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Supporting Information

Pd/Mannose promoted tandem cross coupling-nitro reduction: Expedient synthesis of aminobiphenyls and aminostilbenes

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Characterization data of the synthesized compounds.

Biphenyl-3-ylamine (3a): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.64-7.59 (m, 2H), 7.50-7.43 (m, 2H), 7.39-7.24 (m, 2H), 7.04 (d, *J* = 7.8 Hz, 1H), 6.94 (s, 1H), 6.72 (d, *J* = 7.8 Hz, 1H), 3.73 (s, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 146.75, 142.48, 141.41, 129.72, 128.68, 127.26,127.15, 117.72, 114.13, 113.94; MS (ESI) *m/z* 170 $[M+H]^+$; HRMS Calculated for $C_{12}H_{12}N$ 170.0964; Found: 170.0970 $[M + H]^+$.

4-Ethyl-biphenyl-3-ylamine (3b): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.48 (d, *J* = 8.1 Hz, 2H), 7.26-7.18 (m, 3H), 6.98 (d, *J* = 7.5 Hz, 1H), 6.89 (s, 1H), 6.66 (d, *J* = 7.8 Hz, 1H), 3.73 (s, 2H), 2.69 (q, *J* = 7.5 Hz, 2H), 1.27 (t, *J* = 7.5 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 146.64, 143.34, 142.42, 138.75, 129.63, 128.16, 127.02, 117.60, 113.59, 113.80, 28.52, 15.89; MS (ESI) *m/z* 198 $[M+H]^+$; HRMS Calculated for $C_{14}H_{16}N^+$ 198.1277; Found: 198.1285 $[M + H]^+$.

3-Naphthalen-1-yl-phenylamine (3c): ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.06-7.92 (m, 4H), 7.93 (d, *J* = 7.8 Hz, 1H), 7.54 (s, 2H), 7.31 (t, *J* = 7.8 Hz, 1H), 7.17 (d, *J* = 6.6 Hz, 1H), 7.08 (s, 1H), 6.75 (d, *J* = 7.2 Hz, 1H), 3.82 (s, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 146.86, 142.36, 138.77, 133.67, 132.68, 129.81, 128.29, 128.22, 127.66, 126.25, 125.87, 125.73, 125.68, 117.98, 114.25, 114.16; MS (ESI) *m/z* 219 $[M+H]^+$; HRMS Calculated for $C_{16}H_{13}N^+$ 220.1121; Found: 220.1132 $[M + H]^+$.

4'-Methoxy-biphenyl-3-ylamine (3d): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.28-7.22 (m, 2H), 7.18-7.13 (m, 1H), 6.86-6.76 (m, 4H), 6.69 (d, *J* = 8.1 Hz, 1H), 3.81 (s, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 146.77, 143.49, 140.62, 130.22, 129.76, 128.36, 127.83, 119.32, 118.52, 115.71, 115.52, 113.93; MS (ESI) *m/z* 184 $[M+H]^+$; HRMS Calculated for $C_{12}H_{12}N_2^+$ 185.1073; Found: 185.1075 $[M + H]^+$.

[1,1'-Biphenyl]-2-amine (3e): ^{1}H NMR (300 MHz, DMSO): δ 7.51-7.42 (m, 4H), 7.41-7.37 (m, 1H), 7.24-7.17 (m, 2H), 6.91-6.81 (m, 2H), 3.70 (s, 2H); ^{13}C NMR (75 MHz, CDCl3): δ 143.36, 139.53, 130.49, 129.13, 128.84, 128.53, 127.78, 127.21, 118.80, 115.73; MS (ESI) *m/z* 170 $[M+H]^+$; HRMS Calculated for $C_{12}H_{11}N$ 170.0964; Found: 170.0970 $[M + H]^+$.

4'-Ethyl-biphenyl-4-ylamine (3f): ^{1}H NMR (300MHz, $CDCl_3$): δ 7.51 (d, *J* = 7.8 Hz, 2H), 7.45 (d, J = 8.1Hz, 2H), 7.28 (d, *J* = 7.8 Hz, 2H), 6.79 (d, *J* = 8.4 Hz, 2H), 3.74 (s, 2H), 2.72 (q, *J* = 7.5 Hz, 2H), 1.32 (t, *J* = 7.5 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 145.60, 142.34, 138.60, 131.65, 128.22, 127.88, 126.37, 115.43, 28.50, 15.68; MS (ESI) *m/z* 198$[M+H]^+$; HRMS Calculated for $C_{14}H_{16}N^+$ 198.1277; Found: 198.1285 $[M + H]^+$.

2-Methoxy-biphenyl-3-ylamine (3g): ^{1}H NMR (300 MHz, CD_3CN): δ 7.36-7.30 (m, 1H), 7.28-7.25 (m, 1H), 7.12 (t, *J* = 7.5 Hz, 1H), 7.10-6.99 (m, 2H), 6.75 (d, *J* = 7.2 Hz, 2H), 6.63-6.60 (m, 1H), 4.15 (s, 2H), 3.79 (s, 3H), ^{13}C NMR (75 MHz, $CDCl_3$): δ 156.47, 145.99, 139.64, 130.90, 128.88, 128.48, 120.72, 120.14, 116.50, 113.93, 111.21, 55.59, MS (ESI) *m/z* 199 $[M+H]^+$; HRMS Calculated for $C_{13}H_{14}NO$ 200.1069; Found: 200.1072 $[M + H]^+$.

2,5-Dimethoxy-biphenyl-3-ylamine (3h): ^{1}H NMR (300 MHz, CD_3CN): δ 7.01(t, *J* = 7.2 Hz, 1H), 6.88 (d, *J* = 9 Hz, 1H), 6.87 (d, *J* = 3 Hz, 1H), 6.75 (s, 1H), 6.67-6.64 (m, 2H), 6.53-6.49 (m, 1H), 4.04 (s, 2H), 3.66 (s, 3H), 3.61 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 153.68, 150.80, 146.06, 139.50, 131.92, 128.94, 119.99, 116.56, 116.37, 114.07, 113.11, 112.77, 56.42, 55.80; MS (ESI) *m/z* 230 $[M+H]^+$; HRMS Calculated for $C_{14}H_{15}NO_2$ 230.1175; Found: 230.1183 $[M + H]^+$.

4-Napthyl amine (3i): ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.06 (s, 1H), 7.94-7.89 (m, 3H), 7.76 (d, *J* = 8.7 Hz, 1H), 7.54-7.52 (m, 2H), 7.32 (t, *J* = 7.5 Hz, 1H), 7.17 (d, *J* = 7.8 Hz, 1H), 7.07 (s, 1H), 6.75 (d, *J* = 7.2 Hz, 1H), 3.81(s, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 146.85, 142.35, 133.65, 132.67, 129.82, 128.22, 127.66, 126.25, 125.87, 125.73, 125.68, 117.98, 114.25; MS (ESI) *m/z* 219 $[M+H]^+$; HRMS Calculated for $C_{16}H_{13}N^+$ 220.1121; Found: 220.1132 $[M + H]^+$.

2,5-Dimethoxy-biphenyl-4-ylamine (3j): ^{1}H NMR (300 MHz, CD_3CN): δ 7.16 (d, *J* = 8.1 Hz, 2H), 6.85 (d, *J* = 8.4 Hz, 1H), 6.75-6.69 (m, 2H), 6.57 (d, *J* = 8.1 Hz, 2H), 4.11 (s, 2H), 3.66(s, 3H), 3.62 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 152.73, 149.79, 144.52, 130.75, 129.34, 127.53, 115.35, 113.73, 111.63, 111.18, 55.31, 54.74 ; MS (ESI) *m/z* 230 $[M+H]^+$; HRMS Calculated for $C_{14}H_{15}NO_2$ 230.1175; Found: 230.1181 $[M + H]^+$.

4'-Ethoxy-[1,1'-biphenyl]-3-amine (3k): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.51 (d, *J* = 8.1 Hz, 2H), 7.29-7.26 (m, 2H), 7.22 (d, *J* = 7.8 Hz, 1H), 7.01 (d, *J* = 7.8 Hz, 1H), 6.92 (s, 1H), 6.69 (d, *J* = 7.8 Hz, 1H), 3.76 (s, 2H), 2.71 (q, *J* = 7.5 Hz, 2H), 1.30 (t, *J* = 7.5 Hz, 3H), ^{13}C NMR (75 MHz, $CDCl_3$): δ 146.66, 143.35, 142.42, 138.75, 129.63, 128.17, 127.02, 117.60, 113.86, 113.80, 28.52, 15.59. MS (ESI) *m/z* 213 $[M+H]^+$; HRMS Calculated for $C_{14}H_{16}NO^+$ 214.1226; Found: 214.1225 $[M + H]^+$.

2'-Methyl-biphenyl-3-ylamine (3l): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.29-7.27 (m, 2H), 7.25-7.22 (m, 3H), 6.78 (d, *J* = 7.2 Hz, 1H), 6.70 (d, *J* = 11.2 Hz, 2H), 3.72 (s, 2H), 2.34 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 146.13, 143.17, 142.17, 135.37, 130.24, 129.62, 128.98, 127.16, 125.66, 119.75, 116.05, 113.61, 20.49; MS (ESI) *m/z* 184 $[M+H]^+$; HRMS Calculated for $C_{13}H_{14}N^+$ 184.1120; Found: 184.1127 $[M + H]^+$.

Biphenyl-4,3-diamine (3m): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.41-7.21 (m, 3H), 6.97-6.64 (m, 5H), 3.61 (s, 4H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 146.64, 145.81, 142.38, 131.73, 129.59, 127.96, 127.31, 117.05, 115.31, 113.26; MS (ESI) *m/z* 185 $[M+H]^+$; HRMS Calculated for $C_{12}H_{13}N_2^+$ 185.1073; Found: 185.1076 $[M + H]^+$.

[1,1'-Biphenyl]-3,3'-diamine (3n): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.20 (t, *J* = 7.8Hz, 2H), 6.96 (d, *J* = 7.2 Hz, 2H), 6.88 (s, 2H), 6.68-6.65 (m, 2H), 3.71 (s, 4H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 146.60, 142.63, 129.56, 117.69, 114.10, 113.93; MS (ESI) *m/z* 184 $[M+H]^+$; HRMS Calculated for $C_{12}H_{12}N_2^+$ 185.1073; Found: 185.1076 $[M + H]^+$.

4'-Fluoro-biphenyl-2-ylamine (3o): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.32-7.27 (m, 2H), 7.06-6.96 (m, 4H), 6.71 (t, *J* = 7.5 Hz, 1H), 6.64 (d, *J* = 8.1 Hz, 1H), 3.62 (s, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 163.70, 160.44, 143.55, 135.45 (d, *J* = 3.15 Hz), 130.81 (d, *J* = 7.95 Hz), 130.52, 128.71, 126.65, 118.78, 115.89-115.61 (m); MS (ESI) *m/z* 188 $[M+H]^+$; HRMS Calculated for $C_{12}H_{11}FN^+$ 188.0870; Found: 188.0874 $[M + H]^+$.

4-Fluorobiphenyl-3-ylamine (3p): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.42-7.38 (m, 2H), 7.16-7.08 (m, 1H), 6.99 (t, *J* = 8.7 Hz, 2H), 6.82 (d, *J* = 7.2 Hz, 1H), 6.73 (s, 1H), 6.57-6.55 (m, 1H), 3.54 (s, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 164.02, 160.76, 146.88, 141.38, 137.48, 129.78, 128.62 (d, *J* = 7.88 Hz), 117.39, 115.48 (d, *J* = 24.23 Hz), 113.71 (d, *J* = 30 Hz); MS (ESI) *m/z* 188 $[M+H]^+$; HRMS Calculated for $C_{12}H_{11}FN^+$ 188.0870; Found: 188.0875 $[M + H]^+$.

N-(3'-Amino-biphenyl-4-yl)-acetanilide (3q): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.55-7.46 (m, 5H), 7.20 (t, *J* = 7.8 Hz, 1H), 6.95 (d, *J* = 7.8 Hz, 1H), 6.86 (s, 1H), 6.65 (d, *J* = 7.8 Hz, 1H), 3.70 (s, 2H), 2.19 (s, 3H), ^{13}C NMR (75 MHz, $CDCl_3$): δ 168.71, 146.75,

141.83, 137.44, 137.10, 129.72, 127.55, 120.14, 117.37, 114.00, 113.58, 24.60; MS (ESI) *m/z* 227 $[M+H]^+$; HRMS Calculated for $C_{14}H_{14}N_2O^+$ 227.1184; Found: 227.1184 $[M+H]^+$.

3′-Amino-3-methyl-biphenyl-4-carbonitrile (3r): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.55 (d, *J* = 7.8, 1H), 7.37 (t, *J* = 10.5, 2H), 7.19-7.14 (m, 1H), 6.88 (d, *J* = 7.5 Hz, 1H), 6.80 (s, 1H), 6.66 (d, *J* = 7.2Hz, 1H), 3.51 (s, 2H), 2.51 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 146.89, 147.77, 142.23, 140.56, 132.84, 129.99, 128.84, 124.96, 118.40, 117.64, 115.27, 113.75, 111.18, 20.67; MS (ESI) *m/z* 209 $[M+H]^+$; HRMS Calculated for $C_{14}H_{13}N_2^+$ 209.1073; Found: 209.1075 $[M+H]^+$.

3′-Amino-[1,1′-biphenyl]-4-carbonitrile (3s): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.70-7.61 (m, 4H), 7.27-7.22 (m, 1H), 6.95 (d, 7.5 Hz, 1H), 6.87 (s, 1H), 6.73 (d, *J* = 7.8 HZ, 1H), 3.81 (s, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 148.47, 147.35, 141.78, 133.88, 131.46, 129.09, 120.41, 118.95, 116.73, 115.06, 112.19; MS (ESI) *m/z* 194 $(M + H)^+$; HRMS Calculated for $C_{13}H_{11}N_2^+$ 195.0917; Found: 195.0921 $[M+H]^+$.

3-(1H-Indol-5-yl)-phenylamine (3t): ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.18 (s, 1H), 7.83 (s, 1H), 7.41-7.38 (m, 2H), 7.25-7.20 (m, 2H), 7.06 (d, *J* = 7.8 Hz, 1H), 6.97 (d, *J* = 1.5 Hz, 1H), 6.66-6.59 (m, 2H), 3.76 (s, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 146.60, 143.79, 135.33, 129.56, 128.29, 124.80, 121.90, 119.17, 118.08, 114.32, 113.32, 111.12, 102.99; MS (ESI) *m/z* 208 $[M+H]^+$; HRMS Calculated for $C_{14}H_{13}N_2^+$ 209.1073; Found: 209.1071 $[M+H]^+$.

3-Styrylaniline (6a): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.50 (d, *J* = 7.2 Hz, 2H), 7.35 (t, *J* = 7.2 Hz, 1H), 7.23-7.10 (m, 2H), 7.05 (d, *J* = 3 Hz, 2H), 6.99-6.92 (m, 1H), 6.86 (s, 1H), 6.58 (d, *J* = 15.3 Hz, 1H), 3.71 (s, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): 146.75, 138.53, 137.53,

129.70, 128.98, 128.78, 128.66, 127.66, 126.61, 117.46, 114.82, 113.02; MS (ESI) *m/z* 196 $[M+H]^+$; HRMS Calculated for $C_{14}H_{14}N^+$ 196.1121 Found: 196.1126 $[M+H]^+$.

3-(2-Naphthalen-2-yl-vinyl)-phenylamine (6b): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.84-7.71 (m, 6H), 7.47-7.41 (m, 2H), 7.21-7.12 (m, 2H), 6.98 (d, *J* = 7.5 Hz, 1H), 6.89 (s, 1H), 6.64−6.61 (d, *J* = 7.5 Hz, 1H), 3.71 (s, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 146.69, 138.45, 134.92, 133.73, 133.02, 129.64, 129.23, 128.64, 128.29, 127.99, 127.70, 126.56, 126.32, 125.86, 123.56, 117.39, 114.77, 112.94; MS (ESI) *m/z* 246 $[M+H]^+$; HRMS Calculated for $C_{18}H_{16}N^+$ 246.1277; Found: 246.1282 $[M+H]^+$.

2-(2-Naphthalen-2-yl-vinyl)-phenylamine (6c): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.88 (d, *J* = 8.4 Hz, 4H), 7.79 (d, *J* = 8.4 Hz, 1H), 7.53-7.51 (m, 3H), 7.35 (d, *J* = 15.9 Hz, 1H), 7.29-7.16 (m, 2H), 6.90 (t, *J* = 7.2 Hz, 1H), 6.78 (d, *J* = 8.1 Hz, 1H), 3.76 (s, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 144.10, 135.17, 133.78, 133.05, 130.35, 128.80, 128.37, 128.05, 127.76, 127.26, 126.48, 126.42, 125.94, 124.59, 123.94, 123.58, 119.28, 116.41; MS (ESI) *m/z* 246 $[M+H]^+$; HRMS Calculated for $C_{18}H_{16}N^+$ 246.1277; Found: 246.1286 $[M+H]^+$.

4-Styryl-phenylamine (6d): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.51 (d, *J* = 7.8 Hz, 2H), 7.39-7.34 (m, 4H), 7.28-7.22 (m, 1H), 7.06 (d, *J* = 16.2 Hz, 1H), 6.95 (d, *J* = 16.2 Hz, 1H), 6.71 (d, *J* = 7.2Hz 2H), 3.77 (s, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 146.17, 137.97, 128.70, 128.62, 128.05, 127.77, 126.91, 126.12, 125.13, 115.22; MS (ESI) *m/z* 196 $[M+H]^+$; HRMS Calculated for $C_{14}H_{14}N^+$ 196.1121 Found: 196.1128 $[M+H]^+$.

3-[2-(4-Tert-Butyl-phenyl)-vinyl]-phenylamine (6e): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.45 (d, *J* = 8.4 Hz, 2H), δ 7.37 (d, *J* = 8.7 Hz, 2H), 7.17-7.08 (m, 1H), 7.02 (d, *J* = 7.8 Hz, 2H), 6.95-6.91 (m, 1H), 6.84 (s, 1H), 6.61-6.58 (m, 1H), 3.68 (s, 2H), 1.29 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 150.70, 146.62, 138.64, 134.65, 129.54, 128.35, 128.11, 126.23, 125.59, 117.26, 114.50, 112.83, 34.62, 31.30; MS (ESI) *m/z* 252 $[M+H]^+$; HRMS Calculated for $C_{18}H_{21}N^+$ 252.1747; Found: 252.1758 $[M+H]^+$.

3-[2-(2,5-Dimethyl-phenyl)-vinyl]-phenylamine (6f): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.42 (s, 1H), 7.28 (t, *J* = 8.7 Hz, 1H), 7.18 (t, *J* = 7.8 Hz, 1H), 7.09 (d, *J* = 7.5 Hz, 1H), 7.01 (d, *J* = 6.9 Hz, 1H), 6.96 (d, *J* = 4.8 Hz, 1H), 6.89 (d, *J* = 5.7 Hz, 2H), 6.63 (d, *J* = 7.8 Hz, 1H), 3.78 (s, 2H), 2.19 (s, 6H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 140.65, 138.85, 136.18, 125.51, 132.76, 130.30, 129.84, 129.58, 128.29, 126.47, 125.94, 117.38, 114.60, 112.88, 21.08, 19.45; MS (ESI) *m/z* 224 $[M+H]^+$; HRMS Calculated for $C_{16}H_{18}N^+$ 224.1445; Found: 224.1453 $[M+H]^+$.

2-[2-(2,5-Dimethyl-phenyl)-vinyl]-phenylamine (6g): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.44-7.39 (m, 1H), 7.38 (s, 1H), 7.28 (s, 1H), 7.18-7.16 (m, 1H), 7.14-7.12 (m, 1H), 7.08 (d, *J* = 4.5 Hz, 1H), 7.03 (d, *J* = 6.00 Hz, 1H), 6.84 (t, *J* = 7.5 Hz, 1H), 6.77-6.71 (m, 1H), 3.82 (s, 2H), 2.26 (s, 6H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 143.98, 136.44, 135.58, 132.73, 130.33, 128.61, 128.47, 128.34, 127.34, 125.99, 125.28, 124.32, 119.13, 116.18, 21.07, 19.44; MS (ESI) *m/z* 224 $[M+H]^+$; HRMS Calculated for $C_{16}H_{18}N^+$ 224.1445; Found: 224.1453 $[M+H]^+$.

3-[2-(4-Methoxy-phenyl)-vinyl]-phenylamine (6h): ^{1}H NMR (300 MHz, CD_3CN): δ 7.51 (d, *J* = 8.7 Hz, 2H), 7.11 (d, *J* = 5.7 Hz, 1H), 7.07 (d, *J* = 3 Hz, 1H), 6.99 (s, 1H), 6.96 (s, 1H), 6.93 (s, 1H), 6.85 (d, *J* = 7.5 Hz, 2H), 6.58-6.55 (m, 1H), 4.18 (s, 3H), 3.82 (s, 1H);

^{13}CNMR (75 MHz, CDCl3): δ 159.05, 147.96, 138.22, 129.91, 129.06, 127.33, 127.12, 126.58, 115.27, 113.81, 113.43, 111.66, 54.65; MS (ESI) *m/z* 225 $[M+H]^+$; HRMS Calculated for $C_{15}H_{16}NO^+$ 226.1226; Found: 226.1234 $[M+H]^+$.

2-[2-(4-Methoxy-phenyl)-vinyl]-phenylamine (6i): ^{1}H NMR (300 MHz, CD_3CN): δ 7.58-7.53 (m, 2H), 7.46-7.41 (m, 1H), 7.18-7.11 (m, 1H), 7.07-7.02 (m, 2H), 6.99-6.94 (m, 2H), 6.75-6.71 (m, 2H), 4.34 (s, 2H), 3.83 (s, 3H); ^{13}C NMR (75 MHz, CD_3CN): δ 158.94, 144.93, 130.34, 127.94, 127.33, 125.80, 122.58, 121.79, 117.52, 117.00, 115.42, 113.75, 54.64; MS (ESI) *m/z* 225 $[M+H]^+$; HRMS Calculated for $C_{15}H_{16}NO^+$ 226.1226; Found: 226.1234 $[M+H]^+$.

1-{4-[2-(3-Amino-phenyl)-vinyl]-phenyl}-ethanone (6j): ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.53 (d, *J* = 8.7 Hz, 2H), 7.42 (d, *J* = 7.2 Hz, 1H), 7.17-7.10 (m, 4H), 7.01 (s, 1H), 6.84 (t, *J* = 7.5 Hz, 1H), 6.77-6.73 (m, 1H), 3.84 (s, 2H), 2.34 (s, 3H); ^{13}C NMR (75 MHz, CDCl3): δ 169.60, 150.02, 143.97, 135.49, 130.76, 129.29, 128.78, 128.05, 127.23, 124.56, 123.76, 121.84, 119.25, 116.36, 115.44, 21.17; MS (ESI) *m/z* 254 $[M+H]^+$; HRMS Calculated for $C_{16}H_{16}NO_2^+$ 254.1175; Found: 254.1183 $[M+H]^+$.

2-(4-nitrophenyl)-2,3-dihydrofuran (6'): ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.22 (d, *J* = 8.4 Hz, 2H), 7.51 (d, *J* = 8.4 Hz, 2H), 6.48 (d, *J* = 2.1 Hz, 1H), 5.61 (t, *J* = 10.2 Hz, 1H), 4.99 (d, *J* = 2.4Hz, 1H), 3.17 (t, *J* = 14.7 Hz, 1H), 2.55 (q, *J* = 6.00 Hz, 1H), ^{13}C NMR (75 MHz, $CDCl_3$): δ 150.49, 145.13, 126.20, 123.86, 99.05, 81.00, 71.54, 38.01, 29.69.

2-Nitro-1,1'-biphenyl (7a) : ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.88 (d, *J* = 8.1 Hz, 1H), 7.65 (t, *J* = 7.5Hz, 1H), 7.53-7.44 (m, 5H), 7.39-7.34 (m, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 149.31, 137.40, 136.35, 132.31, 131.98, 128.71, 128.25, 128.19, 127.91, 124.09.

3-Nitro-1,1'-biphenyl (7b) : ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.47 (d, *J* = 1.8 Hz, 1H), 8.23-8.21 (m, 1H), 7.95-7.92 (m, 1H), 7.66-7.60 (m, 3H), 7.55-7.44 (m, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 148.73, 142.87, 138.66, 133.06, 129.74, 129.19, 128.57, 127.17, 122.04, 121.95.

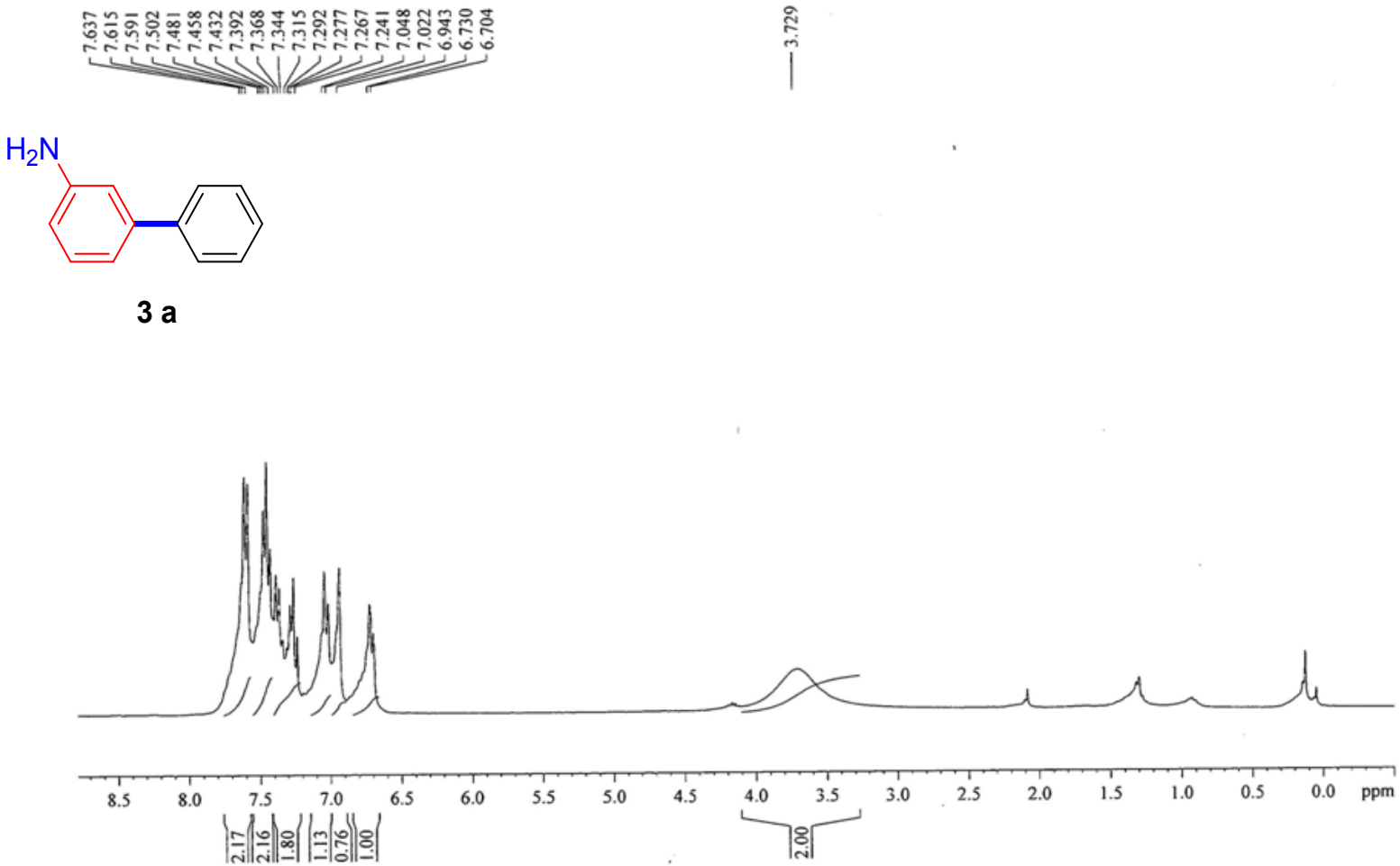
4-Nitro-1,1'-biphenyl (7c) : ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.32 (d, *J* = 8.7 Hz, 2H), 7.76 (d, *J* = 8.7 Hz, 2H), 7.67-7.64 (m, 2H), 7.56-7.47 (m, 3H); ^{13}C NMR (75 MHz, CDCl3): δ 147.64, 147.08, 138.77, 129.18, 128.94, 127.81, 127.40, 124.12.

3-Methyl-3'-nitro-1,1'-biphenyl (7d): ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.45 (t, *J* = 1.8 Hz, 1H), 8.21-8.18 (m, 1H), 7.94-7.91 (m, 1H), 7.61 (t, *J* = 8.4 Hz, 1H), 7.45-7.40 (m, 3H), 7.28 (t, *J* = 6 Hz, 1H), 2.48 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 148.68, 142.98, 138.91, 138.61, 133.07, 129.67, 129.32, 129.09, 127.90, 124.26, 121.94, 121.91, 21.53.

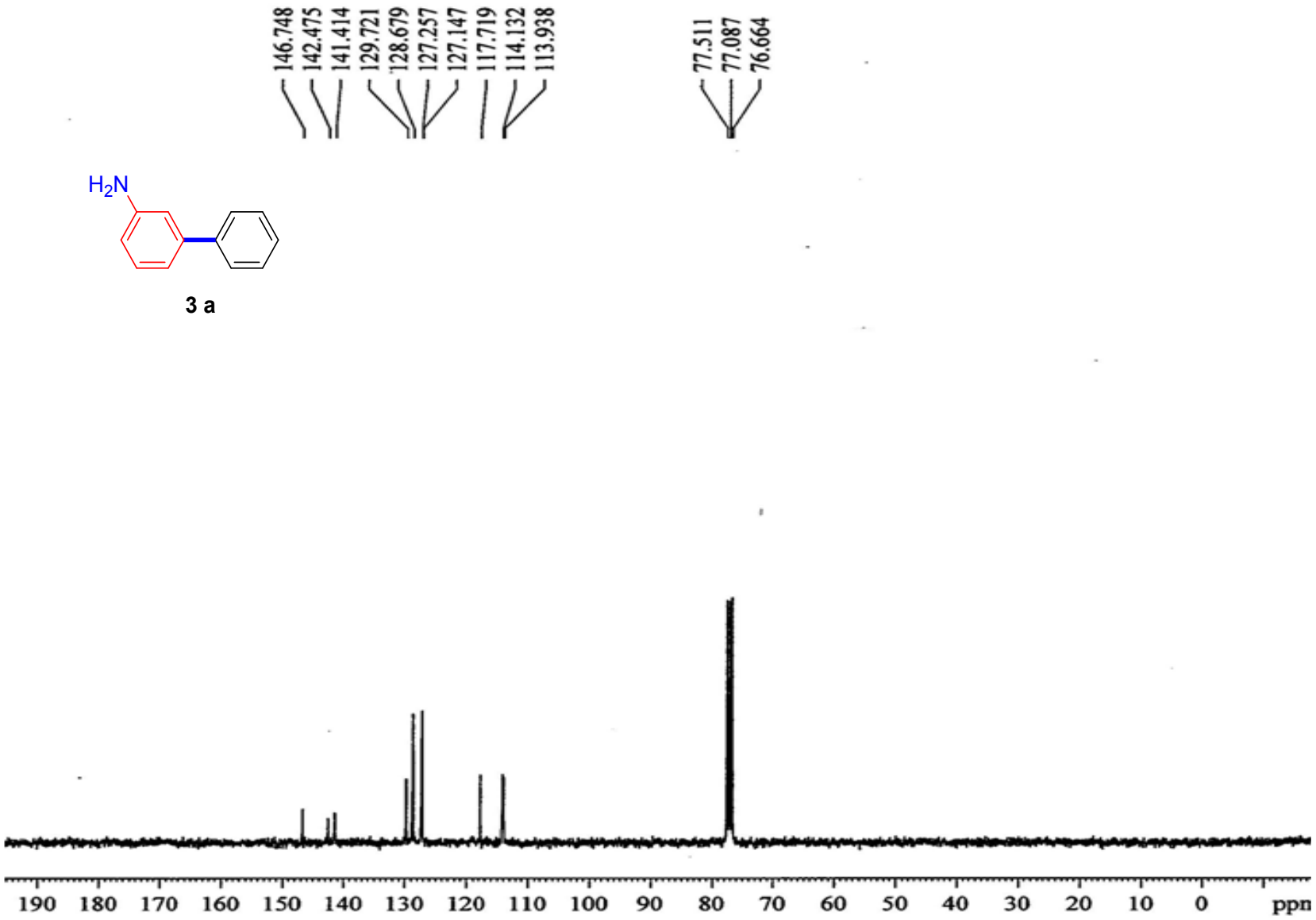
1-(3'-Nitro-[1,1'-biphenyl]-4-yl)ethanone (7e): ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.02 (d, *J* = 8.4 Hz, 2H), 7.93 (d, *J* = 8.1 Hz, 1H), 7.67 (t, *J* = 6.9 Hz, 1H), 7.57-7.40 (m, 4H), 2.63 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 197.53, 148.88, 142.36, 136.58, 135.43, 132.72, 131.76, 128.97, 128.67, 128.24, 124.42, 26.70.

3'-Nitro-[1,1'-biphenyl]-4-carbonitrile (7f): ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.51-8.48 (m, 1H), 8.30 (d, *J* = 7.5 Hz, 1H), 8.01-7.94 (m, 1H), 7.83-7.68 (m, 5H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 148.85, 143.53, 143.01,140.83, 133.10, 132.90, 130.24, 127.96, 127.91, 123.35, 122.15, 118.42, 112.40.

