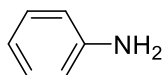

Supporting Information for:

**Sustainable and Recyclable Pd-Nanoparticles-Catalyzed
Reduction of Nitroaromatics in Water/glycerol at Room
Temperature**

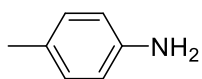
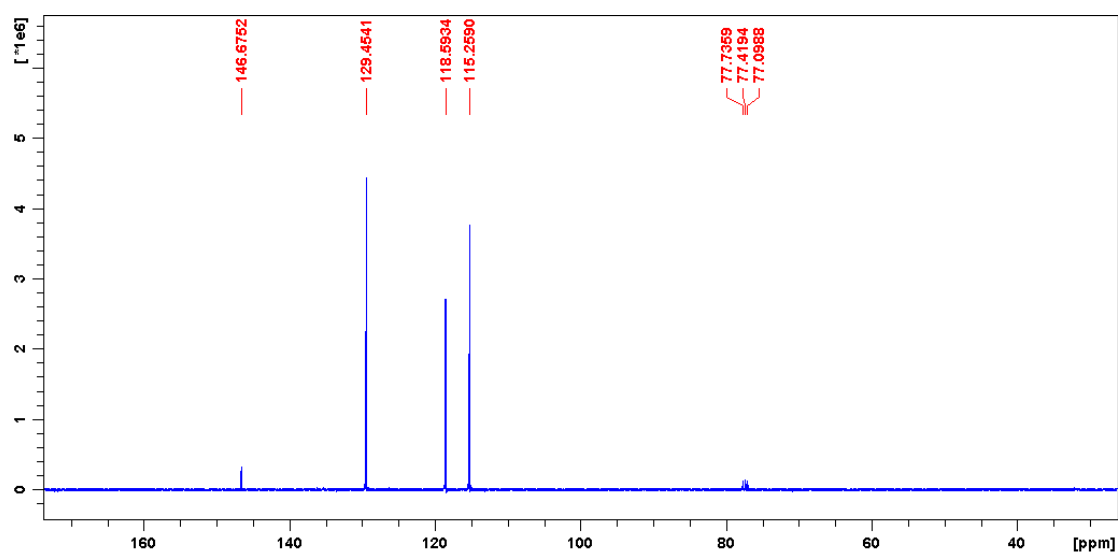
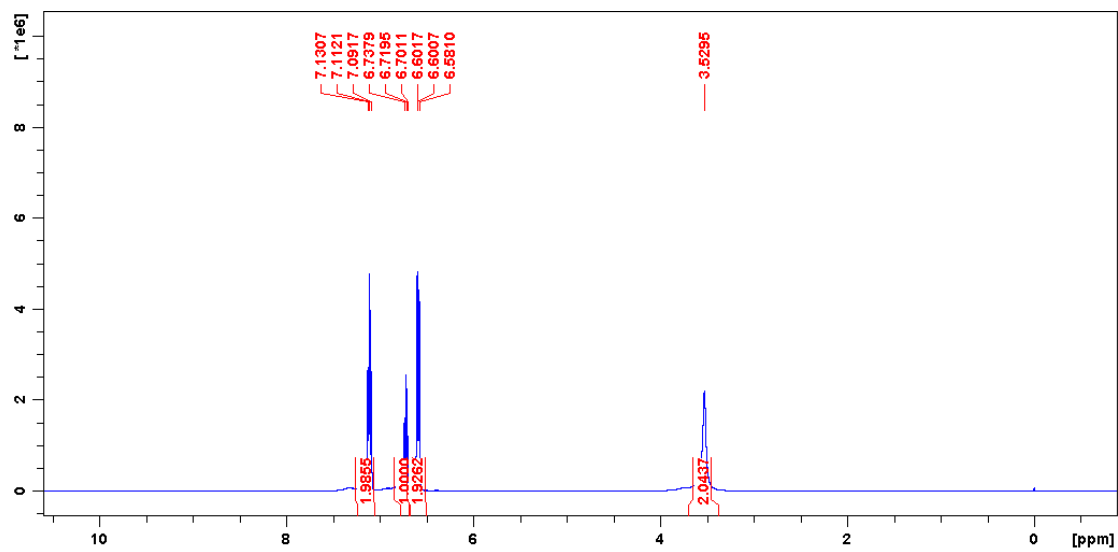


Figure 1. Experimental installation for hydrogenation of arylamines

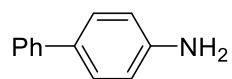
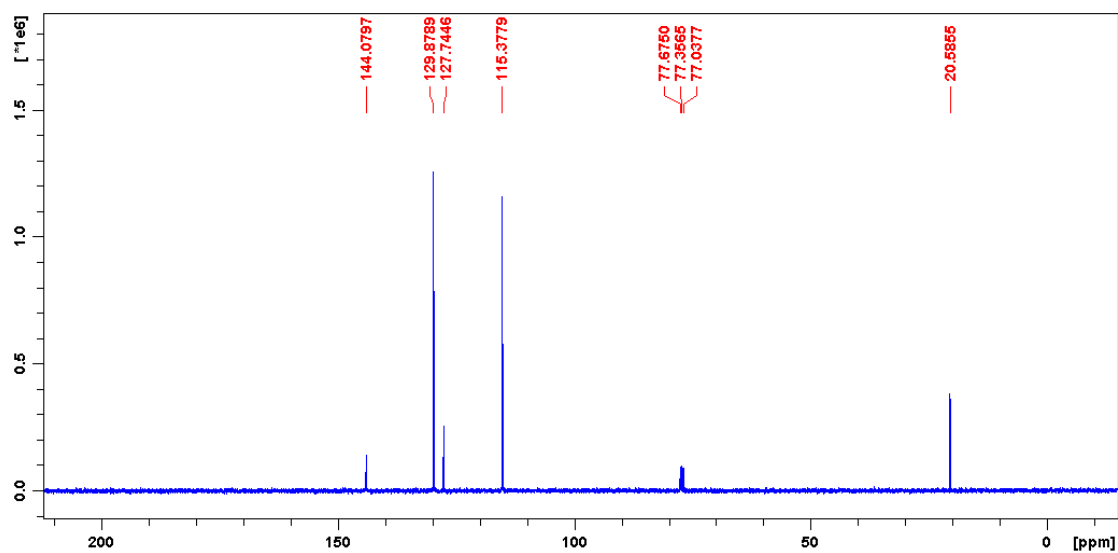
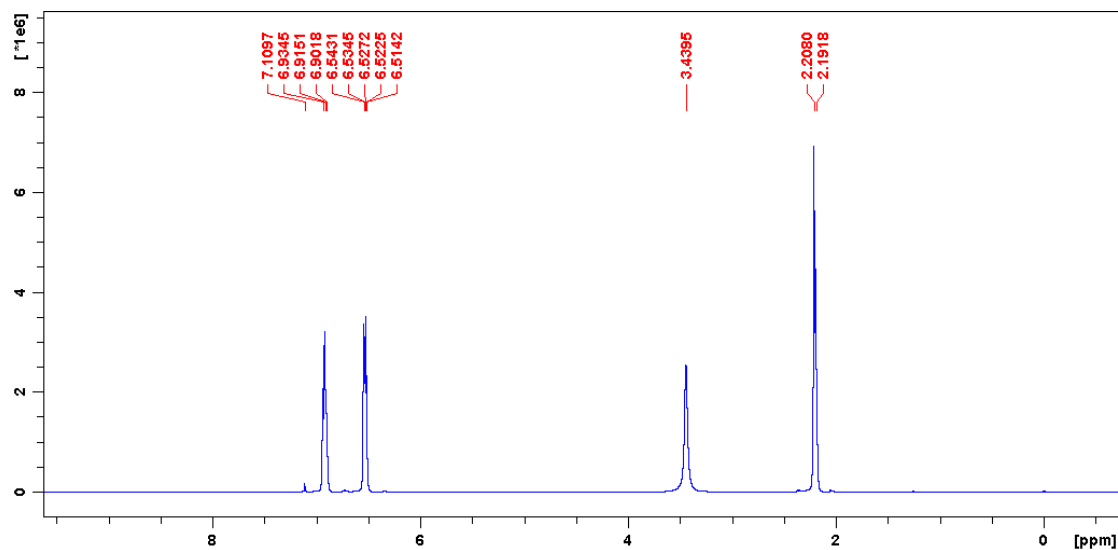
Characterization Data and $^1\text{H}/^{13}\text{C}$ NMR Spectra of the Products



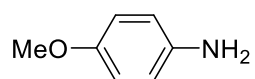
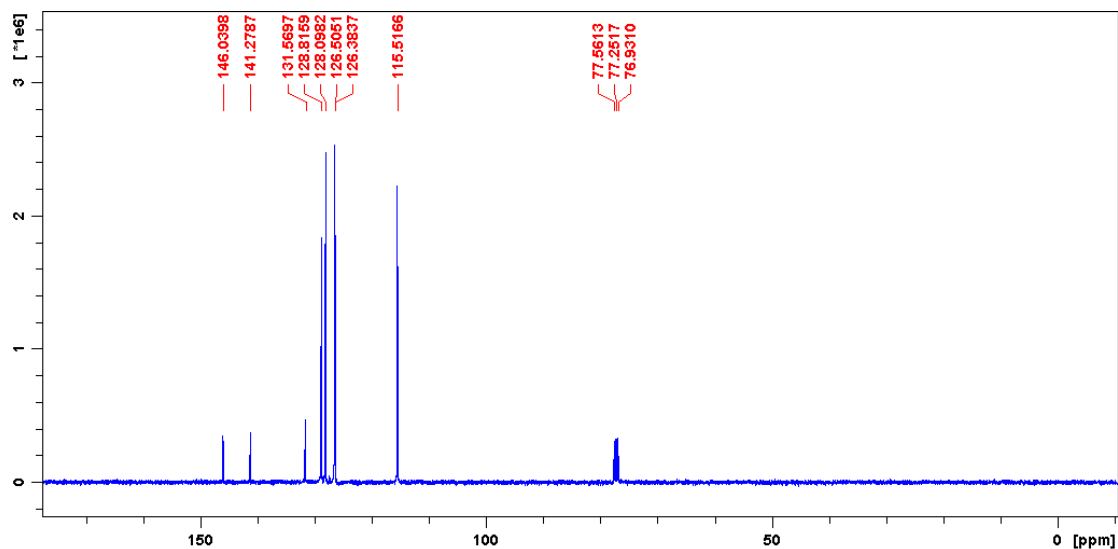
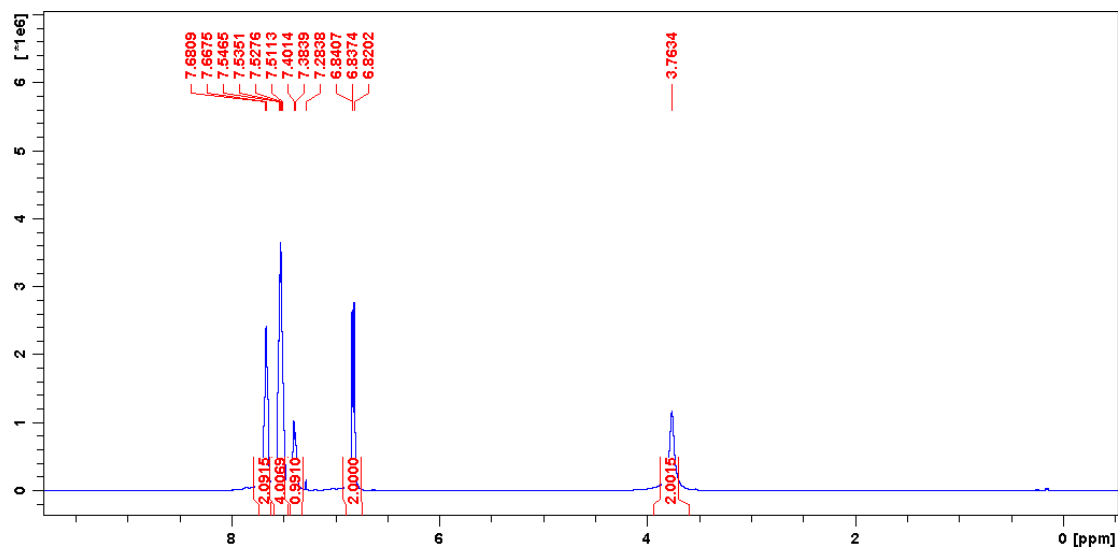
2a: 97% yield, ^1H NMR (400 MHz, CDCl_3): δ = 3.53 (s, 2H), 6.58-6.60 (m, 2H), 6.72 (t, J = 8.0 Hz, 1H), 7.11 (t, J = 8.0 Hz, 2H). ^{13}C NMR (100 MHz, CDCl_3): δ = 115.26 (s, 2CH), 118.59 (s, CH), 129.45 (s, 2CH), 146.68 (s, C).



