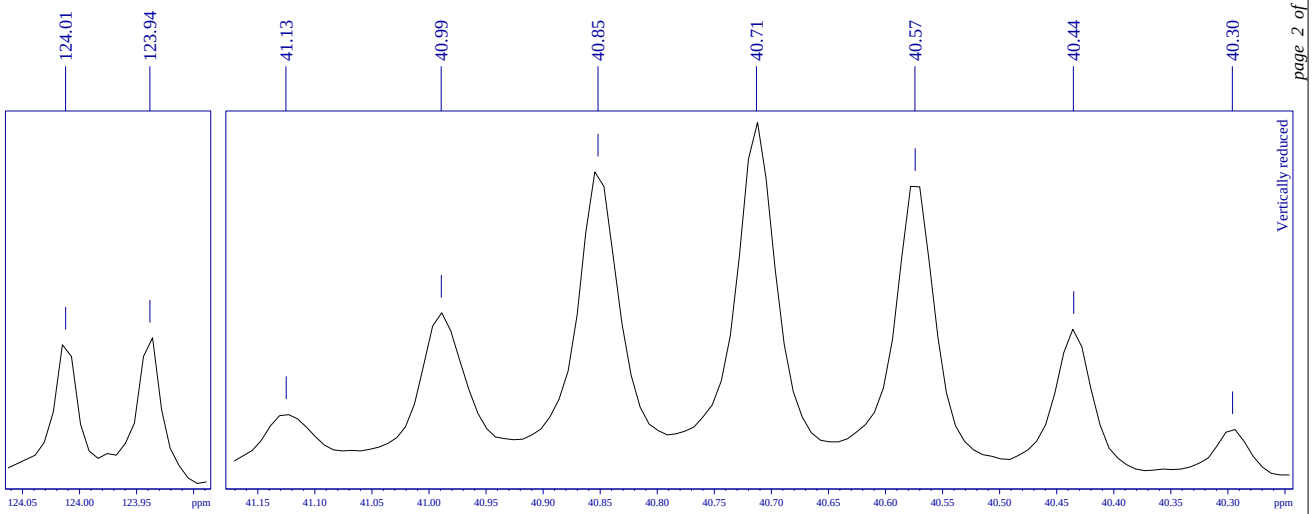

140.05 139.51 138.06 136.81 135.83 129.18 128.15 126.04 124.01 123.94 119.75 118.60 117.50 111.07 102.47 60.09 57.39 41.13 40.99 40.85 40.71 40.57 40.44 40.30



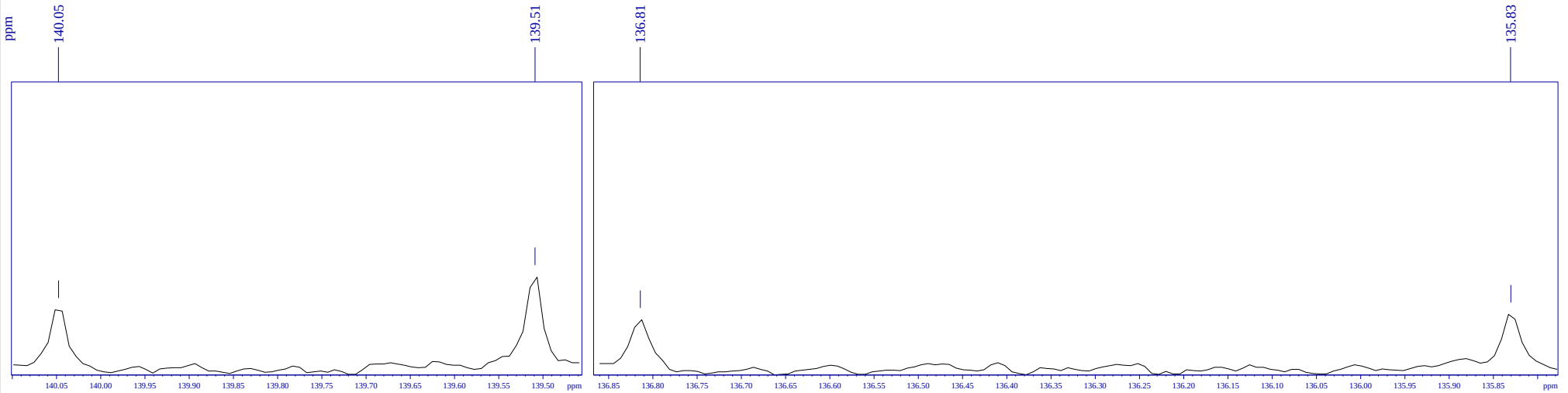
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