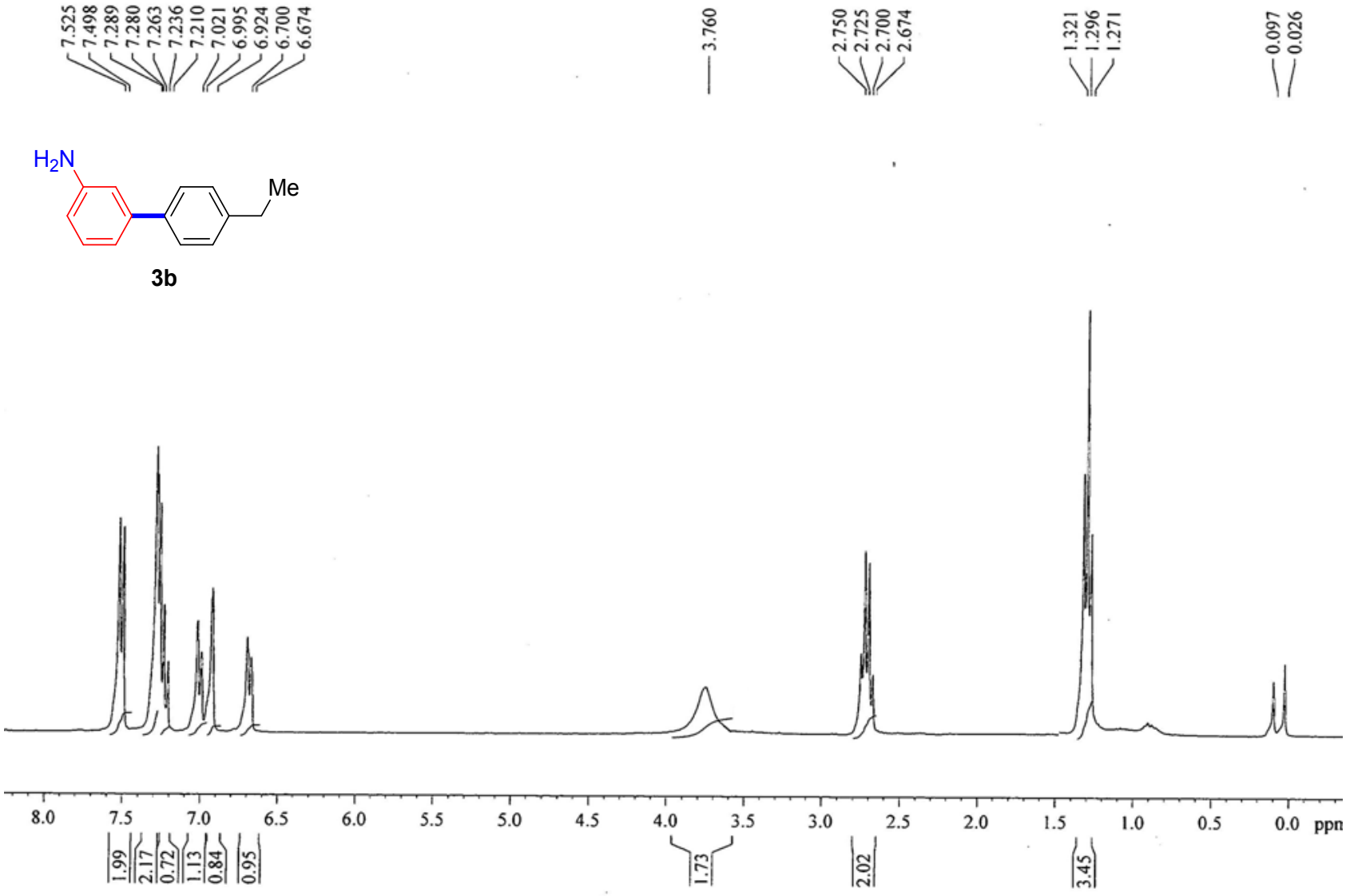
1. Copies of ^{1}H NMR and ^{13}C NMR spectra



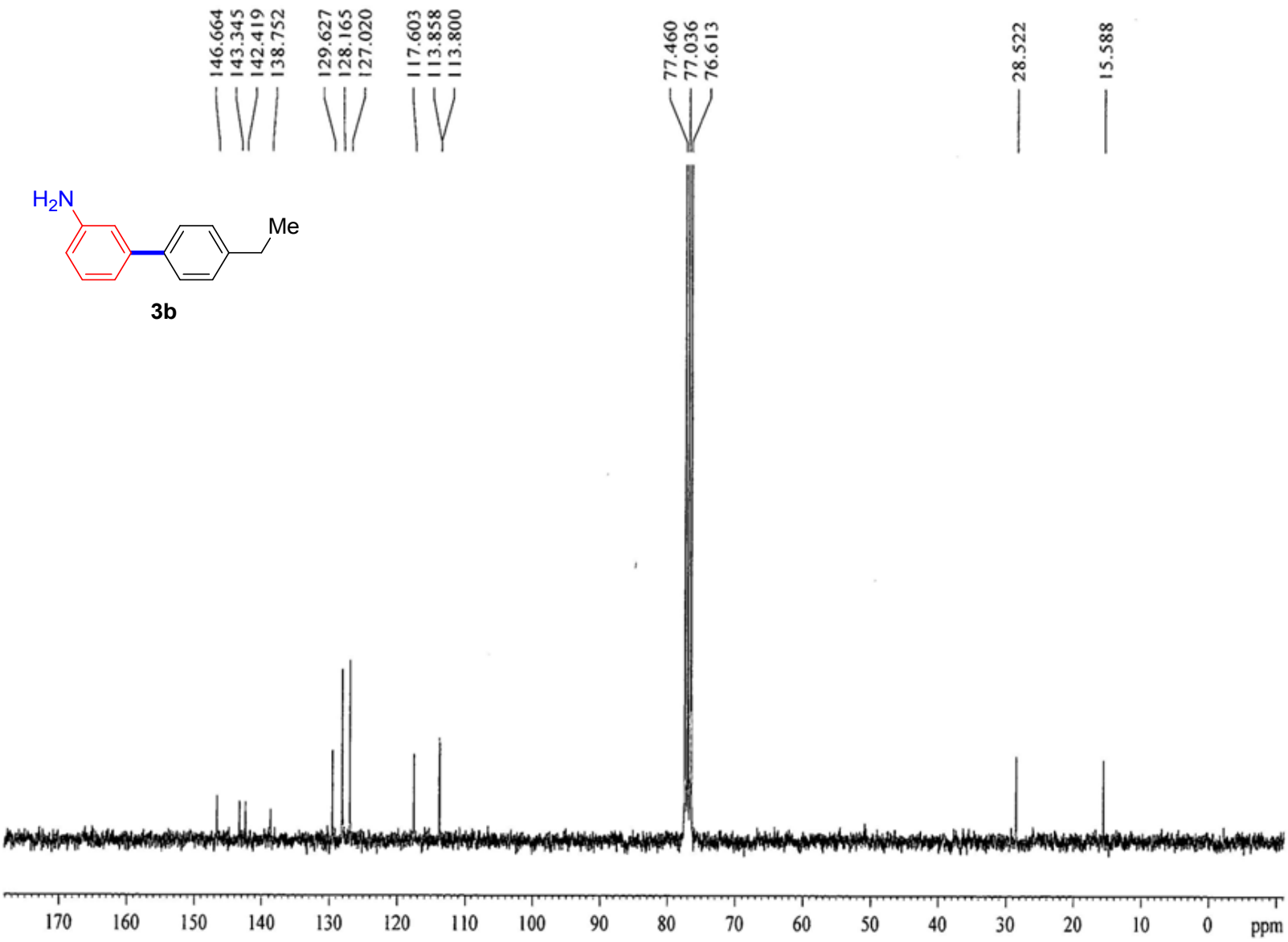
Spectrum1. 300 MHz ^{1}H NMR of compound **3a**



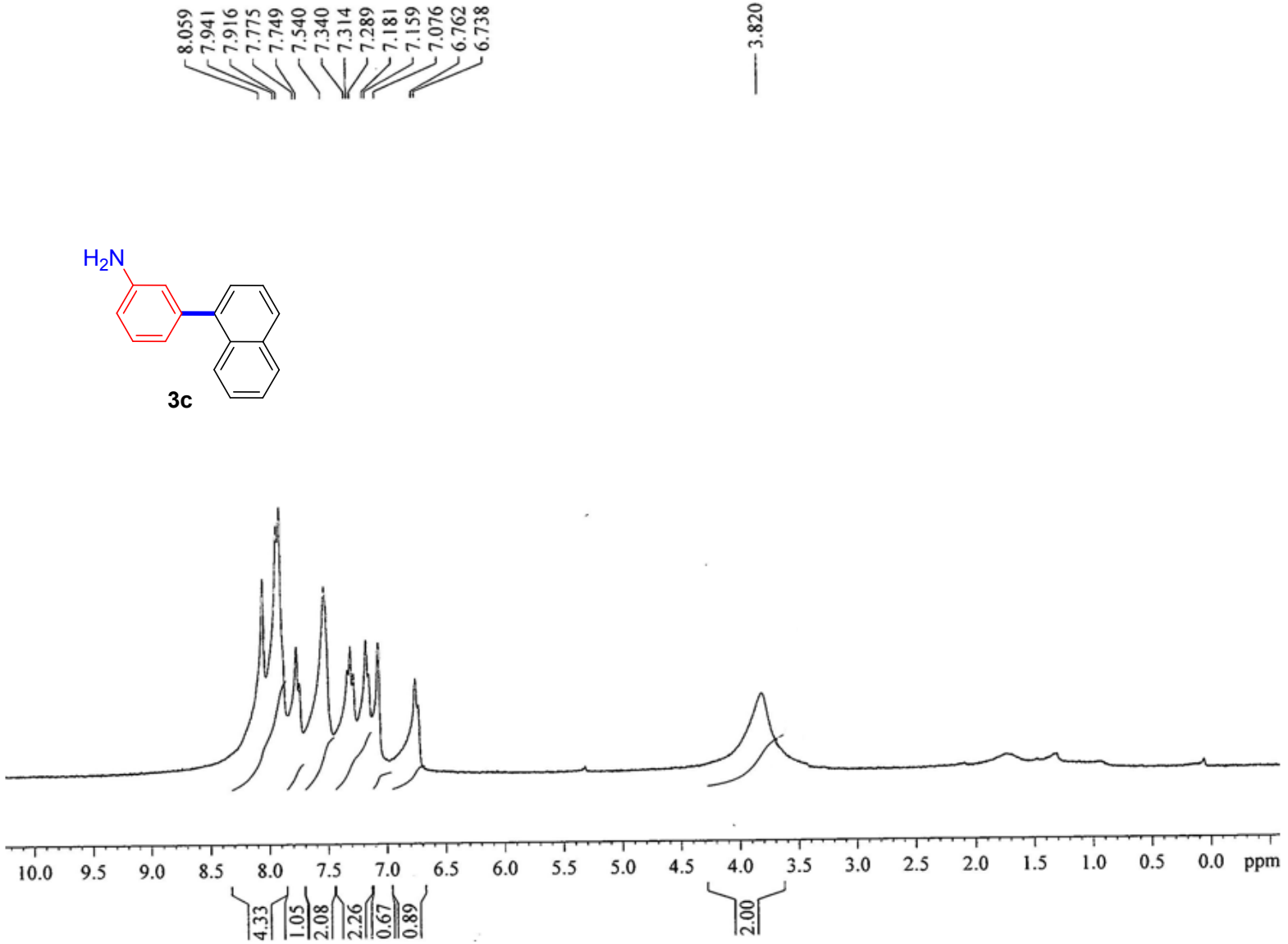
Spectrum 2. 75 MHz ^{13}C NMR of compound **3a**



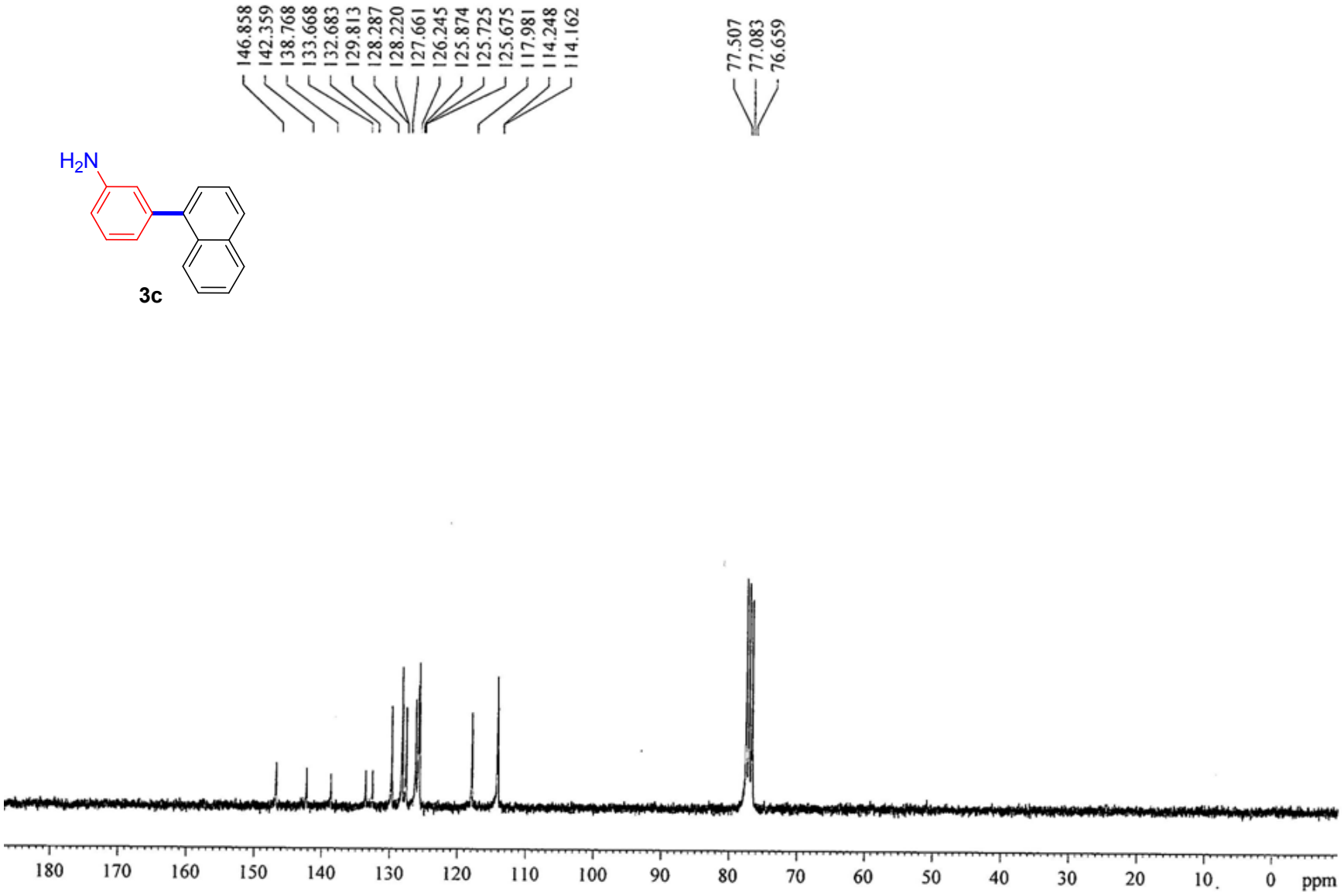
Spectrum3. 300 MHz ^{1}H NMR of compound **3b**



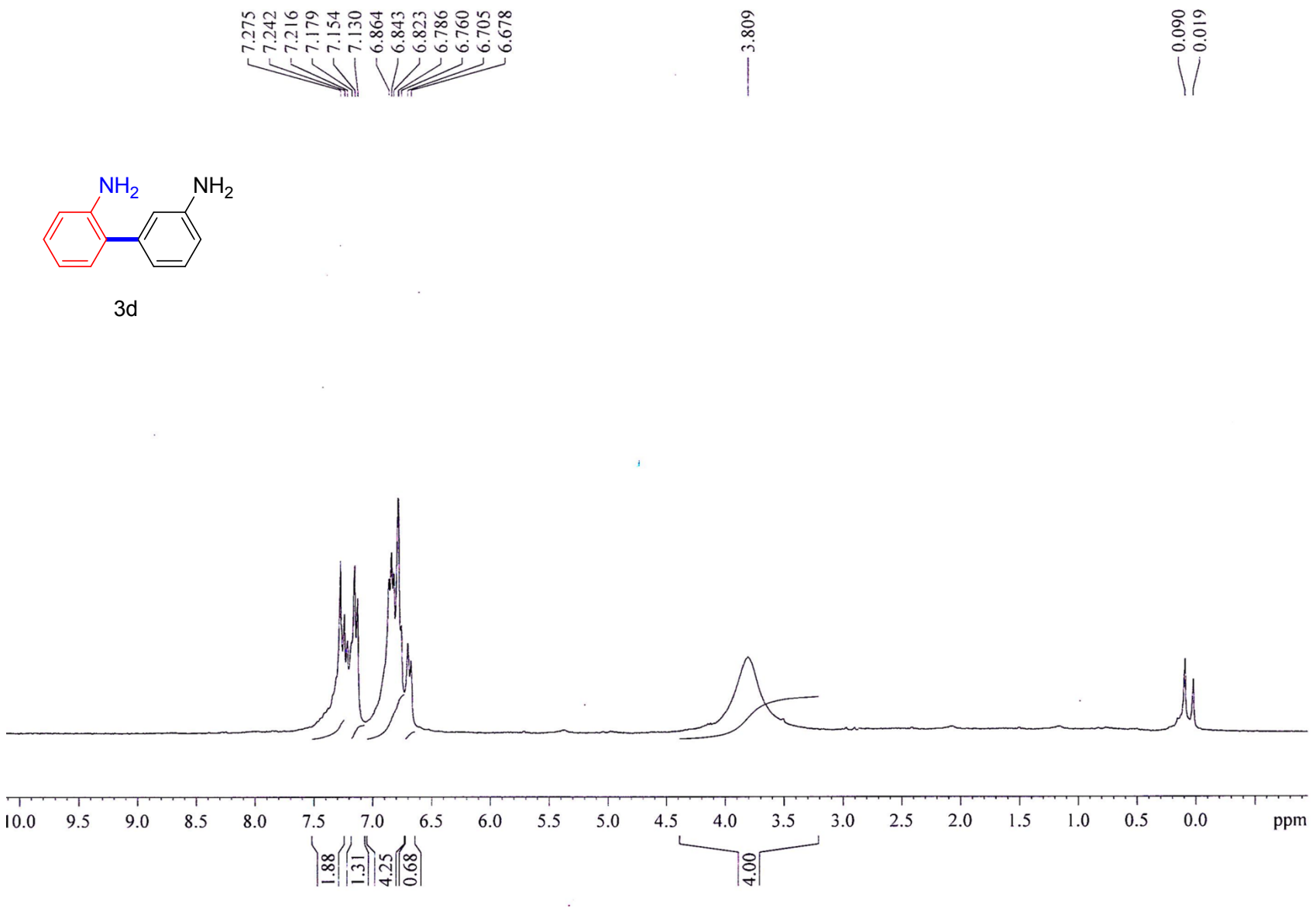
Spectrum4. 75 MHz ^{13C} NMR of compound **3b**



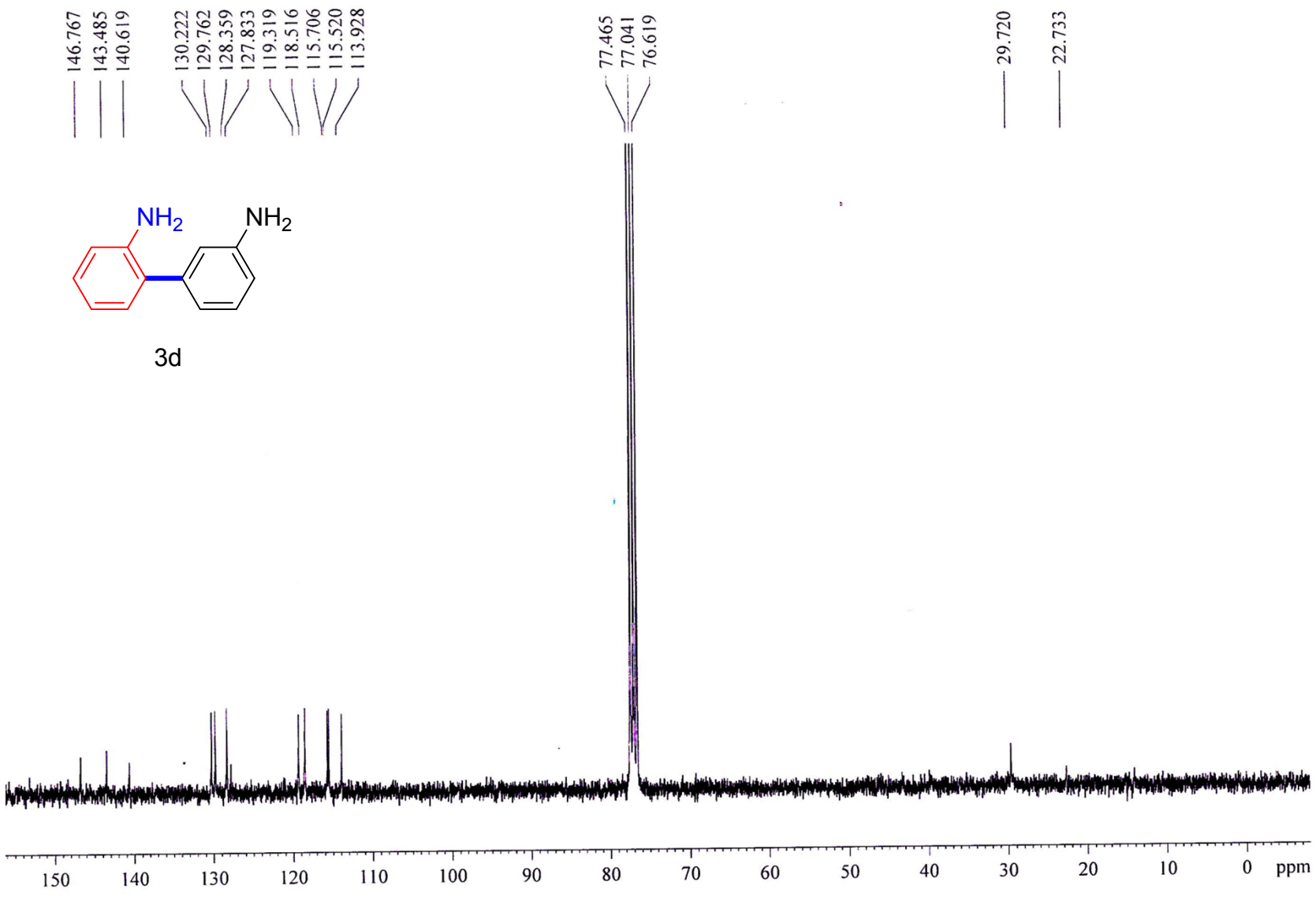
Spectrum5. 300 MHz ^{1}H NMR of compound **3c**



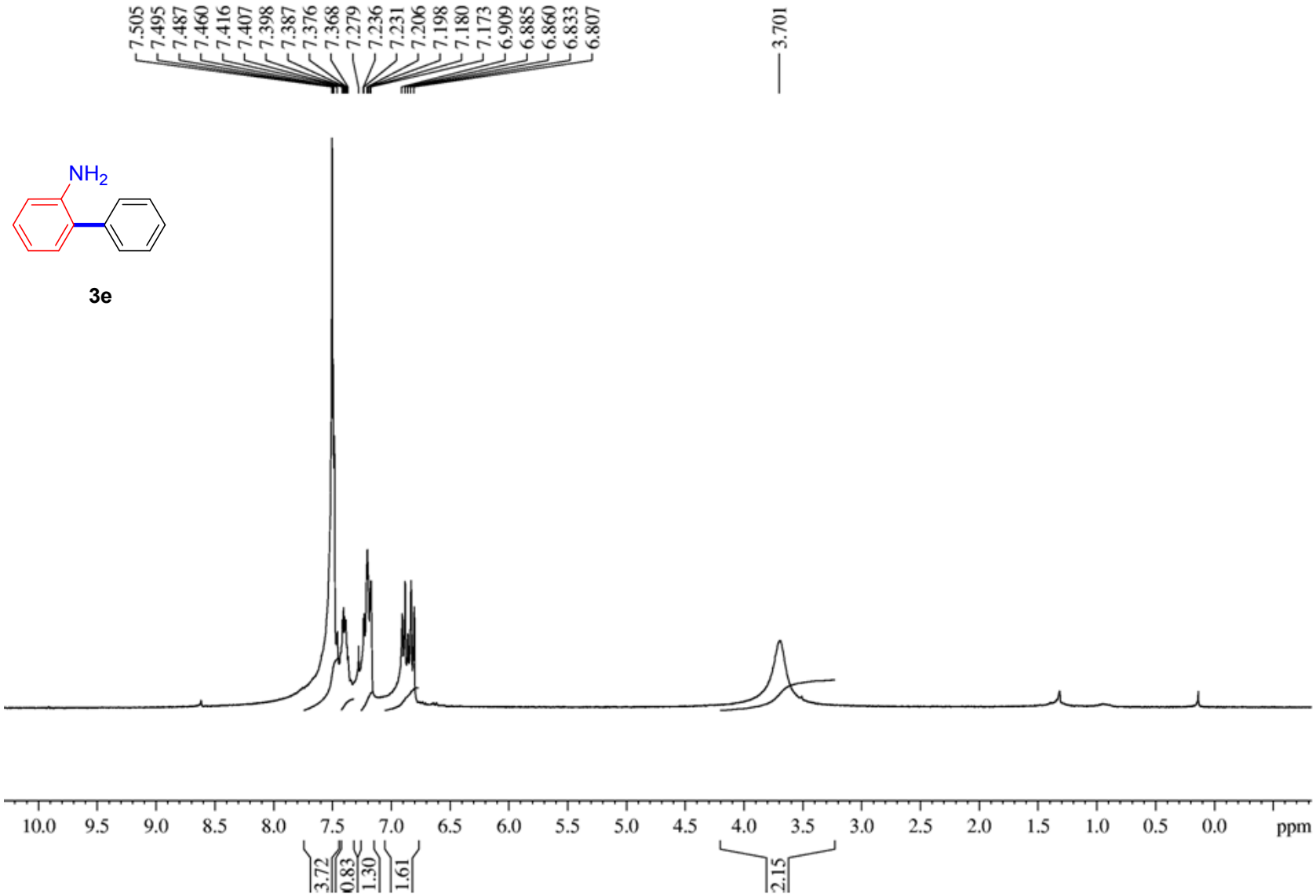
Spectrum6. 75 MHz ^{13C} NMR of compound **3c**



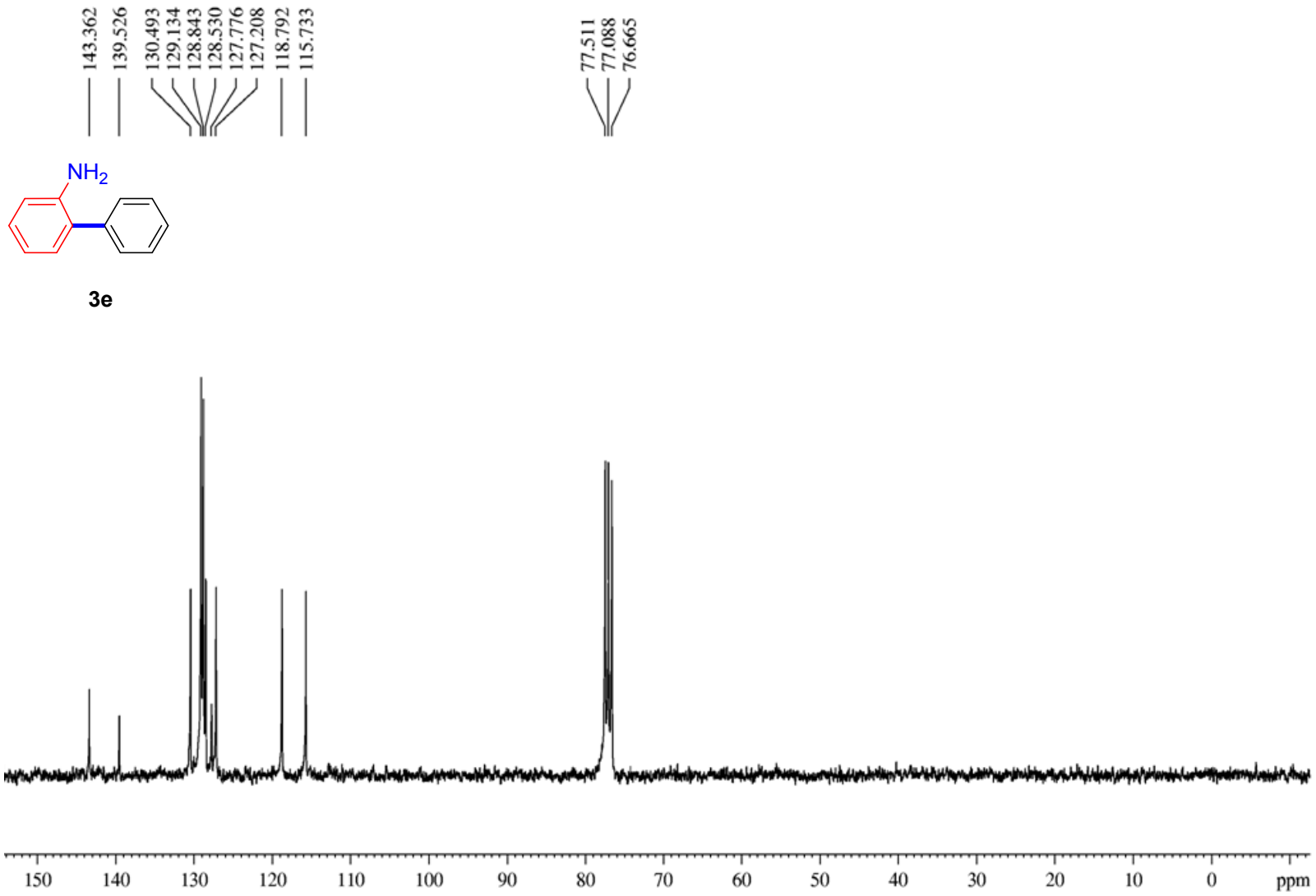
Spectrum7. 300 MHz ^{1}H NMR of compound **3d**



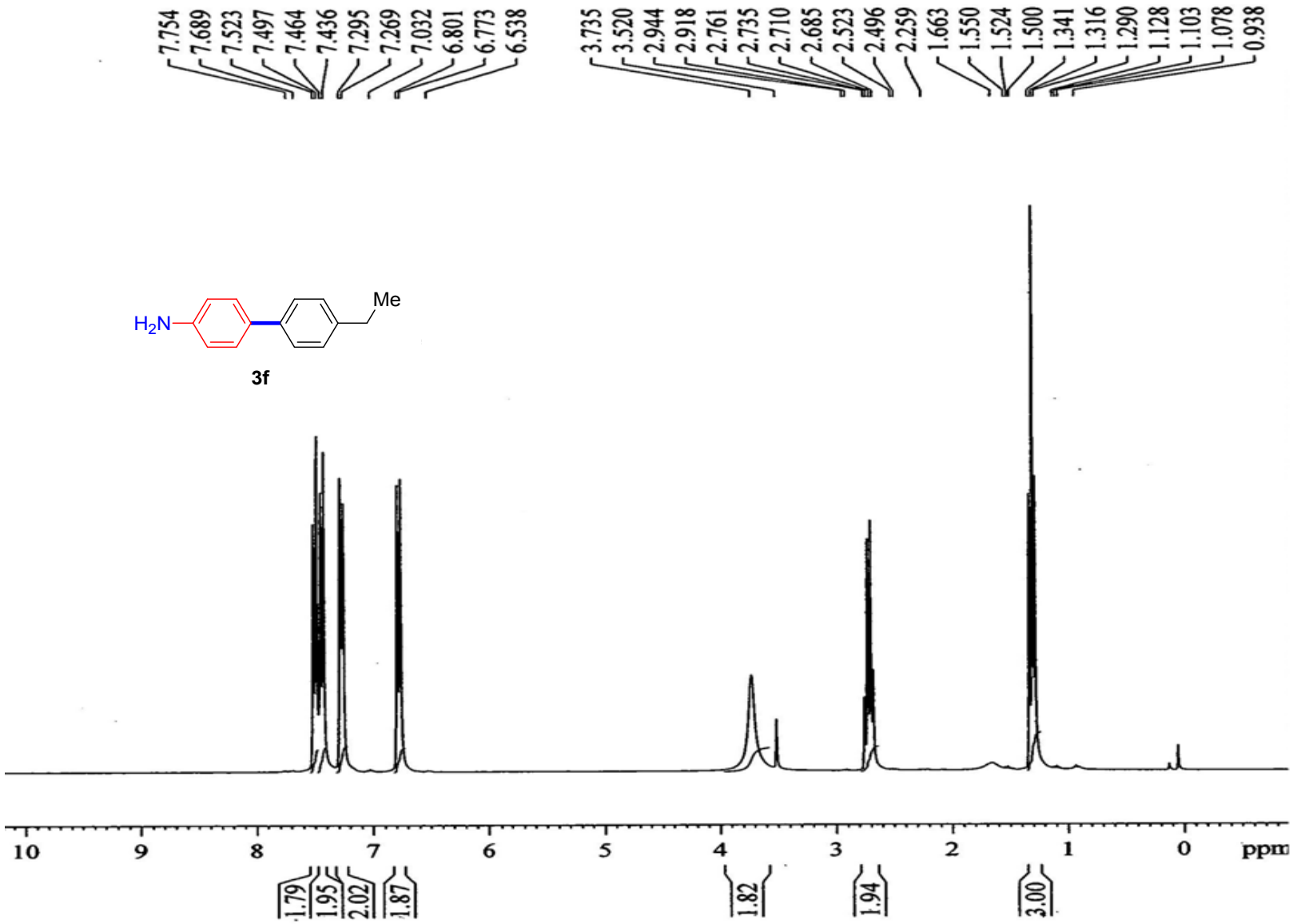
Spectrum8. 75 MHz ^{13}CNMR of compound **3d**



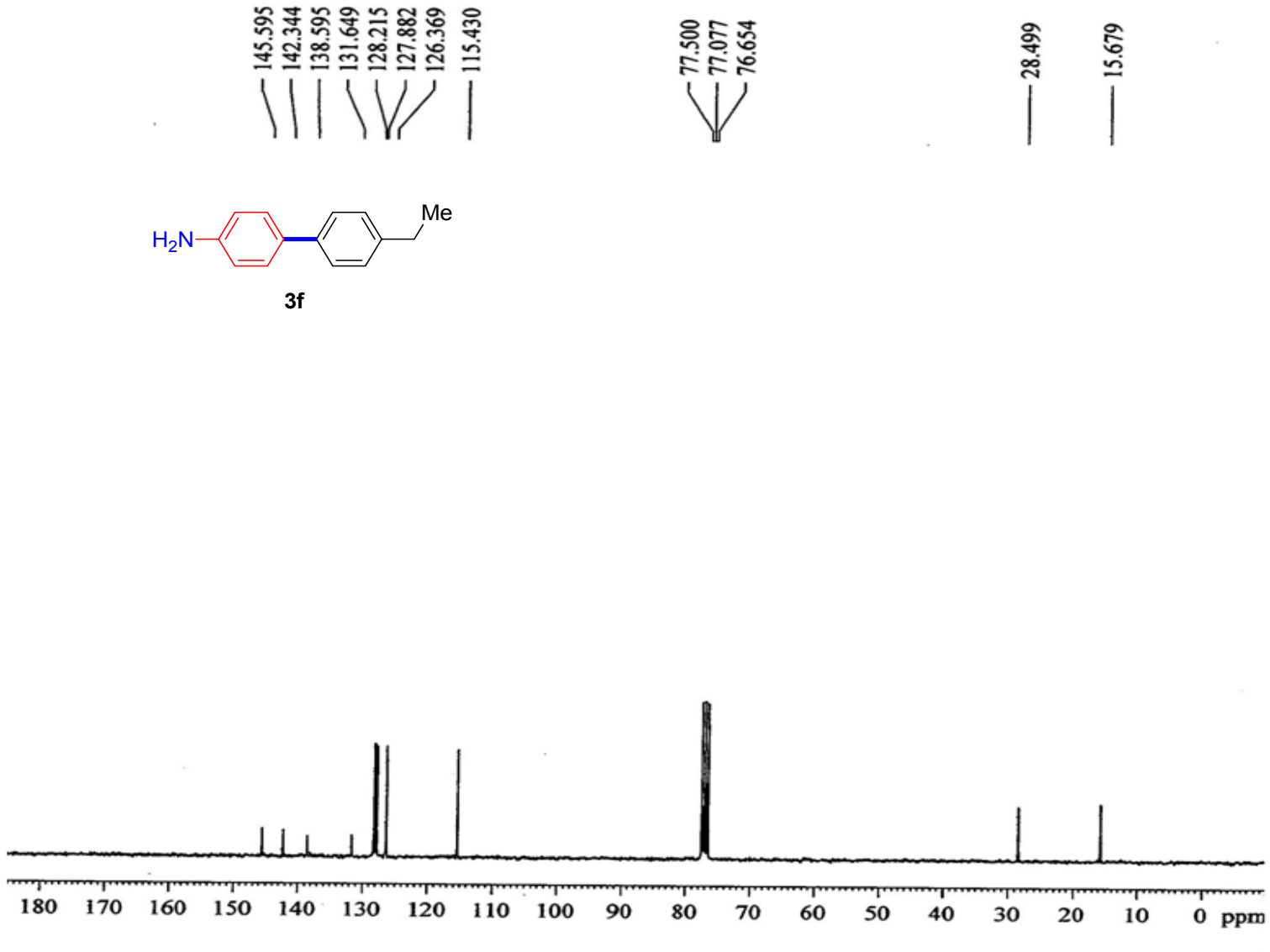
Spectrum9. 300 MHz ^{1}H NMR of compound **3e**



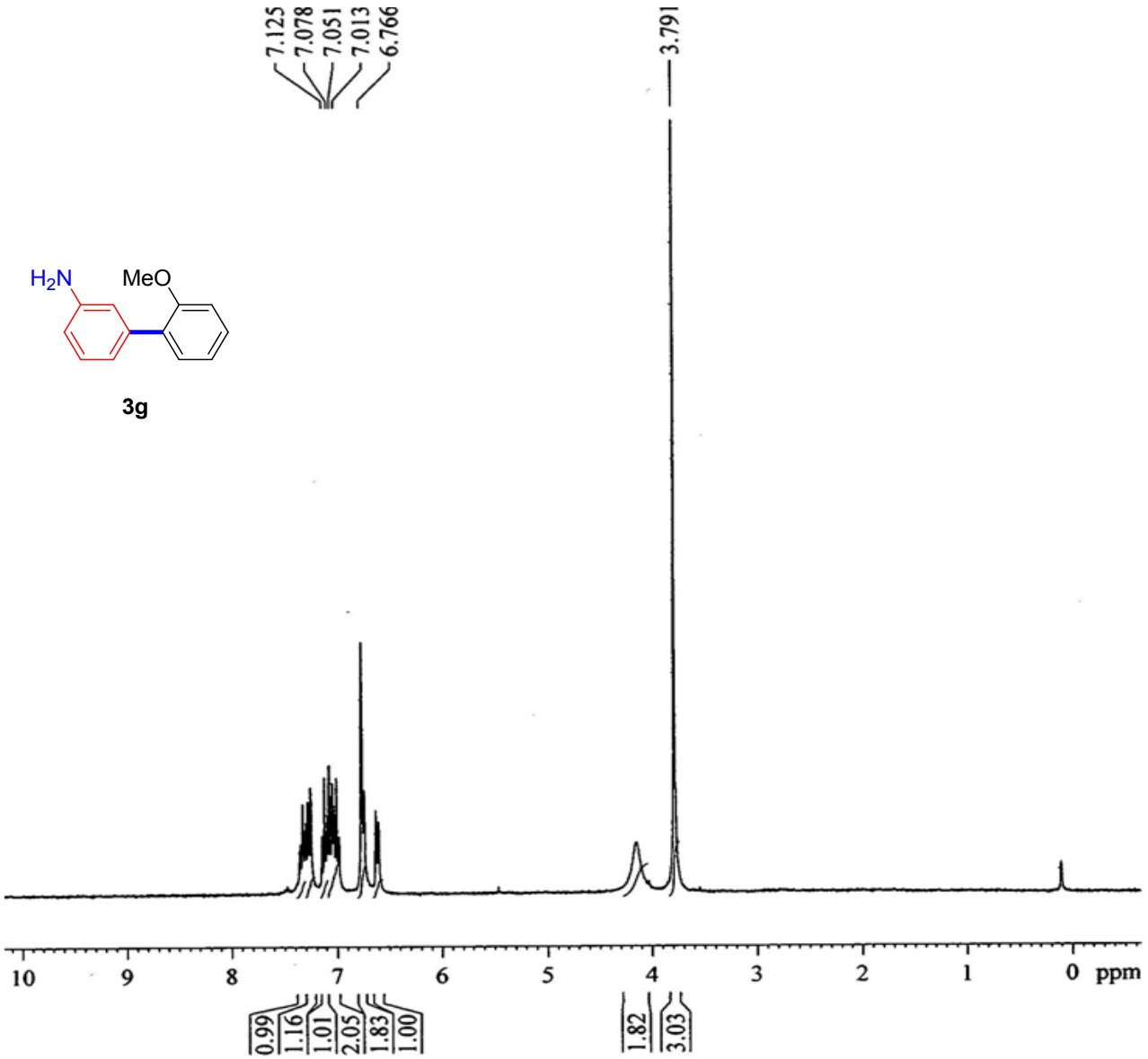
Spectrum10.75 MHz ^{13C} NMR of compound **3e**



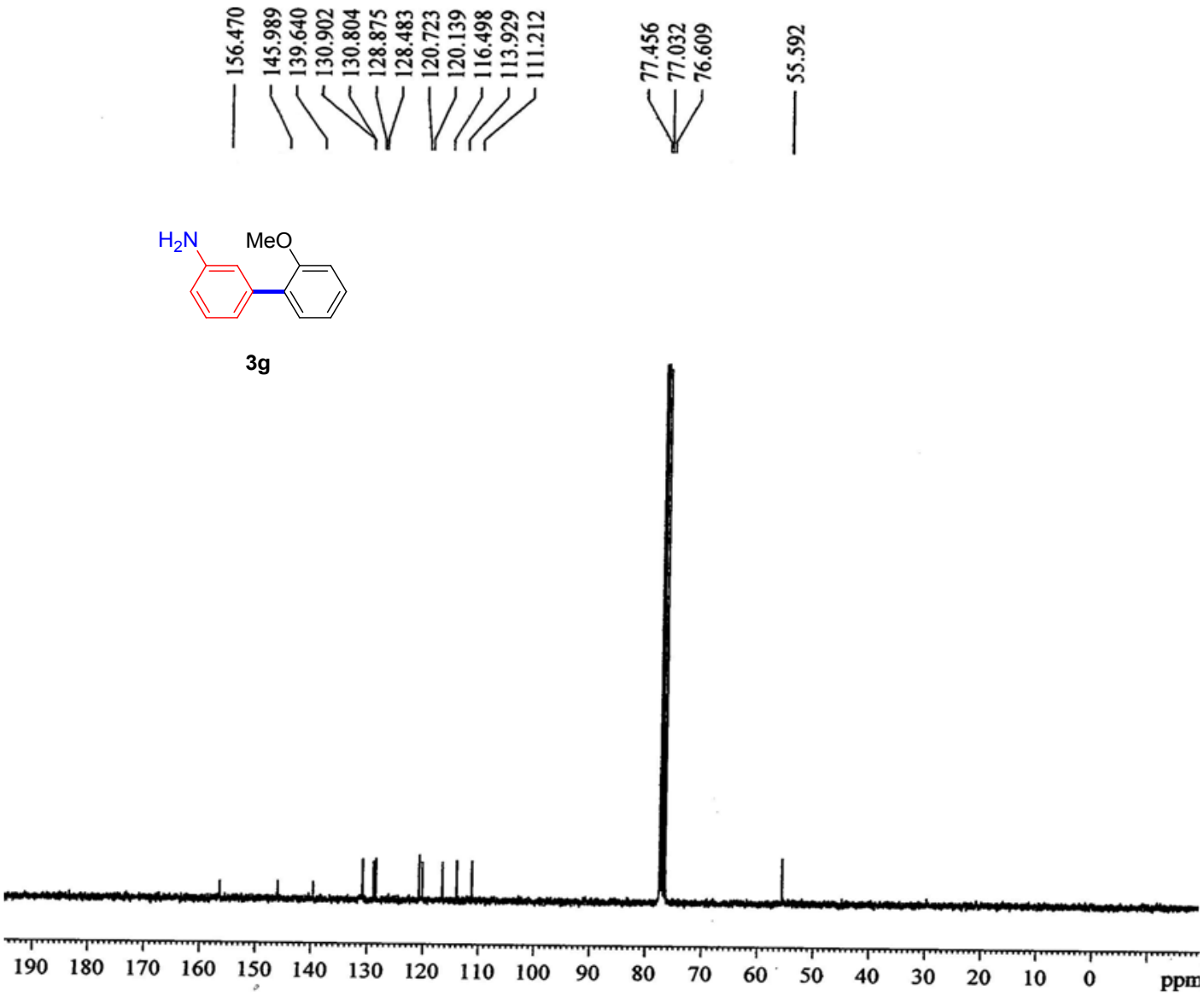
Spectrum11. 300 MHz ^{1}H NMR of compound **3f**