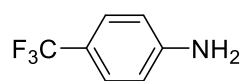
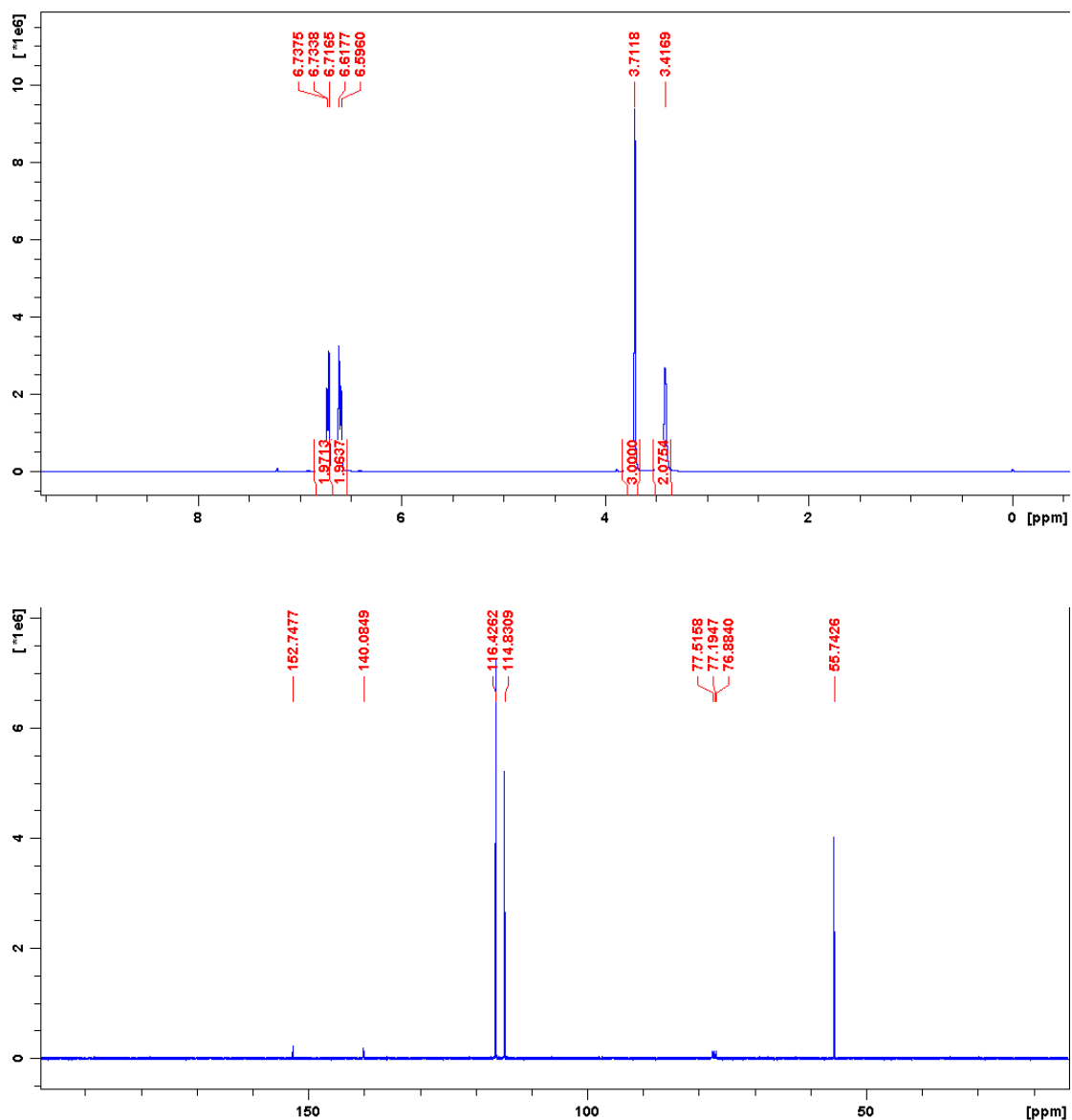
2b: 97% yield, ¹H NMR (400 MHz, CDCl₃): δ = 2.20 (d, *J* = 8.0 Hz, 3H), 3.44 (s, 2H), 6.51-6.54 (m, 2H), 6.90-6.93 (m, 2H). ¹³C NMR (100 MHz, CDCl₃): δ = 20.59 (s, CH₃), 115.38 (s, 2CH), 127.74 (s, C), 129.88 (s, 2CH), 144.08 (s, C).



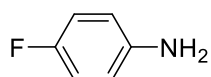
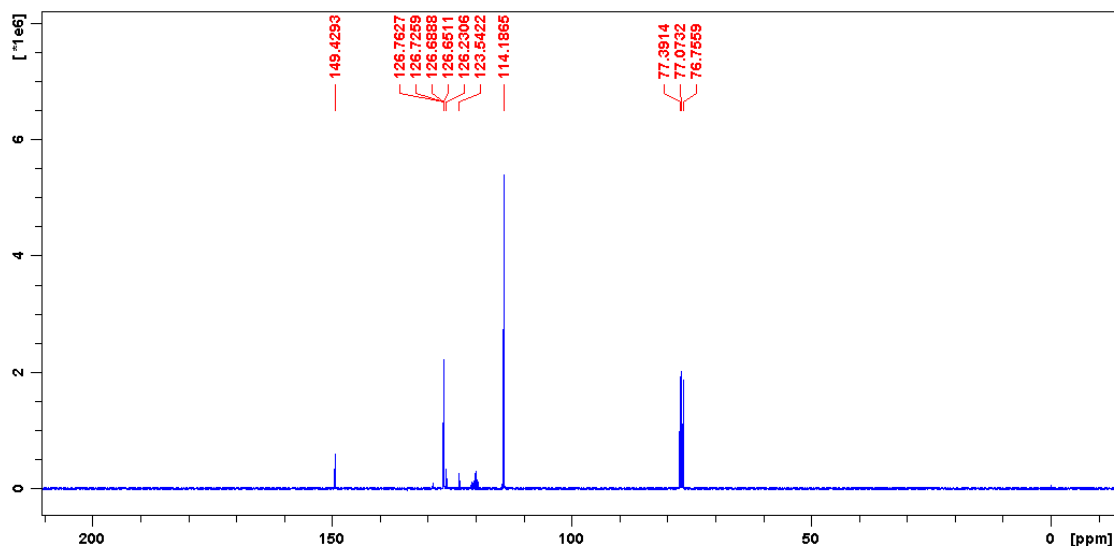
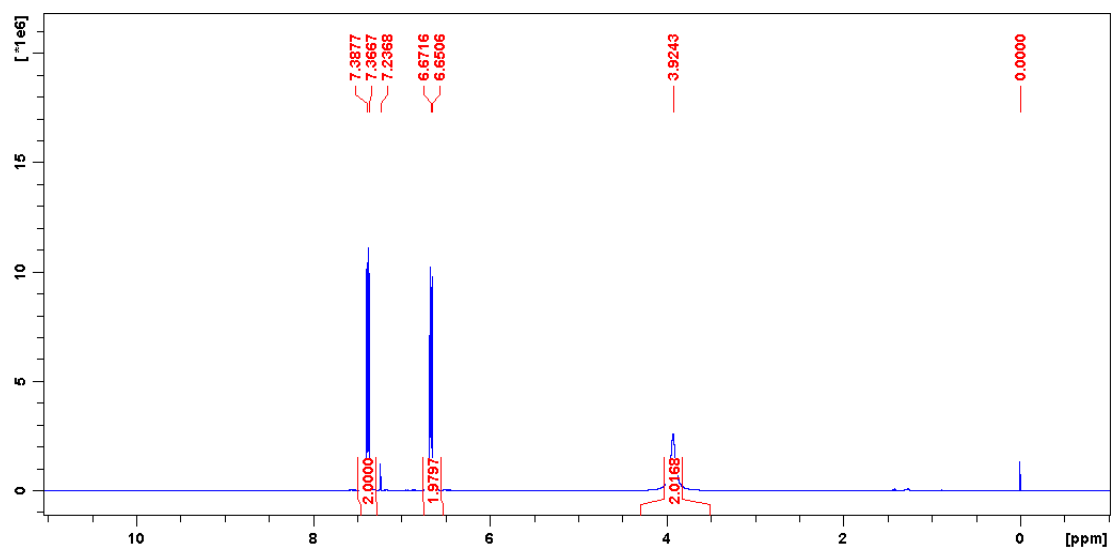
2c: 97% yield, ^1H NMR (400 MHz, CDCl_3): δ = 3.76 (s, 2H), 6.82-8.4 (m, 2H), 7.39 (d, J = 8.0 Hz, 1H), 7.51-7.55 (m, 4H), 7.67 (d, J = 4.0 Hz, 2H). ^{13}C NMR (100 MHz, CDCl_3): δ = 115.52 (s, 2CH), 126.38 (s, CH), 126.51 (s, 2CH), 128.10 (s, 2CH), 128.81 (s, 2CH), 131.57 (s, C), 141.28 (s, C), 146.04 (s, C).