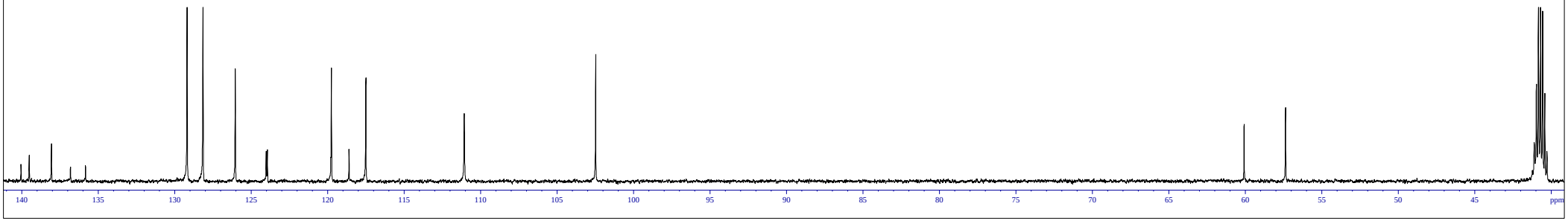
# 10e (NMR/27290008)






Scale: 10.00 Hz/cm



# 10e (NMR/27290008)



Peaks List

| # | Address [points] | Frequency [Hz] | [ppm] | Intensity [cm] |
|---|---|---|---|---|
| 1 | 13820.5 | 21133.576 | 140.0477 | 1.05 |
| 2 | 13888.7 | 21052.281 | 139.5090 | 1.60 |
| 3 | 14072.5 | 20833.188 | 138.0571 | 2.35 |
| 4 | 14229.8 | 20645.639 | 136.8142 | 0.84 |
| 5 | 14354.3 | 20497.158 | 135.8303 | 0.94 |
| 6 | 15195.6 | 19494.291 | 129.1845 | 13.75 |
| 7 | 15326.7 | 19337.967 | 128.1486 | 14.00 |
| 8 | 15594.1 | 19019.205 | 126.0362 | 6.69 |
| 9 | 15850.4 | 18713.771 | 124.0122 | 1.83 |
| 10 | 15859.7 | 18702.619 | 123.9383 | 1.91 |
| 11 | 16389.8 | 18070.678 | 119.7505 | 6.76 |
| 12 | 16535.9 | 17896.514 | 118.5964 | 1.90 |
| 13 | 16674.6 | 17731.139 | 117.5005 | 6.33 |
| 14 | 17488.9 | 16760.424 | 111.0678 | 4.01 |
| 15 | 18577.0 | 15463.384 | 102.4725 | 7.51 |
| 16 | 23941.6 | 9068.289 | 60.0936 | 3.56 |
| 17 | 24283.9 | 8660.148 | 57.3890 | 4.36 |
| 18 | 26342.7 | 6205.895 | 41.1251 | 2.30 |
| 19 | 26359.9 | 6185.375 | 40.9892 | 5.75 |
| 20 | 26377.3 | 6164.663 | 40.8519 | 10.68 |
| 21 | 26394.9 | 6143.691 | 40.7129 | 12.26 |
| 22 | 26412.5 | 6122.721 | 40.5740 | 10.36 |
| 23 | 26430.1 | 6101.764 | 40.4351 | 5.19 |
| 24 | 26447.7 | 6080.758 | 40.2959 | 1.80 |