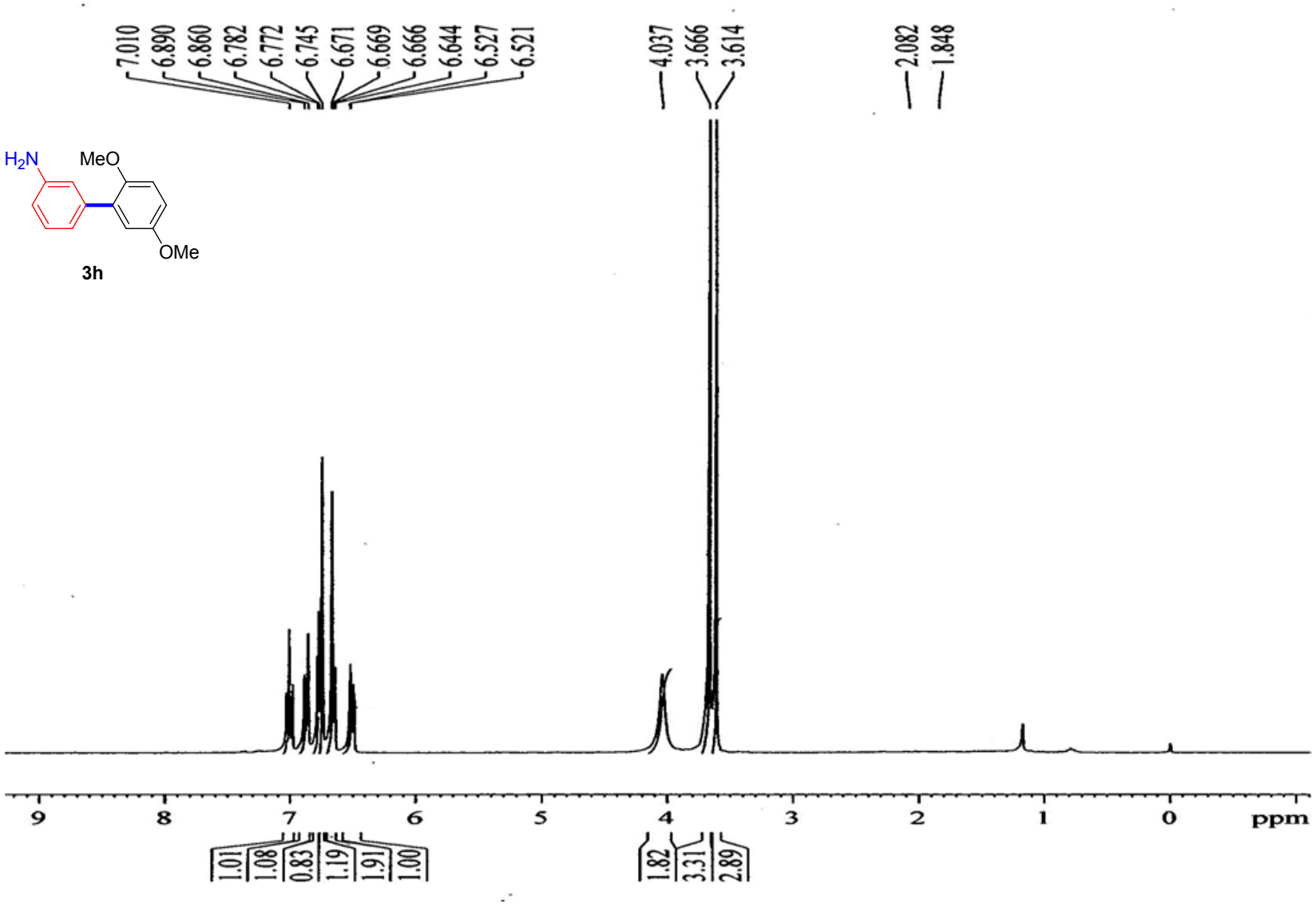
Spectrum12. 75 MHz ^{13}C NMR of compound **3f**



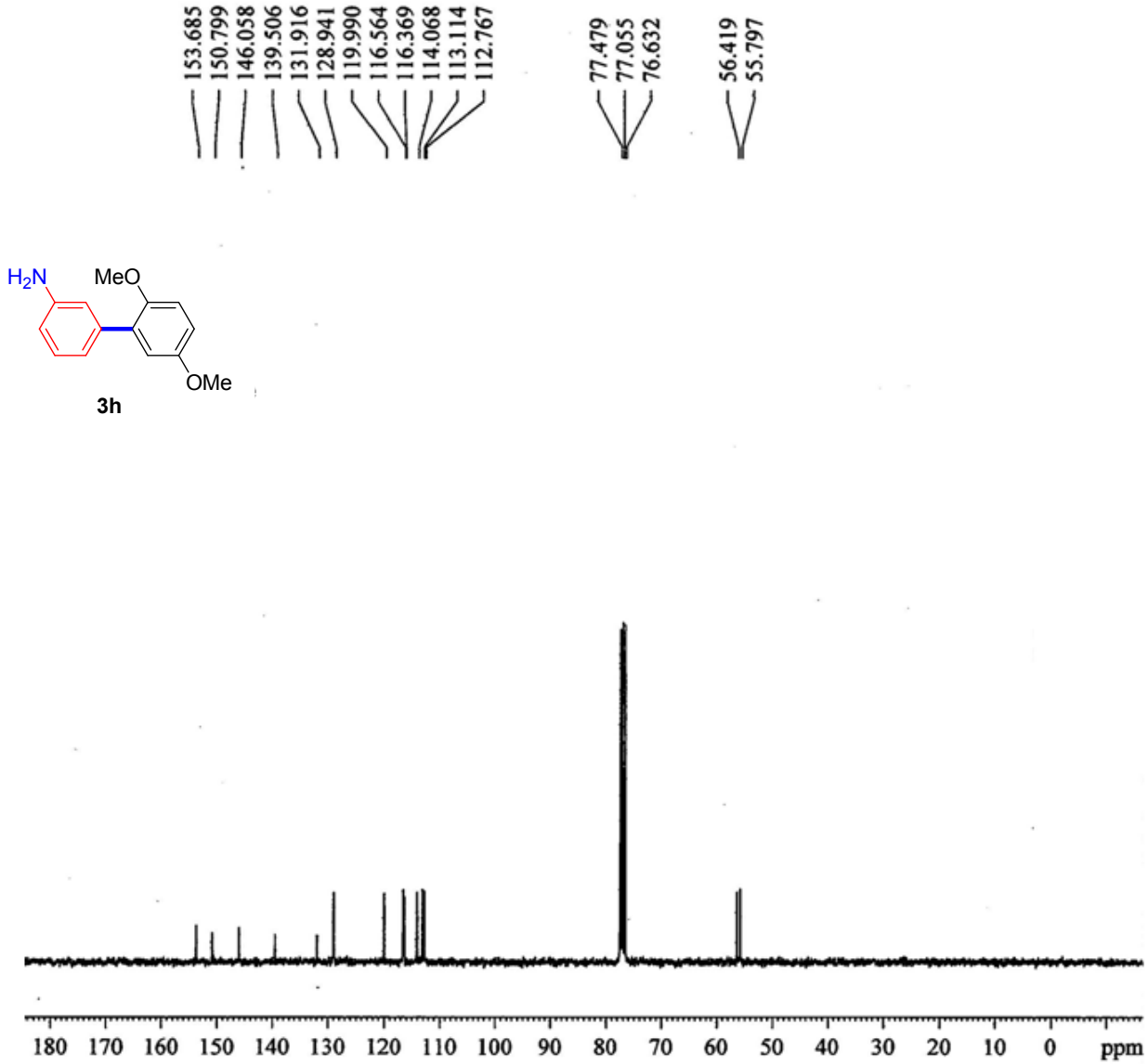
Spectrum13. 300 MHz ^{1}H NMR of compound **3g**



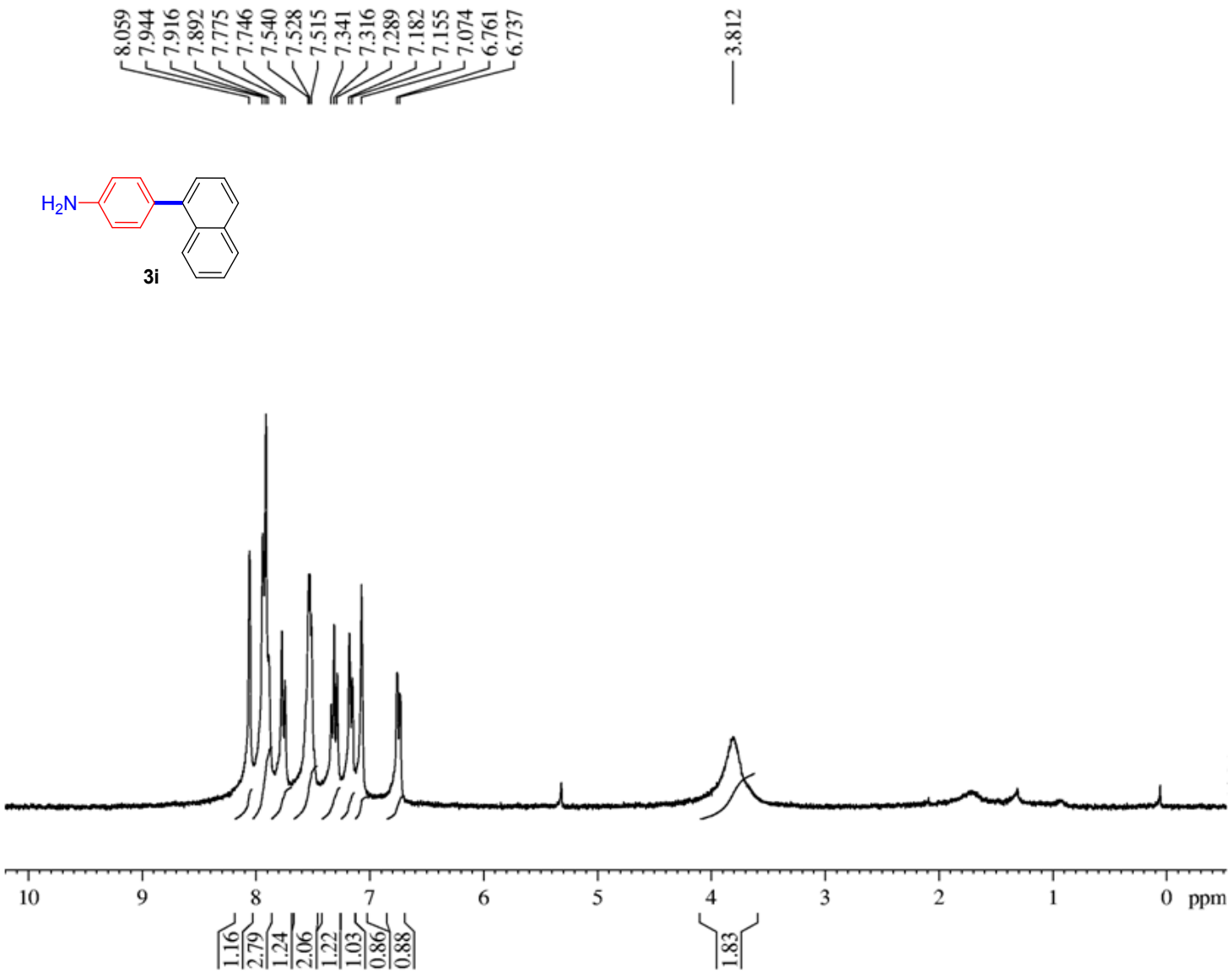
Spectrum14. 75 MHz ^{13}C NMR of compound **3g**



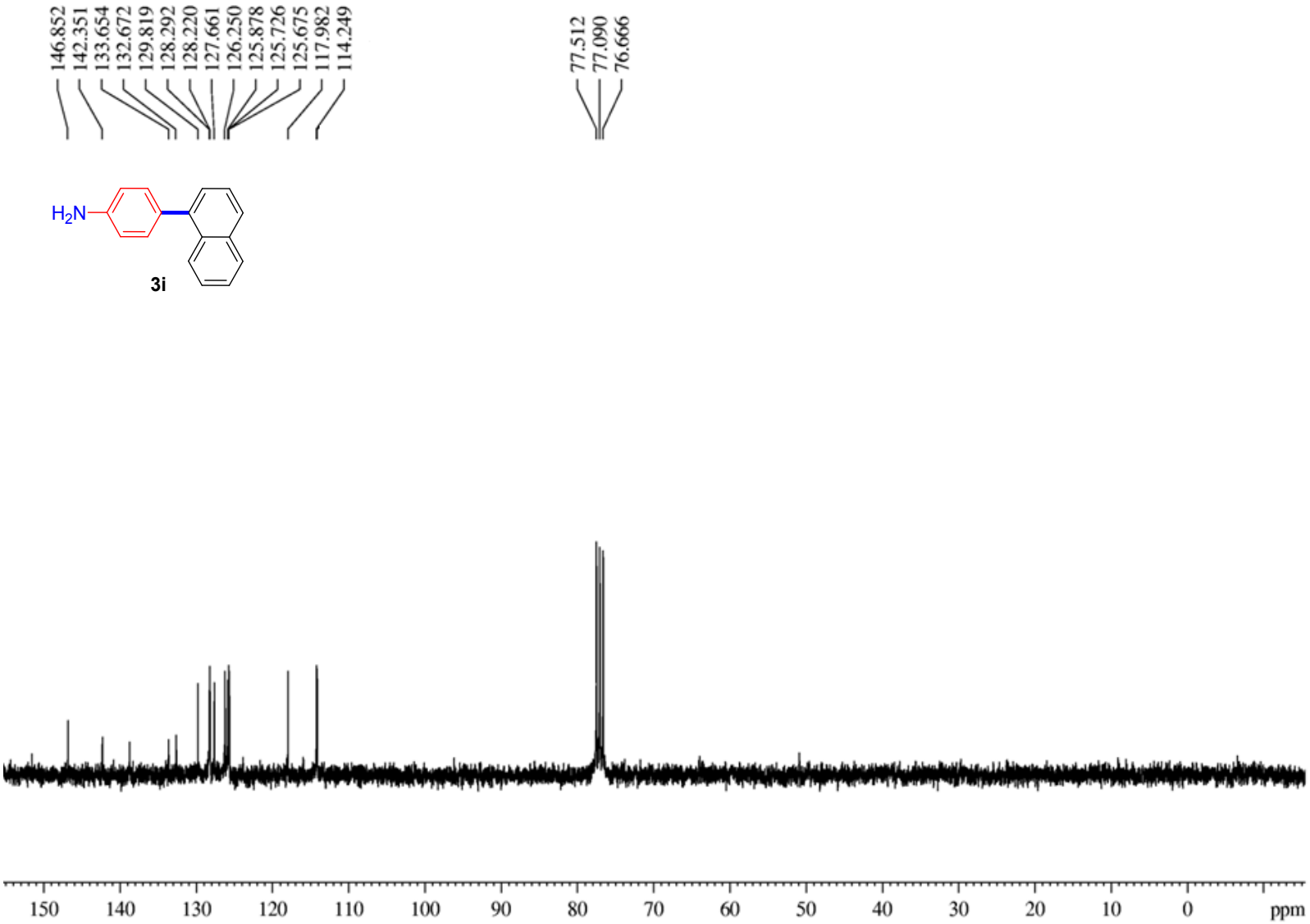
Spectrum15. 300 MHz ^{1}H NMR of compound **3h**



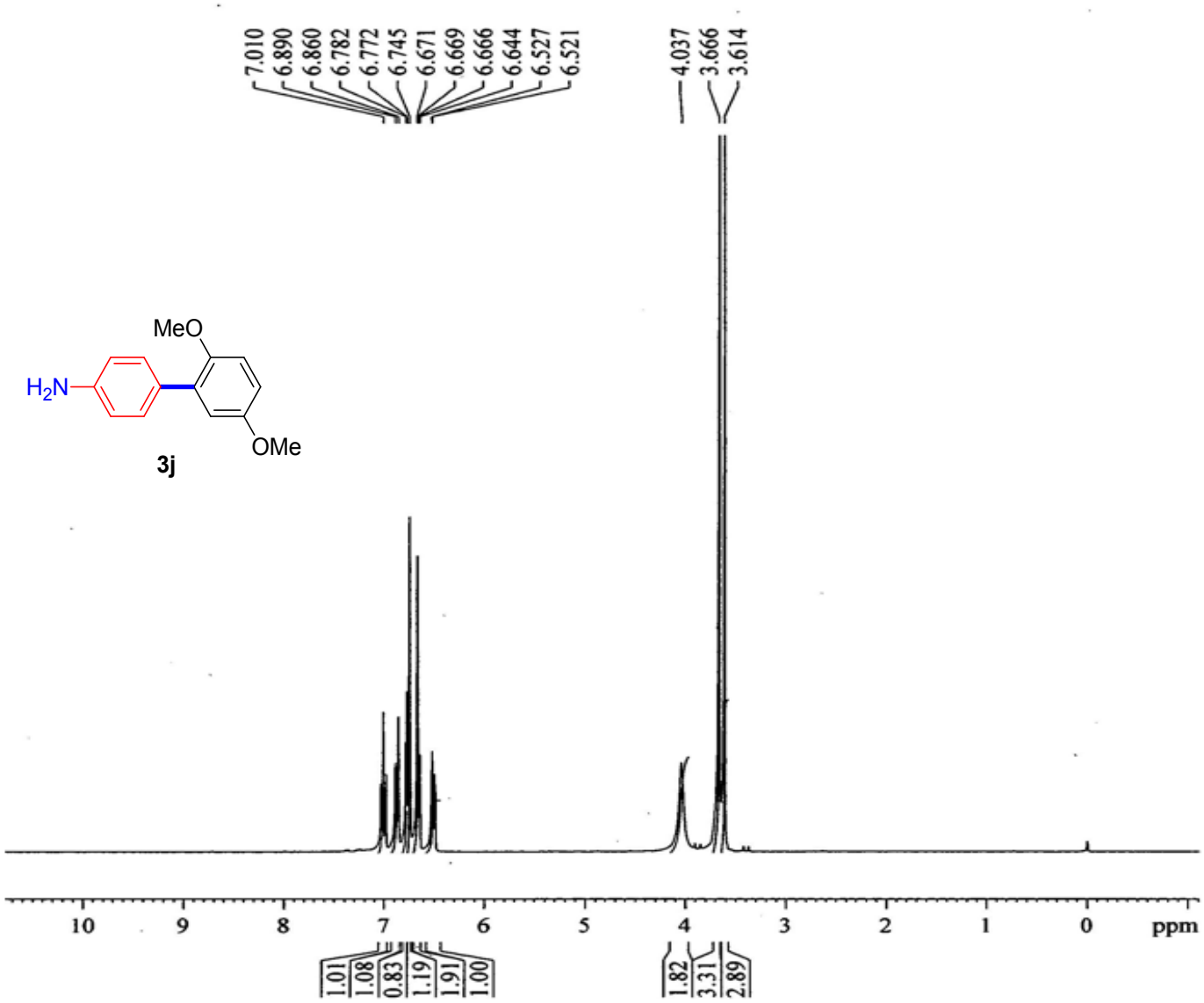
Spectrum16. 75 MHz ^{13}C NMR of compound **3h**



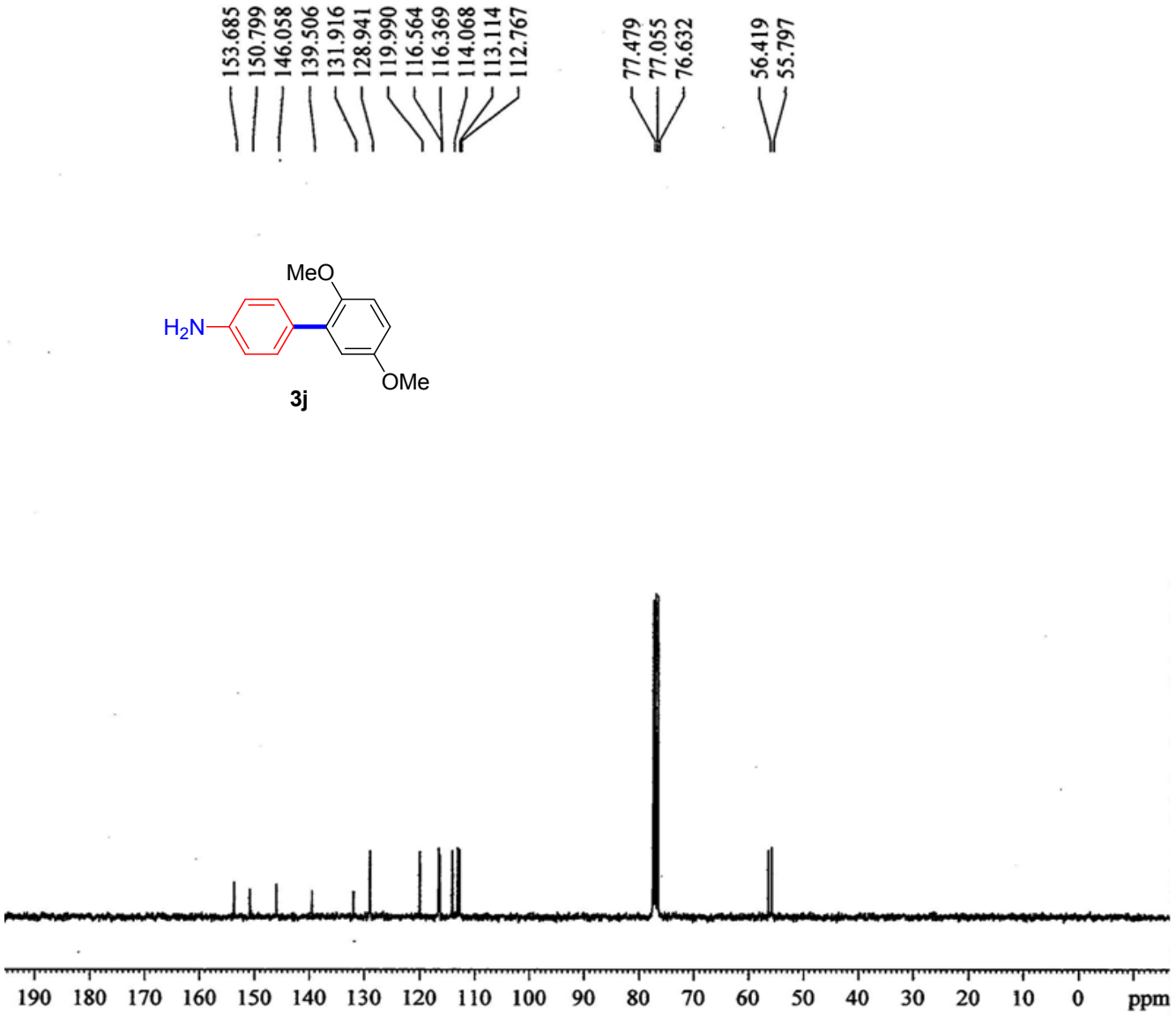
Spectrum17. 300 MHz ^{1}H NMR of compound **3i**



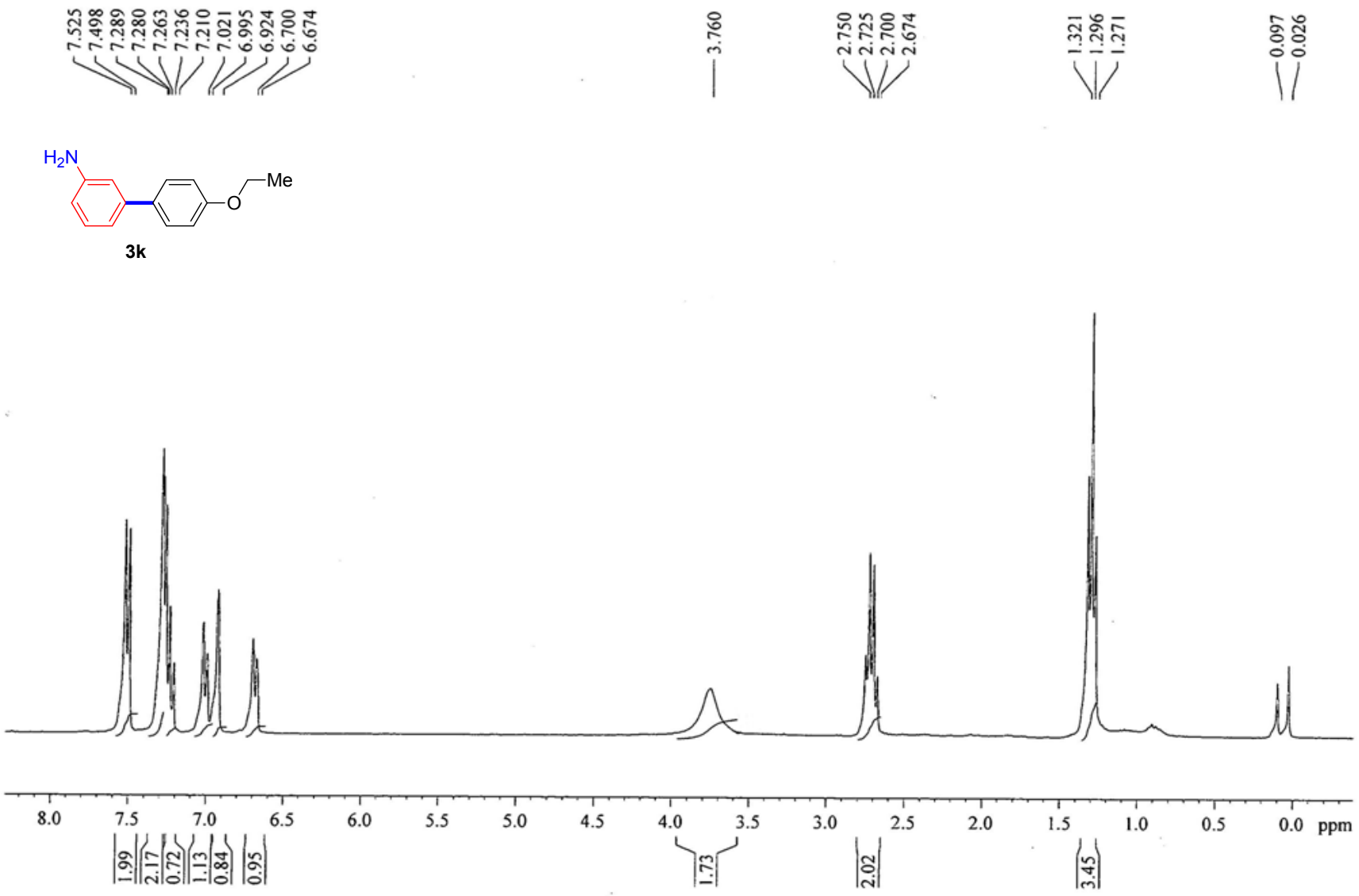
Spectrum18. 75 MHz ^{13}C NMR of compound **3i**



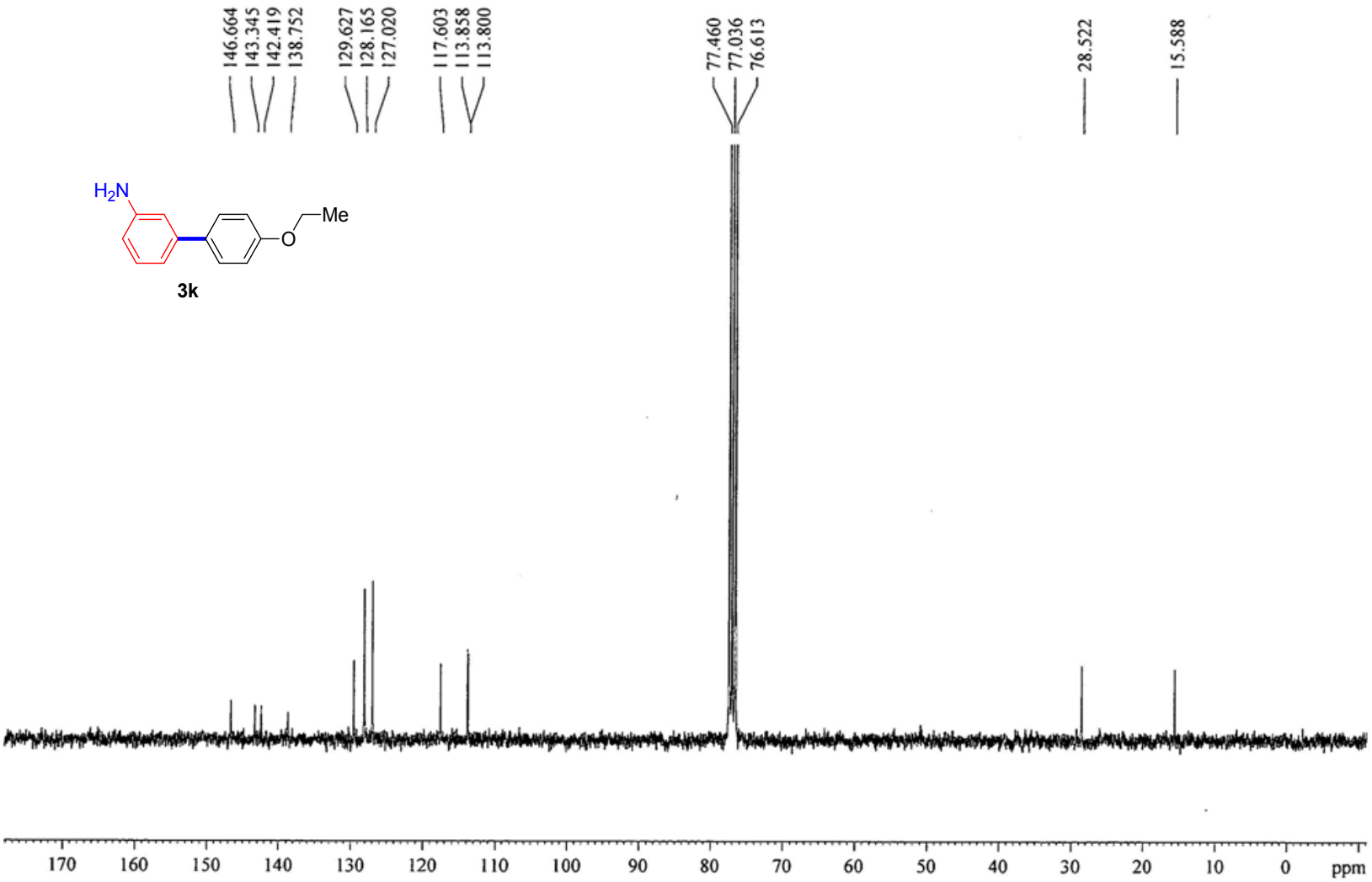
Spectrum19. 300 MHz ^{1}H NMR of compound **3j**



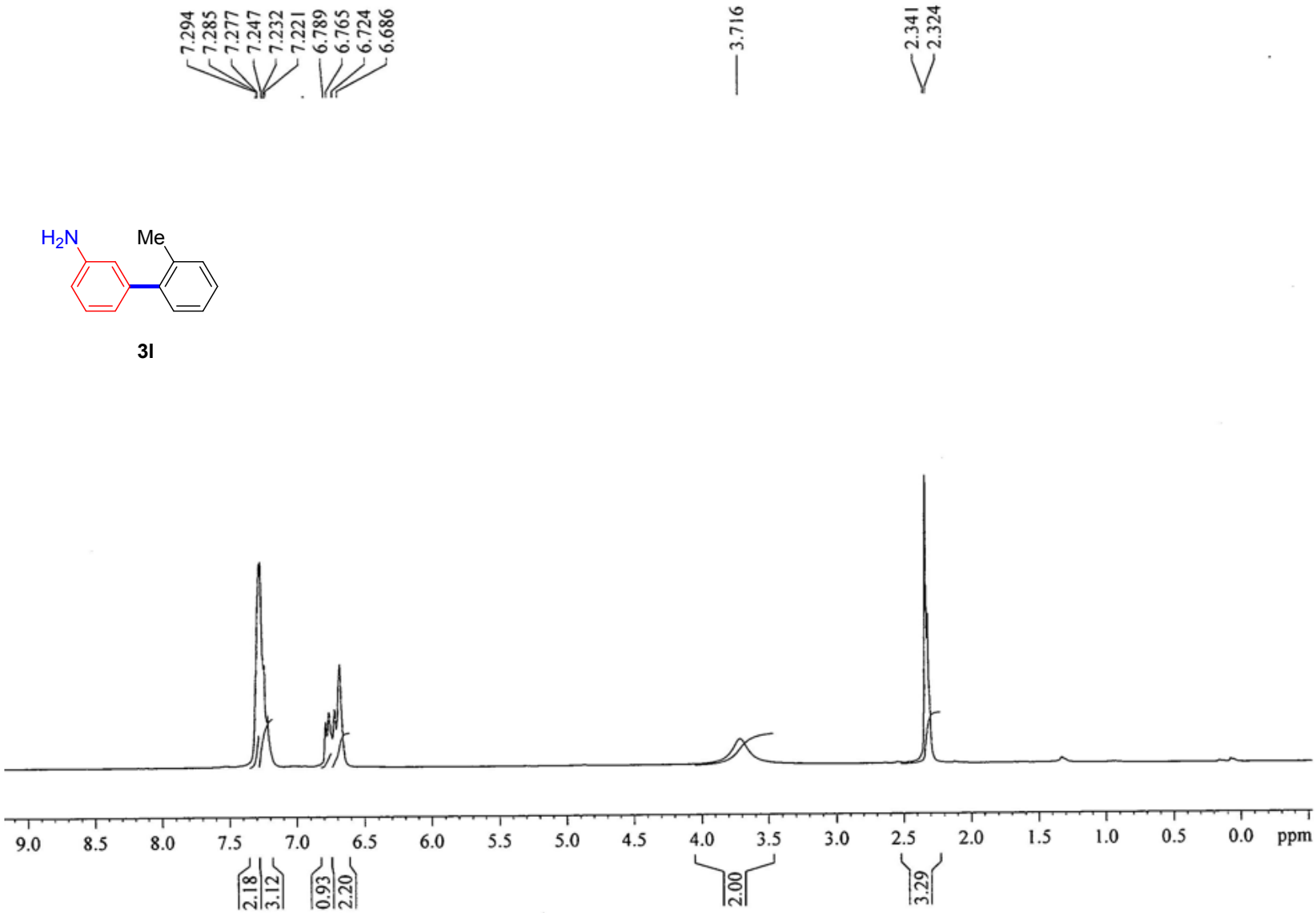
Spectrum20. 75 MHz ^{13}C NMR of compound **3j**



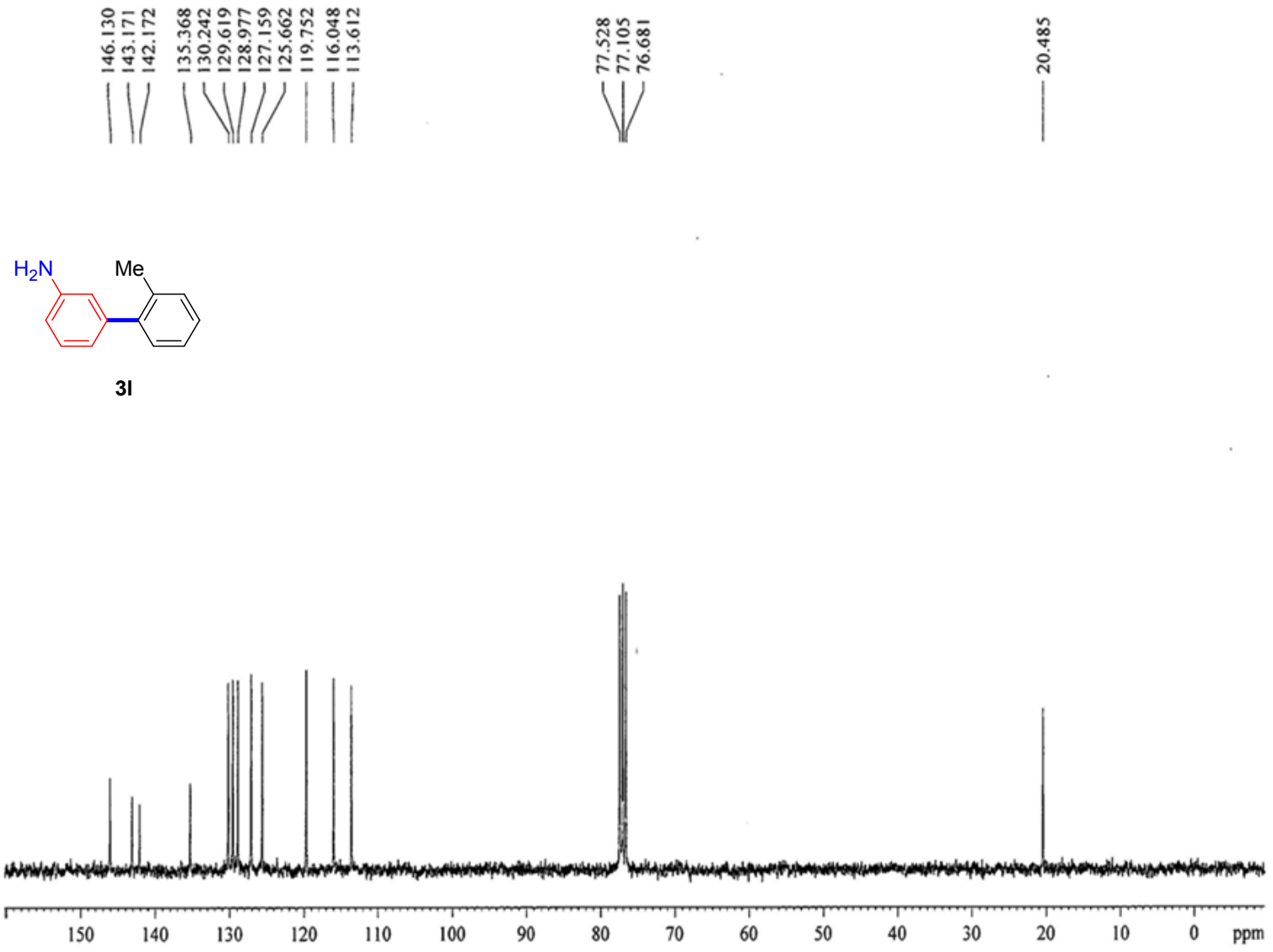
Spectrum21. 300 MHz ^{1}H NMR of compound **3k**