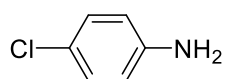
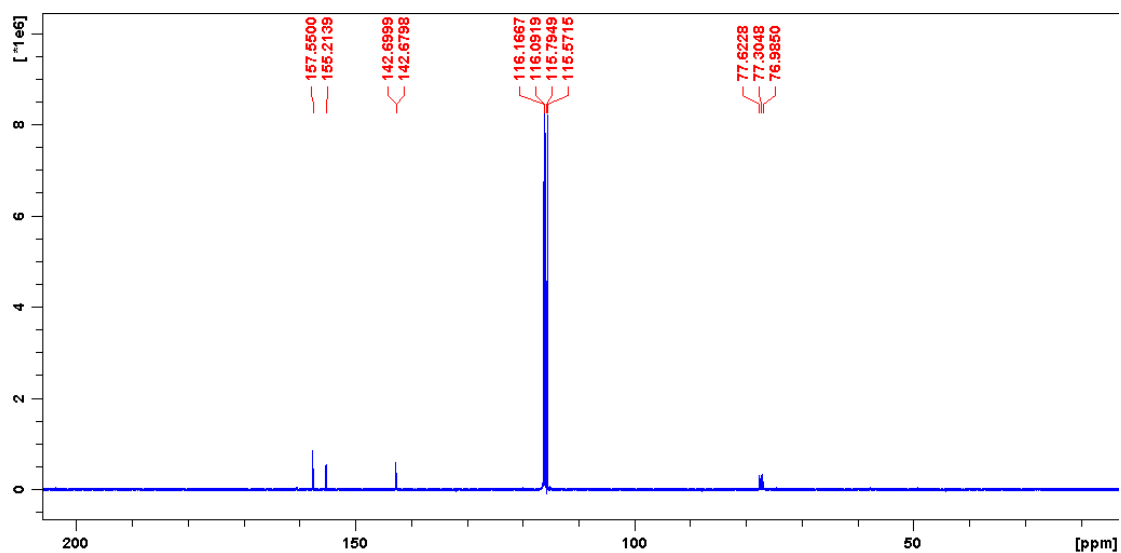
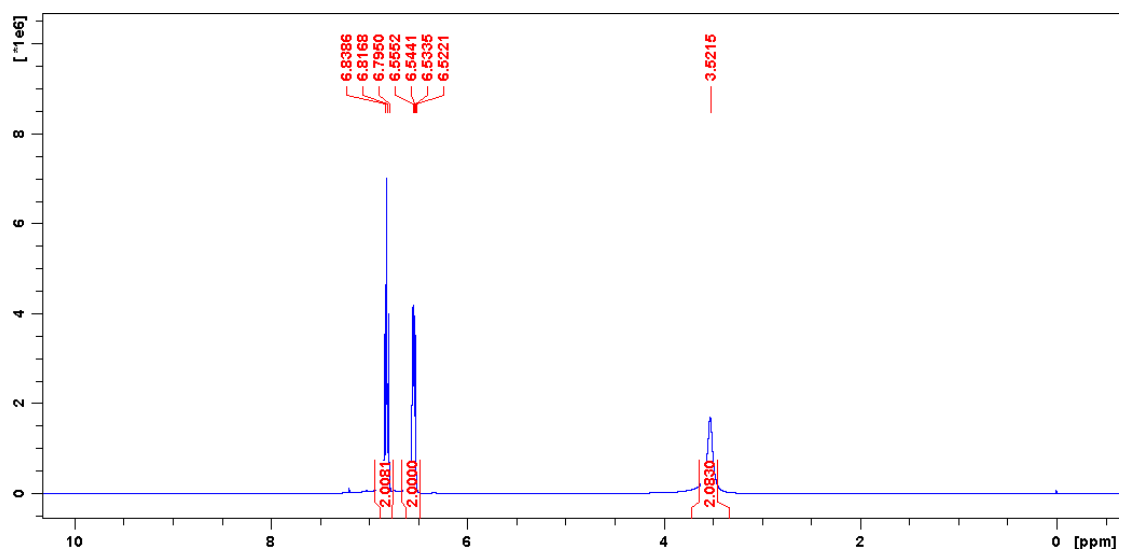
2d: 94% yield, ¹H NMR (400 MHz, CDCl₃): δ = 3.42 (s, 2H), 3.71 (s, 3H), 6.61 (d, *J* = 8.0 Hz, 2H), 6.72-6.74 (m, 2H). ¹³C NMR (100 MHz, CDCl₃): δ = 55.74 (s, CH₃), 114.83 (s, 2CH), 116.43 (s, 2CH), 140.08 (s, C), 152.75 (s, C).



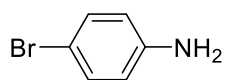
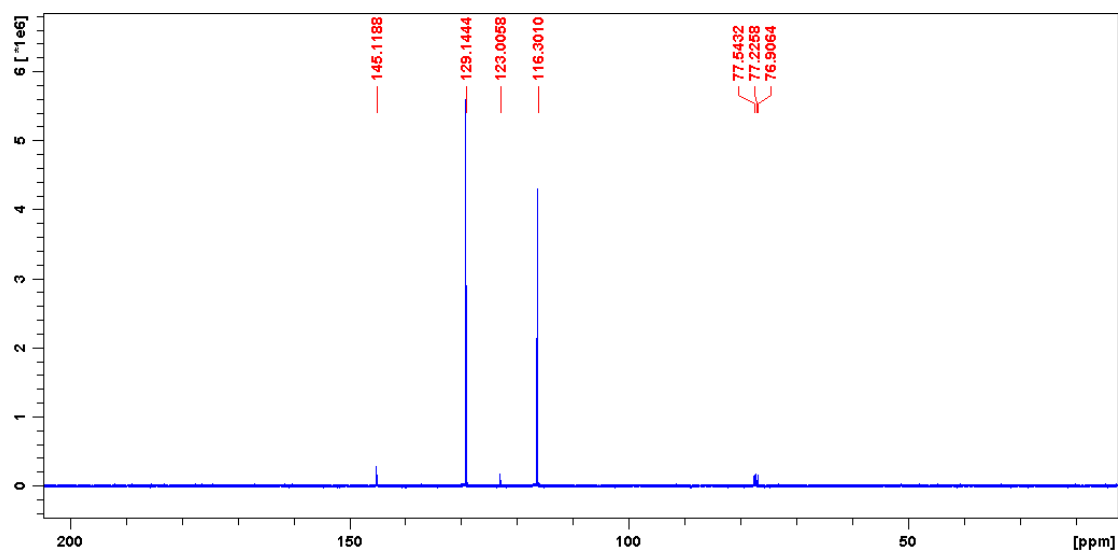
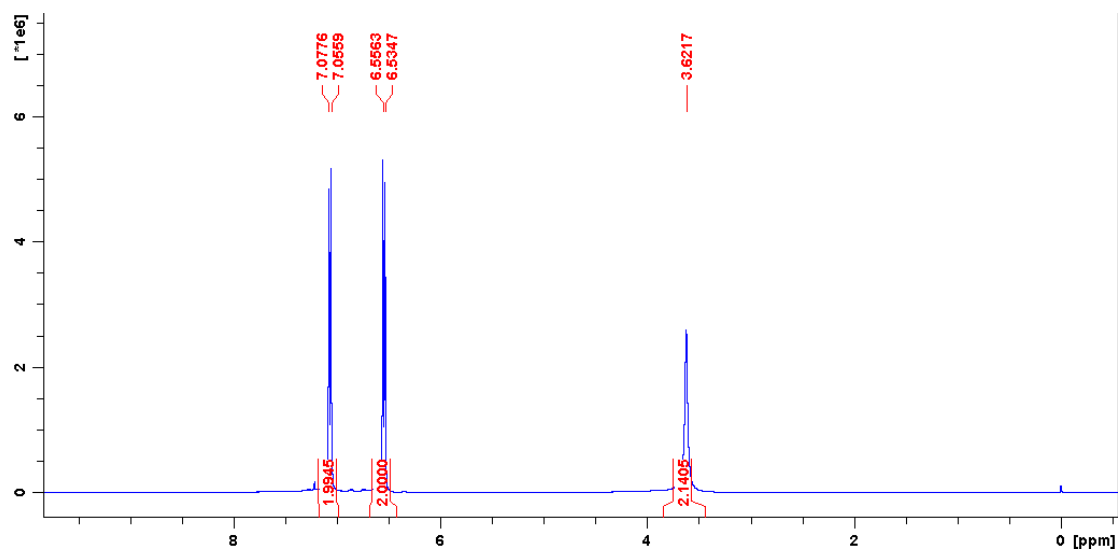
2e: 97% yield, ¹⁹F NMR (376 MHz, CDCl₃): δ = -61.11 ppm; ¹H NMR (400 MHz, CDCl₃): δ = 3.92 (s, 2H), 6.66 (d, *J* = 8.0 Hz, 2H), 7.38 (d, *J* = 8.0 Hz, 2H). ¹³C NMR (100 MHz, CDCl₃): δ = 114.19 (s, 2CH), 124.89 (d, *J*_{CF} = 270.0 Hz, C), 126.70 (d, *J*_{CF} = 11.2 Hz, C), 126.71 (d, *J*_{CF} = 3.7 Hz, 2CH), 149.43 (s, C).



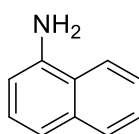
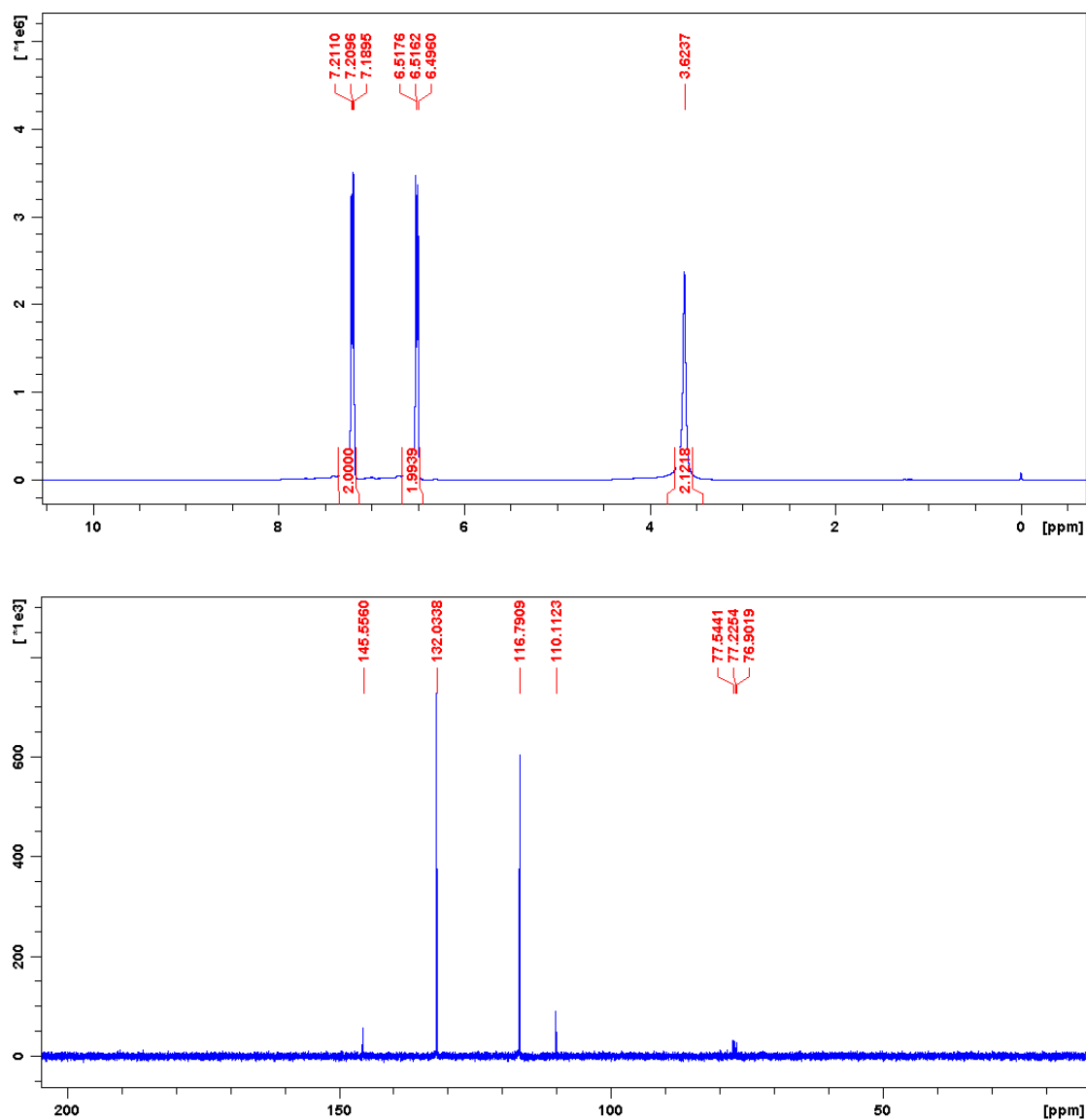
2f: 95% yield, ¹H NMR (400 MHz, CDCl₃): δ = 3.52 (s, 2H), 6.54 (dd, *J* = 4.0, 4.0 Hz, 2H), 6.82 (d, *J* = 8.0 Hz, 2H). ¹³C NMR (100 MHz, CDCl₃): δ = 115.68 (d, *J*_{CF} = 22.7 Hz, 2CH), 116.13 (d, *J*_{CF} = 7.3 Hz, 2CH), 142.69 (d, *J*_{CF} = 2.2 Hz, C), 156.38 (d, *J*_{CF} = 235.0 Hz, C).