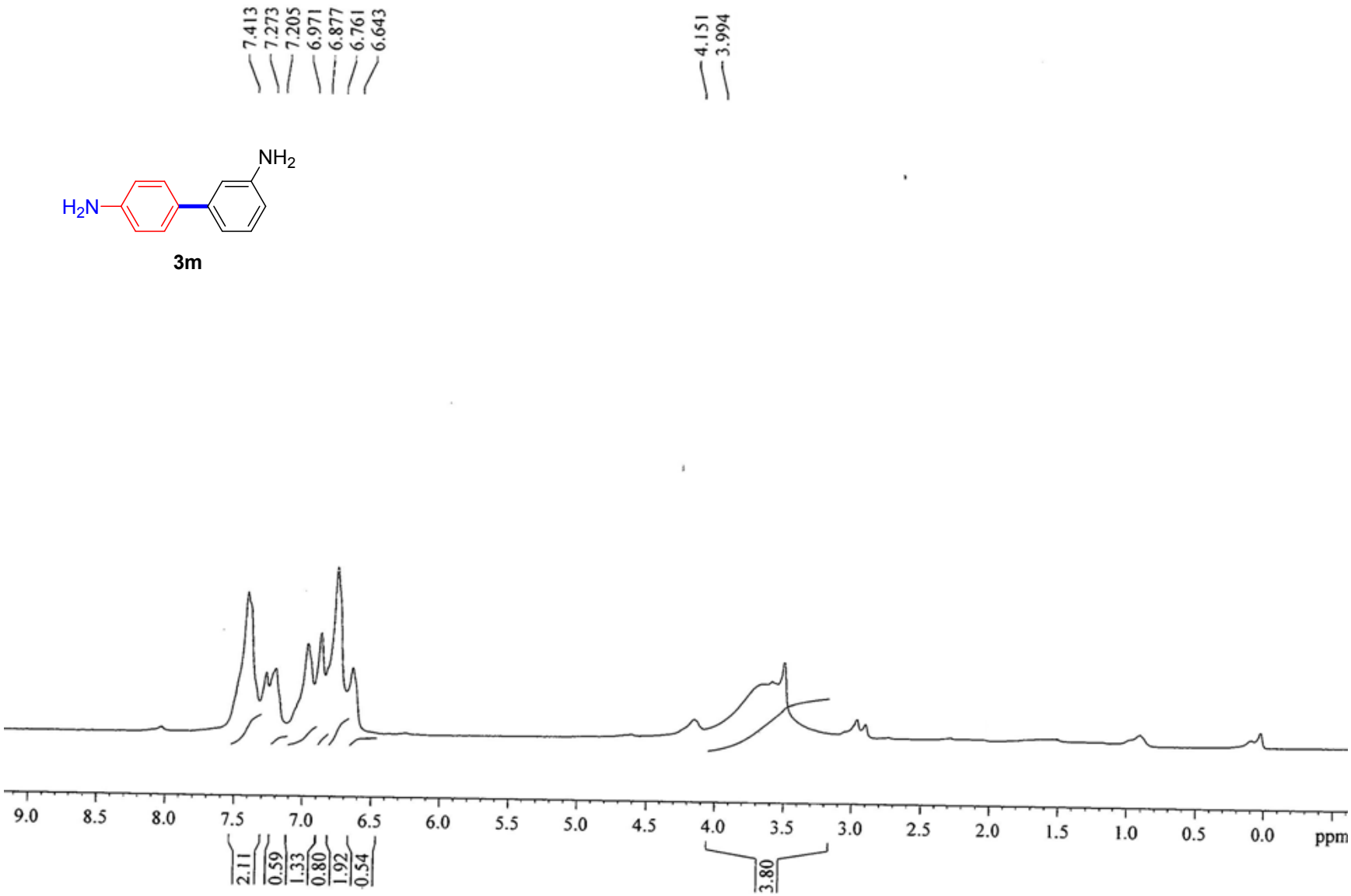
Spectrum22. 75 MHz ^{13}C NMR of compound **3k**



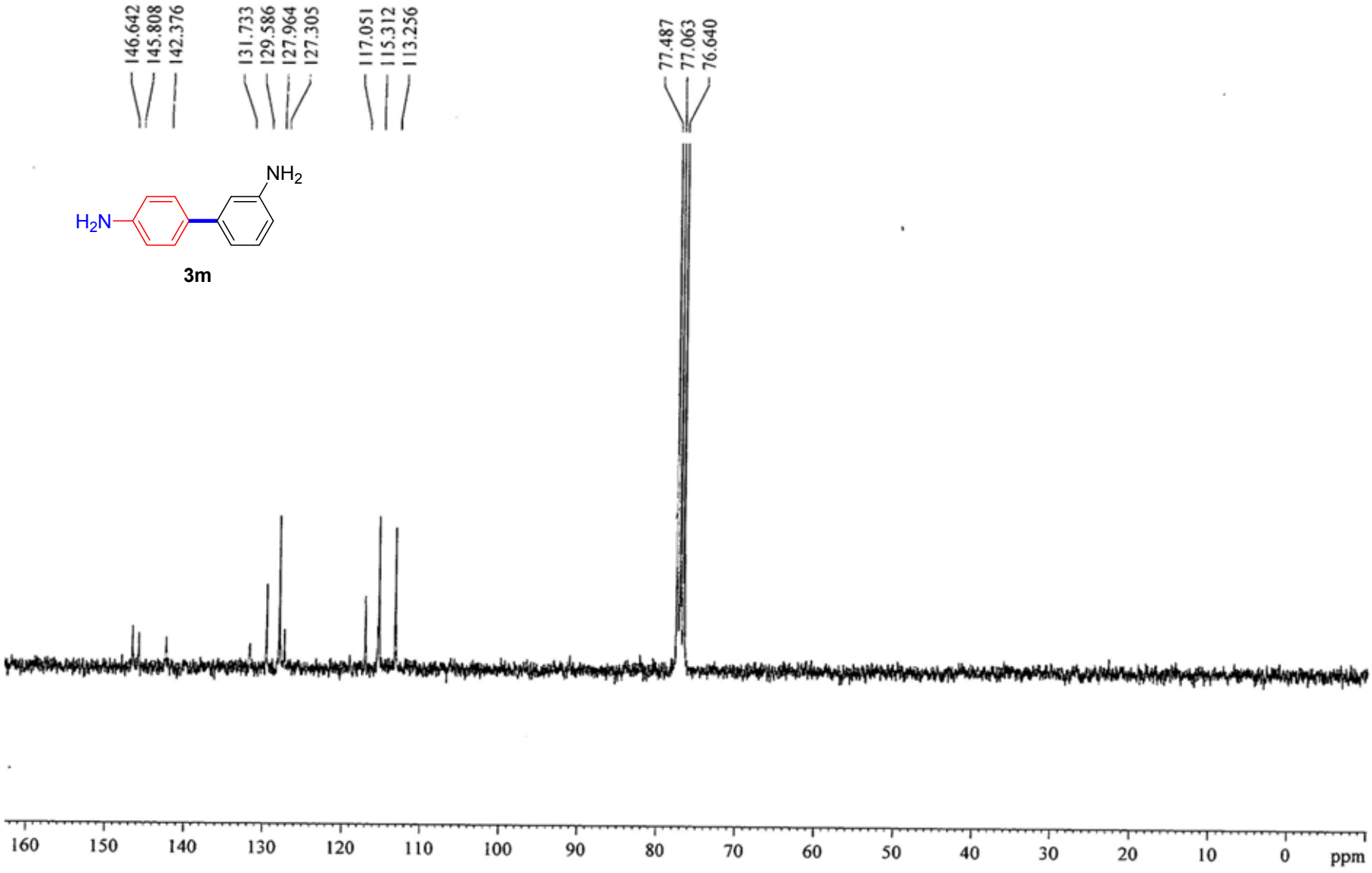
Spectrum23. 300 MHz ^{1}H NMR of compound **3l**



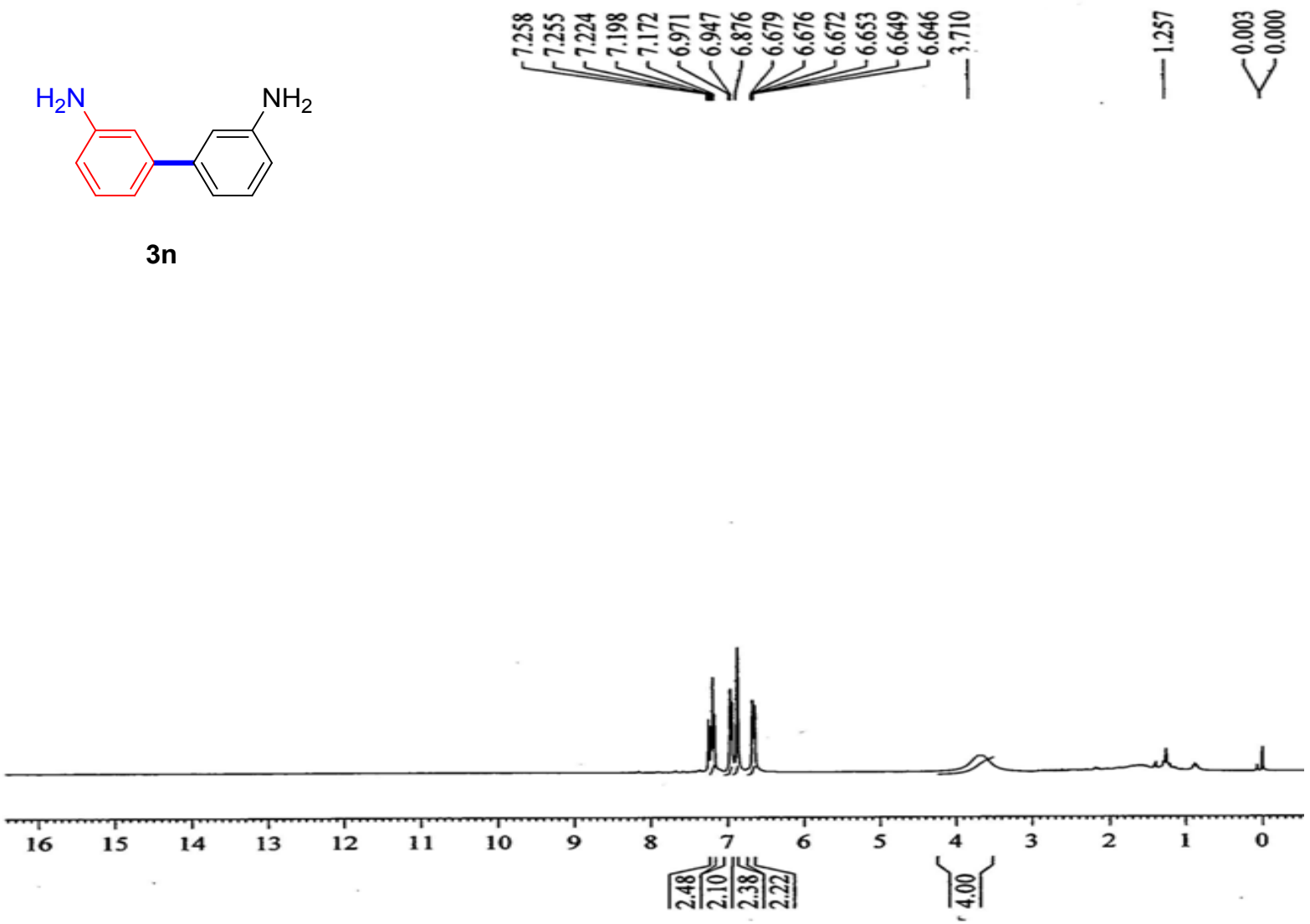
Spectrum24. 300 MHz ^{13}C NMR of compound **3l**



Spectrum25. 300 MHz ^{1}H NMR of compound **3m**

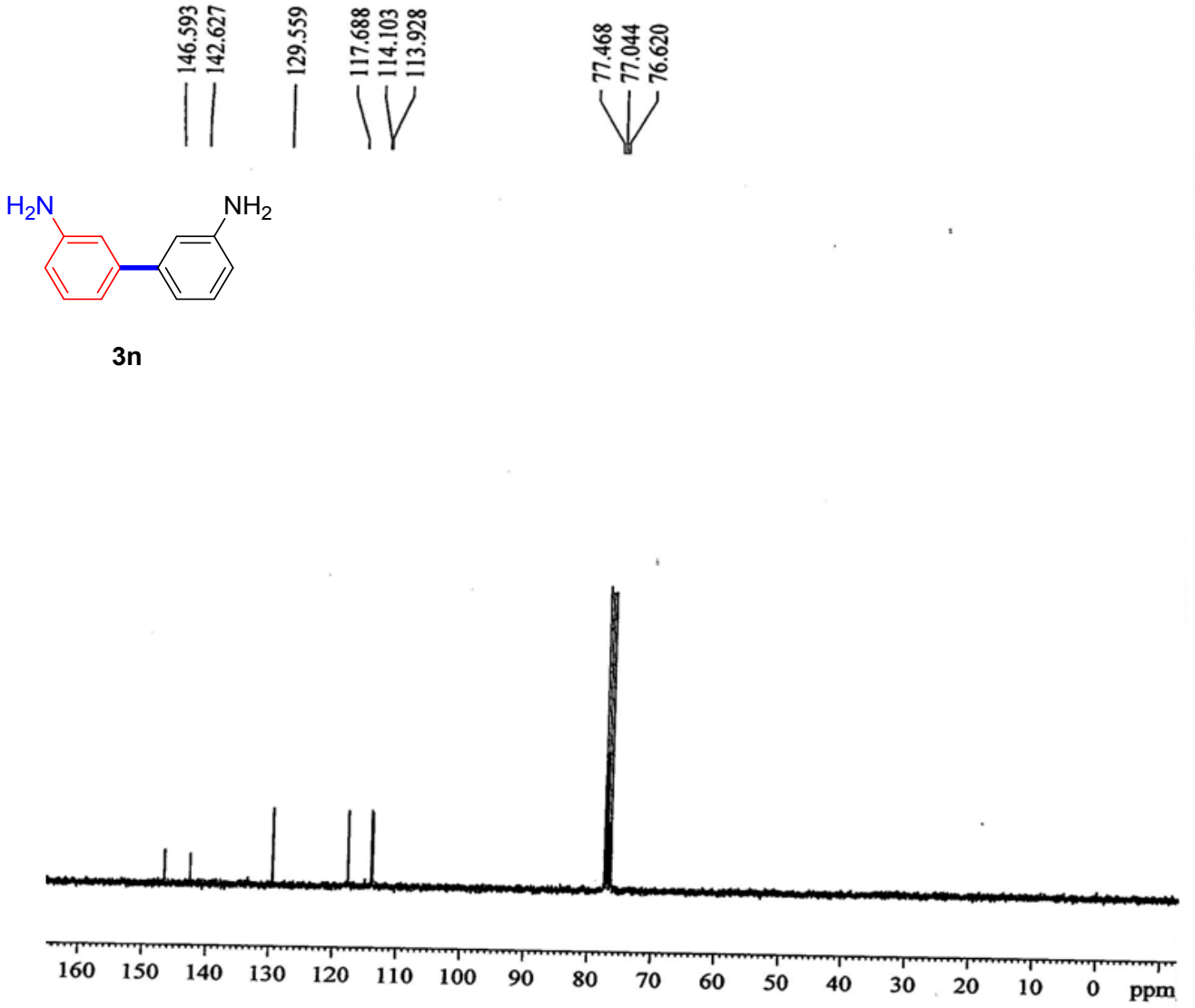


Spectrum26. 75 MHz ^{13}C NMR of compound **3m**

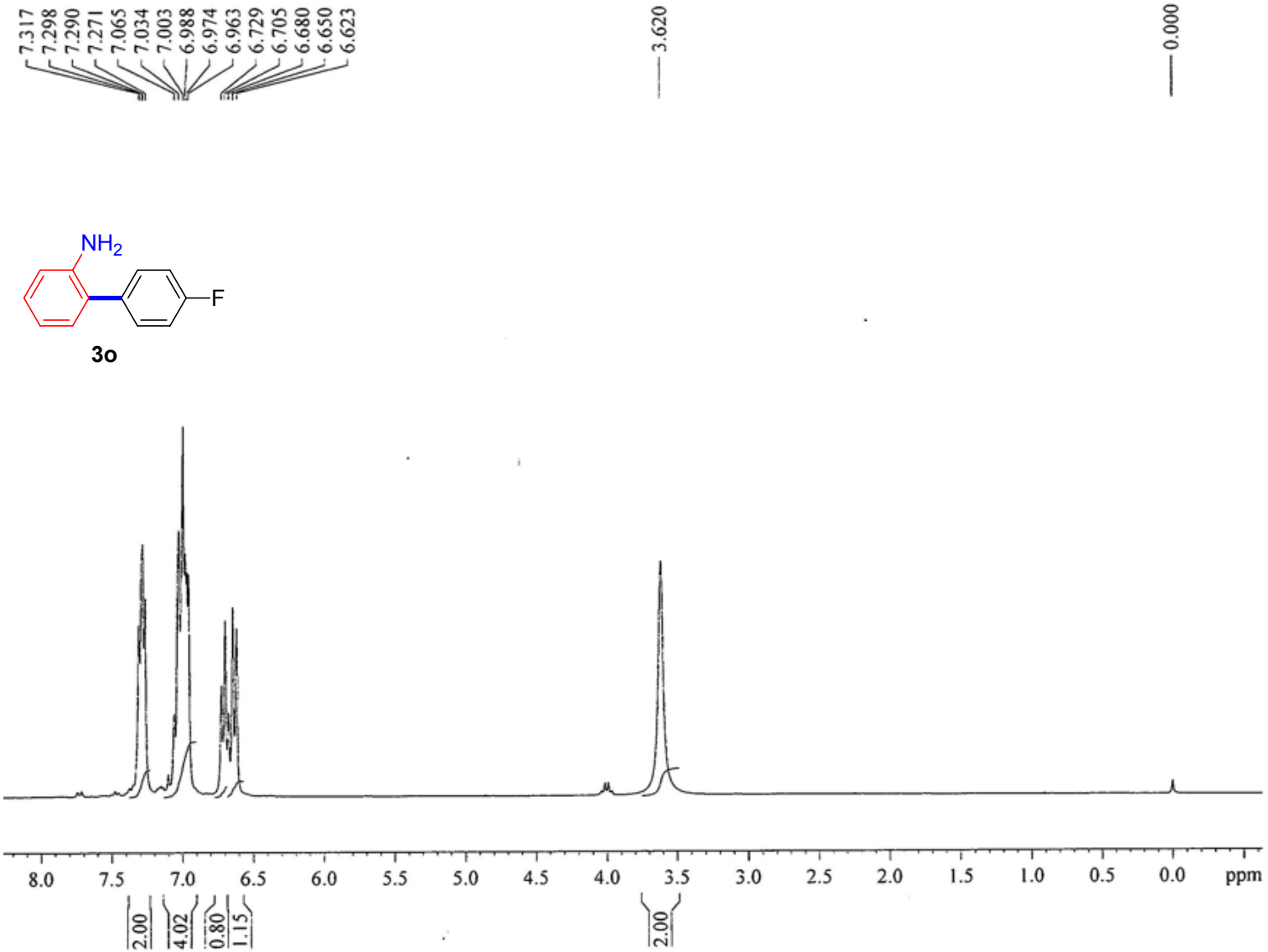


3n

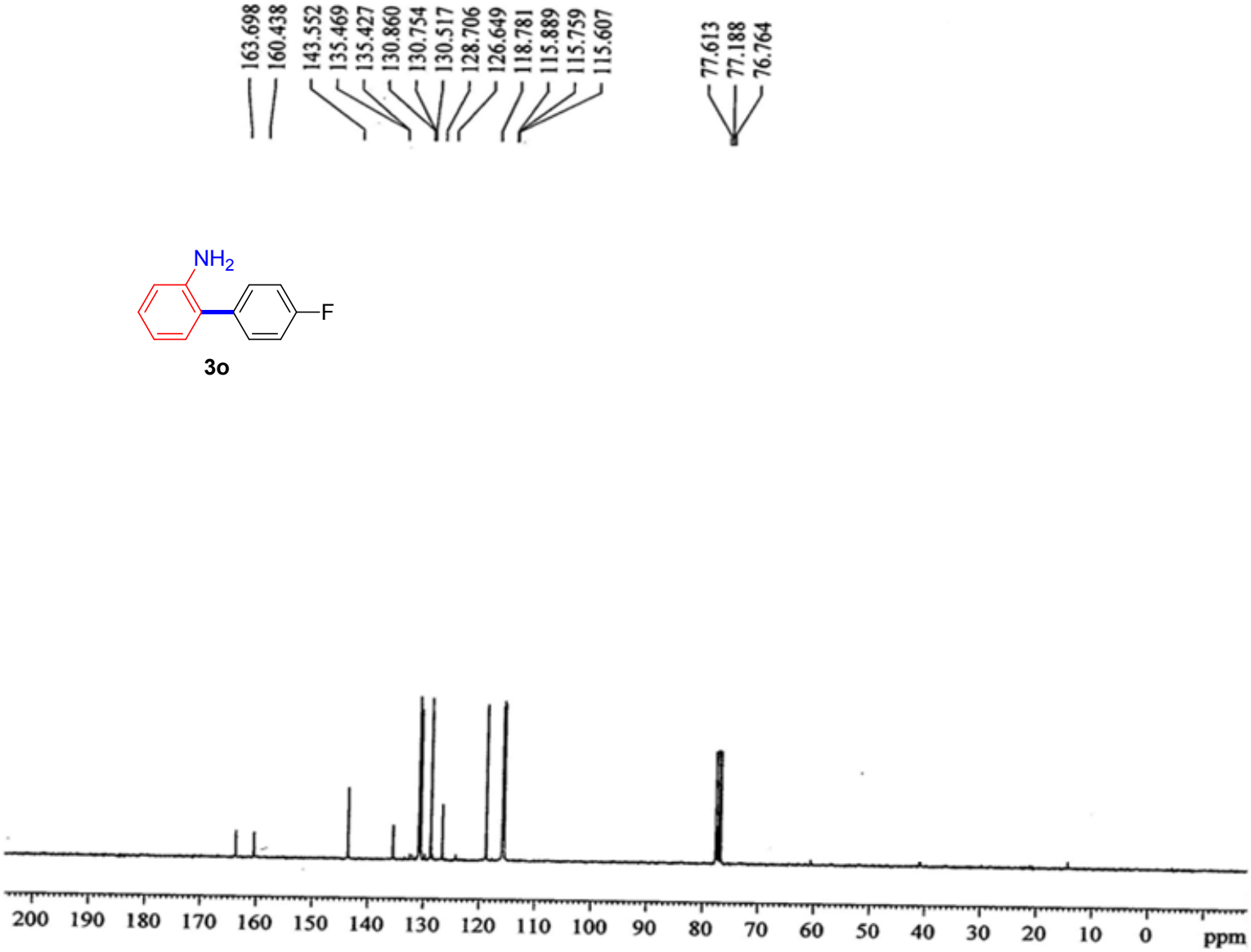
Spectrum27. 300 MHz ^{1}H NMR of compound **3n**



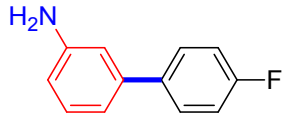
Spectrum28. 75 MHz ^{13}C NMR of compound **3n**



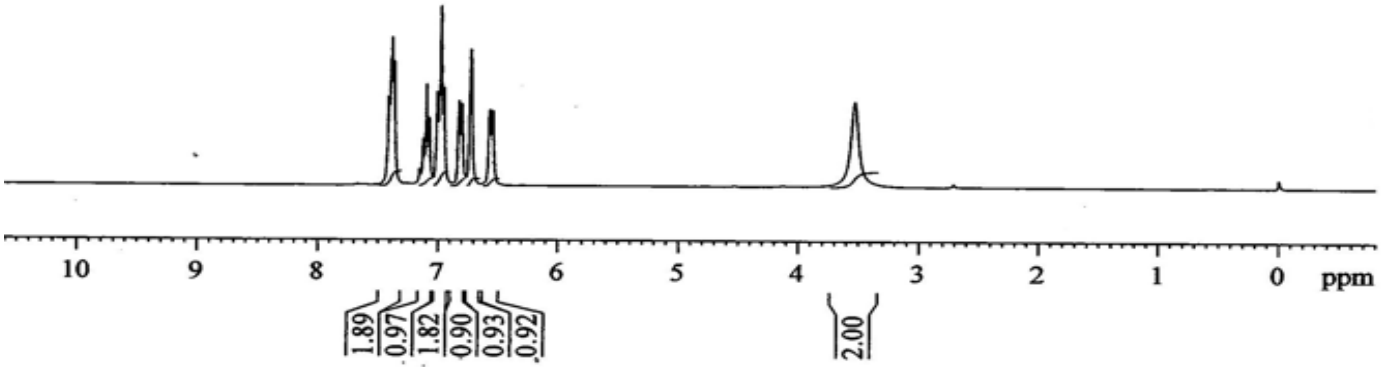
Spectrum29. 300 MHz ^{1}H NMR of compound **3o**



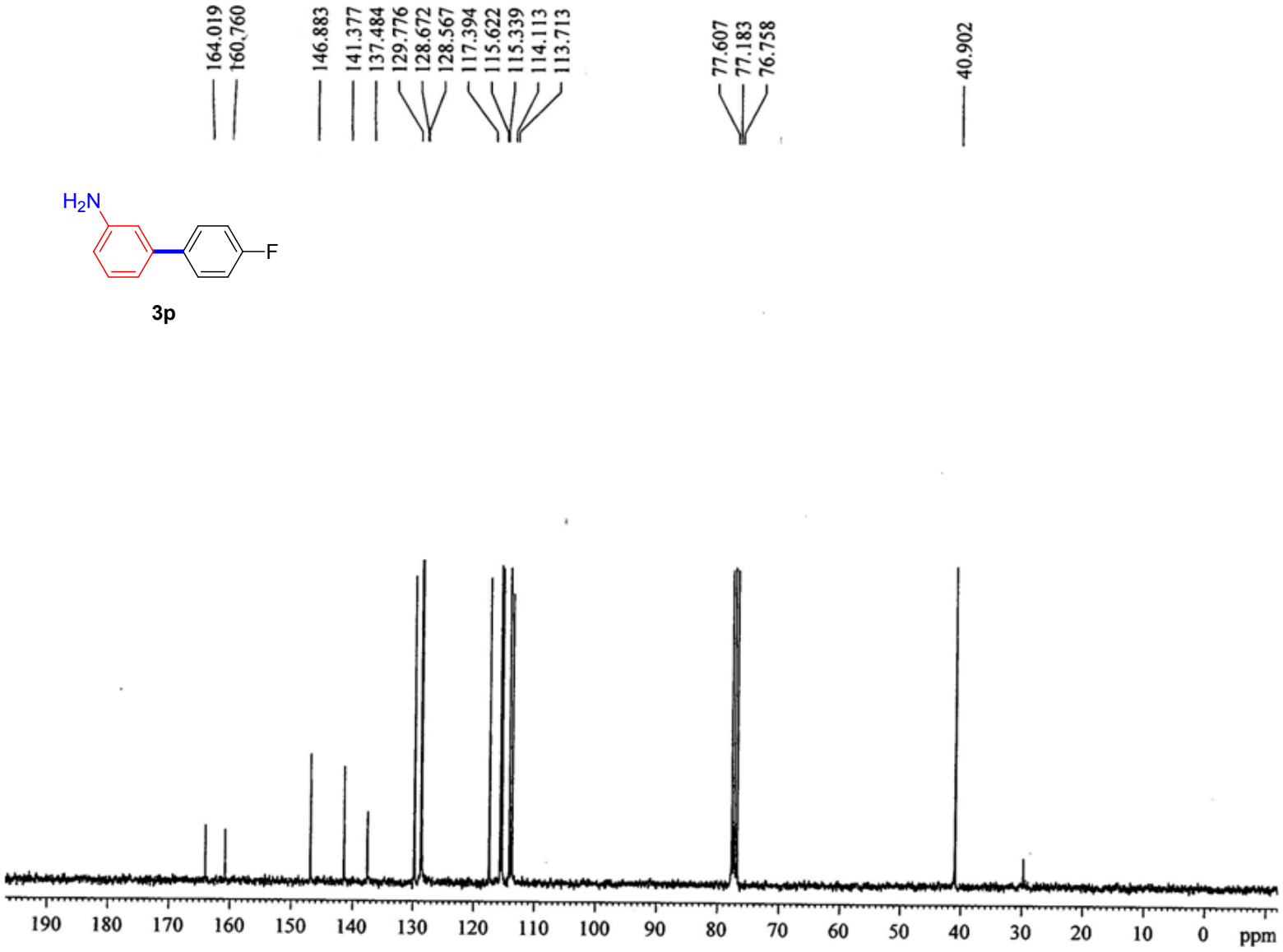
Spectrum30. 75MHz ^{13}C NMR of compound **3o**



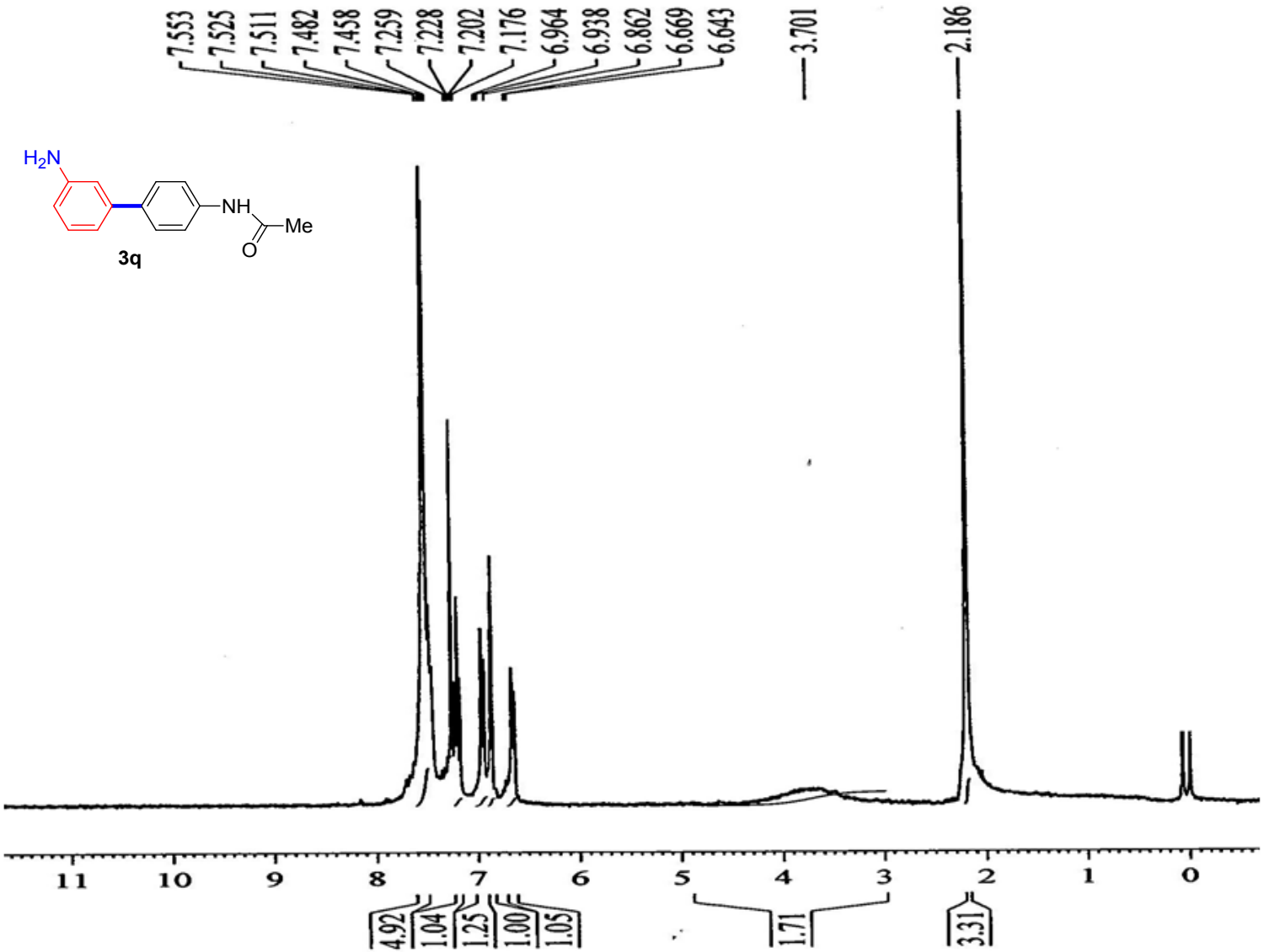
3p



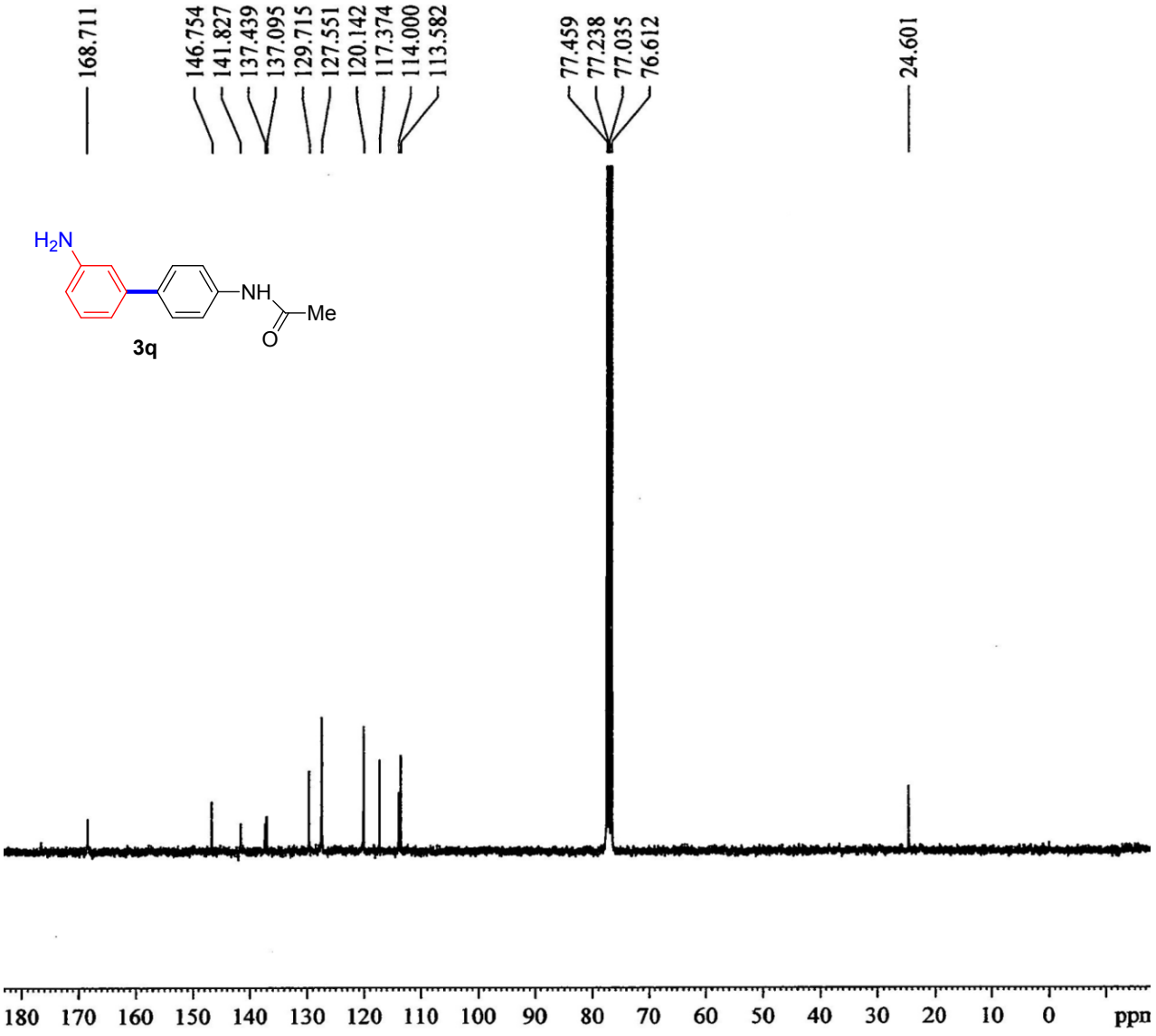
Spectrum31. 300 MHz ^{1}H NMR of compound **3p**



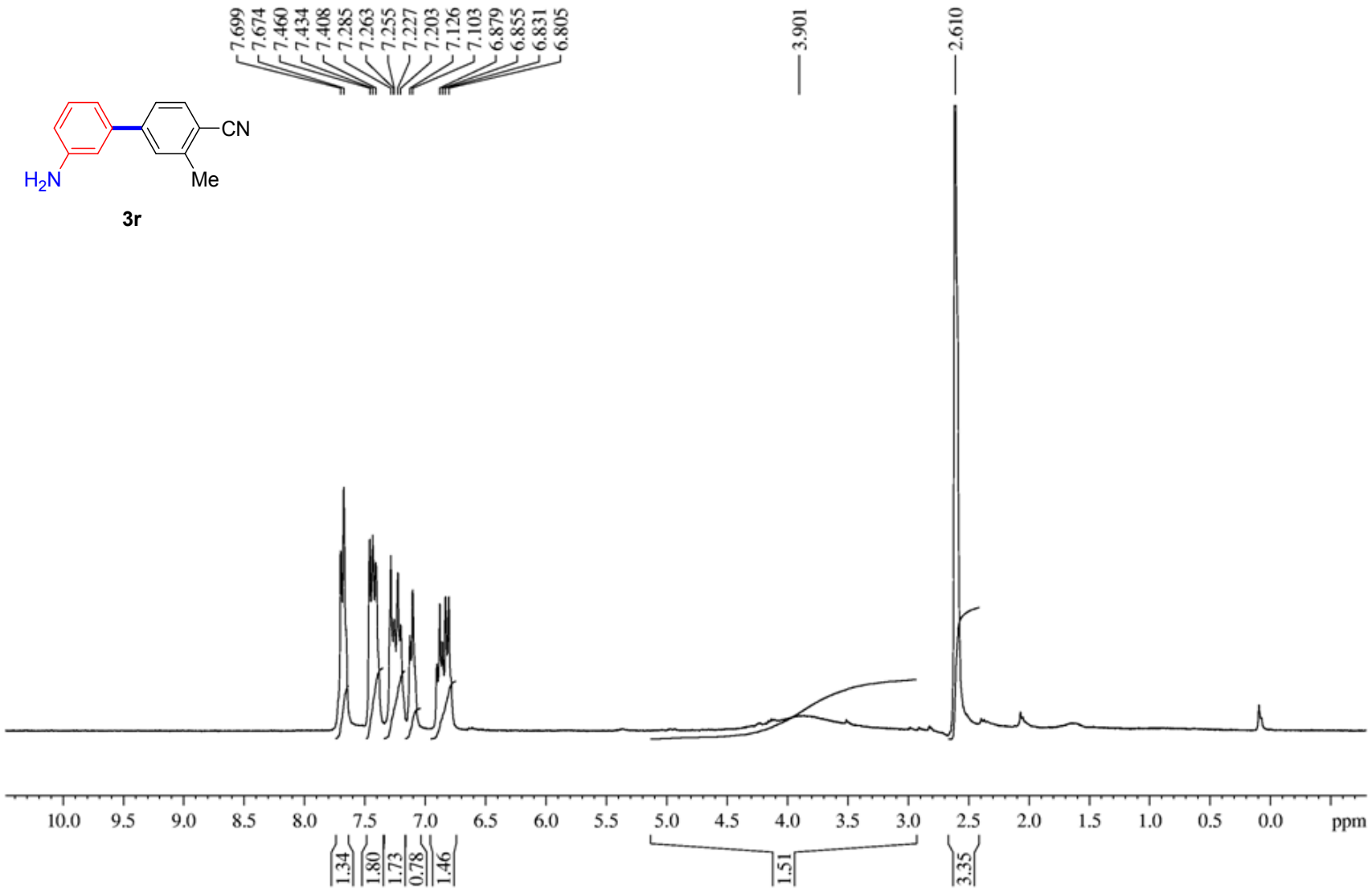
Spectrum32. 75 MHz ^{13}C NMR of compound **3p**



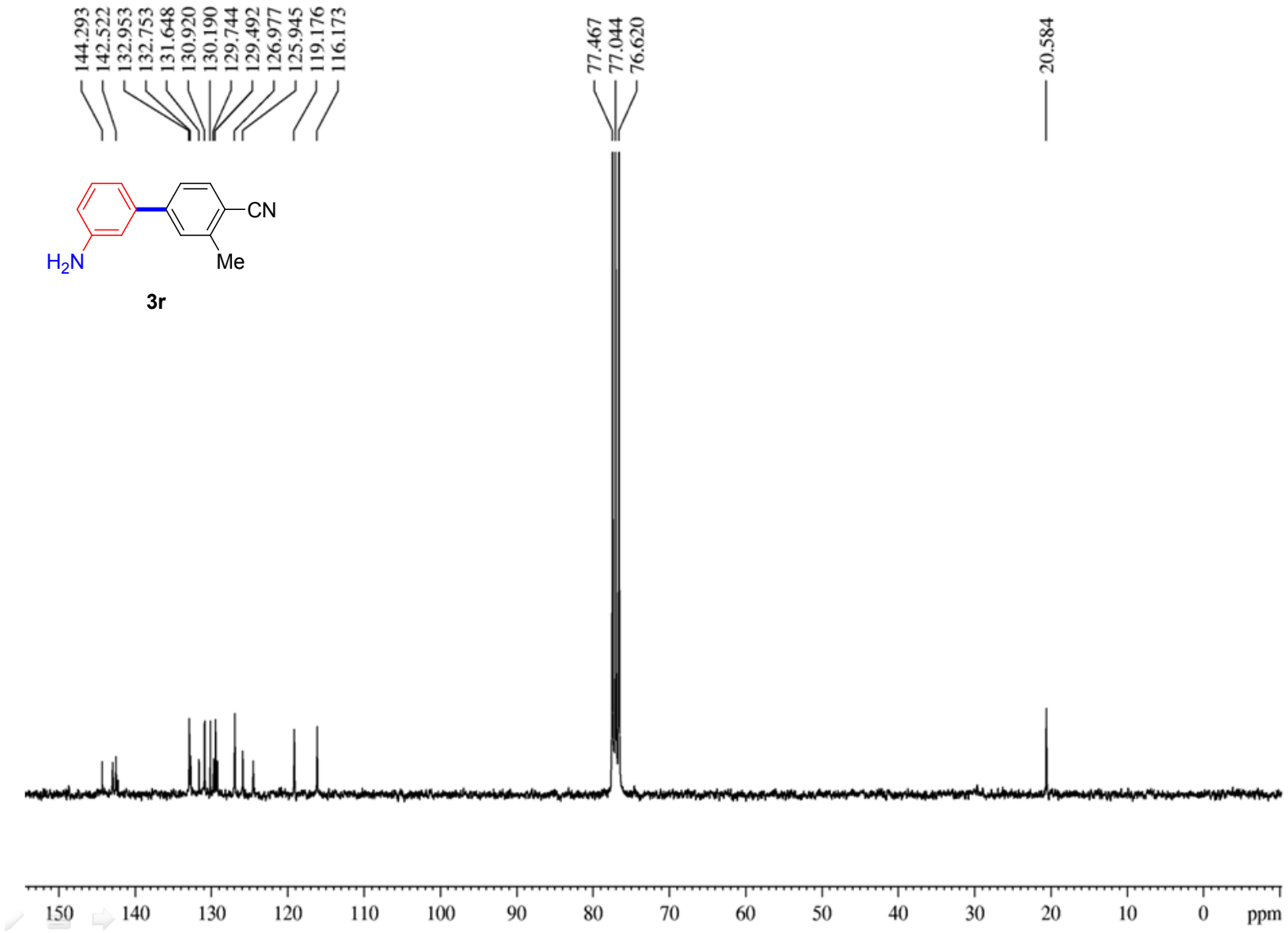
Spectrum33. 300 MHz ^{1}H NMR of compound **3q**



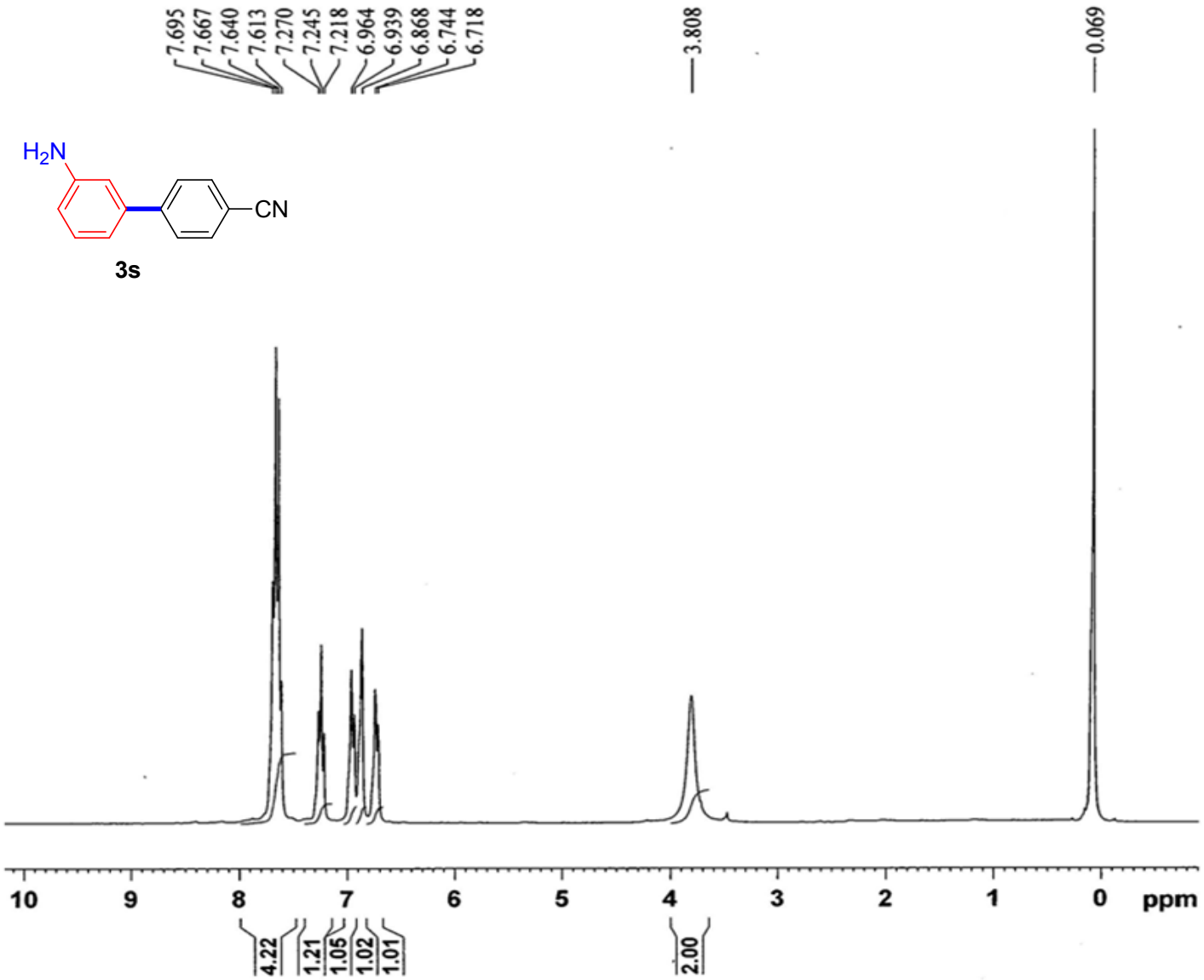
Spectrum34. 75 MHz ^{13}C NMR of compound **3q**



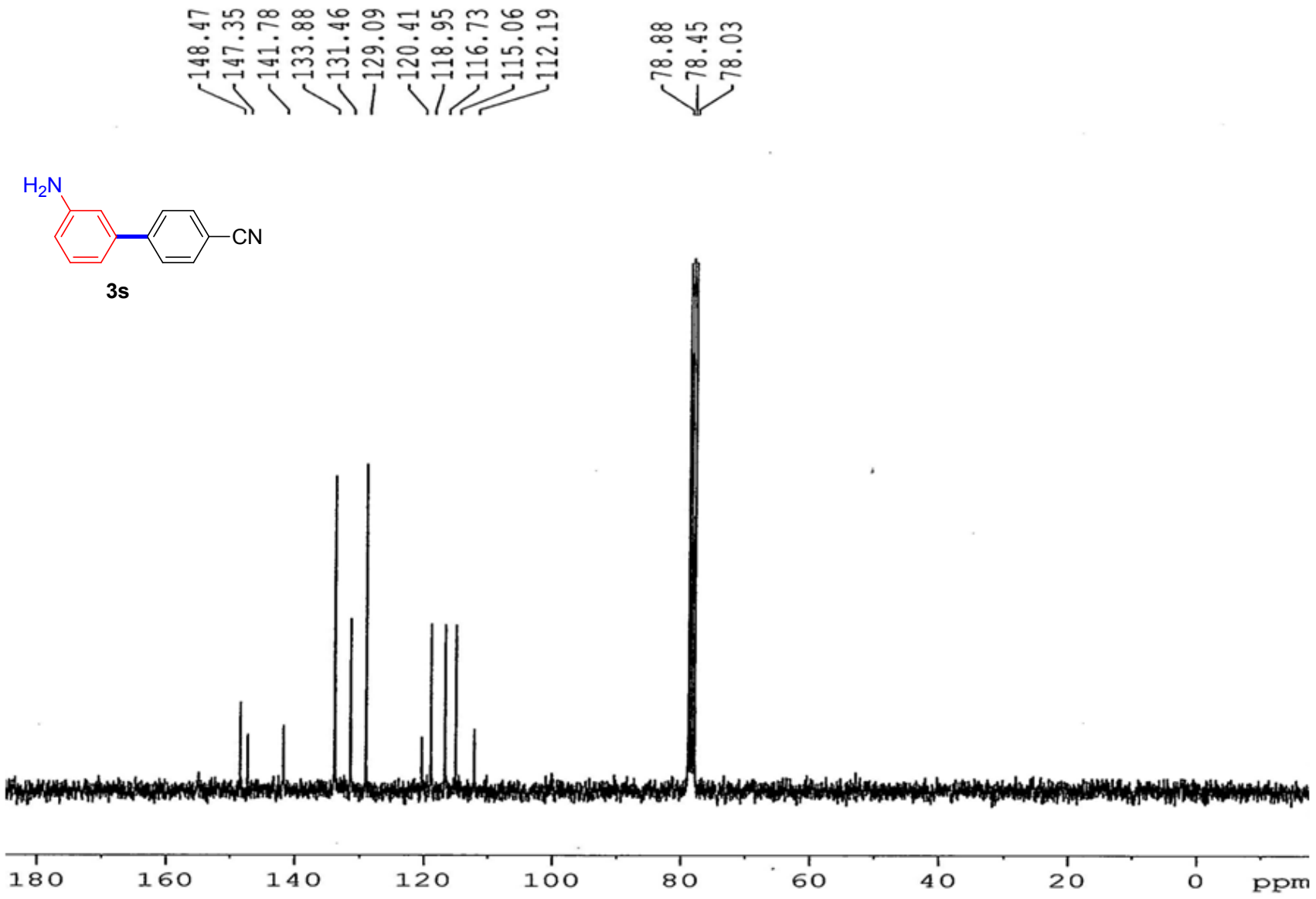
Spectrum35. 300 MHz ^{1}H NMR of compound **3r**



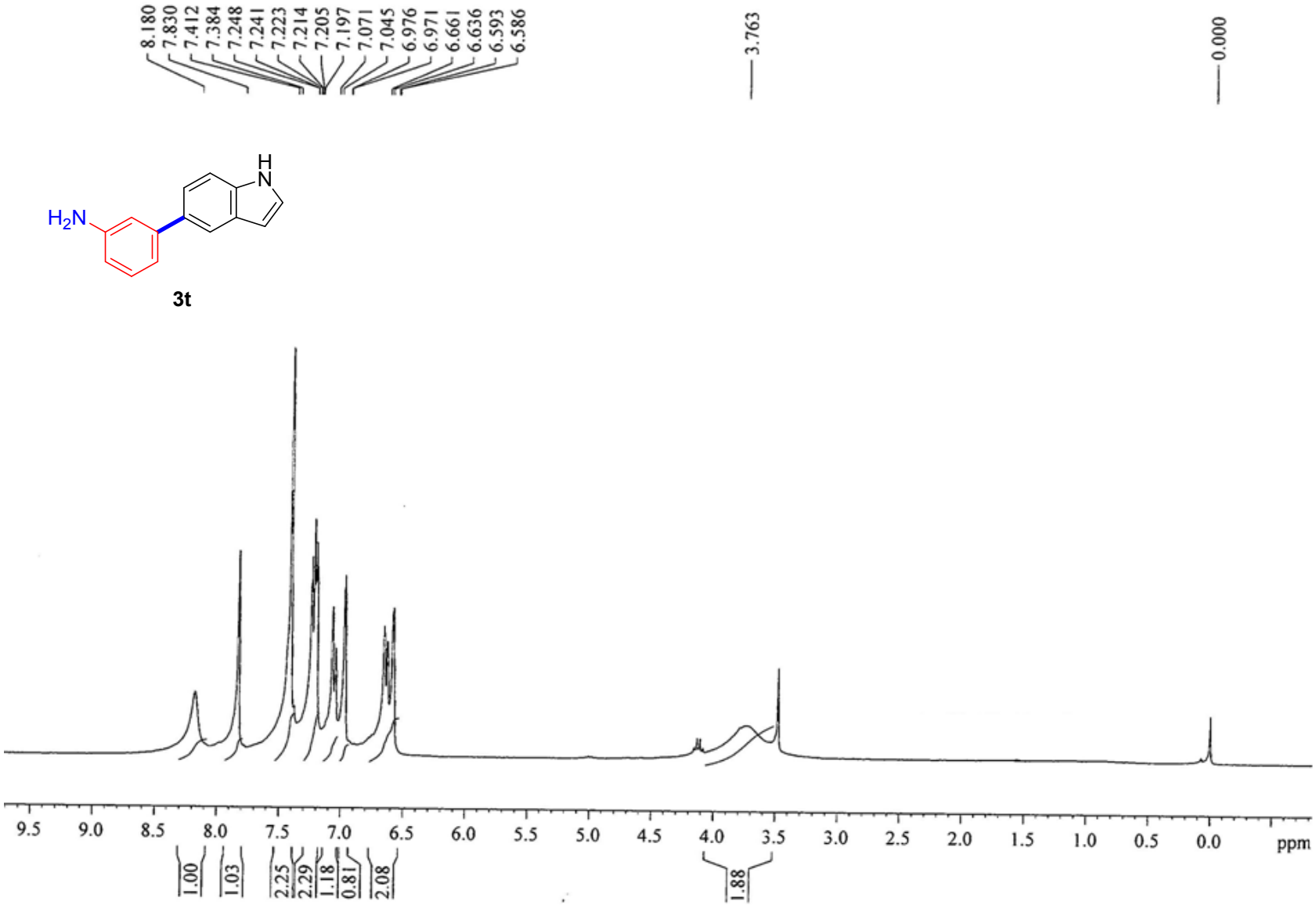
Spectrum36. 75 MHz ^{13}C NMR of compound **3r**



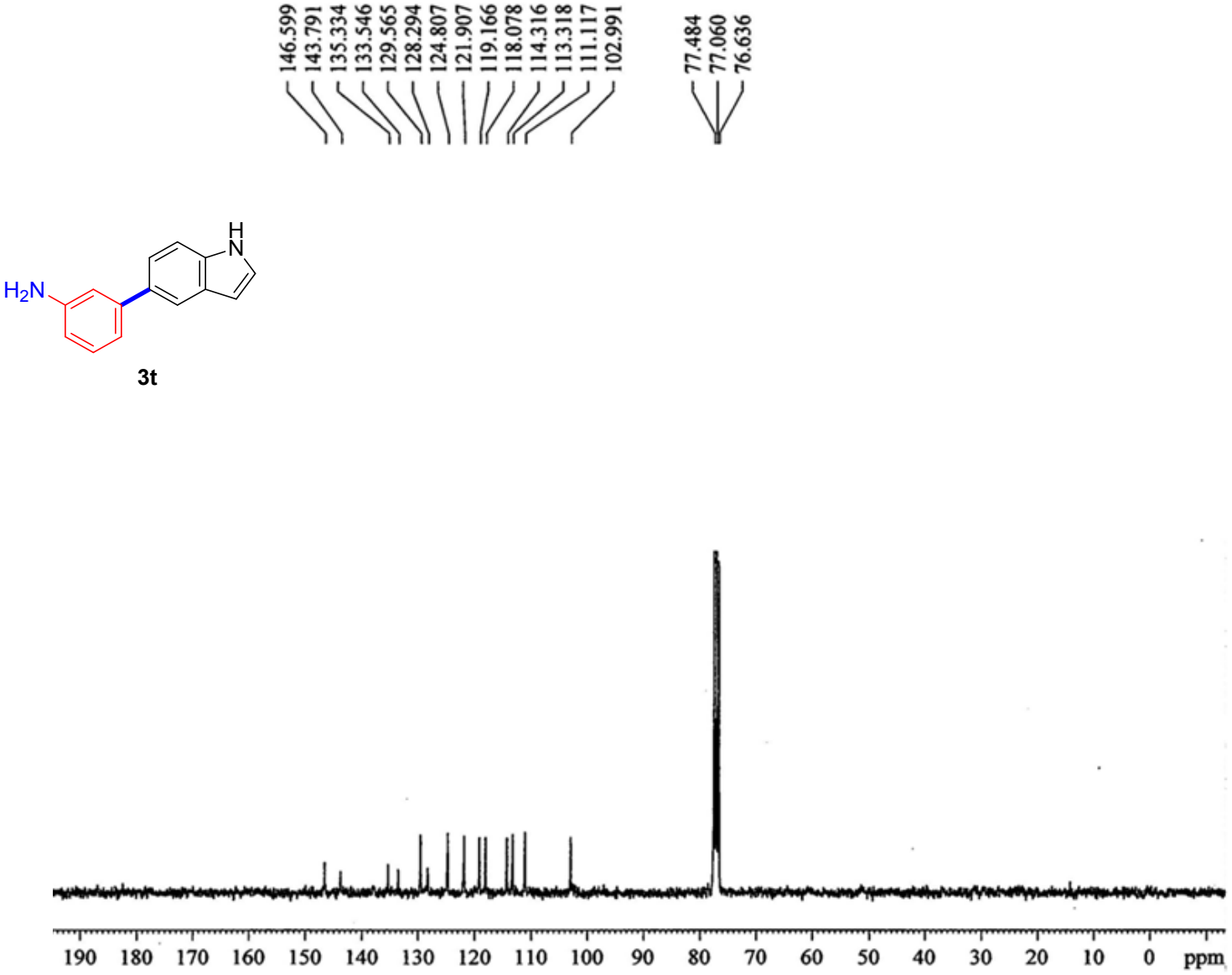
Spectrum37. 300 MHz ^{1}H NMR of compound **3s**



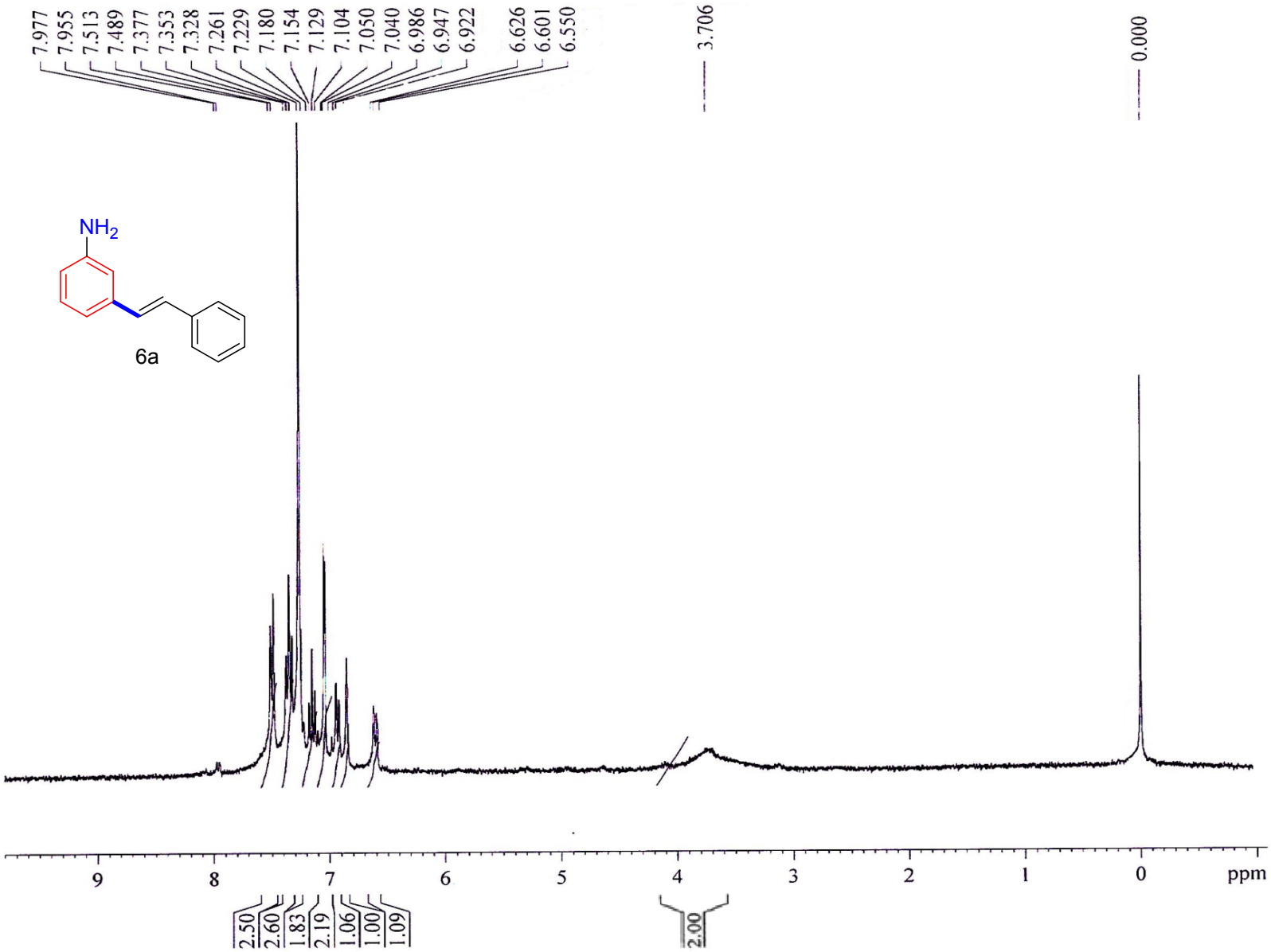
Spectrum38. 75 MHz ^{13}C NMR of compound **3s**



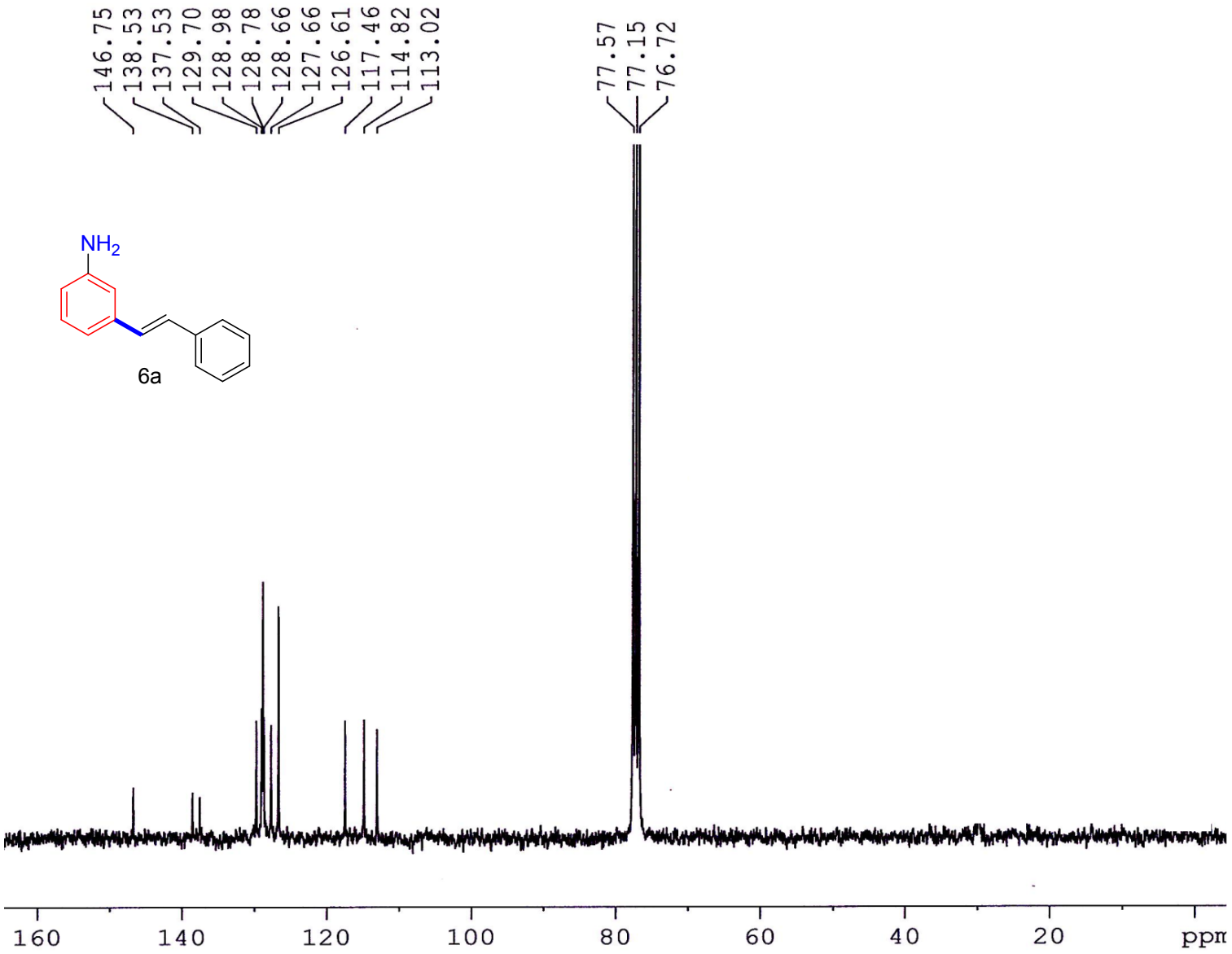
Spectrum39. 300 MHz ^{1}H NMR of compound **3t**



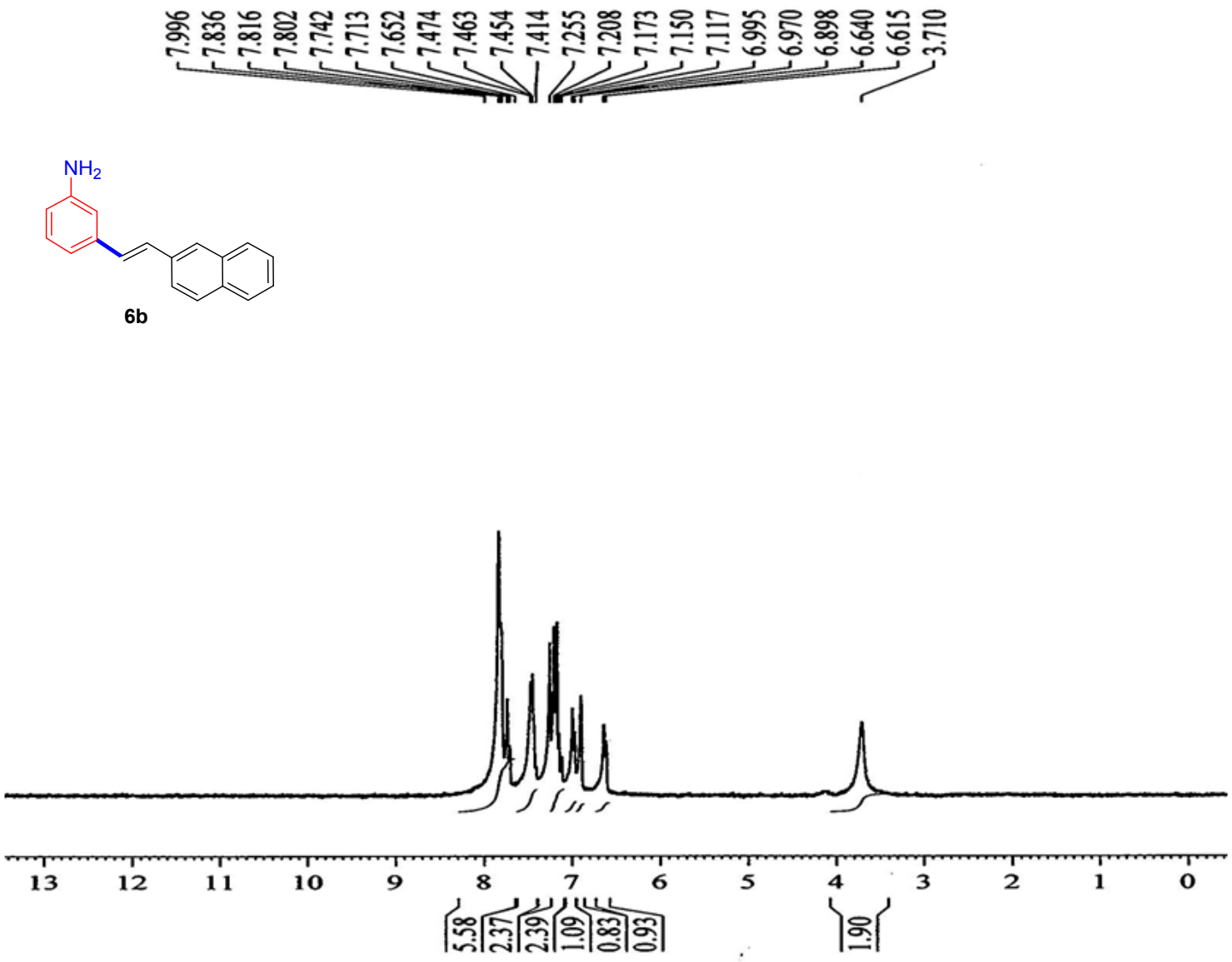
Spectrum40. 75 MHz ^{13}C NMR of compound **3t**



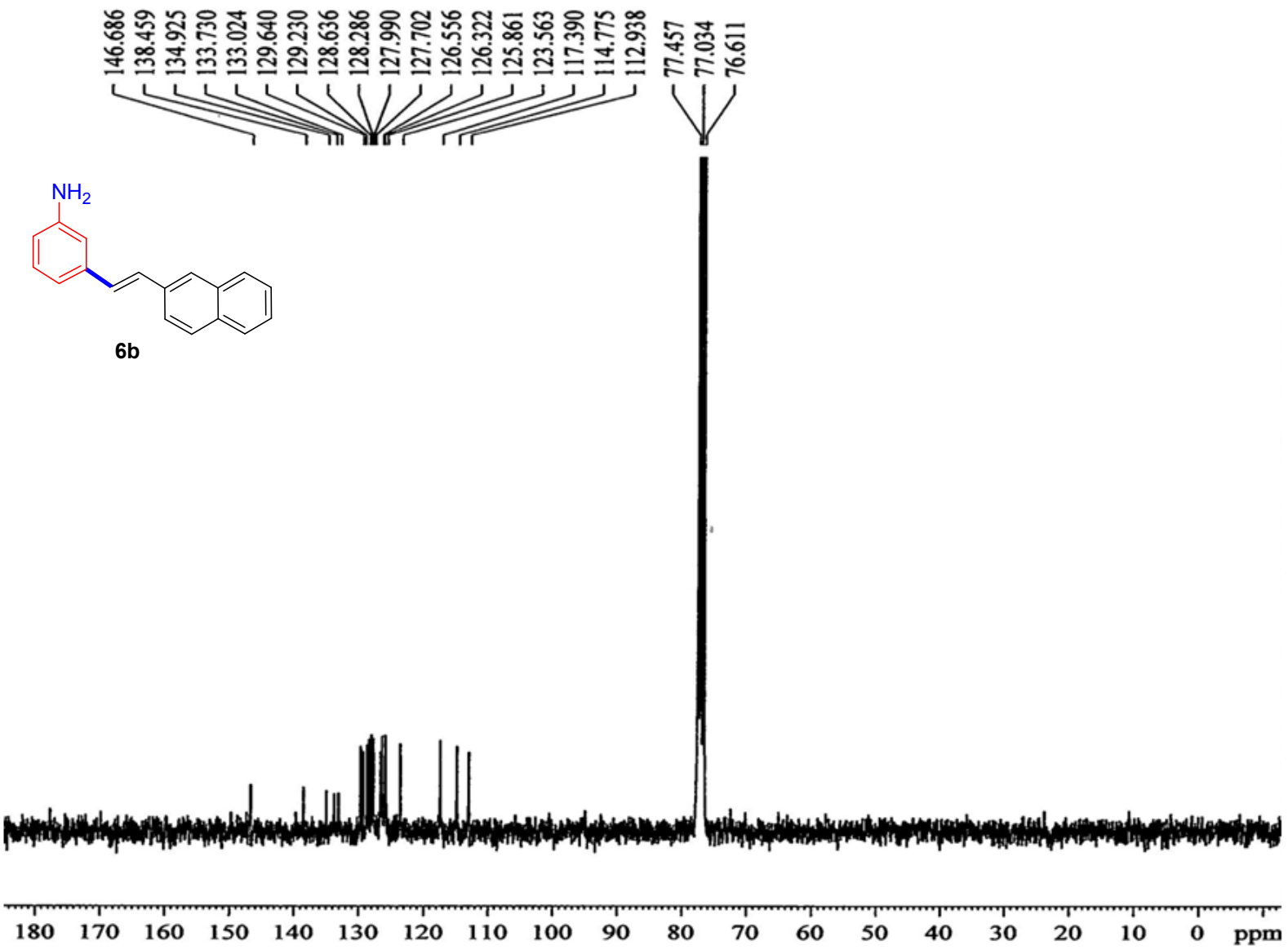
Spectrum41. 300 MHz ^{1}H NMR of compound **6a**



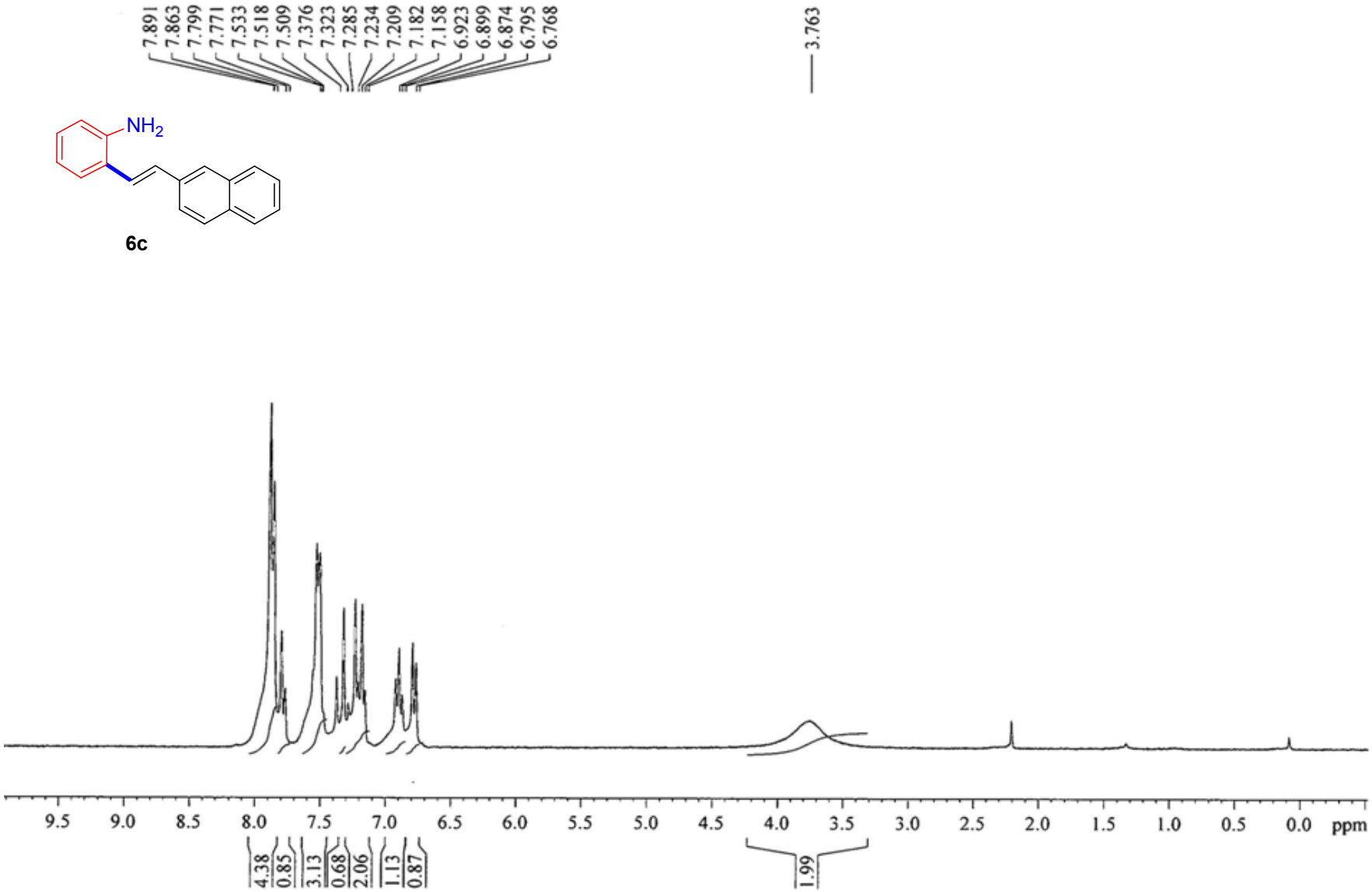
Spectrum42. 75 MHz ^{13}C NMR of compound **6a**