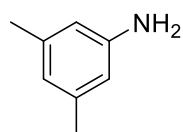
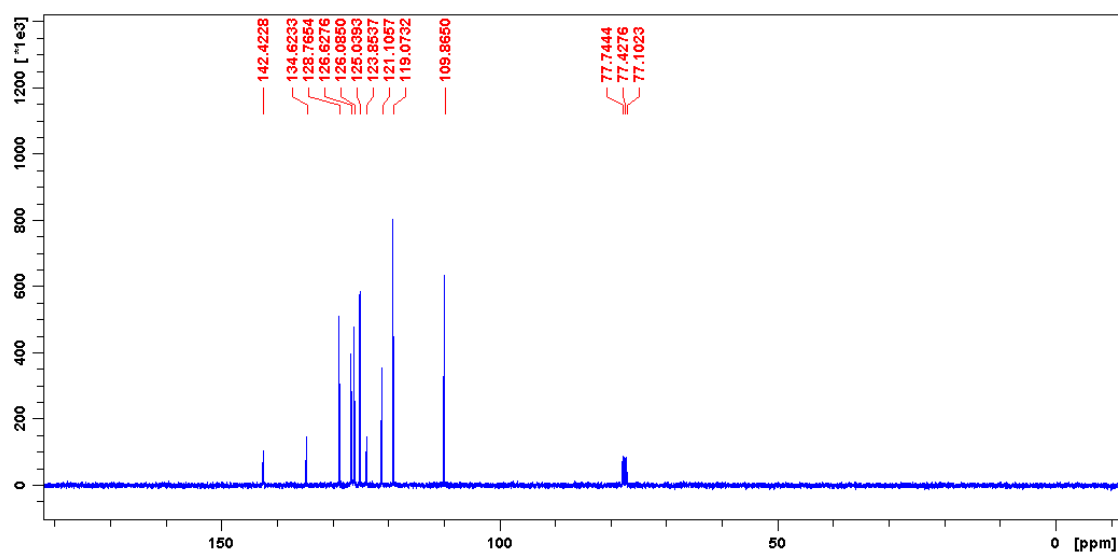
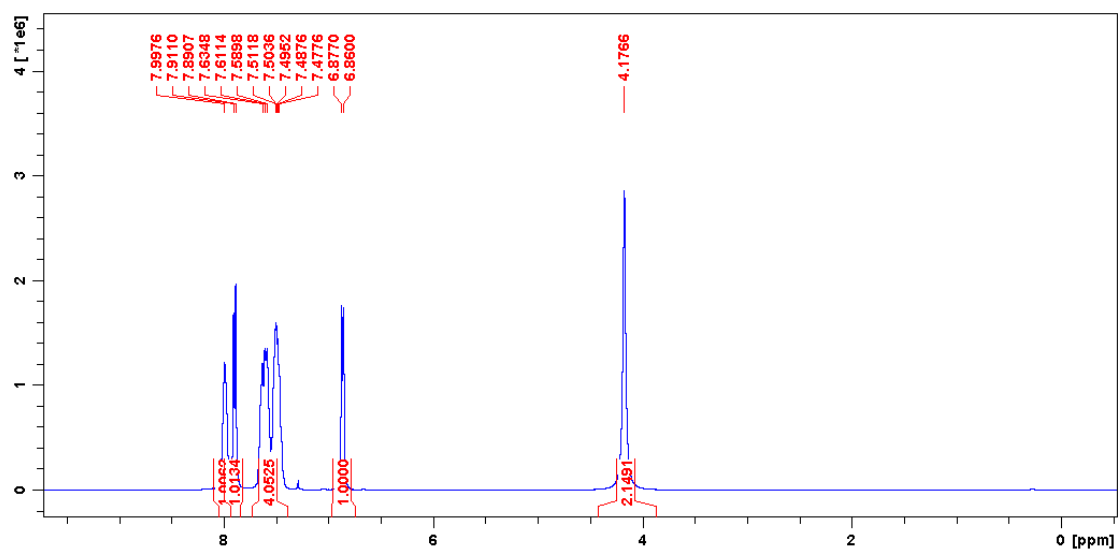
2g: 95% yield, ¹H NMR (400 MHz, CDCl₃): δ = 3.62 (s, 2H), 6.54 (d, *J* = 8.0 Hz, 2H), 7.07 (d, *J* = 8.0 Hz, 2H). ¹³C NMR (100 MHz, CDCl₃): δ = 116.30 (s, 2CH), 123.01 (s, C), 129.14 (s, 2CH), 145.12 (s, C).



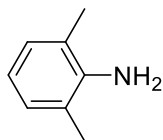
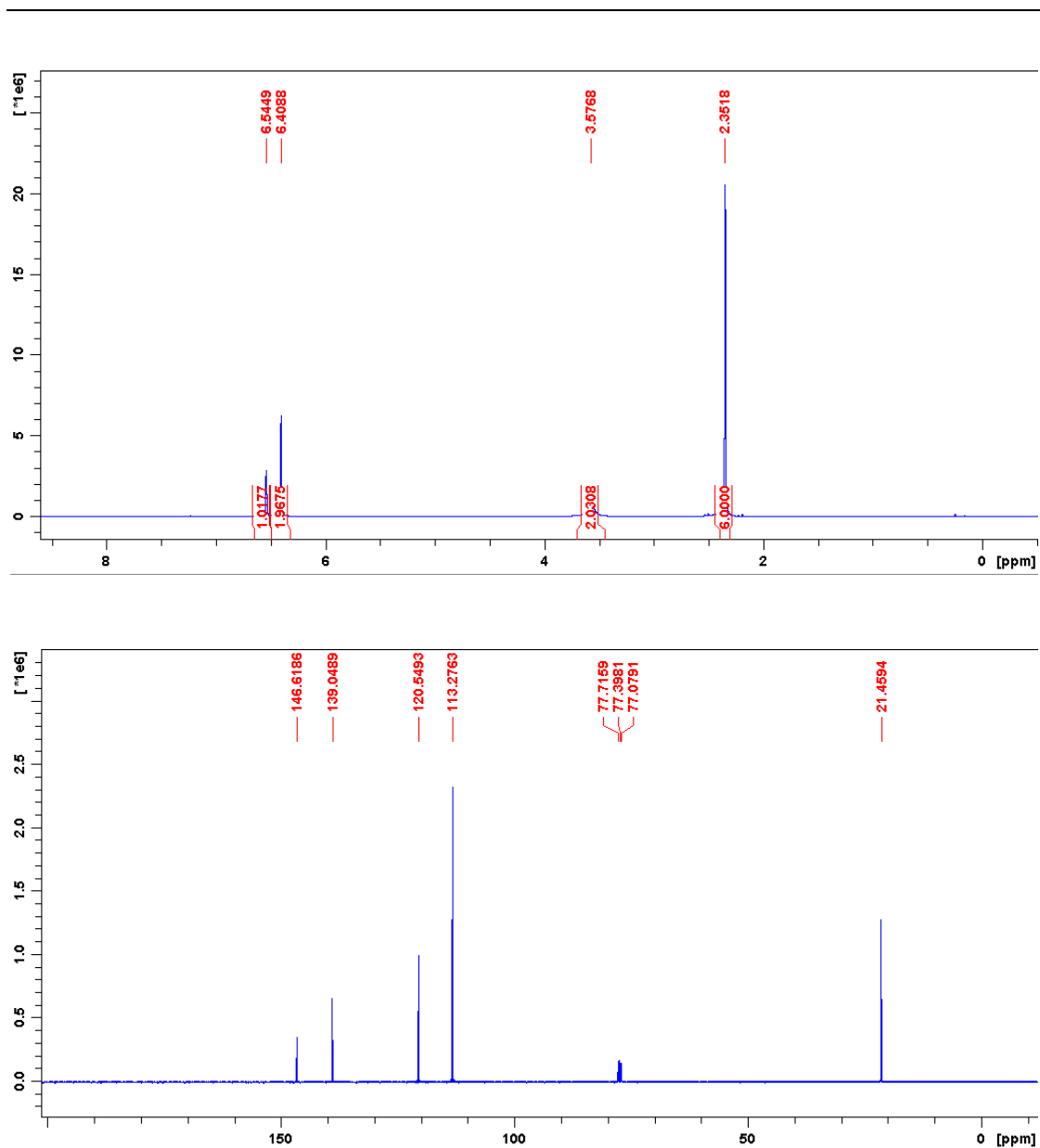
2h: 94% yield, ¹H NMR (400 MHz, CDCl₃): δ = 3.62 (s, 2H), 6.50-6.52 (m, 2H), 7.19-7.21 (m, 1H). ¹³C NMR (100 MHz, CDCl₃): δ = 110.11 (s, C), 116.79 (s, 2CH), 132.03 (s, 2CH), 145.56 (s, C).