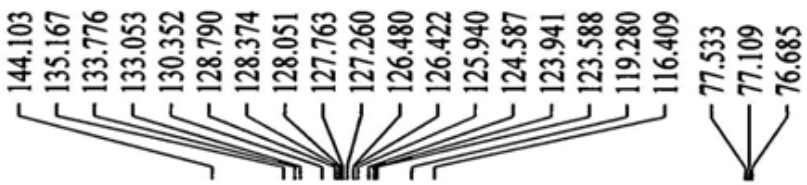
Spectrum43. 300 MHz ^{1}H NMR of compound **6a**

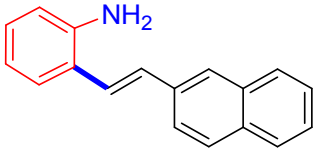


Spectrum44. 75 MHz ^{13}C NMR of compound **6b**

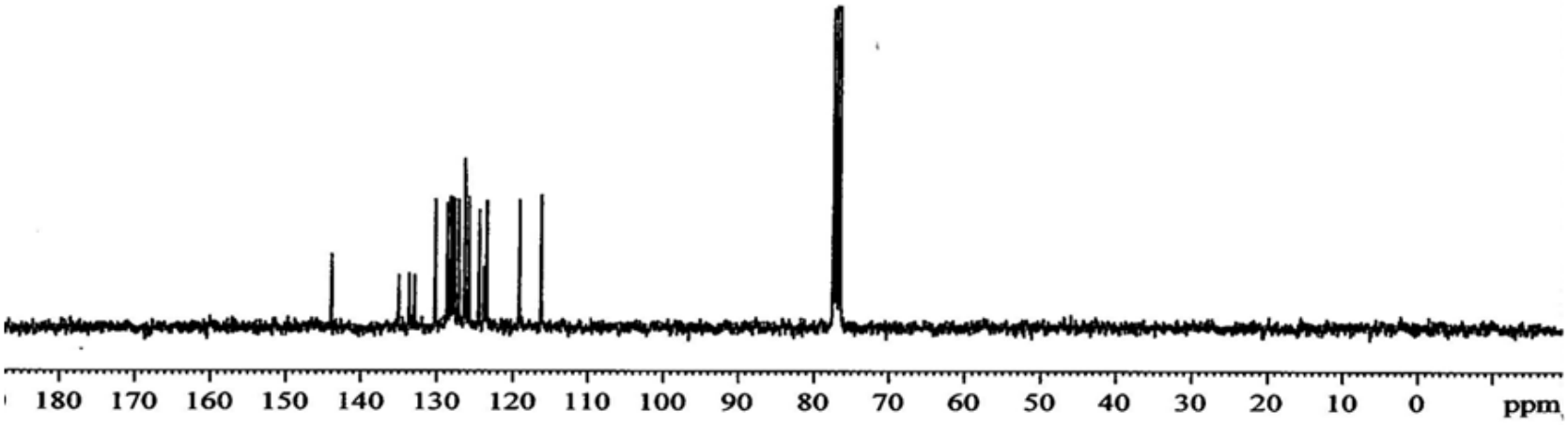


Spectrum45. 300 MHz ^{1}H NMR of compound **6c**

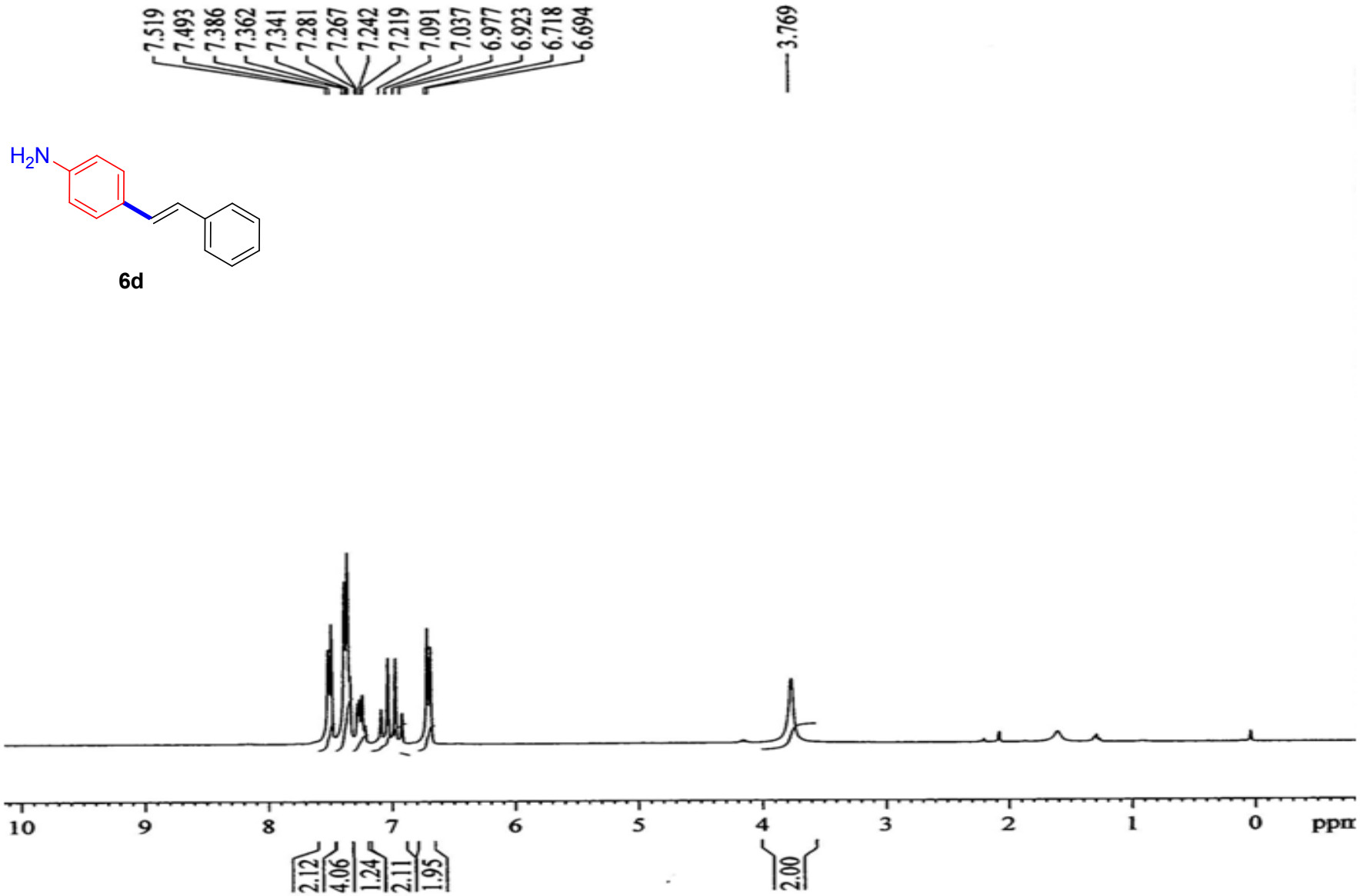




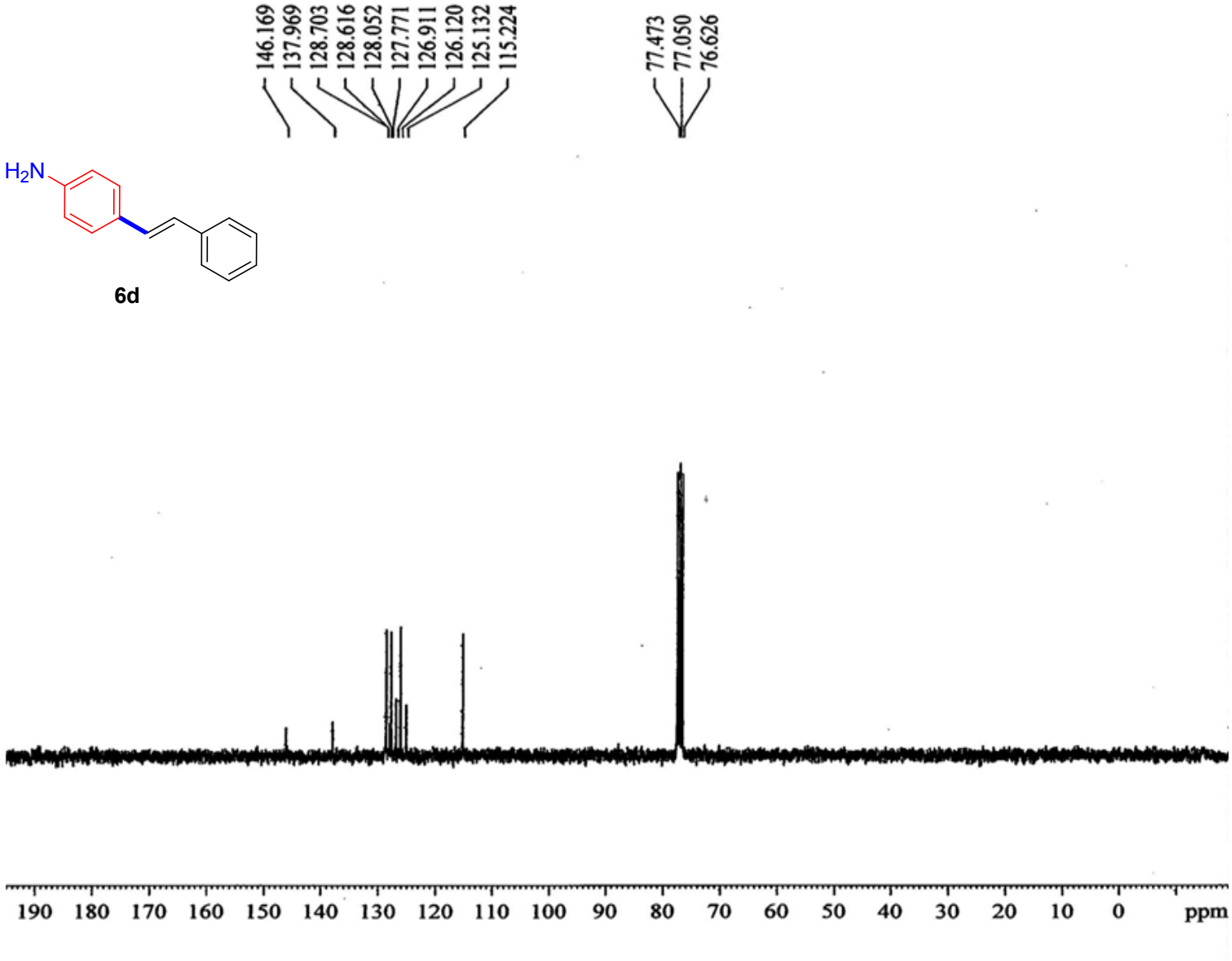
6c



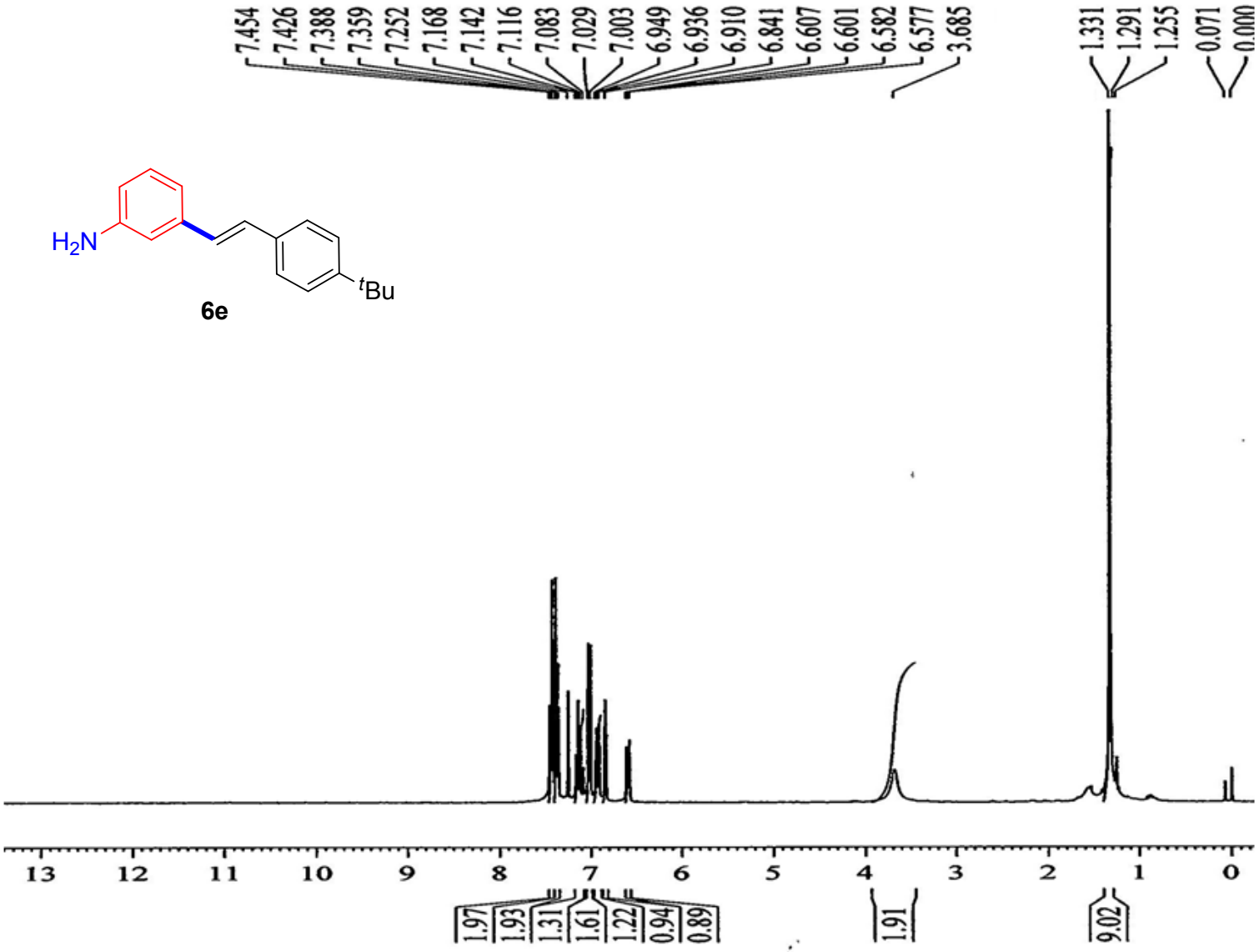
Spectrum46. 75 MHz ^{13}C NMR of compound **6c**



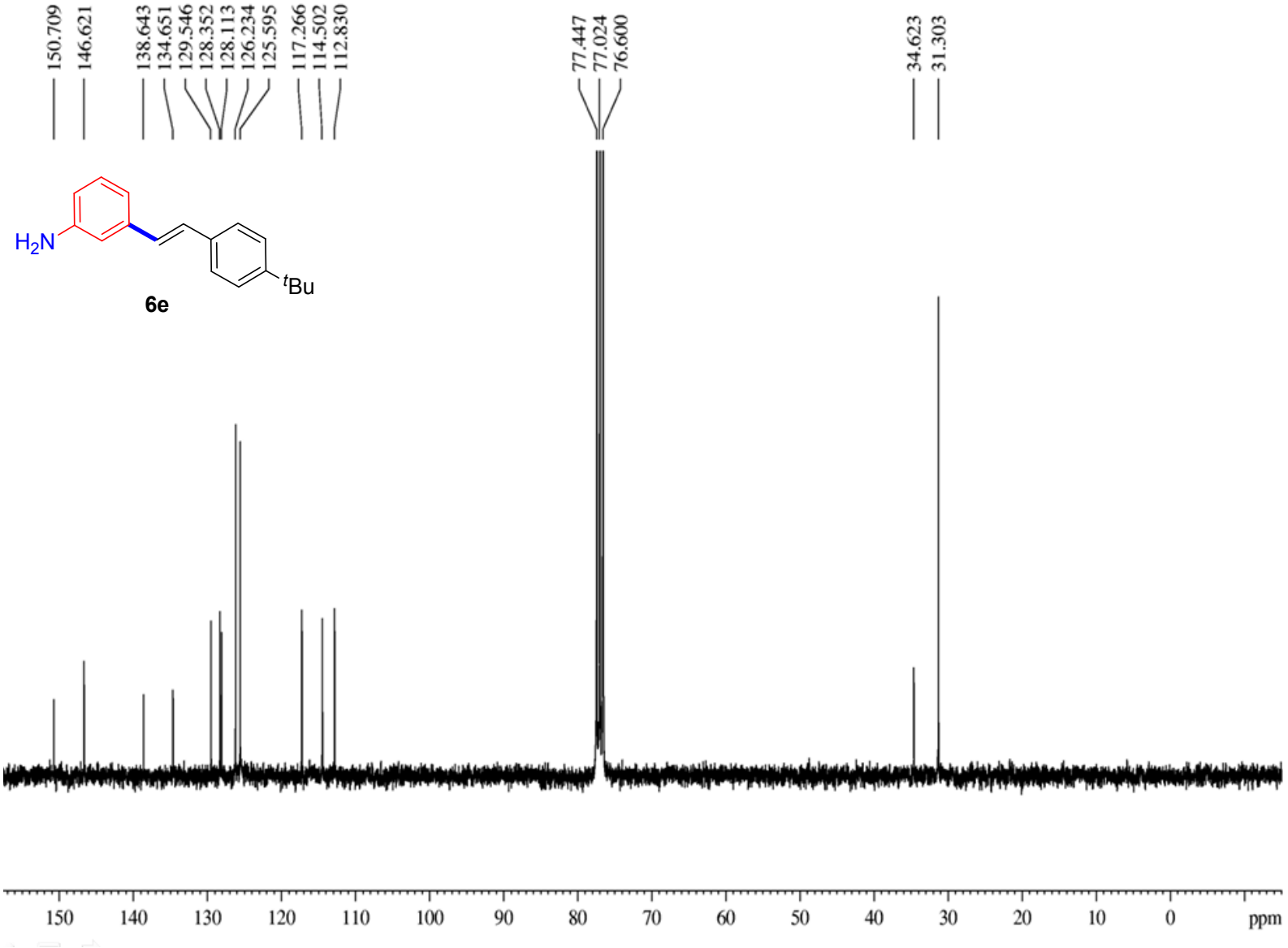
Spectrum47. 300 MHz ^{1}H NMR of compound **6d**



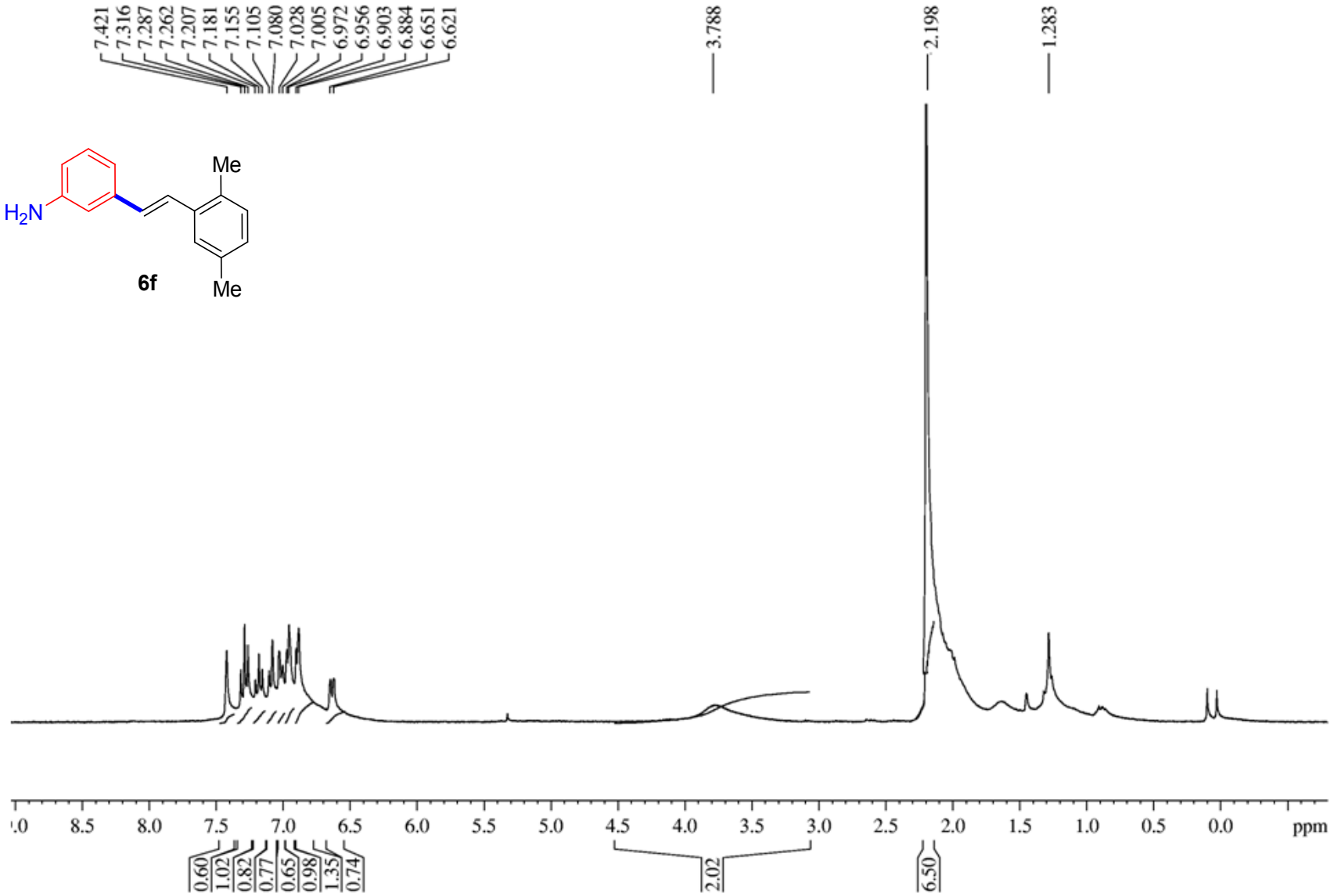
Spectrum48. 75 MHz ^{13}C NMR of compound **6d**



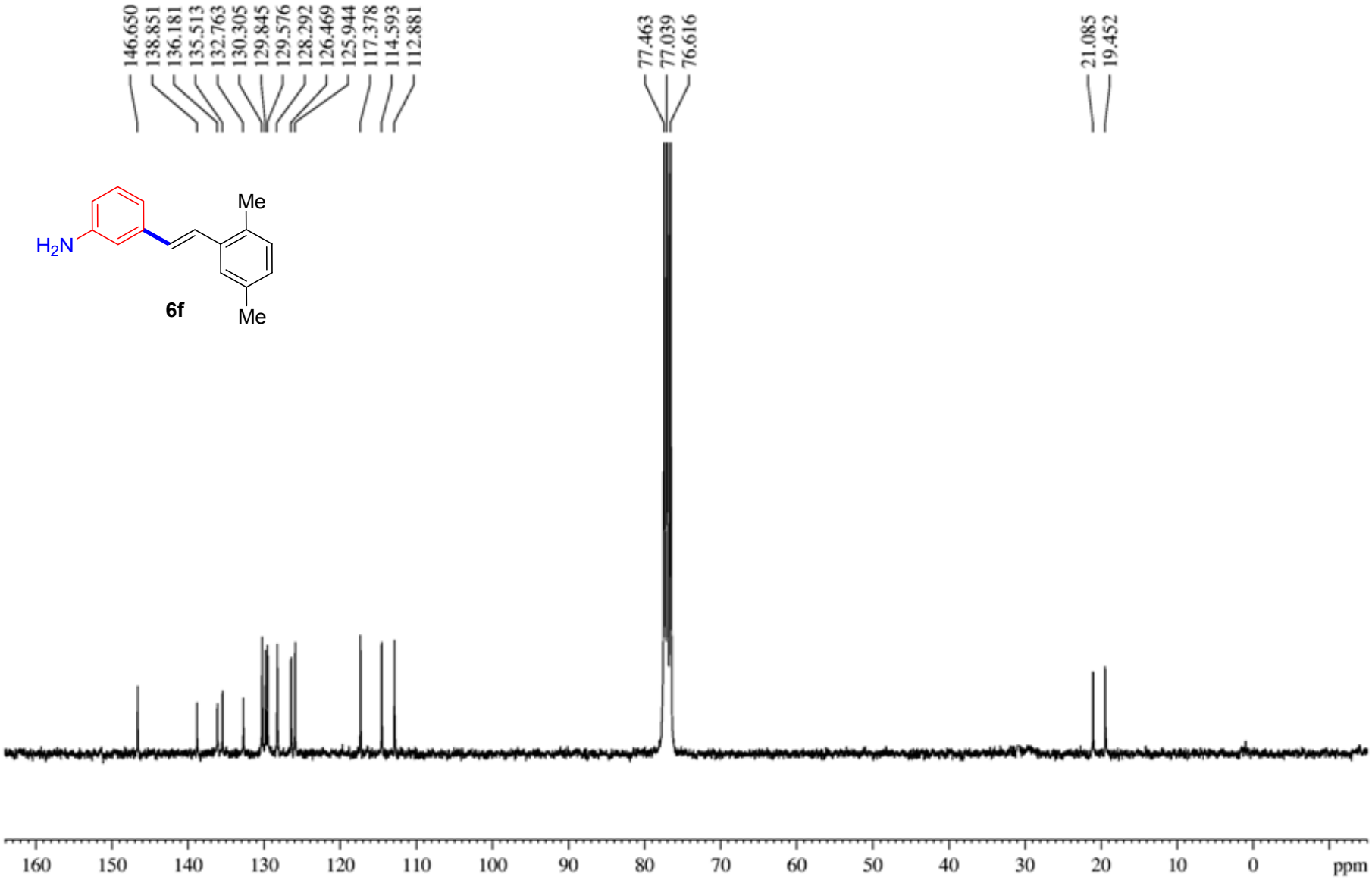
Spectrum49. 300 MHz ^{1}H NMR of compound **6e**



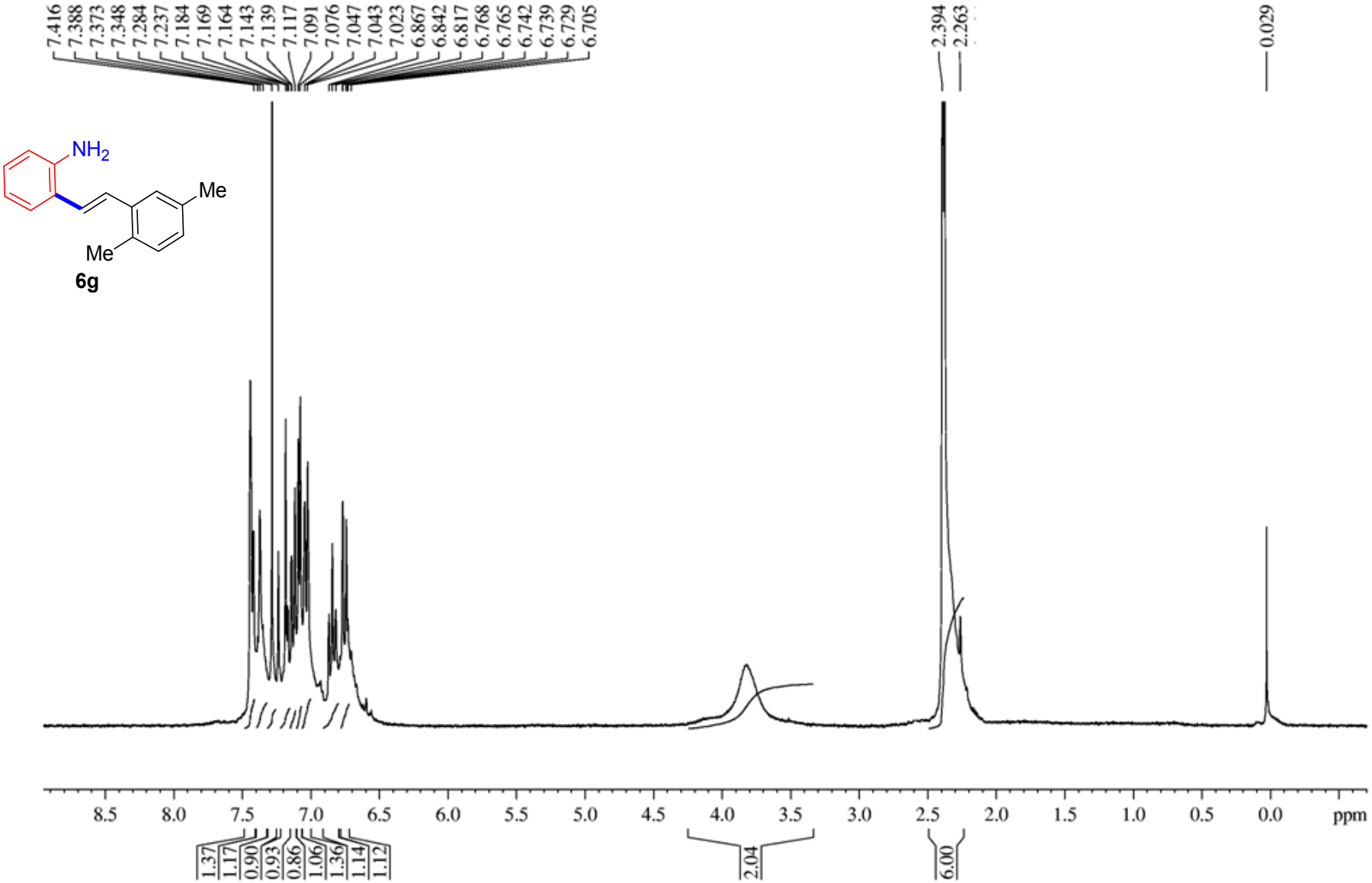
Spectrum50. 75 MHz ^{13}C NMR of compound **6e**



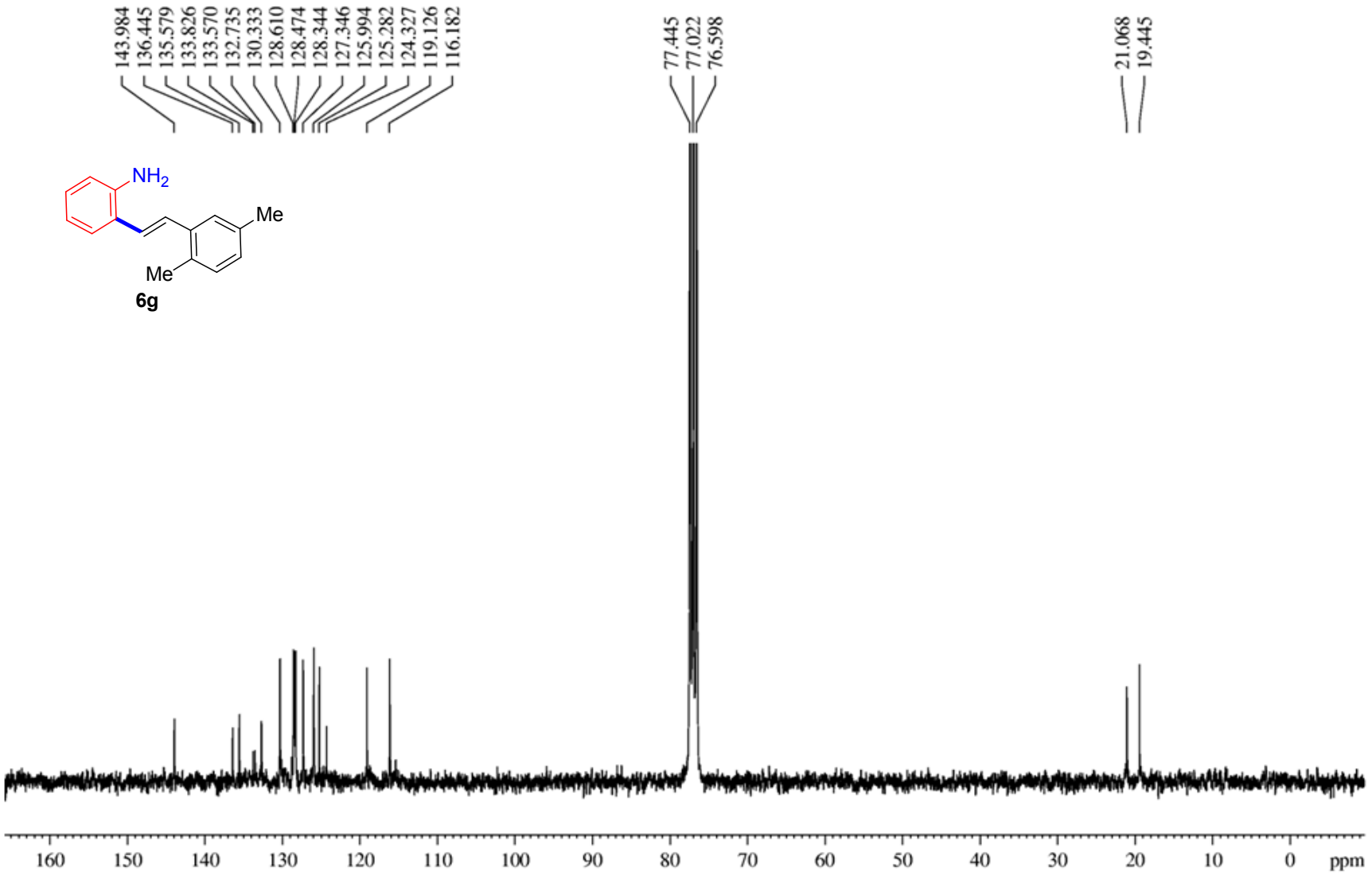
Spectrum51. 300 MHz ^{1}H NMR of compound **6f**



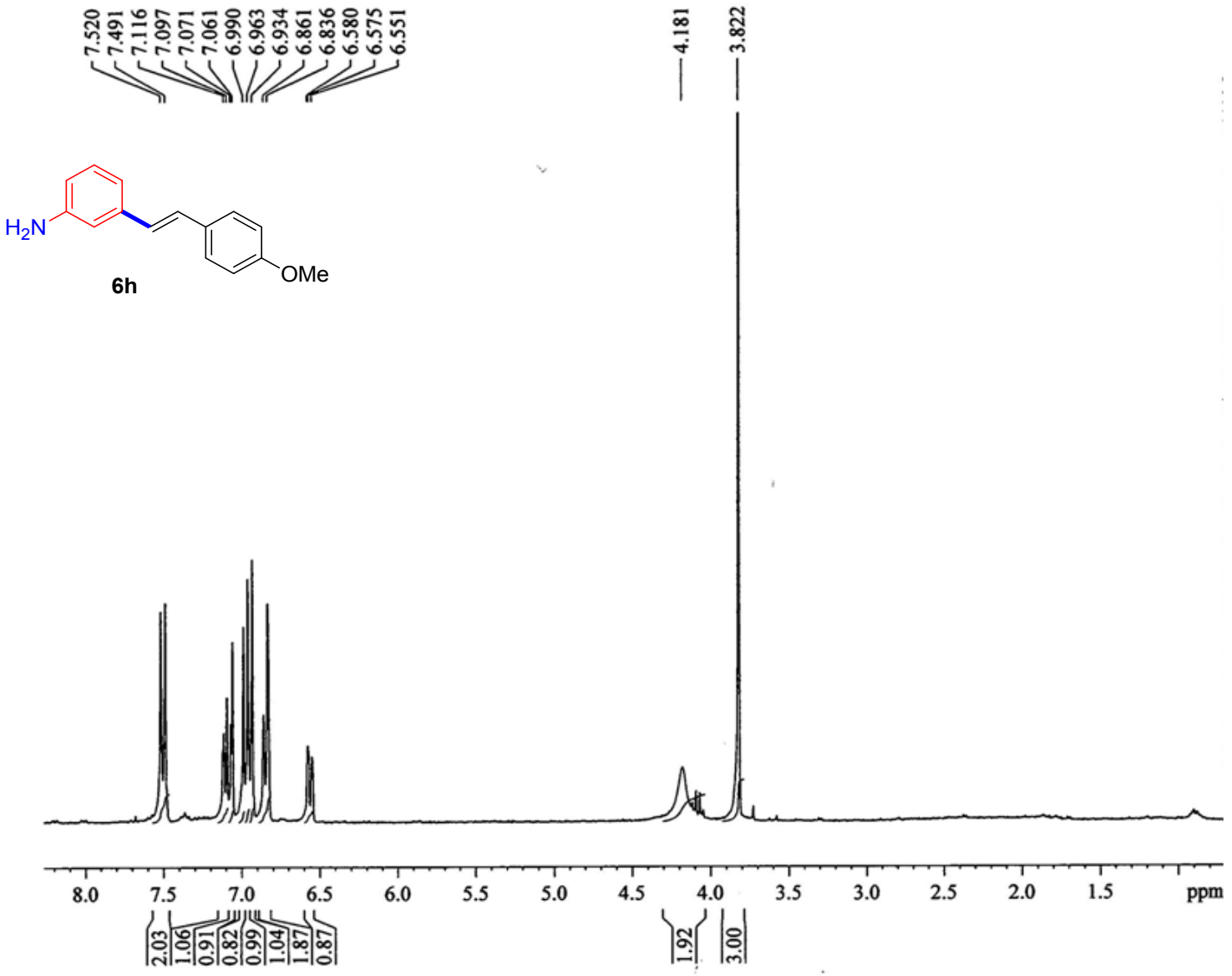
Spectrum52. 75 MHz ^{13}C NMR of compound **6f**



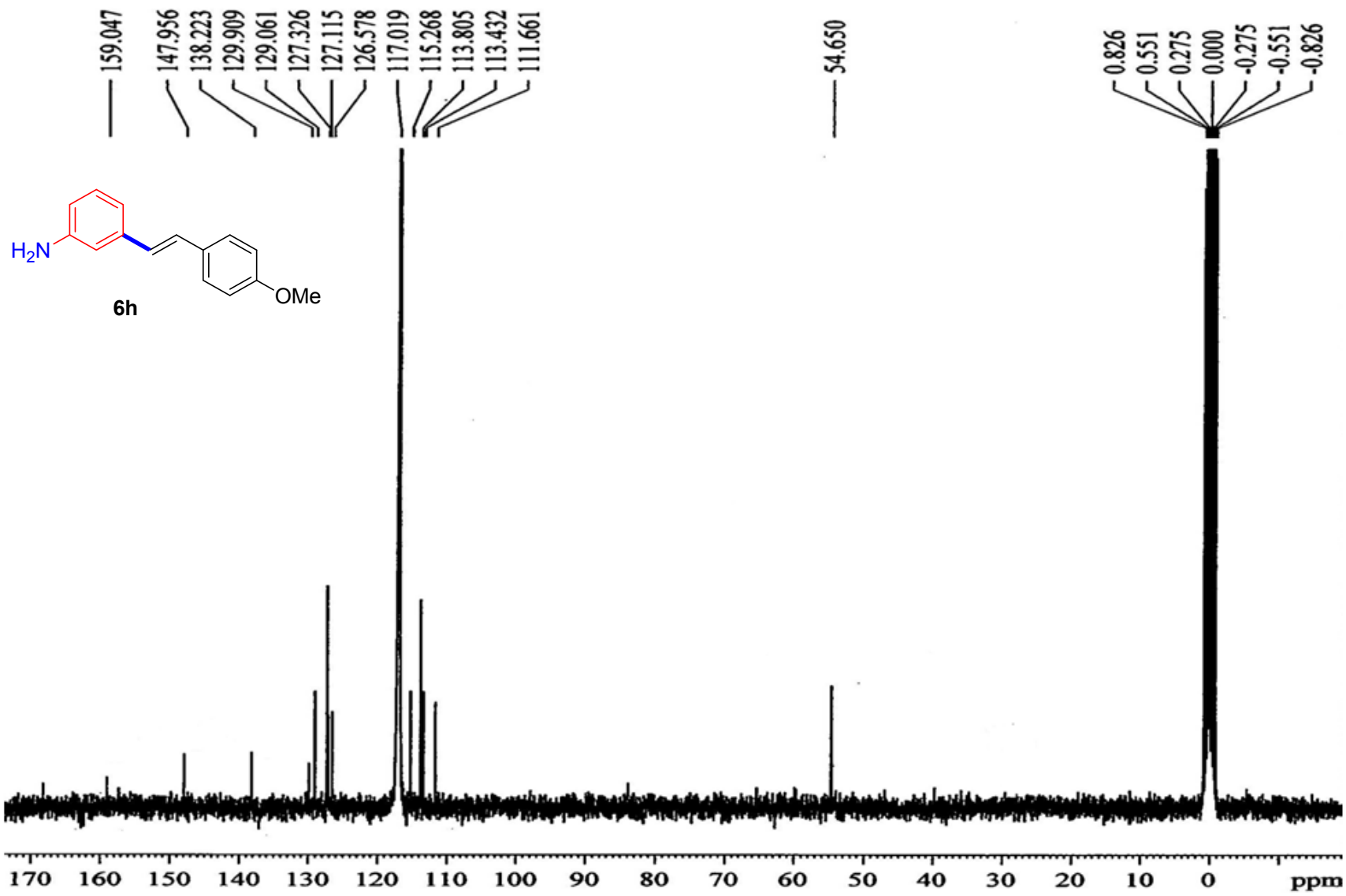
Spectrum53. 300 MHz ^{1}H NMR of compound **6g**



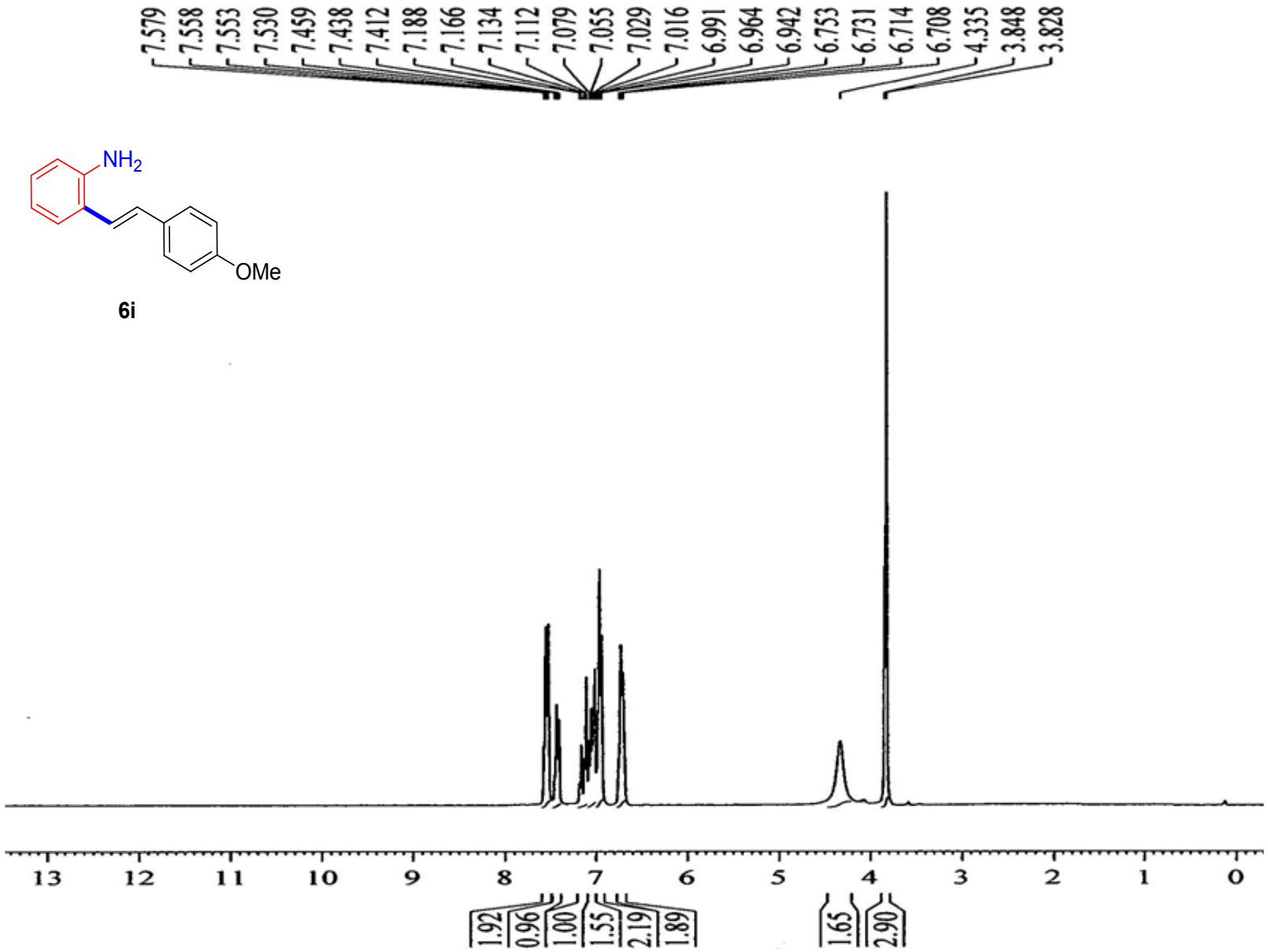
Spectrum54. 75 MHz ^{13}C NMR of compound **6g**



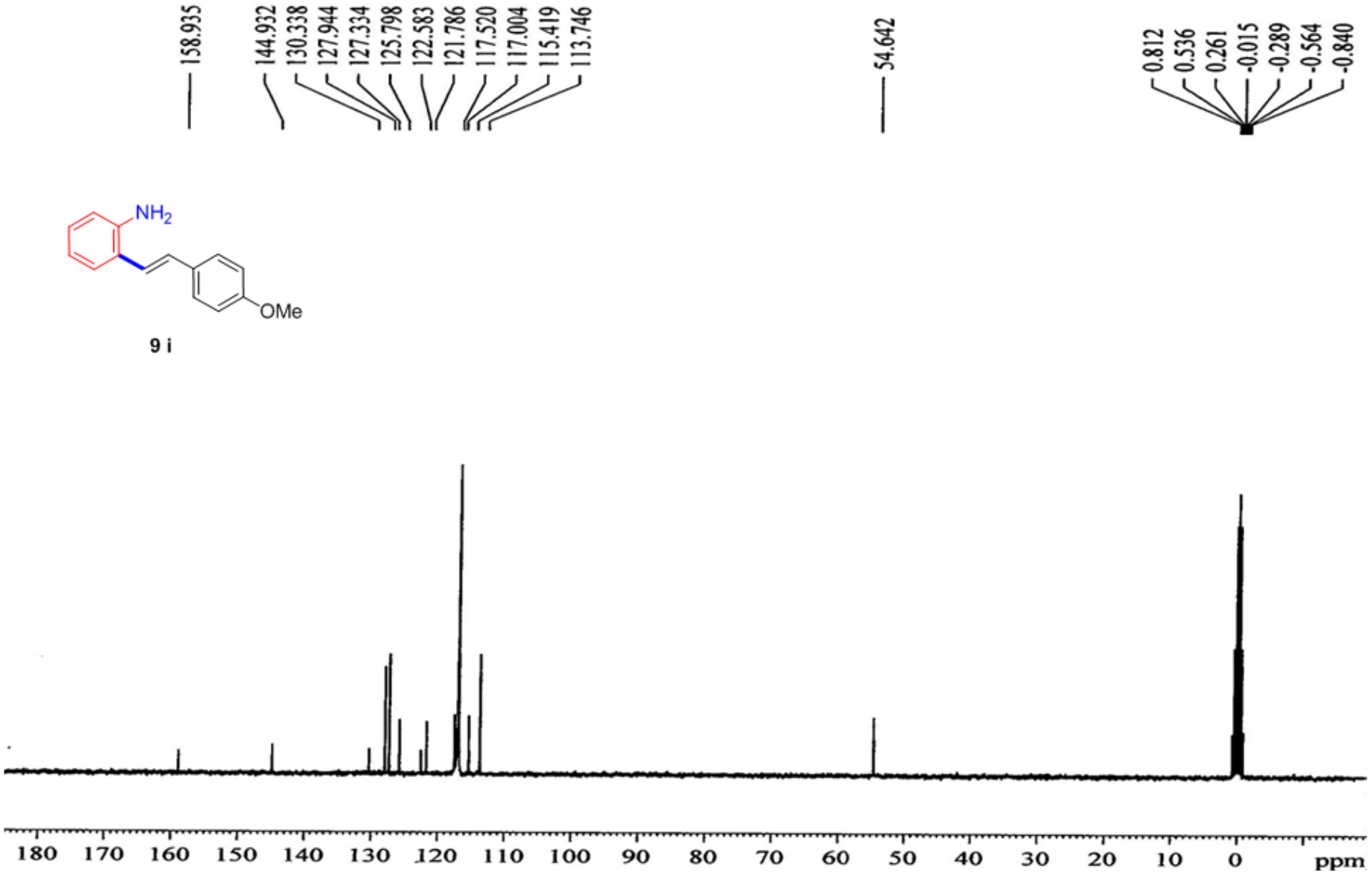
Spectrum55. 300 MHz ^{1}H NMR of compound **6h**



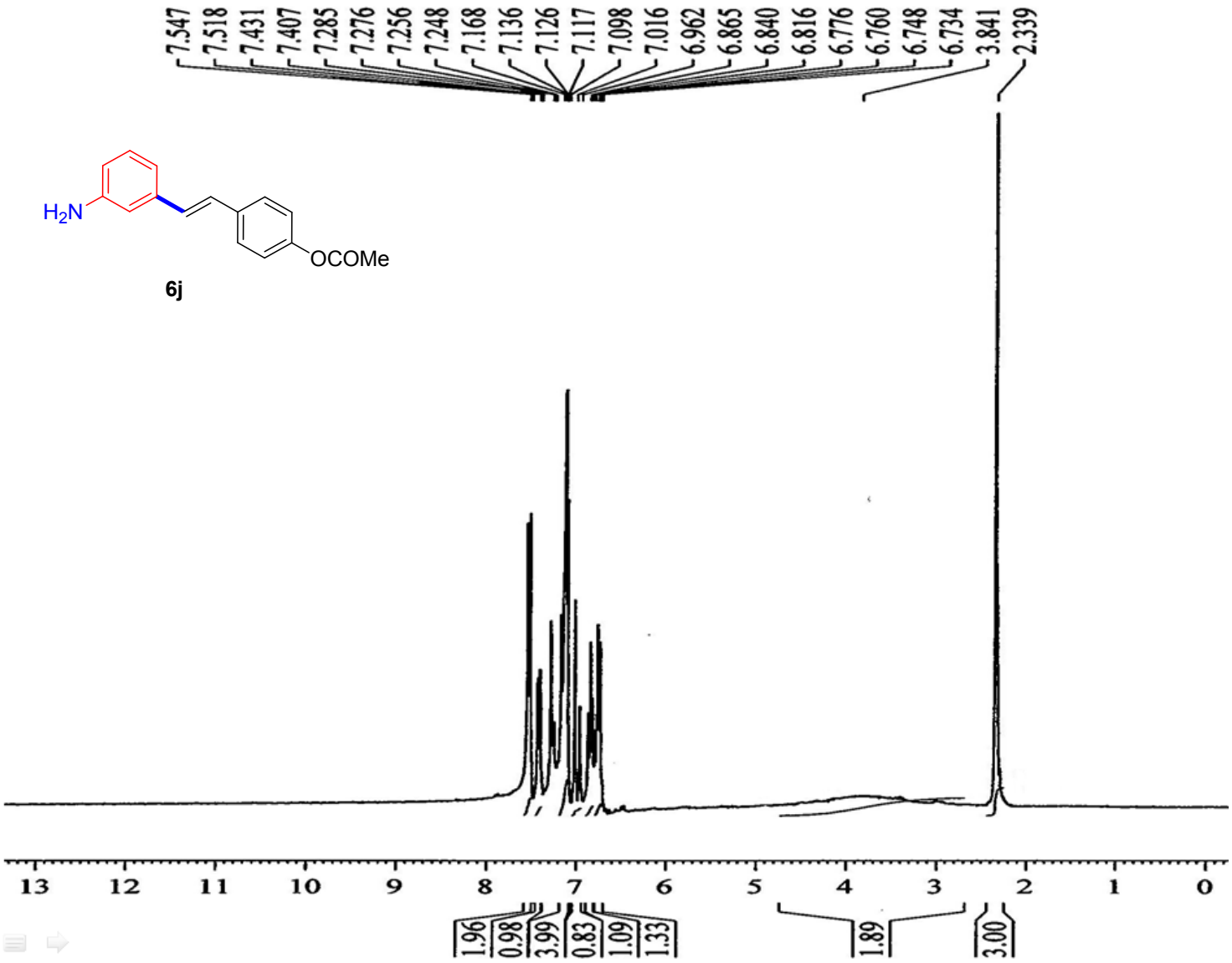
Spectrum56. 75 MHz ^{13}C NMR of compound **6h**



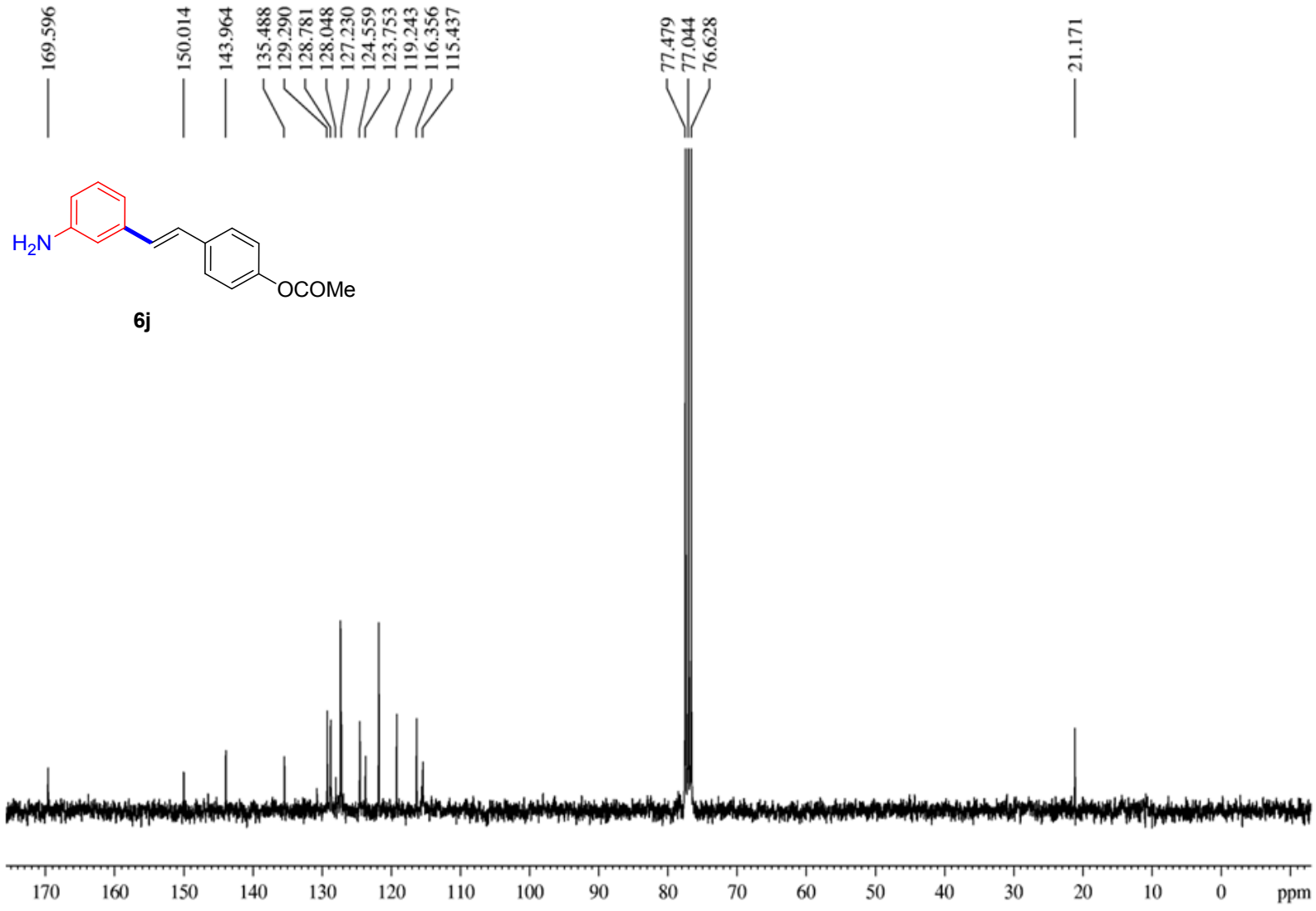
Spectrum57. 300 MHz ^{1}H NMR of compound **6i**



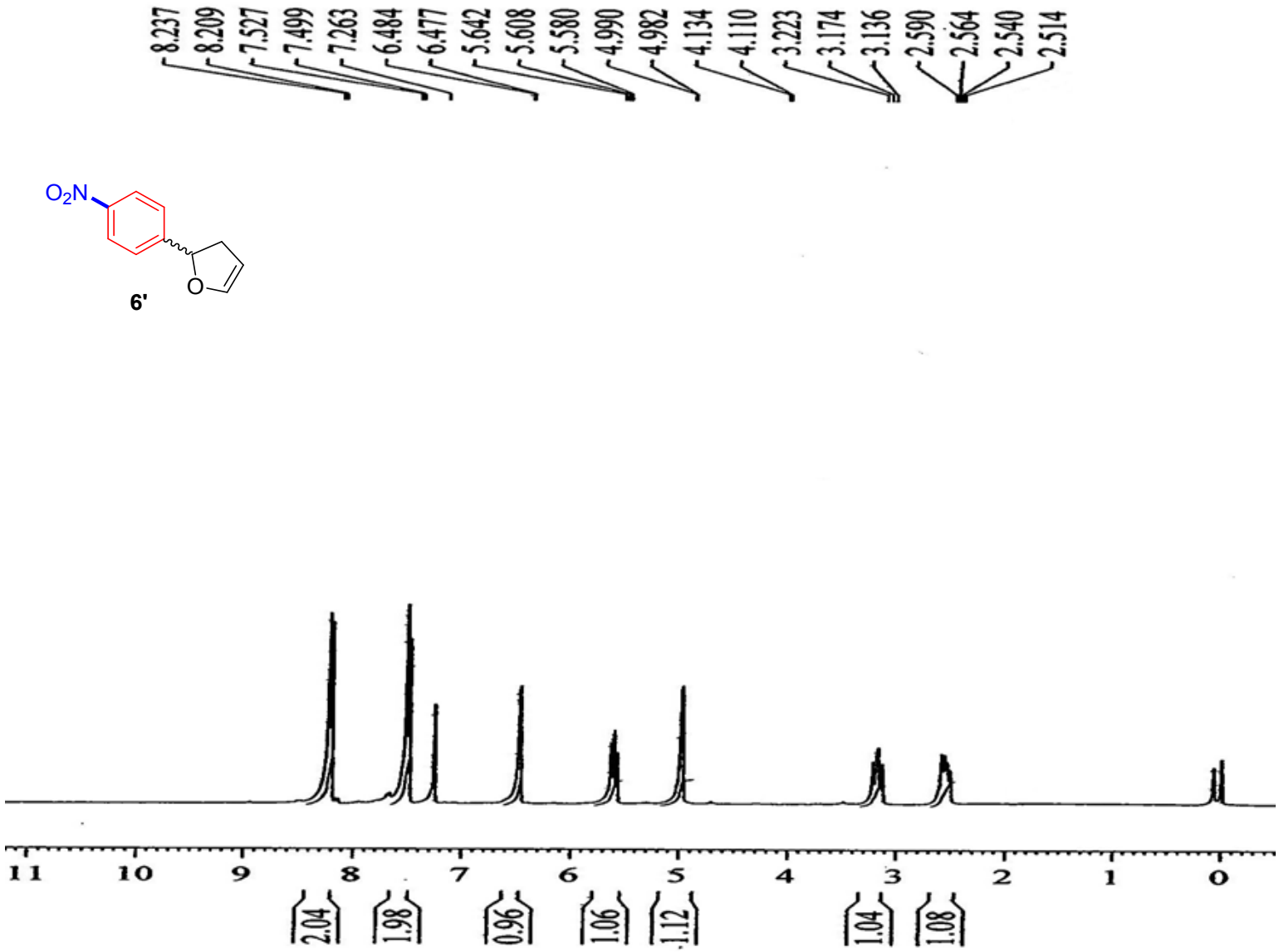
Spectrum58. 75 MHz ^{13}C NMR of compound **6i**



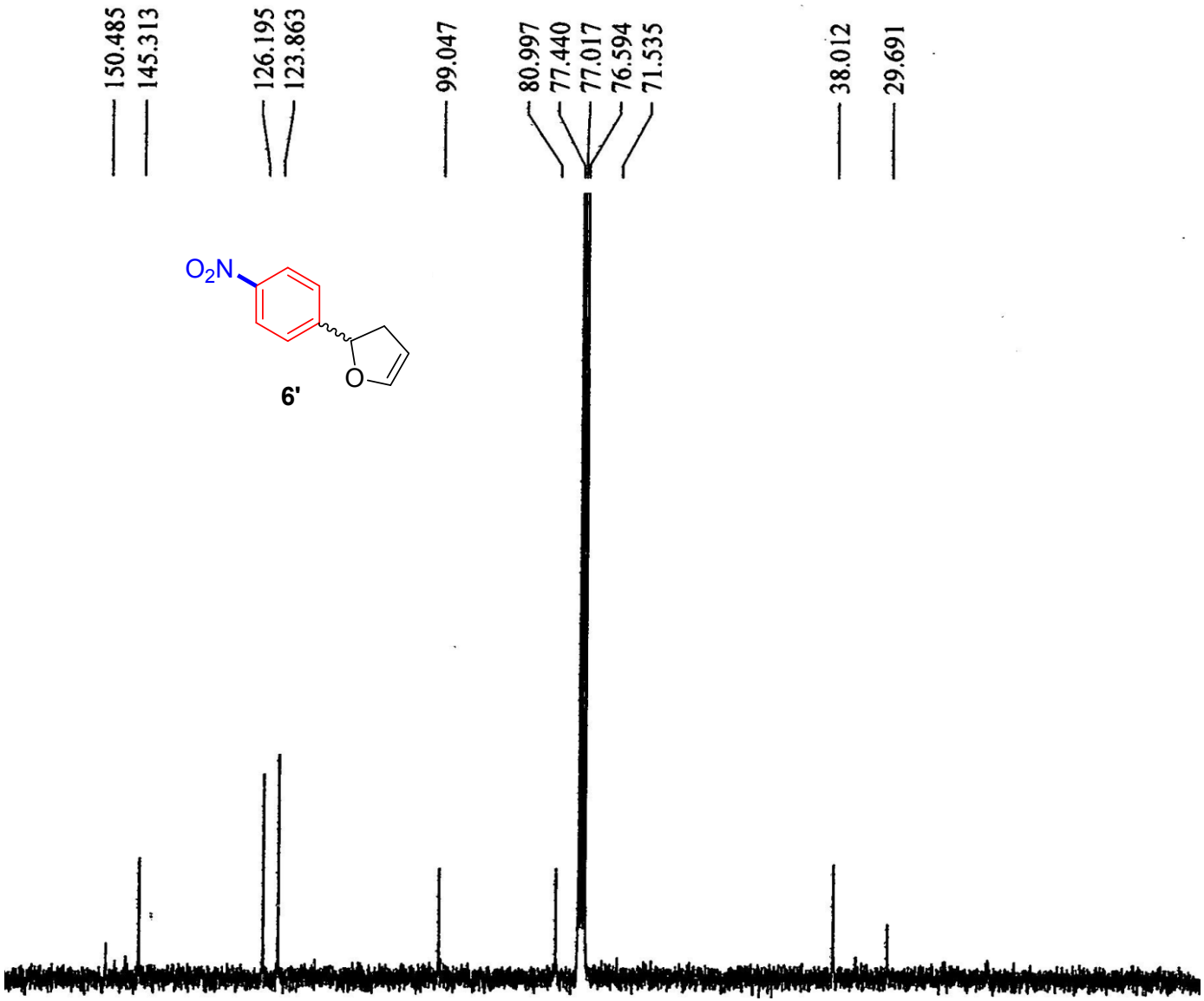
Spectrum59. 300 MHz ^{1}H NMR of compound **6j**



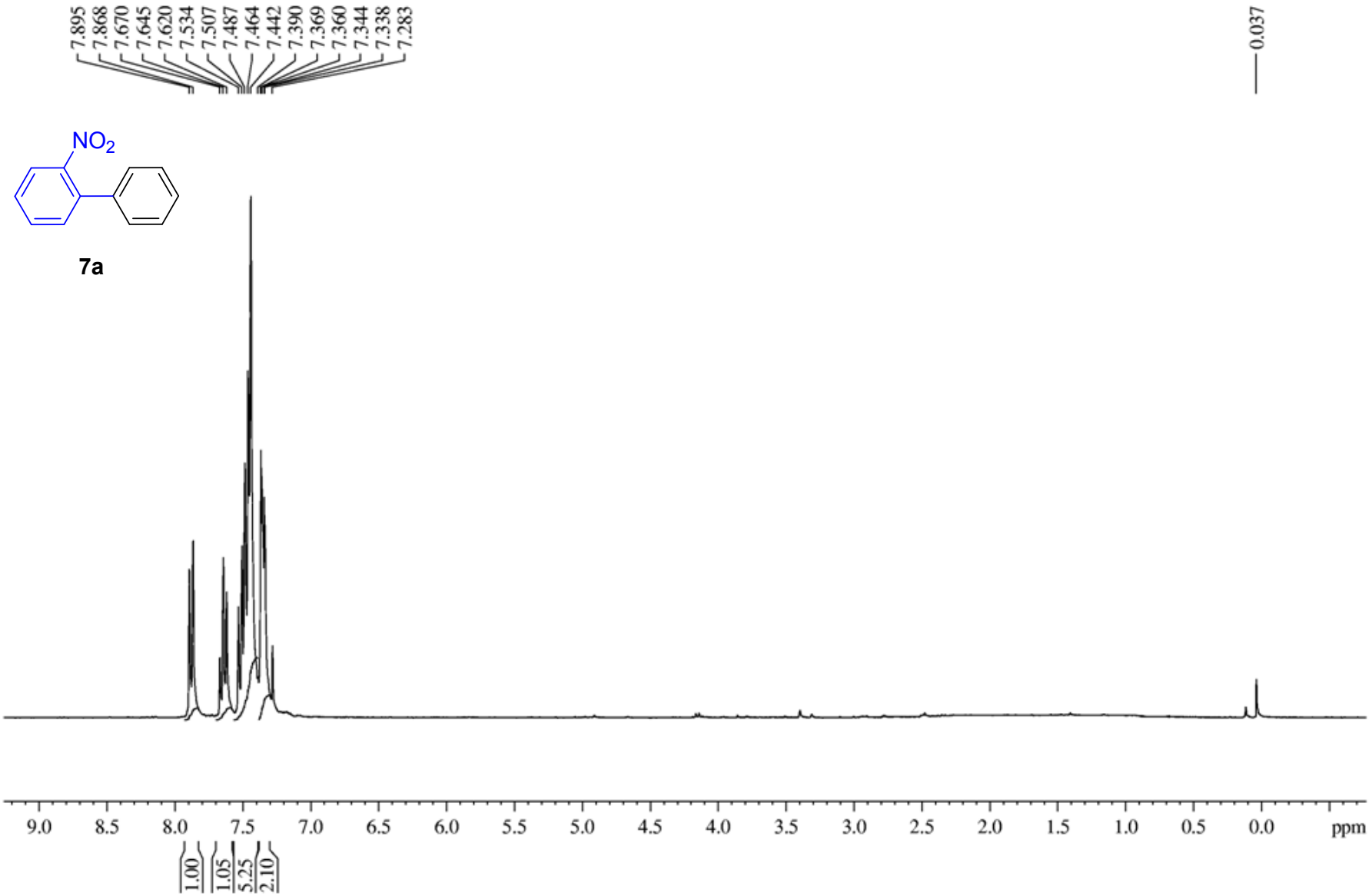
Spectrum60. 75 MHz ^{13}C NMR of compound **6j**



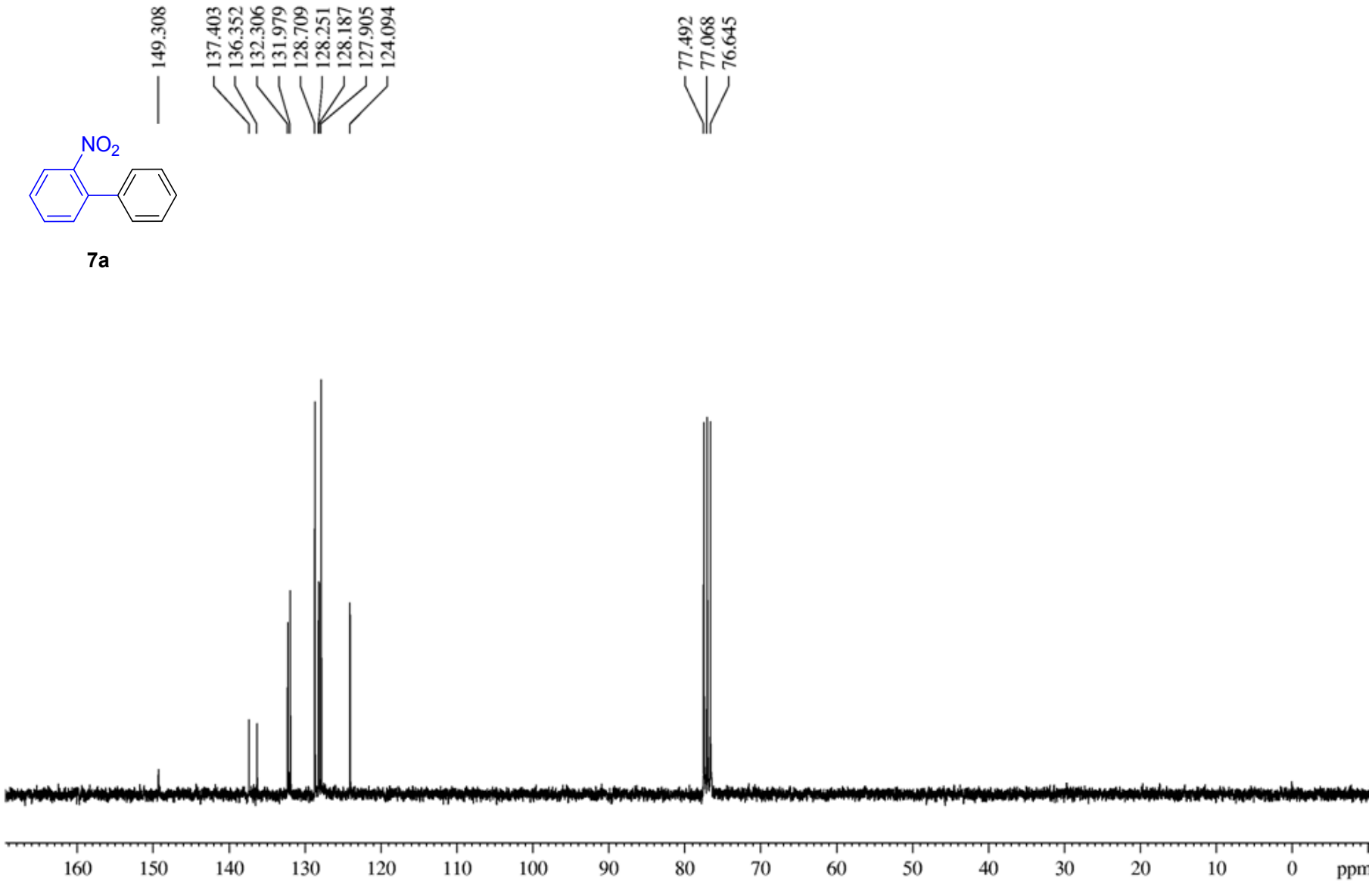
Spectrum61. 300 MHz ^{1}H NMR of compound **6'**



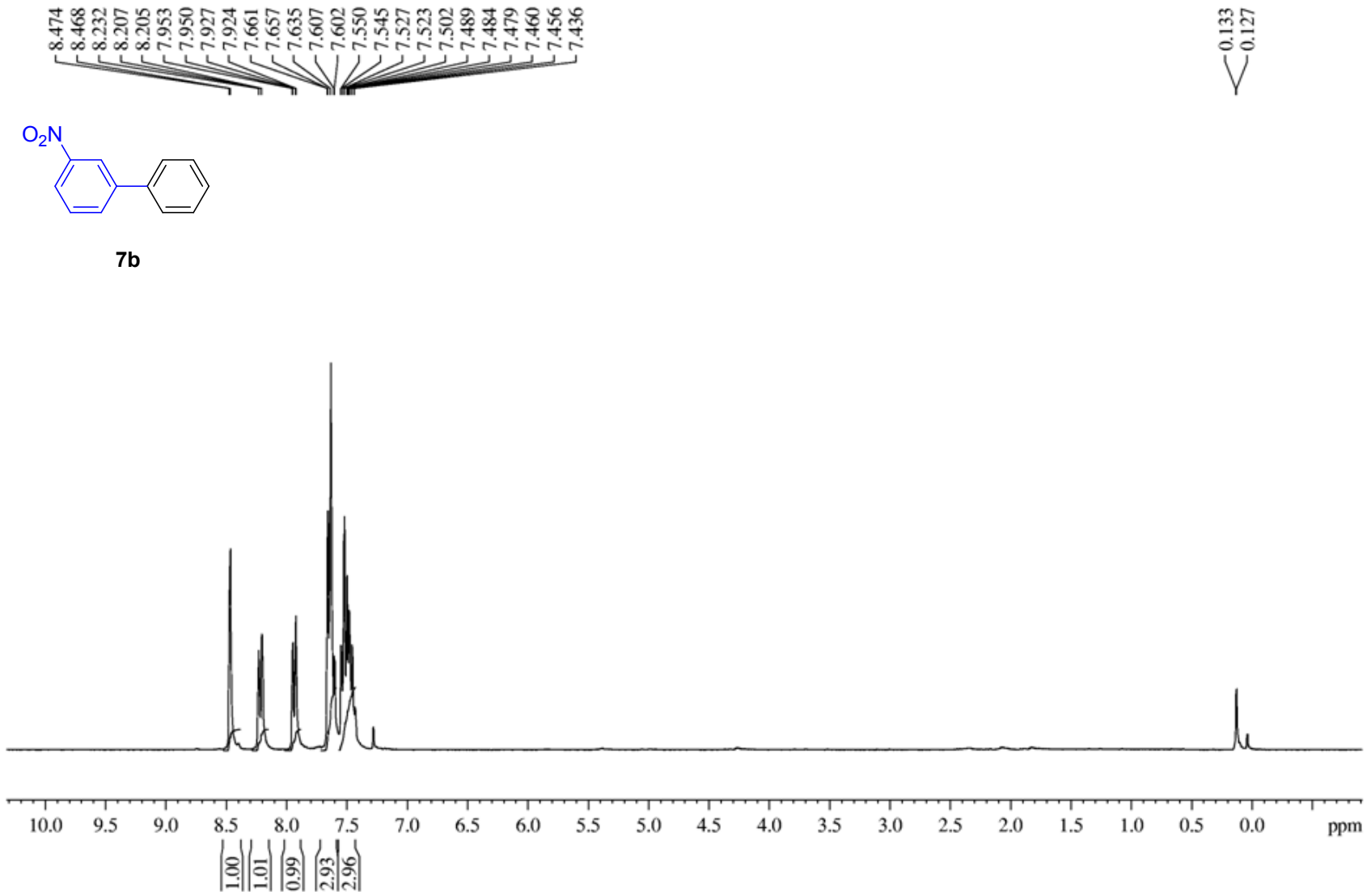
Spectrum62. 75 MHz ^{13}C NMR of compound **6'**



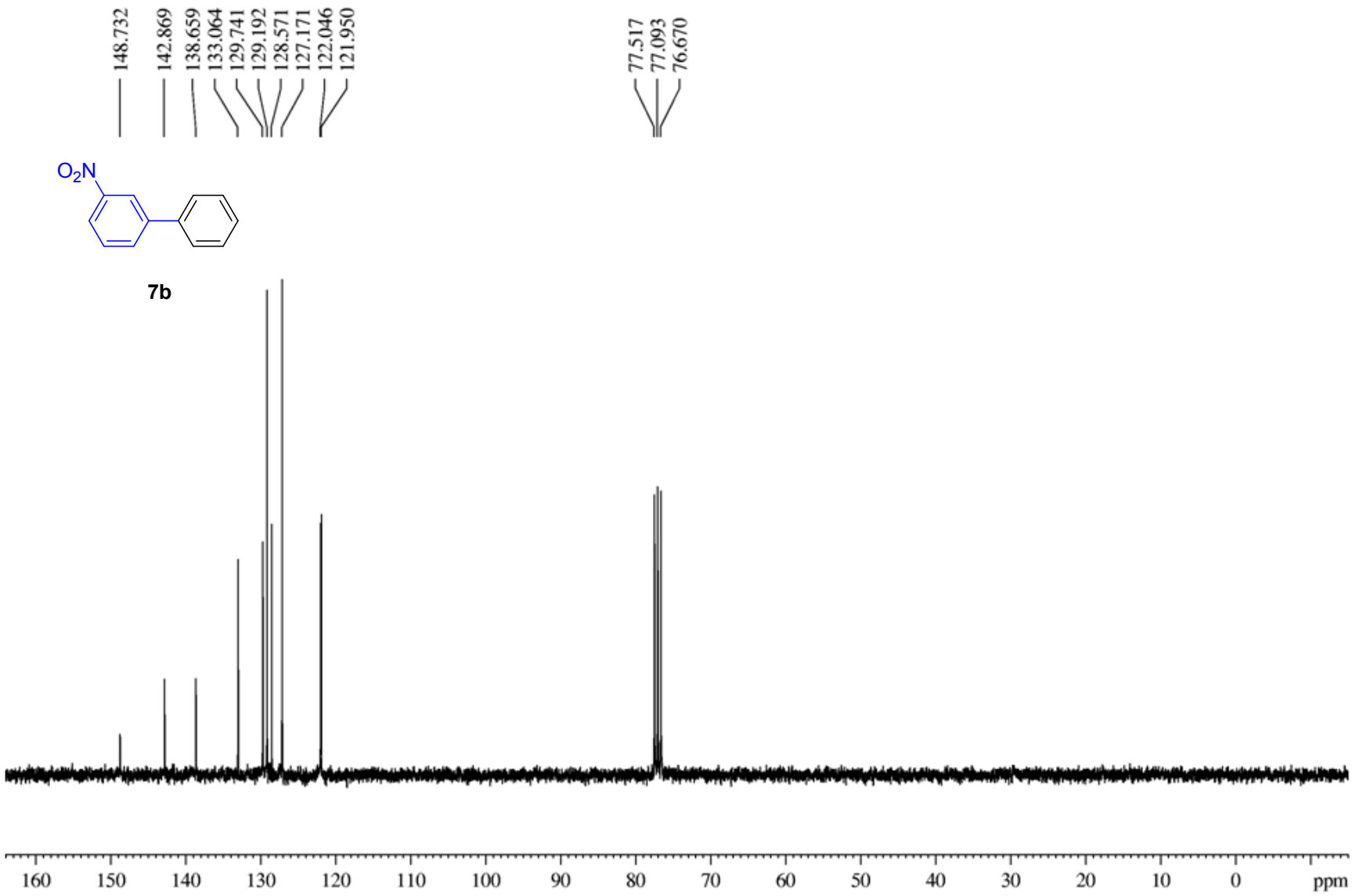
Spectrum63. 300 MHz ^{1}H NMR of compound **7a**