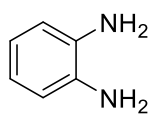
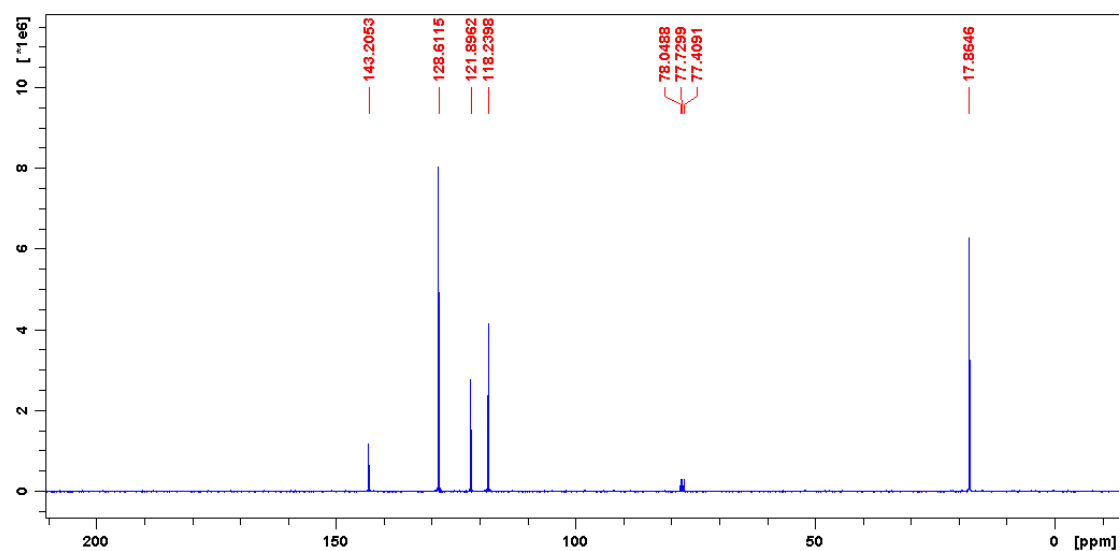
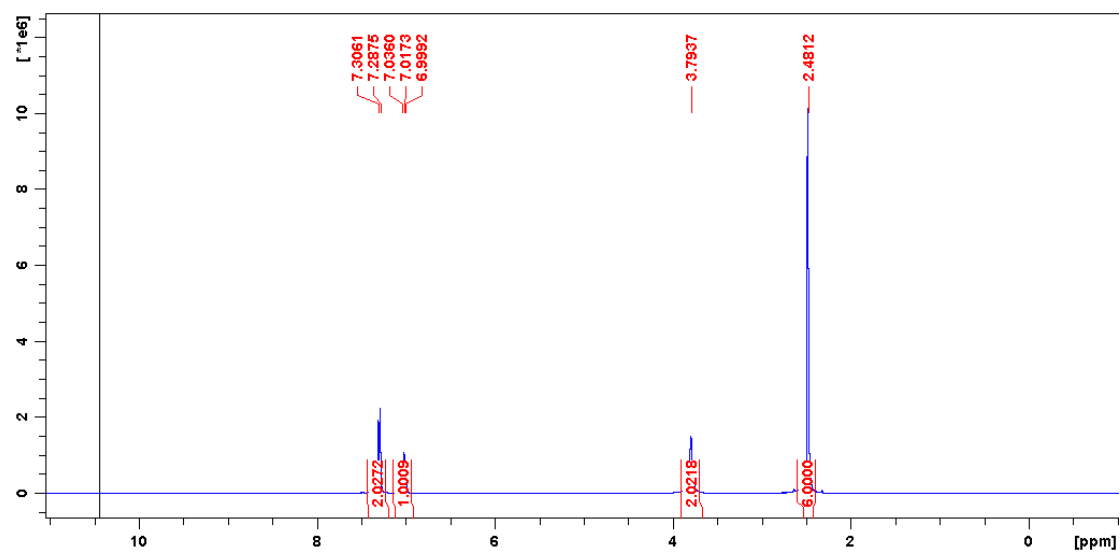
2i: 93% yield, ^1H NMR (400 MHz, CDCl_3): δ = 4.18 (s, 2H), 6.87 (d, J = 8.0 Hz, 1H), 7.48-7.63 (m, 4H), 7.90 (d, J = 8.0 Hz, 1H), 8.00 (s, 1H). ^{13}C NMR (100 MHz, CDCl_3): δ = 109.87 (s, CH), 119.07 (s, CH), 121.11 (s, CH), 123.85 (s, C), 125.04 (s, CH), 126.09 (s, CH), 126.63 (s, CH), 128.77 (s, CH), 134.62 (s, C), 142.42 (s, C).



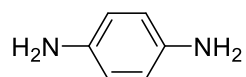
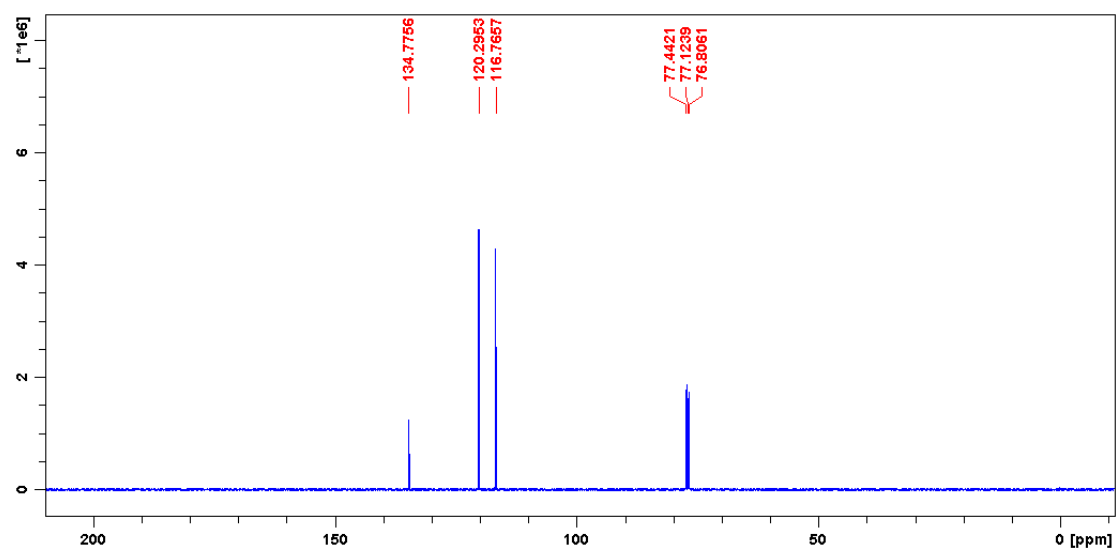
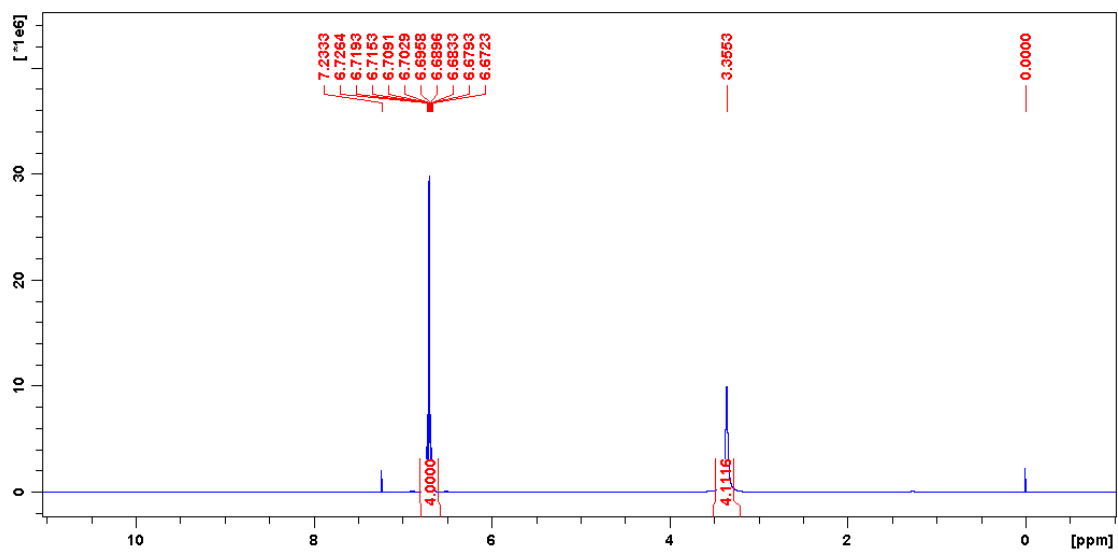
2j: 95% yield, ¹H NMR (400 MHz, CDCl₃): δ = 2.35 (s, 6H), 3.58 (s, 2H), 6.40 (s, 2H), 6.54 (s, 1H). ¹³C NMR (100 MHz, CDCl₃): δ = 21.46 (s, 2CH₃), 113.28 (s, 2CH), 120.55 (s, CH), 139.05 (s, 2C), 146.62 (s, C).



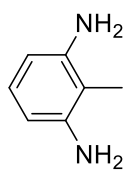
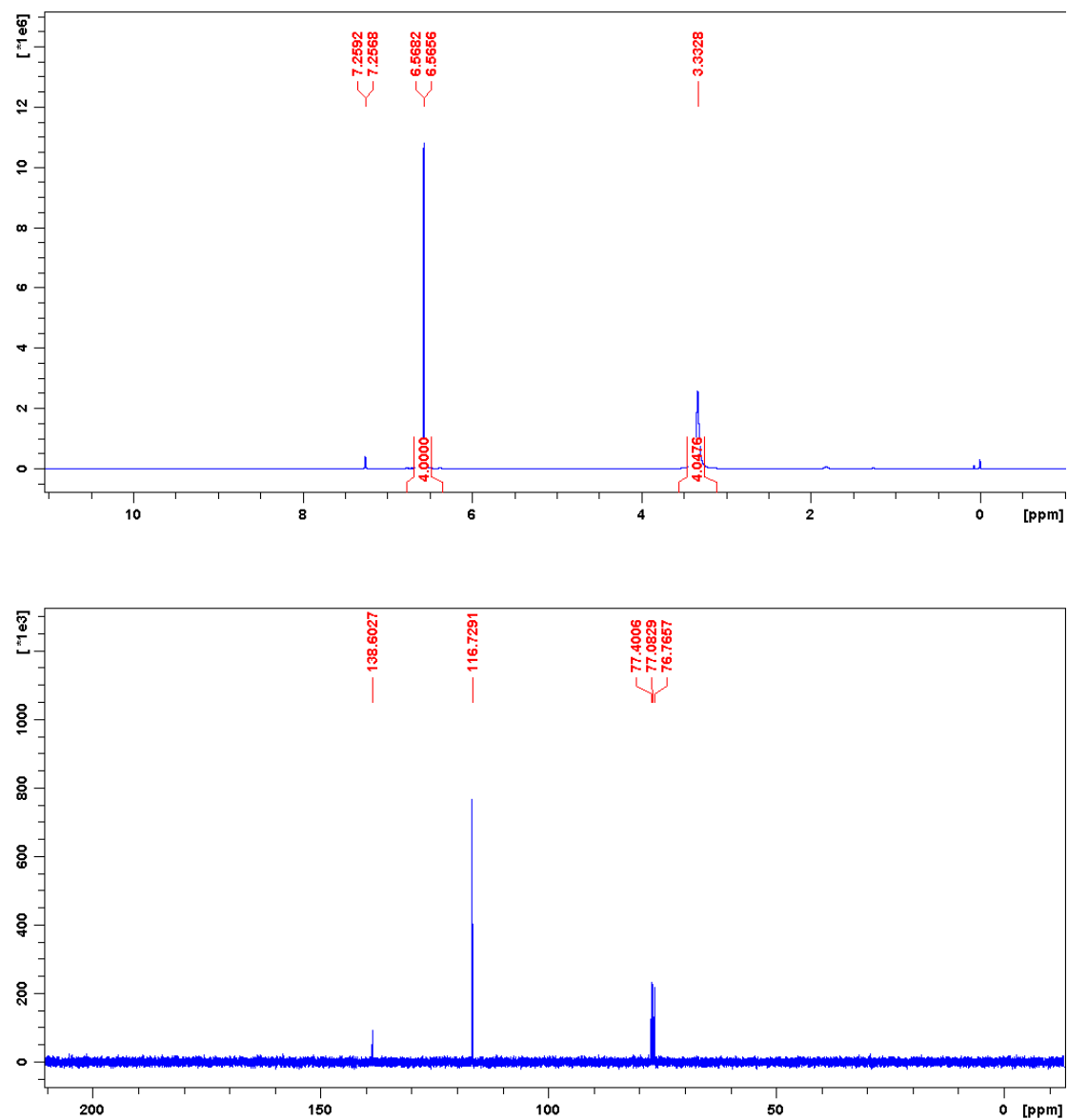
2k: 93% yield, ¹H NMR (400 MHz, CDCl₃): δ = 2.48 (s, 6H), 3.79 (s, 2H), 7.02 (t, *J* = 8.0 Hz, 1H), 7.30 (d, *J* = 8.0 Hz, 2H). ¹³C NMR (100 MHz, CDCl₃): δ = 17.86 (s, 2CH₃), 118.24 (s, CH), 121.90 (s, 2C), 128.61 (s, 2CH), 143.20 (s, C).