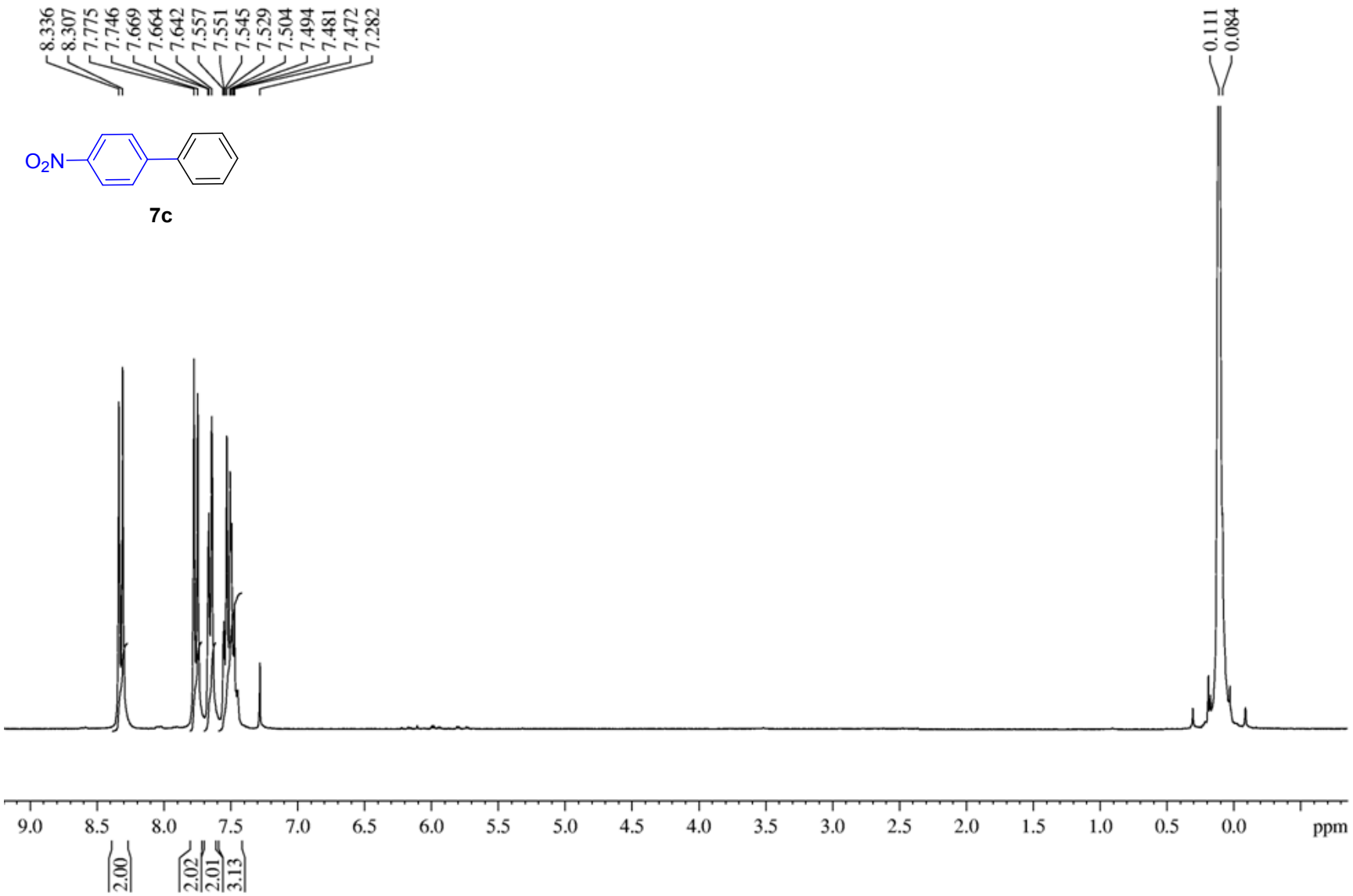
Spectrum64. 75 MHz ^{13}C NMR of compound **7a**



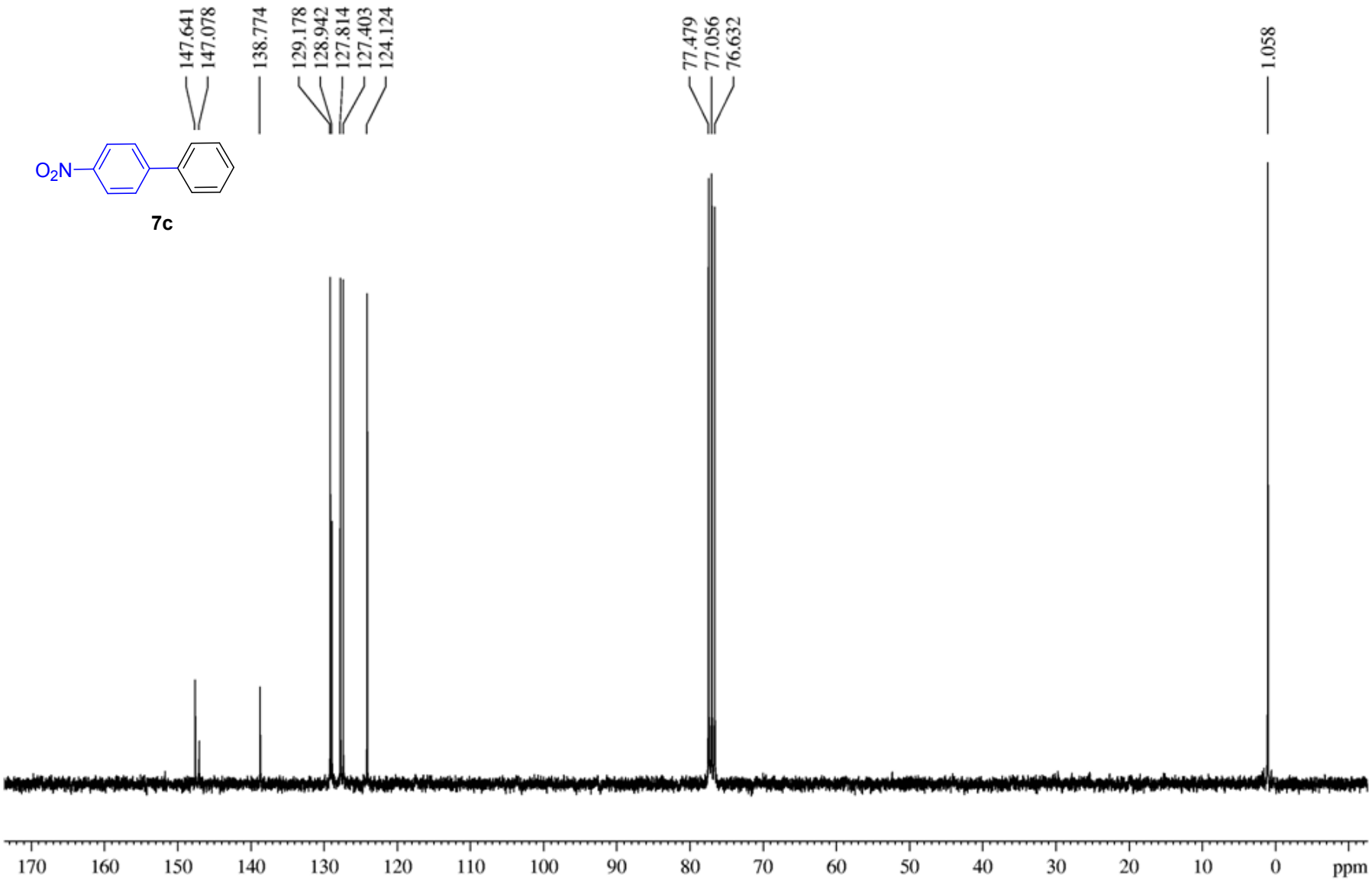
Spectrum65. 300 MHz ^{1}H NMR of compound **7b**



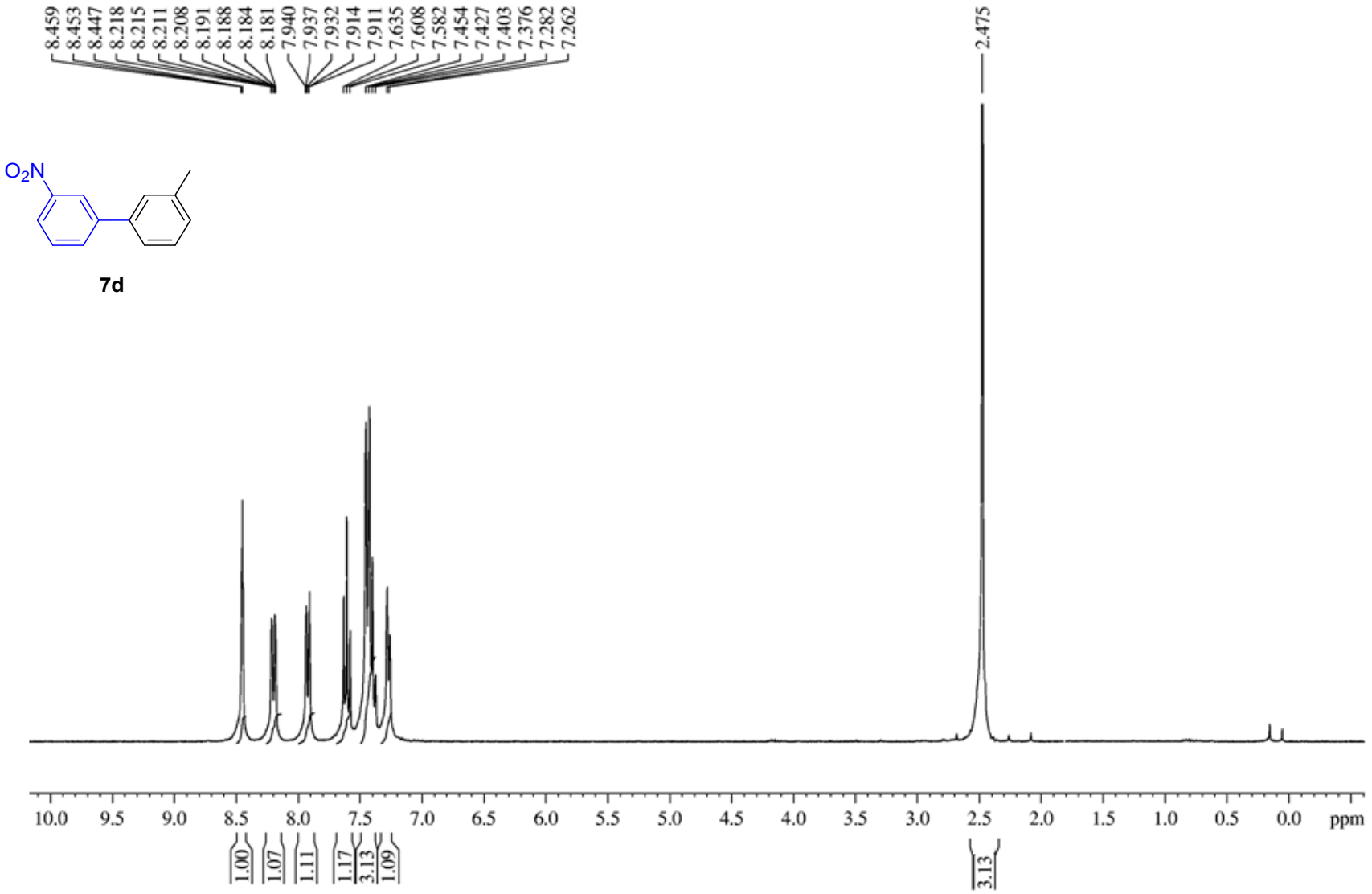
Spectrum66. 75 MHz ^{13}C NMR of compound **7b**



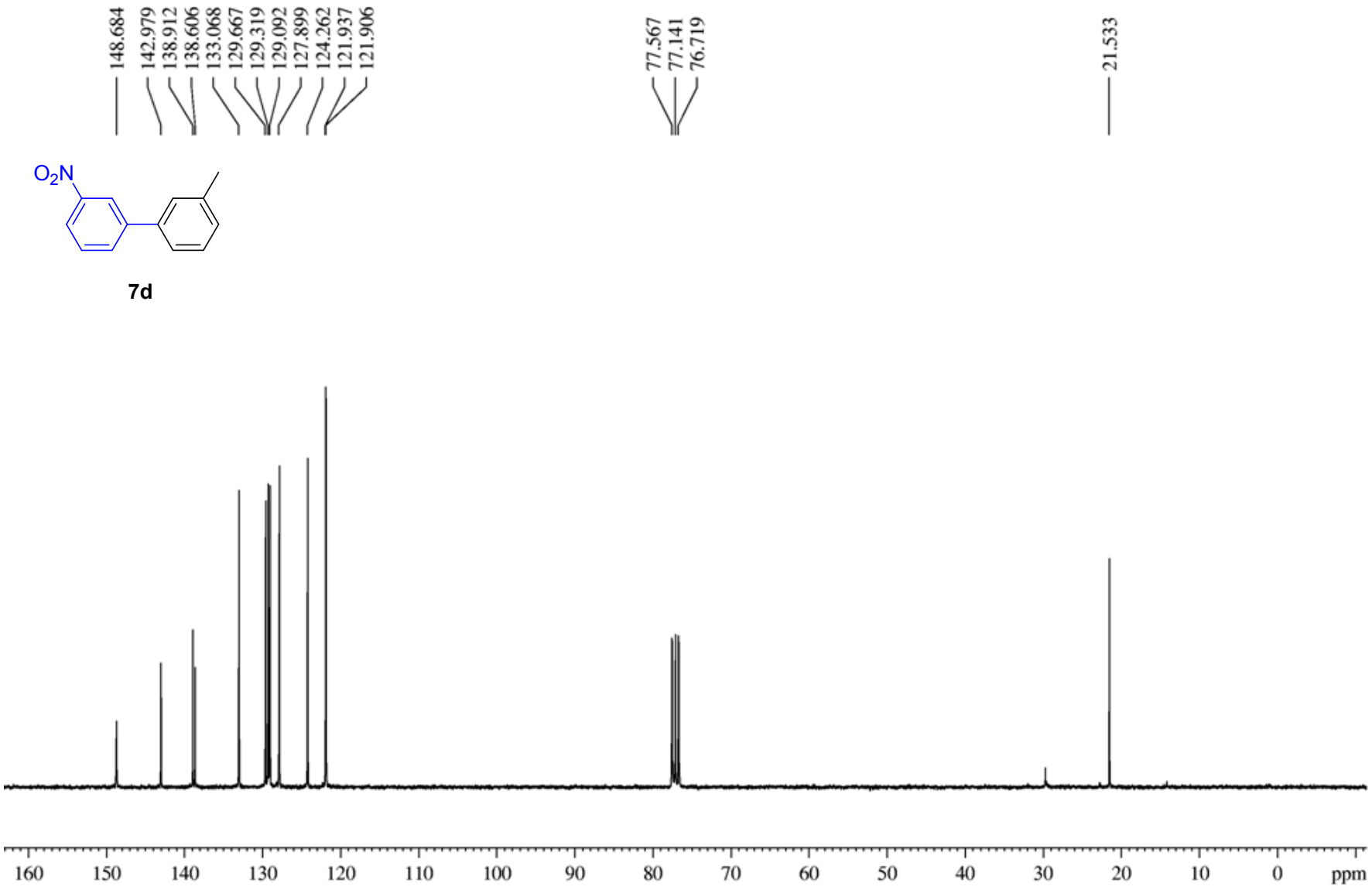
Spectrum67. 300 MHz ^{1}H NMR of compound **7c**



Spectrum68. 75 MHz ^{13}C NMR of compound **7c**

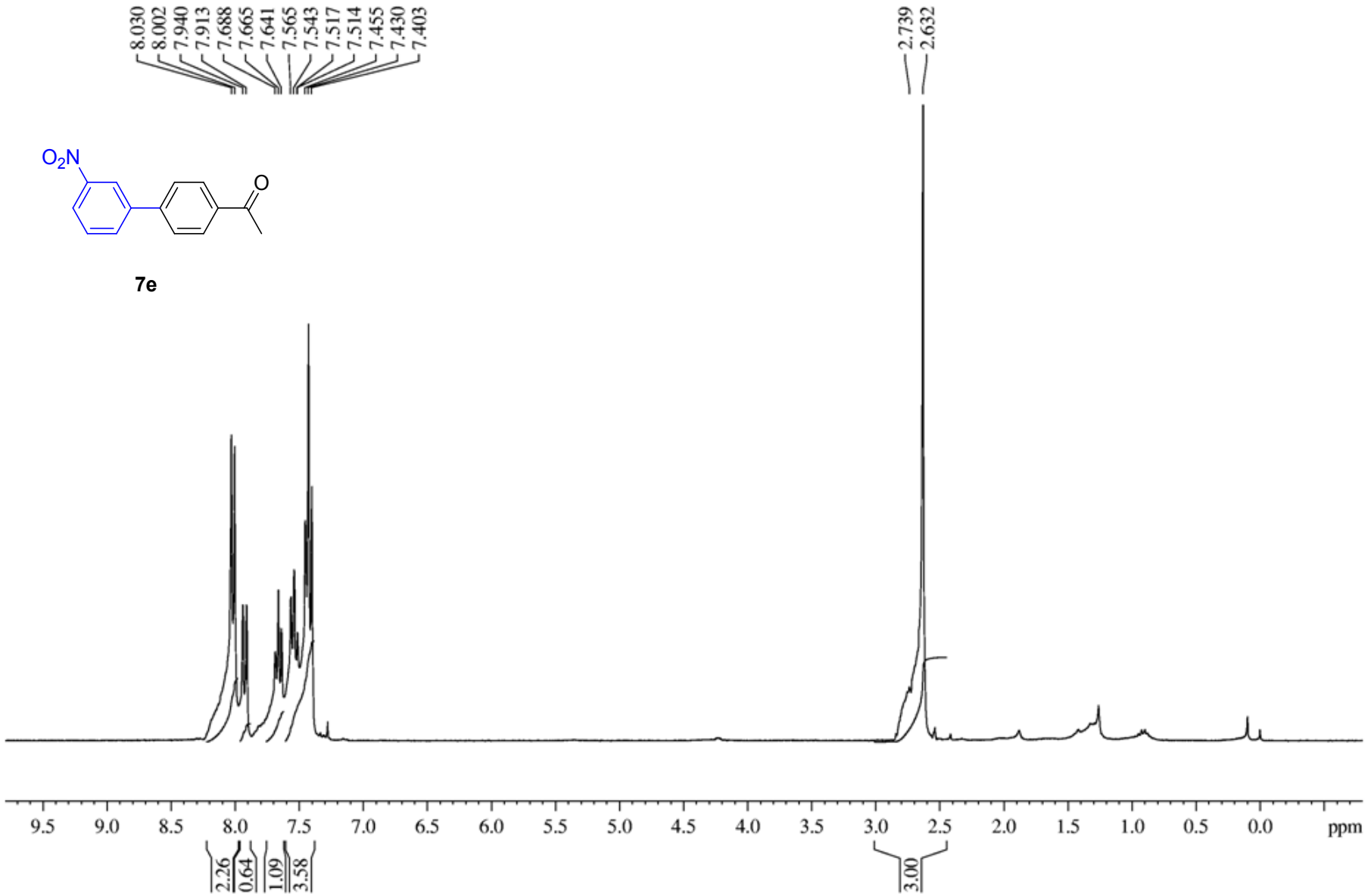


Spectrum69. 300 MHz ^{1}H NMR of compound **7d**

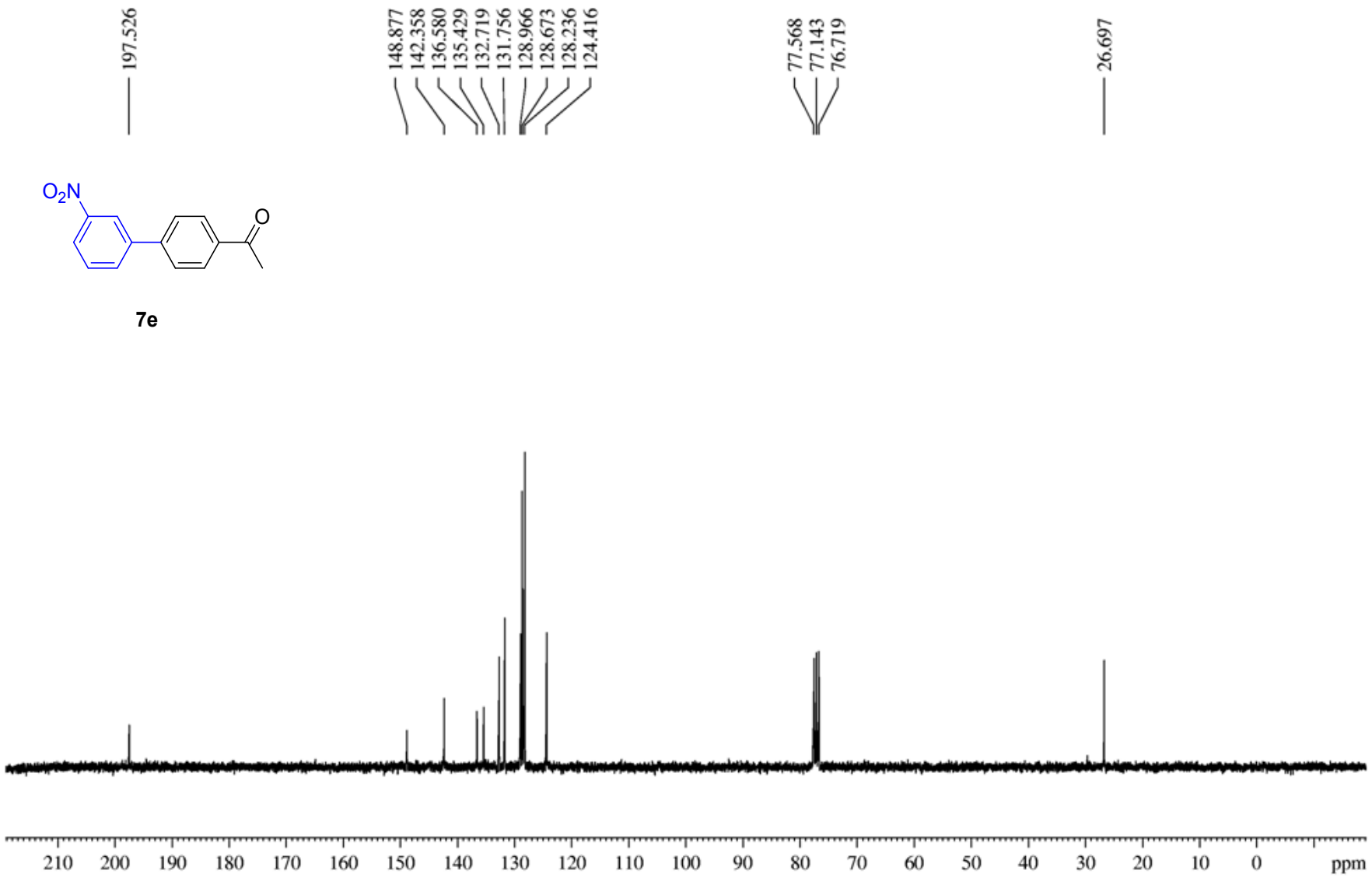


7d

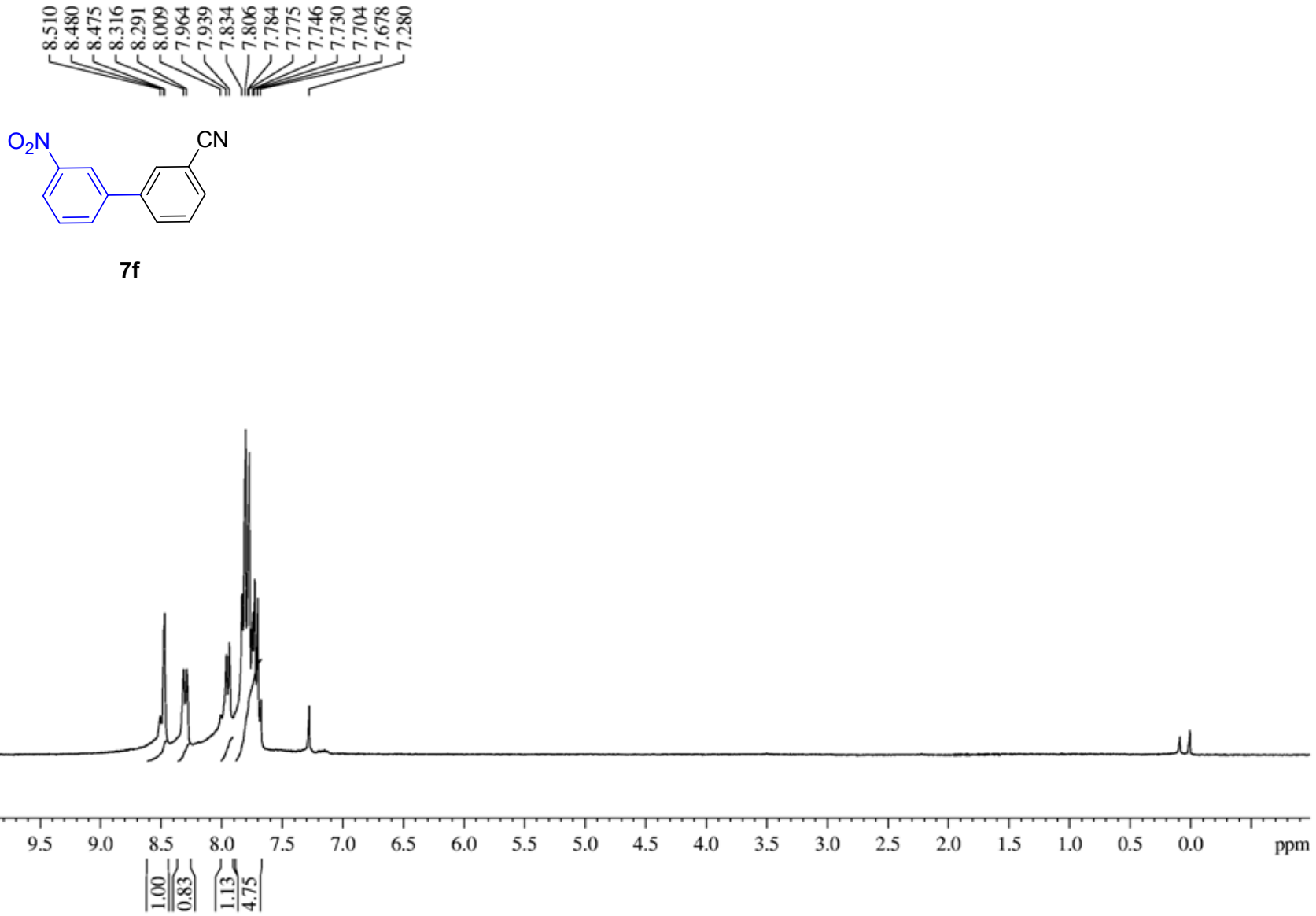
Spectrum70. 75 MHz ^{13}C NMR of compound **7d**



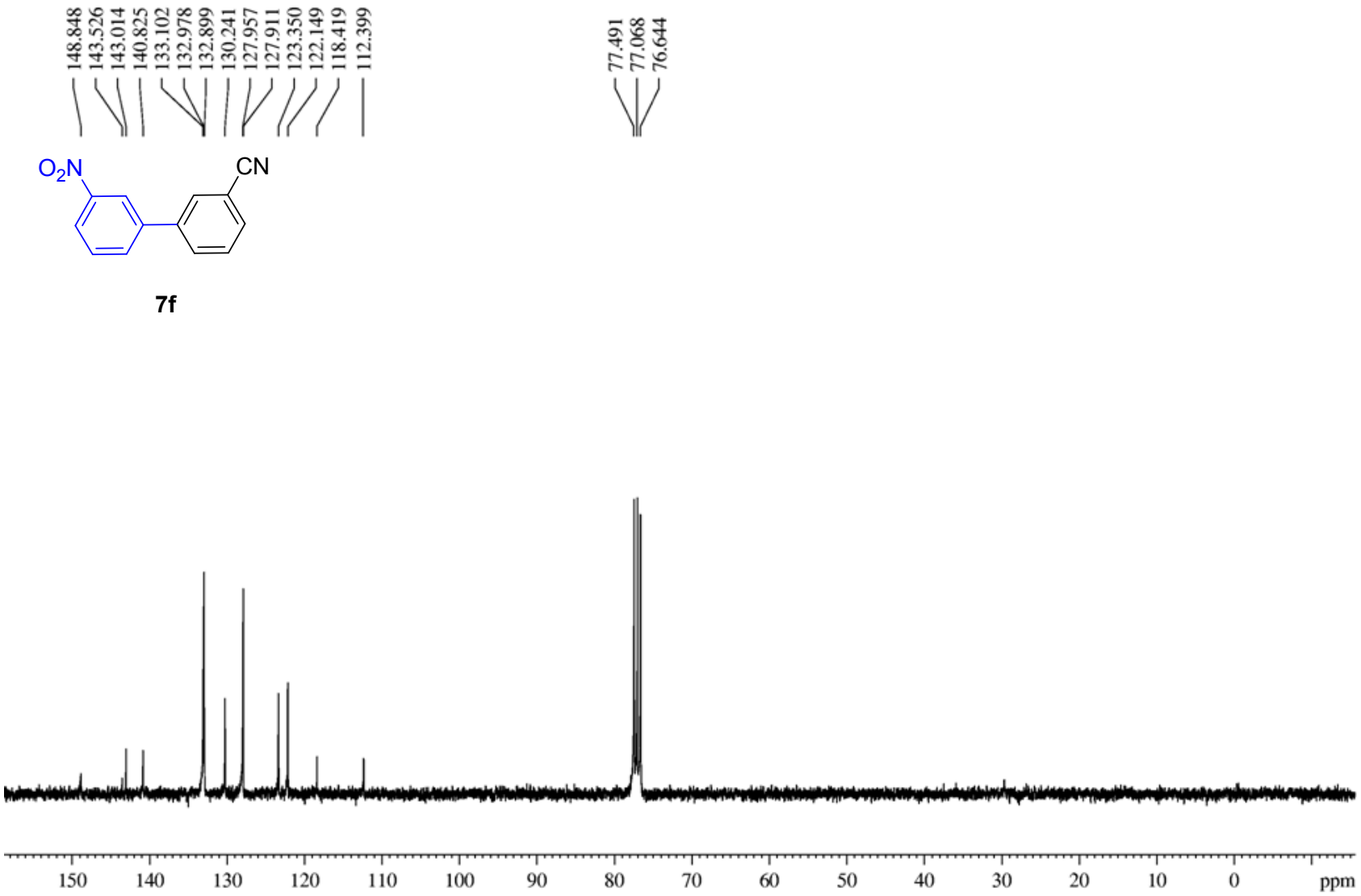
Spectrum71. 300 MHz ^{1}H NMR of compound **7e**



Spectrum72. 75 MHz ^{13}C NMR of compound **7e**



Spectrum73. 300 MHz ^{1}H NMR of compound **7f**



Spectrum74. 75 MHz ^{13}C NMR of compound **7f**

2. HPLC data

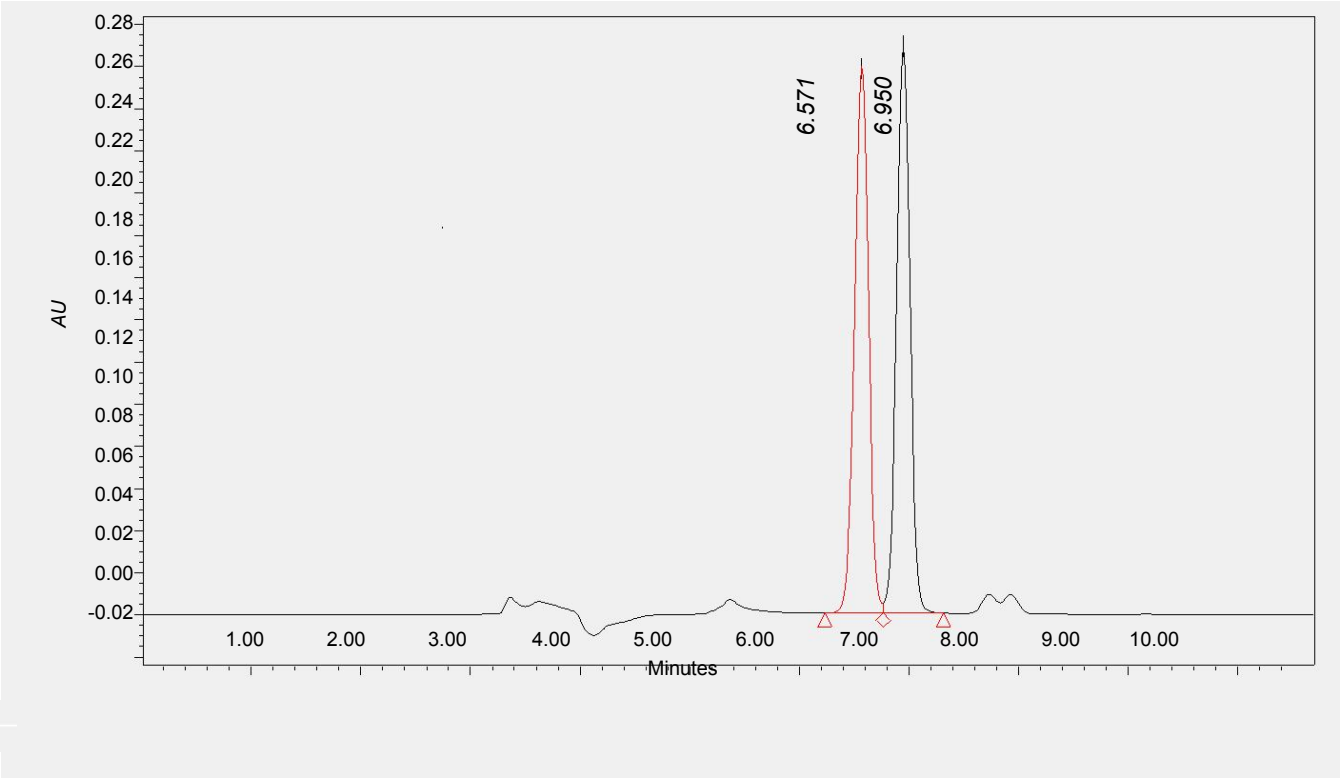


Figure 1: HPLC chromatogram of compound 6'

	Retention Time	% Area
1	6.571	49.89
2	6.950	50.11

3. Powder XRD Images:

Powder XRD data of palladium (0) oxides is shown below obtained under different conditions. The XRD pattern showed five peaks, which could be readily indexed to Pd(0) both in the peak position and relative intensity (Fig.2) in agreement with the reported data on JCPDS, 782076.

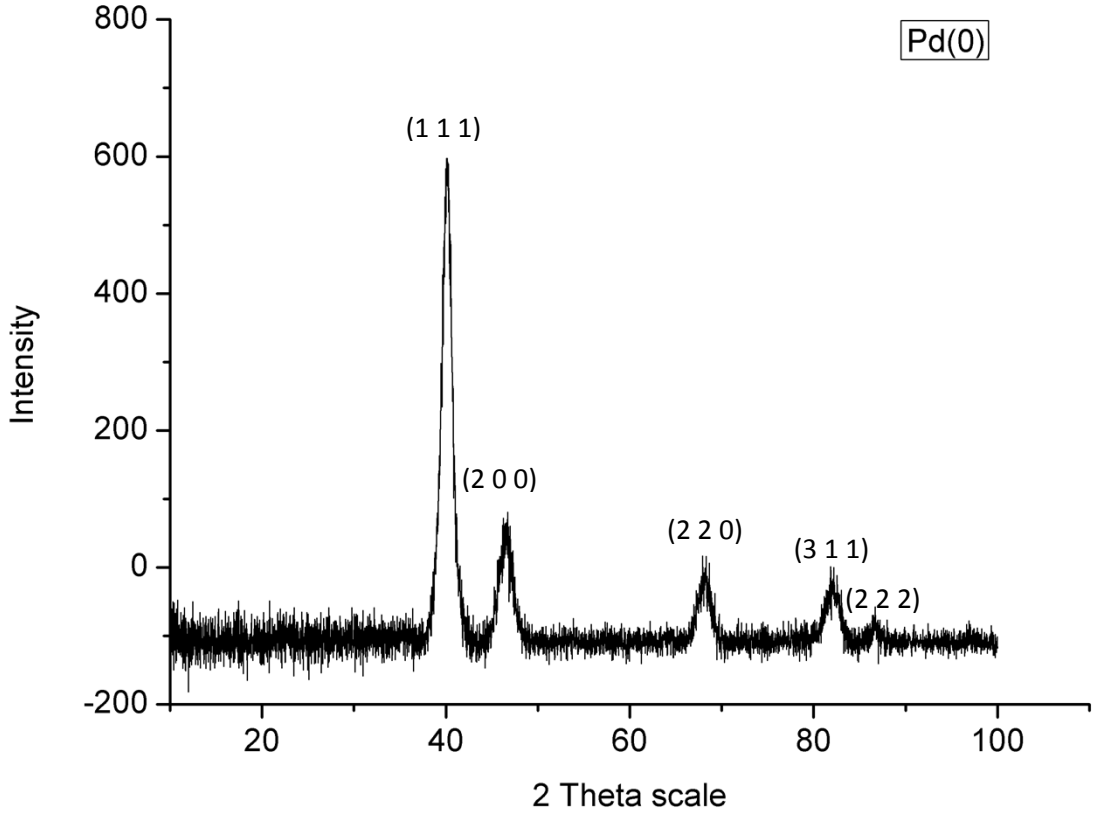


Figure2 : Powder XRD Pattern of Palladium(0)