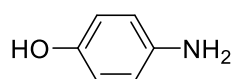
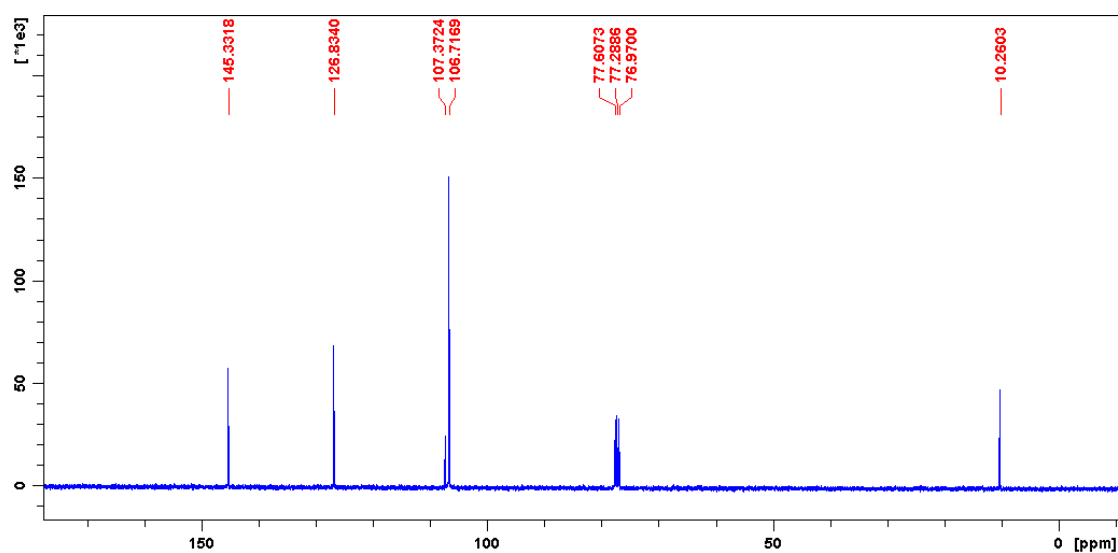
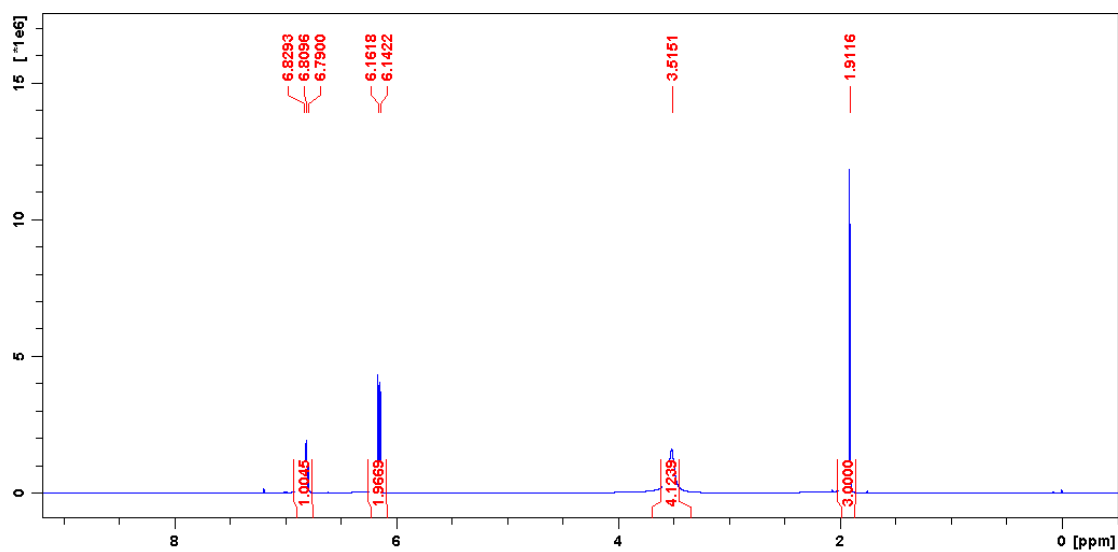
2I: 90% yield, ¹H NMR (400 MHz, CDCl₃): δ = 3.36 (s, 4H), 6.67-6.73 (m, 4H). ¹³C NMR (100 MHz, CDCl₃): δ = 116.77 (s, 2CH), 120.30 (s, 2CH), 134.78 (s, C).



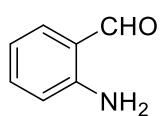
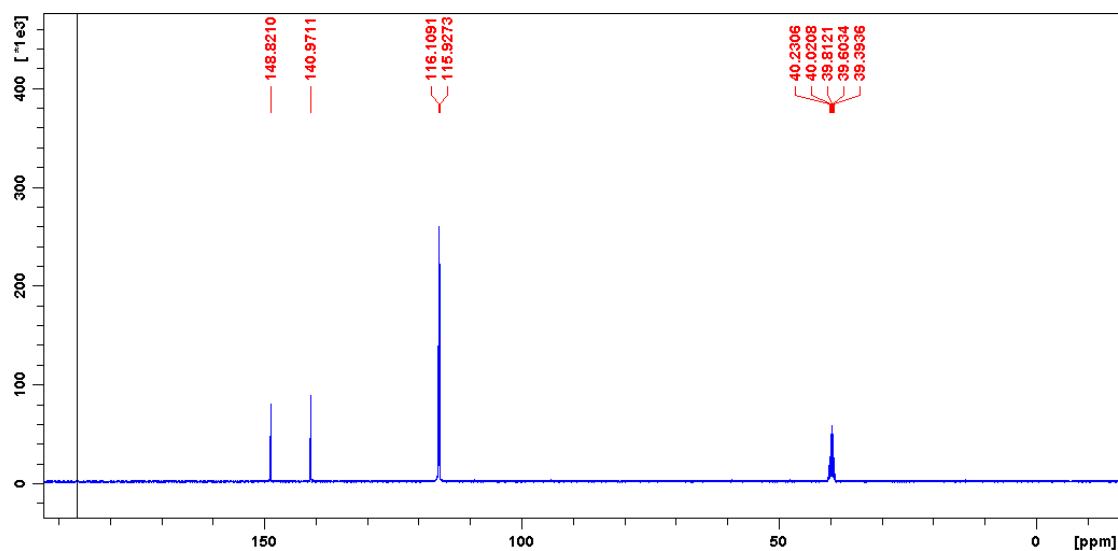
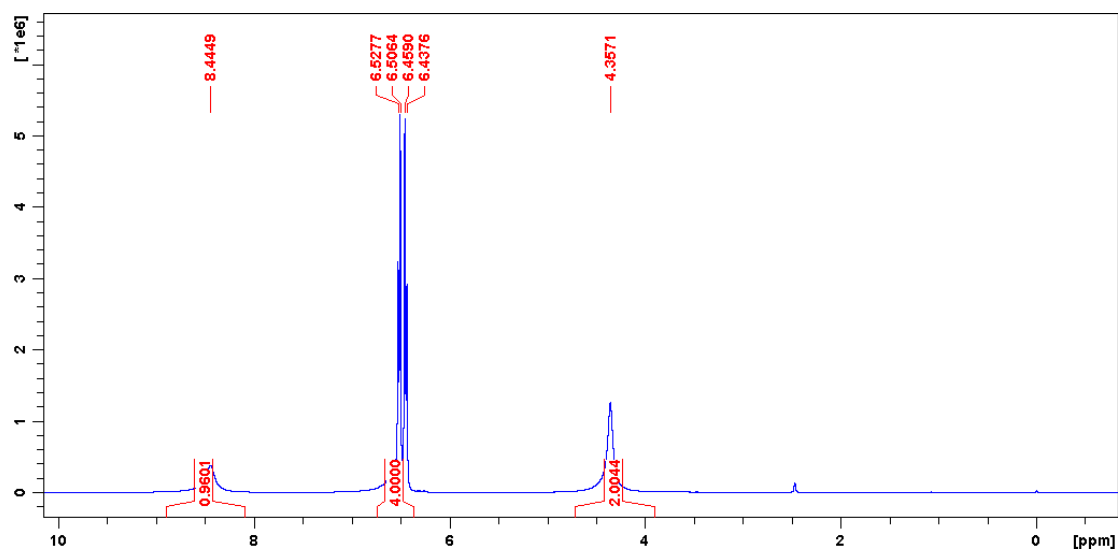
2m: 92% yield, ¹H NMR (400 MHz, CDCl₃): δ = 3.33 (s, 4H), 6.56 (d, *J* = 1.2 Hz, 4H). ¹³C NMR (100 MHz, CDCl₃): δ = 116.73 (s, 4CH₃), 138.60 (s, 2C).



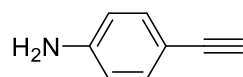
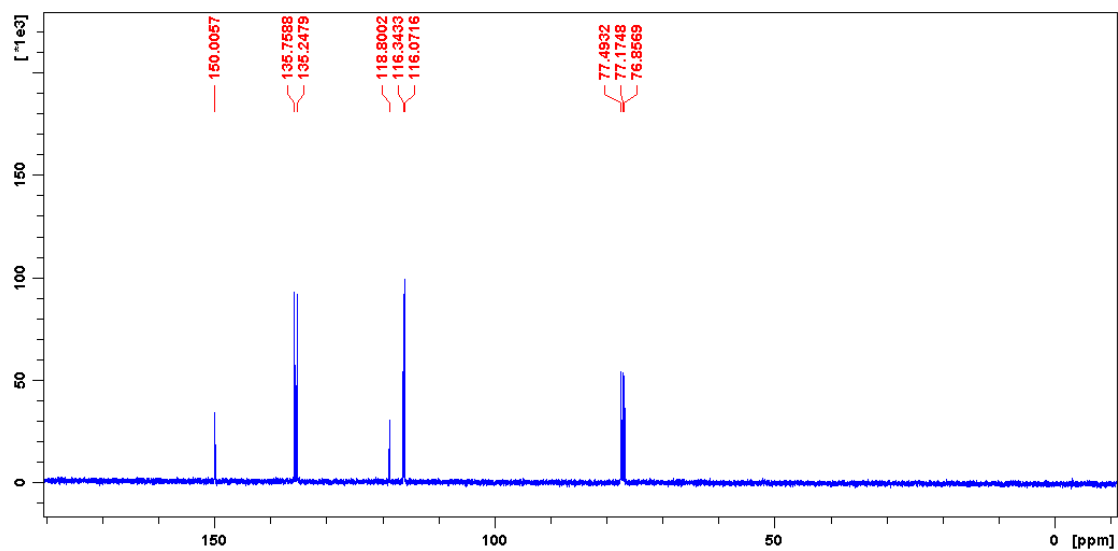
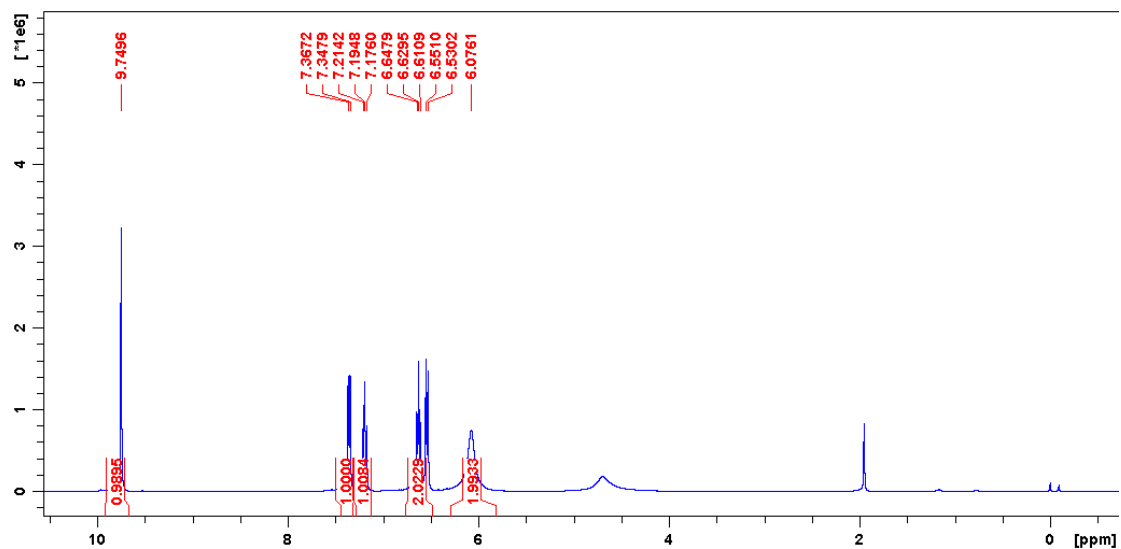
2n: 91% yield, ¹H NMR (400 MHz, CDCl₃): δ = 1.91 (s, 3H), 3.52 (s, 4H), 6.15 (d, *J* = 8.0 Hz, 2H), 8.81 (t, *J* = 4.0 Hz, 1H). ¹³C NMR (100 MHz, CDCl₃): δ = 10.26 (s, CH₃), 106.72 (s, 2CH), 107.37 (s, C), 126.83 (s, CH), 145.33 (s, C).



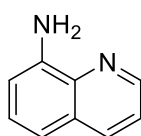
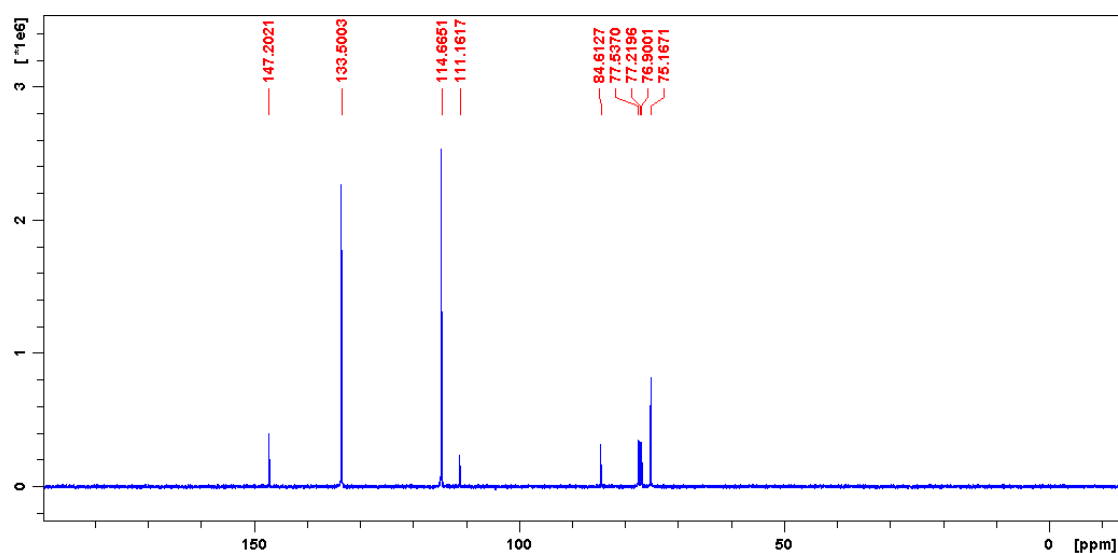
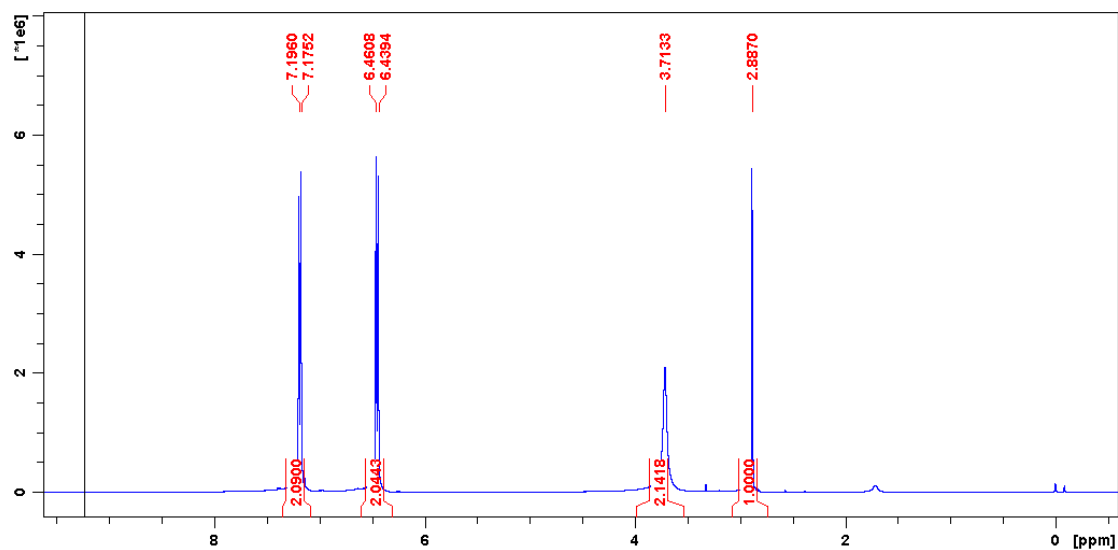
2o: 95% yield, ^1H NMR (400 MHz, DMSO): δ = 4.36 (s, 2H), 6.44-6.53 (m, 4H), 8.44 (s, 1H). ^{13}C NMR (100 MHz, DMSO): δ = 115.93 (s, 2CH), 116.11 (s, 2CH), 140.97 (s, C), 148.82 (s, C).



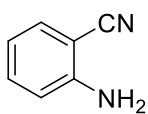
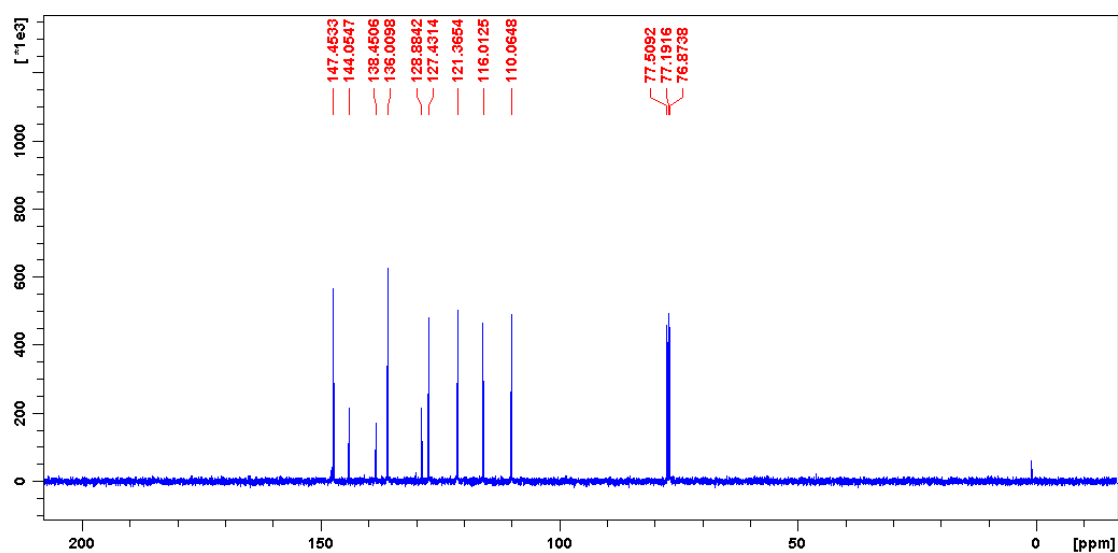
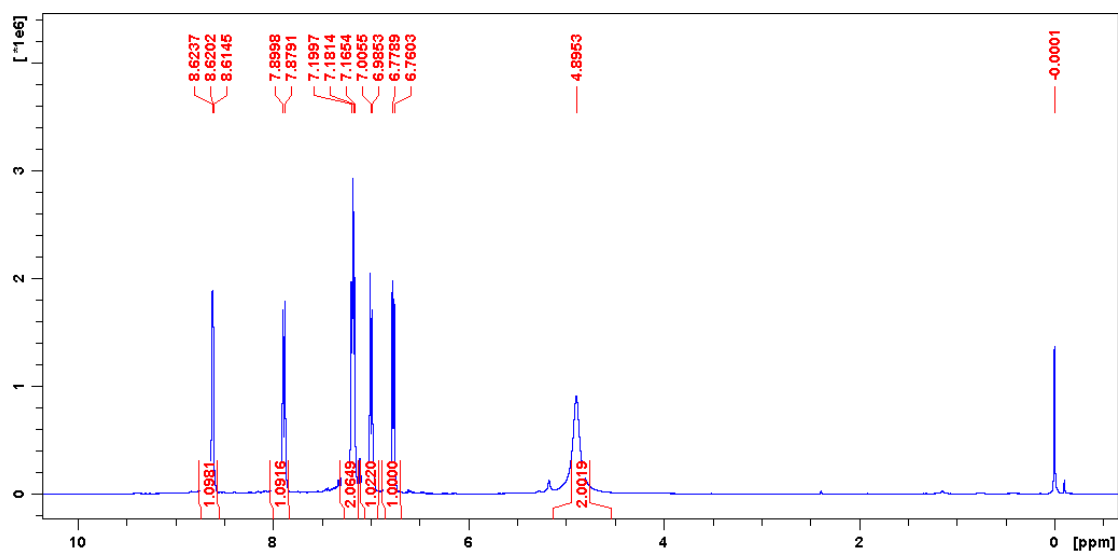
2p: 89% yield, ^1H NMR (400 MHz, CDCl_3): δ = 6.08 (s, 2H), 6.53-6.65 (m, 2H), 7.19 (t, J = 8.0 Hz, 1H), 7.36 (d, J = 8.0 Hz, 1H), 9.75 (s, 1H). ^{13}C NMR (100 MHz, CDCl_3): δ = 116.07 (s, CH), 116.34 (s, CH), 118.80 (s, C), 135.25 (s, CH), 135.76 (s, CH), 150.01 (s, C), 194.15 (s, CH).



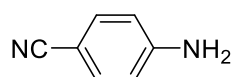
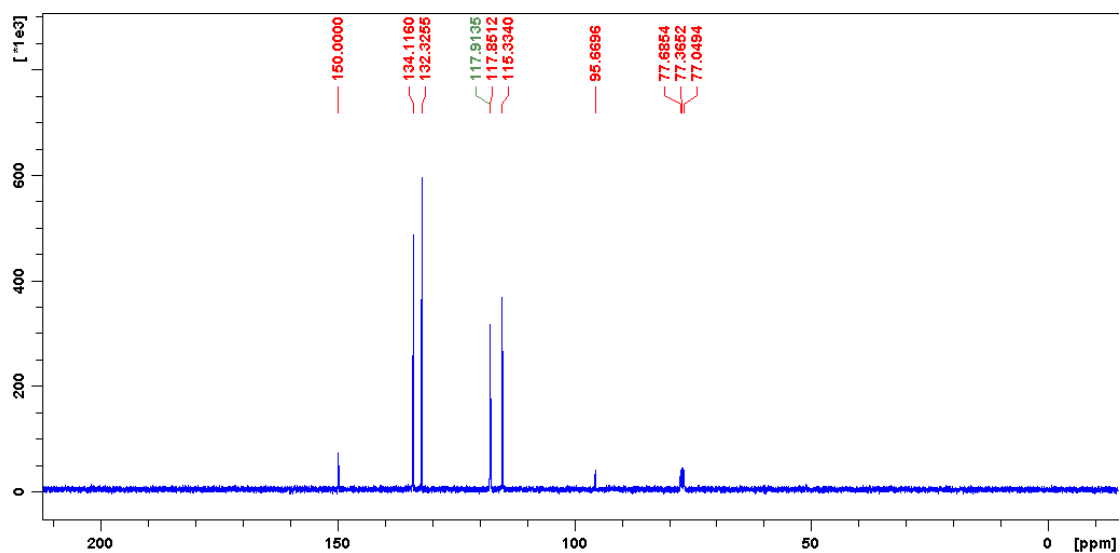
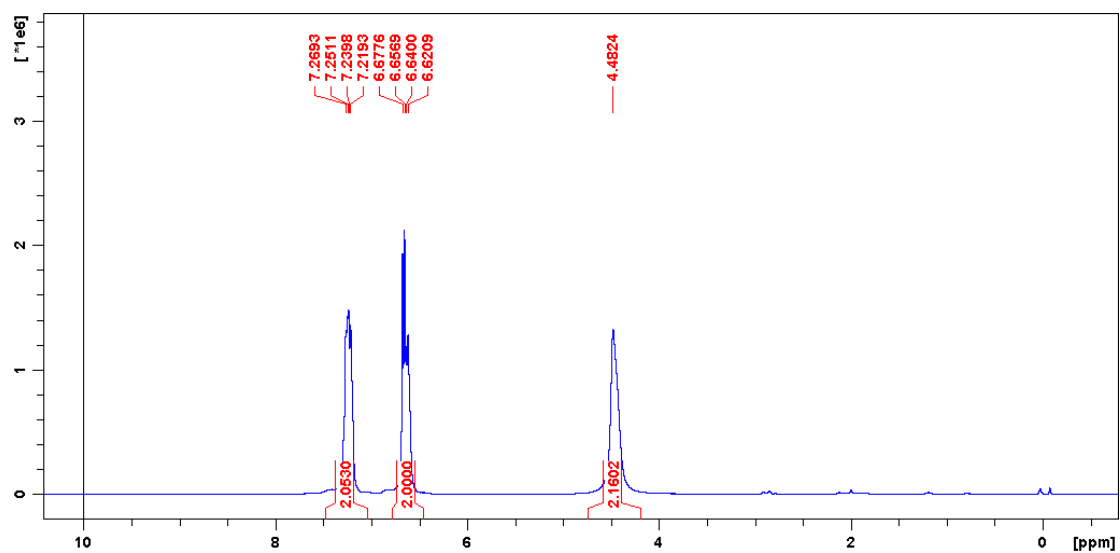
2q: 83% yield, ^1H NMR (400 MHz, CDCl_3): δ = 2.89 (s, 1H), 3.71 (s, 2H), 6.45 (d, J = 8.0 Hz, 2H), 7.19 (d, J = 8.0 Hz, 2H). ^{13}C NMR (100 MHz, CDCl_3): δ = 75.17 (s, CH), 84.61 (s, C), 111.16 (s, C), 114.67 (s, 2CH), 133.50 (s, 2CH), 147.20 (s, C).



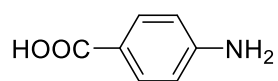
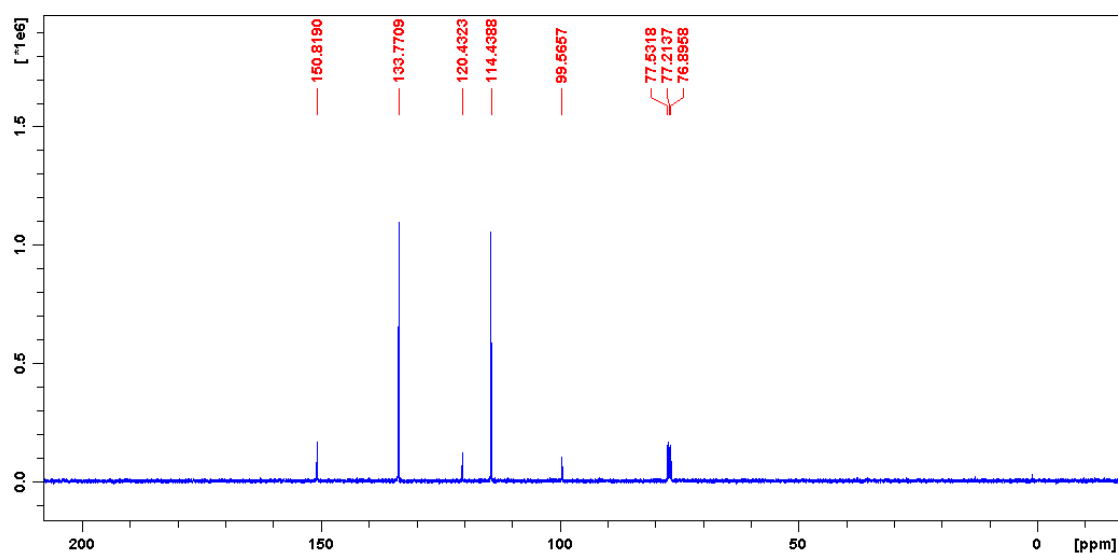
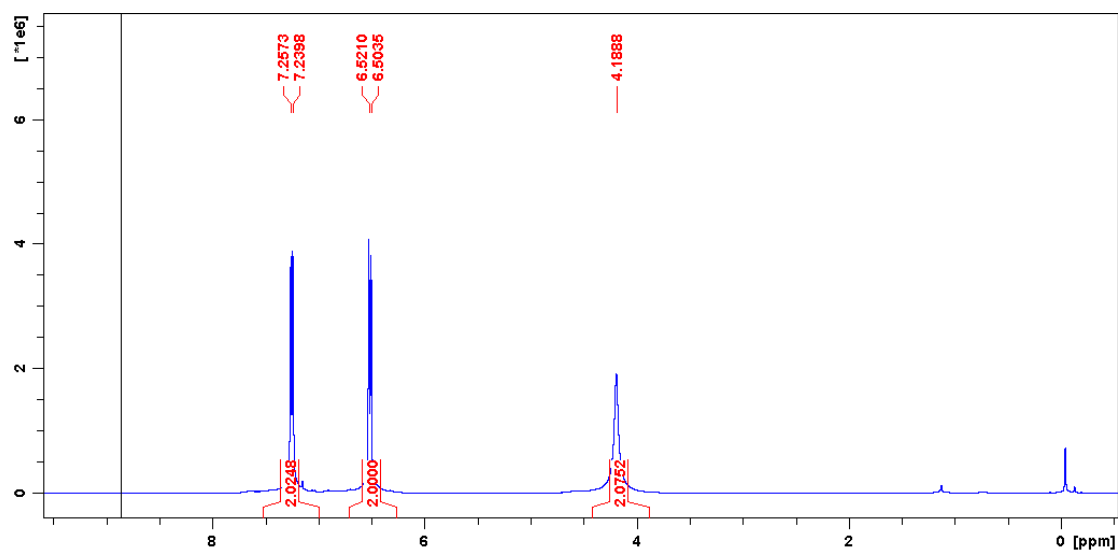
2r: 80% yield, ^1H NMR (400 MHz, CDCl_3): δ = 4.90 (s, 2H), 6.77 (d, J = 8.0 Hz, 1H), 6.99 (d, J = 8.0 Hz, 1H), 7.18 (t, J = 6.0 Hz, 2H), 7.89 (d, J = 8.0 Hz, 1H), 8.62 (t, J = 2.0 Hz, 1H). ^{13}C NMR (100 MHz, CDCl_3): δ = 110.06 (s, CH), 116.01 (s, CH), 121.37 (s, CH), 127.43 (s, CH), 128.88 (s, C), 136.01 (s, CH), 138.45 (s, C), 144.05 (s, C), 147.45 (s, CH).



2s: 85% yield, ¹H NMR (400 MHz, CDCl₃): δ = 4.48 (s, 2H), 6.62-6.68 (m, 2H), 7.22-7.27 (m, 2H). ¹³C NMR (100 MHz, CDCl₃): δ = 95.67 (s, C), 115.33 (s, CH), 117.85 (s, CH), 117.91 (s, C), 132.33 (s, CH), 134.11 (s, CH), 150.00 (s, C).



2t: 86% yield, ^1H NMR (400 MHz, CDCl_3): δ = 4.19 (s, 2H), 6.51 (d, J = 8.0 Hz, 2H), 7.25 (d, J = 8.0 Hz, 2H). ^{13}C NMR (100 MHz, CDCl_3): δ = 99.57 (s, C), 114.44 (s, 2CH), 120.43 (s, C), 133.77 (s, 2CH), 150.82 (s, C).



2u: 88% yield, ^1H NMR (400 MHz, DMSO): δ = 5.88 (s, 2H), 6.57 (d, J = 8.0 Hz, 2H), 7.64 (d, J = 8.0 Hz, 2H), 11.99 (s, 1H). ^{13}C NMR (100 MHz, DMSO): δ = 113.03 (s, 2CH), 117.33 (s, C), 131.71 (s, 2CH), 153.60 (s, C), 168.00 (s, C).

